

THE BLOODSUCKING ARTHROPODS
OF THE DUTCH EAST INDIAN ARCHIPELAGO

VII.

The Tabanids of the Dutch East Indian Archipelago
(including those of some neighbouring countries)

by

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PREFACE.

The following book is not intended to be a pure systematic monograph in the common sense of scientific logography. Although it will contain a great amount of systematic description, my purpose in the first place is a practical one. As a matter of fact, Tabanids participate in the surratransmission, but it is not known, whether all species, belonging to the Genera: *Tabanus*, *Chrysops*, and *Haematopota* and some other genera are able to carry this disease. In respect with the direct or indirect mode of transmission, many facts, open to discussion, should be elucidated and solved in one way or another. Besides little is known about the lifecycle and the optimum conditions, favourable to the development of the immature stages, as eggs, larvae and pupae.

Here opens a magnificent field of co-operation, between veterinarians and entomologists. It is however of the highest importance, to enable the concerned scientific workers to determine the different species of insects, caught in field-work. Up to the present it has been practically impossible for laymen in entomology to find their way in the labyrinth of the System of the Tabanids. Moreover many descriptions of recent species have been published in periodicals, almost inaccessible to scientists, working in tropical countries. A work, such as SWELLEN-GREBEL'S: „De Anophelinen van Nederlandsch Indië” (The Anophelines of the Dutch East Indies) is urgently required on the Tabanids of the same regions.

From a practical point of view, it is necessary to limit the material. Thus I am obliged to treat in the following book mainly the Tabanids occurring in

the Dutch East Indian Archipelago, — although this dominion does not form a geographical and faunal unity —, and to mention the habitations and peculiarities of some species, common to neighbouring countries or possibly to confuse with the described species. In the mean time I will rectify the errors, I encountered in the studied collections. Further I am aware, that the present book will not furnish a complete account of all the species, occurring in our archipelago, since many isles are explored only superficially on their dipterous fauna.

The majority of the papers, dealing with the system of Tabanids, except the Studies from LUTZ, SHIRAKI, SZILADY, AUSTEN and some others, lack clear and demonstrative illustrations. Coloured plates are indispensable in difficult instances and would greatly simplify the determination of the concerned species. Figures of antennae, palpi, forehead and other important characters accompany nearly all my descriptions. These I have not made too short, as this causes much doubt, especially, when figures are missing. To prove this I could quote several of RICARDO's descriptions. Photographical reproductions I shall omit. Furthermore I will emphasize especially the variations of the characters in a given species. The keys of determination must be easy and simple. The binary system is preferable to other, more complicate systems. Regarding the grouping of the species I will deviate at many points from the system, followed by RICARDO. Studying several thousands of Tabanids, belonging to upwards of 250 species, I found, that the callusshape can hardly be the general base for the separation of the different groups, since it may vary in a high degree in the same species. I think it better to favour markings and other peculiarities, visible to the naked eye, instead of those, which can be discerned only by minute observation. Dealing with fresh specimens, the eyecolour is a valuable guide to an easy and correct determination. Special wingmarkings, as coloured bands, the presence of a recurrent veinlet, the appendix, to the third longitudinal vein, strike the eye during a superficial examination of the insect. The colouring of the beard is a useful character. In *Chrysops* species the colour of the abdomen, ornated with transversal bands or longitudinal striations forms an obvious characteristic.

Arranging my determinationkeys I reckoned with the fact, that a given specimen may be incomplete; — A part of the wings or a pair of legs being disturbed —; yet one will be able to diagnose the species exactly by consulting another key, for which the knowledge of the first characteristic was not indispensable. Especially in case of rare species this is of great service.

Taking into account of the different peculiarities mentioned above, I hope to have succeeded in grouping the described species on a more natural manner, than was possible according to the old system. Confer RICARDO's paper on Oriental Tabanidae.

In the mean time at this point a few remarks may be made with respect to ENDERLEIN's system. I think ENDERLEIN has fallen into another fault by making a differentiation into „genera”, where evidently even the word „variety”

was not correct and the condition of the described species, due to rubbing or other mishaps, mislead him. Later on I will describe cases, in which rubbing or defects gave specimens of the same species quite different aspects. But apart from this, the presence or absence of an appendix for instance does not rectify the separation of Genera, since it is a well known fact, that this character is very variable and generally does not occur in all specimens of the same species. So I don't see any reason, why I should accept ENDERLEIN's system.

Our knowledge upon the biology of Tabanids is up to the present scarce and fragmentary. What is known about the pathogenicity, the lifecycle and other important facts, I will note under the particular species. Beginners in Entomology and Veterinary Surgeons require a more extensive description of the typical features, common to all Tabanids, including an explanation of the artificial terms used. See for this the General Part.

At last I wish to express my hearty thanks to all who have enabled me to accomplish my task; in the first place to the Governments Veterinary Surgeons, who frequently furnished me large collections of Tabanids, as well as to all other people, who did the same thing.

Major AUSTEN's kind help in difficult decisions on synonyms and other controversies, regarding the Oriental Tabanidae, present in the collections of the British Museum of Natural History was of high value to me.

By the courteousness of Prof. Dr. C. H. DE MEYERE and Prof. Dr. C. VAN OORT I was able to refer to the collections of *Natura Artis Magistra* and of the Rijks Museum voor Natuurlijke Historie at Leyden.

Dr. BODEN KLOSS, Director of the Raffles Museum at Singapore, several times sent me collections for determination.

I regret that I can't mention separately all who helped me in one way or another to make the following book a base for further research in relation to the biology, control measures and other problems, which are waiting a solution. A special word of thank I will consecrate to Dr. C. BUBBERMAN, Director of the Veterinary State Laboratories, who made the first move to study the surrproblem in the Dutch East-Indian Archipelago in all its details and who enabled me to make all the studies required and supported my efforts to edit the book in its present form.

In this book the different Collections are indicated by the following capitals:

- V.S.L. = Veterinary State Laboratories.
- B.Z.M. = Buitenzorg Zoological Museum.
- R.M.S. = Raffles Museum Singapore.
- N.A.M. = *Natura Artis Magistra*.
- L.M.N.H. = Leyden Museum of Natural History.
- BR.M. = British Museum of Natural History.
- F.M.S.M. = Federated Malay States Museum

UTRECHT, 5 January 1925.

GENERAL PART.

The Tabanidae, a family of dipterous insects are characterised inter alia by the large head, which is convex in front and concave or flattened behind, by the large eyes, bordering the forehead, with its specific markings as calli, vertexspot or ocellar plate in the female and meeting in the median line in the holoptic male. Confer the plates and textfigure 1. In the male sex the eyes nearly always show particular markings: an upper area, composed of big facets and a lower part, at the same time different in colouring, with numerous small facets. In the female (also occasionally in the male of the Genus *Tabanus*) of several *Tabanus*-, *Haematopota*-, and *Chrysops*-species, peculiar coloured spots or bands occur. In the Genus *Erephopsis* they are hairy. In other Genera the eyes may be more or less pubescent as well. All Genera, belonging to the Subfamily *Pangoninae* (see below), *Chrysops* for example, present ocelli, placed at the vertex on an ocellar plate. The antennae are three-jointed, short in the Genera *Tabanus*, *Silvius*, *Neobolbodimyia*, *Erephopsis* etc. The third antennal joint presents 5 divisions in *Tabanus*, *Silvius*, *Chrysops*, *Gastroxides*, seven or eight annulations in *Erephopsis*, *Pangonia* and *Coryzoneura*.

The wingstructure of the Tabanids distinguishes them at once from the other families, in that the third longitudinal vein is forked, the fourth spreads and is divided into a number of branches, which surround the disc cell. Generally the lower branch of the fifth longitudinal vein and the sixth unite. The third longitudinal vein shows a recurrent veinlet (appendix) in some *Tabanus* species, whereas it occurs in alle *Haematopota* species.

The body of the Tabanids is in general of a large size and even the smallest species are mostly bigger than the more voluminous representatives of the *Muscidae* Family.

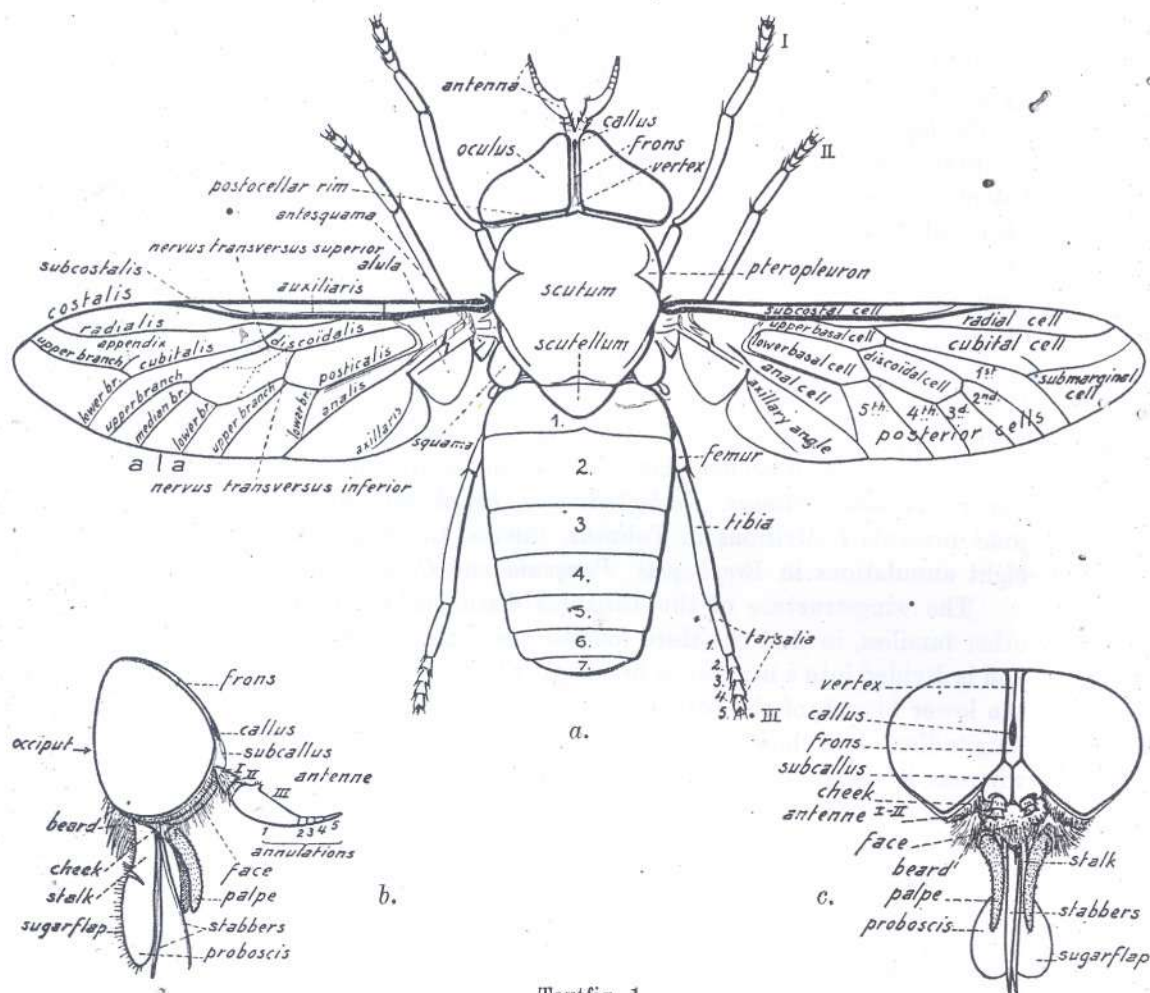
Thorax and abdomen are uniformly coloured or show peculiar markings in the form of special spots or stripes, covered with coloured hairs. Representatives of Tabanids occur in all parts of the world. In the Tropics they often become a serious pest to horse, buffalo and cattle, swarming around neck and belly of the attacked animals, being a great nuisance by the painful bite and the large volume of blood they suck and last not least by the carrying of diseases. In human pathology *Chrysops caecutiens* is known as a carrier of *Filaria loa*. The larvae of *Filaria loa* develop in the body tissues of this Chrysopid.

Further they are feared as carriers of Trypanosomiasis.

The popular names for Tabanids are serootflies, a name originated from the arabic, gad flies, or more simply horseflies. For a correct notion of the treated flies a more detailed description of the fullgrown insect, the larva and the pupa is indispensable.

The Fullgrown Insect or Imago.

The Head. (confer Textfig. 1 b. and c.) The big eyes need no further description. In the female-sex all facets are of the same size. The interocular space is filled with the frons or forehead. The forehead is covered with a down of very short



Textfig. 1.

a. *Tabanus* sp. scheme; b. head in side view; c. head in front view.

PRIJS del.

hairs, the so-called tomentum, only visible with lenses of strongly magnifying power, which covers also almost the whole surface of the body. Furthermore longer hairs, called pubescence, are visible. The anterior part of the forehead is thickened and bears special hairless markings or calli. According to the species one will find one single square or round callus, with or without a further prolongation, the linear extension or callus stripe; two calli; or even each trace of a callus may be absent. Underneath the forehead a triangular space, the subcallus or antennal triangle is

inclosed by the eyes at its lateral borders and below by a line passing by the implantations of the antennae. This subcallus is covered with a similar tomentum as the frons in most of the species, in other species it is quite bare, incrassated and shining. A median groove divides this field into two equal parts. More or less convex walls separate it from the cheeks, which border the eyes. At the lower border of the cheeks there is always a row of long, flossy hairs, forming the beard. The area, connecting the antennae with the mouth is called in my descriptions face or clypeus. In the Genus *Chrysops* the clypeus possesses facial calli. At its lower end the proboscis, flanked by the palpi, is inserted on the clypeus. The three-jointed antennae are provided with a tooth on the basal annulation of the third joint in *Tabanus*. In *Haematopota* the same basal annulation does not present a tooth. In *Chrysops* the three antennal joints are almost equal in size and together much longer than the head and generally as long as thorax and head together. In *Erephopsis* and *Corizoneura* the 2 basal joints are short, the third, which becomes narrower towards the apex, consists of seven or eight cylindrical annulations. Male and female possess similar antennae, whenever the antennae in the male are slightly narrower and shorter than in the female. The palpi are two-jointed, short in the male, much longer in the female, where they nearly equal the proboscis in length. In *Tabanus* the first joint of the palpi is short and nailshaped, the second joint much longer and pointed towards the end, curved at its inner border and covered with tomentum and depressed hairs. The proboscis consists superficially of the stalk and the big sugarflaps. Labium, labrum, hypopharynx, the paired maxillae and mandibles form together the complicated mechanism, which enables the female to bite and suck. These stabbers are rudimental in the male, so that this animal is obliged to suck plant juices, since it cannot pierce the animal skin.

The **T h o r a x**. Dorsally the thorax presents the scutum, the scutellum, the wings and the halteres, ventrally one finds 3 pair of legs, one pair belonging to each thoracal segment, resp. prothorax, meso- and metathorax. A shallow groove separates the scutum from the scutellum; both parts being covered with tomentum and pubescence.

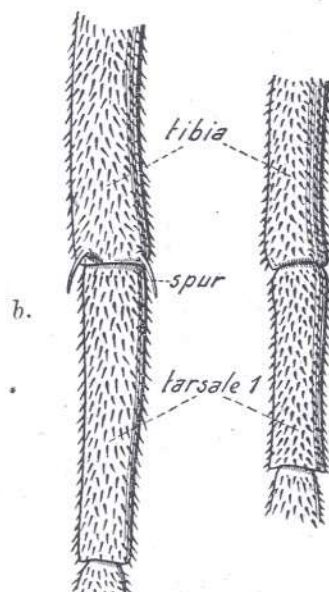
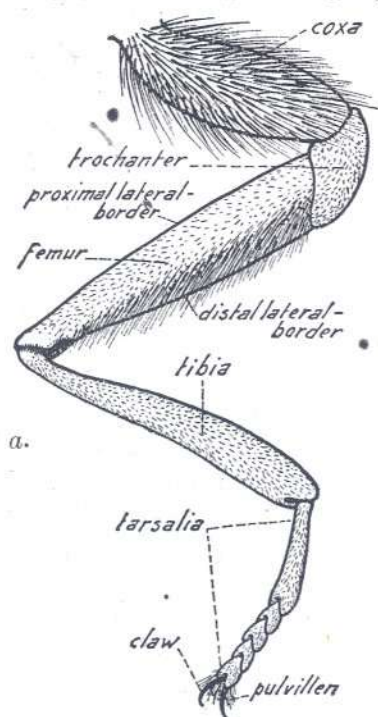
At the lateral borders of the scutum, where the pro- and mesothorax meet, a forked suture surrounds the pteropleuron. Sides and breast are composed of the following parts, the prothorax with its sclerites, the prosternum, the epimeron prothoracis, the episternum prothoracis, the mesothorax with the mesosternum and its big lobus, the epimeron- and episternum mesothoracis and lastly the metathorax with the metasternum, the episternum- and epimeron metathoracis.

The wing, sometimes ornated with crossbands or spots, shows a rather complicate structure. The costal vein circulates the whole wing. Besides one finds an auxilliary vein or mediastinalis and 7 longitudinal veins.

The mediastinalis is also called auxilliary vein.

„ 1st longitudinalis is also called subcostalis.

The 2d	"	"	"	"	radialis.
" 3d	"	"	"	"	cubitalis, sometimes with an appendix or recurrent veinlet.
" 4th	"	"	"	"	discoidalis.
" 5th	"	"	"	"	posticalis.
" 6th	"	"	"	"	analis.
" 7th	"	"	"	"	axillaris.



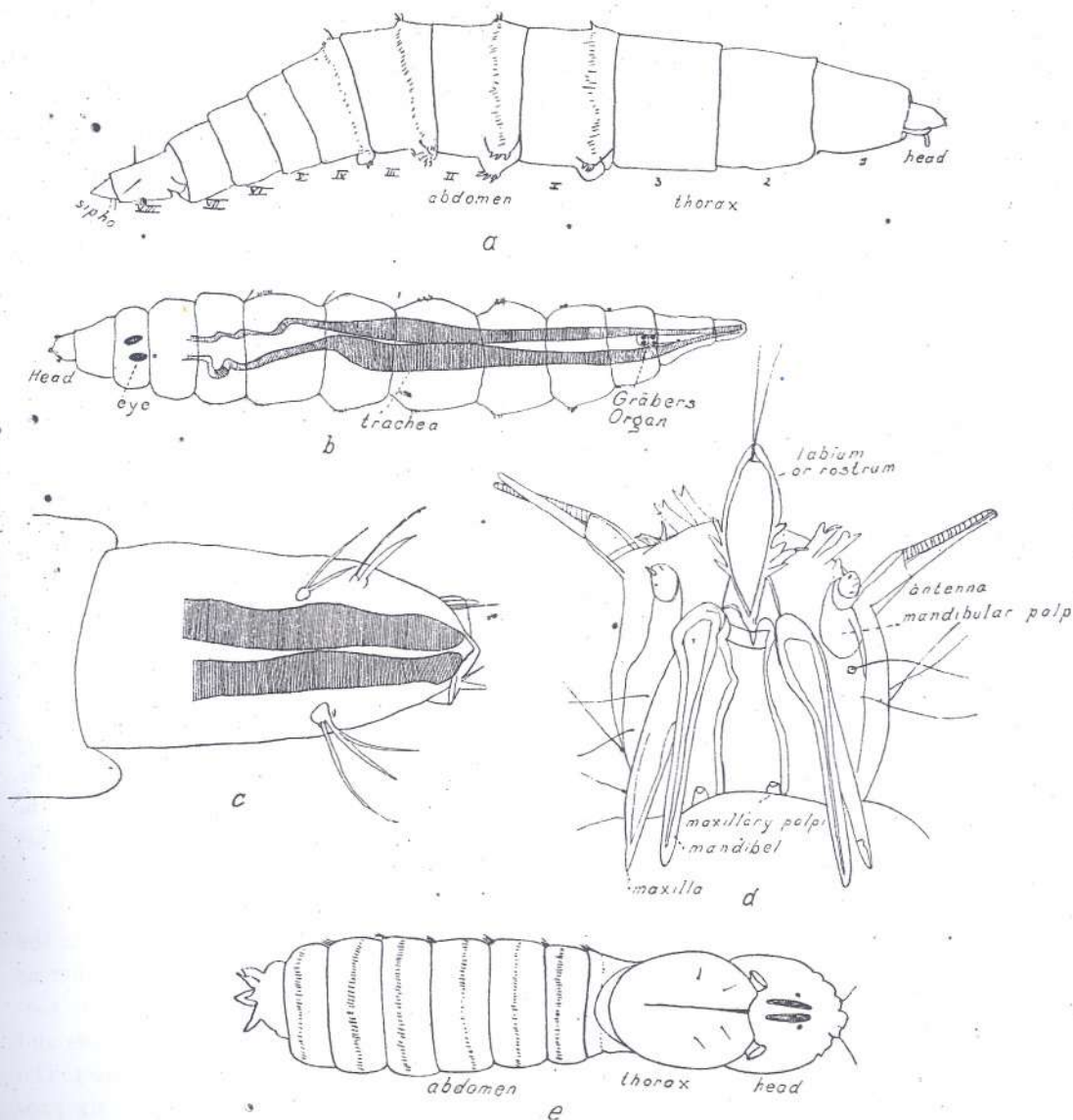
c.

Textfig. 2.

a. *Tabanus* spec. leg. b. *Pagonine*, tibio-metatarsal articulation. c. *Tabanine*, tibio-metatarsal articulation. b. and c. apud SURCOUF and GONZALES- RINCONES. PRIJS del.

Some veins are forked, as for example the third, which presents two branches. The fourth vein forms the disc cell, which is connected with the hind border of the wing by means of three branches. Between the trunk of the third vein and the fourth vein one finds the median or superior crossvein. The posterior or inferior crossvein runs between the upper branch of the fifth vein and the disc cell, whereas the anterior crossvein stretches between the costalis and the mediastinalis. For the names of the cells compare the scheme. The wing consists of four parts, the greatest part, called ala, a little flap or alula, the antequama and the squama, which covers the halteres, composed of a stalk and a club with its sensory organs. Each leg presents a coxa, trochanter, femur, tibia

and five tarsalia. The tibiae of the middle legs, in other words the middle tibiae are provided with two subequal spurs. In the *Pangoninae*, to which belongs inter alia the genus *Chrysops*, the hind tibiae also show two, sometimes indistinct



Textfig. 3.

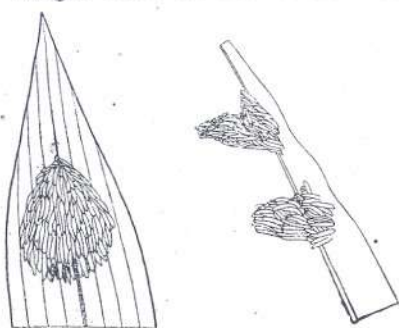
a.—d. Stages of *T. rubidus*. e. Pupa of *T. striatus*. a. en b. Larvae of *T. rubidus*.
c. Respiratory siphon of larva. d. Head of larva, ventral side.

spurs (Textfig. 2 b. and c.) The fifth tarsale of each leg ends into two claws and three pulvilli. In the male the tarsal appendices differ somewhat in construction from the female.

The abdomen. The abdomen is composed of seven segments, at the end of which is situated the anal opening and the sexual orifices, the greatest part of the sexual organs being hidden in the interior and only protruding in the act of copulation or oviposition. Males and females mostly show sexual differences in the colouration of their abdomen.

The Larva. The larva is a vermiform (Textfig. 3 a. en b.) creature showing 12 segments in total. One finds a head with the usual appendices, the thorax, being composed of three segments and the abdomen presenting eight parts. The literature contains some controversies concerning the exact number of the abdominal segments in the larva. One author finds 11 segments, but when the sypho and the anal segment are taken as a whole, there are in my opinion twelve segments. The head, three thoracic segments, seven abdominal segments with propodia and the anal segment with the sypho possessing the spiracles (Textfig. 3 c.) The head is rather simple, but exhibits at its anterior end the different mouthparts and appendages, (textfig. 3d.) the strong hooks or mandibles, coloured brown, the maxillae, congruent to the firstnamed but colourless and clear and between them the labium being visible as the prow of a boat, bearing two hairs. At sides one finds the mandibular palpi and the antennae, which have 2 joints. A little further behind the maxillary palpi are found, wholly hidden in the sheath of the head when this part is retracted in the first thoracic segment. Then also the eyes shimmer through. Both ends of the larva are tapering. At the hindborder of each segment, small propodia are found, in *Tabanus* in total 6 pieces per segment, lying on the ventral surface. On the dorsal half one may follow the course of two big tracheae, opening in the sypho at the end of the 8th abdominal segment. This sypho is retractile.

A typical organ, the GRAEBER'S organ, which probably has an excretory function, is found in the eighth segment, distinguishable by its black round balls. Rows of short hairs accompany the hind borders of the segments, whereas the propodia, being promotory organs, are beset with small hooks and hairs. Other longer hairs are scattered over the segment.



Textfig. 4.

Eggmasses of *T. rubidus*. a. laid in one time. b. the female was disturbed during oviposition.

The Pupa. (Textfig. 3e.) resembles in the shape of its head and thorax the imago, whereas its abdomen resembles the larva. The segmentations are fringed with rows of hairs and each segment bears a lateral tuft of hairs. The abdominal spiracles are situated on six projecting spurs or teeth. Also there is a broad anal tubercle.

The Eggs. (Textfig. 4) are laid in masses by the female which does not cease ovipositing before the whole number of eggs has been produced (Textfig. 4a.), unless it becomes disturbed

when ovipositing (Textfig. 4b). Each eggproduction amounts from 600 to 800 cylindrical elongated eggs.

THE SYSTEM OF TABANIDS.

The family of the Tabanidae is subdivided into two subfamilies, the *Pangoninae* and the *Tabaninae* strictiori sensu. Each of these subfamilies composes a number of Genera. The greatest part of these Genera is limited to tropical America. Most of the Tabanids, caught in our Archipelago, as well as in the South-Eastern Part of Asia, belong to the three Genera *Tabanus*, *Haematopota* (*Chrysozona*) and *Chrysops*. From the other Genera only occasionally a single specimen is captured, but they are of no importance from an economical point of view.

The classification of the two subfamilies is based mainly upon the presence or absence of spurs on the hind tibiae as the following Key shows.

KEY 1.

Classification of the two Subfamilies.

1. Hind tibiae with spurs, three well developed ocelli usually present, failing in some Genera: Subfamily **Pangoninae**.
2. Hind tibiae without spurs. Ocelli never present, or rudimentary in the form of a vertex spot or vertigial tubercle: Subfamily **Tabaninae**.

Although the biggest part of my book is consecrated to the Genera *Chrysops*, *Haematopota* and *Tabanus*, the other Genera, encountered in the explored regions, found a place in the determinationkeys and are treated in the descriptions.

The Pangoninae.

From this Subfamily, according to DE MEYERE and RICARDO the following Genera and Subgenera occur in the Dutch East Indian Archipelago: *Chrysops*, *Pangonia*, *Corizoneura*, *Gastroxides*, *Erephopsis* and *Silvius*. They may be determined with the following Key.

KEY 2.

- 1a. Third antennal joint with five annulations, proboscis usually short, not longer than the head, eyes bare 2
- b. Third antennal joint with seven or eight annulations, proboscis usually prolonged, longer than the head, eyes bare or pilose..... 4

- 2a. Wings with a median crossband, anal cell closed or open, the two basal antennal joints equally long, or when unequal, never differing much in size, facial calli always present, ocelli distinctly visible:

Chrysops MEIG.

- b. Wings almost wholly hyaline or wholly dark brown 3
- 3a. Wings usually hyaline or when tinged, with an apical shadow, combined or not with one or more transverse streaks, but never in the middle of the wing, anal cell closed, second antennal joint always much shorter than the first, third joint with a well developed dorsal tooth as in *Tabanus*, the clypeus with facial calli in some species, ocelli usually present:

Silvius MEIG.

- b. Wings quite dark brown, except some clear hyaline streaks or spots, third antennal joint with a sharp spur on the first annulation. Body uniformly brown or black. Facial calli and ocelli present:

Gastroxides SAUNDERS.

- 4a. Eyes bare, proboscis exceptionally long, almost equal in length to head and thorax, palpi round in cross-section, clypeus elevated, third antennal joint with eight annulations, first posterior cell of wing open, although narrower at border. Appendix long. Anal cell closed:

Pangonia LATREILLE.

- b. Eyes pilose 5
- 5a. Wings clear or with small, brown spots, anal cell closed, first posterior cell open or closed, femora bare or with scanty pubescence

Erephopsis ROND.

The pubescence of the eyes at once separates the last Genus from the foregoing ones. The nature of the antennae on the other hand separates the first three Genera from the last two. In the absence of antennae the nature of the eyes, the wingstructure and its colour suffice in determining the Genus.

The Genus *Chrysops* MEIG.

All *Chrysops* species are small. In the typical, banded wings the crossband reaches always to the hind border. In some species the brown colour is prolonged along the foreborder as an apical shadow, in other species this apical spot is absent. The antennae are long and surpass the head and thorax in length. The two basal joints are almost equally long and rudimentary ringed; the third joint, swollen at base, is distinctly five-ringed, the basal ring showing an indication of further segmentation, so that apparently seven segments are present, they are however never equally long as in the real seven-segmented Genera. The wide forehead and the clypeus present the following markings, the ocellar tubercle, present in male and female; the frontal callus and the facial calli, which join in the median line, just above the implantation of the proboscis

in the ♀, and separated in the middle line in the ♂. Further a round marking, lies close to the facial calli on the cheeks and another connects the lower angle of the eyes and the clypeus.

In the male the head is nearly holoptic. The eyes meet under the ocellar-plate in a point. Fresh specimens show beautiful eyemarkings, which fade away after death. Palpi, long and bulletshaped in the female, are short and blunt in the male. The markings on the somewhat conical abdomen are specific, although they may differ slightly, according to the sexes.

DE MEYERE mentions 5 *Chrysops* species, occurring in the Dutch East Indian Archipelago. In the mean time the number of species has increased and my collection includes 11 species.

Chrysops translucens MACQUART not having been found up to the present in the Dutch East Indies, frequently occurs in the Federated Malay States. *Chrysops alter* RONDANI was not seen by me and therefore I excluded it from the Key 3. I will however quote its description.

KEY 3.

The Genus *Chrysops*.

- 1a. Wings with 2 clear eyespots, as for the rest wholly brown. Abdomen with a single black transverse band on the second segment in the ♀, havanna-brown crossbands on the 2d and 3d segments and a narrower one at the apex of the 4th segment, all transverse bands being connected sideways by a brownish shadow in the ♂; thorax with a median longitudinal golden-yellow haired band and similar coloured sidetufts. Fore tibiae in the ♀ fore- and hind tibiae in the ♂ distinctly swollen
fixissima WALKER.
- b. Wings with a dark median crossband, with or without an apical spot. . . 2
- 2a. Wings with no apical spot, dark transverse band not reaching the hind-border of the wing, anal cell open; body small; antennae yellow, darker at apex, all joints almost equal in size. Legs blackbrown with paler olivaceous-yellowbrown tarsalia. Abdomen black with a yellow band on the anterior half of the first two segments: flavocincta RICARDO.
- b. Wings with median crossband and apical shadow..... 3
- 3a. Abdomen black with transverse white or yellowish bands 4
- b. Abdomen marked otherwise 5
- 4a. Abdomen black, except an almost parallelsided, transverse white band on the second segment and a small fenestrate white spot just under the scutellum on the first segment. The main part of the transverse wingband is triangular, the fifth posterior cell with a distinct clear area, a brown streak accompanies the fifth longitudinal vein. Anal cell open. Antennal joint nearly equally long. Tibiae normal: albicincta VAN DER WULP.

- b. Abdomen conical, black, except a yellowishwhite collar on the first segment, a similar pellucid transverse band on the second segment, sharply incised at hindborder, and a brown median longitudinal bar, connecting 2d and 3d segment. Apical band of wing straight-concave; fifth posterior cell with clear centre. Tibiae normal: **translucens** MACQUART.
- 5a. Abdomen with fenestrate markings on the second segment, whereas the following segments present four longitudinal stripes, ending on the 7th segment: **atrivittata** SCHUURMANS STEKHOVEN.
- b. Abdomen with reversed v-spots or black crossbands 6
- 6a. Abdomen with reversed v-spots 7
- b. Abdomen with one or more black crossbands only 8
- 7a. The black v, narrowest at base, extends over the second and third abdominal segments, to the apex the legs of this v are broadened; the first abdominal segment presents an apical narrow, black transverse stripe; fifth posterior cell of the wing with distinct clear area, disc cell slightly clearer in the centre. Anal cell widely open. Tibiae normal. Abdominal markings identical in the ♂: **dispar** FABRICIUS.
- b. The v-spot smaller, only covering the second segment, in some specimens the v is prolonged on the third segment as a faint redbrown shadow, first segment with a median small, black, round spot only or a fine shadow of black hairs, not extending to the lateral borders. Anal cell open or closed. In the ♂ the legs of the black v are separated in the middle, first segment identical. Tibiae normal: **flaviventris** MACQUART.
- 8a. Abdomen with extreme base black and a single black, broad transverse band 9
- b. Abdomen with no black base but three black bands 10
- 9a. Abdomen in female sex with a black basal collar on first segment and a broad transverse band, covering the hindborder of the second and the whole of the 3d segment, two first segments elsewhere dirtywhite, fifth posterior cell of wing without a sharply circumscribed clear area; anal cell open. Male abdomen with black collar on first segment, brownblack at the apex of the fourth and following segments. Dorsum elsewhere white. Fore and hind tibiae distinctly swollen: **fasciata** WIEDEMANN.
- 10a. Male. Abdomen with three black bands on the first, second and third segment, last two connected and enclosing a yellow triangle with sharp side-edges, sideways these black bands, which do not touch the lateral borders of the tergites, are connected with the black transverse stripe on the first segment by a black longitudinal lateral stripe. Obscure black square spots present in the centres of the 4th and 5th abdominal segments. Tibiae distinctly swollen. Wings with no clear area in disc cell; fifth posterior cell somewhat clearer in the centre; crossband on wing narrow: **signifer** WALKER.

- b. Female. Abdomen with three black bands, on the 1st, 2d and 3d segment, none of them reaching the lateral borders. Second band largest, strongly elevated, third band parallel, covering the smaller part of the 3d segment, connected with the black band on the second segment by means of a blackish shadow. First two segments elsewhere yellow. Apical segments reddish. Tibiae strongly swollen. Crossband on wing broad:

atrisignata SCHUURMANS STEKHOVEN.

When the wings are absent, one should consult the following Key:

KEY 4.

- 1a. Abdomen mainly black..... 2
 b. Abdomen mainly yellow 4
 2a. Abdomen black with a single transverse white band on the second segment, which widens towards the lateral borders: **albicincta** VAN DER WULF
 b. Abdomen black with two white transverse bands at the bases of the first two segments 3
 3a. Face prominent, shining black, except a small yellow transverse spot, somewhat underneath the antennae **flavocincta** RICARDO.
 b. Face yellowish with a black spot on each side, below the antennae: **translucens** MACQUART.
 4a. Abdomen with four longitudinal stripes, forming fenestrate markings on the second segment and ending on the 7th segment: **atrivittata** SCHUURMANS STEKHOVEN.
 b. Abdomen marked otherwise 5
 5a. Abdomen with reversed v-spots 6
 b. Abdomen with a black apex or one or more black crossbands only.. 7
 6a. The black v, narrowest at base, is distinctly visible on the second and third abdominal segment, sometimes also prolonged over the fourth segment; besides the first abdominal segment presents a narrow transverse band at apex. ♀ and ♂ identical: **dispar** FABRICIUS.
 b. The v-spot only covering the second segment, broader at base, in some specimens it is prolonged on the third segment as a faint redbrown shadow, first segment with a median small black round spot only or a fine shadow of black hairs, not extending to the lateral borders; in the ♂ the legs of the black v are separated in the middle **flaviventris** MACQUART.
 7a. Abdomen with a black apex and a black collar on the first segments at base, abdomen elsewhere white: **fasciata** ♂ WIEDEMANN.
 b. Abdomen with one or more black crossbands 8
 8a. Abdomen with a single black transverse band at the apex of the second segment, curved at base, straight at apex, elsewhere ochraceous-yellow, darker at apex; fore tibiae distinctly swollen: **fixissima** WALKER. ♀

- b. Abdomen with a black basal collar on the first segment and a broad transverse band, covering hindborder of the second and the whole of the 3d segment, two first segments elsewhere dirtywhite. Apex redbrown to blackbrown: *fasciata* WIEDEMANN ♀
- c. Abdomen with three black bands 9
- 9a. Abdomen ochraceousyellow with havannabrown narrow crossbands on the 2d and 3d segment and a narrower one at the apex of the 4th segment, all transverse bands being connected sideways by a brownish shadow. Fore- and hind tibiae distinctly swollen: *fixissima* WALKER ♂
- b. Abdomen with three black bands on 1st, 2d and 3d segment, broadest on the 3d segment, last two bands connected and enclosing a yellow triangle with sharp side-edges. Sideways these black bands, which do not touch the lateral borders of the tergites, are connected with the black transverse stripe on the 1st segment by a black longitudinal lateral stripe. Obscure black square spots in the centres of the 4th and 5th segments. Tibiae distinctly swollen *signifer* WALKER ♂
- c. Abdomen with three black bands on the first three segments, broadest and strongly elevated in the middle on the 2d segment, none of them reaching the lateral borders of the tergites, third band parallelsided, covering the smaller part of the 3d segment, connected with the black bands on the 2d segment by means of a blackish shadow. Tibiae strongly swollen *atrisignata* SCHUURMANS STEKHOVEN.

1. *Chrysops fixissima* WALKER (♀, ♂) Pl. 1, Fig. 1 a, b, c.; Textfig. 5.

Synonyms: *C. unizonatus* RONDANI.

C. testaceicallosus DE MEYERE.

References:

WALKER, Proc. Linn. Soc. London I, p. 112 (1856)).

RONDANI, Ann. Mus. Civ. Stor. Nat. Genova VII, p. 459 (1873).

RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 376 (1911).

„ Rec. Ind. Mus. IV, p. 392 (1911).

DE MEYERE, Tijdschr. v. Ent. LIV, p. 179 (1911).

„ „ „ „ LX, p. 298 (1918).

„ „ „ „ LXVII, p. 203 (1909).

PRATT, Jl. of Trop. Vet. Science IV, p. 390 (1909).

OSTEN SACKEN, Berlin. Ent. Zeit. XXVI, p. 97 (1882).

Females

Isle Borneo

Type ♀ from Borneo, Sawarak 1868 SAUNDERS

Coll. BR.M.

2 ♀ ♀ „ Sandakan BR.N. Borneo 1898 CATOR

„

1 ♀ „ „ 1895

„

1 ♀ „ Sawarak 1856 SAUNDERS

„

Federated Malay States

1 ♀ from Singapore 1896 FLOWER

Coll. BR.M.

1 ♀ „ „ 8. '02

Coll. R.M.S.

Isle Ceylon

2 ♀ ♀ from Trincomalee

resp. 1 ♀ „ 2.10.'90

Col. BR.M.

1 ♀ „ 10.9.'91

Isle Java

1 ♀ from Djasinga Res. Batavia, on horse 17.4.'22

Coll. V.S.L.

2 ♀ ♀ „ Buitenzorg Res. Batavia SIEBERS

Coll. B.Z.M.

resp. 1 ♀ „ 2.1.'21

1 ♀ „ 12.2.'21

1 ♀ from Moeara Angke, Batavia 4.'18

Coll. N.A.M.

1 ♀ „ Mount Ardjoeno HECKMEYER

Coll. L.M.N.H.

Isle Sumatra

Residency Tapanoei, Veterinary Ressort: Padang Sidempoean

1 ♀ from Angkola, Padang Sidempoean, on buffalo, 7.1.'22 TARIP Coll. V.S.L.

1 ♀ „ Sibalapak, Moeara Tais, on buffalo 3.6.'24 BAKKER Coll. V.S.L.

1 ♀ „ Si Boehoean, Djandi Lobi, Binanga, on horse 6.2.'22 „

1 ♀ „ Si Oendol, Paringgonan, Binanga, on horse 2.'24 BAKKER „

1 ♀ „ Si Paho, Oedjoeng Padang, Goenoeng Toea, on horse BAKKER 13.11.'23

Males

Isle Java

Type ♂ and another ♂ from Mount Ardjoeno, HECKMEYER Coll. L.M.N.H.

1 ♂ „ „ same locality Coll. N.A.M.

1 ♂ from Buitenzorg, Residency Batavia LEEFMANS 9.'19 Coll. N.A.M.

1 ♂ „ labelled *Chr. fasciatus* WIED, locality unknown „

PRATT, Journal. Trop. Vet. Science, Vol. IV 3. p. 390, 1909 says *Haematopota* and *Chrysops* have a breeding season and the foregoing records show, that *Chr. fixissima* is mainly captured in the wet-monsoon from November till April, thus evidently confirming PRATT's statement. According to Colonel YERBURY, to whose opinion RICARDO refers, *Chrysops fixissima* is a rare species, which concords with my opinion, since from the mentioned species only now and then a single specimen was captured, whereas for example *Chrysops fasciata* yielded whole series at the same time. I don't agree with RICARDO's idea, that *Chrysops fixissima* WLK is related to *Chrysops fasciata* WIED, „distinguished from it by the facial tubercle being yellowish brown, becoming black only on its upper corner. Legs also paler”, as I will discuss afterwards.

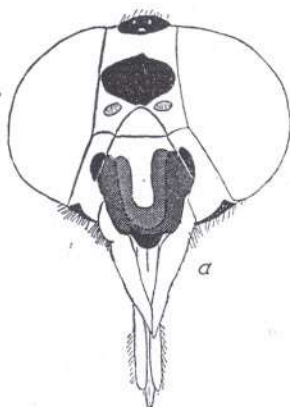
The most obvious character of the mentioned species, the brown wing-markings, encircling, two clear eyespots, I miss in several descriptions, except in DE MEYERE's paper.

Chrysops fixissima is a rather large beautiful yellow species. Forehead goldenbrown, yellow haired; Callus convex, black; Ocellar plate big, yellow-brown haired. Facial callus olivebrown with black upper corners only and a black spot just in front of the base of the proboscis. Scutum black with a median broad longitudinal band of golden yellow hairs and beautiful golden hairtufts at its lateral borders. Wings with two eyespots. Fore tibiae strongly incrassate, other tibiae less swollen, black. Abdomen goldenyellow with a single transverse black band on the posterior border of the second segment in the ♀; 8 black bands of equal size occurring in the male. Four specimens yielded the following dimensions.

The Female.

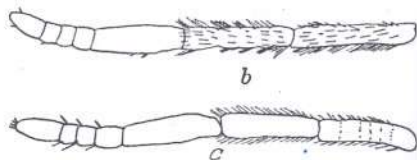
Table of dimensions.

Bodylength	varying from	11,2 m.M.	to	12	m.M.
Width of thorax	"	3.2	"	—	4
Width of abdomen	"	4	"	—	4,2
Wingexpanse	"	23.2	"	—	26
Length of head	"	1,8	"	—	2
Length of thorax	"	4	"	—	4,5
Length of abdomen	"	6,5	"	—	8
Length of wing	"	10	"	—	11
Breadth of wing	"	3,5	"	—	4,5
Forehead index	"	1,27	"	—	1,45



The Head. (Textfig. 5.) Forehead goldenbrown, goldenyellow tomentose, yellowbrown and yellow haired. In a female from SOHN's collection the forehead showed a greenish-brownyellow hue. Callus shining black, prominent, not reaching to the eyes, notched at its lower border between the antennae, accompanied sideways by some blackbrown hairs. Ocellar plate big, covered with yellowbrown hairs, presenting 3 ocelli. Triangular subcallus with goldenyellow tomentum and

long, goldenyellow pubescence. Cheeks goldenyellow tomentose. Lower cheeks with black shining triangles, beset with some black hairs between the eyes and the palpi. Beard goldenyellow. Clypeus, filled up mainly with the shining olivebrown facial callus, which shows some gradation in the colouring as the outer area is darker than the inner one. The outer line is nearly black and connects the black halfmoonshaped patch, situated at the base of the proboscis with both black comma-shaped patches at the upper corners of the facial callus which are divided from the face by shallow grooves. The rest of the clypeus, in the shape of a T, is golden yellow. Antennae long, 1st joint yellow at base, more olivebrown towards the apex, pubescence scarce and black, ventral surface with a row of long black, erect hairs; Second joint, indistinctly 5- or 6 ringed, pubescence black, ground colour brownish yellow, nearly equal in size to the first joint, Third joint redbrown at base, darker at apex, much longer than each of the foregoing joints, but shorter than the first 2 joints together. Palpi: rufous, long goldenyellow haired on first joint, second joint slender, ending blunt, bearing yellowbrown and black pubescence. Proboscis brownblack; brownblack, erect hairs on the sugarflaps, stalk covered with very short, black pubescence. Postocular rim beset with reddishbrown hairs.



Textfig. 5.

C. fixissima Wlk. ♀ a. head,
b. ♂ antenna, c. ♀ antenna.

Thorax black, the median part exhibiting a pale brownishgrey to reddishbrown longitudinal band, thickly covered with goldenyellow hairs. The groundcolour of the fields at both sides of the median band is shining black, in well preserved specimens a comparatively large number of goldenyellow hairs is found here, so that a golden lustre is spread over the whole scutum. Hindborder of scutum accompanied by a broad band of tightly placed, appressed, goldenyellow hairs, connecting both wings as a golden festoon. Lateral borders accompanied by beautiful, thick hairtufts, running from the shoulders to the described band, imitating a querrymark. Pteropleuron covered with thick, long, goldenyellow pubescence. Breast brownblack, except the reddishyellow mesosternumlobus. Median part of scutellum black; lateral borders reddishbrown, dull, covered with sparse goldenyellow or yellowbrown hairs, intermixed with brownblack. Wings for the main part brown, with two clear yellow-white eyespots. Foreborder of wing yellowish-caramelbrown, stigma reddishbrown. From the end of the radial cell the yellowish caramelbrown colour of the foreborder grows darker and becomes havannabrown. The apical spot is broad, curves round the tip of the wing, stretches along the hind border of the wing, where it fuses with the transverse crossband, thus enclosing the apical eyespot. Towards the alula the black streak is prolonged for a certain distance, to form the basal eyespot, which however is not closed as the streak fades away and becomes bright sooty grey before it reaches the wingbase. The apical eyespot includes the angle between the trunk of the cubital vein and its upper branch, a very small angle of the forkcell, an area of the first posterior cell and a part of the apex of the second posterior cell. The wingbase, that is; the basal part of both basal cells is tinged with an oblique caramelbrown streak, whereas the basal eyespot is yellow. Most veins are brown, the cubituses yellow, the same fits for the trunk of the 4th and 5th longitudinal vein. Halteres, club reddishbrown, stalk slightly brighter. Legs: First leg, Coxa orangeyellow, apex brownish, pubescence goldenyellow, alternating with some brown hairs at apex. Femur yellowish-orange, apex slightly darker than the base, basal part beset with yellowish hairs, then black haired; apical part covered with thick, black pubescence, distallateral border fringed with a row of long, erect hairs. Tibia voluminous, strongly incrassate, especially at the outer border, the inner border nearly straight or even slightly concave, shining. In the female from SOHN's collection the fore tibiae are biceps-shaped. Base of fore tibiae reddishbrown, then darkening and becoming piceous, pubescence black. Tarsalia reddishbrown, black haired. Second leg. Coxa and trochanter reddishbrown, yellow haired. Femur with reddishbrown, black haired apex, elsewhere orange-strawyellow, covered with butteryellow pubescence. Tibia spindleshaped, reddishbrown at base, elsewhere shining black, black haired. Tarsalia pale dirty yellowwhite, black haired. Third leg: Coxa and trochanter reddishbrown, goldenyellow haired. Femur orange citronyellow on basal $\frac{2}{3}$, goldenyellow haired, apex reddish havannabrown, covered with black pubescence. Tibia broad lancetshaped, somewhat reddishbrown at base, apex shining black, black haired. Tarsalia olivebrown, black haired. Tarsalia olivebrown, black haired.

Abdomen. First and second segment orange yellow, goldenyellow pubescent, except the posterior border of the second segment, where one finds a black transverse band, indented at base in the middle and straight along the segmentation. In the female from SOHN's collection, originating in Madioen, the black transversal band is indistinctly indented and possesses a pointed brown prolongation in the median line, reaching to the anterior border of the second segment. The third and following segments are reddishbrown, slightly blackish at the segmentations, black haired. Abdomen becoming blackish reddishbrown to the broad, rounded apex. Latéral borders of tergites orange coloured, lateral borders of the sixth and seventh tergite with some goldenyellow pubescence. The ventral surface of the abdomen is yellow, slightly blackish at its base, on the segmentations 3—6 the pubescence is yellowbrown on an orange yellow back-ground. RICARDO mentions the following quotations about this species. „WALKER describes the var. with two bands, one black, the other brown," I should rather describe it as having one black band only, on the posterior border of the second seg-

ment." The species described by RONDANI as *C. unizonata* is a synonym of this species, and not of *C. signifer*, WALKER, as suggested by OSTEN SACKEN, who states, that the face in the RONDANI species is yellow, which agrees with the colouring of the face of this species. Length 11 m.M. of others 9—11.5 m.M. When further material is available, this species may prove only to be a subform or identical with *Chrysops fasciata* WIED, the abdomen with only one black band on the posterior border of the second segment and the more largely colouring of the face appearing the only differences."

DE MEYERE gives under the theading *Chrysops testaceicallosus* nov spec. the following particulars of this species. „Diese Art ist mit *Chr. fasciata* WIED sehr nahe verwandt, die V-formige Untergesichtsschwiele ist jedoch fast ganz braungelb, nur an den oberen Aussenecken und an der unteren Spitze schwarzbraun, der 1ste Hinterleibsring ist ganz gelb, auch der 2te ist gelb, nicht weisslich (italicised by me, S.S.); die braune Flügelbinde erstreckt sich bis zum Hinterrand und von dort an noch etwas wurzelwärts den Flügelrand entlang und ist an diesen nicht eingeschnitten, auch sind die Hinterschienen beim vorliegenden Exemplar gelb, während sie bei *Chr. fasciata* verdunkelt sind. Der Hinterleib ist ganz gelb mit einer schmalen, in der Mitte vorn etwas eingeschnittenen und der Seitenrand nicht erreichenden Hinterrandsbinde am 2-ten Ringe. Weil WIEDEMANN bei seinem *Chr. fasciata* den 1-ten Hinterleibsring als weisslich beschreibt, so könnte man der Ansicht sein, dass hier der echte *fasciatus* vorliegt. Dennoch treffen mehrere weitere Merkmale, wie sich aus dem Obigen ergibt, auf unser Exemplar nicht zu. Entweder hat wohl W. die schwarze hinterleibsbasis übersehen, oder was mir wahrscheinlicher zu sein scheint, beide Arten vor sich gehabt. Was mich besonders dazu veranlasst, die Art mit schwarzer Hinterleibsbasis als den richtigen *fasciatus* zu betrachten, ist der Umstand, dass ein solches mir vorliegendes Exemplar auch in der Färbung des dritten Ringes genau W's. Beschreibung entspricht. Im Uebrigen ist die Färbung dieses Ringes nicht constant, bisweilen ist derselbe in ausgedehnterem Maasse heller."

After having consulted RICARDO's specimen DE MEYERE states the synonymy of *Chr. testaceicallosa* with *fixissima*. There exist however so many differences between *Chrysops fixissima* WLK. and *Chr. fasciata* WIED, that I can't find any close relation between the 2 species. As far as I know, no other *Chrysops*-species, occurring in the oriental region possesses the described typical eyespots, similar species being known from the neotropical region only (tropical America and adjacent countries) consult LUTZ's figures.

The Male.

The Head. Eyes showing two areas, a yellowbrown, big-faceted upper part and a small-faceted, black lower area, prolonged halfway towards the vertex as a narrow line. From this black area two blackbrown crossstripes start, the lower one in the middle and the upper one near the upper corner of the black area, running parallel, neither of them however reaching the vertex. The lower one is shorter than in the male of *Chrysops dispar* F., which presents similar eyemarkings. Antennae, cheeks, face, etc. as in the ♀, in one of the Ardjoeno males the antennae are slightly darker, more reddisholive-brown at base, instead of brownish pale yellow. Palpi reddishyellowbrown, yellow haired, intermixed with black hairs.

Abdomen pale yellowishwhite on the first 3 segments with distinct havannabrown crossbands on the second and third segments and a narrower one at the hindborder of the fourth segment. Sideways these black haired crossbands are connected by a black haired brownish shadow. Ventral surface with a brown crossband on the fourth segment only. Body-length 10,8 m.M. Width of thorax 3 m.M., Length of wing 8,5 m.M., Wingexpanse 20 m.M.

2. *Chrysops flavocincta* RICARDO (♀) Pl. 1, Fig. 7a, b.; Textfig. 6.

References:

RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 380 (1902).

„ Rec. Ind. Mus. IV, p. 395 (1911).

PRATT, Jl. Trop. Vet. Sci. IV, p. 390 (1909).

AUSTEN, Bull. Ent. Res. XII, p. 481 (1922).

Habitat:

Type ♀	and another ♀ Khasi Hills, Assam	HEYNE	Coll. BR.M.
2 ♀ ♀	„ N. Khasi Hills, Lower Ranges	CHENNELL	Coll. BR.M.
1 ♀	„ Isle Ceylon, Trincomalee	YERBURY	Coll. BR.M.
3 ♀ ♀	„ Doi Chom Chang near Chiangmai, Siam	16.4. '21 BARNES	Coll. BR.M.
1 ♀	„ Isle Borneo, Sawarak	WALLACE	Coll. BR.M.
1 ♀	„ Isle Borneo	MACKLOT	Coll. L.M.N.H.

ANNANDALE says: „this species is very common on the West side of the W, Ghats in Travancore in November, resembling *C. dispar* F. in habits. I did not consult the type in the British Museum; the forelaying description was made from the female, present in the L.M.N.H., completed with RICARDO's annotations, taken from the type. The female in the L.M.N.H. coll, labelled by VAN DER WULF as *C. pellucidus* F. is in bad condition, rubbed nearly all over. It belongs however quite certainly to *C. flavocincta* Ric., distinguishable from the other species by the wingmarkings. Length 8,5 m.M.



Textfig. 6.

C. flavocincta Ric. ♀ antennae.

small space only. RICARDO mentions further a grey tomentose stripe just below the antennae and a line of grey tomentum, dividing the cheeks from the upper part of the face, latter stripe or line not being visible in the Leyden specimen. Antennae (Textfig. 6), all joints about equal in size, first joint brownishyellow, second joint redbrown, both yellow haired on dorsum, black haired below; third joint bare, darker than the foregoing joints. Palpi chinese-yellow, yellow and blackbrown haired.

Thorax shining black with traces of a broad grey stripe (rubbed in the MACKLOT-specimen), and some hairs on dorsum and posterior border of the scutum, sides yellow haired. Scutellum and breast blackbrown. Wings without an apical spot, crossband elongate, triangular, brown, not reaching the hindborder; apical border of the same straight, passing the apex of the disc-cell, basal border touching base of disc cell, also straight. Anal cell widely open. Base of wing pale, foreborder brown, apex quite clear, stigma siennabrown. RICARDO gives the following description of the wingmarkings:

„It (the band) hardly attains the hindborder and becomes paler in the fourth posterior cell, only just continuing into the fifth in some of the specimens, it does not reach beyond the fourth and never attains the anal cell, it is straight on both borders." Halteres blackbrown. Legs. (In all descriptions I have named the fore legs: the first leg; the middle legs: the second leg; the hind legs: the third leg). First leg. Coxa and trochanter black-brown, black haired, femur redbrown at base, then more yellowbrown, darker at apex, black haired. Tibia blackbrown, black haired. Tarsalia similar. Second leg. Femur yellowbrown, black haired, tibia as in first leg. Tarsalia olivebrown, black haired. Third leg identical, tarsalia yellowbrown.

Abdomen reddish blackbrown with a yellow band on the anterior half of the first 2 segments, broadest on the second segment, where it is concave in the middle becoming broader at the sides. Ventral surface yellow, black at the apex.

About the habits Dr. BARNES wrote to Major AUSTEN:

„Caught on Doi Chom Chang, while attacking me in a cottage. These flies are very common on the mountain in that region and are extremely troublesome at a sanatorium, situated at an altitude of about 2500 Ft. They were never reported from the top of the Mountain (5500 Ft.) until a few cottages were built there, but since that time they are to be found on the peak also. They attack very cautiously, approaching their victim from behind and rarely making for the face. In flight they somewhat resemble „Hover-flies”, noiselessly approaching and settling upon the ears, back of neck, legs, back of the hands, and on the exposed elbows. It is only the severe pain of the bite, that attracts the victims attention, and should the sufferer make the slightest movement, the flies at once effect their escape. The wound, made by their bite is very painful and causes much swelling in many people. A minute blab forms at the site of the puncture, and if the contents be expressed, the irritation usually subsides, though the pain and intense itching may persist several days. If these wounds become infected, as is frequently the case in children, who are very apt to scratch them, they heal very slowly.”

3. *Chrysops albicincta* VAN DER WULP (♀), Pl. 1, Fig. 2; Textfig. 7.

References:

VAN DER WULP, Tijdschr. v. Ent. XI; p. 103 (1868).

OSTEN SACKEN, Ann. Mus. Civ. Stor. Nat. Genova XVI, p. 418 (1868).

RICARDO, Nova Guinea IX, p. 406 (1914).

„ Rec. Ind. Mus. IV, p. 377 (1911).

DE MEYERE, Nova Guinea XIII, p. 53.

Habitat:

Type ♀ from Island Salawati.

RICARDO studied ♀♀ from Dutch Nova Guinea
Nova Guinea

1 ♀	from Mimika River	Coll. BR. M.
3 ♀♀	„ Dutch Nova Guinea LORENTZ	Coll. N.A.M.
9 ♀♀	„ Bivak island LORENTZ	„
resp. 4 ♀♀	from 9.'09	
2 ♀♀	„ 12.'09	
1 ♀	„ 1.'10	
1 ♀	„ 25.2.'10	
1 ♀	„ 2.'10	
2 ♀♀	from Noordrivier LORENTZ 19.'09	Coll. L.M.N.H.
2 ♀♀	„ Rivierkamp LORENTZ 10.2.'10	Coll. N.A.M.
1 ♀	„ Alkmaar LORENTZ 12.'09	„
2 ♀♀	„ Kloofbivak VERSTEEG 30.10.'12	„
1 ♀	„ Bivak island LORENTZ 3.4.'10	Coll. B.Z.M.

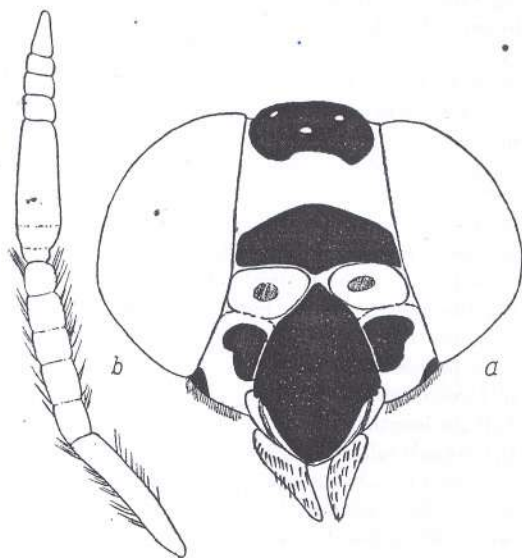
According to RICARDO's remarks the wingmarkings of *Chr. albicincta* VAN DER WULP are typical and distinct from any species of the oriental region.

VAN DER WULP however does not mention the most prominent feature of the considered wingmarkings. When observed macroscopically the triangular crossband is distinctly visible with its straight foreborder, but in the specimen studied by me no clear areas were present in the centres of the cells, covered by the crossband, the fifth posterior cell being almost completely clear.

C. albicincta v. D. WULP is a small black species; abdomen black, with a white transverse band on the second segment broadening to the lateral borders. Thorax black. Hind border of the scutum bearing a thin goldenyellow hair-covering, sidetufts similarly goldenyellow. Forehead broad, black, transverse. Callus shining black, nearly reaching to the eyes Ocellar plate with three ocelli. Facial callus covering the whole clypeus, ochraceousyellow brown; at the upper corners shining black, halfmoonshaped spots are found. Wings with almost triangular crossbands, cut off straight at the foreborder, and an apical spot, upper part of the hindborder faintly greyish. Fifth posterior cell possessing a distinct sharply circumscribed clear area, a brown streak accompanying the fifth longitudinal vein. Legs brown.

Table of dimensions.

Bodylength	7,5 m.M.
Width of thorax	2,5 „
Width of abdomen	2,5 „
Wing expanse	16,5 „
Length of head	1,8 „
Length of thorax	3 „
Length of abdomen	4,2 „
Length of wing	7 „
Breadth of wing	2,8 „
Forehead index	0,9



Textfig. 7.

C. albicincta WULP ♀
a. head, b. antenna.

The head. (Textfig. 7) Forehead broad, black, denuded; v. D. WULP describes it as blackish; in S. N. Guinea ♀ grey tomentose, grey haired. Callus transverse, nearly reaching to the eyes, breadth greater than height, shining black to dull reddish, halfmoon shaped, grooved,

somewhat prominent between the antennae. Rectangular ocellar plate shining black, covered with black hairs, nearly reaching to the eyes. Cheeks shining havannabrown, with brownblack pubescence, and some white hairs close to the implantations of the palpi, no particular markings occurring in the space between eyes and palpi. Beard white. Clypeus wholly shining, ochraceous yellowbrown, with sparse brownish hairs; at upper corners of the facial callus black or reddish caps are situated on the cheeks. Facial callus with a shallow indentation at its upper border in the middle. Antennae 2—2½ times as long as the head; joints almost equal in size; 1st joint: rings faintly indicated, colour ochraceous yellow, darker to the slightly

swollen apex, which is pale havannabrown, covered with sparse black pubescence; 2d joint, 5-ringed, in some lights seeming 6-ringed, dark havannabrown, black haired; 3d joint bare, 1st ring, broadened near the base, faintly 4-ringed, shining black at base, elsewhere dull brown, four apical rings deep velvety black. Palpi short, reddishbrown, pointed, black haired.

T h o r a x black, scanty black haired on disc, hind border of scutum bearing a narrow streak of goldenyellow hairs, which is prolonged along the lateral borders of the scutum as a falciform tuft. Pteropleuron covered with goldenyellow hairs. Scutellum black. Breast shining black or blackbrown, black haired. Mesopleuronlobus distinctly tinged redbrown. Here and on the shoulders a black haircovering is present. Wings with a triangular crossband and an apical spot. The fifth posterior cell is almost quite clear, a narrow brown shadow accompanying the fork. A brown streak running along the trunk of the postical vein, connects the crossband with the base of the wing, where the basal angles of the basal cells and the anal cell, are brown in colour. Anal cell open. Generally clear areas in centres of cells fail. In some specimens however the discoidal cell and the fourth posterior cell show clearer centres. Anterior border of the crossband straight. Apical spot, ending just before the extreme apex of the wing. Hind border of wing, basal from the sixth longitudinal vein, covered with a greyish hue. Veins yellowbrown, except on the markings, where they are havannabrown. Halteres redbrown. Legs. First leg. Coxa blackbrown, covered with brownish hairs, trochanter blackbrown; femur yellowish to reddish brown, black haired. Tibia and tarsalia olivebrown, black haired. Second leg. Coxa and trochanter blackbrown, black haired. Femur tawny, black haired. Tibia havannabrown, black haired, swollen; Tarsalia straw-yellow, black haired. Third leg; coxa black with velvety-brown apical border, white haired; trochanter redbrown, femur reddishbrown black, sparsely yellowbrown haired, tibia as in second leg, less thick, black haired.

A b d o m e n black, 1st segment chocolatebrown, except a pair of small white spots in the median line, nearly touching the scutellum, separated by a very narrow longitudinal stripe. Foreborder darker, black. Second segment broad chocolatebrown with a yellowwhite ring at base, surrounding the whole abdomen, widening to the lateral borders of the tergite. Ventrally it becomes more brownish white and covers also a part of the first segment. In the middle of the black band on the second segment there may be found in some specimens a brownish-white longitudinal stripe. Dorsum elsewhere black, ventral surface blackbrown to black, haircovering, except on the transverse white haired band, black. RICARDO describes the wings as having a broad transverse band with a hyaline sinus in the fifth posterior cell, and an apical spot, the apex beyond being grey, with the dark colouring in foreborder and in basal cells reaching to about two thirds of the length in the first one, and half the length in the second basal cell." The specimens I studied mostly had smaller brown spots in the basal cells, whereas the grey colouring, found by RICARDO, was not present in all of them.

VAN DER WULP says: face shining brownyellow, at sides blackish, a dark spot is situated in it." This dark spot I could not find. OSTEN SACKEN has compared *Chr. albicinctus* v. d. W. with *Chr. pellucida* FABR. In this species however the face is black, covered with dense grey tomentum in the middle, below the antennae is a large, shining black tubercle and a small black spot on each side, the lower part of face also black, pubescence on lower part of face whitish. Besides the palpi are blackish and not reddishbrown as in *Chr. albicincta* v. d. W. The shape of the transverse band on the second segment of the abdomen is also distinct. Length 8 m.M. With RICARDO I agree, that this is another species as *Chr. albicincta*, having however many points in common with it.

4. *Chrysops translucens* MACQUART (♀) Pl. 2, Fig. 5.

References:

MACQUART, Dipt. exot. I, p. 158 (1838).

RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 375 (1902).

„ Rec. Ind. Mus. IV, p. 385 (1911).

Habitat:

Federated Malay States

1 ♀ from Kuala Lumpur PRATT

Coll. BR.M.

2 ♀ ♀ „ Gunung Angsi, Negri Sembilan 2000—2790 Ft. 4. '18 Coll. R.M.S.

The specimens seen by me were in bad condition, so I have to refer mainly to MACQUART's and RICARDO's descriptions. MACQUART's description is extensive and pays attention to all specific characters.

„Niger, Abdomine segmentis primo, secundoque basi albo-pellucidis. Femoribus fuscis, infra rufis, tarsis rufis. Alis fascia nigra, ad marginem internum excisa. Long. 4 l.

The Head. „Palpi brownish. Face pale fawncoloured, shining" (RICARDO's description), „yellowish with a black spot on each side below the antennae, the sides of face, bordering the median line, shining yellowishbrown, becoming blackish over the oral opening, base of cheeks black. Forehead black, with broad band of grey tomentum beyond the prominent frontal callus, which appears transverse, its anterior border sinous, reaching the eyes. Antennae not bare as MACQUART mentions, yellowish, second joint equal in size to the first joint, browner, and the dark pubescence thicker."

Thorax brownblack, denuded in type as in the specimens seen by me. Above the wingbase on each side a fawncoloured spot appears. Pteropleuron and sides goldenyellow haired, similar hairs being scattered over the scutum. Scutellum blackbrown, bare. Breast almost wholly bare. Wings hyaline, stigma dark burnt siennabrown, foreborder narrowly reddbrown. Basal cells nearly wholly clear, with a small oblique brownish streak over the bases of both cells, straight concave at apical border, nearly straight at basal border. Transverse band reaching hindborder of wing. Fifth posterior cell with a diffuse clear area. Fourth posterior cell distinctly narrower at opening, diffusely paler in centre. Anal cell open. Halteres blackbrown. Legs brownish. First leg. Coxa and trochanter blackbrown, femur dark yellowbrown to brownish black, black haired. Tibia curved and slightly incrassate, black haired. First tarsale fawn-coloured at base, other tarsalia brown. Second leg missing in the female, seen by me. Third leg, blackbrown on femur and tibia, last part distinctly fringed with suberect hairs, tarsalia olivaceous yellowbrown.

Abdomen conical, described very characteristically by MACQUART as follows: „First segment transparent white, black on its posterior border, a little narrowed in the middle, reduced to nothing on the outer borders", black haired on the black areas, white haired elsewhere, „second segment silverywhite with a large triangular black spot on the posterior border in the middle of which is a small dorsal white spot, transparent and triangular; the third shining black with a small dorsal white band, following that of the second segment, the others shining black; under side: the first 2 segments transparent, white, white haired, the second black on its outer borders", connecting thus the black spot on the first segment with the black spot on the second segment.

5. *Chrysops alter* RONDANI (♀).

References:

RONDANI, Ann. Mus. Civ. Genova VII, p. 44 (1875)

RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 373 (1902).

„ Rec. Ind. Mus. IV, p. 387 (1911).

Habitat:

Type ♀ from Sarawak, Borneo

Genova Mus.

Female. The Head. „Antennae with first joint reddish, the two following dusky black. Forehead in the middle narrowly greyish, with a very large anterior callus, which is subrotund, shining black, taking up almost the whole width of the forehead. Palpi reddish. Face shining black, at the sides narrowly and under the antennae pale pollinose.

Thorax with scutellum black, sides and pleurae under the root of the wings yellow haired. Calyptra and halteres black. Wings with the base luteous; the costal border brown, the apex with a paler expanded brown colour; the blackish band is beyond the middle of wing posteriorly narrower. Legs: the anterior legs blackish, with the exception of the base of femora, which are pale testaceous, the intermediate femora, the extreme apex of tibiae and the tarsi pale testaceous, the tibiae blackish; the posterior legs black with a subapical ring of the femora, the apex of the tibiae and the tarsi luteous testaceous; RONDANI. Ann. Mus. Civ. Stor. Nat. Genova VII, p. 44.” Type ♀ in Genova Museum was seen by me (RICARDO). It is a small species, the face wholly black, shining, convex, the frontal callus black, large, reaching the eyes, a narrow grey band divides it from the vertex. Antennae yellow.

Abdomen, which is in a bad state, appears black, the first segment yellow anteriorly and the second segment has a yellow band on its anterior border. Wings with one band and the apex narrowly dark. Length 5,5 m.M. This species must be nearly allied to *Chrysops pellucida* with the face black and to *C. translucens* with the first segment yellow anteriorly. RONDANI omitted to describe the abdomen, which is now hard to distinguish as to colouring. From *C. flavocincta* RIC. it is distinguishable by the absence of an apical wingspot in the latter species and in the colouring of the palpi and antennae. From *C. translucens* MACQ. it may be divided by the colouring of the face, and the colouring and shape of wingmarkings: As nothing is known about the shape of the crossband on the second and first abdominal segment, it is difficult to conclude in how far these species differ in respect to this character. From *C. pellucida* F. it is distinguished by the abdominal markings, the foreborder of the second segment being yellowish only, the colouring of the palpi, the prominent apical wingspot and the clear area in the centre of the fifth posterior cell, etc.

6. *Chrysops atrivittata*. SCHUURMANS STEKHOVEN, (♀) Pl. 1, Fig. 4; Textfig. 8.

References:

SCHUURMANS STEKHOVEN, Treubia Vol. V, page 317 (1924).

„ „ Boeroe expeditie Vol II, 1 p. 1 (1924).

Habitat:

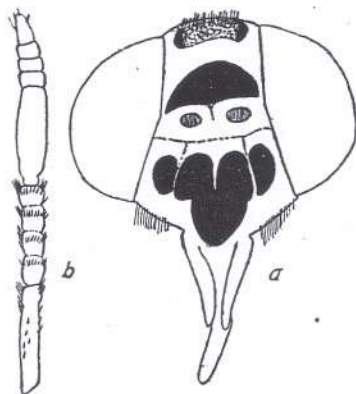
Type ♀ and 4 ♀ ♀ from station 9. Rana, Buru, collected respectively on 11.5.'21, 13.6.'21; 3.7.'21; 4.7.'21; 6.7.'21; 750—850 M. above sea-level. TOXOPAEUS coll. N.A.M.

4 ♀ ♀ from station 12, Koentoeroen Marsh 1075 M. above sea-level. L. TOXOPAEUS coll. on 6.2.'22 • Coll. N.A.M.

Chrysops atrivittata is a beautiful yellowish species; the abdomen showing a peculiar striation, consisting in 4 stripes, united on the second and third segment by transversal connectives, thus forming small black fenestrae with yellow centres. Wings with crossband and apical spot. No clear area in the discoidal cell. Fifth posterior cell with a very distinct, sharp circumscribed clear area. Anal cell open. Antennae long 3,5—4 m.M. Body length 9,2—11 m.M.

Table of dimensions.

Bodylength varies between	9.2	and	11	m.M.
Width of thorax	2,5	„	3	„
Width of abdomen	2,6	„	3,5	„
Wingexpanse	20,7	„	23,4	„
Length of head	1,3	„	1,8	„
Length of thorax	3,2	„	4	„
Length of abdomen	5,2	„	6,8	„
Length of wing	9	„	10,2	„
Breadth of wing	3	„	4	„
Length of antennae	3,5	„	4	„



Textfig. 8.

c. atrivittata, s. s. ♀

a. head, b. antenna.

The Head. Eyes in death unicolorous mauve, when moistened presenting 3 indistinct dark patches.

Forehead broad, nearly the same width throughout, at best slightly narrower at vertex, yellowgrey tomentose, sooty on some places. Callus and ocellar plate, are divided by a dark olive-yellowbrown coloured excavation, surrounded by a whitishgrey margin. Callus dark blackbrown in type, varying from redbrown to blackbrown in other females, shining, convex to the posterior end, pointed between the antennae, bearing a shallow flat groove, which divides the halfmoonshaped callus into two unequal halves, not reaching to the eyes. In most of the other specimens the callus is divided by two grooves in three parts, the middle part being a little prominent and convex, the two lateral parts being flattened. Ocellar plate triangular with rounded sides, bearing 3 punctiform ocelli and a relatively thick covering of long yellowbrown hairs, similar hairs in the space between eyes and ocellar plate, in the excavation, close behind the callus, the hairs are white. In one of the specimens the excavation in the forehead exhibits a yellow centre and sootygrey borders, in another it was dark olivebrown, whereas a third presents a yellow velvetybrown excavation. Once the colour of the excavation was reddishbrown. Postocular rim very narrow, darkbrown, beset with very short fine brown hairs. Antennae 3-jointed. First and 2d joint equally long, the 3d joint longer than each of the preceding joints apiece, whole length 4 m.M. First joint bright yellowbrown, coloured darker bismarckbrown to the apex, indistinctly 6- or 7-ringed, at base the rings are barely visible, to the apex they become clear and distinct. The blackbrown, erect hairs are placed more or less in festoons, corresponding with the described rings, at base they are short and appressed, to the outwardly directed, somewhat dilated apex and especially on the 3 apical rings, they grow longer and tighter and are intermixed with some white hairs. In some specimens the apex of the first joint shows short yellow pubescence. Second joint superficially corrugated, dark olivebrown with a blackish hue, nearly as long as the first joint but slightly broader, 5-ringed, sometimes 4- or 6-ringed, black hairs placed in festoons, arranged as in the first joint, longer on the distal lateral border than on the proximal lateral border of the joint, intermixed with some white hairs. The third joint, broader than the preceding joints, is shorter than the first and second one together, but longer than each of them apiece, possessing 5 distinct rings, velvety-brown at base, nearly blackbrown at apex. The basal annulation longer than the following ones together, is swollen at apex. The fifth ring is nearly as long as the third and fourth ring together and ends blunt. In one specimen the third joint was longer than first and second one together. Each antenna is fixed in a hollow excavation of the head, which is surrounded by a dullbrown wall, tinged yellow on the outer rim.

Palpi 2-jointed. The first brownblack joint is very short triangular, cut off slanting (oblique), covered with long, black hairs. The second ochraceous-yellowbrown joint, at least

four times as long as the first, ends with a blunt point, pubescence mainly yellowbrown, intermixed with some black hairs. Proboscis with long sugarflaps, reddish ochrebrown at dorsum, ventral half more blackbrown, sugarflaps covered ventrally with longer and shorter darkbrown hairs. Stalk nearly totally bare, near the apex some short, dark blackbrown hairs are visible on the ventral surface. Cheeks and face yellowish pollinose, except on the two shining dark olivebrown streaks which border the clypeus laterally. Median part of clypeus bright ochraceous, pubescence long, yellow. A second pair of shining bright olivebrown spots, shadowed by a rusty hue and bordered at their dorsal border by a black stripe, exist in the neighbourhood of the jowls. In another specimen the streak just beneath the eyes is greyishwhite coloured. A reddish rustybrown breadth, surrounded by a sooty stripe fits close to it, to the mouth it is yellow pollinose. Beard bright brownish yellowwhite. Cheeks elsewhere nearly devoid of long hairs.

T h o r a x. Scutum divided into three fields by a median longitudinal dull rustybrown stripe. The median breadth is slightly attenuated to the base where one finds, just as at the apex some darker lines. At each side the median stripe is darkened. Both lateral fields are reddishbrown to black with a violet hue, pubescence short and sparse, varying from bright to dark brownyellow, at the hind border of the scutum, a broad streak of magnificent goldenyellow hairs separates the scutum from the scutellum and ends at each side in a triangular tuft, of goldenyellow hairs. Pteropleuron golden haired. Sides olivebrown, goldenyellow haired. Mesosternum blackbrown, covered with blackbrown pubescence. Breast dark brownblack, nearly bare. Scutellum dark reddishbrown with a median transverse very narrow black spot, fringed with bright yellowbrown short pubescence. Halteres: club dark blackbrown, stalk paler, dull bismarckbrown. Wings with a dark transverse band and an apical spot, stigma dark reddishbrown. Foreborder of wing yellowbrown. Transverse band, straight on the apical border, basal border more or less concave with an angle just ahead the spreading of the vena posticalis. Fifth posterior cell with a distinct clear area in the centre. Anal cell of wing open. A pale yellowbrown shadow accompanies the vena posticalis as also the basal part of the vena radialis. The upper basal cell presents also a bright yellowbrown streak. The bases of the upper and lower basis-cells are filled with brown colour. Wing elsewhere clear. In two out of the 9 specimina, the fourth posterior cell is not wholly brown, as in the type, but presents a small clear area to the apex of the cell. In another specimen a small white isle is found in the apical spot. Legs. First leg. Coxa, whitish tomentose, at the articulation with the body shining black, the median part swollen. Dorsum covered with dark black hairs. Distal lateral border yellowbrown haired, proximal lateral border bright oakbrown, with a reddish hue, brownblack haired, some white hairs are intermixed. Femur darker than trochanter, rustybrown, bearing on dorsum a thick dark black haircovering, on lateral distal border there is a row of erect, long, black hairs, decreasing in length to the base. Distal lateral border covered with long, erect yellowbrown hairs, near the base, surface bare. Knee bright yellow. Tibia dilated slightly above the middle, oakbrown, thickly covered with short appressed hairs. Ventral half covered with short black appressed hairs. Tarsalia 1—4 darkbrown, same colour as tibia; tarsale 5 black, on its hind border some erect, relatively long, dirty white hairs are seen, elsewhere it is black haired. Second leg, coxa and trochanter both short, darkbrown, bearing only a few hairs. Femur same colour as in the first leg, with yellow knee. Dorsum black haired. Lateral borders with a fringe of black hairs, increasing in length to the apex. Tibia blackredbrown, slightly dilated, thickly covered with black hairs, ventrally black haired too, intermixed with some white hairs at base and at apex. First tarsale very long, nearly as long as the other ones together, mainly black-haired, a number of short appressed yellow hairs are found on the basal third of the article. Lateral borders yellow haired too. Tarsale 2—4 yellow haired with an apical ring of black hairs, and some black hairs on the proximal lateral border. Fifth tarsale black, at apex 5 long white hairs are found; 3 pulvilli. Hairs elsewhere black except a few white ones on dorsum. Ventral half yellow with a festoon of black hairs at apex. Third leg. Coxa swollen, yellow-

brown haired, intermixed with some black hairs, trochanter short, narrow. Femur dark yellow-brown, thickly covered with black hairs, some longer yellowwhite hairs are scattered all over the surface. Tibia shining darkbrown, swollen at base, black haired. Ventrally at apex two thick spurs. Tarsale 1 attenuated, long, brownyellow, longer than the following ones together, black haired on dorsum, on lateral borders some yellowwhite hairs are intermixed. Ventral surface mainly yellowwhite haired, apical ring black haired. Tarsale 2-4 yellowbrown black haired, ventral surface with black haired apexring, elsewhere yellow haired, tarsale 5 black on dorsal half, ventral part yellowbrown with black haired apexring.

Abdomen, marked with 4 longitudinal stripes, connected on the second and third segments. Segment 1 hazelbrown with two black spots, placed laterally from the median line. Segment 2 yellow with a black fenestra with yellow centre, which is very small in some specimens, on each side of the middle, a black stripe at the lateral borders of tergites connects the fenestrae with the spots on the first segment. Segment 3 shows four longitudinal black stripes connected in pairs at the foreborder of the segment by black connectives. The enclosed parts are yellowbrown, all black stripes being interrupted at the segmentations, middle stripes broader than the lateral ones, other segments similar. Since the abdomen darkens to the apex the difference between the markings and the rest of the tergites grows less distinct on the sixth segment, the black markings approaching each other on the sixth segment. On the 7th segment the stripes end with a point. The first segment is brownyellow haired except on the spots, which are black haired. Second segment yellowwhite haired, markings black haired. Third segment mainly black haired, some yellowwhite hairs occur. Rest of dorsum black haired, except the yellowfringed segmentations. Ventral surface yellowwhite haired on first 2 segments. Following segments reddishbrown, black haired, on segment 7 some yellow hairs are intermixed. Lateral borders dirty yellowwhite haired. *Chrysops atrivittata* is allied to *Chrysops mlokosiewiczzi* BIGOT, which possesses likewise an abdomen with 4 longitudinal stripes. These stripes, „according to SHIRAKI,” more or less interrupted at the segmentations, are however not connected. The two median stripes are broader than the lateral ones, no fenestrate markings are seen by me in the specimen presents in the L.M.N.H. collection from Amoy, China, collected by BUDDING and labelled by VAN DER WULP: *Chr. striatus* type, a synonym of *Chr. mlokosiewiczzi* BIGOT. The wingmarking is very characteristic, since the transverse band does not extend to the hindborder, the disc cell showing a big clear centre, fifth posterior cell wholly clear, the brown streak extending along the lower branch of the postical vein. Thorax yellowish cinereous with three very distinct narrow, blackish-brown or black stripes, of which the middle one is about half broader than the lateral ones and is gradually narrowed towards the front and pointed. Antennae nearly twice as long as the head, the third joint is much longer than the two basal joints together. *Chrysops designata* RIC. shows further some resemblance with *Chrysops atrivitta* but can be discerned at once from it by the black markings on the abdomen. It presents fenestrate markings on the second and third abdominal segments, but no longitudinal stripes are found. The discoidal cell of the wing possesses a clear area, whereas the femora and the apical joints of tarsi are blackish.

7. *Chrysops dispar* FABRICIUS (♀, ♂), Pl. 1, Fig. 3; Textfig. 9.

Syn. Tabanus dispar FABRICIUS.

Haematopota lunata GRAY.

Chrysops bifasciata MACQUART.

C. ligatus WALKER.

C. semicirculus WALKER?

C. impar RONDANI?

References:

FABRICIUS, Ent. Syst. Suppl. p. 567 (1798).

- „ Syst. antl. p. 112. 5 (1805).
 WIEDEMANN, Dipt. exot. p. 102 (1821).
 „ Auss. Zweifl. Ins. I, p. 196 (1828).
 MACQUART, Dipt. exot. I, (8) p. 159, 157 (1838).
 „ Suppl. 3 p. 174 (1848).
 VAN DER WULP, Sumatra Exped. Dipt. p. 19 (1881).
 „ Catal. Dipt. S. Asia p. 65 (1896).
 OSTEN SACKEN, Ann. Mus. Civ. Genova XVI, p. 418 (1882).
 „ Berlin. Ent. Zeitg. XXVI, p. 97 (1882).
 ROEDER, Ent. Nachr. XIX, p. 234 (1893).
 RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 374 (1902).
 „ „ „ „ „ (7) IX, p. 375 (1902).
 „ Rec. Ind. Mus. IV, p. 380 (1911).
 „ Ann. Mus. Hung. XI, p. 173 (1913).
 GRAY, GRIFFITH in Cuvier's Animal Kingdom XV, p. 696 (1832).
 WALKER, List. Dipt. Br. Mus. I, p. 195, 196 (1848).
 „ „ „ „ „ V, Suppl. I, p. 229 (1854).
 RONDANI, Ann. Mus. Civ. Stor. Nat. Genova VII, p. 460 (1875).
 DE MEYERE, Tijdschr. v. Ent. LIV, p. 275 (1911).
 „ „ „ „ „ LX, p. 298 (1918).
 „ „ „ „ „ LXVII, Suppl. p. 56 (1924).
 „ „ „ „ „ LXVIII, p. 203 (1924).
 PRATT, Jl. Trop. Vet. Sc. IV p. 390 (1909).
 SURCOUF, Genera Insectorum Dipt. Tabanidae, Fasc. 175 (1921).
 SHIRAKI, Tokubetsu Hokoku Agr. Exp. St. Gvt. Formosa VIII, p. 280 (1913).
 SHIRAKI, The Tabanidae of Formosa p. 35 (1918).
 MATSUMURA, Thous. Ins. Japan. Addit. II, p. 384 (1916).
 SENIOR WHITE, Rep. Dept. Agric. VII, (1922).

Habitat:

Type ♀ from E. India FABRICIUS Coll.

♀ ♀ „ „ WESTERMAN'S Coll.

Type ♀ from E. India RICARDO'S Coll.

♀ ♀	„ „	Coll. BR.M.
♀	„ N. Bengal (<i>C. ligatus</i> WLK) Miss CAMPBELL	Coll. BR.M.
♀ ♀	„ Nepal	Coll. BR.M.
♀ ♀	„ Bangalore WATSON	„
♀ ♀	„ Moulmein CLARK	„
♀ ♀	„ Balighai, near Puri; Orissa	Coll. Ind. Mus.
♀ ♀	„ Kulattupuzza W. base of W. Ghats, Travancore	„
♀ ♀	„ Nedumangad, 10 Miles N. East of Trivandum,	„
♀ ♀	„ Morapai, S. Bengal	„

- 1 ♀ from Upper Dihing, Lakimpur District (mountaneous regions) SENIOR
WHITE Coll. BR.M.
- ♀ ♀ „ Rangoon „
- ♀ ♀ „ Annam „
- ♀ ♀ „ Bukit Besar, Patani States, Siam Ind. Mus. Coll.
- ♀ ♀ „ Isle Ceylon
- ♀ ♀ „ Ceylon (YERBURY, GREEN) Coll. BR.M.
- ♀ ♀ „ „ common, torments cattle Coll. Ind. Mus.
- 1 ♀ „ „ SHIRAKI
- China
- ♀ ♀ from Hongkong BOWRING Coll. BR.M.
- Isle Formosa
- 14 ♀ ♀ and 14 ♂♂ from Formosa SHIRAKI Coll. Shiraki
- 1 ♀ „ Horisha SHIRAKI
- 1 ♂ „ Hainan Island SHIRAKI
- Federated Malay States
- Specimens from Singapore and Penang RIDLEY Coll. BR.M.
- 1 ♀ from Botanical Gardens 2.'11 Coll. R.M.S.
- Isle Sumatra
- Residency Tapanoei, Veterinary Ressort Padang Sidempoean
- Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean
- 1 ♀ from Moeara Tais, Moeara Tais on buffalo 2.11.'24 BAKKER Coll. V.S.L.
- Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
- 1 ♀ from Hoeta Nagodang, Manambin on buffalo 24.12.'22 LOBEL
Coll. V.S.L.
- 2 ♀ ♀ „ Kota Siantar on horse LOBEL
resp. 1 ♀ from 10.'22
1 ♀ „ 3.'23
- 9 ♀ ♀ from Mandailing, Kota Nopan LOBEL
resp. 4 ♀ ♀ on horse 23.11.'22
3 ♀ ♀ „ „ 25.11.'22
1 ♀ „ „ 26.11.'22
1 ♀ „ buffalo 26.11.'22
- 2 ♀ ♀ from Moeara Tagor, Tamiang 30.9.'23 BAKKER
- Ressort Padang Sidempoean, Mantrie Ressort Sibolga
- 9 ♀ ♀ from Siboeleoean, Siboeleoean, LOBEL and BAKKER
resp. 1 ♀ on cow on 6.9.'23
2 ♀ ♀ „ buffalo on 6.9.'23
1 ♀ „ „ „ 7.9.'23
1 ♀ „ horse „ 16.11.'24
1 ♀ „ „ „ 17.11.'24
- Ressort Padang Sidempoean, Mantrie Ressort Binanga

- | | | | |
|-----------------|--|---------------------|---------------------|
| 4 ♀ ♀ | from Si Oendol, Paringgonan | LOBEL and BAKKER | |
| resp. 2 ♀ ♀ | on buffalo | 25.6.'23 | |
| 1 ♀ | " " | 4.6.'24 | |
| 1 ♀ | " horse | 25.6.'23 | |
| 1 ♀ | from Pasar Siboehoean, Djandi Lobi | on horse 1.6.'24 | BAKKER |
| 1 ♀ | " Hoendoelan Parmaksian, Balige | on buffalo | TARIP 7. 1.' 22 |
| 2 ♀ ♀ | " Porsea, Balige | on buffaloe | VAN DER REEST 3.'22 |
| 1 ♀ | " Solok, Sumatra Exped. '07 | KLEIWEG DE ZWAAN | Coll. N.A.M. |
| 1 ♀ | " Piladang, Pad. Bovenlanden Sumatra | 11.'13 | JACOBSON |
| | | | Coll. N.A.M. |
| 2 ♀ ♀ | " Sumatra, without locality | Sumatra Exped. | Coll. L.M.N.H. |
| 2 ♀ ♀ | " Silago | 7.'77 | Sumatra Exped. " |
| 1 ♀ | " Loeboek (?) | 12.'77 | Sumatra Exped. " |
| 1 ♀ | " Grabak, | 5.'77 | Sumatra Exped. " |
| 1 ♂ | " Tandjong Morawa, Serdang, N.E. Sumatra, | Res. Sumatra's E. | |
| | Coast | HAGEN | Coll. L.M.N.H. |
| 1 ♂ | from Pagar Marbau, Resid. Sumatra's East Coast | 24.2.'21 alt. 24 M. | |
| | CORPORAAL | | Coll. N.A.M. |
| 2 ♂ ♂ | from Buo, Padang High lands | JACOBSON | |
| resp. 1 ♂ | on | 3.'14 | |
| 1 ♂ | " | 2.'14 | |
| | Isle Java | | |
| 1 ♀ | in Coll. | SERVILLE | |
| 5 ♀ ♀ and 2 ♂ ♂ | in Coll. | PAYEN | |
| | Residency Batavia | | |
| 2 ♀ ♀ | from Tjinangsi, Soebang | 4.'22 | Coll. V.S.L. |
| 3 ♀ ♀ | " Batavia | JACOBSON | |
| resp. 1 ♀ | from | 10.'07 | Coll. N.A.M. |
| 1 ♀ | " | 8.'07 | Coll. L.N.M.H. |
| 1 ♀ | " | 5.'06 | Coll. L.M.N.H. |
| 1 ♀ | from Goenoeng Pantjar, near Buitenzorg | 11.'07 | Coll. N.A.M. |
| | Residency Semarang | | |
| 7 ♀ ♀ | from Semarang | JACOBSON | |
| resp. 1 ♀ | on | 8.'05 | Coll. L.M.N.H. |
| 2 ♀ ♀ | " | 1.'06 | Coll. N.A.M. |
| 2 ♀ ♀ | " | 9.10.'05 | " |
| 1 ♀ | " | 2.3.'06 | " |
| 1 ♀ | " | 9.'09 | " |
| 2 ♀ ♀ | from Ambarawa, | LUDEKING | Coll. L.M.N.H. |
| 1 ♀ | " Java, | BLUME | " |
| 1 ♀ | " " without locality | | Coll. N.A.M. |
| ♂ ♂ | | | |
| 1 ♂ | " " JACOBSON | | " |

1 ♂	from Semarang,	JACOBSON
1 ♂	„	Java, MULLIE
2 ♂♂	„	Ambarawa LUDEKING

Coll. L.M.N.H.

„

„

Although the optimum conditions for this species occur in October—November, the species is found the whole year through, as was observed by SHIRAKI, who found it from Spring to Autumn, but very often he found it also in Winter. Apparently *C. dispar* F. is a common species throughout the whole Eastern Part of Asia, including BR. E. India, Annam, Bengal, Ceylon, Siam, China, Japan, Formosa, Malacca, Sumatra and Java.

The Female.

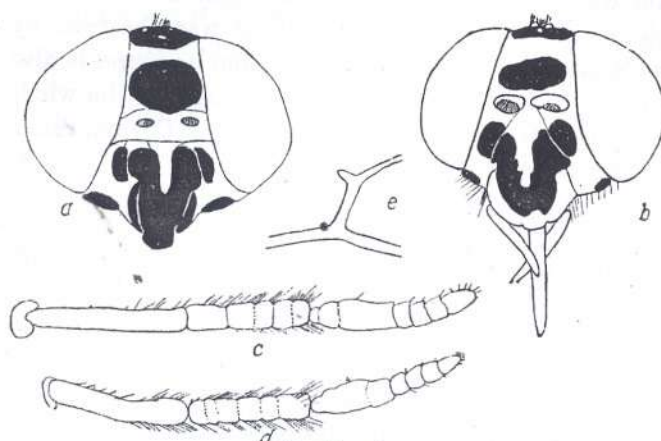
C. dispar is distinguishable from allied species by the reversed V-spot, narrowest at base and extending over the second and third segment, both legs being broad. In one of the specimens the legs of the V did not connect at base. It is closely allied to *C. flaviventris* MACQUART, which is smaller in size and presents a shorter V-spot. Forehead in *C. dispar* F. goldenyellow, brownishyellow haired. Callus big, not reaching to the eyes, facial callus pale olivebrown, median part of face ochraceous-goldenyellow. Antennae yellowish at base, darker at apex. Palpi reddishbrown. Beard brownyellow. Thorax black with goldenyellow haired sides and scanty goldenyellow hairs, scattered over the surface. Wings with crossband and apical spot. Legs brown. ♂ almost identical.

Table of dimensions.

Bodylength	varying from	7,8	m.M.	to	11	m.M.
Width of thorax	„	2,5	„	—	3,5	„
Width of abdomen	„	3	„	—	4	„
Wingexpanse	„	18,5	„	—	24,5	„
Length of head	„	1,5	„	—	2,2	„
Length of thorax	„	2,5	„	—	4	„
Length of abdomen	„	4,2	„	—	6	„
Length of wing	„	7,8	„	—	10,5	„
Breadth of wing	„	3,2	„	—	4	„
Foreheadindex	„	1,18	„	—	1,80	„
Length of antennae 3,2 m.M.						

The Head. Forehead broad, narrow at apex, goldenyellowish, yellow tomentose, scanty brownish yellow haired. Callus transverse, large, oval, broader than long, convex, not reaching to the eyes, hindborder straight, shining black. Ocellar plate covering the whole width of the frons, shining black, bearing 3 ocelli, yellowbrown haired. In one of the Tjinangsi females the space between callus and ocellar plate is grey, callus in the same female brown-black. Facial callus deeply incised in the median line, olivebrown, upper corners embraced by small, half moon-shaped darkbrown caps, situated on the cheeks. Just beyond the mouth both legs of the callus are united to a black spot. One of the Soebang specimens presented

long sickle-shaped shining spots, found on the cheeks and running along the facial callus (Textfig. 9). Another oval, black (or chocolatebrown) shining spot is situated between the clypeus and the lower eyeangle. Median part of clypeus orangeous-goldenyellow, yellow haired. Cheeks brown, yellow haired. Beard similar. Antennae long, mostly about 2,5 times



Textfig. 9.

C. dispar F. ♀ a., b. head; c., d. antenna; e. wingappendix

as long as the diameter of the head, first joint slightly longer than the second, but shorter than the third joint. First joint slender, slightly curved, pale caramelbrown, yellow at base, darker to the yellowbrown apex, scanty black haired, second joint dark reddishbrown, indistinctly 6-7-ringed, rather distinctly divided in 3 areas, pubescence comparatively long, placed in festoons; third joint distinctly 5-ringed, basal annulations subdivided in three divisions, dull darkbrown to blackbrown, darker at apex, broadened at base.

Palpi reddishbrown, pointed, brownyellow haired. Proboscis long, sugarflaps shining black, covered with unequal long, black hairs. Stalk blackish, covered with yellowbrown tomentum and short brownblack pubescence. Postocular rim butteryellow tomentose, brownblack haired.

T h o r a x. Scutum shining black, with two hoary tomentose longitudinal stripes connected at border of scutellum with the lateral hoary stripes, sparse yellowish hairs being scattered over the whole surface; golden yellow to messingyellow (DE MEYERE) haircovering along the lateral borders and the hindborder of the scutum. Pteropleuron with a tuft of goldenyellow hairs. Shoulders reddbrown, covered with whitish hairs. Goldenyellow hairtufts border the meso- and metathorax-sclerites. Breast black, nearly bare, sides yellowbrown, goldenyellow-brown haired. Scutellum black on foreborder, violetreddbrown on hindborder and at sides, yellow haired. Halteres, stalk reddbrown, club big, brownblack. Wings with crossband and apical spot. Foreborder brown. The fifth posterior cell with a sharply circumscribed hyaline sinus. Centres of fourth posterior cell and of discoidal cell paler. Stigma reddbrown. Bases of subcostal and radial cell grey. Veins brownish yellow to yellowbrown on the crossband. Both basal cells partly filled with brown colour. Anal cell closed. Legs. First leg. Coxa dull havannabrown, brown haired. Femur shining leather-brown, beset with brownblack hairs, long and erect at the distal lateral border. Tibia slightly swollen, dull dark olivebrown, blackish to the apex, black haired. First tarsale dull reddishbrown, black haired, other tarsalia coffeebrown, black haired. Second leg. Coxa and trochanter reddbrown. Femur leatherbrown, black-brown haired; Tibia slightly swollen coffeebrown, black haired, presenting two black spurs. Tarsalia coffeebrown, black haired. Third leg. Coxa black, trochanter reddbrown. Femur ventrally dull mahogany-black, coffeebrown on dorsum, black haired, intermixed with some yellowbrown pubescence. Tibiae yellowishbrown, slightly incrassate, adorned with two reddbrown spurs. Tarsalia coffeebrown, black haired.

A b d o m e n. First segment with narrow transverse brownblack, black haired band at anterior border, base pale brownyellow, yellow haired. The black reversed spot runs over the second and third segment and is sometimes prolonged on the fourth abdominal segment,

where it grows fainter. The same was observed by SHIRAKI. The area surrounded by the V shaped marking is brownyellow. Outside this marking the second and third segment are white, pale yellow haired. Following segments reddishbrown, yellow haired. Abdomen ending rather broad. Lateral borders of second, third and fourth tergites brownishblack. Ventral surface, yellow on the first segment, pale brown on the second, elsewhere reddishbrown, covered with yellow pubescence. One of the Soebang females presents on the dorsum of the first segment a blackbrown to reddishbrown spot at each side of the median line. On a female from Porsea brownblack stripes run along the lateral borders of the 2d—6th segment. Here the transverse band on the first segment is reduced to a small black stripe. The females attack cattle resting in pasture or pen, according to SHIRAKI in the daytime and become active towards evening, sometimes biting people also. The specimens observed by me did bite cattle also in the morning hours about 10—11 o'clock.

The Male. Almost identical with the female. Abdomen paler, reddisholivebrown at apex with the usual V-spot, wholly similar to that, found in the ♀, continued on the 4th segment. Ventral surface of abdomen as in the ♀.

The Head. Lower area of eyes consisting of small black facets, not extending to the vertex. Upper large-facetted area yellowbrown in death, in life probably goldenyellow, with two brown, parallel stripes, similar to those in *C. fixissima* Wlk., the lower of both stripes being longer than in the lastnamed species. None of the stripes reaches the vertex. Antennae finer than in the female, identical in colour and pubescence. Palpi yellowbrown, yellow haired, some black hairs at apex. Callosities on cheeks and face as in the ♀, the shining borders of the clypeus not connected in the middle. The callosities, situated in the lower eyeangle broader and slightly darker than in the female.

Thorax, wings and legs identical. Scutum slightly darker than in the ♀, more red-brown. According to SHIRAKI the male flies are found during the daytime on the lower surface of the leaves of shrubs, growing on somewhat wet places.

Discussion. The synonymy of this species is rather difficult. DE MEYERE named according to VAN DER WULP the species with the yellow face and testaceous facial callus *C. dispar* F., whereas the other species, named by him *C. V-nigrum*, a synonym of *C. flaviventris* MACQ. possesses a back facial callus and a reversed V, which is limited to the 2d segment only. In *C. dispar* F. it sometimes reaches almost the apex of the 4th segment. FABRICIUS says: „head below the antennae yellow with two large, raised ovate, testaceous spots; above the antennae pale, with a large, transverse, raised, black spot. First abdominal segment pale. Half-moonshaped brown spot present on the middle of the abdomen (macula media lunata fusca) whereas he says in the beginning „lunula nigra" (with a black spot), he does not mention however the black transverse stripe at the apex of the first segment. The halfmoonshaped spot is black in *C. dispar* F. and brown in *C. flaviventris* MACQ. „Transverse band distinctly incised at hindborder of wing". So possibly DE MEYERE is right, when supposing, that most authors had to do with both species. FABRICIUS male has the abdomen testaceous, the first segment however being pale with a halfmoonshaped brown spot, which may apply to *C. flaviventris* MACQ. WIEDEMANN neither mentions the black transverse band on the first abdominal segment, which is essential to *C. dispar* F. Further he describes this species as follows: „Abdomen of the male rustyyellow, the first segment brown in the middle, the second segment pale, with 2 brown spots, united towards the base of the segment in a somewhat rounded angle, not resting on the base itself, continued till upon the base of the third segment, sides of abdomen brown, in the middle of the underside of abdomen an abbreviated brown band". MACQUART remarked, „according to WIEDEMANN the brown lunulate marking stretches over the second and third segment in the male," so that one gets the impression, that he described both species at the same time. About the female WIEDEMANN says: „abdomen of the female more brownish, the first segment pale." This appasites to *C. dispar* F., but further

he remarks: the spots as in the male, but not continued to the third segment," and this suits for *C. flaviventris* MACQ. So WIEDEMANN confused both species. MACQUART, who mentions a black face, laterally bordered with a grey spot, a grey forehead and a black scutellum, certainly had to do with *C. flaviventris* only. In *C. dispar* the face has rufous borders. The same is applicable to the FERRARI females from Buitenzorg, brought to *C. dispar* F. by others. The ♀♀ and ♂♂ described in the 3d Supplement of MACQUART's, *Diptères exotiques*, quite certainly were specimens of *C. dispar* F., since the band stretches equally over the 2d and 3d segment. The transverse band on the first segment has been overseen. *C. bifasciata* MACQUART has an abdomen with 2 longitudinal black bands, beginning near the base of the second segment. RICARDO who has seen this type remarks, „that the black stripes on abdomen are of unusual length, extending to the end of the abdomen. Further MACQUART mentions two ventral longitudinal black bands, not surpassing the fifth segment. It seems improbable to me, that this species really should be a synonym of *C. dispar* F. WALKER describes *C. ligatus* WLK.: „Chest pale ferrugineous with four hoary stripes with a yellowish tinge, breast ferrugineous with a hoary bloom." Except the variations in colour of the background, which I found to be brown in some specimens *C. ligatus* WLK, carefully described by this author, wholly agrees with *C. dispar* F. The abdomen of *C. semicirculus* is described by WALKER very superficially only. He notes nothing about the black markings. So I am not sure whether RICARDO's synonymy is correct. RICARDO calls this species „a poor specimen of *C. dispar* F., with the black markings of the abdomen obsolete or almost so." About *C. impar* RONDANI, RICARDO remarks „it has the abdomen entirely black after the third segment, and the frontal callus is deeply incised posteriorly, a peculiarity I have not seen in any other specimens". It is doubtful to me if RICARDO and OSTEN SACKEN are right, bringing both species together and I join DE MEYERE, when he denies the identity of both species.

8. *Chrysops flaviventris* MACQUART. (♀, ♂) Pl. 1, Fig. 5, 6; Textfig. 10.

Syn. C. v-nigrum DE MEYERE.

C. terminalis WALKER.

References:

- MACQUART, *Dipt. exot.* I p. 159 (1838).
 „ *Dipt. exot. Suppl.* 1, p. 172 (1845).
 DE MEYERE, *Tijdschrift v. Entomologie* LIV p. 277 (1911).
 „ „ „ „ LX p. 298 (1918).
 WALKER, *List Diptera Brit Mus.* 1 p. 195 (1848).
 RICARDO, *Ann. Mag. Nat. Hist.* (7) IX p. 373 (1902).
 „ *Rec. Ind. Mus.* IV. pl VI p. 396 (1911).

Habitat:

Type ♀ from India

- | | | |
|-----------------------------|-----------------------|------------------|
| 1 ♀ from Ceylon Trincomalee | FELDER | • Coll. L.M.N.H. |
| 1 ♀ „ Ambarawa | LUDEKING | „ |
| 1 ♀ „ Garoet, West Java | ADER | VERVER 1893 |
| 7 ♀♀ from Buitenzorg | (FERRARI) | Coll. N.A.M. |
| 1 ♀ „ „ | Sept. '07 E. JACOBSON | Coll. L.M.N.H. |

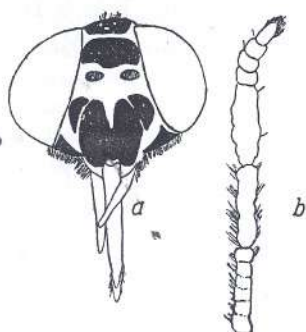
2 ♀ ♀	„	Tandjong Priok, December '07	E. JACOBSON	Coll. N.A.M.
1 ♀	„	Batavia, December 1908	E. JACOBSON	„
1 ♀	„	„	April '08 E. JACOBSON	„
2 ♀ ♀	„	Wonosobo May '09	E. JACOBSON	„
2 ♀ ♀	„	Maos January '09	E. JACOBSON	„
1 ♀	„	„	June '09 E. JACOBSON	Coll. L.M.N.H.
1 ♀	„	Salatiga February '09		Coll. N.A.M.
1 ♀	„	„	May '09 DOCTERS V. LEEUWEN	„
2 ♀ ♀	„	Java	E. JACOBSON	„
1 ♀	„	„	1880	„
3 ♀ ♀	„	Buitenzorg Juni '20	KARNY	Coll. B.Z.M.
1 ♀	„	„	21.2'21 KARNY	„
1 ♀	„	„	(hotel room) 12.9'22	SCH. STEKH. Coll. V.S.L.
1 ♀	„	„	4.'23	SCH. STEKH. „
4 ♀ ♀	„	Tjinangsi Soebang, Krawang, Res. Batavia, on buffalo	April '22	Coll. V.S.L.
1 ♀	„	Kg. Madja, Tjinangsi, Soebang on buffalo	3. '22	„
1 ♀	„	Tegal Nov. '22	LAGAS	„
1 ♀	„	Tjiawi, on horse		„
3 ♀ ♀	„	Poerwokerto on cattle	7.4.'23	SCH. STEKH. „
2 ♀ ♀	„	captured in train between Djoeja and Koetoardjo	7.4.'22	SCH. STEKH. Coll. V.L.S.
2 ♀ ♀	from	Tasikmalaja	29.7.'22	LE COULTRE „
1 ♀	„	Parigi, Tasikmalaja	24.12.'22	„ „
1 ♀	„	Tasikmalaja on horse	13.2.'23	LE COULTRE „
2 ♀ ♀	from	Isle Sumatra, Lampong Districts, road between Wai Lima and Tandjong Karang, neighbourhood of river	17.12.'12	Coll. B.Z.M.

DE MEYERE says, when speaking from *Chr. flaviventris* MACQ.: very much like *Chr. dispar* F. Facial callus black, abdomen reddishyellow, 1st abdominal ring only slightly darker in the median line, the second segment bearing a reversed v, which is not narrower at its base, mostly even broader. This v is sometimes prolonged faintly on the third segment. Body-dimensions as in *Chr. dispar* F. Herewith *Chr. flaviventris* MACQ. is characterised very sufficiently.

Table of dimensions.

Bodylength	varying between	7,8 m.M. and	9,8 m.M.
Width of thorax	„	2,4 „	3 „
Width of abdomen	„	2,6 „	3,8 „
Wing expanse	„	15,6 „	20,6 „
Length of head	„	1,2 „	1,8 „
Length of thorax	„	2,8 „	4,2 „

Length of abdomen	varying between	4,2 m.M. and	6 m.M.
Length of wing	" "	6,6 "	8,8 "
Breadth of wing	" "	3 "	3,8 "
Forehead index	" "	0,87	1,71



Textfig. 10

C. flaviventris MACQ ♀
a. head, b. antenna.

The Head. (Textfig. 10.) Forehead greyish white, somewhat yellowish. Frontal callus shining black, square, nearly reaching to the eyes, straight at apical border, prolonged between the antennae, ocellar plate shining black, brown haired, not reaching to the eyes, bearing three ocelli. Facial callus very big, brownblack, shining, nearly covering the whole clypeus, with a shallow median indentation. Two hemicircular black spots lie down on the legs of the v, whereas to the mouth the facial callus is indented also. Eyes and clypeus are connected with a broad triangular, shining brownblack spot at each side. Median part of clypeus below the antennae goldenyellow tomentose. Beard yellowbrown. Antennae 3-jointed, reddishbrown, yellowwhite pubescent, intermixed with some black hairs. First joint pale brownyellow at base, reddishbrown to the apex, indistinctly ringed, black haired, second joint dull reddish olivebrown, distinctly 5-6-ringed, nearly equal in size to the first, black hairs in festoons; third joint as long

as the first and second joint together, 5-segmented, the first segment showing indications of further rings, black. Palpi: Ochraceous-yellow, slender, awl-shaped, yellow haired. Postocular rim greyblack, black haired.

Thorax black with a mouldy-grey longitudinal, goldenyellow haired median stripe divided into two fields by a fine median black line, shoulders redbrown, pteropleuron goldenyellow haired, as are sides and hindborder of scutum, lateral tufts placed in the shape of a Querry mark. Scutellum shining black at base, hind border brownish. Breast black, grey tomentose in places, bare. Sides yellowbrown, yellow haired. Halteres, stalk redbrown, club black. Wings with crossband and apical spot. Foreborder brownyellow, crossband sharply incised at hindborder, the clear area mostly filling up the fifth posterior cell and a part of the fourth. Apical border of crossband concave, basal border almost straight; small brown spots in basal cells, veins yellow on clear parts, brown on band. Legs. First leg; Coxa swollen, brownblack, yellowbrown haired, femur shining dark, blackbrown at base, elsewhere yellowleather-brown, yellow haired. Tibia swollen, basal half yellowbrown, dark redbrown to the apex, black haired. First tarsale coffeebrown at base, apex black, black haired, other tarsalia black. Second leg, Coxa black, Trochanter redbrown. Femur chromate orangeousyellow, yellow haired. Tibia somewhat incrassate, bright orangeousyellow, or ochraceousyellow, pubescence as on femur. Tarsale 1 orangeousyellowbrown, oliveredbrown to the apex, yellow haired; following tarsalia reddishbrown, black haired. Third leg; Coxa and trochanter blackbrown. Femur black with a brownish hue to the slightly paler apex, yellow haired to the base. Tibia yellow, becoming olivebrownyellow to the apex, pubescence brownishblack on dorsum, yellow below. Tarsale 1 chromateyellow, black haired above, yellow haired below. Following tarsalia olivebrown, black haired.

Abdomen. Segment 1. reddishbrownyellow, yellow haired, a darker transverse shadow, composed of black hairs at hindborder of the segment. Other females present a brownish or black, black haired round spot at the same place. One of the Lampong females showed a brown narrow transverse stripelet, covered with black hairs. 2d and 3d segment reddishbrownyellow. Second segment with a reversed bright redbrown v-shaped, black haired spot; the legs

of the v being in this species but slightly broadened. On third segment in most specimens the legs of the v are prolonged as an almost indistinct brownish shadow with parallel straight sides, covered with black hairs. Following segments pale reddishbrown, yellow haired. Lateral borders of tergites bordered by a black olivebrown streak, running from the second segment to the apex. Ventral surface with first three segments chromateyellow in some specimens, in other specimens same colour on first 5 segments, apex brownblack, pubescence yellow, black on apical dark part. DE MEYERE mentions especially the black facial callus. I cant confirm DE MEYERE when he asserts „Körpergrösse wie bei der *Chr. dispar*“, as *Chr. flaviventris* is on the average smaller than *dispar*. DE MEYERE considers *Chr. v. nigrum* to be a synonym of *Chr. flaviventris* MACQUART. As indicated above, MACQUART's *Chr. dispar* Fab. is the same as *Chr. flaviventris* MACQ. *Chrysops terminalis* WLK. (nec MACQUART), which RICARDO states to be a synonym of *Chr. dispar* F. is apparently synonym with *Chr. flaviventris* MACQ. It differs however from the latter species in the colour of the palpi, which are tawny, the length of the third antennal joint, which is nearly as long as the first joint. Abdomen with a black bifid stripe not reaching beyond the second segment. Confer further the references in respect with *Chr. dispar* F.

The Male.

♂ type, locality unknown.

Coll. B.Z.M.

The Head. Eyes contiguous, oceller plate black. Big-faceted part yellowbrown, lower part small-faceted, darkbrown. Antennae first joint yellow, brownblack haired, 2d joint olivebrown, pubescence black; third joint blackbrown, slightly broadened near the base. Palpi pale brown, in the space between eyes and palpi a triangular shining spot is found, identical to that present in the ♀. Facial callus dull brownblack.

Thorax as in the female as also the wings. Fore tibiae more blackbrown. Middle tibiae slightly swollen, olivebrown, black haired. Tarsalia yellowbrown to pale yellow. Third leg similar.

9. *Chrysops fasciata* WIEDEMANN (♀, ♂) Pl. 2, Fig. 1, 2; Textfig. 11.

Syn.: *C. rufitarsis* ♂ MACQUART.

References:

- WIEDEMANN, Dipt. exot. I, p. 103 (1821).
 „ Auss. Zweifl. Ins. I, p. 198 (1828).
 MACQUART, Dipt. exot. Suppl. III, p. 174 (1847).
 DOLESCHALL, Natuurk. Tijdschr. v. Ned. Indie XVII, p. 84 (1858).
 RICARDO, Ann. Mag. Nat. Hist. (7) IX, p. 373, 375 (1902).
 DE MEYERE, Tijdschr. v. Ent. LIV, p. 278 (1911).
 „ „ „ „ LX, p. 298 (1918).

Habitat:

- 2 ♀ ♀ from Ross Island, Andaman Islands BINGHAM 5.'04 Coll. London Sc.
 Trop. Med.
 1 ♀ from Assam Coll. BR.M.
 1 ♀ „ Sibagsar, Assam „
 1 ♂ „ Burma (labelled *C. rufitarsis* MACQ. by Miss RICARDO) Coll. BR.M.
 The Federated Malay States
 1 ♀ from unknown locality PRATT Coll. BR.M.

Isle Borneo

1 ♀ from Sawarak WELLINGTON

Coll. London. Sc. Trop. Med.

Isle Amboina?

Recorded by DOLESCHAL

Isle Sumatra

1 ♀ and 1 ♂ from Tandjong Morawa, Serdang, Gvt. East Coast Sumatra

Dr. HAGEN

Coll. L.M.N.H.

Residency Tapanoeli, Ressort Padang Sidempoean

9 ♀ ♀ from Pidjang Bolang 20.3.'22 TARIP

Coll. V.S.L.

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

3 ♀ ♀ from Angkola, TARIP 1.'22

2 ♀ ♀ „ Hoeta Tongga, Moeara Tais LOBEL

resp. 1 ♀ on horse 24.12.'22

1 ♀ „ „ 1.'22

1 ♀ from Moeara Tais, Moeara Tais on buffalo 24.12.'22 LOBEL

1 ♀ „ Si Paho, Moeara Tais, on buffalo 24.12.'22 LOBEL

2 ♀ ♀ „ Si Balapak, Moeara Tais, on buffalo 5.8.'24 BAKKER

7 ♀ ♀ „ Bintloedjoe, Moeara Tais LOBEL and BAKKER

resp. 1 ♀ on cattle 1.'23

2 ♀ ♀ „ buffalo 20.2.'23

1 ♀ „ „ 5.6.'23

2 ♀ ♀ „ horse 20.2.'23

1 ♀ „ „ 3.'23

1 ♀ from Hoeta Padang, Pidjor Koling, Si Pirok on buffalo 24.12.'22 LOBEL

4 ♀ ♀ „ Si Doea doea, Pidjor Koling BAKKER

resp. 3 ♀ ♀ on buffalo 6.6.'23

1 ♀ „ horse 5.8.'24

2 ♀ ♀ from Pidjor Koling, Pidjor Koling BAKKER

resp. 1 ♀ on horse 6.6.'23

1 ♀ „ buffalo 5.8.'24

4 ♀ ♀ from Hapesong, Marantjar BAKKER

resp. 2 ♀ ♀ on horse 1.6.'24

2 ♀ ♀ „ cattle 6.8.'24

1 ♀ from Si Dadi, Si Galangan on horse 1.'23 LOBEL

1 ♀ „ Si Galangan, Si Galangan on horse 1.'23 LOBEL

Ressort Padang Sidempoean, Mantrie Ressort Binanga

4 ♀ ♀ from Pasar Sibohoean, Djandi Lobi LOBEL and BAKKER

resp. 1 ♀ on cattle 26.2.'23

2 ♀ ♀ „ buffalo 5.2.'24

1 ♀ „ horse 2.12.'23

6 ♀ ♀ from Si Oendol, Paringgongan BAKKER

resp. 3 ♀ ♀ on buffalo 6.12.'23

3 ♀ ♀ „ „ 26.11.'24

- 1 ♀ from Hoeta Nopan, Hoeta Nopan on horse 25.11.'14 BAKKER
Residency Djambi
- 1 ♀ from Djambi on horse MARSIDI 4.'22
- 1 ♀ „ Sumatra, without locality CORPORAAL 19.5.'21 Coll. N.A.M.
Isle Java
- Type ♀ in WESTERMANN'S Coll.
- 1 ♀ from Mount Ardjoeno SCHEEPMAYER Coll. N.A.M.
- 1 ♀ „ Tjilatjap DRESCHER 2.'10 „
- 1 ♀ „ Noesa Kambangan JACOBSON 3.'11 „
- 1 ♀ „ Java, without further locality „
- Type ♂ from Java, (*C. rufitarsis* MACQ.) Mr. PAYEN'S Coll.

C. fasciata WIED is a blackish Chrysopid, characterised at once by the comparatively broad abdomen with black collar at base, rest of first segment and base of second segment dirty white, yellow haired. Posterior third of second and the whole third segment with transverse, black crossband, some brown spots being scattered over the dorsum of the segment. Apex of abdomen rusty brown. Forehead brownyellow. Frontal callus fanshaped. Facial callus v-shaped, black, deeply indented. Clypeus elsewhere goldenyellow tomentose Triangular black spots, situated in the space between eyes and proboscis. Thorax black, lateral borders golden-yellow haired, hind border scanty yellowbrown haired. Wings with crossband and apical spot. Fifth posterior cell slightly paler at hindborder.

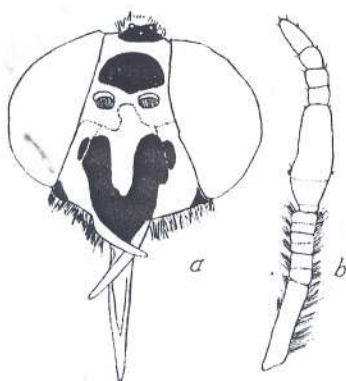
The Female.

Table of dimensions.

Bodylength	varying from	8,2	m.M.	to	10,8	m.M.
Width of thorax	„ „	2,8	„	—	4	„
Width of abdomen	„ „	3	„	—	4,2	„
Wingexpanse	„ „	17,2	„	—	23	„
Length of head	„ „	1,8	„	—	2	„
Length of thorax	„ „	3,8	„	—	4,6	„
Length of abdomen	„ „	4,8	„	—	5,8	„
Length of wing	„ „	7,2	„	—	9,5	„
Breadth of wing	„ „	3,2	„	—	4	„
Forehead index	„ „	1,22	„	—	1,75	„
Length of antennae	3,2 m.M.					

The Head. (Textfig. 11) Forehead brownyellow, brownyellow haired. Callus black, fan-shaped, not reaching to the eyes, sometimes grooved. Ocellar plate relatively narrow, not reaching to the eyes, yellowbrown haired. Subcallus goldenyellow tomentose with a thick tuft of longer similar hairs. Face with goldenyellow tomentum and pubescence. Facial callus black, deeply indented. On cheeks between eyes and palpi a small black, triangular, black haired spot. Cheeks elsewhere brilliantly yellow haired. Beard thin, yellowgoldenbrown. Antennae rising from violetbrown-randed antennal pits, 3-jointed. First joint curved, coffeenutbrown, covered with sparse black pubescence, second joint darker, havannabrown, with 3 distinct ringlets

subdivided in their turn, thus forming 6 rings in total, hairs in black festoons, accompanying the ringborders, third joint black, first annulation broadened and flattened, indistinctly 3—5 ringed, the apical annulation is the longest of the last four rings. Third joint as long or longer than the first two joints together. Palpi dullreddishbrown, black haired, ending in a short point. Proboscis, stalk reddishbrown, beset with brownblack hairs; sugarflaps black. Postocular rim brownyellow haired.



Textfig. 11.

C. fasciata WIED ♀

a. head, b. antenna.

Thorax. Brownishblack, shining, covered dorsally with pale brownyellow scanty pubescence, sides tightly goldenyellow haired, the dullbrown hind-border of scutum bearing a thin yellowbrown hair-covering only. Scutellum black, reddishbrown pubescent. Wingmarkings dark chocolatebrown, apical spot present. Stigma dark chocolatebrown, almost black. The crossband covering also the apical part of anal cell is slightly concave at apical border and nearly straight at basal border. Fifth posterior cell with a somewhat clearer diffuse area. Wingbase with a reddishbrown oblique streak covering basal part of the basal cells. Halteres, club brownblack, stalk reddishbrown. Legs. First leg, Coxa brownishblack, brownyellow haired. Femur piceous, distal lateral border with long hairfringe, ventral surface reddishbrown. Tibia curved, swollen, especially at distal lateral border, basal part brownish, elsewhere black. Tarsalia black. Second leg; Coxa and trochanter black; Femur

reddishbrownblack with darker apex, black haired. Tibia blackish reddishbrown, covered with loose black pubescence, incrassate, especially at distal lateral border, first tarsale whitishbrown, black haired. Other tarsalia whitishbrown, black haired. Third leg; Coxa and trochanter black, Femur black, black haired. Tibia black, slightly incrassate. Tarsalia oliverrddishbrown, black haired.

Abdomen. First segment with a black, black haired collar at base, surrounding the scutellum, elsewhere white, yellow haired. Basal two thirds of second segment likewise white, yellow haired, the hind border black, this transverse band covering also the dorsal surface of the third segment. In some specimens the transverse black band may be prolonged over the base of the fourth or even over the whole fourth segment. In other specimens the transverse black, black haired band is dotted with brown spots, seldom the third segment is almost wholly brown, whereas a few black spots are scattered over the surface. Fourth to seventh segment rustysbrown, black haired. Sixth segment with yellowish, yellow haired triangles at lateral borders. Lateral borders of second tergite fringed with similar hairs. Ventral surface yellowish-white on the first three segments. Fourth to seventh segment rustysbrown.

The Male.

The Head. Eyes with golden, large-faceted, tridentate upper part, lower half black, small-faceted, prolonged to the vertex as a comparatively broad stripe. (Pl. 2, Fig. 2b.) Ocellar plate black haired. Cheeks and face goldenyellow, yellow haired. Near the lower eyeangle one finds a blackbrown spot. A blackbrown shining callosity, not unlike that found in the ♀ borders each side of the face, but here both stripes are not connected by a thick stripe. Beard goldenyellow. Palpi short, havannabrown, blackbrown haired. Antennae, first joint dark olivebrown, black haired, following joints blackbrown, black haired.

Thorax as in the ♀, legs identical as also wings and halteres.

Abdomen, first segment with blackbrown collar. Rest of first segment, 2d, 3d and the greater part of the 4th segment white, white haired. Apex wholly brownblack, black

haired. Ventral surface identical with median, fine, reddishbrown line connecting the collar with the dark apical part, the collar being more reddbrown. The male described by RICARDO had reddishbrown facial tubercles. Antennae reddishyellow. Legs reddishbrown.

Discussion. WIEDEMANN does not mention the black collar at the base of the first abdominal segment. RICARDO describes the frontal callus as reaching to the eyes, whereas in her specimens middle and posterior tibiae were almost wholly pale yellow. I agree with DE MEYERE, when he considers *C. rufitarsis* MACQ. to be the male of *C. fasciata* WIED, the only difference laying in the fact, that the largest part of the abdomen is white in the male.

10. *Chrysops signifer* WALKER (♂). Pl. 2, Fig. 3.

WALKER, Proc. Linn. Soc. London V p. 276 (1861).

RICARDO, Ann. Mag. Nat. Hist. (7) IX p. 376 (1902).

OSTEN SACKEN, Berlin Ent. Zeit., XXVI, p. 97 (1882).

SCHUURMANS STEKHOVEN, Boeroe Expeditie II, I, p. 26 (1924).

„ „ Treubia V, p. 324 (1924).

The type, a male, is in the Brit. Mus. Coll. from Batchian. (Batjan) S. from Halmahera; OSTEN SACKEN records males and females from the Philippines and states they vary very much in size. TOXOPAEUS collection contains 1 male from: Buru, station 1, from the neighbourhood of Leksula, the coastland, with a very variable vegetation; each group with its own special fauna. The male was collected on 24.8.21. *Chrysops signifer* ♂ WALKER and *Chrysops cincta* ♀ BIGOT have many points in common. Though they appear to be synonyms they are certainly distinct, see under discussion.*

The Burumale has beautiful yellowbrown eyemarkings; abdomen yellow to reddishbrown, with a transverse blackbrown band on first, second and third segment, connected with each other at the lateral borders. Wings with cross-band and apical spot. No clear area in the discoidal cell. Fifth posterior cell with a diffuse somewhat clearer area. Anal cell closed with a short petiole. Antennae long 4 m.M. Bodylength 10,5 m.M. The only specimen gave the following data.

Table of dimensions.

Body length	10,5 m.M.
Width of thorax	3,6 „
Width of abdomen	3,2 „
Wingexpanse	20 „
Length of head	1,8 „
Length of thorax	3,8 „
Length of abdomen	6 „
Length of wing	8,2 „
Width of wing	3,5 „
Length of antennae	4 „

The Head. The eyes touch in the median line. The upper big-facettèd apical half of the eyes is mainly yellowbrown, see the plate. The lower small-facettèd part is black. The

ocellar plate, bearing three ocelli, is covered with short, erect hairs. In stead of a callus, the male presents a rudimentary dark black triangular incrassation of the exo-skeleton. Antennae 3-jointed, rising from piceous pits, surrounded by convex rims. First joint dorsally coffeebrown at base, to the apex blackish, black haired, indistinctly 8-ringed. Second joint black, 8 indistinct rings are to be seen, the last three broad, swollen at the borders, the first five rings narrow and indistinct. Second joint equal in size to the first joint. Third joint bare, black, slightly longer as the second joint, incrassate at base, showing distinctly 5 annulations, the basal one being as long as the following ones together. The basal annulation is subdivided into four indistinct rings by shallow grooves, the apical ring ending in a blunt point. Clypeus dark black, shining, with a narrow median yellowgrey tomentose stripe, just below the antennae. Subcallus likewise yellow tomentose. Cheeks goldenyellow, goldenyellow haired. Beard same colour. A black rim connects eyes and clypeus. Proboscis piceous, sugarflaps covered with short, brownblack hairs. Palpi very short, black.

Thorax. Scutum dark black, in bad condition. Short goldenyellow hairs abound on the median line. Hindborder of scutum broadly covered with a thick goldenyellow haircovering. Lateral goldenyellow tufts in the shape of a Querrymark. Scutellum piceous. Wings with crossband and apical spot. The extreme wingbase is orange yellowbrown. An oblique brown streak fills up base of anal, upper and lower basalcells. Foreborder darkbrown. Stigma chocolatebrown. Apical spot broad, filling up almost the whole cubital cell, except a small clear piece, situated in the edge between trunk and upper branch of cubital vein. Apical border of crossband nearly straight. Disc cell without a clear area in its centre. Fifth posterior cell with a slightly paler diffuse centre. Anal cell closed with a short petiole. Halteres; stalk black, club brownblack. Legs. First leg, coxa piceous, covered with erect black hairs. Femur deep chocolatebrown, black haired, proximal lateral border short haired, distal lateral border fringed with long and erect hairs. Tibia swollen as a biceps, chocolatebrown at base, black to the apex, black haired. Tarsalia blackishbrown, black haired. Fifth tarsale black. Second leg. Femur and tibia similar, femur black haired, slightly brighter brown, showing a dark apex. Tibia with two unequal spurs. First tarsale long with a row of black hairs along the proximal lateral border; following tarsalia pale white, covered with a brownish hue, apices bordered by black hairs, ventral surface thick black haired. Third leg. Femur and tibia black covered with long, erect, black hairs. First tarsale dirty yellowbrown, black haired, other tarsalia identical. Fifth tarsale black in all legs.

Abdomen. First abdominal segment showing posteriorly a narrow black transverse band touching the foreborder of the second segment in the median line, curved backwards near the lateral borders till half the distance between base and segmentations. First segment elsewhere yellow, shadowed by the brownishyellow pubescence. Second segment pellucidyellow, yellowwhite haired with a crescentiform blackbrown band at apex, not reaching to the lateral borders of the tergite. Third segment presenting a broad concave blackbrown hoofshaped band, the legs of the hoof touching to the crescentiform marking of the second segment, the lateral borders of this segment remain yellowwhite, yellowwhite haired. Both markings enclose a curved triangular yellow spot with very sharp basal angles. All dark markings blackbrown haired. Segment 4-7, terracotta-reddishbrown. The fourth and following segment with blackish median indistinct spots. Pubescence brown, intermixed with yellow hairs. Ventral surface: fourth segment with a brownred nearly black transverse band. A blackish stripe connects this band with the dorsal marking on the third segment. Seventh segment ventrally wholly black haired. Fifth and 6th segment oakleaf reddishbrown, pubescence same colour. First three segments yellow haired. *Chrysops signifer* Wlk. from Buru is only slightly longer than WALKER's type.

Discussion.

., *Chrysops signifer* n.s. (WALKER's description). Male black. Head deep black and shining in front, with a patch of gilded tomentum on each side of the face, and with a smaller one

at the base of the antennae. Antennae filiform, tawny towards the base, much longer than the breadth of the head. Thorax with two bands of gilded hairs. Abdomen yellow, blackish at the tip, with a black band at the base, and in the middle with two black bands, which are connected on each side and enclose a triangular space between them. Femora mostly dark red, tibiae dilated, posterior tarsi tawny. Wings cinereous, blackish along the costa, and with two blackish bands, the second very much broader than the first, which is found near the base. Length of the body 4 lines, of the wings 7 lines. WALKER does not mention the yellowbrown markings on the eyes. In the Buru male the thoracal bands of gilded hairs were not visible. RICARDO giving no notice to the curved basal band, says: „second band on the third segment is concave in the middle, neither of the bands reach the sides, but the third and fourth segments are bordered with a narrow black stripe. Legs in the type yellowishbrown, the hind pair darker, tibiae slightly incrassate. Length 9,5 m.M. The legs in the Boeroe ♂ are also darker than in the type seen by RICARDO. *C. cincta* BIGOT has whitish yellow palpi. BIGOT describes this species as having a black abdomen, segments very narrowly bordered with yellowishwhite, large band of the same colour at base of the second segment. Wings whitish... with a large median crossband of the same colour. RICARDO describes the type ♀ from the Philippines as darker than the three other species, with black bands and the yellow colour of the abdomen is not diaphanous; it is nearly allied to *C. fasciata* WIED and *C. signifer* WALKER, but the abdomen is darker and the black bands broader. She amends the original description thus: „Face black, yellow at the sides and with a central short yellow stripe. Abdomen with the first segment pale yellow and a narrow black posterior border, the second is pale yellow on its anterior border; the black band posteriorly is nearly equal in width to the yellow colour the third segment is almost wholly black, with only a narrow yellow border anteriorly, the two black bands join at the sides, but the second band is entirely straight on its posterior border thus differing from *C. signifer* Wlk., which is deeply indented in the centre, the fourth, fifth, sixth and seventh segments are reddishyellow, with obscure black square spots in the centre of the fourth and fifth". The words spaced by me indicate the main differences between the described *C. signifer* Wlk. and *C. cincta* BIGOT. In my Buru paper I supposed *C. cincta* BIGOT was a synonym of *C. signifer* Wlk. but now having seen a large amount of Chrysopids, I think they are really distinct species, differing mainly in the colour of the palpi, the width and size of the crossband of the wing and in the shape of the abdominal markings. The differences in size and shape of the abdominal markings might probably be due in part to sexual differences but the colour of the palpi and the large median band on the wing, distinguish this species clearly from *C. signifer* Wlk., which has a rather narrow crossband.

11. *Chrysops atrisignata* nov. spec. (♀) Pl. 2, Fig. 4; Textfig. 12.

Habitat:

Type ♀ from Gorontalo, Celebes ROSENBERG (determined by VAN DER WULF as *C. fasciatus* WIED) Coll. L.M.N.H.

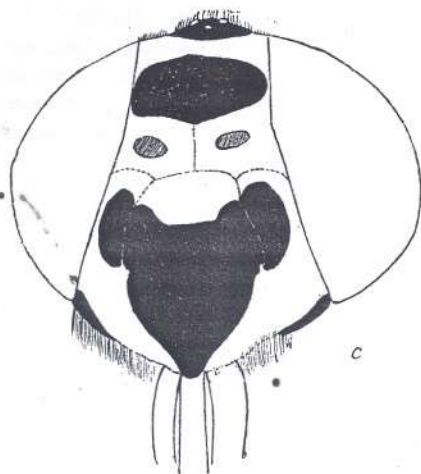
1 ♀ from Limbotto, Celebes ROSENBERG „

A female closely allied to *C. fasciatus* WIED but distinguished by the abdominal markings, the absence of a collar on the first segment, the shape of the frontal callus, the wingmarkings, the facial callus, etc. Bodylength 10,6 m.M. Width of thorax 3,8 m.M. Wingexpanse 20,2 m.M.; Length of wing 8,2 m.M.; Breadth of wing 4 m.M.

The Head. (Textfig. 12) Forehead almost the same width throughout, goldenyellow tomen-

tose, yellow haired. Vertex with black ocellar plate reaching from eye to eye, bearing 3 ocelli. Callus blackbrown, prominent, not wholly reaching to the eyes. Antennal plate narrow, yellowbrown. Cheeks goldenyellow, yellow haired, except a blackbrown triangular shining, black haired spot, touching to the lower eyeangle. Beard redbrown to yellowbrown. Face almost wholly

occupied by the large, shining facial callus, letting free at its upper and lateral borders narrow goldenyellow streaks. Palpi pale havannabrown, acuminate, black haired. Antennae olivebrown, yellowish at base, black haired on first joint, second joint darker, blackbrown, black haired, third joint broken off.



Textfig. 12

C. atrisignata s. s. ♀ head.

Thorax brownblack, rubbed on dorsum in the middle, scanty goldenyellow haired. Scutum ornated at hindborder with a thick row of goldenyellow hairs, connecting thus the wingbases. Sides bearing goldenyellow hairgroups forming together a querrymark. Breast blackbrown, scanty blackbrown and goldenyellow haired. Wings with crossband, nearly 2 times as broad as in *C. fasciata* WIED and an apical shadow, which passes the upper branch of the cubital vein. Crossband straight on apical border, basal border convex, cutt off rather straight along the anal vein. Base of wing with a small redbrown spot. No clear spots in the centres of cells, occupied by the crossband. Anal

cell closed at border. Halteres redbrown. Legs dark. First leg. Coxa redbrown, blackbrown haired. Trochanter blackbrown, femur yellowbrown, blackbrown haired. Tibia swollen, blackbrown, black haired. Tarsalia paler, redbrown, black haired. Second leg, wholly black haired. Femur pale havannabrown, tibia almost straight-sided, yellowish blackbrown, tarsalia pale yellowbrown. Third leg identical, tibia swollen, tarsalia yellowbrown, black haired.

Abdomen rather long, conical, first segment reddishyellowbrown, yellow haired round the scutellum, black-banded on posterior border as in *C. dispar* F. Second segment bright yellowbrown, goldenyellow haired at base. Hindborder with curved black band, broadest in the middle and gradually decreasing in height to the lateral borders. Third segment with straight-sided black crossband on the segmentation, suddenly reduced to nothing near the lateral borders and connected with the band of the foregoing segment by means of a blackbrown shadow, disc of third segment pale redbrown, yellowbrown and black haired. Following segments redbrown, black haired. Ventral surface yellowbrown, yellow haired.

Discussion: The species is allied to *C. signifer* Wlk and *C. cincta* BIGOT, the wingband being however broader, the palpi rather pale and the abdominal markings identical, the only difference consists in the third segment, which RICARDO describes as almost wholly black in *C. cincta* with only a narrow yellow border anteriorly. In the studied specimens of *C. atrisignata* this yellow band was rather broad, whereas the black band is less than half as height as the length of the segment. The obscure black spots, present in the *cincta* type ♀ are wanting in *atrisignata*. *C. clavicrus* THOMPSON is considered by RICARDO as a synonym of *C. cincta* BIGOT. I agree with this synonymity. Here again the black part on the third abdominal segment is described as wider than on the second segment, whereas other specimens show the reverse. So I am not sure about the synonymity of the last mentioned 2 species with the specimens of *C. atrisignata*, the more, as the abdomen of the Celebes specimens were in bad condition, largely extended by bloodfilling, which gave it a darker appearance than fresh specimens would have shown.

GEOGRAPHICAL DISTRIBUTION OF THE SPECIES BELONGING TO THE GENUS CHRYSOPS.

The *Chrysops* species are distributed over the Dutch East Indian Archipelago and the neighbouring countries as follows:

- British India, including Northern India, Nepal, Bengal (10 species)
- Chrysops* designata, **dispar**, **fasciata**, **fixissima**, **flavipes**, **flaviventris**, **flavocincta**, **indiana**, **pellucida**, **stimulans**.
- Ceylon (2 species)
- Chrysops* **dispar**, **flavocincta**.
- Siam, including Burma Annam, Cambodja (3 species)
- Chrysops* **dispar**, **fasciata**, **flavocincta**.
- Federated Malay States (5 species)
- Chrysops* **cincta**, **dispar**, **fasciata**, **fixissima**, **translucens**.
- Sumatra (4 species)
- Chrysops* **dispar**, **fasciata**, **fixissima**, **flaviventris**.
- Java (4 species)
- Chrysops* **dispar**, **fasciata**, **fixissima**, **flaviventris**.
- Borneo (4 species)
- Chrysops* **alter**, **fasciata**, **fixissima**, **flavocincta**.
- Celebes (1 species)
- Chrysops* **atrisignata**.
- The Philippines (2 species)
- Chrysops* **signifer**, **cincta**.
- Batchian (1 species)
- Chrysops* **signifer**.
- Boeroe (2 species)
- Chrysops* **atrivittata**, **signifer**.
- Nova Guinea (1 species)
- Chrysops* **albocincta**.
- Formosa
- Chrysops* **dispar**, **mlokosiewiczzi**, **sinensis**.

The species, which other countries have in common with our Archipelago are printed in fat types.

The Genus *Silvius* MEIGEN.

MEIGEN, Syst. Beschreib. II, p. 27 (1820).

MACQUART, *Ediorhynchus*, Dipt. Exot. Vol. I. p. 111, pl. 6, 11 (1838).

WIEDEMANN *Philochile*?, Aussereurop. zweifl. Ins. Vol. I, p. 95 (1828).

The genus *Silvius* is characterised by the habitus of the antennae, which are shaped as in *Tabanus*, first and second joint short, dorsal tooth to second joint always wanting, third joint regularly five-annulated, mostly angular at

base, tooth usually absent. Palpi long and slender, elongate, usually covered with rather long black or yellow pubescence. Frons always longer than broad with callus and mostly 3 ocelli, sometimes ocelli inconspicuous or even wanting. No facial calli or shining spots on cheeks and face in the Malaysian species. Wings clear or marked with brown shadows and streaks, abdomen more or less conical. Small species. In the collections studied by me, the following species were represented:

- 1 *Silvius vittatus* RICARDO.
- 2 *S. latistriatus* nov. spec.
- 2 *S. de Meyeri* RICARDO.
- 3 *S. dimidiatus* VAN DER WULP.
- 4 *S. dimidiatus* VAN DER WULP, subspec. *femoralis* RICARDO.
- 5 *S. variegatus* nov. spec.
- 6 *S. atripes* nov. spec.
- 7 *S. atriventer* nov. spec.
- 8 *S.? atratus* nov. spec.

The species may be identified by means of the following key.

KEY 5.

Synopsis of species.

- 1a. Wings clear or with brown apical shadow and eventually also other brown shadows along the veins 2
- b. Wings with transverse brown streaks or markings 9
- 2a. Abdomen brown with a median longitudinal yellowbrown, yellow haired stripe 3
- b. Abdomen not so 4
- 3a. Ocelli distinct, forehead almost half as wide at base than is a vertex. Legs dark yellowbrown. Callus narrow *vittatus* RICARDO.
- b. Ocelli wanting, forehead almost the same width throughout. Callus broad, almost square. Legs dark tawnybrown *latistriatus* SCHUURMANS STEKHOVEN
- 4a. Abdomen with paler segmentations only, elsewhere unicolorous.... 5
- b. Abdomen with a median transverse broad, blackbrown band, elsewhere yellow 8
- 5a. Abdomen with white haired segmentations 7
- b. Abdomen with yellowbrown, yellow haired segmentations..... 6
- 6a. Abdomen olivebrown to blackbrown, segmentations yellowbrown, yellow haired on segments 2—5, forehead nearly half as wide anteriorly than it is at vertex, legs mainly yellowbrown or dark olivebrown
de Meyeri RICARDO.
- 7a. Abdomen blackbrown with white, white haired segmentations to the second till fifth segment, alike on dorsum and venter, forehead slightly narrower at vertex, legs blackbrown with short, inconspicuous spines to the hind tibiae *atriventer* SCHUURMANS STEKHOVEN.

- b. Abdomen chocolatebrown with white, white haired segmentations on the dorsum only, palpi curved. Body everywhere black haired, hairtuft at base of wings white *atripes* SCHUURMANS STEKHOVEN.
- 8a. Abdomen ochraceous yellow with a median black tranverse band, covering the hindborder of the second, the third and fourth segment, apex of abdomen paler yellow, yellow haired, thorax and abdomen elsewhere black haired, forehead narrow, callus nearly reaching to the eyes. Legs, femora yellowbrown, tibiae darker, more havannabrown *variegatus* SCHUURMANS STEKHOVEN.
- 9a. Abdomen ochraceous yellow or ochraceous yellowwhite on first two segments only, hindborder of second segment black, other segments partly reddishyellow, partly black. Wings with brown foreborder, blackbrown apical spot and two transverse brown streaks. Palpi darkbrown, femora blackbrown *dimidiatus* VAN DER WULP.
- b. Abdomen wholly reddishyellow, wings as in *dimidiatus*, palpi ochraceous yellow, yellow haired, femora ochraceous reddishyellow; *dimidiatus* WULP subsp. *femoralis* RICARDO.

The foregoing key does not contain a species which could be taken at the first glance for *Silvius atriventer* SCHUURMANS STEKHOVEN, but differs in different points. Following SURCOUF's monograph this species could be brought to the Genus *Pseudopangonia* RICARDO, since one of the specimens has a third antennal joint which is composed of four divisions only in the right antenna, the left antenna of the same specimen however presents three annulations to the third joint, Ocellar plate elevated, bearing three distinct blackbrown ocelli; forehead same width throughout, subcallus whitish; no dark spots on cheeks; face unicolorous; antennae yellowbrown on basal annulations. Wings with dark brown apical shadow, hind tibiae with very distinct spines, in other respects conform *S. atriventer* S.S. I will describe this dubious *Silvius* species at the end of the genus *Silvius* provisionally as a new *Silvius* species, named *Silvius atratus* nov. spec. When more material is available of the mentioned species one may conclude whether this specimen is an aberrative teratological one as could be supposed, in account of the difference existing between right and left antenna, or if it the identification can be maintained.

12. *Silvius vittatus* RICARDO. (♀) Textfig. 13.

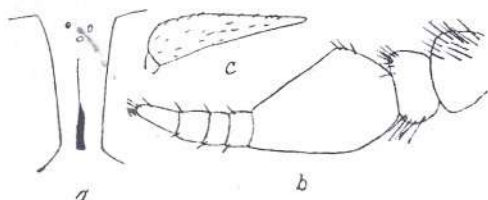
References:

RICARDO, Nova Guinea IX, p. 405 (1914).

Habitat:

Type ♀ and 2 other ♀ ♀ from Bivak Island, Nova Guinea 12.'09	Coll. N.A.M.
2 ♀ ♀ from same locality	Coll. BR.M.
1 ♀ „ Noord-rivier LORENTZ '07	Coll. N.A.M.
1 ♀ „ Dutch Nova Guinea LORENTZ '07	„

Silvius vittatus Ric. is a yellowbrown species. Forehead reddishbrown, nearly half as wide at base than it is at vertex; Callus narrow, reddishbrown. Ocellar plate with 3 ocelli. Subcallus yellowbrown. Face and cheeks brownish-yellow, yellow haired. Palpi reddish-yellowbrown as are also the antennae, basal annulation of third joint broad, stylus black. Beard white. Scutum dusky yellowbrown, yellow haired. Wings clear. Legs yellowbrown. Abdomen brown-blackbrown with median longitudinal yellow-yellowbrown stripe, reaching the 7th segment. Length 11 m.M.



Textfig. 13.

S. vittatus Ric. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 13.) Forehead broad, 3,1 times as long as it is wide anteriorly, reddishbrown, black haired in type. Callus narrow, reddishbrown, almost reaching the ocelli. Face and cheeks yellowwhite haired. Palpi reddish-yellowbrown, second joint long, flat, ending in a fine point, yellow haired. Antennae same colour as the palpi, both basal joints black haired, first joint cylindrical, second joint cups-shaped, nearly half as long as the first; third joint with broad basal annulation, which is 1,3 times as long as its widest

part and 1,2 times as long as the narrow, dark stylus. Proboscis almost twice as long as the palpi. Further RICARDO says: „Eyes appear to have one or more greenish crossbands, as in *Silvius dimidiatus* VAN DER WULP.

Thorax. Scutum and scutellum same colour, both dusky yellowbrown, yellow haired (in denuded specimens the greyish tomentum becomes distinct). Breast greyish brown, yellowish haired. Wings clear, stigma havannabrown, foreborder yellowish. Halteres dark tawny-brown. Legs. First leg. Coxa yellowbrown, pale yellow haired. Coxae of all other legs similar, femora yellowbrown, yellow haired, some black hairs being intermixed at apices. Tibiae dark olivebrown, black haired. Hind tibiae darker than the middle tibiae, same colour as fore tibiae. Tarsalia blackish brown, darker than the tibiae.

Abdomen brown-blackbrown, darker to the apex, black haired, with a median yellow haired stripe, ending at the end of the 6th segment, forked on the first segment and embracing the scutellum, broader at the segmentations in type, in other females only reaching the end of the 4th or 5th segment. In the last cases the 5th and 6th segments mostly show a number of scattered yellow hairs, intermixed between the black ones. Ventral surface yellow haired. Lateral borders of the first 5 tergites yellowbrown, yellow haired.

13. *Silvius latistriatus* nov. spec. (♀) Textfig. 14.

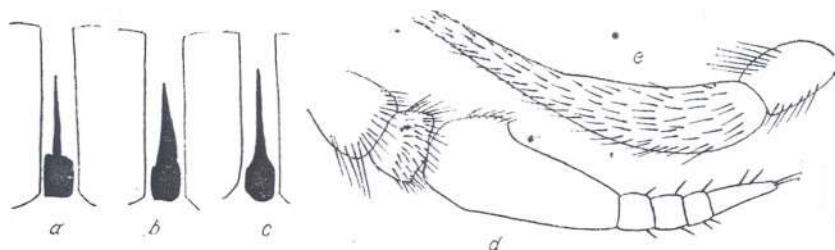
Habitat:

Type ♀ (Textfig. 14a, d, e) and 3 other females (Textfig. 14b, c) from S. Nova Guinea VERSTEEG, BEAUFORT 13/11 1902

• Coll. N.A.M.

A handsome yellowishredbrown species, distinguishable from *S. vittatus* Ric. i.a. by the shape of forehead and callus, the absence of ocelli, and the colour of the legs. Although the ocelli are wanting and the spurs to the hind tibiae are not distinct, the typical shaped palpi with their pubescence, the absence of a tooth to the second antennal joint, the shape of the abdomen and the whole habitus of the species brings it to the Genus *Silvius*.

Forehead bright yellowbrown, with a median havannabrown shadow, black haired. Callus dark olivebrown, square or cylindrical, rounded at upper angles, linear extension short, pointed. Subcallus havannabrown-redbrown, prominent, cheeks and face brownishgrey, yellow haired. Beard yellow. Palpi narrow, chocolatebrown, black haired. Antennae pale olivaceous yellowbrown, black haired on basal joints, third joint bright yellow, only slightly darker at apex, tooth distinct. Thorax reddishyellowbrown, yellow haired, intermixed with black pubescence, traces of 3 indistinct longitudinal redbrown stripes are visible. Wings slightly smokybrown with clearer centres in the cells, apical shadow havannabrown. Appendix on right wing only. Legs dark tawnybrown, mainly black haired. Abdomen pale havannabrown at base, blackbrown to the apex with a median yellowbrown, yellow haired longitudinal stripe, present on the segments 1—5. Pubescence elsewhere redbrown and black. A yellowbrown, yellow haired spot occurs on the first segment at each side of the scutellum. Lateral borders of tergites yellowbrown, yellow haired. Bodylength 11 m.M.; Width of thorax 3 m.M.; Wingexpanse 25,4 m.M.; Length of wing 11,2 m.M. Length of abdomen 6,8 m.M.



Textfig. 14.

S. latistriatus s. s. ♀

a—c. forehead, d. antenna, e. palpe.

The Head. Forehead the same width throughout or slightly narrower at vertex (type ♀), index 4,25. Palpi, first joint chocolatebrown, black haired, second joint slender, only slightly broader at base, dark olivebrown, black haired, ending in a long point. Antennae, second joint without dorsal spur. Third joint with indistinct tooth, basal annulation almost 2 times as long as its widest part, 1,2 times as long as the redbrown stylus.

Thorax, scutum as mentioned, pteropleuron dull redbrown, black haired. Lateral borders of scutum pale yellowbrown. Scutellum yellowbrown, yellow haired. Breast and sides yellowbrown, sootygrey in the middle, brownishyellow haired. Wings smokybrown, foreborder dark burnt sienna coloured, stigma dark havannabrown, the appendix found in the type is not present in the other females. Legs. First leg. Coxa yellowbrown, yellowwhite haired, intermixed with some black hairs on dorsum, trochanter brownblack, femur and tibia tawnybrown, the tibia slightly paler at base, partly redbrown haired on ventral surface, elsewhere black haired. Tarsalia same colour. Second leg identical, tibia olivaceous-yellowbrown, black haired. Third leg similar, tibia tawnybrown, slightly paler at base.

Abdomen as described. Ventral surface blackbrown, black haired, segmentations white, white haired.

14. *Silvius de Meyeri* RICARDO. (♀) Textfig. 15.

References:

RICARDO, Nova Guinea IX, p. 405 (1914).

Habitat:

Type ♀ and 1 other ♀ from Nova Guinea, Rivierkamp 2.10 LORENTZ

Coll. N.A.M.

1 ♀ paratype from same locality LORENTZ

Coll. BR.M.

1 ♀ „ Digoel River, Nova Guinea Dr. KOCH

Coll. BR.M.

2 ♀♀ „ same locality Dr. KOCH 27.3.'05

Coll. N.A.M.

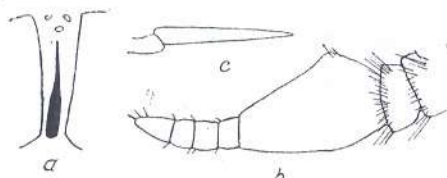
1 ♀ „ Dutch Nova Guinea LORENTZ

„

1 ♀ „ Dutch Nova Guinea LORENTZ

„

A walnutbrown species. Abdomen olivebrown at base, blackbrown at apex, black haired, with yellowbrown, pale yellow haired segmentations. Forehead rather narrow, almost half as wide anteriorly as it is at vertex, pale reddish-brown. Callus blackbrown. Three ocelli present. Subcallus yellowbrown, cheeks and face yellowwhite, yellowwhite haired. Beard same colour. Palpi very fine, needle-shaped, pale yellowbrown, scanty black haired. Antennae dark reddish yellowbrown, basal annulation of third joint broad, stylus black. Thorax walnutbrown, black haired, legs olivebrown-yellowbrown. Length 11,5 m.M.



Textfig. 15.

S. de Meyeri. Ric. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 15.) Forehead narrow, index about 5, narrowed to the base, pale reddishbrown, black haired. Callus blackbrown, more olivebrown in one of the specimens, ending in a long, fine point. Subcallus yellowbrown. Cheeks and face as mentioned. Palpi fine, pale yellowbrown with some short black hairs on second joint. Antennae yellowbrown, black haired on first two joints, third joint dark to bright reddishyellow on basal annulation, which is 1,5 times as long as its widest part

and 1,4 times as long as the narrow, black stylus. Eyes as in *Silvius vittatus* Ric.

Thorax walnutbrown, black haired, grey tomentose on foreborder with three indistinct yellowbrown longitudinal stripes on the scutum. Hairtufts at base of wings and behind reddbrown. Breast brownisgrey, white haired. Wings clear, foreborder yellowbrown, stigma havannabrown, prolonged into a pale brownish apical shadow, veins brown. Legs. First leg. Coxa pale olivebrown, white haired, femur dark olivebrown, black haired, knee whitish. Tibia yellowbrown, blackbrown at apex, black haired, tarsalia blackbrown. Second leg. Coxa grey, white haired, femur yellowbrown, yellowwhite haired, with some black hairs at apex. Tibia olivebrown, black haired. Tarsalia blackbrown. Third leg. Femur yellowbrown, darker at apex. Tibia blackish olivebrown, tarsalia blackbrown.

Abdomen olivebrown-yellowbrown on basal segments, apex more blackbrown, black haired. First, sixth and seventh segment yellowbrown. Segmentations 2-5 yellowbrown, narrowly fringed with yellowwhite hairs on the second segment, with broader bands of the same pubescence on the following segments. Lateral borders of the first 5 tergites yellowbrown, yellow haired. Ventral surface olivebrown, yellow haired, apex darker, segmentations paler, sixth segment yellow and black haired. Seventh segment wholly black haired.

15. *Silvius atriventer* nov. spec. (♀) Textfig. 16.

References:

FERGUSON, Rec. South Austr. Mus. Vol. I, p 370 (1921).

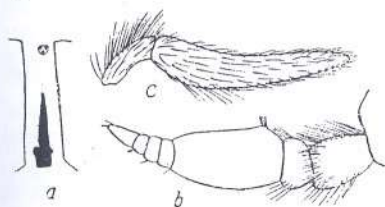
Habitat:

Type ♀ from S. Nova Guinea 26, XII, '12 VERSTEEG Coll. N.A.M.

The specimen seen by me was labelled by RICARDO: aff. *Silvius marginatus* WALKER. It is a dull blackbrown species, showing much resemblance with *Pseudopangonia atra* nov. spec. but distinct.

Forehead broad, white, narrower at apex, ocelli inconspicuous. Callus brownblack, much narrower than the forehead with rather short linear extension. Subcallus elevated, reddishbrown. Cheeks white, white haired, with a black haired, velvety brown spot between eyes and palpi. Face partly redbrown, partly white. Palpi dark havannabrown, slender, black haired. Antennae dark havannabrown. Thorax blackish with two longitudinal paler stripes. Wings rather clear, with brownish shadows along the blackbrown veins. Legs blackbrown, black haired with short spines to the hind tibiae.

Abdomen blackbrown, black haired, except on the white tomentose, white haired segmentations on dorsum and venter. Length 9 m.M., Wingexpanse 23,2 m.M., Length of wing 10 m.M.



Textfig. 16.

S. atriventer s.s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 16). Forehead broad white, black haired, intermixed with some white hairs at base, 0,2 narrower at apex than it is at base, the ocelli being situated on a small spot, inconspicuous and detected only after much research. Forehead slightly more than 3 times as long as it is wide anteriorly, irregular in shape, much narrower than the frons with black distinct linear extension, ending in an acute point. Subcallus dark reddish-velvetybrown, grooved in the middle, divided from the forehead by a distinct groove. Cheeks as described above, white haired as is the beard. Face white just under the

antennae till halfway the mouth where it becomes brown, darker along the lateral borders. Palpi dark havannabrown, rather short, first joint narrow, black haired, second joint almost the same width throughout ending with an obtuse point, black haired. Antennae, first joint club-shaped, broader at apex than at base, dark havannabrown, black haired, second joint cup-shaped, much shorter than the first, black haired, third joint with broad basal annulation, flattened at lateral borders, redbrown at base, then blackbrown, without tooth, stylus blackbrown, composed of four annulations.

Thorax wetted on foreborder, violetbrownblack with 2 longitudinal pale olivebrown stripes ending at the suture, where they connect with the olivebrown pteropleuron. Hindborder of scutum, behind the wing till the scutellum same colour, white haired. Scutum black haired, intermixed with some white hairs. Pteropleuron partly white, partly black haired. Breast and sides redbrown, mainly white haired, except on mesosternumlobus, which is thick black haired and on metasternum where one finds a group of black hairs near the implantation of the legs. Wings with blackbrown veins, a siennabrown big stigma, a faint narrow apical shadow and a very short petiole to the anal cell. Halteres blackbrown. Legs blackbrown, black

haired except on the coxae, which are grey tomentose, white haired. Hind tibiae with short spines.

Abdomen velvety blackbrown, black haired, except on the white, white haired distinct segmentations, found on all segments on dorsum and venter.

From *Silvius marginatus* WALKER it is distinguished by the paler forehead, the darker antennae, the paler segmentations, which are tawny in *marginatus*. From *Silvius tepperi* FERGUSON, occurring in Australia like the foregoing species, it is distinguished by the bicolorous face, the darker palpi, which are wholly black haired, the darker antennae, the distinct forehead and calli.

16. *Silvius atripes* nov. spec. (♀) Textfig. 17:

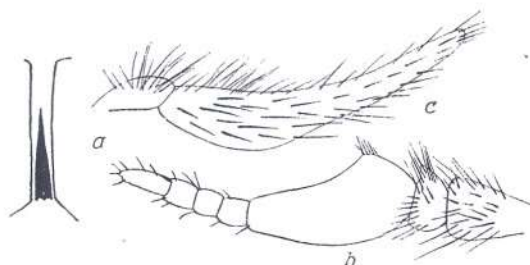
References:

FERGUSON, Rec. Austr. Mus I, p. 369 (1921)

Habitat:

Type ♀ from Nova Guinea, DOORMAN path 10.'20 (in alcohol Coll. N.A.M.
another ♀ from same locality

A dark brownblack species. Forehead sooty grey with elongate triangular callus, ocelli unvisible, absent. Cheeks, subcallus and face reddish cacaobrown, blackbrown haired. Antennae and palpi blackbrown, black haired. Beard blackbrown, poor. Proboscis short. Thorax; Scutum red- to blackbrown, denuded, slightly paler on foreborder. Wingstinged brownish, especially along the blackbrown veins, halteres blackbrown. Legs dark brownblack, black haired. Abdomen chocolatebrown, black haired, with paler white tomentose, white haired segmentations to the second to fifth segment. Length 9,5 m.M.; Wingexpanse 25,5 m.M., Length of wing 11 m.M.



Textfig. 17.

S. atripes, s. s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 17). Forehead about 5 times as long as it is anteriorly, slightly broader anteriorly than it is at vertex, greyblack at vertex, elsewhere darkbrown, black haired. Callus brownblack, elevated at base, narrowed gradually to the black pointed linear extension, elongate triangular in shape. Subcallus and cheeks as mentioned above. Palpi blackbrown slender as in all *Silvius* species, pubescence scanty, black. Face dullbrown, black haired. Antennae, first joint cylindrical, redbrown at base, blackbrown at apex, black

haired, second joint cup-shaped, dark brownblack, black haired, third joint with a narrow chocolatebrown stripe at extreme base, then black, with dorsal hump, crowned with black hairs on basal annulation, stylus black. Proboscis short, black.

Thorax, scutum, scutellum, breast and sides brownblack, similar pubescence. Hair-tuft at base of wings white. Wings, anal cell closed with short petiole or even just at border, stigma brownblack. Legs wholly blackbrown, black haired. Hind tibiae with indistinct subequal spines, difficultly to discern from the neighbouring black bristles. Tarsalia of the third leg with similar binary spines.

Abdomen as described above. Ventral surface blackbrown, black haired over its whole surface.

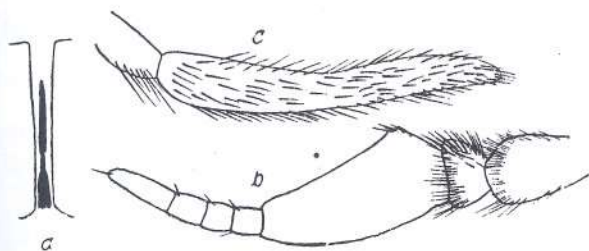
The forelaying species may be distinguished i.a. by the narrow, darker forehead, the shorter, more pointed callus, the curved palpi, the black pubescence being everywhere, the absence of white segmentations on the ventral side of the abdomen, etc. from *S. atriventer* S.S. to which it is closely allied. From *S. Imitator* FERGUSON it can be divided by the shape of forehead, which is much broader, the absence of longitudinal paler streaks on the scutum and of median white triangles on the abdomen at segmentations.

17. *Silvius variegatus* nov. spec. (♀) Textfig. 18.

Habitat:

1 ♀ from N. Nova Guinea, Tor-rivier, middenloop, jungle; 9, X, '11 (in alcohol)
Coll. N.A.M.

A beautiful very characteristic species, allied to *Silvius dimidiatus* VAN DER WULP but easily distinguishable by the black crossband on the yellow abdomen and the clear wings. Forehead narrow, dullbrown, callus tawny yellowbrown at base, darker at apex with a spear-shaped linear extension. Subcallus, face and cheeks golden-yellowbrown, blackbrown haired. Beard blackbrown and ochraceous yellow. Palpi slender, ochraceous, yellowbrown haired, intermixed with some black hairs. Antennae ochraceous with black stylus. Thorax ochraceous yellowbrown, pubescence black and ochraceous. Sides and breast same colour, pubescence almost exclusively ochreyellow. Wings clear, slightly brownish. Legs. Fore femora dark brown, other femora yellowbrown, tibiae darkbrown. Abdomen with reddish yellowbrown, black haired base, a black haired blackbrown median crossband, embracing the abdomen dorsally and ventrally, apex pale yellowbrown, yellow and redbrown haired. Length 9 m.M.; Wing-expanse 24,8 m.M. Length of wing 10,5 m.M.



Textfig. 18.

S. variegatus, s. s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 18). Forehead almost 7 times as long as it is wide anteriorly, 0,2 narrower anteriorly than it is at vertex, dull blackbrown, black haired. Callus eggshaped, nearly reaching to the eyes, yellowbrown at base, redbrown at apex, linear extension redbrown, ocelli wanting. Palpi only slightly shorter than the short proboscis, pubescence scanty. Antennae with a few black hairs on dorsum at apex, elsewhere mainly

yellowbrown. Basal annulation angular, 2 times as long as its widest part, 1,1 times as long as the black stylus.

Thorax, scutum and scutellum uniformly coloured, slightly paler on border, where the ochraceous hairs abound, scutellum wholly black haired. Halteres yellowbrown. Wings yellowbrown at base, anal cell closed with a short petiole. Legs: First leg, Coxa yellowbrown, ochraceous-yellow haired, femur dull redbrown, black haired, ochraceous pubescent at

distal lateral border, tibia and tarsalia blackbrown, black haired. Second leg, Coxa and trochanter yellowbrown, yellow haired, femur yellowbrown, mainly ochraceous yellow haired, some black hairs on dorsum at apex, tibia and tarsalia reddbrown, black haired. Third leg identical, hind tibia with short yellowbrown spines, occurring also on the apices of the tarsalia.

A b d o m e n, as mentioned above.

18. *Silvius dimidiatus* VAN DER WULP. (♀) Textfig. 19.

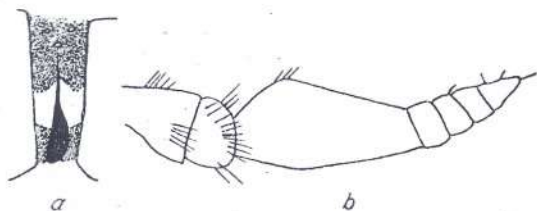
References:

- VAN DER WULP, Tijdschr. v. Entomologie XI, p. 102, Pl. III, fig. 3—5 (1868).
OSTEN SACKEN, Ann. Mus. Civ. Stor. Nat. Genova XVI, p. 478 (1880).
RICARDO, Ann. Mag. Nat. Hist. (7) VIII, p. 296 (1901).

Habitat:

Type ♀	from Island Salawati, BERNSTEIN	Coll. L.M.N.H.
1 ♀	from Doré, Nova Guinea, OSTEN SACKEN	
1 ♀	„ Regen Island, Nova Guinea 9.10.'09 LORENTZ	Coll. BR.M.
1 ♀	„ same locality	Coll. N.A.M.
1 ♀	„ Bivak Island, Nova Guinea 12.'09, LORENTZ	Coll. BR.M.
1 ♀	„ Digoel '04/'05	Coll. N.A.M.
1 ♀	„ Dutch Nova Guinea, LORENTZ	„

A beautiful species. Eyes according VAN DER WULP with a single green crossband. Forehead brownish with a grey median patch, almost $\frac{2}{5}$ narrower anteriorly than it is at vertex. Callus club-shaped, dark brown. Subcallus, face and cheeks yellowwhite, white haired. Beard same colour. Palpi darkbrown, awl-shaped. Antennae reddishyellow. Thorax grey on foreborder, velvety-darkbrown behind the suture. Wings with brown oblique streaks and brown foreborder, elsewhere clear. Legs blackbrown on femora and tibiae. Abdomen ochraceous yellow on the first two segments, hindborder of second segment black, other segments partly reddishyellow, partly black. Length 5,5 lines.



Textfig. 19.

S. dimidiatus VAN DER WULP ♀
a. forehead, b. antenna.

The H e a d. (Textfig. 19). Forehead broad (index 3,9) 0,4 narrower at base than it is at vertex, velvety-brown at base and at apex, median part yellowish or grey. Callus rather broad, darkbrown, linear extension slender. Subcallus, face and cheeks asmentioned above. Palpi darkbrown, base more yellowbrown, swollen, apex almost blackbrown, pointed, awl-shaped. Antennae olivaceous-yellowbrown, black haired on basal 2

joints, third joint reddishyellow, basal annulation 2,1 times as long as its widest part, 1,5 times as long as the darker stylus. Proboscis black, almost as long as the head. Eyes with oblique green crossband, narrowed to the lower eyeangle, upper eyeborder also green.

Thorax grey, pale yellow haired on foreborder, pteropleuron covered with similar but longer pubescence. Scutum behind the suture and scutellum velvetybrown, black haired. Breast grey-olivebrown, white haired. Wings rather clear along the hindborder, foreborder reddishbrown, apical shadow blackbrown, passing the dorsal branch of the cubital vein. The wing presents two brown streaks, the first covering the apex of the submarginal cell, the basal one reaching the hindborder of the wing at the opening of the anal cell, crossing the apices of first and fifth posterior cells and of the disc cell. Both streaks are connected. Another oblique brownish streak fills up the bases of the upper and lower basal cells. Halteres yellowbrown. Legs dark blackbrown on femora, tibiae and tarsalia. Coxae yellowbrown, white haired.

Abdomen, ochraceousyellow, yellow haired on first 2 segments, more yellowwhite, covered with the same pubescence in other specimens. Hindborder of the second segment black, black haired. Lateral borders of the mentioned tergites yellow haired. Third and fourth segment reddish-yellow at base, black at hindborder, darker yellowbrown in others. Segments 5 and 6 black, black haired. Seventh segment ochraceousyellow again, lateral borders of the 3d-7th segment black haired. Sternites reddishyellowbrown, yellow haired.

18a. *Silvius dimidiatus* VAN DER WULP, subspec. *femoralis* RICARDO. ♀

References:

RICARDO, Nova Guinea IX, p. 405 (1914).

Habitat:

Type ♀ from Regenisland

Coll. N.A.M.

Paratype ♀ from same locality

Coll. BR.M.

This subspecies differs from *S. dimidiatus* WULP in the following characters:

The **Head**. Forehead blackbrown at base and apex, median area yellow. Palpi strongly swollen at the ochraceousyellow base, apex olivaceous, yellow haired. Antennae similar in shape as in the true *dimidiatus*, wholly ochraceousyellow, yellow haired.

Thorax goldenyellow, yellow haired on foreborder, elsewhere as in *S. dimidiatus* s. str. Wings similar. Halteres yellowbrown. Femora ochraceous-reddishyellow, yellow haired, fore femora brownish at apex, where one finds some black hairs. Tibiae dark olivebrown, black haired. Coxae yellow.

Abdomen in the type with basal 2 segments reddishyellow, yellow haired, except on the hindborder of the second segment, which is black haired. Other segment brownred (wetted?), black haired. Sixth and seventh segment yellowfringed at segmentations; other specimen, dorsum reddishyellow allover, black haired on the segments 2-7. Ventral surface goldenyellow haired as are also the lateral borders of the tergites.

19. *Silvius* (?) *atratus* nov. spec. (♀) Textfig. 20.

References:

FERGUSON, Rec. South Austr. Mus. Vol. I, p. 370 (1921).

RICARDO, Ann. Mag. Nat. Hist. (8) XVI, p. 273 (1915).

Habitat:

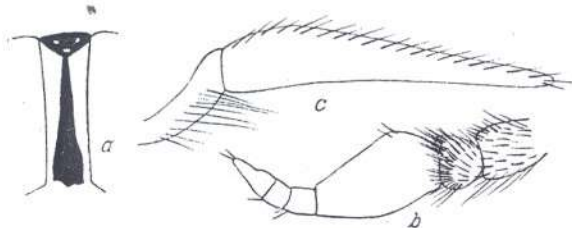
Type ♀ from Bivak island, S. Nova Guinea 25.2, '10

Coll. N.A.M.

1 ♀ from Obi, BERNSTEIN

Coll. L.M.N.H.

A dull blackbrown species. Forehead brownish white, nearly the same width throughout, black haired. Callus broad, blackbrown, clubshaped with long broad linear extension, reaching to the ocellar plate with its three blackbrown ocelli. Subcallus, cheeks and face brownishwhite, yellow haired. Beard white. Palpi needle-shaped, blackbrown, black haired. Antennae yellowbrown on basal 2 joints, black haired, third joint not very broad on basal annulation, stylus black. Thorax mahoganybrown, mainly black haired. Wings almost clear with apical shadow, also brownish along the veins. Legs shining blackbrown, hind tibiae with long, distinct spines. Abdomen blackbrown, black haired with white haired segmentations on ventral and dorsal surface. Length 9 m.M. (type and other ♀). Wingexpanse 23,2 m.M.



Textfig. 20.

S. atratus, s. s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 20). Forehead brownishwhite, nearly the same width throughout, black haired, intermixed with some white hairs to the base, 3,6 times as long as it is wide anteriorly. Callus broad, nearly reaching to the eyes, blackbrown, club-shaped with a long broad linear extension. Ocellar plate elevated. Palpi almost straight, slightly broader at the base, long. Antennae with yellowbrown first and second

joint, third joint dusky redbrown at base, soon growing darker, stylus black, composed of three annulations in the right antenna, of two annulations in the left one, in the type ♀; third joint broken off in the other ♀.

Thorax mahoganybrown, with 2 longitudinal brownishwhite stripes, ending near the suture, median band dark blackbrown. Scutum greyish in front with scanty white pubescence, elsewhere black haired. Hindborder of scutum whitish, white haired. Lateral borders of scutum whitish too. Pteropleuron whitish olivebrown, black haired. Scutellum blackbrown, black haired. Sides and breast bluish greybrown, white haired. Wings brownish along the veins, foreborder smokybrown, stigma dark blackbrown, apical shadow distinct. Halteres blackbrown. Legs blackbrown, shining. First leg, Coxa greyish olivebrown, white haired, leg elsewhere blackbrown, black haired. Tibia reddishbrown at base, apex blackbrown. Tarsalia black. Other legs identical. Hind tibiae with long thick spines, similar spines to the hind tarsalia.

Abdomen as described above, segmentations white haired, elsewhere black haired.

The type ♀, partly rubbed on her abdomen, does not show very clear the distribution of the white and black pubescence. The other female has a more intact pubescence. Both females show white tomentose, broad segmentations to the 1st, 2d, 4th, 6th and seventh segment, covered with thick white pubescence in the second ♀, as last two segments are very small and the corresponding white bands broad, the last two bands seem to be fused, so that apparently the abdomen possesses 4 distinct white bands, particularly distinct in the second female, the other segmentations being narrowly paler, dirty white in the type female, partly rubbed, and on the intact places covered with black-redbrown pubescence; in the second female, the narrow white segmentations of the 3d and 5th segment being hardly visible and wholly covered with black hairs. In the type the ventral surface has white, indistinct

segmentations to the same segments as on dorsum, white haired on the 1st, 2d, 4th, 6th and 7th segment only; the other female has distinct white haired, broad segmentations to the 1st, 2d and 4th segment; 6th and 7th segment indistinctly white fringed. The second female is rubbed on the forehead and the subcallus, which appears therefore shining tawnybrown.

In the genus *Pseudopangonia* RICARDO, all antenal divisions of the third antennal joint are equal in length, so the present species could not be brought to this Genus to which it shows some points of resemblance, as mentioned above. Yet this species remains somewhat uncertain in respect with its affinity. The affinity with *Silvius atriventer* I discussed above. This species may be distinguished from *S. tepperi* by the darker palpi, which are yellow in *S. tepperi* and not wholly black haired, nor grey tomentose, callus broader than in *tepperi*. The lateral borders of scutum are paler in *S. atratus*. In *tepperi* the segmentations are slightly elevated in the middle to a series of indistinct spots on the 2d—5th segments. Femoral pubescence whitish, bigger in size than in *atratus*.

The Genus *Gastroxides* SAUNDERS.

References:

- SAUNDERS, Trans. Ent. Soc. London III, p. 59 (1841).
 BIGOT, *Ditylomyia*, Rev. et Mag. Zool. (2) XI, p. 305 (1859).
 RICARDO, Ann. Mag. Nat. Hist. (7) VIII, p. 289, 297 (1901).
 " " " " " (7) XIV, p. 372 (1907).
 " Rec. Ind. Mus. IV, p. 370 (1911).

SAUNDERS characterizes this Genus: „it approaches nearest to *Tabanus*, but differs in having ocelli, in the antennae, and in the shape of the abdomen. Its approach to other Genera of the Family *Tabanidae* is also evident but it differs from all the Genera I am acquainted with and therefore I have made it the type of a new Subgenus under the name of *Gastroxides*, in allusion of the shape of the abdomen, which is unusual in the family to which the insect belongs.” Wings dark with paler streaks. Up to the present no species, belonging to the mentioned Genus were found in the Dutch East Indies. I received however some *Gastroxides* specimens from Malacca, belonging to species, new to science.

KEY 6.

Synopsis of species.

1. Abdomen black, black haired, with white fringed segmentations. Scutum and scutellum blackbrown. Wings with two clear streaks, not reaching the hindborder *aterrimus* SCHUURMANS STEKHOVEN.
2. Abdomen ferrugineous, blackish at apex, black haired, ventral surface redbrown haired, bearing no white hairfringes. Scutum and scutellum ferrugineous, yellowbrown haired. Clear streaks on wings reaching to the hindborder *fuscus* SCHUURMANS STEKHOVEN.

20. *Gastroxides aterrimus* nov. spec. (♀, ♂). Textfig. 21.

References:

RICARDO, Rec. Ind. Mus. IV, p. 370 (1911).

Habitat:

Federated Malay States

Type ♀ from Gunung Angsi, Negri Sembilan at 2000—2790 Feet altitude,
4.'18 Coll. R.M.S.

Type ♂ from the same locality 4.'18 „

A dark black species, distinguishable from *G. ater* SAUNDERS by the darker, shining black face, the white hairfringes to the abdominal segmentations and the site and shape of the pale clear wingmarkings. Forehead parallelsided, shining black. Callus oval round with long black linear extension. Face prominent, shining black. Beard black. Cheeks dull darkbrown, blackbrown haired. Palpi reddishblackbrown, black haired. Antennae dark brownblack with dorsal hump to the third joint. Thorax blackbrown, black haired. Wings with 2 clear areas. Legs brownblack, tibiae incrassated. Abdomen brownblack, black haired, white hairfringes occurring dorsally on the segments 1 and 2, dorsum elsewhere denuded.

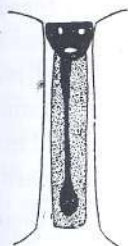
From *G. ornatus* BIGOT, *G. aterrimus* may be divided by the darker face, the darker antennae, especially on the basal annulation of the third joint, the colouring of the scutum and scutellum, and the darker femora and tibiae.

The Female.

Table of dimensions.

Bodylength	15,8 m.M.
Width of thorax	4,5 „
Width of abdomen	5,5 „
Wingexpanse	32,1 „
Length of head	2,8 „
Length of thorax	6 „
Length of abdomen	9 „
Length of wing	13,8 „
Breadth of wing	5 „
Foreheadindex	5,2

The Head. (Textfig. 21). Forehead only slightly broader at vertex, 0,28 narrower anteriorly than it is at vertex, shining black. Callus and linear extension on an elevated median band; Callus oval round, linear extension reaching to the ocellar plate with its three ocelli. Subcallus black. Cheeks dull, darkbrown haired. Beard black. Face convex, produced, shining black. Palpi stout, reddish blackbrown, black haired, ending in a broad point. Antennae brownblack on the first 2 joints, second joint small, third joint paler, long, with dorsal hump to the basal annulation, stylus yellowishbrown, divided into 4 rings.



Textfig. 21.
Gastroxides ater-
rimus s. s. ♀
forehead.

Thorax wholly blackbrown, black haired. Wings almost wholly brown, with 2 clear spots, the apical one starting from the apex of the stigma, crossing radial and cubital cell, passing after the bifurcation of the cubital vein, and ending in the third posterior cell. First posterior cell narrower at opening. The second clear spot is composed of clear markings in the upper basis cell and fills up nearly the whole basis-cell. Hindborder of wing paler. A white hairtuft is found at the base of the wings. Legs brownblack, tibiae incrassate, fore tibiae thicker than the other ones. Fore tarsalia black. Other tarsalia ochraceousyellow.

Abdomen brownblack, black haired, described above. Ventral surface with white hairfringes to all segmentations, except the seventh, elsewhere black haired.

The Male.

Compared with the ♀ type, almost wholly identical. Eyes brown, large-facettied part covering slightly more than the apical half, lower small-facettied part black, not prolonged to the vertex. Palpi black, black haired. Wingmarkings as in the female. Abdomen redbrown, black haired.

21. *Gastroxides fuscus* nov. spec. ♀

Habitat:

Type ♀ from Semangko Pass, 2700 Feet, Selangor, Federated Malay States
3.12 Coll. R.M.S.

The type is headless, allied to *G. ornatus* BIGOT, distinguishable i.a. by the wingmarkings, as there is no clear spot on the apex, crossing the fork of the third longitudinal vein. Abdomen distinct in colouring. In other respects *G. fuscus* has many points in common with *G. ornatus* BIGOT.

Thorax bright ferrugineous, yellowbrown haired allover the scutum. Sides and breast more yellowbrown to ferrugineous. Wings, basal part, including the axillary angle, both basal cells and the base of the radial cell, clear. The second clear streak begins in the middle of the cubital cell, just after the cubital fork, filling up the largest part of the first posterior cell to the posterior border, passing over the disc cell at apex and including the second, the third, the lower part of the fourth and the apex of the fifth posterior cell. Foreborder of wing redbrown. Wing elsewhere smokybrown. Submarginal cell slightly paler at apex. Halteres yellow. Legs. First leg. Coxa and femur reddishyellowbrown, redbrown haired. Tibia blackbrown, black haired. Tarsalia black, black haired. Second leg similar, femur with a narrow black line at apex. Tibia blackbrown, black haired. Tarsalia orangeous yellowbrown, black haired. Third leg as the first.

Abdomen bright ferrugineous, dark blackish at apex, black haired. Ventral surface reddish yellowbrown, redbrown haired. No median black spots are found on the dorsum.

The Genus *Erephopsis* RONDANI.

Syn. Diatomineura RONDANI.

References:

- RONDANI, Arch. Zool. Modena. III, 3, Fasc. 1 (1864).
RICARDO, Ann. Mag. Nat. Hist. (7) V, p. 118 (1900).
,, Nova Guinea IX, p. 403 (1914).

When describing the following species I will point to the fact, that the Genera *Erephopsis* and *Diatomineura*, created by RONDANI, ought to be fused into one single Genus *Erephopsis* RONDANI. Up to the present, they were defined nearly only by the, in some Genera, rather variable character, in that the first posterior cell may be closed or open at the wingborder. As noted in my second key, in *Erephopsis* the wings are clear or dotted with small brown spots. This character can, as to my opinion, never serve as a distinction between Genera.

The studied collections contained the following species, limited in their geographical distribution to Nova Guinea.

1. *Erephopsis caliginosa* WALKER.
2. *Erephopsis novaeguineensis* RICARDO.
3. *Erephopsis albibarbus* nov. spec.

KEY 7.

Synopsis of species.

- 1a. Wings with two burnt-sienna streaks 2.
- b. Wings diffuse yellowbrown, beard white, sides and breast white haired, legs yellowbrown, femora yellow haired, abdomen yellowbrown, redbrown haired, segmentations yellow haired *novaeguineensis* RICARDO.
- 2a. Beard and lower cheeks brownishyellow haired, breast and sides reddishyellow haired. Legs tawnybrown. Abdomen tawnyredbrown, darker at apex, wholly black haired *caliginosa* WALKER.
- b. Beard and lower cheeks white haired, breast and sides white haired, legs darkbrown, abdomen rounded at apex, yellowbrown on first two segments, elsewhere blackbrown, black haired, except at segmentations, which are white haired, fine narrow median, white haired stripe present *albibarbus* SCHUURMANS STEKHOVEN.

22. *Erephopsis caliginosa* Wlk. (♀), Textfig. 22.

Syn. Diatomineura caliginosa Wlk.

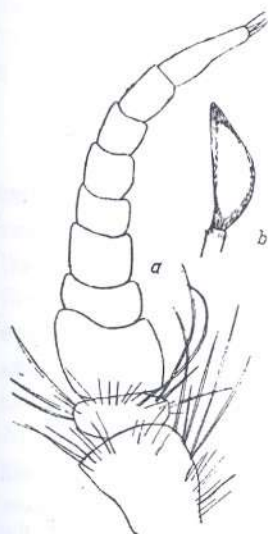
References:

- WALKER, Proc. Linn. Soc. London VIII, p. 108 (1865).
 RICARDO, Nova Guinea IX, p. 403 (1914).
 „ Ann. Mag. Nat. Hist. (7) V, p. 118 (1900).

Habitat:

- Type ♀ from Upper Utakwa Valley, Nova Guinea 5000—10000 Feet, Febr. March, '12, A. R. WOLLASTON • Coll. BR. M.
 Another ♀, same locality „ „
 1 ♀ from Dutch Nova Guinea, LORENTZ • Coll. N.A.M.
 1 ♀ „ S. Nova Guinea, VERSTEEG '12/'13, TREUB 1.1.'13 Coll. N.A.M.
 3 ♀ ♀ „ Dutch Nova Guinea, LORENTZ Coll. N.A.M.
 2 ♀ ♀ „ Mount Wichmann, „ '09, 3000 M. alt. „

Eyes strongly pubescent; Forehead redbrown, without obvious callus; Subcallus dull redbrown, upper cheeks pale greybrown, black haired, lower cheeks yellowgrey, pubescence reddishyellow. Beard same colour, very thick. Face convex, redbrown, black haired. Antennae, third joint with 8 divisions, dullbrown. Palpi dark redbrown. Proboscis somewhat more than 2 times as long as the head. Wings brownish with 2 burnt-sienna spots, first posterior cell open at border or closed. Legs tawny brown. Abdomen dark shining tawny-redbrown, black haired. Length 16,5 m.M. other ♀ 17 m.M.



Textfig. 22.

E. caliginosa Wlk. ♀

a. antenna, b. palpe.

The Head. (Textfig. 22). Forehead redbrown, to dark blackbrown, barely half as wide at apex than it is anteriorly, black haired, lateral borders brownish white tomentose. Vertex spot with 3 ocelli, thick black haired, Callus indicated as a roundish reddish shining elevation, covered with black hairs. Subcallus redbrown, dull. Face shining, prominent, dullredbrown, brownish tomentose at sides, black haired. Upper cheeks pale greybrown, black haired. Lower cheeks yellowgrey, pubescence brownishyellow. Beard same colour, very thick. Antennae dullbrown, first two joints grey tomentose, with long, black pubescence, third joint with 8 divisions, apical annulation with a small tuft of black hairs, 3d joint reddish yellowbrown, blackish at apex. Palpi darkredbrown, black haired at apex and along the borders. Proboscis black. Length of proboscis 4,5 m.M., head + thorax 7,5 m.M., proboscis however much longer than in *E. novaeguineensis*, two times as long as the head.

Thorax pale tawny-redbrown, black haired, pale tomentose on foreborder. Shoulders and sides covered with reddish yellow pubescence. Tufts behind the wings same colour. Pteropleuron with blackbrown pubescence; Breast reddishbrown, pubescence dirty yellowbrown. Wings yellowish with two burnt-sienna streaks, the first at base of discoidal cell, including a part of the apex of the first posterior cell, fourth posterior cell and apices of lower and upper basal cells. Second streak more diffuse, situated round apex of disc cell, crossing the first posterior cell, growing fainter in the cubital cell. Both spots connected by a fine stripe of brown colour along the cubital trunk, absent in other specimens. Intermediate parts clearer, yellowish. First posterior cell open, distinctly narrower at opening. Fourth posterior cell much narrower at opening than it is along the discoidal cell. Stigma reddish-siennabrown. Halteres yellowbrown. In the type the first posterior cell is closed just at border, Legs. First leg. Coxa yellowbrown, pubescence reddishyellowbrown. Trochanter blackbrown, femur tawnybrown, black haired. Tibia yellowish, covered with short black hairs on dorsum, yellow haired below. First two tarsalia same colour, others more blackish, black haired. Second leg, femur as in first leg; tibia somewhat darker, pubescence redyellow with 2 spines, first tarsale similar, other tarsalia blackhaired. Third leg darker again, Tibia blackbrown, black haired, above, yellowred pubescent below. Tarsalia identical. All femora with distinct pubescence.

Abdomen dark, shining tawny-redbrown, darker at segmentations, black haired. Segmentations with thick black hairfringes. On first and second segment median black spots. Ventral surface as dorsum. The only difference between the type female from Utakwa Valley and the other females studied by me consists in the wingstructure, the first posterior cell

being closed just at border in the type, open in the other females. In respect with the differences between the Genera *Erephopsis* and *Diatomineura*, which is based upon the same principle, the type ought to be reckoned to the Genus *Erephopsis*, the other females however to *Diatomineura*. I think that all studied females belong to the same species and therefore I propose to fuse both Genera into one single Genus again, which should be named *Erephopsis* RONDANI. The forelaying species ought to be named therefore *Erephopsis caliginosa* WALKER. According to the wingmarkings, the forelaying species should be reckoned also to the Genus *Erephopsis* ROND.

23. *Erephopsis novaeguineensis* RICARDO. (♀) Textfig. 23.

References:

RICARDO, Nova Guinea IX, p. 404 (1914).

Habitat:

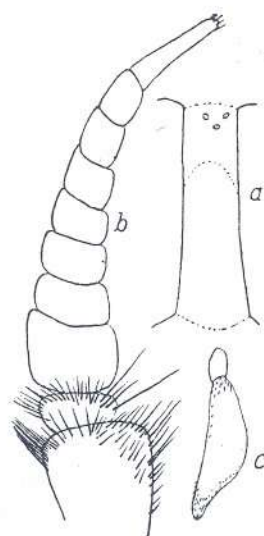
Type ♀ from Mount Hellwig, Nova Guinea, LORENTZ '09—'10 1800 M. 1.'09

Coll. N.A.M.

Paratype ♀, same locality

Coll. BR.M.

A redbrown species with hairy eyes, no callus on the forehead. Subcallus dullbrown, upper cheeks darkbrown, black haired, lower cheeks greybrown. Beard white. Face redbrown, black haired. 3 Ocelli at vertex. Palpi broad, flat, bright redbrown. Antennae reddishbrown. Thorax redbrown, black haired. Wings with first posterior cell closed with a short petiole in paratype, type female without petiole to the same cell. Legs yellowbrown. Abdomen yellowbrown, redbrown haired. Length 17 m.M.



Textfig. 23.

E. Novaeguineensis RIC. ♀

a. forehead, b. antenna,
c. palpe.

The Head. (Textfig. 23). Eyes black haired. Forehead shining (by denudation?) dull reddish brown with a median groove, borders velvetybrown, black haired, pubescence short. Ocellar plate with 3 ocelli. No callus on forehead. Subcallus dullbrown. Upper cheeks darkbrown, black haired, lower cheeks greybrown. Face redbrown, black haired. Beard white. Proboscis 2,5 times as long as the head. Palpi broad and flat on second joint with black haired apex only, first joint dullbrown, second joint bright redbrown. Antennae with 8 divisions to the third joint. First and second joint yellowbrown, black haired, third joint reddishyellowbrown, blackish to the apex.

Thorax dark redbrown, covered with a cloth of fine erect, black and redbrown hairs. Tufts at bases of wings redbrown. Pteropleuron same colour as scutum, redbrown haired. Breast pale brown, white haired. Sides white haired also. Wings pale yellowishbrown in type, hindborder paler; paratype with reddishbrown wings, vena radialis applicated over its whole length against the costa. First posterior cell very narrowly open in type, in paratype closed with a short petiole on one wing, on the other wing closed at border. Halteres stalk redbrown, club yellowbrown. Legs. First leg, coxa yellowbrown, white haired, trochanter yellowbrown, nearly bare, shining, femur yellowbrown, yellow haired. Tibia darker, tawny yellowbrown, beset with short, black, appressed hairs.

Tarsalia darkredbrown, black haired. Middle tibiae more yellowbrown, black haired allover. The rest is identical to the first leg.

Abdomen yellowbrown on first segment, darker to the apex, reddbrown haired. Segmentations with reddishyellow hair-fringes. Ventral surface as dorsum. Seventh segment wholly black haired. From *Erephopsis caliginosa* Wlk, *E. novaeguineensis* Ric. is distinguished at once by the more diffuse colouring of the wings, the white beard, the pubescence on the palpi, especially in respect to its distribution, the colour of the pubescence on sides and breast, the pubescence on the legs and the colour and pubescence of the abdomen.

24. *Erephopsis albibarbus* nov. spec. (♀) Textfig. 24.

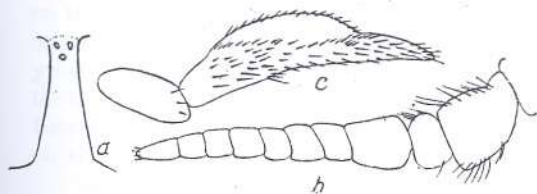
Habitat:

Type ♀ from S. Nova Guinea, VERSTEEG 1.12.'12 Coll. N.A.M.

3 ♀♀ from N. Nova Guinea, Doorman path 10.'20, VAN HEURN Coll. N.A.M.

A median-sized brownish species with yellowishbrown to blackbrown forehead, bearing no callus, only slightly elevated in the middle. Face dull havannabrown, black haired. Upper cheeks dull velvetybrown, lower cheeks greyish. Beard white. Palpi yellowbrown. Antennae olivebrown, third joint yellowbrown. Thorax dull havannabrown, black haired, with 2 whitish longitudinal stripes. Pteropleuron reddishbrown. Hairtufts at base of wings white. Wings yellowish at base with 2 brown crossbands, most centres of cells, situated in the crossbands clear or paler. Apex of wing fuscated. No appendix present. Legs darkbrown. Abdomen yellowbrown. A median longitudinal stripe of white hairs is found. Ventral surface yellowbrown. Length type ♀ 11,8 m.M. Wingexpanse 28,8 m.M. Length of wing 12 m.M.

In its wingstructure and wingcolour *E. albibarbus* nears *E. caliginosa* Wlk. From this species and *E. novaeguineensis* it differs i.a. in the paler pubescence on the eyes, the darker legs, the colour of the palpi, the pubescence of the abdomen, etc.



Textfig. 24.

E. albibarbus n. spec. ♀

a. forehead, b. antenna, c. palpe.

The Head (Textfig. 24). Eyes hairy, pubescence near the upper angles short and brown, at the lower border, near the cheeks longer and white. Forehead more blackbrown in the middle, yellowishbrown tomentose at the lateral borders, barely half as wide at vertex, than it is at base. Subcallus olivebrown. Face dull havannabrown, black haired. Upper cheeks velvetybrown along the face, black haired; lower cheeks greyish, white haired. Beard thick, white. Palpi

yellowbrown, apex and base of second joint black haired; short black hairs fringing the flat broad point at its lateral borders. Antennae olivebrown, basal 2 joints black haired; third joint orangeousyellowbrown, darker brown at apex, with 8 divisions. Proboscis about 2,5 times as long as the head.

Thorax dull havannabrown, black haired, longitudinal stripes as mentioned; between the distinct lateral stripes a finer median one is observed, lateral borders of scutum also white tomentose. Scutum scanty, short blackbrown haired, intermixed with some white hairs; hindborder of scutum white haired. Hairtufts at base of wings and behind white. Pteropleuron reddishbrown-violet, black haired. Sides and breast greybrown, white haired. Scutellum same colour as the scutum, white haired along the borders. Wings yellowish at base, distinctly so in basal cells and in the anal cell. Axillary angle clear. Foreborder brownish yellow. Costal cell with a havannabrown shadow round the basal crossvein; a brown patch in the apex of the same cell. Here the basal crossband starts, crossing the apices of radial, cubital, first posterior, discoidal, fourth and fifth posterior and both basal cells, not reaching the hindborder, incised in the discoidal and upper basal cell; the outline of this brown streak is therefore more or less irregular. Second brown streak more diffuse in its circumference; it crosses the apex of the radial cell, cubital, submarginal, first and second posterior, and the extreme apex of the discoidal cell. Clear incisions in cubital, first and second posterior cells. A fine brown shadow runs to the apex of the wing from this streak. Apical streak not reaching to the hindborder of the wing. Veins dark redbrown to havannabrown. Stigma yellow. Subcosta almost over its whole length applied to the costa. First posterior cell open. Legs darkbrown. First leg. Coxa dullbrown, black haired at apex, white haired on the basal part, trochanter blackbrown, femur blackbrown, black haired. Tibia dull olivebrown, blackbrown, at apex, black haired. Second leg similar. Third leg identical, some white hairs along the distal lateral border of the femur.

Abdomen yellowbrown on basal 2 segments, first segment with a median darker brownblack spot and a fine dark line bordering the segmentation. Second segment with a similar stripe along the segmentation, elevated in the middle to a halfmoon-shaped dark spot. Following segments darker in the middle; third segment with 2 reddish-yellowbrown spots, forming a continuation of the yellowbrown colour on the foregoing segments. Other segments elsewhere blackbrown. The dorsum shows a fine narrow median, white haired longitudinal stripe, 5th and 6th segments white fringed at segmentations. Lateral borders of all tergites white haired, except the 3d and 4th, which are black haired. Abdomen rounded at apex, ventral surface yellowbrown on first segments, other segments tawnybrown, white fringed, pubescence scanty, black.

The Genus *Pangonia* LATREILLE.

References:

- LATREILLE, Hist. Nat. Crust. et Ins. III, p. 437 (1802).
 RONDANI, Arch. Zool. Modena III, p. 84 (1863).
 SURCOUF, Genera Insectorum, Tabanidae, Fasc. 175, p. 124 (1921).

The Genus is characterised by the bare eyes, the proboscis being exceptionally long, almost as long as head and thorax together, palpi roundish in cross-section, clypeus elevated and protruded, third antennal joint with 8 divisions, first posterior cell according to RONDANI closed, slightly open in the forelaying oriental species. Appendix long. Anal cell closed.

The only species occurring in the Dutch East Indian Archipelago is *Pangonia amboinensis* FABRICIUS.

24. *Pangonia amboinensis* FABRICIUS.

References:

- FABRICIUS, Syst. Antl. p. 91 (1805).
 LATREILLE, Encyclop. Method., VIII, p. 704 (1811).
 WIEDEMANN, Dipt. exot. I, p. 53 (1821).
 „, „, Auss. zweifl. Ins., 8, p. 92 (1828).
 RICARDO, Ann. Mag. Nat. Hist (7), p. 167 (1900).

Habitat:

Type ♀ from Amboina, FABRICIUS' coll.

2 ♀ ♀ from Timor, MACKLOT

Coll. L.M.N.H.

The Head. Eyes redbrown, bare. Frons redbrown, pubescence yellowbrown. Epistoma prominent. Length of proboscis 7,5 m.m., 3 times as long as the head, nearly as long as the head and thorax together, pubescence yellowbrown. Palpi yellowbrown, short, curved halfway round the proboscis. Face bare, yellowbrown. Cheeks paler, thick yellowbrown haired. Beard very thick, brownishwhite. Antennae with basal two joints olivaceous black-brown, black haired, pubescence long, third joint 8-ringed, reddishyellowbrown, last annulation black.

Thorax blackbrown, thick yellowbrown haired. Tufts at base of wings and behind, thick, brownishwhite. Breast yellowbrown with thick brownish yellowwhite pubescence. Wings brownish, appendix long. Veins blackbrown. First posterior cell much narrower at border, nearly closed. Halteres yellowbrown, club blackish. Legs: First leg, coxa and trochanter shining blackbrown, pubescence brownish white, very thick; femur bright yellowbrown, yellow haired; tibia yellowbrown, black at apex, yellow haired; tarsalia yellowbrown, yellow haired. Second leg; coxa and trochanter shining blackbrown, femur and tibia yellowbrown, yellow haired; tarsalia olivaceous yellowbrown, yellow haired. Third leg incomplete, similar, tibia broken off.

Abdomen broad, ending broad also, ochraceous yellow to pale brownish yellow on ventral surface, similar pubescence. Dorsum chinese yellowbrown with a median black patch on first segment and in the middle of the second segment, brownishblack shadows being found on the bases of the third and fourth segments, becoming gradually broader, fifth to seventh segment darker blackbrown, thick black haired. Pubescence bright yellow on the chinese-yellow areas. Yellowwhite hairtufts in the middle of the second and fourth (probably also of the third?) segmentation. Fourth to seventh segment with white hairtufts in the lateral corners. Lateral borders of first two tergites yellow, yellow haired, intermixed with some black hairs on the second segment.

WIEDEMANN and FABRICIUS describe this species as brown with scutum provided with white longitudinal stripes, not visible in the specimens studied by me. „Die Seitenflecken des Hinterleibes stehen auf den ersten drei Abschnitten; an den übrigen sind die Seitenränder auch rostbraun; Einschnitte mit gelben Härchen besetzt." Ventral surface according to WIEDEMANN white. WIEDEMANN's and FABRICIUS' descriptions are too fragmentary to make sure an identity of their specimens and the specimen after which the foregoing description was made. The Timor specimens are however in a rather bad condition and before more material is available, I am urged to bring these specimens to the mentioned species, as was done by VAN DER WULF also. The suggestion arises, that in the foregoing specimens the thoracic stripes were probably not visible, due to the thick yellow haircovering.

The Tabaninae.

The *Tabaninae* are characterised by the shape of the forehead and the antennae, and by the absence of ocelli. Hind tibiae without spurs.

In the Dutch East Indian Archipelago the following Genera of *Tabaninae* occur: *Haematopota*, *Neobolbodimyia*, *Tabanus*, differentiated by the following characteristics.

KEY 8.

- 1a. Forehead mostly uniform in colour, apart from the callosities. 2
- b. Forehead with two or more roundish or commashaped spots, callus large transverse, mostly reaching the eyes, black spots found on cheeks and sometimes also on the face. Forehead almost as broad as long, wings greyish with white spots and rings. Body brown without particular markings in most species **Haematopota** MEIGEN.
- 2a. Forehead *Tabanus*-like. Wings almost dark, or with dark spots. Antennae placed on a bulbous projecting tubercle, first joint incrassate with a dorsal spur **Neobolbodimyia** RICARDO.
- b. Forehead with a callosity, sometimes separated into two different parts. Antennae with a more or less distinct tooth to the third antennal joint. Wings clear or infuscated. Abdomen uniform in colour, with transverse, resp. longitudinal stripes or spotted. **Tabanus** LINNAEUS.

The only sure difference between *Neobolbodimyia* and *Tabanus* lies in the shape of the basal antennal joint and its implantation.

The Genus *Haematopota* MEIGEN.

Syn.: *Chrysozona* MEIGEN.

References:

- MEIGEN, Illiger's Magazine II, p. 267 (1803).
 „ Nouvelle Class., p. 23, (1800) *Chrysozona*.
 KERTESZ, Cat. Dipt., III, p. 201 (1908).
 SURCOUF, Genera Insectorum, Fasc. 175, p. 31 (1921).

Eyes in life with green crossbands, the bands varying in shape, according to the species. The usually small species are characterised by the wingmarkings, consisting in most species in three more or less distinct rosettes, a single or double apical band and two transverse basal bars. Some species present instead of pale streaks rosettes. Forehead with large transverse callus and velvetyblack spots, which may be found also on cheeks and face. Antennae longer than the head, slender, third antennal joint usually broader, without dorsal

tooth, first joint incrassate in some species. Abdomen brownish or blackish, with or without transverse or longitudinal paler stripes or spots. The differentiation of the species may be based also upon the colouring of the legs, as these may show pale rings on one or more pairs of tibiae, in other species all tibiae being only white at base. All species with appendiculate wings.

Males holoptic, forehead reduced in the male sex to a small triangle between the eyes. Up to the present 11 species were known from the Dutch East Indian Archipelago and the Federated Malay States. In the Literature I found 2 other species described under known names recorded from the same regions, which after comparison with the types appeared to be new species. During my investigations I found a number of new species bringing thus the total number of species found in these regions to 32.

Namely:

1. *Haematopota javana*, WIEDEMANN.
2. *H. confluens*, SCHUURMANS STEKHOVEN.
3. *H. cingulata*, WIEDEMANN.
4. *H. punctifera*, BIGOT.
5. *H. borneana*, RONDANI.
6. *H. atomaria*, WALKER.
7. *H. irrorata*, MACQUART.
8. *H. annulipes*, SCHUURMANS STEKHOVEN.
9. *H. roralis*, FABRICIUS.
10. *H. ensifer*, SCHUURMANS STEKHOVEN.
11. *H. malayensis*, RICARDO.
12. *H. lunulata*, MACQUART.
13. *H. intermedia*, SCHUURMANS STEKHOVEN.
14. *H. truncata*, SCHUURMANS STEKHOVEN.
15. *H. elegans*, SCHUURMANS STEKHOVEN.
16. *H. pungens*, DOLESCHALL.
17. *H. fumigata*, SCHUURMANS STEKHOVEN.
18. *H. pachycera*, BIGOT.
19. *H. atriventer*, SCHUURMANS STEKHOVEN.
20. *H. irregularis*, SCHUURMANS STEKHOVEN.
21. *H. splendens*, SCHUURMANS STEKHOVEN.
22. *H. nigricans*, SCHUURMANS STEKHOVEN.
23. *H. nigrita*, SCHUURMANS STEKHOVEN.
24. *H. equitibiata*, SCHUURMANS STEKHOVEN.
25. *H. tuberculata*, DE MEYERE.
26. *H. marginata*, DE MEYERE.
27. *H. mediatrifrons*, SCHUURMANS STEKHOVEN.
28. *H. jacobsoni*, SCHUURMANS STEKHOVEN.

29. *H. paucipunctata*, SCHUURMANS STEKHOVEN.

Further for comparison with the types I will give the descriptions of:

30. *H. lata*, RICARDO.31. *H. unizonata*, RICARDO.32. *H. rubida*, RICARDO.

The different species may be determined with the following key, which however does not include *H. unizonata* Ric.

KEY 9.

Synopsis of Species.

- 1a. Species with more or less distinct rosettes on the wings 3
- b. Species with curved lines or oblique stripes not arranged in rosettes.. 2
- 2a. Wings with white lines running along the wingborder and curving backwards along the hindborder, all tibiae with white bases, abdomen with whitish segmentations, forming a white triangle on the second segment, thorax with a median broad, yellow haired longitudinal stripe ending on the scutellum *cingulata* WIED.
- b. Wings with a pale rather broad oblique streak, crossing the middle part of the wing and a number of white spots and bars, not arranged in rosettes, apical band single, curved, First antennal joint very much incrassate nearly as long as the third joint, shining yellow, third joint very broad, reddishyellow, dark-tipped; Fore tibiae white at base, middle and hind tibiae with 2 ill-defined yellow rings, Abdomen reddishbrown with very narrow yellow borders to the segments. *rubida* RICARDO.
- 3a. A peculiar sword-shaped marking on dorsum thoracis and abdominis, middle and hind tibiae with yellowish rings, rosettes on the wings indistinct, a rather large white spot in the opening of the fifth posterior cell only, no distinct apical band *ensifer* SCHUURMANS STEKHOVEN.
- b. Not such a sword-shaped marking on the dorsum 4
- 4a. Eyes with a peculiar horn at their upper margin, apical wingcrossband single, not reaching to the hindborder, legs brownish with 2 rings to the middle and hind tibiae, abdomen chocolatebrown, white-segmentated with a median pale yellowbrown longitudinal stripe and white lateral borders to the first two segments, frontal callus rudimentary, third antennal joint longer the first two joints together *tuberculata* DE MEYERE.
- b. Not such a horn on the eyes 5
- 5a. Abdomen unicolorous or nearly so 6
- b. Abdomen with *distinctly* paler segmentations or other markings .. 9
- 6a. Abdomen and thorax reddishbrown, segmentations indistinctly paler, black haired. Legs brownish, middle tibiae nearly wholly white, except

an apical ring, other tibiae wholly brown, wings with a broad single apical band, rosettes composed of fine spots, centres of cells distinctly paler, first antennal joint incrassate, shining brown, palpi white haired

intermedia SCHUURMANS STEKHOVEN.

- b. Legs brownish with 2-ringed middle and hind tibiae 7
- 7a. Wings without white spots in the openings of the posterior cells .. 8
- b. Wings with a broad white spot in the openings of all posterior cells, almost fused with the transverse bars in the same cells, rosettes without brown centres, passing gradually into each other, apical band double, abdomen havannabrown, segmentations white haired *maculata* DE MEYERE.
- 8a. Abdomen with segmentations indistinctly indicated, first antennal joint shining yellowbrown, incrassate at apex, wings with a single apical cross-band, broken into spots, not starting at the foreborder, but situated round the dorsal branch of the cubital vein *irrorata* MACQUART.
- b. Abdomen unicolorous olivebrown, slender, first antennal joint chromate-yellow, incrassate in the middle, wings with a single crossband, starting at the anterior border, but not reaching the hind border
paucipunctata SCHUURMANS STEKHOVEN.
- 9a. Abdomen with a median longitudinal stripe, extending over one or more segments, with or without accompanying lateral spots on one or more segments or with a transverse paler spot at the second segment. 22
- b. Abdomen with distinctly paler segmentations only, without longitudinal stripes 10
- 10a. Abdomen with chocolatebrown paler segmentations, accompanied with paler lateral spots to the third to sixth segments, lateral borders of tergites whitish. Frontal callus band-shaped, straightsided, apical band of wing single, middle and hind tibiae with 2 white rings. Palpi brown, white haired *lata* RICARDO.
- b. Abdomen without paler round spots on the segments 11
- 11a. All tibiae white at base only 12
- b. One or two pairs of the tibiae with 2 more or less distinctly indicated paler rings 13
- 12a. Frontal callus brownblack, reaching the eyes, elevated at its upper border, palpi havannabrown, second joint mainly black haired; Antennae with rather narrow third joint, first joint longer than the basal annulation of the third joint, shorter than 3d joint in toto, apical wingband single, not reaching the hindborder of the wing. Abdomen havannabrown, segmentations white *equitibiata* SCHUURMANS STEKHOVEN.
- b. Frontal callus ferrugineous brown, palp reddish, first joint almost as long as the third. Abdomen yellowbrown at base, then black, posterior segmentations white *borneana* RONDANI.

- 13a. Middle tibiae with two white rings..... 14
 b. Middle and hind tibiae with 2 more or less distinct white rings.... 15
- 14a. Abdomen dark chocolatebrown, segmentations slightly paler, white fringed at sides only, seventh segment distinctly white fringed, ventrally segmentations narrowly white, white haired. Antennae with long third joint, all joints black, frontal callus bandshaped. Apical wingband single broken into three spots **splendens** SCHUURMANS STEKHOVEN.
 b. Abdomen blackbrown with paler whitish, wholly white haired segmentations, equally on dorsal and ventral surface, apical wingband single, not reaching the hindborder. First antennal joint very long, olivebrown. Frontal callus medusiform **nigricans** SCHUURMANS STEKHOVEN.
- 15a. Wings with a single apical crossband all or not reaching the posterior border 16
 b. Wings with a double apical crossband, one of them not reaching the hindborder in some species 21.
- 16a. Wings with a single broad apical crossband, reaching the hindborder or not 17
 b. Wings with a single narrow apical crossband, mostly not reaching the hindborder 18
- 17a. Broad apical crossband reaching the hindborder of the wing, convex at inner border. White triangles distinctly visible in the openings of 2d, 3d and 5 th posterior cell, sometimes indicated in the 1st and 4th posterior cells, Antennae, first joint shining brownred, third joint as long as the first two joints together, flat, rather broad, brownblack. Abdomen brownblack with distinct white, white haired segmentations to the first and second segments, less broad to the others. Middle and hind tibiae with 2 bands. Frontal callus brownblack, strongly convex, band-shaped **annulipes** SCHUURMANS STEKHOVEN.
 b. Frontal callus triangular, pitchy black. Antennae incomplete, first joint swollen, shining black. Apical wingband single, broad, not reaching to the hindborder of the wing, white triangles in all posterior cells, except the first. Abdomen with narrow, white haired triangles to all segments **nigrita** SCHUURMANS STEKHOVEN.
- 18a. Abdominal segmentations white, white haired..... 19.
 Abdominal segmentations yellowbrown, yellowwhite haired 20
- 19a. Abdomen coffeebrown with broad white, white haired segmentations, forehead narrow, callus broad band-shaped, pointed at upper border. Antennae with shining yellowbrown first joint. Wings with no triangles in the openings of the posterior cells **irregularis** SCHUURMANS STEKHOVEN.
 b. Abdomen blackbrown, with distinct white segmentations to the first three segments only, other segmentations narrowly white, white haired,

forehead broad, callus blackbrown, straight at base, convex at upper border. Antennae dull yellowbrown, third joint as long or even slightly longer than the first. No white spots in the openings of the posterior cells
atriventer SCHUURMANS STEKHOVEN.

20. Big-sized species. Wings with a single crossband, in some specimens indications of a second apical band, rarely found, forming a second complete band. Callus wholly shining black, or black in the middle and with yellowbrown lateral borders. White spots in the openings of all posterior cells. Antennae yellowbrown, slender
pungens DOLESCHALL.
- 21a. Both apical crossbands complete. Abdomen black with fine white, white-haired segmentations. Thorax brownblack, without longitudinal stripes. Antennae with a strongly broadened third joint, first joint nearly as long as the basal annulation of the third joint. Callus black, triangular
fumigata SCHUURMANS STEKHOVEN.
- b. Inner apical crossband not complete. Abdomen reddish havannabrown with distinct white segmentations to the first three segments. Thorax with 3 pale yellowwhite longitudinal stripes. Antennae, third joint indistinctly broader at the extreme base, basal annulation 1.5 times as long as the 1st joint. Callus reddbrown
elegans SCHUURMANS STEKHOVEN.
- 22a. Legs uniform in colour, with no rings on the tibiae or pale bases to fore tibiae. Abdomen blackish brown with a distinct ashy grey median stripe, and grey roundish spots on each segment. Apical crossband single, not reaching the hindborder
roralis FABRICIUS.
- b. Legs not uniform in colour 23
- 23a. Abdomen with a continuous longitudinal stripe 24
- b. Abdomen with a transverse paler spot on the second segment only . . 27
- 24a. Wings with confluent spots, indistinctly arranged in rosettes and bars 25
- Wings with distinct rosettes, composed of separate spots 26
25. Abdomen brown with a median white stripe and broad curved lines, segmentating the first three segments. First antennal joint cylindrical, incrassate at apex, third joint broadened at base
confluens SCHUURMANS STEKHOVEN.
- 26a. Abdomen with a median longitudinal stripe, broad, curved segmentations to the first three segments and white lateral spots on the 6th and 7th segment in most of the specimens. Apical crossband double. First antennal joint long, third antennal joint broad on basal annulation
javana WIEDEMANN.
- b. Abdomen with a median greywhite longitudinal stripe, ending on the 6th segment, no broad white segmentations, but a series of lateral white

spots on the 2d—7th segment, lateral borders of tergites white. Apical crossband double, both branches broad. First antennal joint short

punctifera BIGOT.

- 27a. All tibiae white at base 28
- b. Middle, or middle and posterior tibiae with 2 whitish or white rings 29
- 28. Apical band of wings single, broad, with straight sides, convex, white spots in the openings of all posterior cells except the 4th. Thorax and abdomen brown, first part without longitudinal stripes. Abdomen with a narrow white triangular median spot to the second segment and narrow white segmentations to all segments. Antennae long and slender, brown on first joint
lunulata MACQUART.
- 29a. Middle tibiae with 2 white rings, other tibiae white at base 30
- b. Middle and posterior tibiae with 2 white rings, sometimes indistinctly so on the hind tibiae 31
- 30a. Abdomen black with white segmentations and a truncate transverse spot to the second segment, which has moreover the broadest segmentation. Antennae with shining black, cylindrical first joint. Apical wingband single, curved. All posterior cells with white spots in the openings
truncata SCHUURMANS STEKHOVEN.
- b. Abdomen chestnutbrown with a pale whitish spot at the end of the 2d segment and white segmentations to the 3d—6th segment. Antennae with shining incrassate darkbrown first joint
atomaria WALKER.
- 31a. Abdomen with lateral borders of tergites grey 32
- b. Lateral borders of the tergites not grey 33
- 32. Abdomen with a median longitudinal blackbrown band, sides and segmentations grey, 2d segment with a fine longitudinal stripe. Wings greyblack, dotted with white spots, apical band double. Antennae slender, brown, third joint longer than 1st and 2d joint together
jacobsoni SCHUURMANS STEKHOVEN.
- 33a. Apical band of wing single 34
- b. Apical band of wing double 35
- 34a. Apical band of wing single, white triangular spot wanting in the opening of the 4th posterior cell. First antennal joint, broad cylindrical, swollen, longer than the basal annulation of the 3d joint. Abdomen black with distinct grey segmentations
pachycera BIGOT.
- b. Apical band of wing single, irregular, not reaching the hindborder, triangular spots in all posterior cells. Antennae with basal annulation of third joint longer than first and second joint together. Abdomen brown, second segment with a triangular median grey spots as in *H. lunulata*, 2d segmentation distinct, grey, white haired, other segmentations white bordered, forehead with linear unpaired spots
malayensis RICARDO.

35. Apical band of wing double, white triangular spots in all posterior cells. First antennal joint slender, swollen at apex only, slightly shorter than the basal annulation. Abdomen blackbrown with distinct whitishgrey segmentations and a faint median grey triangle as in *H. lunulata*
mediatrifrons SCHUURMANS STEKHOVEN.

25. *Haematopota cingulata* WIEDEMANN. (♀, ♂) Pl. 4, Fig. 3; Textfig. 25. 26.

References:

- WIEDEMANN, Auss. zweifl. Ins. I, p. 216 (1828).
 BIGOT, Bull. Soc. Zool. France XVI, p. 79 (1891).
 RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 115 (1906).
 „ Rec. Ind. Mus. IV, p. 326 (1911).
 DE MEYERE, Tijdschrift v. Ent. Vol. LIV, p. 280 (1911).
 „ Tijdschrift v. Ent. Vol. LX, p. 295 (1917).
 SURCOUF, Genera Insectorum, Fasc. 175, p. 32 (1921).

Habitat:

Females

Isle Java

WIEDEMANN's type from Java

- 1 ♀ from Buitenzorg Res. Batavia 1.3.'21, SIEBERS coll. Coll. B.Z.M.
 4 ♀ ♀ „ Poerwokerto Res. Banjoemas 7.4.'22 on Bengalese Cattle, SCHUUR-
 MANS STEKHOVEN leg. Coll. V.S.L.
 2 ♀ ♀ from Tjinangsi, Res. Batavia April '22 „
 1 ♀ „ Berbak, Res. Djoejakarta, April '22, S. B. LUITJENS, on cattle
 Coll. V.S.L.
 4 ♀ ♀ „ Tegal, Tjibiroes, Res. Pekalongan 2.5.'22 on horse, LAGAS
 Coll. V.S.L.
 10 ♀ ♀ „ Tasikmalaja, Res. Preanger Regencies 26.9.'22, LE COULTRE
 Coll. V.S.L.
 6 ♀ ♀ „ Tjigoegoer, Res. Preanger Regencies 4.11.'22, LE COULTRE
 Coll. V.S.L.
 1 ♀ „ Parigi, Res. Preanger Regencies 10.1.'23, LE COULTRE
 Coll. V.S.L.
 1 ♀ „ Kebandoengan, Tegal, Res. Pekalongan Nov. '22, on horse LAGAS
 Coll. V.S.L.
 3 ♀ ♀ „ Pengarasem, Res. Pekalongan Dec. '22 on horse, LAGAS
 Coll. V.S.L.
 1 ♀ „ Langkap, Keboemen, Res. Kedoe on horse, BAKKER
 Coll. V.S.L.
 1 ♀ „ Tanggal, Randoeblandang, Blora, Res. Rembang 10.2.'23, DE
 WILDE Coll. V.S.L.
 1 ♀ from coll. SOHNS, Madioen Coll. V.S.L.

1 ♀	„	Semarang, JACOBSON	Coll. L.M.N.H.
2 ♀ ♀	„	Ardjoeno, HEKMEYER	„
2 ♀ ♀	„	Java, without locality, KUHLE	„
1 ♀	„	Java, without locality	„
1 ♀	„	Bekassi, Res. Batavia, E. JACOBSON 6.'08	Coll. N.A.M.
1 ♀	„	Semarang, DRESCHER 12.'05	„
1 ♀	„	Kemang, LUCASSEN	„
<i>males</i>			
1 ♂	from	Djocja Java, JACOBSON	„
1 ♂	„	Semarang 1.'96, JACOBSON	„
1 ♂	„	Ardjoeno, HEKMEYER	„

This species although common on Java never appears in large numbers. In Poerwokerto *H. cingulata* specimens were found on the cossum of Bengalese cattle, grazing under bamboobush, early in the morning.

The wingmarkings and the median thoraxstripe form the most obvious characters of the forelaying species. Abdomen black, except the narrow white haired segmentations, elevated to triangular spots on the first two segments. Frontal callus very large, clear olivebrown to black. Antennae long and slender, 1,5 times as long as the head, yellowbrown, black at apex. Palpi long, blackish. Beard silvery white.

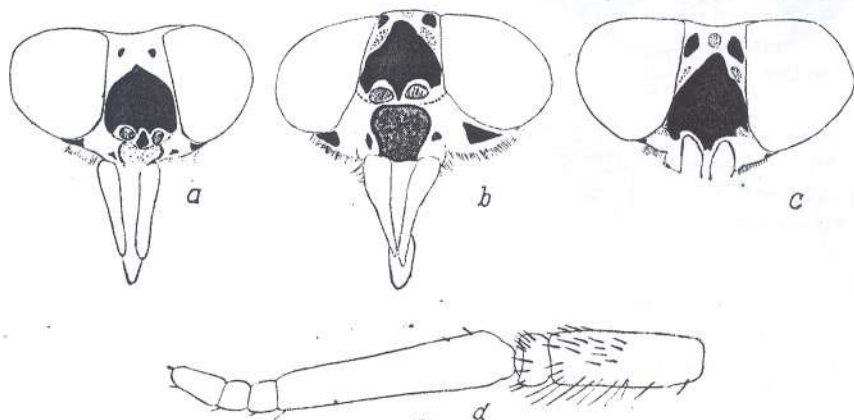
The Female.

Table of dimensions.

Bodylength	varying from	8,8 m.M.	—	11,2 m.M.
Width of thorax	„	1,6	„	— 3,2
Width of abdomen	„	2,5	„	— 3,6
Wingexpanse	„	18,5	„	— 22
Length of head	„	1,5	„	— 2,2
Length of thorax	„	3	„	— 4,5
Length of abdomen	„	4,2	„	— 6,2
Length of wing	„	2,8	„	— 4
Breadth of wing	„	8	„	— 9,5
Foreheadindex	„	1,08	—	1,87

The Head. (Textfig. 25). Forehead $\frac{1}{3}$ narrower at vertex than it is at base, straight-sided greyishbrown, pubescence white along the eye borders, black on the black spots, elsewhere yellowbrown. Vertex bluishgrey tomentose. Frontal callus shining black to redbrown or olivebrown, covering a big part of the forehead, gradually flattened at its upper part to a dullblack, halfmoon-shaped black spot, separated from the first by a shallow groove. At its basal part the callus points to the space between the antennae. Paired spots neither touching to the eyes nor to the callus. Between the callus and these paired spots one finds three other shadowy velvetybrown markings. Callus connected at base with the eyes by means of similar velvetybrown shadows. Clypeus wholly velvetyblack or dark to the borders,

paler sooty-grey in the middle, black haired, upper margin just underneath the antennae brownish, extreme lateral walls of clypeus distinctly white, lateral pits black. Between the clypeus and the eyes at each side a black haired, triangular black spot, is found, rather indistinct in some specimens. Cheeks bluishgrey, white haired. Beard silvery white. Antennae 1,5 times as long as the head, first joint long and slender, slightly incrassate, yellowbrown, black haired on dorsum, yellowwhite haired on the ventral surface, shorter than the basal annulation of the four-ringed third joint, which is blackish at apex. Second joint short, darker than the first. First annulation of 3d joint longer than first and second joint together. Palpi long and slender, blackish.



Textfig. 25.

H. cingulata WIED ♀ a, b, c. head; d. antenna.

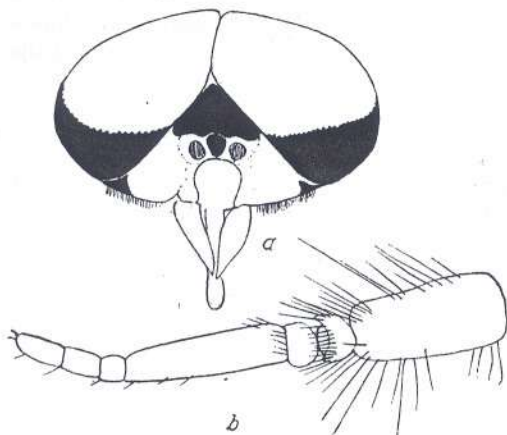
Thorax. A longitudinal, black tomentose, bright yellowbrown haired, broad median stripe divides the scutum in three equal parts, the lateral areas being mahoganybrown, black haired. Pteropleuron and shoulders brownblack, black haired. Scutellum same colour as scutum. Hairtufts at base of wings and behind yellowishbrown. Sides and breast greywhite, white haired, mesosternumlobus blackbrown on its upper half, black haired. Halteres stalk brownish-white, club white. Wings with a curved hyaline streak running parallel to the hindborder of the wing, uniting with the hyaline zones at base in the anal cell. A second hyaline streak in the shape of an elongated elliptical o connects with the first stripe on two points. Base of wing likewise hyaline. Wings elsewhere blackbrown. In older specimens the blackish colour has changed to more bright brown. Legs rather uniform in colour. First leg: Coxa reddbrown, femur brownblack, chineseyellow at apex, tibia basal half white black at apex. Tarsalia black. Second leg similar. White part of tibiae slightly longer than in first leg, first tarsale yellowwhite at base. Third leg, Coxa blackbrown, white haired. Trochanter dark reddbrown. Femur greyblack at base, apical $\frac{3}{4}$ orangeous honey-yellow, haircovering white. Tibia reddbrown, chinese yellow at base, dorsally more whitish, apex blackish brownred, black haired. Tarsalia black, first tarsale slightly paler at base.

Abdomen, brownblack, black haired. First and second segment with median white, white haired triangles in some specimens reaching the bases of the respective segments, largest on second segment. White, white haired segmentations to the 1st till 6th segment. Ventral surface shining blackishbrown with paler bluishgrey segmentations, white haired. Pubescence elsewhere black.

The male.

The Head. (Textfig. 26). Eyes, big-faceted part large, yellowbrown; small-faceted part narrow, blackbrown, reaching to the upper eyecorner only, not to the vertex. Frontal triangle and the incrassate convex callus, incised at lower border, shining tawny-dark havannabrown. Cheeks face and beard as in the female. Brownblack spot near lower eyecorner

larger than in the female. Antennae similar but the first joint slightly thicker than in the female. Palpi short, with long white pubescence at lateral borders; black haired on dorsum.



Textfig. 26.

H. cingulata WIED. ♀

a. head, b. antenna.

Thorax, with pale redbrown, broad, median, white tomentose, scanty blackbrown haired stripe, ending at the hindborder of the scutellum. Scutum elsewhere darkbrown, to blackbrown, black haired. Breast and sides brownish-grey, white haired with a small dot of blackbrown hairs on mesosternumlöbus. Wings as in the female. Halteres white. Legs. First leg, Coxa pale whitish yellowbrown, white haired, Trochanter olivebrown. Femur reddish yellowbrown, black haired on dorsum, distal lateral border yellowbrown haired. Tibia blackbrown, black haired as are all tarsalia.

Second leg, femur tawny, knee yellowbrown, yellow haired, elsewhere black haired. Tibia blackbrown, black haired as are the tarsalia Third leg femur bright yellowbrown, golden-yellow haired below, black haired on dorsum. Tibia and tarsalia as in second leg.

Abdomen, narrow, elongate, pointed, pale havannabrown on first three segments, dark havannabrown to blackbrown at apex, black haired. In the male from Djocja the abdomen is blackbrown from the 3d segment and onwards. Ventral surface pale olivebrown on first 4 segments, yellowwhite haired. Following 2 segments yellowwhite fringed at segmentations, elsewhere blackbrown, black haired. Seventh segment wholly black haired.

26. *Haematopota rubida* RICARDO. ♀**References:**

- RICARDO, Ann. Mag. Nat. Hist. (7), XVIII, p. 120 (1906).
 „ Rec. Ind. Mus. IV, p. 338 (1911).
 PRATT, Journ. Trop. Vet. Sc. IV, p. 390 (1909).

Habitat:

Type ♀ from Burma, Mrs. WARRING
 other ♀ ♀ from Fed. Malay, States, PRATT '09

Coll. BR.M.

Since this species is found in the F.M.S., I think it will be useful to enter it in my book. It is according to RICARDO, whose description I follow:

„an easily distinguished red species, with the hind tibiae incrassate; the

hind femora with a white bunch of hairs above and a fringe of black hairs on the under side. Length 10 m.M. During my stay at the British Museum I did not compare this species with my collections.

The Head. Forehead grey, darker in the centre; the paired spots are black, small and isolated, the unpaired spot not present. Frontal callus shining brown, protuberant, rounded, the posterior border produced, the anterior border with a deep incision in the middle, filled up by the black spot, usually present between the antennae, which is large and square with yellow borders; the frontal callus is short, not reaching the eyes. Face grey, the whole upper part deep black. Palpi yellow with black pubescence and white hairs below. Antennae of an unusual form; the first joint very much incrassate and large, nearly as long as the third joint, yellow and shining, the second very small and narrow, yellow, both joints with black pubescence; the third joint very broad, ending in an obtuse point, reddish yellow, darker to the tip.

Thorax reddish brown, with paler stripes, darker at the sides; the breast grey, with white hairs, scutellum same colour. Wings reddishbrown, the veins yellow, with a long appendix, the apical band single; the pale streak across the middle of the wing is very roticeable, and at once distinguishes the species from *H. lata* Rrc. Legs reddish brown; the anterior and posterior pairs darkest, the anterior tibiae white at base, the middle tibiae yellowish brown, the two yellow rings not well-defined; the posterior femora broad, with the fringe of hairs on the under side black; on the upper side black on the basal half, on the apical half a tuft of white hairs is present; the posterior tibiae very stout and broad, with ill-defined rings as on the middle pair and fringed with black hairs above and below; the basal joints of the middle and posterior tarsi pale yellow.

Abdomen reddish brown, with very narrow yellow borders to the segments, darker to the apex; the under side yellow, with grey tomentum. This species, says RICARDO, is in the shape of its antennae very nearly allied to my new species *H. validicornis* and *annandalei*, and might be almost included in that group but is left for the present here owing to the similarity of the wing to *H. singularis* RICARDO".

27. *Haematopota ensifer* nov. spec. (♀) Pl. 4, Fig. 2; Textfig. 27.

Habitat:

Type ♀ and 3 other ♀ ♀ from Gamboeng, on horse and in the jungle 27.9.'22.

Teaestate on the Goenoeng Tiloe 1400 M., Res. Preanger Regencies SCHUUR-
MANS STEKHOVEN

Coll. V.S.L.

1 ♀ on horse, same locality 5.'23, KERKHOVEN leg

1 ♀ without indication of locality

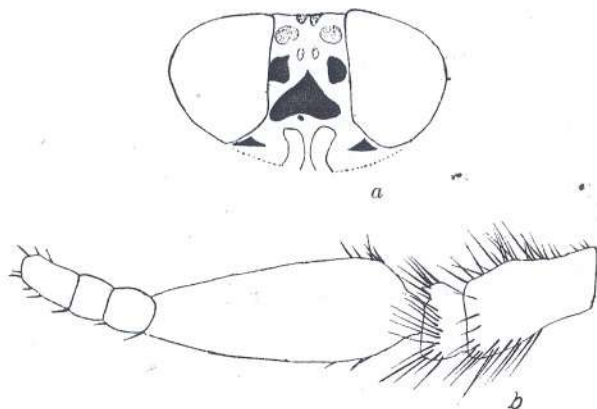
Coll. L.M.N.H.

A beautiful species, characterised by the peculiar swordshaped marking, running over the thorax, the scutellum and the first 2 abdominal segments. Moreover from the sword-shaped marking, 3 fine whitish stripes run in apical direction on the foreborder of the chocolatebrown thorax. Pteropleuron grey. Forehead chocolatebrown. Callus reversed heartshaped, deepblack. A havanna-brown triangular spot is situated on the cheeks between the eyes and the clypeus. Antennae long, brownish. Palpi slender, sootygrey. Wings without apical cross-

band. Rosettes not very distinct, the composing spots small. Posterior cells without white triangles at openings except in the fifth one. Middle and hind tibiae yellowwhite ringed.

Table of dimensions.

Bodylength	varying from	9,5 m.M.	—	10, 5 m.M.
Width of thorax	„ „	2,5 „	—	3,2 „
Width of abdomen	„ „	2 „	—	3,8 „
Wingexpanse	„ „	20,6 „	—	24,2 „
Length of head	„ „	1,5 „		
Length of thorax	„ „	3,8 „	—	4 „
Length of abdomen	„ „	5 „	—	5,5 „
Length of wing	„ „	8,8 „	—	10,5 „
Breadth of wing	„ „	3 „	—	3,5 „
Foreheadindex	„ „	1,22	—	1,30



Textfig. 27.

H. ensifer, s. s. ♀ a. head, b. antenna.

The Head. (Textfig. 27). Forehead distinctly narrower at vertex, chocolatebrown, brown-black haired, divided by white lines, arranged in a star-shaped figure, into a number of brown spots. No unpaired black spot. Paired spot velvetyblack. Callus deep-black, reversed heart-shaped. Between the callus and the implantation of the antennae one finds a small shining spot. Cheeks rusty-brown along the eye borders. Lower cheeks powdered with a bluish grey tomentum. Between the clypeus and the eyes each cheek shows a havannabrown spot. Cheeks and beard greywhite coloured. Postocular rim black haired. Eyes in fresh specimens distinctly showing 4 transverse narrow green bands. The upper one is faintly curved and exhibits 2 waves, the second band has 2 waves with sharp apices. The third band interferes with its 2 waves with the waves of the 2d band and shows besides a spur. The 4th band broadest of all has a nearly straight lower border whereas the wavy upper border presents 2 small elevations. Palpi long and slender, first joint covered with long, soft white hairs, intermixed with some black hairs at apex, second joint grey at base, darker blackish to the apex, greywhite haired at base, to the apex white and black hairs are intermixed. Proboscis, stalk grey, white haired, brownish to the apex, sugarflaps brownblack. Antennae brownish, First joint yellowishbrown at base slightly incrassate to the apex where it becomes havannabrown, black haired. Second joint cup-shaped, small, havannabrown, black fringed. Third joint slightly broadened at base, circumfringed with a number of black hairs at the broadest point, first annulation longer than first and 2d joint together, yellowbrown at base, soon growing darker, apical annulations cylindrical in shape, velvetyblack.

Postocular rim black haired. Eyes in fresh specimens distinctly showing 4 transverse narrow green bands. The upper one is faintly curved and exhibits 2 waves, the second band has 2 waves with sharp apices. The third band interferes with its 2 waves with the waves of the 2d band and shows besides a spur. The 4th band broadest of all has a nearly straight lower border whereas the wavy upper border presents 2 small elevations. Palpi long and slender, first joint covered with long, soft white hairs, intermixed with some black hairs at apex, second joint grey at base, darker blackish to the apex, greywhite haired at base, to the apex white and black hairs are intermixed. Proboscis, stalk grey, white haired, brownish to the apex, sugarflaps brownblack. Antennae brownish, First joint yellowishbrown at base slightly incrassate to the apex where it becomes havannabrown, black haired. Second joint cup-shaped, small, havannabrown, black fringed. Third joint slightly broadened at base, circumfringed with a number of black hairs at the broadest point, first annulation longer than first and 2d joint together, yellowbrown at base, soon growing darker, apical annulations cylindrical in shape, velvetyblack.

Thorax deep chocolatebrown with the pointed pure white swordblade resting on the scutellum in the median line, from which start 3 fine, white threads, connecting with the point and the edges of the sword. In one of the specimens these stripes are not connected with the sword but stop at the level of the pteropleural suture. The sword runs over the scutellum and the first 2 abdominal segments embrace the rapier of the sword. Pteropleuron greyish white. Lateral borders of scutum with white linings, touching neither the scutellum nor the shoulders. The described markings are white haired, pubescence elsewhere black. The pteropleura mainly rustybrown in one of the studied specimens, possess long black erect hairs, intermixed with some white ones. Breast and sides greyish, except the mesosternum lobus, which is partly brownish, the hindpart being however bluishgrey. Wings dark black with darker shadows along several veins. Apical band single, not reaching the hindborder, and broken into two or three white spots. The 5th posterior cell only has a big white spot in its opening. Rosettes composed of small spots. First rosette closed at apex by a white ringlet with a darker centre. Basal bars connected along the wingborder by a distinct white line, the most apical of both bars reaches the hindborder of the wing in a wavy line. Paired transverse spots present in the 1st—4th posterior cell. Foreborder yellowbrown. Squama brown. Antesquama sootygrey. Legs. First leg, Coxa bluish grey at base, reddishbrown at apex, greywhite haired. Trochanter redbrown. Femur brownblack, havannabrown at base, knee yellowbrown, black haired. Tibia curved, redbrown at extreme base, then white, white haired, apical two thirds black, black haired, at distal lateral border some white hairs are intermixed between the black ones. Tarsalia black. Second leg. Coxa bluish grey. Trochanter redbrown, femur lilacbrown, pubescence on dorsum at base greywhite as also on the lateral borders and on the ventral surface, apex blackbrown, bearing a number of black hairs. Tibia with 2, scanty white haired, yellowwhite bands, elsewhere black haired. Tarsalia black, first tarsale yellowish, brown at base. Third leg. Coxa bluishgrey, white haired, intermixed with some black hairs. Trochanter and femur similar to those of the 2d leg. Tibia nearly identical, the basal yellowbrown ring bears a big number of white hairs, apical ring with white hairs at lateral borders only, rest black haired. First tarsale yellowbrown at base, elsewhere black.

Abdomen. First 2 segments deepredbrown, black haired, except the white, white haired rapier. Third to 6th segment blackbrown, segmentations indistinctly paler with a small number of white hairs in the median line on each segment. Lateral borders of tergites of the first 4 segments of the abdomen white haired. Fifth and 6th tergite with a small triangular white haired spot. Ventral surface olivebrown in the median line, black haired. Segmentations and sides greyish, white haired. Seventh segment wholly black haired.

29. *Haematopota tuberculata* DE MEYERE. (♀) Pl. 4, Fig. 13; Textfig. 28,

References:

DE MEYERE, Tijdschr. v. Entom. LIV, p. 284 (1911).

Habitat:

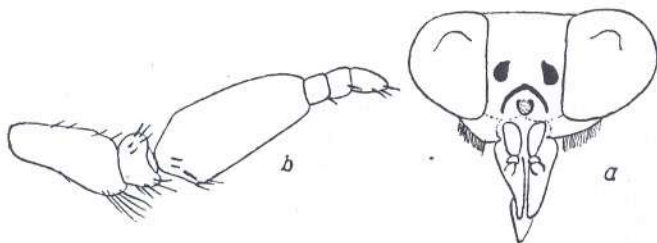
Type ♀ from Java, Goenoeng Pantjar, Buitenzorg, Residency Batavia, March '08, EDW. JACOBSON Coll. N.A.M.

A very peculiar species, characterised by the tuberculate eyes. Forehead browngrey with rudimental callus. Cheeks and beard greywhite haired. Palpi yellow-olivebrown. Antennae yellow — to reddish yellow, third joint not distinctly broader at base, longer than the foregoing joints together. Thorax dark havannabrown with a white median stripe and a similar spot on the scutellum.

Apical band of wing single, interrupted in the middle of the submarginal cell. White triangles in all posterior cells, except the 4th. Legs brownish; 2 white rings on middle and posterior tibiae. Abdomen chocolatebrown, lateral borders of first 2 tergites broadly white, furthermore a brownish median pale stripe is found.

Table of dimensions:

Bodylength	8,8 m.M.
Width of thorax	2,8 „
Wingexpanse	18,4 „
Length of wing	7,8 „
Breadth of wing	2,8 „
Foreheadindex	1,4



Textfig. 28.

H. tuberculata DE MEYERE ♀. a. head, b. antenna.

The Head. (Textfig. 28). Forehead brownish-grey tomentose, black haired, almost the same width throughout. Paired spots neither reaching to the eyes, nor to the callus, which is rudimental and consists in a round spot, surrounded by a fine redbrown margin, marking a fine rising moon. Cheeks and face greywhite, without any black spots,

white haired. Beard same colour Palpi olivebrownishyellow, first joint white haired, second joint black haired, intermixed with some white hairs, point blunt and narrow. Antennae, first 2 joints yellowbrown, first joint white haired, with a dorsal median row of black hairs, second joint black fringed. Third joint longer than the foregoing joints together, reddishyellow, basal annulation not very broad, flat, some black hairs on the dorsal border.

Thorax, dark havannabrown, black haired, greyish on foreborder, adorned with a median white longitudinal stripe, 2 white, triangular spots at the level of the sutures, remnants of the lateral longitudinal stripes and a median white spot on the scutellum. Lateral borders of the scutum whitish. Pteropleuron brownishgrey, black haired. Sides and breast browngrey, white haired, mesosternumlobus brownblack haired. Wings with apical crossband single, narrow, interrupted in the middle of the submarginal cell. White triangles in all posterior cells, except the fourth. White rosettes fine. Both basal bars not connected at the hindborder of the wing. Halteres, stalk white, club yellowbrown. Legs brownish. First leg, Coxa pale olivebrown, white haired, trochanter tawny, femur pale havannabrown or dark olivebrown, black haired on dorsum, distal lateral border white haired. Tibia reddish havannabrown, black haired, except on the white, white haired basal ring. Tarsalia black haired. Second leg. Coxa and trochanter similar, femur yellowbrown, white haired, with some black hairs at apex on dorsum. Tibia havannabrown, black haired with 2 white, white haired rings, first tarsale white, black haired other tarsalia redbrown, black haired. Third leg, Coxa browngrey, white haired, trochanter reddishyellow, femur yellowbrown, white haired, with a number of black hairs on dorsum at apex, tibia and first tarsale as in second leg, other tarsalia havannabrown, black haired.

Abdomen chocolatebrown with broad, white, white haired lateral borders to the first 2 tergites, segmentations paler brownwhite, yellow and white haired; a pale median yellow-brown, broad, yellowbrown haired stripe is visible on the first 2 segments. Tergites elsewhere black haired. Ventral surface, first two segments greywhite, white haired, following segments with broad white, white haired segmentations and narrow havannabrown, wholly white haired bases. Seventh segment wholly black haired.

30. *Haematopota intermedia* nov. spec. (♂) Pl. 4, Fig. 1; Textfig. 29.

Habitat:

Type ♂ from Sumatra, Wai Lima, Lampong Districts, KARNY coll.

Coll. B.Z.M.

Our knowledge about the males of the different *Haematopota* species is incomplete and fragmentary, as the males of most species are unknown up to the present. So it is not always easy to say whether a male belongs to an already known species or to a new species. The forelaying male however could not be brought to one of the known species.

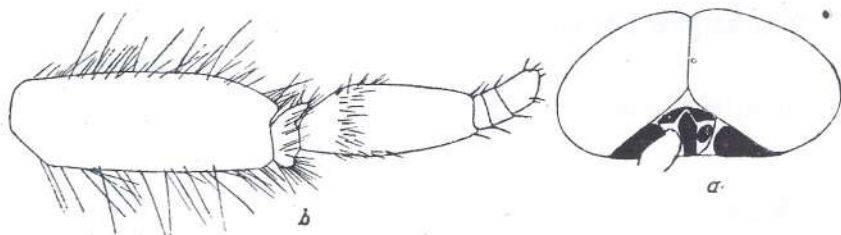
It is reddishbrown, abdominal segmentations yellowbrown. Head holoptic. Eyes, upper $\frac{1}{3}$ large-facetted, reddishbrown; lower $\frac{2}{3}$, black, small-facetted. Frontal callus reduced to an indented halfmoon-shaped spot. Cheeks with a large triangular black spot; face white with reddishbrown upper border. Antennae brown, first joint strongly swollen, cylindrical, equal in size to the third joint. Palpi brownish, white haired. Wings dullbrown with a single apical cross-band, paler centres in most of the cells. Basal bars reduced to some spots, neither connecting nor reaching the hindborder of the wing. Triangular spots in all posterior cells except the 4th.

Table of dimensions.

Bodylength	10	m.M.
Width of thorax	3	„
Width of abdomen	3	„
Wingexpanse	21	„
Length of head	2	„
Length of thorax	3,8	„
Length of abdomen	6	„
Length of wing	9	„
Breadth of wing	3,2	

The Head. (Textfig. 29). Eyes as mentioned above. Callus black, halfmoon-shaped, composed of 2 triangles, connected in the median line, indented at its lower border, this space being filled up with an elongate black spot, which reaches till between the antennae. Cheeks white with a large black haired spot between the eyes and the lower border of the

callus. Clypeus white, upper border brownish. Palpi shining goldenbrown with a rather sharp point, first joint black and white haired, second joint thick white haired. Antennae, first joint long, equal in size to or even slightly longer than the third joint, very stout, colour ranging from dark blackbrown to shining black; pubescence long, erect, black, second joint short, provided with a short dorsal blunt tooth, black, black haired; third joint dusky blackbrown with a velvetyblack stylus, basal annulation broadened at base, showing a ring of black hairs at its broadest point. Proboscis, stalk white, white haired, sugarflaps black haired.



Textfig. 29.

H. intermedia s. s. ♂. a. head, b. antenna.

Thorax. Scutum and scutellum dull redbrown, black haired, pteropleura blackbrown, black haired. Breast white, white haired, mesosternumlobus tinged redbrown. Wings dull cacao-brown, centres of most cells paler, hind border paler than the apex. Apical crossband single, reaching the hindborder, broad, almost straight, narrowed in the middle on the upper branch of the cubital vein. First and second rosette distinct, composed of a number of very fine spots. The first rosette presents a number of white spots in its centre, second rosette without central white spots. Third rosette, indistinct. Triangular spots in the openings of the posterior cells arranged as mentioned. Paired transversal spots present in all posterior cells. Basal transverse wingbars broken up into a number of white spots, not reaching the hindborder of the wing. Foreborder of wing brownishwhite, stigma dark havannabrown. Squama dullbrown, antesquama greyish. Halteres, stalk ivory-coloured, club dullhavannabrown. Legs. First leg, Coxa white ringed, white haired, apical half dark havannabrown, black haired, femur dark redbrown on dorsum, knee yellowbrown, black haired, venter shining goldenbrown, bare; Tibia swollen to the apex with a yellowbrown ring at base, elsewhere black, wholly black haired. Tarsalia blackbrown. Second leg, Coxa greybrown, white haired, trochanter redbrown; femur brownred, knee yellowbrown, black haired at apex, some white hairs at base, distal lateral borders fringed with long white, erect hairs, ventral surface blackbrown, black haired. Tibia nearly wholly white, white haired, extreme base brownish, apex-ring yellowredbrown, black haired. First tarsale basally white, redbrown at apex, black haired as all other tarsalia. Third leg, Coxa as in first leg, wholly white haired, trochanter redbrown, white haired. Femur faintly dull havannabrown-violet, knee narrowly yellowbrown, lateral border white haired, except the apical $\frac{1}{3}$, which is thick black haired, dorsum black haired. Tibia nearly identical to the fore tibiae, yellowredbrown, white haired at base, proximal lateral border with some white hairs intermixed between the black ones. Tarsalia redbrown, black haired.

Abdomen redbrown, darker to the apex, with narrow, yellowbrown segmentations, ventral surface greywhite with median, longitudinal blackishbrown, black haired stripe, sides and segmentations white haired. *H. intermedia* S.S. differs from *H. unizonata* Ric. i.a. by the absence of white rings to the middle tibiae and of white bases to the other tibiae, the absence of longitudinal stripes on the thorax, the narrower apical wingband. From *H. atomaria* Wlk. it differs by the pubescence on the palpi, the thicker and longer first antennal joint and the absence of longitudinal thorax-stripes.

31. *Haematopota maculata* DE MEYERE. (♀) Pl. 4, Fig. 8; Textfig. 30.

References:

DE MEYERE, Tijdschrift v. Entom. Vol. 54, p. 288 (1911).

Habitat:

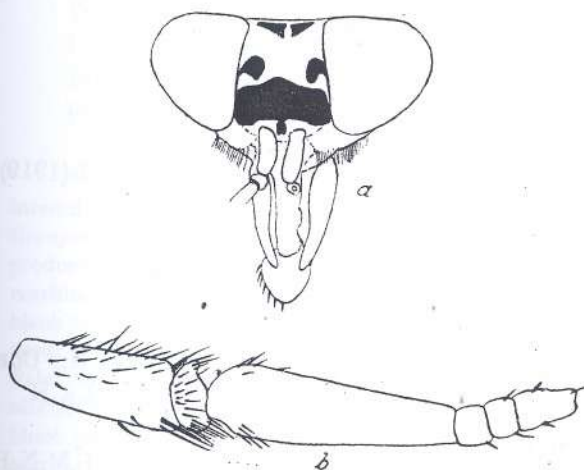
Type ♀ from Java, Semarang DRESCHER 12.'05

Coll. N.A.M.

This species has very peculiar wingmarkings, as the rosettes have no darker centres but are wholly white and connect with each other, so that the basal part of the wing has become almost wholly white. Apical crossband double, broad, white triangles in the openings of all posterior cells, connected with the paired transverse spots in the same cells. Callus blackbrown, band-shaped, paired spots comma-shaped, touching the eyes. Cheeks and face white, white haired. Palpi olivebrown, black haired on 2d joint. Antennae yellowbrown, 3d joint longer than the basal ones together, slender. Thorax havannabrown with 2 lateral distinct, white longitudinal stripes and a finer median one. Legs brown, middle and posterior tibiae with 2, rather indistinct, white rings. Abdomen havannabrown, black haired, white haired at segmentations.

Table of dimensions.

Bodilylength	9	m.M.
Width of thorax	3	"
Width of abdomen	3,2	"
Wingexpanse	22,6	"
Length of wing	9,8	"
Breadth of wing	3,2	"
Foreheadindex	1,1	



Textfig. 30.

H. maculata DE MEYERE ♀. a. head, b. antenna.

The Head. (Textfig. 30). Forehead olivebrown, mainly black haired, white haired near the callus, narrower at vertex than it is at base. Callus band-shaped, reaching the eyes, elevated at its upper border, concave at its lower border, where a narrow brownish spot wedges between the antennae. Paired spots comma-shaped, velvetyblack, touching the eyes. No unpaired spot. Cheeks and face white, white haired, no black spots on them. Palpi olivebrown, first joint white haired, intermixed with some black pubescence, second joint awl-shaped, slightly swollen at base, black haired. Antennae, first and second joint

yellowbrown, black haired, third joint longer than the first 2 joints together, basal annulation longer than the first joint, yellowbrown at base, where it hardly broadens and presents some black hairs, then duskier, dark yellowbrown, stylus black.

Thorax havannabrown with 2 distinct, straight, white, longitudinal, lateral stripes, reaching to the scutellum and a finer median one of the same length. Lateral borders of the scutum white tomentose. Pubescence on the scutum white, intermixed with some black hairs. Scutellum same colour as scutum, paler at borders, white haired. Pteropleuron havannabrown, black haired at base, white haired at apex. Sides and breast brownishgrey, white haired with some brownish hairs on the mesosternumlobus. Legs. First leg. Coxa brownishwhite, white haired with some brownblack hairs at apex, trochanter reddishbrown. Femur pale havannabrown, knee yellowbrown, black haired, lateral border brownish white tomentose. Tibia white, white haired on basal half, intermixed with some black hairs, rest havannabrown, black haired. Tarsalia black, black haired. Second leg, femur yellowbrown, white haired on basal half, apical part more tawny, black haired, knee yellowbrown, tibia yellowbrown, mainly black haired, with 2, rather indistinct, white rings, beset with some paler hairs. Tarsalia whitish at base, black haired. Third leg, femur havannabrown, black haired with a few white hairs on distal lateral border. Tibia identical, as also the tarsalia. Wings presenting the same scheme as the other species but the rosettes have become white spots, connected with each other, the basal transverse bars confluent with the white wingbase. Apical band double, prolonged into the series of transverse paired spots, present in all posterior cells and connected with the white triangles, being found in the openings of all posterior cells. Halteres, stalk white, club blackbrown.

Abdomen havannabrown, black haired on dorsum, segmentations white haired. Ventral surface whitish, white haired at segmentations, elsewhere black haired. According to DE MEYERE this species is nearly allied to *H. pungens* DOLESCHALL, differing from *H. maculata* i.a. by the broader thoraxstripes, the wingmarkings and the brighter third antennal joint.

32. *Haematopota irrorata* MACQUART. (♀) Pl. 4, Fig. 10; Textfig. 31.

References:

- MACQUART, Dipt. exot., 1 (I), p. 167, pl. XIX, fig. 3 (1838).
 VAN DER WULP, Sumatra Exped. Dipt. XIX, pl. 8, fig. 13 (1881).
 OSTEN SACKEN, Ann. Mus. Civ. Genova XVI, p. 419 (1882).
 BIGOT, Bull. Soc. Zool. France XVI, p. 75 (1891).
 RICARDO, Rec. Ind. Mus. Vol. IV, p. 352, Pl. XVIII, fig. 30 (1911).
 DE MEYERE, Tijdschrift v. Entom. Vol. 54, p. 280 (1911).
 „, Tijdschrift v. Entom. Vol. 63, p. 56 (1924).
 EDWARDS, Journal of the Fed. Malay States Museums Vol. VIII, p. 27 (1919).
 SURCOUF, Genera Insectorum, Tabanidae, Fasc. 175, p. 34 (1921).

Habitat:

Isle Sumatra

Type ♀ from Java Museum, locality unknown

1 ♀ from Bandar Baroe, Sumatra's East Coast on 16.5.'21, 850 M., Cor-

PORAAL

Coll. N.A.M.

3 ♀ ♀ from Brastagi 5.'18, CORPORAAL

1 ♀ „ Soeban Ajam 7.'16, Bengkoelen, JACOBSON

Coll. L.M.N.H.

1 ♀ „ Lebong 5.'78

„

1 ♀	„	Grabak 5.'77	„
2 ♀ ♀	„	Alahan Pandjang 9.'77	„
4 ♀ ♀	„	Goenoeng Singalang 7.'78, BECCARI	Coll. Genova
2 ♀ ♀	„	Barong Baroe, Korinchi, Main range 4500 feet 6.'14	Coll. F.M.S.M.

Federated Malay States

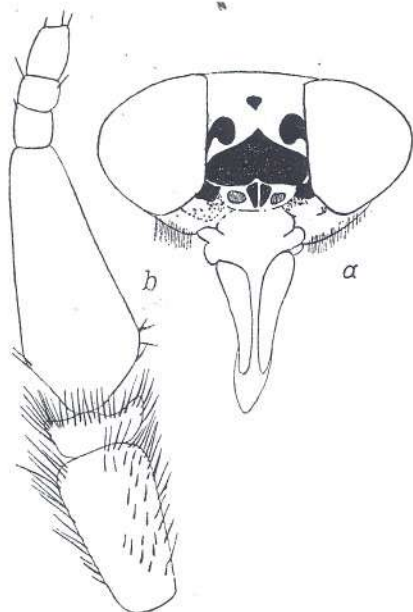
1 ♀	from Negri Sembilan, RIDLEY 1900	Coll. BR.M.
	Isle Borneo	
1 ♀	from Kōbele, N. Borneo, D. CATER 1895	„

A species nearly allied to *H. pungens* DOLESCHALL but differing i.a. in the colour of face and cheeks, the colour and pubescence of the palpi, the antennae and the shape of the apical wingcrossband. Frons havannabrown, black haired. Callus brownyellow, band-shaped, paired spots present. Cheeks and face pale yellowbrown, yellowwhite haired. A small black spot connects eyes and antennae. Antennae yellowbrown with shining first joint, third joint blackbrown, longer than the first 2 joints together, not very broad. Palpi olivebrown, black-haired at apex of second joint. Thorax havannabrown with paler longitudinal stripes. Wings without white triangles in the openings of the posterior cells, a rudimental single apical crossband. Legs yellowbrown, middle and hind tibiae with 2 white rings. Abdomen unicolorous in most specimens, darkolivebrown, black haired, in other specimens segmentations slightly paler. Variations occur, see below.

Table of dimensions.

Bodylength	11	m.M.
Width of thorax	3,2	„
Width of abdomen	3,5	„
Wingexpanse	23,2	„
Length of wing	10	„
Breadth of wing	3,2	„
Foreheadindex	1,5	

The Head. (Textfig. 31). Forehead, pale havannabrown, darker at vertex, black haired, intermixed with some yellowbrown hairs. Paired spots velvetyblack, comma-shaped, reaching to the eyes but not resting on the callus, unpaired spot smaller. Callus brownyellow, band-shaped, produced to a point at its apical border, nearly straight, faintly concave at its lower border, reaching to the eyes. A small black spot is present between the antennae, whereas another black spot connects eyes and antennae at each side of the face. Underneath some black points occur. Cheeks and face elsewhere pale yellowbrown, yellowwhite haired. Beard same colour. Palpi olivebrown, white tomentose, brownishwhite haired on first joint and at base of the second joint, which grows afterwards dark havannabrown, black haired, and tapers to a blunt point. Antennae first joint yellowbrown to tawny, shining, swollen at apex, black haired, second joint blackbrown, halfmoon-shaped, black haired, third joint not very broad at base, blackbrown, slightly longer than the first and second joint together, basal annulation almost equal in size to the first joint or slightly longer, stylus narrow, blackbrown.



Textfig. 31.
H. irrorata Macq. ♀
 a. head, b. antenna.

Thorax dark havannabrown with a median yellowbrown tomentose stripe, divided into two parts by a median blackbrown stripe, reaching to the suture, and with two dark brown lateral stripes, ending at the level of the suture in a yellowbrown tomentose spot. Lateral borders of scutum yellowbrown tomentose, connecting with 2 comma-shaped transverse spots, lining the hindborder of the scutum. Pubescence on the scutum yellowwhite on foreborder, elsewhere yellowwhite and black hairs are intermixed. Breast and sides yellowbrown, yellowwhite haired. Wings smokybrown without white triangles in the openings of the posterior cells. Apical band single, incomplete, reduced to a white spot at each side of the upper cubital branch. Paired transverse spots in all posterior cells. Rosettes visible, both apical rosettes connected, filled up with a number of chromosome-shaped white lines. Third rosette indistinct, bordered by one of the basal transverse bars which forms with a white spot, resting on the anal vein, a sort of eye. Halteres stalk reddishyellowbrown, club havannabrown. Legs. First leg, Coxa yellowbrown, white haired, trochanter blackbrown, femur tawny, black haired with some yellowbrown hairs at the distal lateral borders, intermixed between the black ones.

Tibia havannabrown at extreme base, then white, white-haired, apical half havannabrown, black haired, Tarsalia black, black haired. Second leg, femur yellowbrown, yellowwhite haired; Tibia with 2 whitish, white haired rings, elsewhere havannabrown, black haired. First tarsale brownishwhite at base, black haired, other tarsalia brownblack, black haired. Third leg similar, apical ring on the tibia not distinct on dorsum, which is mainly black haired.

Abdomen dark olivebrown on first 3 segments, then blackbrown, black haired. Ventral surface more yellowbrown, yellowbrown haired, except on seventh segment which is wholly black haired.

In one of the Brastagi females the antennae are darker, the dorsal thoracal markings more distinct and the abdominal segmentations narrowly paler yellowbrown, whereas the centres of the rosettes present no white spots. The rosettes on the wings of the Gunung Teleman female are composed of finer spots, the apical wingband almost reaches the foreborder of the wing, paired spots approaching the rosettes. First antennal joint yellowbrown, rest identical, on the abdomen yellowwhite segmentations are indicated. Median white thoracal stripe absent, other thoracal markings indistinct. The females from Lebong probably belong to *Haematopoga pungens* DOLESCHALL, see there, the specimens described by RICARDO on page 353 after specimens present in the British Museum are certainly identical with the described specimens.

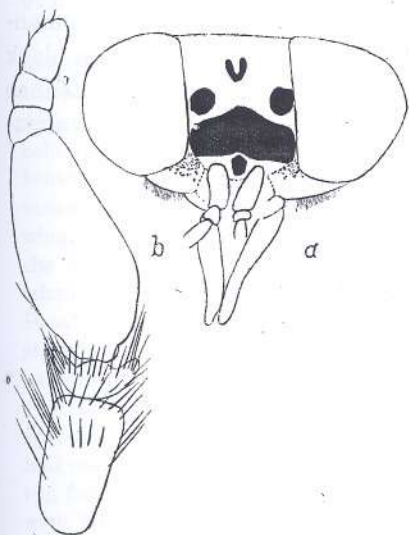
32a. *Haematopota irrorata* MACQUART, subspec. *cristata*
 nov. subspec. (♀) Textfig. 32.

Habitat:

Type ♀ from Sumatra Air Gaung Ketjil 8.16
 3 other ♀♀ from same locality

Coll. L.M.N.H.

These females are in so far distinct from the described species, that I propose to bring them to a subspecies named *cristata*. Bodylength 10 m.M.; Wingexpanse 23,2 m.M.; Length of wing 10 m.M.



Textfig. 32.

H. irrorata, subsp. *cristata* ♀
a. head, b. antenna.

The Head. (Textfig. 32). Callus distinct in shape from that of *H. irrorata*, forehead reddy-brown, index 1,3. Brown spot on eyes and between antennae rudimental, palpi in the type havanna-brown, first joint yellowbrown haired at base, apex black haired, second joint black haired. In the second specimen the first joint is almost wholly yellowwhite haired, intermixed with a few black hairs at apex, second joint yellowwhite haired at base, elsewhere black haired. Another specimen has a blackbrown second joint, yellow haired at base. First antennal joint blackbrown to shining black. Beard yellow haired.

Thorax. Scutum with a broad white hind-border, from which a distinct white median stripe starts, running in forward direction but not reaching the middle of the scutum. Besides two white stripes are present, ending at the level of the suture in a triangular white spot. Lateral borders of scutum white. The type female shows no other deviations from the *H. irrorata* typical form. In the second female the apical wingband is rudimental and visible only on the left wing, spots composing the rosettes finer and smaller.

Abdomen with yellowwhite segmentations. In a third female the median white thoracal stripe fails. Since the typical *H. irrorata* varies much I feel not responsible to form a new species for these specimens but bring them to a subspecies.

33. *Haematopota paucipunctata* nov. spec. (♀) Pl. 3, Fig. 1; Textfig. 33.

Habitat:

Isle Java

Type ♀ from Gamboeng, Tea-estate on Goenoeng Tiloe 1450 M. Preanger Regencies on horse, SCHUURMANS STEKHOVEN 27.9.'22 Coll. V.S.L.

9 other ♀♀ from the same locality, SCHUURMANS STEKHOVEN, 27.9.'22 on horse Coll. V.S.L.

2 ♀♀ same locality, KERKHOVEN leg, 5.'23

1 ♀ „ Pasir Datar, Tea-estate, Preanger Regencies, BARTELS 1.'01 Coll. B.Z.M.

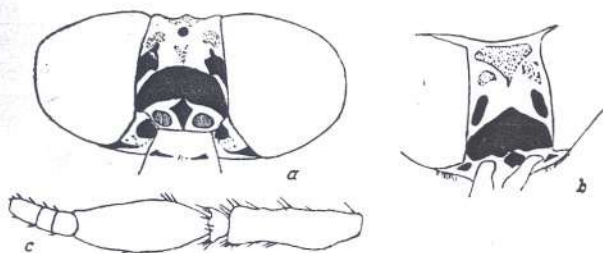
1 ♀ „ Goenoeng Gedeh, PIEPERS leg. Res. Batavia Coll. N.A.M.

H. paucipunctata is closely allied to the foregoing species. The apical wingband however starts at the foreborder of the wing and is more complete than

in *H. irrorata*, the basal transverse bars don't connect, neither at their upper nor at their lower border as in the foregoing species. Further it differs in the shape of the callus, the palpi and the antennae. It is a slender species with a dark coffeebrown thorax, an abdomen, olivebrown at base, darker to the apex. Middle and posterior tibiae with 2 white rings. Forehead rather narrow with a broad dark black halfmoon-shaped to triangular callus. Cheeks white tomentose with 2 black spots and a row of dark points. Face brownyellow with a black spot between the antennae and 2 other brownish triangles below them. Antennae brown on basal annulation, darker at apex, slender. Palpi awl-shaped, havanna-brown, black haired.

Table of dimensions.

Bodylength	varying from	9,5 m.M.	to	11	m.M.
Width of thorax	" "	2,5	"	3	"
Width of abdomen	" "	2,5	"	3,6	"
Wingexpanse	" "	22	"	24,8	"
Length of head	" "	1,5	"	1,8	"
Length of thorax	" "	3	"	4	"
Length of abdomen	" "	5,6	"	6,5	"
Length of wing	" "	9,6	"	11	"
Breadth of wing	" "	3	"	3,8	"
Foreheadindex	" "	1,09	"	1,33	"



Textfig. 33.

H. paucipunctata s. s. ♀ a, b, head, c. antenna.

The Head. (Textfig. 33).

Forehead faintly dullyellow-brown, narrower at vertex. The shining black transverse callus is somewhat variable in shape and may appear as a halfmoon or as a more or less heartshaped triangle, reaching to the eyes. Velvetyblack paired comma-shaped or bacilliform spots resting on the callus and reaching to the eyes. Unpaired spot mostly present, absent in

3 out of 12 specimens. Apart from these spots the forehead shows 4 darker brown shadows. Pubescence mainly black in the median line, on lateral borders yellow and brownblack hairs are intermixed. Vertex wholly brownblack haired. Postocular rim yellowbrown pubescent. Eyes with 4 transverse green bands, both middle ones broadest, and connected near the occiput. The lowest stripe is nearly straight and very narrow, the apical stripe is wavy, curving back with a sharp edge. Between the antennae one finds a quadrangular black spot. Face yellowbrown tomentose, white haired, adorned on its upper border with 2 small triangular black spots, connected by fine brown points. On the upper, brownish, black haired part of the cheeks a black roundish spot appears and a likewise black spot near the lower eye-angles, triangular in shape and connected with the first one by a row of fine black points.

Cheeks elsewhere white, white haired. Beard white. Palpi blackish dull havannabrown, black and yellow haired. Antennae long and slender, first joint chromate yellow at base, then darker, yellowbrown, curved, slightly swollen in the middle, black haired, equal in size to the basal annulation of the third joint. Second joint very small, cup-shaped, yellowbrown, black fringed. Third joint brownish at extreme base, then velvetyblack, hardly broader at base, crowned with black hairs.

Thorax dark coffeebrown with 2 longitudinal yellowbrown stripes, starting at the foreborder, fading away behind the suture, the hind part of the scutum only shows some traces of the same stripes. A yellowbrown transverse stripe connects the longitudinal stripes with the reddishbrown, black haired pteropleuron. The scutum is divided from the similar coloured scutellum by a fine transverse yellowbrown line. Pubescence on scutum and scutellum brownyellow and black. Breast bluishgrey in the middle, yellowbrown at sides and on the mesosternumlobus. Wings with a single apical crossband, not reaching the hindborder of the wing, composed of spots. In front of the apical wingband a faint, white spotlet is visible in the apex of the cubital cell. Rosettes rather indistinct with white spots in the centres. No triangular white spots in the openings of the posterior cells, paired transverse spots present. Basal bars not connected, reaching the axillary vein. Halteres, club darkhavannabrown, stalk white. Legs. First leg. Coxa greybrown, white haired, trochanter redbrown, femur havannabrown, black haired on dorsum, distal lateral border with a fringe of long, erect hairs, ventrally bare with some brownishyellow hairs at the lateral borders. Tibia clear, brown at extreme base, then broadly white, white haired, intermixed with some black hairs, apical half redbrown, black haired. First tarsale redbrown, black haired, other tarsalia black. Second leg, femur yellowbrown, yellowbrown haired at base, redbrown, black haired at apex; tibia with 2 white, white haired rings, elsewhere havannabrown, black haired. First tarsale white at base, apex black, other tarsalia black, black haired. Third leg similar, first tarsale brown-yellow at base, black at apex, other tarsalia black.

Abdomen olivebrown, darker havannabrown on the last 4 segments, darker shadows in the middle of the first 4 segments. Lateral borders of tergites yellow haired, pubescence elsewhere black. Segmentations indistinctly paler, fringed with yellow hairs. Ventral surface more redbrown, yellow haired, 7th segment black haired. The mentioned darker shadows are not always visible.

34. *Haematopota lata* RICARDO. (♀) Textfig. 34.

References:

RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 121 (1906).

„ Rec. Ind. Mus. Vol 4 p. 344 (1911).

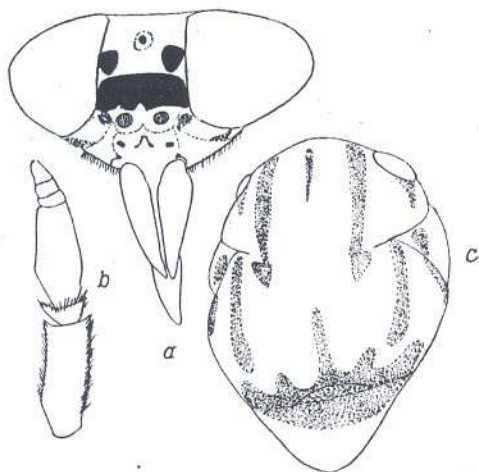
Habitat:

Type ♀ from Khasi Hills District, India (CHENNEL) 1878 Coll. BR.M.

5 ♀♀ from N. Chinese Hills, Burma, WATSON 4.'93 „

This species not occurring in our Archipelago is brought in comparison with the new species *nigrita* S.S. It is a broad-bodied species with a chocolate-brown thorax with longitudinal white stripes and other markings. Abdomen same colour, segmentations white tomentose. Middle and hind tibiae with 2 white rings. Forehead broad, coffeenutbrown, paired and unpaired spots present. Callus dark walnutbrown, straight-sided. Cheeks yellow with a crescentiform

spot and some brown patches. Face white. Palpi very plump, brownish, white haired. Antennae olivebrown-orangeousbrown, first joint slightly longer than the basal annulation of the 3d joint. Length 9 m.M.



Textfig. 34.

H. lata, Ric. ♀

a. head, b. antenna, c. thorax, as seen on dorsum white markings indicated by the dotted stripes.

The Head. (Textfig. 34). Forehead rather broad, nearly as broad as it is long, pale coffeenutbrown, black haired, eyeboards white. Paired spot, big, black, touching to the eyes; unpaired spot roundish, surrounded by a paler area. Callus walnutbrown, straight-sided above, incised below, reaching the eyes. Upper cheeks shaded with groups of brown patches and bearing a crescentiform spot near the jowls, cheeks elsewhere yellowwhite, white haired, beard white. Face white, white haired with some black, curved lines. Palpi very plump with blunt apex, brownish, white haired, some brown hairs being intermixed. Antennae with cylindrical, olivebrown, black haired first joint, showing a dorsal spur, second joint yellowishbrown with a dorsal spur. Third joint orangeousbrown.

Thorax chocolatebrown with a number of white tomentose stripes, see figure. Hindborder of scutum and foreborder of scutellum provided with a transverse crescentiform spot, prolonged by a number of white points, placed symmetrically to the median line. Pteropleuron with a roundish white spot, pubescence silvery white, intermixed with some black hairs. Breast whitish, white haired. Wings with a rather broad apical crossband, not reaching to the hindborder. A large white and a smaller white spot in the openings of the 5th and 3d posterior cell respectively. The usual rosettes present, like the paired transverse spots. The apical one of the basal transverse bars very wavy, reaching the hindborder of the wing and forming an eye with a spot situated on the anal vein. Legs yellowish, fore tibiae white, white haired on basal half, first tarsale of 2d leg whitish, middle and hind tibiae as mentioned.

Abdomen chocolatebrown with the segmentations 1—6 white tomentose, sticking to the bases of the following segments. Round white spots appear on the 3d—6th segment at each side of the median line, particularly large on the 4th and 5th segment, smaller on the other segments. Lateral borders of tergites whitish. RICARDO mentions further a grey indistinct median stripe, which I could not find however.

35. *Haematopota equitibiata* nov. spec. (♀) Pl. 4, Fig. 9; Textfig. 35.

Habitat:

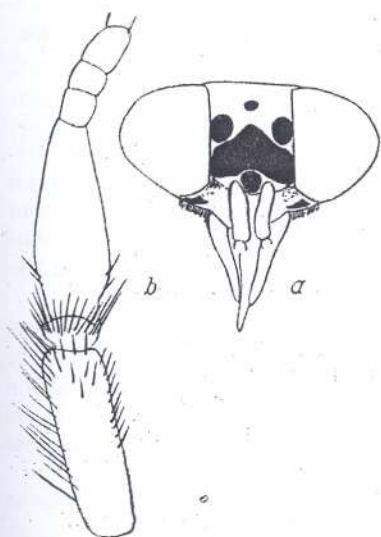
Type ♀ from Sumatra, Muara Sako 10.'15, EDW. JACOBSON Coll. N.A.M.
1 ♀ from Sumatra, Tanang Talu 5.'15 EDW. JACOBSON

Forehead havannabrown, black haired. Callus brownblack, convex, reaching

to the eyes. Paired spot comma-shaped, unpaired spot failing in type ♀. Other black spots between the antennae and on the cheeks, greywhite, white haired. Palpi havanna-brown with mainly black haired second joint. Antennae yellow-brown, stylus brownblack, first joint longer than the basal annulation of the third joint. Thorax havannabrown with 2 whitish, indistinct, longitudinal stripes. Wings with apical band single, not reaching the hindborder. White triangles distinct, in the openings of all posterior cells, except the 4th. Usual rosettes present, transverse basal bars broad, connected at the hindborder. Legs brownish, all tibiae white at base. Abdomen havannabrown, segmentations white, white fringed.

Table of dimensions.

Bodylength	8	m.M.
Width of thorax	3	„
Width of abdomen	3	„
Wingexpanse	19,4	„
Length of wing	8,2	„
Breadth of wing	2,6	„
Foreheadindex	1,35	



Textig: 35.

H. equitibiata s. s. ♀
a. head, b. antenna.

The Head. (Textfig. 35). Forehead havanna-brown, mainly black haired, intermixed with some yellow hairs, almost the same width throughout. Callus brownblack, convex, reaching to the eyes, upper border with a pointed elevation, lower border concave. Paired spot comma-shaped, reaching to the eyes, separated narrowly from the callus, unpaired spot absent in the type, present in the other female. A small velvetybrown spot is found between the antennae and two other similar ones, connected with each other by black points, on the upper cheeks. Cheeks elsewhere greywhite, white haired as is the beard. Palpi dark havannabrown, first joint white haired, second joint white haired at base, where it is incrassate, ending in a slender, rather acute, black haired point. Antennae, first joint long, longer than the basal annulation of the third joint, yellowbrown, black haired as is the small second joint; third joint rather narrow, pale redbrown at base, havannabrown at apex, stylus brownblack.

Thorax havannabrown, in bad condition, paler on foreborder, with 2 indistinct whitishbrown longitudinal stripes. Lateral borders of scutum paler havannabrown as also the pteropleuron, pubescence white

and black, intermixed. Sides and breast grey-olivebrown, white haired. Wings as described above. Apical band pointed at the apex, broader below. A white triangle may be indicated

in the 4th posterior cell at opening. Paired transverse spots in all posterior cells. Both apical rosettes connected with broad outlines, first rosette closed with a broad white spot, without central spotlets, second rosette nearly wholly filled up with small white spots. Third rosette irregular. Legs. First leg, Coxa white, white haired on basal half, apex havannabrown, black haired. Femur blackbrown, black haired, tibia white, white haired on basal half, apex blackbrown, black haired. Tarsalia brownblack, black haired. Second leg, femur paler havannabrown, black haired, intermixed with some white hairs, knee yellowbrown. Tibia nearly wholly white, white haired, except the apical blackbrown, black haired ring. First tarsale whitish at base, then blackbrown, black haired, other tarsalia blackbrown, black haired. Third leg. Coxa browngrey, white haired, trochanter blackbrown, femur blackbrown, black haired, with a few white hairs on the distal lateral border. Tibia white, white haired on the basal half, apex blackbrown, black haired. Tarsalia blackbrown, black haired.

A b d o m e n havannabrown, black haired, segmentations white, white fringed. Ventral surface with havannabrown, black haired bases to the segments and white, white haired segmentations.

36. *Haematopota borneana* RONDANI. (♀)

References:

- RONDANI, Ann. Mus. Civ. Genova, VII, p. 461 (1875).
 BIGOT, Bull. Soc. Zool. France, XVI, p. 78 (1891).
 RICARDO, Rec. Ind. Mus. IV, p. 329 (1911).

Habitat:

Borneo without further locality.

I did not see this species, so I have to refer to RONDANI's and RICARDO's descriptions. Forehead dullbrown, callus wide, ferrugineous brown. Face reddish. Palpi yellow. Antennae yellow, first joint nearly as long as the third. Thorax brownish. Wings with apical band single. Legs, all tibiae white at base. Abdomen yellowish brown at base, then black, segmentations white. Length 6,5 m.m.

The Head. Forehead dullbrown with 2 rather small black spots, callus reddishbrown shining, transverse, produced in the middle on posterior border near antennae. Face dull reddish, no dark spots on it. Cheeks with 2 impressed spots at sides of the yellow palpi. Antennae, first joint yellowish brown, second joint pitchy blackish with the greater part of the third, whose apex is black.

Thorax red with a broad, black stripe and traces of lateral ones, side-spots brownish, not very distinct, pleurae paler coloured. Wings brownish, the costal border towards the apex browner, first rosette distinct, the spots small, with the apical band single. Halteres with a white stalk and ferrugineous club. Legs with anterior and posterior femora pitchy black, the intermediate ones yellowish brown; all tibiae white with the apex blackish; anterior tarsi wholly black, the posterior ones reddish at base.

Abdomen at the base yellowish brown, then black, with white segmentations to the posterior segments.

37. *Haematopota unizonata* RICARDO. (♂)

References:

- RICARDO, Ann. Mag. Nat. Hist. (7), XVIII, p. 117 (1906).
 „, Rec. Ind. Mus. IV, p. 332 (1911).

PRATT, Journ. Trop. Vet. Sc. IV, p. 390 (1909).

Habitat:

Type ♀	from Ceylon 1892, YERBURY	Coll. BR.M.
Type ♀	from Ceylon 1891, YERBURY, from Hakgala	"
3 ♀ ♀	from Ceylon 5.1891, YERBURY, from Niuwara Eliya, common	Coll. BR.M.
♀ ♀	" Ceylon 1890/'98 from Pundaluoya	"
1 ♀	" Ceylon 1897, GREEN from Galagedara	"
♀ ♀	" The F.M.S. collected by PRATT.	

This species does not occur in the Dutch East Indian Archipelago. Also I have not revised RICARDO's description of the same, but as it occurs in the Federated Malay States it possibly may be found one day in our countries and so I will give RICARDO's description for the use of future researchers.

It is a reddishbrown species, with rings on the middle tibiae only; the other tibiae white at base, antennae long, cylindrical. Length 8 m.M.

The Head. Forehead brownish yellow, darker on the vertex, grey at sides. Frontal callus dark brown, shining, concave on the anterior (lower) border, convex on the posterior (upper) border; the spot between the antennae black, oblong; the paired spots black, oblong, just reaching the eyes, with grey borders. Face grey; a yellowish stripe covered with brown dots and spots reaches from the antennae to the eyes on each side. Beard white. Palpi yellow, white haired. Antennae long and slender, reddish yellow, third joint darker; first joint not quite so long as the third, the second small, both black haired.

Thorax reddish brown, the shoulders, two stripes which reach the suture and end in two spots, the base of thorax and a spot on each side grey; traces of a short white pubescence on the dorsum; breast brown, brown haired, then grey, white haired; scutellum reddish brown. Wings brownish, with brown veins and an appendix, the pale markings distinct, three rosettes present, apical band single. Legs dark brown, the middle tibiae redder with two white rings, and the base of the tarsi yellowish, as also the posterior tarsi; middle femora reddish, white haired.

Abdomen redder brown, segments bordered with narrow whitish bands; pubescence black, white on the borders of the segments and at the sides; traces of grey spots on the apical segments; the under side brown with white borders to the segments, grey at sides.

The species is distinguished from *H. atomaria* Wlk. by the narrower frontal callus, and by the longer cylindrical first antennal joint.

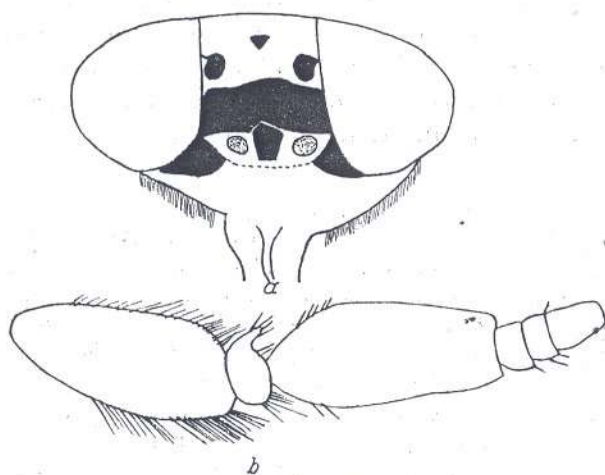
38. *Hzematopota splendens* nov. spec. (♀) Textfig. 36.

Habitat:

Type ♀	from the Federated Malay States, Bukit Kutu, 15.5.'03, PRATT	Coll. BR.M.
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H. splendens nov. spec. is closely allied to *H. atomaria* Wlk. and *H. truncata* S.S. but differs from both, as no truncate spot is visible on the second abdomi-

nal segment. An unpaired spot, failing on the forehead of *H. atomaria*, is present, wingpattern different from that in both species. Forehead broad, callus band-shaped, blackbrown. Paired spots comma-shaped, black. Black spots between the antennae and on the cheeks. Cheeks elsewhere white, white haired. Palpi brownish white haired, apex black haired. Antennae black, third joint longer than the foregoing joints together, first joint incrassate, shining. Thorax uniformly brown, white haired. Wings with a single broad apical band, broken into 3 white spots. White triangles in the openings of all posterior cells, except the fourth. Usual rosettes present. Middle tibiae with 2 white rings only, other tibiae white at base. Abdomen chocolatebrown, segmentations slightly paler, white fringed at sides only.



Textfig. 36.

H. splendens s.s. ♀. a. head, b. antenna.

its white haired base, apex blunt, black haired. Antennae black, first joint swollen, cylindrical, shining black, black haired, slightly shorter than the basal annulation of the dull velvetyblack third joint, second joint short, darkblack, basal annulation of the third joint broadened and flattened at base, fourth annulation of the same equal in size to the 2 foregoing annulations together.

Thorax almost uniformly brown with indications of 2 longitudinal white haired, whitish stripes Scutellum same colour as scutum. Wings nearly the same pattern as in *H. truncata* S.S., apical band broken into 3 pieces. White triangles arranged as mentioned. Third rosette with smaller spots than in *H. truncata*. Second rosette without central spots. Apical transversal basal bar finer. Halteres redbrown. Legs: Fore tibiae redblackbrown at extreme base, then white, white haired, apical half black, black haired. Middle tibiae blackbrown, black haired at extreme base, with 2 unequal white rings of which the basal one is the broadest. Hind tibiae white, white haired on basal half, apex black, thick fringed with black hairs. All tarsalia black.

Abdomen dark chocolatebrown, segmentations as described, 7th segment with a thick white hairfringe. Ventrally segmentations, narrowly white, white fringed.

The Head. (Textfig. 36).

Forehead broad, whitishgrey-brown. Callus big, band-shaped, blackbrown, nearly straight at upper border, incised at its lower border. Paired spot comma-shaped, reaching to the eyes, smaller than the same in *H. truncata*, unpaired spot present, forming the centre of a number of white lines, radiating in different directions. Between the antennae one finds a quadrangular, velvetyblack spot. Each cheek presents at its upper border a triangular, chocolatebrown spot, cheeks elsewhere white, white haired. Beard white. Face white, white haired. Palpi rather stout, first joint white haired, second joint, swollen at

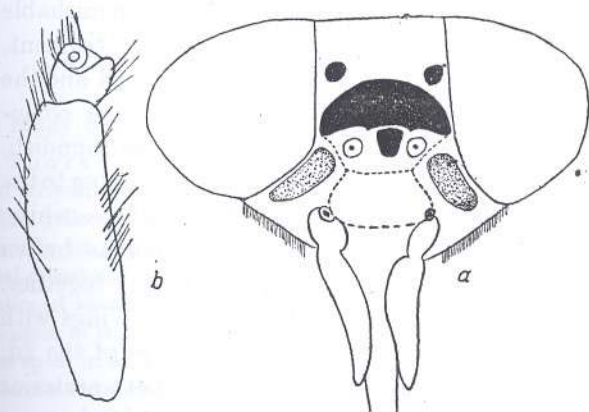
39. *Haematopota nigricans* nov. spec. (♀) Textfig. 37.

Habitat:

Type ♀ from Sumatra, Korinchi Peak 7300 feet 5.14

Coll. BR.M.

A big species with long, darkbrown wings, dotted with a big number of small white spots, arranged in rosettes and transverse basal bars, apical cross-band single, not reaching the hindborder. A white triangle in the opening of the 5th posterior cell only. Forehead blackbrown, callus low, medusiform, black. Paired spots round. Cheeks on upper border with an elongate dotted shadow, elsewhere grey, white haired. Palpi reddish blackbrown, white and black haired. Antennae incomplete, olivebrown, with very long first joint. Thorax chocolatebrown, with 2 longitudinal white stripes. Legs blackbrown, with 2 white bands to the middle tibia only. Abdomen blackbrown with paler whitish, white fringed segmentations.



Textfig. 37.

H. nigricans s. s. ♀ a. head, b. antenna, partly.

The Head. (Textfig. 37). Forehead broad, blackbrown. Callus not huge, black, medusiform, barely reaching to the eyes. Paired spots black, round. Unpaired spot failing. Between the antennae one finds a rectangular black spot and the upper border of the cheeks presents an elongate shadow, dotted with blackbrown spots. Cheeks elsewhere grey, white haired. Palpi reddish blackbrown, slightly swollen at the white haired, base of the second joint, apex black haired. Antennae, first joint long, olivebrown, second joint, short.

Thorax chocolatebrown with 2 whitish longitudinal stripes, mainly rubbed, some white

pubescence remaining. Scutellum same colour. Breast yellowbrown, white haired. Wings darkbrown, crossband single, not reaching to the hindborder and composed of 3 white spots, furtheron in the same direction a small white spot is resting on the lower cubital branch. Two rosettes distinct, first one closed by a white circle with darker centre; inside this rosette 3 faint white spots surround the appendix. Second rosette without white central spots. Transverse paired spots in all posterior cells. Triangles as mentioned. Third rosette irregular, broken into pieces. Two basal transverse bars, apical one curved backwards with a point, becoming broader near the hindborder of the wing and resting upon it. Basal bar interrupted in the lower basal cell. Two other spots are situated respectively in the top of the subcostal cell and in front of the stigma. Three other small white spots are to be found in the basal part of the discoidal cell. Halteres chocolatebrown. Legs. First leg. Coxa yellowbrown, darker to the apex, white haired, femur blackbrown, tibia blackbrown at extreme base, then white, white haired, apical band narrow, blackbrown, black haired. Tarsalia blackbrown.

Second leg, femur dark tawnybrown, black haired, distal lateral border white haired. Tibia blackbrown, black haired, with 2 white, white haired bands. Tarsalia blackbrown. Third leg, femur as in 2d leg, tibia, basal $\frac{2}{3}$ white, white haired with a faint trace of a darker shadow in this part. Apical band blackbrown, black haired. Tarsalia blackbrown.

A b d o m e n blackbrown, black haired with paler whitish, white fringed segmentations to all segments. Ventrally the same.

40. *Haematopota annulipes* nov. spec. (♀) Pl. 4, Fig. 7; Textfig. 38.

References:

MACQUART, Diptera exot. Suppl. III, p. 175, pl. I, fig. 6 (1847).

VAN DER WULP, Sumatra Exped. Dipt. 20, pl. I, fig. 14 (1881).

OSTEN SACKEN, Berl. Ent. Zeit., XXVI, p. 97 (1882).

RICARDO, Rec. Ind. Mus. IV., p. 354 (1911).

Habitat:

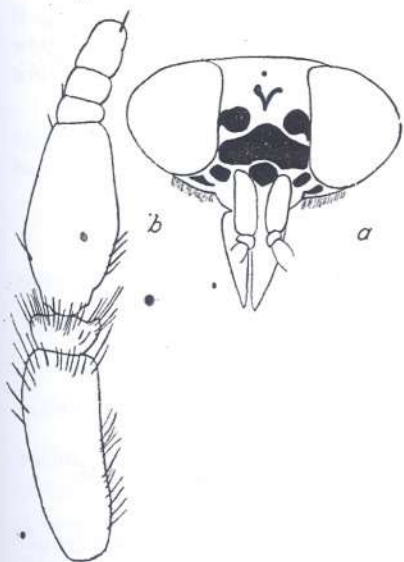
Type ♀ from Sumatra, Balun, Padang Highlands 4.14, JACOBSON

Coll. N.A.M.

A dark, relatively large species allied to *H. lunulata* MACQ. but distinguishable i.a. by the absence of the white triangle on the second abdominal segment, the shape of the callus, the curved inner border of the apical wingband and the shape of the white triangles in the openings of the posterior cells and the colouring of the legs. Forehead dull olivebrown, black haired. Paired spots roundish, unpaired spot present. Callus brownblack, convex, band-shaped, reaching to the eyes. Other black spots on upper cheeks and face. Cheeks elsewhere white, white haired. Palpi olive-havannabrown, mainly white haired. Antennae brown to brownblack, third joint equal in size to the first and second joint together. Thorax havannabrown, with the indications of longitudinal stripes. Wings with a single broad apical band, triangular spots distinct in the openings of the 2d, 3d, and 5th posterior cells, indications of similar spots in the 1st and 4th posterior cells. Three distinct rosettes are present. The most apical of both transverse basal bars ends at the hindborder in a big spot. Legs havannabrown, middle and posterior tibiae with 2 white rings. Abdomen blackbrown with broad white segmentations to the first 2 segments, narrower to the following segments.

Table of dimensions.

Bodylength	9,8 m.M.
Width of thorax	2,6 „
Width of abdomen	3 „
Wingexpanse	21,4 „
Length of abdomen	6 „
Length of wing	9,4 „
Breadth of wing	3,5 „



Textfig. 38.
H. annulipes s. s. ♀
a. head, b. antenna.

The Head. (Textfig. 38). Forehead distinctly narrower at vertex than it is at base, index 1,4. Paired spots velvetyblack, roundish, touching to the eyes, not resting on the callus. Unpaired spot sharply triangular, paler lines surround the paired and unpaired spots and accompany the eye borders. Callus brownblack, strongly convex, reaching to the eyes, band-shaped, elevated at its upper border in the middle by means of a roundish prolongation and incised at its lower border, which embraces partly the velvetyblack spots between the antennae. Each of the upper cheeks bears a pair of black spots, separated by a transverse white stripe. Cheeks elsewhere white, white haired. Beard white. Face with 2 rudimental black spots on its upper border. Palpi olive-havannabrown, second joint swollen at base, rather suddenly tapering to a long blunt point, white tomentose at base, covered with long rather erect hairs, to the apex they become more appressed, white, intermixed with some few black hairs. Antennae, first joint shining brownred, slightly swollen, pubescence scanty, black, second joint very short, cup-shaped, brownblack, black haired. Third joint black, flat

and rather broad at base, longer than the first joint apiece.

Thorax havannabrown, greybrown on foreborder, with the indications of 2 longitudinal stripes, pubescence white, intermixed with some blackbrown hairs. Pteropleuron dark reddish yellowbrown, black haired. Sides and breast grey, white haired, with brown streaks especially on the mesosternumlobus, which is partly redbrown haired. Wings with single apical crossband, convex at its apical border. Comma-shaped white triangles, arranged as mentioned above for the left wing, right wing with distinct spots in the same cells and an indication in the 1st cell only. A similar spot in the axillary angle on each wing. Paired transverse spots in all posterior cells. Three distinct rosettes, each with a number of white spots in its centre. Anal cell closed at hindborder. A round white spot is situated on the anal vein. Transverse basal bars narrowly connected along the hindborder, a circular white spot between anal and axillary vein. Legs havannabrown. First leg, Coxa paler, white haired at base, more blackbrown at apex. Femur redbrown tomentose, black haired, intermixed with some white hairs, tibiae slightly swollen, redbrown at the extreme, black haired base, then white, white haired on basal $\frac{1}{3}$, rest black haired. Tarsalia black haired. Second leg paler, femur black haired on dorsum at apex, white haired on lateral borders, tibia redbrown, black haired with 2 white, white haired rings. Tarsalia redbrown, black haired. Third leg, femur darker than in the second leg, pubescence similar, tibiae black, with 2 transverse white rings of which the apical one surrounds the lower half of the tibia. First tarsale slightly paler at base.

Abdomen rather broad, blackbrown, with distinct white, white haired segmentations on first 2 segments, other segments with less broad, rather indistinct white, white haired segmentations, elsewhere black haired. Ventral surface with similar, very distinct white segmentations, bases of segments mainly blackbrown haired, intermixed with some white hairs. The specimen mentioned under this heading was identified by the different entomologists as belonging to *H. lunulata* MACQUART. I have already pointed to the differences it shows with this species. MACQUART's description is unmistakable with regard to the legs and the abdominal triangle, so these specimens ought to be separated from *H. lunulata* MACQ. VAN DER WULF'S

male from Silago is not in good condition and is set in such a manner, that it cannot be distinctly identified. VAN DER WULP's description of the wingpattern, probably taken after the ♀ fits for *H. annulipes* only as also his figure. OSTEN SACKEN had both species before him, he mentions the annulated tibiae.

41. *Haematopota nigrita* nov. spec. (♀) Textfig. 39.

Syn.: *H. lata* RIC. in parte.

References:

RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 121 (1906).

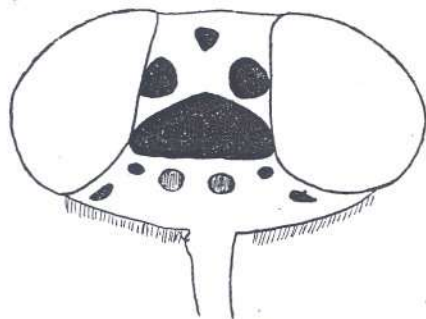
„ Rec. Ind. Mus. IV, p. 344 (1911).

Habitat:

Type ♀ from Sumatra, Bahrong Baroe, Korinchi, Main Range 4000 feet, 6.14, labelled by RICARDO as *H. lata* RIC. (in bad condition).

Coll. BR.M.

The only specimen apparently belongs to a new species, which differs from *H. lata* RIC. i.a. in the shape of the callus, which is triangular, pitchy black, the different frontal black spots, the markings on the thorax, colour of antennae, shape and colour of palpi, etc. Frons sooty black, paired and unpaired spots present. 2 black spots on upper cheeks. Palpi olivebrown, black haired. Antennae incomplete, first joint incrassate, shining black. Apical wingband broad, single, not reaching to the hindborder. White triangular spots in all posterior cells, except the first. Usual rosettes present, basal transverse bars parallel. Legs incomplete, apparently however with 2 white rings to middle and hind tibiae. Abdomen brown, with narrow, white haired segmentations to all segments.



Textfig. 39.

H. nigrita s. s. ♀ head

The Head. (Textfig. 39). Forehead sooty black with two roundish black spots, touching the eyes; unpaired spot black, triangular, surrounded by a triangular brighter area. Callus triangular, dark pitchy black, convex below, pointed at upper border, reaching to the eyes. Upper cheeks at both sides with 2 separated velvety black spots. Palpi olivebrown, rather slender, black haired. Antennae, first joint swollen, shining black, 2d joint very short, third joint failing.

Thorax chestnutbrown with 2 rather narrow longitudinal white stripes and 2 white spots at a level with the suture. Scutellum same colour as scutum. Wings dark brown with centres of cells clearer; apical band single, broad, not reaching

to the hindborder, stopping short underneath the upper branch of the cubital vein. White triangular spots in the openings of all posterior cells, except the first. The usual rosettes present. Second rosette with a few indistinct small, white spots in its centre only. Basal transverse bars nearly parallel, the apical one not so wavy as in *H. lata* RIC. Eyespot present on

the anal vein. Third rosette elongate. Legs brown. First leg, femur brown, tibia, basal half white, white haired, elsewhere chocolate brown. Second leg, femur brown, tibia with 2 white, white haired rings, first tarsale white at base as also in the first leg. Third leg broken off.

A b d o m e n brown, with narrow, white haired segmentations to all segments, elsewhere black haired, ventral surface, segmentations broader, greywhite, white haired, rest black haired.

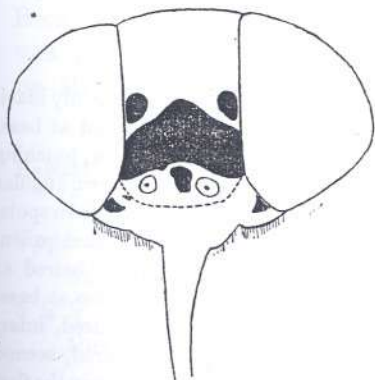
42. *Haematopota irregularis* nov. spec. (♀). Textfig. 40.

Habitat:

Type ♀ from Borneo, Mount Bukit, Sarawak (in bad condition)

Coll. BR.M.

A brown species with a rather narrow forehead with blackbrown, band-shaped callus, pointed at upper border. Paired spots present, unpaired spot absent, other black spots between the antennae and on the cheeks. Palpi short, brown. Antennae incomplete, first joint shining yellowbrown. Thorax brown, bordered whitish. Wings with single apical band, not reaching to the hind border. No white triangles in the openings of the posterior cells. Two contiguous rosettes present. Abdomen brown with broad white, white haired segmentations.



Textfig. 40.

H. irregularis s.s. head.

The Head. (Textfig. 40). Forehead narrow, callus broad, band-shaped, blackbrown, elevated at its upper border to a broad blunt point, lower border concave, reaching to the eyes. Paired spots elongate, an irregular black spot is found between the antennae, each cheek bears a triangular small brown spot at its upper border. Palpi and antennae as described, latter brown haired.

Thorax brown, borders whitish, breast pale greybrown. Wingpattern as mentioned. Each rosette presenting 3 white spots in its centre. Third rosette absent, two parallel transverse basal bars and a third, sticking to the lower rosette.

A b d o m e n coffeenutbrown, with broad, white, white haired segmentations.

43. *Haematopota atriventer* nov. spec. (♀) Pl. 4, Fig. 6; Textfig. 41.

Habitat:

Type ♀ from Sumatra, Peak of Korinchi 8.15, EDW. JACOBSON

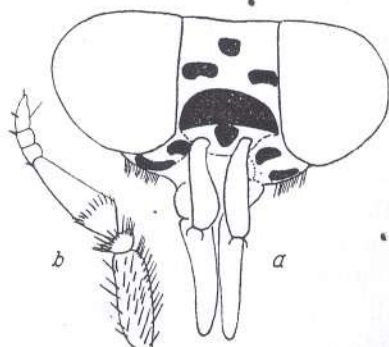
Coll. N.A.M.

A female, labelled *H. lunulata* MACQ., but belonging to quite another species. It differs i.a. in the shape of the apical wingband, the absence of white spots in the openings of the posterior cells, the colouring of the legs, two distinct

white rings being visible on the middle tibiae, indistinct on hind tibiae, callus very narrow, halfmoon-shaped. Forehead broad, paired and unpaired spots indistinct. Other black spots between the antennae and on upper cheeks, face with black upper border. Palpi brownish, black haired. Antennae yellow- to blackbrown, basal joint long, nearly as long as the third joint. Thorax blackbrown, with 2 white longitudinal stripes. Apical wingband not reaching to the hindborder. Abdomen blackbrown, with distinct white, white haired segmentations to the first 3 segments, other segmentations narrowly white, white haired.

Table of dimensions.

Bodylength	12	M.m.
Width of thorax	3,5	„
Width of abdomen	4	„
Wingexpanse	27,5	„
Length of abdomen	7,2	„
Length of wing	12	„
Breadth of wing	4	„
Foreheadindex	1,1	



Textfig. 41.

H. atriventer s. s. ♀
a. head, b. antenna.

The Head. (Textfig. 41). Forehead broad, almost the same width throughout, mainly black haired, intermixed with some yellowbrown hairs. Callus blackbrown, almost straight at base, convex at upper border, reaching to the eyes. Paired spots roundish, indistinct, black, touching the eyes, separated from the callus, unpaired spot indistinct, round, black. A blackbrown angular spot is situated between the antennae, upper cheeks covered under big, blackbrown spots, lower cheeks bluish grey, white haired. Beard white. Upper border of the face blackbrown, black haired, face elsewhere white. Palpi, first joint reddishyellowbrown, white haired at base, crowned at apex with a rather big number of black hairs, second joint swollen at base, attenuated to a blunt point, olivebrown, greywhite tomentose, mainly black haired, intermixed with some white hairs. Antennae, first joint long, yellowbrown, black haired, second joint darker, very short, black haired, third joint as long or even slightly longer than the first joint.

Thorax blackbrown, white haired with 2 white longitudinal stripes, ending at the level of the suture in a triangular white point. Pteropleuron redbrown, black haired. Sides and breast olivebrown, white haired. Wings: apical band single, not reaching to the hindborder, interrupted in the middle of the submarginal cell and resting on the lower branch of the cubital vein. The usual rosettes present, first rosette closed at upper border by a white circular spot with black centre. No white triangle in the openings of the posterior cells, paired transverse white spots in all posterior cells. The most apical of the white transverse basal bars curves back in the axillary angle with a sharp point. Legs. First leg, Coxa yellowbrown, white haired at base, havannabrown, black haired at apex, femur reddish havannabrown, black haired. Tibia havannabrown, black haired at extreme apex, then narrowly white, white haired, apex havannabrown, black haired. Tarsalia black, black haired. Second leg, femur yellowbrown, yellow haired below, dorsally black haired, darker tawny brown to the apex, knee as in the

fore femora, yellowbrown. Tibia havannabrown, black haired with 2 white, white haired rings; first tarsale whitish at base, black haired, other tarsalia blackbrown, black haired. Third leg, femur as in second leg, white haired at base on dorsum; tibia brown, black haired at extreme base, then, on ventral surface, white, white haired, apex narrowly blackbrown, on dorsum 2 white rings are indicated, here the basal white ring stretches till about half the length of the tibia and is interrupted there by a faint brownish shadow, apex black haired. So I brought this species to the group where middle and hind tibiae have 2 white rings, although there was some reason to bring it to the group of species which show 2 white rings to the middle tibiae only.

A b d o m e n, blackbrown, black haired, first segment olivebrown. First 3 segments with distinct white, white haired segmentations, other segments narrowly white at border. 7th segment with white hairfringe, distal lateral borders of first 3 segments greyish tomentose, white haired. Ventral surface bluishgrey, on first 2 segments, in the middle of the 2d segment a havannabrownish triangle forms the beginning of a median longitudinal dark band, which grows broader and broader on the following segments, so that the 4th till 7th segment are almost wholly blackbrown, except the greywhite, white haired segmentations pubescence elsewhere black.

43. *Haematopota pungens* DOLESCHALL. (♀) Pl. 3, Fig. 2; Textfig. 42.

References:

- DOLESCHALL, Natuurk. Tijdschr. v. Néd. Indie XVI, p. 407, Pl. IV, fig. 3 (1856).
 RICARDO, Rec. Ind. Mus. IV, p. 352 (1911).
 VAN DER WULP, Sumatra expeditie, Diptera, p. 19 (1892).
 DE MEYERE, Tijdschrift v. Entom. LIV, p. 282 (1911).
 „ Tijdschrift v. Entom. LX, p. 295 (1918).

Habitat:

Isle Java

Type ♀ from Java, DOLESCHALL annotated „numerous in the woods of the mountain Oengaran and very troublesome to horse in the rainy season”

5 ♀♀ from Goenoeng Oengaran, Java, 9.'19, JACOBSON, in the beginning of the wet monsoon, October, in big quantities, attacking men and animals
 Coll. N.A.M.

1 ♀ from Tjinjiroean, Quinquina estate, Res. Preanger Regencies, Malabar Mountains, 1500, M. VAN DER WEELE leg. Coll. N.A.M.

2 ♀♀ from Semarang 1.'06, JACOBSON „

1 ♀ „ Semarang 10.'05, JACOBSON „

2 ♀♀ „ Goenoeng Prahoe 1500 M. 10.'13, ROEPKE leg., very troublesome to man and animals, big quantities Coll. N.A.M.

2 ♀♀ from Banjoewangi, Res. Besoeki, MAC. GILLAVRY leg. „

2 ♀♀ „ Java, without further locality, JACOBSON „

163 ♀♀ Gamboeng, Goenoeng Tiloe, Tea Estate, 1450—1600 M., Res. Preanger Regencies attacking heavily man and animals, especially horses, KERKHOVEN and SCHUURMANS STEKHOVEN leg. From Mid September to October very frequent on horse 26.9.'22 Coll. V.S.L.

- 2 ♀ ♀ from Java, without further locality. MULLER, 3 other ♀ ♀ from Java,
Coll. L.M.N.H.
3 ♀ ♀ „ Sumatra, Lebong 5.'78 „
1 ♀ „ Borneo, DIARD „

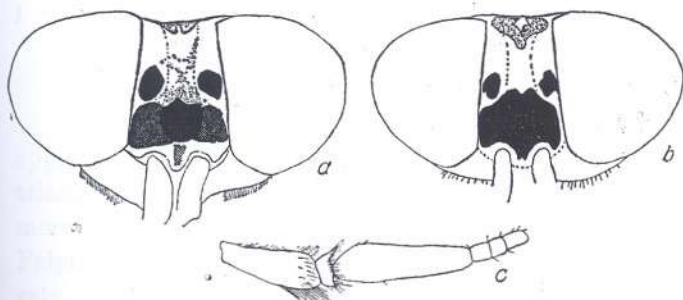
H. pungens was described at first very incompletely by DOLESCHALL. Later on VAN DER WULP and RICARDO considered it to be a synonym of *H. irrorata* MACQ. to which it shows some resemblance. Afterwards DE MEYERE redescribed it after females from the same locality, where DOLESCHALL had captured his specimens.

H. pungens DOL. is a brownish big species, forehead brownish, distinctly narrower at vertex. Callus broad and high, in the shape of an open book, in some specimens wholly black, in others with black centre and olivebrown borders. Paired spots present, unpaired spot failing. No black spots on the yellowbrown cheeks and face, a brownish shadow between the antennae. Beard white. Palpi yellowbrown, mainly black haired on second joint. Antennae yellow to brown, black haired, first joint shorter than the basal annulation of the third joint. Thorax havannabrown, with 3 longitudinal whitish stripes and a white hind-border. Legs brownish, middle and hind tibiae with 2 white rings. Wingpattern much like in *H. irrorata* MACQ., apical band varying from single to nearly double. Abdomen brown, broad with narrow yellowbrown segmentations, no longitudinal stripes and spots, or a faint median stripe on the 2d segment.

Table of dimensions

Bodylength	varying from	9,8 m.M.	to	11,8 m.M.
Width of thorax	„ „	2,8	„ —	3,8 „
Width of abdomen	„ „	3	„ —	4,2 „
Wingexpanse	„ „	22,4	„ —	27,9 „
Length of head	„ „	1,5	„ —	2,2 „
Length of thorax	„ „	4	„ —	5 „
Length of abdomen	„ „	5,5	„ —	6,8 „
Length of wing	„ „	9,8	„ —	12,2 „
Breadth of wing	„ „	3,2	„ —	4 „
Foreheadindex	„ „	1,18	—	1,55 „

The Head. (Textfig. 42). Forehead goldenbrown, black haired, yellowbrown hairs being found between the paired spots and the eyes. At vertex one finds a half star-shaped spot. A triangular redbrown spot is found between the eyes in a percentage of the specimens, in others the same spot is wanting. Two types of calli may be found, the first type is book-shaped, (Textfig. 42 b.) high and broad, convex at its upper border with an incised blunt point, reaching till between the paired spots, lower border pointed also and incised in the middle. Callus black in the middle, lateral portions varying from olivebrown to redbrown, reaching to



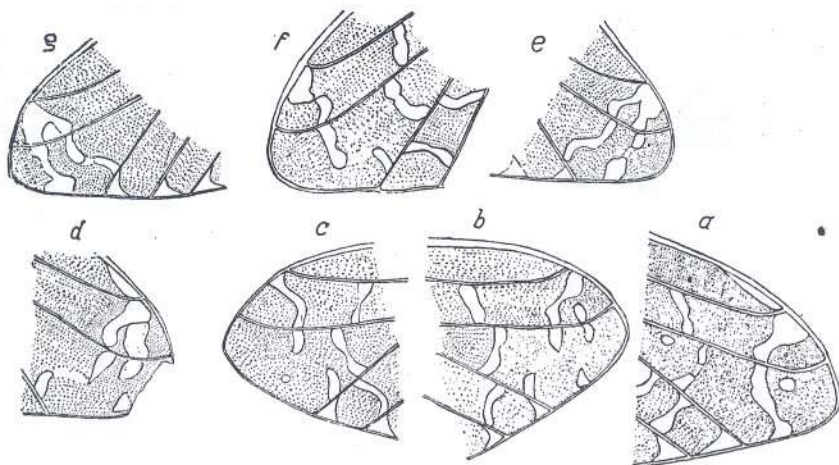
Textfig. 42.

H. pungens Dol. ♀. a., b. head, c. antenna.

the eyes or remaining free at one side. Second type of callus lower, (Textfig. 42 a.) middle portion shield-shaped, convex below, produced to a point at its upper border, shining black, lateral parts shining olivebrown, straight-sided below, curved at their upper border, reaching the eyes at the lower border only. Trans-

itions between both types may be found. Also the colour of the calli is very variable, ranging from wholly black to blackbrown, reddish blackbrown, yellowbrown and when the centre is coloured otherwise than the sides, the last parts may be dark brown, reddishbrown or yellowbrown, whereas the median black part may be broad or very narrow. Paired spots velvetyblack, triangular to oval, reaching the eyes or free. Unpaired spot absent. Postocular rim fringed with yellowbrown hairs. Face and cheeks yellowbrown, white haired, sides of cheeks greywhite. Beard white. Palpi variable. In several specimens the first joint is yellowbrown, yellowbrown haired, intermixed with some black ones, second joint reddishbrown tomentose, yellow haired at base, apex black haired, in other specimens the palpi are yellowish white, black hairs scanty. Antennae in 2 types with different transitions. Type 1: first and second joint chinese yellow, first joint swollen to the apex, shorter than the first annulation of the 3d joint, black haired, second joint with dorsal tooth, third joint indistinctly broader at base, extreme base brownish, then black, in other specimens it is not so dark, more blackbrown. Second type similar in shape, third joint however wholly reddishbrown or yellowbrown on basal annulation, stylus black.

Thorax. Scutum deep havannabrown with a median whitish longitudinal stripe. At each side a lateral stripe runs backward and is interrupted at the suture, where it forms a triangular spot, a continuation of both stripes connects at the hindborder of the scutum in a square white spot, which narrows to the sides and receives the yellowwhite lateral stripes, running along the borders of the scutum to the shoulders. Pteropleuron pale, black haired, intermixed with some yellowbrown hairs. In other specimens the connecting spot is not square but triangular or pentagonal. Tufts at base of wings and behind yellowwhite. Pubescence elsewhere pale yellowwhite on foreborder whereas on the disc yellowwhite and black hairs are intermixed. Scutellum with a pale whitish brown median spot, yellowwhite haired, intermixed with some black hairs, borders dark havannabrown. Breast brownishyellowishwhite, yellowwhite haired, mesosternumlobus with bluegrey streak. Wings, stigma darkbrown; foreborder yellowbrown. Anal cell closed at border. In one of the specimens the upper branch of the 4th longitudinal vein shows a recurrent veinlet. Wingpattern rather variable. (Textfig. 43.) The first type has wings with a single apical band, mostly not reaching the hind border, stopping short in the middle of the submarginal cell, in other specimens a round white spot is situated in front of this band, again other specimens have a complete single band or a single band, with an incomplete or even a complete duplication of this band. The distribution of the white triangles in the openings of the posterior cells is likewise very variable and ranges from the complete absence of white triangles to the presence in all posterior cells, further I found variations, where respectively the first, the fourth, the first and the fourth or the first, second and fourth triangle was absent. Besides one or more of the triangles may be indistinct. Usual rosettes present, the first one closed at upper border with a white circle with darker centre, a white spot, or a curved line. First and second rosette connected mostly by means of a transverse



Textfig. 43.

H. pungens DOL. a.-g. wing-apices,

stripe in the shape of a key of a musical partiture, in other specimens the key is broken up into a number of white spots. White, paired, transverse spots in all posterior cells. Basal transverse bars distinct, the apical one curving back with a point in the axillary angle and forming a white triangle at the hindborder of the wing. Halteres, stalk white, club pale yellowbrown. Legs. First leg, Coxa greybrown at base, redbrown to the apex, pale yellow haired; femur dark redbrown, black haired; tibia brown at extreme base, then white, white haired, apical $\frac{2}{3}$ redbrown, black haired. Tarsalia black; Second leg, Coxa and trochanter similar, femur yellowish-redbrown on dorsum, yellowbrown haired, apex and proximal lateral border with a number of black hairs, distal lateral border white haired. Tibia rustybrown with 2 yellow-white, white haired rings; first tarsale dirtywhite at base, black haired, other tarsalia wholly black. Third leg. Coxa and trochanter similar, femur rustybrown with darker apex, black haired on dorsum, distal lateral border yellowbrown haired. Tibia as in second leg brown, black haired, with 2 white, white haired rings. First tarsale dirtybrownishwhite at base, elsewhere redbrown, black haired, other tarsalia wholly black.

Abdomen broad, rounded at apex, dark redbrown, black haired, segmentations broad yellowbrownwhite, yellowwhite haired, second segment in some specimens with a rather long, median, longitudinal stripe, never reaching the hindborder of this segment, in other specimens this band is wanting. Lateral borders of tergites yellowbrown, ventral surface yellowbrown with paler segmentations. Out of 161, 83 females present a long or short triangle or stripe on the 2d segment, whereas the same stripe fails in 78 specimens. In each case it is not very obvious. The differences between *H. pungens* DOL. and *H. irrorata* MACQ. are mentioned under the lastnamed species. DE MEYERE says: wingpattern similar to that of *H. javana* WIED. but I cannot see this striking likeness. The females from Lebong, Sumatra identified as *H. irrorata* MACQ. to all probability belong to *H. pungens* DOL.

44. *Haematopota fumigata* nov. spec. (♀) Pl. 3, Fig. 4; Textfig. 44.

Habitat:

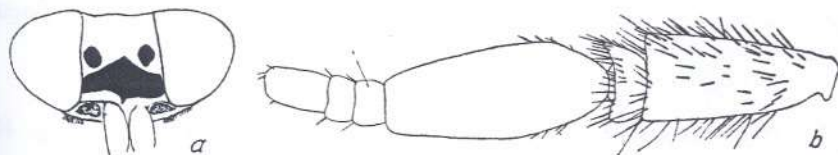
Type ♀ from Java, from Mlangi, Distr. Toeban, Res. Rembang on cattle at 1 h.p.m. on 11.12.'22, DE WILDE Coll. V.S.L.

1 ♀ from Java, from Kali mati, Distr. Bodjonegoro, Res. Rembang on buffalo
at 2 $\frac{1}{4}$ h.p.m. on 15.11.'22, DE WILDE Coll. V.S.L.

H. fumigata is a brownishblack species with blackish wings of a mottled appearance. Forehead greyblack with some paler stripes. Callus shining black, triangular, reaching to the eyes, paired spots present, no unpaired spot. Furthermore one finds a dotted triangular spot on each cheek. Face brown-bordered. Palpi brownblack, black haired. Antennae reddishbrown, first joint incrasate, nearly as long as the basal annulation of the third joint, last one strongly broadened at base. Thorax black with brownish stripes. Wings with the usual, not very distinct rosettes, apical band double, white triangles in the openings of all posterior cells. Abdomen black, black haired with paler, white haired segmentations.

Table of dimensions.

	♀ 1	♀ 2
Bodylength	8,8 m.M.	8,2 m.M.
Width of thorax	2,8 „	2,5 „
Width of abdomen	2,6 „	2,5 „
Wingexpanse	18,8 „	18,1 „
Length of head	1,5 „	1,5 „
Length of thorax	3,2 „	3,2 „
Length of abdomen	5,2 „	4,2 „
Length of wing	8 „	7,8 „
Breadth of wing	2,8 „	2,6 „
Foreheadindex	1,14	1,—



Textfig. 44.

H. fumigata s.s. ♀. a. head, b. antenna.

The Head. (Textfig. 44). Forehead sootygreyblack, with a paler median stripe and paler linings to the paired spots. Paired spots not reaching to the eyes. Pubescence black, intermixed with some white hairs on the median stripe and round the paired spots. Postocular rim black haired. Callus shining black, pointed at upper border, nearly straight at lower border, where it is prolonged into a point between the antennae. No black spot between the antennae. A blackish, black haired spot broken into dots and spots is found on each cheek, between the eyes and the antennae in the type but is indistinct in the other female. Cheeks elsewhere sooty-

greyblack, greywhite haired. Beard same colour. Upper border of cheeks yellowish white. Face sootyblack with brownish, grey tomentose borders, pubescence black and greywhite. Palpi black, brown at apex, black haired. Antennae same shape as in *H. javana*, first joint slightly shorter than the first annulation of the third joint distinctly incrassate, olivebrown, black haired, second joint leatherbrown, cup-shaped, with a black hairfringe. Third joint considerably broadened at base, leatherbrown, soon growing darker to the narrower apex of the basal annulation, stylus black. Fourth annulation longer than the two foregoing ones together. Antenna $1\frac{1}{2}$ times as long as the diameter of the head. Proboscis olive-yellowbrown, black tomentose, stalk brownblack and white haired. Sugarflaps sootybrownblack.

Thorax black with brownish stripes in type ♀, black haired, intermixed with some white hairs. In the second female the thorax shows three longitudinal white stripes, lateral borders whitish also, with 2 white points near the suture. Pteropleuron rustybrownblack, black haired. Breast and sides black, with brownish stripes, black haired, with small groups of white hairs in places. Wings with three not very distinct rosettes, in the centres of which some white, chromosome-shaped spots; the rosettes are connected by means of a transverse wavy line. Apical band double; at the foreborder of the wing both branches are connected, to the hindborder they diverge, the apical branch is narrower than the basal one. Triangular white spots arranged as mentioned. Both basal transverse bars present, the apical one curving back, passing the axillary vein and reaching the hindborder with a spot on the lower branch of the fifth longitudinal vein an eyemarking is formed. Halteres, stalk snowwhite, club pale brown, with a paler streak. Legs. First leg. Coxa havannabrown, mainly black haired, intermixed, with some white hairs, femur paler havannabrown, grey tomentose at sides, knee yellowbrown, black haired. Tibia yellowbrown at extreme base, then white, white haired, intermixed with some black hairs, apical half black, black haired. Tarsalia black. Second leg. Coxa greyblack, bordered brown, trochanter havannabrown, femur same colour, brownish with a blackish-sootygrey spot at base, black haired. Tibia whiteyellow at extreme base, bearing 2 other yellowbrown broader rings, extreme apex also narrowly yellowbrown, all yellowwhite haired, interspaces olivebrown, black haired. First tarsale yellowish at base, apex black, other tarsalia black. Third leg. Coxa bluegrey black, brown bordered, white haired, femur as in second leg with some white hairs on dorsum in the median line, elsewhere black haired. Tibia reddishbrown, black haired with 2 brownyellow, honey-coloured rings and a narrower one at extreme base. Tarsalia as in second leg.

Abdomen black, black haired, with paler white haired segmentations, lateral borders of the first tergite white haired. Ventral surface black, black haired, segmentations brownish, white haired. *H. fumigata* nov. spec. differs from *H. tessellata* Ric. to which it shows some resemblance in the colouring of the abdomen, which presents no grey spots or longitudinal lines and the general appearance, which is more grey.

45. *Haematopota elegans* nov. spec. (♀) Pl. 3, Fig. 3; Textfig. 45.

References:

- RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 122 (1906).
 „ Rec. Ind. Mus. IV. p. 349 (1911).

Habitat:

- Type ♀ from Tasikmalaja on 26.9.'22, LE COULTRE
 other ♀ from Tasikmalaja on 7.11.'22, LE COULTRE
 1 ♀ from Java, MACKLOT
 1 ♀(?) „ Java, BLUME

Coll. V.S.L.

Coll. „ L.M.N.H.

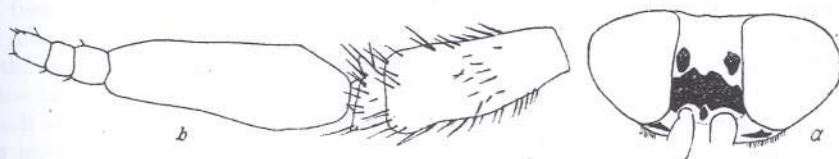
„

H. elegans is allied to *H. brevis* RIC. but differs in the absence of black facial spots, the colour of the beard, the shape and colouring of the frontal callus, etc.

It is a small brownish species. Forehead with dark redbrown, transverse callus. Paired spot present, no unpaired spot, other black spots on cheeks and between the antennae. Cheeks whitish, Beard white. Palpi pale yellowbrown, black haired. Antennae yellowish to redbrown, first joint considerably shorter than the third. Thorax brown, with 2 indistinct whitish longitudinal stripes. Apical wingband double, basal branch incomplete. Usual rosettes present, as also 2 basal transverse bars, white triangles in the openings of all posterior cells. Abdomen reddish havannabrown, black haired with distinct white, white haired segmentations to the first three segments. Legs with middle and hind tibiae 2-ringed.

Table of dimensions.

	♀ 1	♀ 2
Bodylength	8,8 m.M.	8,5 m.M.
Width of thorax	2,8 „	2,5 „
Width of abdomen	2,8 „	2,8 „
Wingexpanse	18,8 „	18,9 „
Length of head	1,5 „	1,8 „
Length of thorax	3,2 „	2,8 „
Length of abdomen	5 „	4,5 „
Length of wing	8 „	8,2 „
Breadth of wing	3 „	3 „
Foreheadindex	1,22	1,33



Textfig. 45.

H. elegans s.s. ♀. a. head, b. antenna.

The Head. (Textfig. 45). Forehead pale brown, yellowbrown haired. Callus redbrown, broad, reaching to the eyes and surrounding the bases of the antennae, prolonged in the direction of the face, where it presents an indentation, filled up by a small black spot, situated between the antennae; upper border of the callus wavy, produced in the middle. Paired spots velvetyblack, not touching to the eyes, vertex rather dark brown, postocular rim similar. Cheeks yellowbrown, with two small triangular black spots, not reaching to the eyes. Beard white. Face greywhite, grey haired. Palpi yellowbrown, first joint yellow haired, intermixed with some black hairs

at apex, second joint yellow haired at base, elsewhere black haired. Antennae, first joint rather short, half as long as the whole third joint and $\frac{2}{3}$ of the length of its basal annulation, incassate, chromyell, black haired; second joint brown, short, with dorsal tooth and black hairfringe. Third joint havannabrown at base, where it is only indistinctly broadened, duskier to the apex, stylus black. Proboscis yellowbrown.

T h o r a x denuded, havannabrown, with 3 longitudinal pale yellowwhite stripes and pale yellowbrown lateral borders. Pteropleuron reddishbrown. Sides and breast yellowbrown haired. Wings as mentioned, second apical band stopping in the middle of the submarginal cell. Two rosettes fairly distinct, with central white spots, third rosette indistinct. Basal transverse bars connected along the axillary vein, the apical one wavy, pointed in the axillary lobe, prolonged to the hindborder of the wing; a single white spot is situated on the anal vein, forming with the last part of this bar an eyemarking. Foreborder of wing pale greybrown. Halteres, stalk brownishwhite, club havannabrown. Legs. First leg, Coxa greybrown at base, redbrown to the apex, white haired. Trochanter redbrown, femur rusty redbrown, black haired, tibia slightly curved, basal half white, white haired, apex black, black haired. Tarsalia black. Second leg, femur leatherbrown, yellowbrown haired, some black hairs being found at apex, Tibia with 2 yellowwhite, white haired rings, elsewhere redbrown, black haired, extreme base redbrown. First tarsale yellowishbrown at base, black haired. Third leg, Coxa leatherbrown, yellowwhite haired, trochanter yellowbrown, femur leatherbrown, yellowwhite haired, ventral surface black. Tibia white on basal half, apical half redbrown, interrupted in the middle by a paler yellowbrown ring, black haired, tarsalia similar.

A b d o m e n redbrown to havannabrown, black haired, with distinct whiteyellow haired segmentations to the basal 3 segments. To the apex the abdomen grows darker to blackbrown, segmentations fainter. Ventral surface redbrown on first 2 segments, then black, black haired.

46. *Haematopota roralis* FABRICIUS (♀, ♂)

References:

- FABRICIUS, Syst. Antl., 107, 2 (1805).
 WIEDEMANN, Dipt. Exot., 97, I (1821).
 „ Auss. Zweifl. Ins. I, 215 (1828).
 BIGOT, Bull. Soc. Zool. France, XVI, 78 (1891).
 RICARDO, Rec. Ind. Mus. IV, p. 323 (1911).
 SURCOUF, Genera Ins. Fasc. 175, p. 35 (1925).

Habitat:

Type ♀ from Tranquebar, FABRICIUS coll.

Isle Ceylon

1 ♀ from Hot Wells, Trincomalee, YERBURY 1891 Coll. BR.M.

1 ♀ „ Pankullam Road, Trincomalee, YERBURY 1891

1 ♂ „ Velverry, YERBURY 1891

females and males from Calcutta, Indian Museum

females and males from Goalbathan, E. Bengal, Indian Museum

a series of females from Gorakhpur, United provinces, HOWLETT coll.

a series of females from Belgatchia, Bengal on cow

SURCOUF mentions this species from Java and Borneo; I cannot find any details about the last habitat in the current literature. SURCOUF's statements

however obliged me to enter this species in my book, although I have not studied specimens, belonging to this species. I refer therefore to RICARDO's description.

„A species distinguished by its testaceous legs with no darker bands, or base of fore tibiae lighter, and by the absence of any spots on the face. The female is long, slender, greyish brown, the abdomen marked with a median grey stripe and with lateral grey spots on each segment. Antennae yellow, long, the first joint nearly as long as the third one which is blackish at apex. Forehead with the usual paired spot, no unpaired spot present. Frontal callus yellowish, transverse. Wings viewed from the base usually appear pale in the basal cells and in the basal portions of the discal, first posterior and submarginal cells, elsewhere greyish brown with 3 rosettes distinct, the apical band simple, short, a row of short whitish disconnected bands run from it round the posterior border of the wing. The males are more reddish yellow on the abdomen, the first joint of antennae short, stout. Length of males 9—11 m.M., of females $8\frac{1}{2}$ —11 m.M.

The Female.

The Head. Forehead same colour as face, greyish, a shade darker, with some white pubescence, broad, hardly narrower at vertex, the frontal callus shining reddish yellow, reaching the eyes, produced to a short point in the middle of its upper border, a narrow spot proceeds from its lower border till between the antennae, the paired spots blackish, not touching the eyes. Face greyish with some short white pubescence, the fovea alone appearing darker. Palpi pale yellow with black pubescence, stout, ending in an obtuse point. Antennae reddish yellow, the first joint yellowish, cylindrical, slightly incrassate, barely as long as the third joint, the second joint very small, yellow, both the first joints with black pubescence, the third joint slender, reddish, blackish on the annulated apex.

Thorax blackish brown with three grey stripes and grey sides, the scanty pubescence consists of short greyish yellow hairs: scutellum blackish brown, largely covered with greyish tomentum. Breast greyish. Wings greyish, paler at base and at base of submarginal, first posterior, first posterior and discal cell, though not always very distinctly so, the stigma and veins yellow, an appendix present on fork of third longitudinal vein, the two upper rosettes distinct, the third small, its outer ring incomplete, continued from above across the anal cell into the axillary lobe of the wing, reaching the border, the short pale bands begin from the anal cell and continues round the border of the wing to the apical band, which is small and often inconspicuous, crossing the anterior branch of third longitudinal vein, but not always reaching the second longitudinal vein. Legs reddish yellow, coxae greyish, base of femora sometimes darker, tibiae not incrassate or hardly so.

Abdomen blackish brown or brownish, with a distinct ashy grey median stripe, and grey roundish spots on each segment, not reaching the anterior or posterior border, these markings are only distinct in well preserved specimens, the pubescence chiefly consists of very fine short yellowish hairs, under side uniformly greyish.

The Male.

Similar, but the abdomen is largely reddish yellow, darker at apex. Eyes with the large facets occupying $\frac{2}{3}$ of surface, coppery coloured, the basal small facets blackish. Face more hairy. Palpi pale whitish yellow. Antennae with the first joint only incrassate about half as

long as the third. Frontal triangle with small yellowish callus, the spot between the antennae brown. Hind tibiae fringed with black hairs on each side. Fore tibiae more filiform than in the female.

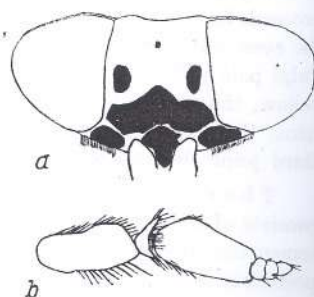
47. *Haematopota confluens* nov. spec. (♀) Pl. 2, Fig. 7; Textfig. 46.

Type ♀ from Sumatra from Siboehoean, Djandi Lobi, Binanga, Tapanoeli, on 12.12.'22 on buffalo LOBEL leg Coll. V.S.L.

H. confluens is closely related to *H. javana* WIED. and could be taken for a subspecies of the same, when not the wings showed such a peculiar pattern, the different wingspots confluencing, forming indistinct rosettes. It is impossible to decide whether the apical band is single or double. Openings of all posterior cells with white triangles. Forehead pale brown. Callus broad, shining redbrown, pointed at its upper border. Paired and unpaired spots present and other spots on the cheeks and between the antennae. Antennae about as long as the head, first joint incrassate, third joint broadened at base, stylus short and narrow. Palpi yellowish olivebrown, white haired. Thorax greybrown, with 3 indistinct whitish stripes and pale lateral borders. Legs with 2 pale rings to the middle and posterior tibiae. Abdomen brown, with a median white stripe, broad, curved, white lines to the first 3 segments at the segmentations. other segmentations narrowly pale.

Table of dimensions.

Bodylength	10	m.M.
Width of thorax	3,2	"
Width of abdomen	3,2	"
Wingexpanse	21,6	"
Length of the head	2	"
Length of thorax	4	"
Length of abdomen	5,8	"
Length of wing	9,2	"
Breadth of wing	3,2	"
Foreheadindex	0,92	



Textfig. 46.

H. confluens s. s. ♀
a. head, b. antenna.

The Head. (Textfig. 46). Forehead broad, slightly narrower at vertex, greybrown, yellow-brown near the callus, bluishgrey at sides, yellowbrown and black haired, with some white hairs along the eyes. Callus reddish olivebrown, grooved and with a black stripe in the middle, upper border pointed, lower border with a corresponding incision. Paired spots black, large, not touching to the eyes, unpaired spot small. A big, black, quadrangular spot lies between the antennae, whereas each cheek presents a triangular spot with rounded angles. Cheeks bluish-grey to creamwhite, white haired. Beard white. Face yellowbrown at upper border, elsewhere bluish greywhite. Palpi rather long, yellowishbrown, first joint yellowwhite haired, second joint same pubescence, intermixed with some black hairs. Antennae, first joint long, cylindrical, incrassate, swollen to the apex, reddishbrown, black haired, second joint cup-shaped, reddishbrown, black fringed. Third joint broadened and flattened on basal annulation, with

a few black hairs, yellowbrown, stylus narrow, darker than the basal annulation. Proboscis havannabrown.

Thorax greybrown, three longitudinal stripes are present, lateral ones broader and shorter than the middle one, which reaches the scutellum, lateral borders of scutum white also. Pubescence black and yellowbrown, whitish hairtufts at the bases of the wings, hind-border of scutum rather clear, pteropleuron dirtybrown-white, black haired. Scutellum same colour, yellowbrown haired. Sides and breast redbrown, dirty white haired. Wings nearly wholly white at base, the spots flow together and form lines, surrounding pale grey areas. Both apical rosettes connected, first rosette open with central white spots like in the second one. Basal transverse bars indistinct. Halteres, stalk ivory, club havannabrown. Legs. First leg, Coxa pale siennabrown with darker apex, femur same colour, black haired on dorsum, white haired on the ventral surface, knee black. Tibia yellowwhite, white haired on basal half, brownish at extreme base, apical half redbrown to black, black haired. Tarsalia black. Second leg, Coxa and trochanter redbrown, femur pale redbrown, black haired, white haired along the lateral borders. Tibia yellowbrown to redbrown, black haired, with 2 ivoryyellow, white haired rings, first tarsale white at base, white haired, apex blackbrown, black haired. Other tarsalia redbrown, black haired. Third leg, coxa and trochanter similar, femur reddish-yellowbrown, yellowwhite haired, knee dusky blackish, black haired. Tibiae swollen as in middle legs, tarsalia similar.

Abdomen, closely resembling that of *H. javana*. No white spots laterally from the median longitudinal stripe on the last segments. Abdomen dark brownblack, darker to the apex, black haired, white haired on the white markings and on the lateral borders of the tergites. Ventral surface with yellowbrown, white fringed segmentations.

48. *Haematopota javana* WIEDEMANN. (♀, ♂) Pl. 2, Fig. 6, a, b, c; Textfig. 47.

References:

- WIEDEMANN, *Diptera Exot.*, p. 100 (1821).
 „ *Aussereurop. zweifl. Ins.* I, p. 218 (1828).
 VAN DER WULP, *Sumatra exped. Dipt.*, p. 19, pl. I, fig. 12 (1881).
 RICARDO, *Rec. Ind. Mus.* IV, p. 349 (1911).
 DE MEYERE, *Tijdschr. v. Entom.* LX, p. 282 (1911).
 „ *Tijdschr. v. Entom.* LX, p. 340 (1918).

Habitat:

Type ♀ from Java

- | | | | |
|-------|---------------|--|-------------------------|
| 1 ♀ | from Batavia, | JACOBSON 9.'08 | Coll. N.A.M. |
| 1 ♀ | „ | Tjinangsi, Soebang, Krawang, Res. Batavia on buffalo | '22
Coll. V.S.L. |
| 1 ♀ | „ | Tegal, Res. Pekalongan 3.'22, | LAGAS, on horse „ |
| 1 ♀ | „ | Tjibiroes, Tegal, Res. Pekalongan, LAGAS, on horse | 3.5.'22
Coll. V.S.L. |
| 1 ♀ | „ | Laren, on cattle 3.'22 | „ |
| 2 ♀ ♀ | „ | Semarang, JACOBSON 1.'06 | Coll. N.A.M. |

- 1 ♀ „ Semarang, JACOBSON, 10.'05 Coll. N.A.M.
 1 ♀ „ Tjandiredjo, Berbak, Res. Djocja, LUITJENS, o cattle 4.'22 Coll. V.S.L.
 1 ♀ „ Madioen, VAN BERGEN 4.'23 „
 1 ♀ „ Madioen? SOHNS' coll. „
 1 ♀ „ Modjokerto, Res. Soerabaja, KOITER, on cattle 31.3.'23 Coll. V.S.L.
 1 ♀ „ Sedangagoeng, Magersari, on cattle 23.1.'23 „
 1 ♀ „ Djember, Res. Banjoewangi, KEUCHENIUS Coll. N.A.M.
 2 ♀ ♀ „ Java, without further locality „
 Isle Sumatra
 Gouvernement Atjeh
 38 ♀ ♀ from Meurundoë, East Coast, DIEBEN Coll. V.S.L.
 respectively 2 ♀ ♀ coll. on 20.1.'23
 6 ♀ ♀ „ „ 10.2.'23
 7 ♀ ♀ „ „ 18.2.'23
 23 ♀ ♀ „ „ 3.'23
 1 ♀ from Lho Nga, coll. on 3.'23, DIEBEN Coll. V.S.L.
 Gouvernement: Sumatra's East Coast
 1 ♀ from Tandjong Morawa, Serdang, Dr. B. HAGEN Coll. N.A.M.
 1 ♀ „ Tandjong Morawa, Serdang, Dr. B. HAGEN Coll. L.M.N.H.
 Residency Tapanoeli
 Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean
 2 ♀ ♀ from Angkola, TARIF 12.'21 Col. V.S.L.
 2 ♀ ♀ „ Bintodjoe, Moeara Tais, LOBEL „
 respectively 1 ♀ on horse 3.'23
 1 ♀ „ buffalo 30.6.'23
 2 ♀ ♀ „ „ 26.9.'23
 1 ♀ from Hoeta Olboeng, Moeara Tais on buffalo 30.6.'23, LOBEL Coll. V.S.L.
 2 ♀ ♀ „ Si Balapak, Moeara Tais on buffalo 24.12.'23, LOBEL Coll. V.S.L.
 3 ♀ ♀ „ Hapesong Lama, Marantjar. LOBEL „
 respectively 1 ♀ on horse 27.2.'23
 1 ♀ „ cattle 29.6.'23
 1 ♀ „ buffalo 1.6.'24
 1 ♀ from Pidjor Koling, Pidjor Koling on buffalo 29. 6.'23, LOBEL Coll. V.S.L.
 3 ♀ ♀ „ Si Doea doea, Pidjor Koling on buffalo 30.6.'23, LOBEL Coll. V.S.L.
 1 ♀ „ Hoeta Lombang „ „ „ horse 24.12.'23, LOBEL Coll. V.S.L.

2 ♀ ♀ „ Si Hitang, Batoe na Doea on buffaloe LOBEL Coll. V.S.L.
respectively 1 on 1.'23

1 „ 9.9.'23

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

67 ♀ ♀ from Pasar Goenoeng Toea, Goenoeng Toea coll. by TARIP, LOBEL and
BAKKER. Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922				5						1			6
	„	1923			1					1			2		4
	„	1924				1	3	1	1			1	1		8
	cattle	1922										1	3	4	8
	„	1923			1		2	1	1				4	5	14
	„	1924			1		3	3			1				8
	buffalo	1922											2	3	5
	„	1923							2				1		3
	„	1924		5		1	3	1	1						11
Total				5	3	7	11	6	5	1	1	3	13	12	67

10 ♀ ♀ from Pidjang Bolang 20.3.'22, TARIP

48 ♀ ♀ „ Si Paho, Oedjoeng Padang, coll. by LOBEL, BAKKER.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922			1				2	1			4		8
	„	1924	2	1		1	12	3							19
	buffalo	1922										2			2
	„	1923			2			1							3
	„	1924		4		1	8	1			2				16
Total			2	5	3	2	20	5	2	1	2	2	4		48

38 ♀ ♀ from Sawah Bangoenan, Portibi, LOBEL, BAKKER coll. Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923			1										1
	„	1923	4				6	5		1	1				17
	buffalo	1922											5		5
	„	1923					2		1				6	1	10
Total			4		1		8	5	1	1	1		11	1	33

4 ♀ ♀ from Goenoeng Toea Djoeloe, G. Toea, on buffalo 21.11.'22, LOBEL
Coll. V.S.L.

6 ♀ ♀ „ Batoe Goena, G. Toea, LOBEL

respectively 2 ♀ ♀ on horse 26.12.'22

4 ♀ ♀ „ buffalo 26.12.'22

8 ♀ ♀ from Goenoeng Toea Tongga 1922, LOBEL

respectively 1 ♀ on horse 10.'22

1 ♀ „ „ 23.12.'22

1 ♀ „ „ 21.11.'22

2 ♀ ♀ „ buffalo 20.11.'22

3 ♀ ♀ „ „ 23.12.'22

2 ♀ ♀ from Hoeta Rimbaroe Poerba Sinomba, LOBEL, Coll. V.S.L.

respectively 1 ♀ ♀ on horse 10.'22

1 ♀ ♀ „ buffalo 10.'22

6 ♀ ♀ Poerba Sinomba 1922, LOBEL

Coll. V.S.L.

respectively 2 ♀ ♀ on horse 10.'22

4 ♀ ♀ „ buffalo 21.12.'22

Ressort Padang Sidempoean, Mantrie Ressort Binanga

23 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, TARIP, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922	2	6										3	11
	„	1923							1	1					2
	buffalo	1922												2	2
	„	1923											5		5
	„	1924										1			1
	cattle	1923		2											2
Total			2	8					1	1		1	5	5	23

- 2 ♀ ♀ from Binanga, on horse 10.'22, LOBEL Coll. V.S.L.
 1 ♀ „ Pangkal Dolok Lama, Pangkal Dolok 1.'23, LOBEL on buffalo
 8 ♀ ♀ „ Si Oendol, Paringgonan, Binanga, LOBEL, BAKKER Coll. V.S.L.
 respectively 1 ♀ on buffalo 25.6.'23
 1 ♀ „ „ 9.1.'24
 2 ♀ ♀ „ „ 4.6.'24
 2 ♀ ♀ „ „ 24.9.'24
 1 ♀ „ horse 4.6.'24
 1 ♀ „ „ 26.11.'24
 22 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, Binanga, LOBEL, BAKKER
 Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923						1		2			2	3	8
	„	1924										3	1		4
	buffalo	1922										2			2
	„	1923						1		4					5
	„	1924			2								1		3
Total					2			2		6		5	4	3	22

Ressort Padang Sidempoean, Mantri Ressort Kota Nopan

87 ♀ ♀ from Kota Siantar, Kota Nopan

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923		6	3	1		1					10	6	27
	buffalo	1922										50			50
	„	1923	1	2									5	1	9
	„	1924						1							1
Total			1	8	3	1		2				50	15	7	87

- 21 ♀ ♀ from Panjaboengan, Mandailing, Kota Nopan on buffalo 26.2.'22, TARIP
 1 ♀ „ Tombang Boestak, Manambin on horse 24.11.'22, LOBEL
 Coll. V.S.L.
 3 ♀ ♀ „ Hoeta Nagodang, Manambin on buffalo 24.12.'22, LOBEL
 Coll. V.S.L.
 22 ♀ ♀ from Moeara Tagor, Tamiang, Kota Nopan „

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923			3	2					5				10
	"	1924		3		2									5
	buffalo	1923		1	1				2						4
	cattle	1923		3											3
				7	4	4			2		5				22

2 ♀ ♀ from Salemboe, Pidoli Boekit, Kota Nopan, BAKKER 10.3.'24 on horse

Males.

- 1 ♂ from Rawa, Sumatra 5.'78 Coll. L.M.N.H.
 1 ♂ „ Silago, Sumatra 7.'77 „
 1 ♂ „ Java, Kuhl „
 1 ♂ „ Dehra Dun, Burma 7.'13, R. SENIOR WHITE Coll. BR.M.
 1 ♂ „ Benhar, North Bihar, Mr. H. A. INGLIS Coll. BR.M.

The Federated Malay States

- A series of Females from Darien Typus F. M. S. STANTON Coll. BR.M.
 A series of Females from Jelebu, Negri Sembilan, STANTON „
 A series of Females from the federated Malay States PRATT Coll. Lond. Sc. Tr. Med.

British India

- 1 ♀ from S. India, Madras, Guindy, PATTON Coll. BR.M.

RICARDO mentions:

- ♀ ♀ from Rajmahal (at light on banks of Ganges) Ind. Mus.
 ♀ ♀ „ Port Canning
 ♀ ♀ „ Bhogoan in Purneah District
 ♀ ♀ „ Khoolna, Bengal
 ♀ ♀ „ Goalbathan, Bengal
 ♀ ♀ and ♂ ♂ from Pusa HOWLETT coll.
 1 ♀ from Calcutta on cattle
 1 ♀ „ Lushai hills KERTESZ coll.
 ♂ ♂ „ Pusa Ind. Mus.
 ♂ ♂ „ Calcutta
 ♂ ♂ „ Purneah District
 1 ♀ „ Kaiang Reserve, Pyinmana, Burma R. SENIOR WHITE 4.5.'19 Coll. BR.M.
 1 ♀ „ Bendaung at light 12.5.'18, Burma, R. SENIOR WHITE
 9 ♀ ♀ from Bendaung, come to light on elephant, R. SENIOR WHITE, 17.5.'18
 4 ♀ ♀ „ Benhar, North Bihar, Burma July/Aug. 21 INGLIS

The following table gives a comprehensive summary of the distribution of *H. javana* the whole year round; all females caught in Sumatra on buffalo, horse and cattle are included.

Table.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922	2	6		5						7	2	8	30
	"	1923		7	10	1		2	3	5	5		18	10	61
	"	1924	6	4	2	4	21	10	1	1	1	4	3		57
	buffalo	1922		21								55	9	19	104
	"	1923	3	3	3		2	7	5	4	3		17	2	49
	"	1924	1	9	2	2	11	5	1		4	1	1		37
	cattle	1922										1	3	4	8
	"	1923		5	1		2	2	1				4	5	20
	"	1924			1		3	3			1				8
Total			12	55	19	12	39	29	11	10	14	68	57	48	374

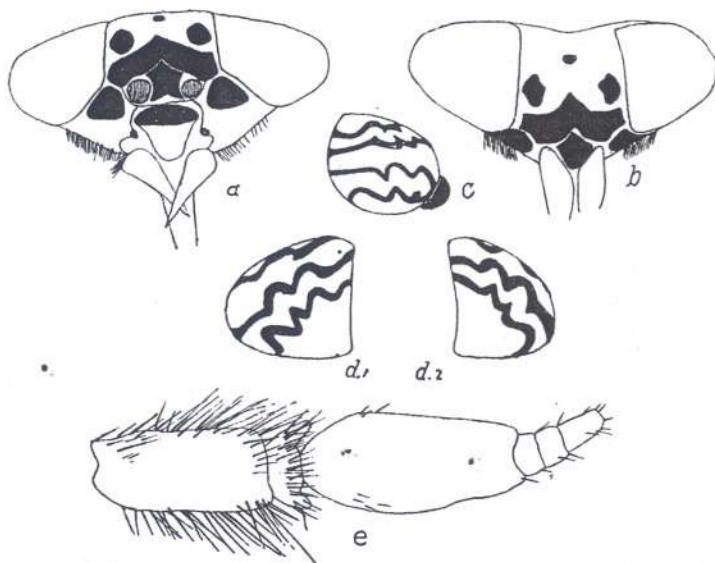
The Female

H. javana WIED. is a greybrown species. Forehead greybrown to brownish-yellow. Paired spots large, unpaired spot small. Callus olivebrown, pointed at upper, incised at lower border. Other black spots between the antennae and on the cheeks, upper border of face wholly black. Eyes with four crossbands. Cheeks white, white haired. Palpi yellowishbrown, white haired. Antennae olivebrown to redbrown, first joint shorter than the broadened and flattened basal annulation of the third joint. Thorax brown, with longitudinal white stripes and borders, scutellum white at base. Legs brown, with 2 yellowbrown rings to middle and hind tibiae. Wings, with double apical band, the usual rosettes, white triangles in the openings of all posterior cells, except the 4th, basal transverse bars connected. Abdomen, with a broad median longitudinal stripe, broad white segmentations to the first 3 segments, narrower ones to the following segments and mostly lateral white spots on the 6th and 7th segment.

Table of dimensions.

Bodylength	varying from	8,5 m.M.	—	11,8 m.M.
Width of thorax	"	2,5	"	3,8
Width of abdomen	"	2,5	"	4

Wingexpanse	varying from	18,5	„	—	24,8	„
Length of head	„	1,5	„	—	2,2	„
Length of thorax	„	3	„	—	4,5	„
Length of abdomen	„	4,8	„	—	7,2	„
Length of wing	„	8,5	„	—	10,5	„
Breadth of wing	„	3	„	—	4	„
Foreheadindex	„	0,75	„	—	1,18	„



Textfig. 47.

H. javana WIED ♀

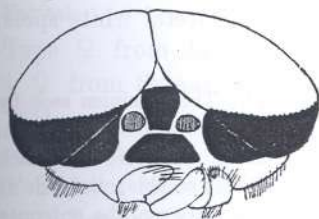
a, b. head, c. eye, lateral view, d.1, d.2 left and right eye, seen from above; e. antenna.

The Head. (Textfig. 47). Forehead almost the same width throughout, yellowbrown, black haired, except between callus and paired spots, where one finds some white hairs. Paired spots big, round, velvetybrown, neither reaching to the eyes, nor touching the callus; unpaired spot small, wholly black or redbrown with black centre. Callus shining olivebrown to wholly black-brown, ribbon-shaped, produced at upper border to a sharp point, deeply incised at lower border, not reaching to the eyes. The lower border of the callus embraces a broad black spot, situated between the antennae. Each cheek bears a big transverse black haired, triangular spot, almost wholly filling up the space between the eyes and the antennae. Lower cheeks greywhite tomentose, white haired. Black pits not far from the mouth at each side of the face. Face with black upper border, lower parts white, yellow white haired. Postocular rim yellow-brown, white haired. Eyes in fresh specimens with 4 coppergreen transverse bands; the lower ones connect near the forehead, the fourth transverse, but curving back near the outer eyeangle. Palpi pale yellowbrown, stout, first joint white haired, second joint ending with a blunt point, white haired at base, black haired at extreme apex, to the base some black hairs are intermixed. Antennae; First joint olivebrown, swollen to the apex, slightly shorter

than the basal annulation of the 3d joint, black haired, second joint olivebrown, cup-shaped, black fringed, third joint havannayellowbrown, broadened and incrassate on basal annulation, stylus narrow.

Thorax dullbrown to blackish brown, with a median longitudinal white stripe, reaching the scutellum. Both lateral stripes are interrupted just after the suture, in front of it lies a triangular white spot, comma-shaped white transverse spots embrace the hindborder of the scutum, lateral borders of scutum whitish also. Foreborder of thorax mainly dirty yellow-white haired, shoulders white haired, hindborder of scutum black haired, intermixed with a few white hairs, pteropleuron yellowbrown, black haired. Breast and sides rustybrown white haired. Scutellum broadly white at base, hindborder violetbrown. Wings, spots and stripes arranged as mentioned. The white triangle in the opening of the fourth posterior cell, which mostly fails, may be indicated in some specimens either on both or on one wing only. Rosettes with central white spots or missing them. Halteres, stalk pale yellow, club havannabrown. Legs fringed with hairs, especially the middle and hind legs. First leg, Coxa yellowbrown, white haired at base, apex redbrown, black haired, femur havannabrown, knee yellowbrown, pubescence on basal $\frac{2}{3}$ dirtywhite, elsewhere black. Tibia swollen to the apex, extreme base brownish, then white, white haired, apical half brownblack, black haired. Tarsalia black. Second leg, coxa and trochanter dull darkredbrown, femur brownyellow, white tomentose, knee leatheryellowbrown, black haired, distal lateral border white haired. Tibia leatheryyellow, black haired, with 2 white haired paler annulations, first tarsale milkywhite at base, apex blackbrown, black haired, other tarsalia yellowish, black haired. Third leg, Coxa lilacbrown, trochanter redbrown, both dirtywhite haired, femur yellowbrown, white haired with redbrown, black haired apex, tibiae similar, basal portions of tarsalia dirtywhite, tarsalia black haired. **Abdomen** brown, darker to the blackishredbrown apex. Apart from the mentioned white markings the lateral borders of the yellowbrown tergites are white haired. Ventral surface brick-redbrown on first 3 segments, segmentations paler yellowish, following segments blackgrey, sides and segmentations yellowwhite haired. RICARDO supposes the synonymity of *H. javana* WIED. with *H. asiatica* RONDANI and *H. nigra* WIED, but the descriptions of both species are so incomplete, that it is impossible to decide if these suppositions are true. DE MEYERE falsely mentions, that the first antennal joint is longer than both following ones together.

The Male.



Textfig. 48.

H. javana WIED ♂
head

The Head. Pl. 2, Fig. 7 c. (Textfig. 48). Black-facetted part of the eyes narrow, prolonged at hindborder till halfway the vertex, large-facetted part brownred. Frontal triangle redbrown. Cheeks and face as in the female. Palpi short, yellowbrown, white haired, pointed at apex, which bears some black hairs. Antennae olivaceous pale havannabrown, first joint shining on dorsum, with a black spot at apex, strongly incrassate, yellowbrown haired at base, apex long, yellowbrown haired, elsewhere black haired, second joint very short, same colour as first joint, black fringed, 3d joint same shape as in the female.

Thorax blackbrown, scutellum paler, more darkolivebrown, longitudinal stripes indistinct, brown, pubescence mainly black, intermixed with some yellowbrown hairs, especially at hindborder of scutum and on the scutellum. Pteropleuron velvetybrown, blackbrown haired. Sides and breast reddisholivebrown, yellowbrown haired. Wingmarkings as in the female. Legs darker, more blackbrown. First leg. Coxa olivebrown, brownishwhite haired at base, blackbrown, black haired at apex. Trochanter and femur blackbrown, black haired, distal lateral border of femur white haired, knee yellowbrown. Tibia less than basal $\frac{1}{3}$ brownish

yellow, yellow haired, elsewhere blackish, black haired. Tarsalia blackbrown, black haired. Second leg, femur yellowbrown, mainly yellow haired, black haired at apex. Tibia blackbrown, black haired with 2 yellowbrown, white haired rings. Tarsalia pale olivebrown, black haired. Third leg, femur, tarsalia and tibiae similar, hairfringes to the tibiae very thick, rings yellow-white haired.

A b d o m e n olivebrown on first 3 segments, following segments blackbrown with loose black pubescence, segmentations paler yellowbrown, white haired. The under side yellowbrown to blackbrown, wholly yellowwhite haired, except the black haired 7th segment.

49. *Haematopota punctifera* BIGOT. (♀) Textfig. 49.

References:

BIGOT, Mem. Soc. Zool. France V, p. 629 (1892).

RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 125 (1906).

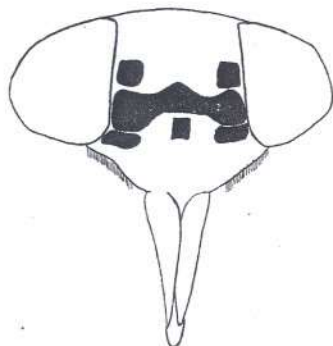
„ Rec. Ind. Mus. IV, p. 327 (1911).

„ Rec. Ind. Mus. IV, p. 347 (1911).

Habitat:

Type ♀ from Java

A very remarkable species, forehead brown, broad, with halter-shaped, transverse, brownblack callus. When fresh, the specimen probably showed the paired spots. Between the antennae a black spot and on each cheek a disc-shaped spot is found. Cheeks greywhite, white haired. Beard white. Palpi yellowbrown, white haired. Antennae brown, first joint short. Thorax chestnutbrown with 3 longitudinal white stripes and similar borders to the scutum, scutellum with white centre and brown borders. Wings with apical band double, white triangles in all posterior cells. Legs tawnybrown with 2 whitish rings to the middle and hind tibiae. Abdomen brown, with a median greywhite longitudinal stripe, ending on the sixth segment, and a series of lateral white spots. 11 m.M.



Textfig. 49.

H. punctifera BIGOT ♀
head

The H e a d. (Textfig. 49). The specimen seen by me in the British Museum collection was in bad condition. The forehead was wetted before, therefore the black square, paired spots are not clearly visible, they don't touch the eyes. The black spot between the antennae is square. Each cheek bears a disc-shaped velvety brown-black spot, touching to the eyes. Frontal callus narrow, brownblack, halter-shaped, produced to a point at upper border, concave at lower border. Cheeks greywhite, white haired. Palpi yellowbrown, white haired, some black hairs at apex. Antennae incomplete, first joint brown, short and incrassate, second joint redbrown, small.

T h o r a x chestnutbrown, with a median narrow and 2 lateral broader longitudinal, greywhite stripes, lateral borders of scutum broadly whitish, breast brownishgrey. Scutellum as mentioned. Wings with double

apical band, each branch broad. White triangles in the openings of all posterior cells, not connected to a continuous white margin as in *H. marginata* RICARDO. Two distinct rosettes with big patches insides, third rosette nearly wholly filled up with white patches, first and second rosette connected. Basal transverse bars present, the most basal one broad, curving back along the axillary vein. A white spot on the anal vein. As a whole the wingpattern of *H. marginata* Ric. is finer, the first apical band broader, halfmoon-shaped, second apical band narrower. Legs in *H. punctifera* BIG. reddishbrown, fore tibiae white, white haired on basal half, apex tawnybrown, black haired, middle and hind tibiae tawnybrown, black haired with 2 whitish, white haired rings.

A b d o m e n chestnutbrown, with a median greywhite, longitudinal stripe, ending on the 6th segment and a series of lateral white spots at each side of the median line on the 2d till 7th segments, lateral borders of 1st till 6th tergite whitish, white haired. Ventral surface chocolatebrown, 2d and 3d segment with some white hairs at sides. *H. punctifera* BIGOT is closely allied to *H. marginata* RICARDO but differs, except in the already mentioned wing-pattern, in the absence of black spots on the cheeks in last named species and the dimensions of the first antennal joint, which is longer in *H. marginata* Ric.

50. *Haematopota lunulata* MACQUART. (♀) Pl. 3, Fig. 5; Textfig. 50.

Syn. H. stantoni RICARDO.

References:

- MACQUART, Dipt. exot. Suppl. III, p. 175, pl. I, fig. 6 (1847).
 VAN DER WULP, Sumatra Exped. Dipt., p. 20 (1881).
 OSTEN SACKEN, Berl. Ent. Zeit., XXVI, p. 97 (1882).
 RICARDO, Rec. Ind. Mus., IV, p. 354 (1911).
 „ Bull. Ent. Research, Lond. VI, p. 403 (1916).
 DE MEYERE, Tijdschr. v. Ent. LIV, p. 281 (1911).
 RONDANI, Ann. Mus. Civ. Genova VII, p. 461 (1875).

Habitat:

- | | |
|--|-------------------|
| Type ♀ from Java, PAYEN | Coll. Paris. Mus. |
| 1 ♀ from Sumatra, Moeara Laboe | Coll. L.M.N.H. |
| 1 ♀ „, Pidjangbolang, Padang Sidempoean, Tapanoeli, 4.22, on buffalo | Coll. V.S.L. |
| LOBEL | |
| 1 ♀ from Moeara Tais, Pad. Sidempoean, Tapanoeli, 24.12.'22, on buffalo, | Coll. V.S.L. |
| LOBEL | |
| 1 ♀ from Si Balapak, Moeara Tais, Sidempoean, Tapanoeli, 24.12.'22 on horse, LOBEL | Coll. V.S.L. |
| 1 ♀ from Tandjong Morawa, Serdang, Sum. East Coast, Dr. HAGEN | Coll. N.A.M. |
| 1 ♀ „, Tandjong Morawa, Serdang, Sum. East Coast, Dr. HAGEN | Coll. L.M.N.H. |

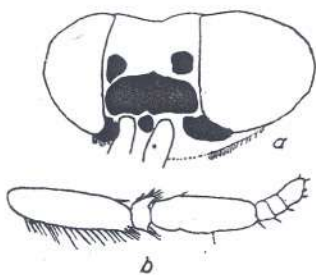
Federated Malay States

- | | |
|----------------------------------|---------------|
| 3 ♀ ♀ from Kuala Lumpur, STANTON | H.F.M.S. Mus. |
| 1 ♀ „, Selangor, RIDLEY 1896 | Coll. BR.M. |

A brownish species. Forehead distinctly narrower at vertex. Callus convex, shining black, transverse, broader than deep. Usual paired spots present, as also the black spots between the antennae and on the white cheeks. Face grey-white, upper border velvetybrown. Beard white. Palpi long and slender, dull piceous, black haired. Antennae nearly 2 times as long as the head, brown, first joint shorter than the third one. Thorax havannayellowbrown without longitudinal stripes, pubescence black and yellow. Wings with the usual rosettes, a broad concave single apical crossband, whose borders are not wavy, triangular spots in the openings of the 2d, 3d, and 5th posterior cell. Legs brownblack with the bases of all tibiae white. Abdomen chocolatebrown, segmentations whitish, with a pointed triangular spot on the 2d segment, almost reaching to the base of this segment.

Table of dimensions.

Bodylength	varying from	8,8 m.M.	—	9,5 m.M.
Width of thorax	" "	3	"	
Width of abdomen	" "	2,6	" —	3 "
Wingexpanse	" "	20,6	" —	21,4 "
Length of head	" "	1,5	" —	2 "
Length of thorax	" "	5,3	" —	3,8 "
Length of abdomen	" "	5	" —	5,2 "
Length of wing	" "	8,8	" —	9 "
Breadth of wing	" "	3	"	
Foreheadindex	" "	1,13	—	1,25



Textfig. 50,

H. lunulata MACQ ♀

a. head, b. antenna.

The Head. (Textfig. 50). Forehead scanty black haired, yellowbrown in the middle, rustybrown at sides, slightly narrower at apex. Postocular rim blackishyellowbrown, with a few yellowish hairs. Callus big, transverse, shining black, quadrangular, reaching to the eyes, convex. Paired spots large, velvetybrownblack, unpaired spot rudimentary, distinct in some specimens. A roundish, velvetyblack spot lies between the antennae, each cheek bears a halfmoon-shaped spot between the antennae and the eyes. Cheeks elsewhere cretaceous white, white haired, beard silvery white. Upper border of face dull velvetybrown, elsewhere yellowishgrey, showing some scanty yellowish pubescence. Palpi dull sootyblack at the outer border, black haired, inner border dull brown, first joint short, white haired,

second joint slender, ending in a point. Antennae long, first joint slightly swollen at the inner border, straight on outer border, dark blackbrown, shorter than the third joint, black haired. Second joint short, cup-shaped, havanna-reddbrown, black fringed. Third joint dull velvetyblack, basal annulation long, hardly broader at base, stylus short, slightly longer than the foregoing 2 joints together.

Thorax havanna-yellowbrown without longitudinal stripes, black haired, intermixed

with short yellow hairs, especially at the foreborder, lateral borders, goldenyellow haired, arranged in tufts at the wingbases and behind. Pteropleuron blackbrown, black haired. Scutellum same colour as scutum. Breast and sides grey, white haired. Mesosternumlobus yellowishgrey, yellow haired. Wings as mentioned with 8 rosettes, of which the apical ones are very distinct, with some central spots. First rosette closed at upper border with a circular white ring with grey-black centre, paired transverse spots in all posterior cells, Basal transverse bars present, apical one of both with a point in the axillary lobus. Apex of wing slightly darker, fore border faintly yellowishbrown. Halteres, stalk dirtywhite, club dull black. Legs. All tibiae white at base. First leg. Coxa yellowgrey, yellowwhite haired, apexring brownblack, black haired, trochanter redbrown, femur blackbrown, black haired, with some yellowbrown hairs at base and long white hairs along the distal lateral border. Tibia rustybrown at extreme base, then white, white haired, apical half black, black haired. Tarsalia black. Second leg. Coxa and trochanter redbrown, Femur blackbrown with a black hairtuft at apex and black hairs along the distal lateral border, pubescence elsewhere white. Tibia nearly wholly white, white haired, except the narrow, apical black, black haired ring and 2 black spurs. First tarsale whitish at base, apex redbrown, black haired. Third leg, Coxa greybrown, yellowbrown haired, trochanter redbrown, yellowbrown haired. Femur as in second leg, Tibia redbrown at extreme-base, basal $\frac{2}{3}$ white, white haired, apex black, black haired, slightly swollen, Tarsalia reddish brown, black haired.

A b d o m e n chocolatebrown at base, darker to the apex, black haired, segmentations narrowly white, yellowwhite to brownishwhite haired. Second segmentation broad, prolonged in the middle to an elongate triangular spot, which nearly reaches the base of this segment. A trace of a similar triangle may be also present on the 3d segment. Ventral surface grey-brown, darker, blackbrown on the last three segments, pubescence yellowwhite, black on the 7th segment.

RICARDO mentions in her description of *H. stantoni* RIC. a blackbrown band, extending across the face from a point touching the eyes more than half way down the face, below the bases of the antennae. In the specimens seen by me there was only a brown streak. Moreover the femora were blackbrown in my specimens, instead of obscurely reddishyellow as RICARDO found them, but I consider these differences as unnoticeable and regard therefore her species *H. stantoni* RIC. as a synonym of *H. lunulata* MACQ. Besides the specimens present in the Dutch collections collected by Dr. HAGEN were wholly identical with the specimens of *H. stantoni* RIC. seen by me in the BR. Museum collection and both agree rather good with MACQUART's description who especially mentions the pale triangle on the second segment and the tibiae, with their white bases in all legs. OSTEN SACKEN pointed to the difformity of the specimens, placed under this heading in the collections, studied by him and it appears probable that he had 2 species before him, the true *H. lunulata* MACQ. and *H. annulipes* SCHUURMANS STEKHOVEN, see there.

VAN DER WULP's male from Moea Laboe was not present in the Dutch collections, I had access to, but I am quite sure, that it belonged to *H. lunulata* MACQ. He mentions the following particularities: „The male from Moea Laboe is 8 m.M. long; the antennae are wholly black or blackbrown; the first joint is a little stouter than the following ones and very shining; the eyes have tolerably large facets above, below very small ones, the small triangular forehead is almost wholly occupied by the shining black callus. The legs are very dark brown, the fore legs black, except the basal third of the tibiae, which is white; on the middle tibiae the white colour extends further, almost three fourth of the length; the hind tibiae are distinctly incrassate, more redyellow and only white at the base, on both sides with thick blackbrown fringes of hairs". I don't agree with DE MEYERE, who regards *H. borneana* RONDANI synonym with *H. lunulata* MACQ. since in last species the face presents no black spots, dark longitudinal thoracal stripes are visible, whereas the abdominal markings are distinct and the pale characteristic triangle on the second segment fails totally.

51. *Haematopota truncata* nov. spec. (♀) Pl. 3, Fig. 6; Textfig. 51.

Habitat:

Isle Sumatra

Type ♀ from Pasar Sibohoean, Djandi Lobi, Binanga, Padang Sidempoean,
 Tapanoeli on cattle 26.2.'23, LOBEL Coll. V.S.L.

7 ♀ ♀ from same locality

respectively 1 ♀ on cattle on 26.2.'23

4 ♀ ♀ on horse on 2.1.'24

1 ♀ „ „ on 5.2.'24, BAKKER

1 ♀ „ buffalo on 24.11.'24, BAKKER

2 ♀ ♀ from Siendol, Paringgonan, Binanga, Pad. Sidempoean, Tapanoeli,
 BAKKER Coll. V.S.L.

respectively 1 ♀ on horse on 24.9.'24

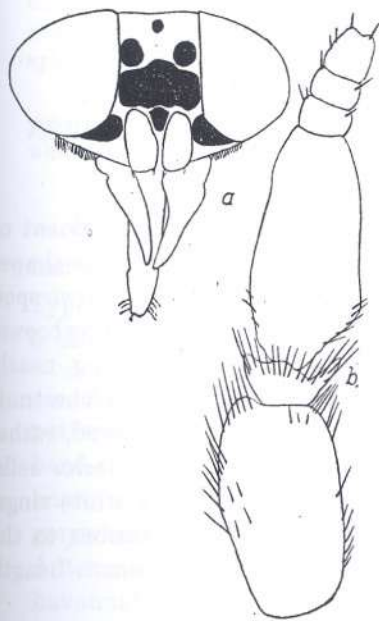
1 ♀ „ buffalo on 26.11.'24

1 ♀ from Hoeta Nopan, Hoeta Nopan, Binanga, Pad. Sidempoean, Tapanoeli,
 on horse 25.11.'24, BAKKER Coll. V.S.L.

H. truncata is a blackish species. Forehead sootybrownblack. Callus quadrangular, shining black, prolonged at apex to a point. Paired spots round, contiguous to the eyes, unpaired spot triangular. Other black spots on the cheeks and between the antennae. Face and cheeks white, white haired. Beard white. Palpi yellowish, white haired. Antennae shining black, first joint strongly incrassate, basal annulation of the third joint incrassate. Thorax black with indications of two white longitudinal stripes and a white transverse spot at hind-border. Wings with a single apical broad crossband, wavy at inner border, concave at outer border. White triangles in all posterior cells. Usual rosettes present, rather indistinct, with white central small spots. Transverse basal bars fine, the apical one ending at the wingborder in a big white spot. Abdomen black, with white segmentations to all segments, broadest on the second segment with a median truncate spot. Legs black with, white bases to fore and hind tibiae, with two white rings to the middle tibiae only.

Table of dimensions.

Bodylength	10,2	m.M.	—	8,2	m.M.
Width of thorax	3,2	„	—	2,6	„
Width of abdomen	3,2	„	—	2,6	„
Wingexpanse	20,8	„	—	16,6	„
Length of head	2,2	„	—	1,6	„
Length of thorax	4	„	—	3	„
Length of abdomen	6	„	—	5	„
Length of wing	8,8	„	—	7	„
Breadth of wing	3,2	„	—	2,6	„
Foreheadindex	1,86		—	1,20	



Textfig. 51.

H. truncata s.s. ♀
a. head, b. antenna.

The Head. (Textfig. 51). Forehead sooty-brownblack, nearly the same width throughout, black haired, some white hairs being found between the callus and the round oval, large, paired spots, contiguous to the eyes and the black shining callus, which is indented at its lower border. Between the eyes one finds a fan-shaped black spot. Each cheek shows a triangular big black spot with rounded angles. Cheeks and face as mentioned. Palpi bright yellowish-white, white tomentose with a violet hue, white haired, second joint ending with a blunt point. Antennae black, first joint broad, cylindrical, shining, almost as long as the basal annulation of the third joint, black haired, second joint very short, cup-shaped, black haired, third joint incrassate, with a narrow stylus. Proboscis brownblack, brownblack haired.

Thorax chocolatevelvetybrown to dark havannabrown, foreborder of scutum greyish white, with indications of 2 white longitudinal stripes, ending in a white spot at the level of the suture. At the hindborder of the scutum 2 connected, transverse white, comma-shaped spots. Pubescence on the scutum brownyellow and black. Scutellum velvetybrown with white tomentose borders, pubescence as on the scutum. Breast blackishgreyblue, white haired.

Wingpattern as mentioned. Apical band with continuous curved line at outer border, wavy at inner border. First rosette closed with a white circle, with a black centre, the white spots composing the rosettes small. Second rosette not connected with the first one, both with central spotlets, third rosette elongate, indistinct. Stigma brownblack. Foreborder of the wing pale grey. Wingapex darker. Halteres, stalk white, club havannabrown. Legs. First leg. Coxa greywhite, white haired, apex blackbrown, trochanter blackbrown, femur brownblack, black haired. Tibia blackbrown at extreme base, then white, white haired, apical half black, black haired. Tarsalia black. Second leg. Coxa greyblue, trochanter dull redbrown, femur violet-pale greyblue, grey haired on ventral surface, dorsum black, black haired. Tibia olivebrown, black haired, with 2 oblique white, white haired rings. First tarsale whitish at base, elsewhere black, black haired; other tarsalia black. Third leg. Coxa greyblue, trochanter dull brown, femur as in second leg. Tibia brown at extreme base, then white, white haired, apical half black, black haired, intermixed with some white hairs. First tarsale paler at base, black haired.

Abdomen black, black haired with narrow white, white haired segmentations, second segmentation broader with a truncate prolongation. Lateral borders of first 2 segments white haired. Ventral surface black, grey tomentose, grey haired with fine, white, white fringed segmentations. *H. truncata* is closely allied to *H. atomaria* Wlk. but differs in the colour of the frontal callus, the first antennal joint, the face with its brown transverse stripe on upper border, white triangle missing in the opening of the 4th posterior cell, etc.

52. *Haematopota atomaria* WALKER. (♀) Textfig. 52.

References:

WALKER, Proc. Linn. Soc. London, I, p. 112 (1856)

RICARDO, Ann. Mag. Nat. Hist. (7) XVIII, p. 117 (1906).

„ Rec. Ind. Mus. IV, p. 332 (1911).

Habitat:

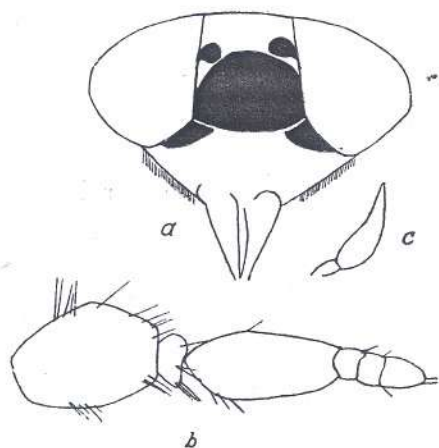
Type ♀ from Sarawak, Borneo, A. R. WALLACE

Coll. BR.M.

2 ♀ ♀ from Sarawak, Borneo, STEVENS 1857

„

A chestnutbrown species. Forehead with voluminous callus, prominent on the darkbrown forehead, which shows moreover the usual paired, comma-shaped spots, unpaired spot absent. Each cheek presents a triangular velvetybrown spot. Cheeks and face greywhite, white haired. Beard same colour. Palpi yellowbrown, black haired. Antennae dark brown, first joint strongly swollen, shining, nearly as long as the broadened basal annulation of the third joint. Thorax chestnutbrown with 2 indistinct whitish longitudinal stripes. Wings with a curved, rather broad single apical band, white triangles in the openings of all posterior cells, the usual rosettes and basal transverse bars. Middle tibiae with 2 white rings, other tibiae white at base. Abdomen brown, with paler segmentations to the 3d—6th segments and a pale whitish spot at the end of the 2d segment. Length 9 m.M.



Textfig. 52.

H. atomaria Wlk. ♀

a. head, b. antenna, c. palpe.

The Head. (Textfig. 52). Forehead darkbrown with an enormous broad, convex, prominent pitchybrown callus, reaching to the eyes. Paired spots comma-shaped, contiguous to the eyes and the callus. Each cheek bears a triangular velvetybrown spot underneath the callus. Cheeks and face as mentioned. Palpi brown to yellowbrown, second joint swollen at base, ending with an acute point, black haired, a few white hairs being found on the distal lateral border. Antennae, first joint shining dark brown, incrassate, second joint short, third joint longer than the basal 2 joints together, brownblack, flat and rather broad on basal annulation.

Thorax chestnutbrown, with 2 faint whitish longitudinal stripes, starting from 2 white triangular spots, situated at the hindborder of the scutum. Pubescence white. Scutellum wholly brown. Breast brownish grey, white haired. Wings darkbrown, apical band single, com-

posed of separate spots, reaching to the hindborder, interrupted by a fine stripe. White triangles in the openings of all posterior cells, smaller in the 4th and 5th one and missing in the 4th posterior cell of one of the STEVEN's females. Paired transverse white spots in all posterior cells. Three rosettes are present, first rosette with central white spots, second one smaller, only half as large as the first one. Basal transverse bars nearly straight, the apical one with a low curvature in the axillary lobus. Halteres darkbrown. Legs. First leg. Coxa whitish at base, apex redbrown. Femur redbrown, black haired, tibia redbrown at extreme base, then white, white haired, apical half blackbrown, black haired. Tarsalia blackbrown, black haired. Second leg,

tibia, with 2 white, white haired rings, first tarsale whitish at base. Third leg, tibia redbrown at extreme base, the following white band does not reach halfway the length of the tibia, apical part redbrown, black haired.

A b d o m e n chestnutbrown, with a pale whitish spot at the end of the second segment, paler very narrow segmentations to the mentioned segments. Ventral surface brown with whitish, broader segmentations to the first 6 segments.

53. *Haematopota jacobsoni* nov. spec. (♀) Pl. 4, Fig. 11; Textfig. 53.

Habitat:

Type ♀ from Java, Semarang, JACOBSON

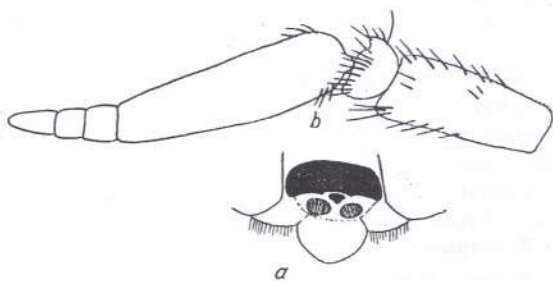
Coll. L.M.N.H.

5 other females, same locality JACOBSON

A species resembling *H. pungens* DOL. but differing from it i.a. in the wing-pattern and the abdominal markings. Forehead greybrown, black haired, with band-shaped blackbrown callus, the usual paired spots comma-shaped, redbrown, unpaired spot present or absent. No black spots on cheeks and face, which are greywhite, white haired. Beard same colour. Palpi olivebrown, black haired. Antennae olivebrown to yellowbrown, third joint hardly broader at base. Thorax havannabrown, with 3 longitudinal white stripes and pale, yellowwhite haired, lateral borders, scutellum white tomentose in the middle and at lateral borders. Wings, apical band double, white triangles in the openings of all posterior cells, in two cases wanting in one or more of the mentioned cells. The usual 3 rosettes distinct, filled up with white spots, transverse basal bars irregular. Legs havannabrown, with 2 yellowbrown rings to the middle and hind tibiae. Abdomen havannabrown, with lateral borders of tergites broadly grey, narrow grey segmentations and a fine white longitudinal stripe on the 2d segment.

Table of dimensions.

Bodylength	9,2 m.M.
Width of thorax	3 "
Width of abdomen	3,6 "
Wingexpanse	21 "
Length of abdomen	5,5 "
Length of wing	9 "
Breadth of wing	3,2 "



Textfig. 53.

H. jacobsoni s.s. ♀. a. head, b. antenna.

The H e a d (Textfig. 53). Forehead greybrown, with scanty black pubescence, index 1,1. Callus blackbrown, concave at base, slightly elevated at its upper border in the middle. Paired spots touching to the eyes in some specimens, separated from them in others. Unpaired spot blackbrown, absent in some of the females. Palpi olivebrown, first joint white haired with some black hairs at apex, second joint black haired. Antennae, first joint olivebrown, black haired, second joint slightly darker, small, third joint yellowbrown at extreme base, where it is hardly broader, then black, longer than the basal 2 joints together.

Thorax havannabrown, with a median fine grey stripe, reaching the scutellum and 2 lateral broader greywhite stripes, gradually narrowing to the hindborder of the scutum, lateral borders of scutum grey tomentose, pubescence on scutum yellowwhite, intermixed with some black hairs. Pteropleuron havannabrown, black haired. Scutellum as mentioned. Sides and breast grey, white haired. Wings with double apical band, starting at the foreborder of the wing from a distinct white triangle, the apical branch running straightway to the hindborder, the other branch is curved and ends upon the lower cubital branch, just beyond the white triangle in the opening of the first posterior cell. Other white triangles, arranged as mentioned. White spots in the centre of the rosettes chromosome-shaped. Paired transverse spots in all posterior cells. The apical of the transverse basal bars is broad, ends at the hindborder of the wing and presents a low point on the axillary lobus. In four out of six specimens white triangles are present in the openings of all posterior cells on both wings, the fifth female has no white triangle in the 4th posterior cell on both wings, whereas the 6th female shows a distinct white triangle in the opening of the first posterior cell, traces of similar spots in the 2d and 3d posterior cells, whereas the concerned spots are wanting in the other posterior cells. Halteres havannabrown. Legs. First leg, Coxa greywhite, white haired, some black hairs being found at apex, trochanter redbrown, femur pale havannabrown, mainly black haired, with some white hairs at base, tibia brownish-white at base, white haired, intermixed with some black hairs, apex blackbrown, black haired. Tarsalia black, black haired. Second leg, femur pale havannabrown, white tomentose, knee yellowbrown, black haired, with white hairs along the distal lateral border. Tibia pale havannabrown, black haired, with 2 very indistinct paler yellowbrown rings, where one finds some white hairs, intermixed between the black ones. Third leg identical.

Abdomen havannabrown, black haired with lateral borders of tergites to all segments, broadly grey, white haired, similar but narrower segmentations and a fine longitudinal white stripe on the second segment. Ventral-surface grey tomentose on first 2 segments, following segments havannabrown, all mainly white haired, intermixed with some black hairs in the middle, 7th segment wholly black haired. The grey tomentose and havannabrown parts are arranged thus, that the abdomen gives the impression to possess a median, straight-sided havannabrown longitudinal stripe, flanked by two lateral broad grey stripes, which become narrower to the apex of the abdomen.

54. *Haematopota pachycera* BIGOT. (♀) Textfig. 54.

Syn. H. validicornis RICARDO.

Potisa pachycera BIBOT

References:

- BIGOT, Nouv. Arch. Mus. Hist. Nat. Paris (3), II, p. 206 (1890).
 „ Bull. Soc. Zool. France, XVI, p. 76 (1891).
 RICARDO, Ann. Mag. Nat. Hist. (8), I, 0. 59 (1908).
 „ Rec. Ind. Mus. IV, p. 336 (1911).
 „ Rec. Ind. Mus. IV, p. 333 (1911).
 AUSTEN, Bull. Ent. Res. XII, p. 432 (1922).
 SURCOUF, Bull. Mus. Hist. Nat., p. 455 (1909);
 SURCOUF Genera Ins. Fasc. 175, p. 30 (1921).
 „ and GONZALEZ-RINCONES Dipt. Vulner, II, p. 29 (1912).

Habitat:

Type ♀ from Laos, Cambodja	Paris Museum
2 ♀♀ from Siam, precise locality unknown 6.'06, PALMER	Coll. BR.M.
1 ♀ „ (Type of <i>H. validicornis</i> RIC.) Biserat, Siam 20.10.'01, in spider's web in jungle, ROBINSON and ANNANDALE	Coll. BR.M.
1 ♀ from Phrapatoon, Siam 1907, Dr. G. P. WOOLLEY	„
1 ♀ „, Federated Malay States, STANTON	„

H. pachycera BIG. is closely allied to *H. confluens* S.S. but differs in the wing-pattern and the shape of the antennae, which are broader. Length 9 m.M.



Textfig. 54.

H. pachycera BIG. ♀
antenna

The Head (Textfig. 54). Forehead greyish, black haired, the paired spot black, touching the eyes and the shining, yellowish brown frontal callus, almost straight on both borders and reaching the eyes at its lower border, its outer angles rounded, receding from the eyes, no well-marked spot between the antennae, but brown rings surround the base of each antenna. Face greyish; where the dark band is usually apparent, it is more yellowishbrown, white haired,

the black spot (on the cheeks) irregular in shape. Palpi pale yellow with pale hairs at base, further black haired. Antennae reddish yellow, first joint swollen, broad, cylindrical, longer than the basal annulation of the third joint, as broad as the widest part of the third joint, black haired, second joint very small, cup-shaped, thick black haired, third joint broad and flattened on its basal annulation, stylus short and narrow.

Thorax brown, with short yellowish pubescence, the grey stripes dispersed as in *H. javana* WIED., and the base of the thorax grey. The grey stripes stop short at the suture, two others meet them from the base. Scutellum brown, with grey tomentum on its centre. Wings with a rather broad, single, crescent moon-shaped continuous band, crossing the whole width of the apex, concave at its apical border, in the other specimens often broken in the middle. The usual rosettes are present, the first one closed at its upper border with a small white spot with dark centre. Triangular spots present in the openings of all posterior cells, except the 4th one, smaller than in *H. confluens* S.S., that in the 1st cell is largest. Paired transverse white spots present, basal transverse white bars distinct, the apical one with a curved point in the axillary lobus. Legs blackish brown, fore tibiae yellowish at base, middle and posterior tibiae brownish, each with 2 yellowish rings, tarsi yellowish on the basal joints of middle and posterior pair, femora black haired, pubescence thick below, thickest on the posterior pair, above and below at apex. Fore and hind tibiae slightly incrassate, all black haired, which pubescence is thickest on the posterior pair, forming fringes.

Abdomen blackish brown, or reddish brown with ashy grey segmentations, round lateral spots and a grey median stripe often apparent, latter on the second segment. Under side blackish with grey segmentations.

I have taken most particulars from RICARDO's description having compared her descriptions with the original specimens. As RICARDO already supposes and like was stated by AUSTEN and others *H. pachycera* BIGOT and *H. validicornis* RICARDO are synonyms. I agree with RICARDO, where she remarks, that it seems hardly to justify the establishment of a new Genus, divided off from *Haematopota*, after the conformation of the first antenal joint in *H. pachycera* and *rubida*, as the shape of the antennae in *Haematopota* varies very considerably, but only in small gradations, while the typical markings of wings and other characteristics remain the same. So the name *Potisa* is synonym with *H. pachycera* BIGOT.

55. *Haematopota mediatrix* nov. spec. (♀) Pl. 4, Fig. 12; Textfig. 55.**Habitat:**

Type ♀ from Bandar, Sumatra, Border of jungle 28.3.'20, CORPORAAL

Coll. N.A.M.

1 ♀ from the Federated Malay States, Goenoeng Tampin, caught on clothing,
late afternoon 29.6.'20

Coll. R.M.S.

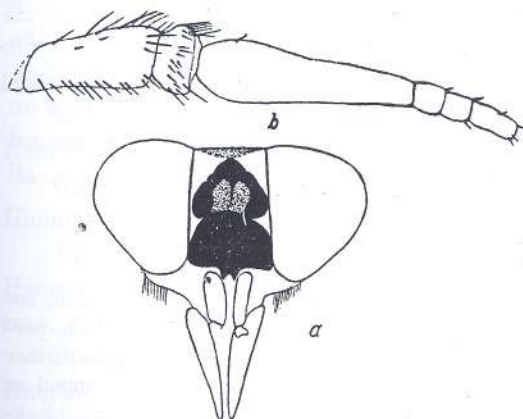
A brown species, forehead chocolatebrown, paired spots black, comma-shaped, connected in the middle. Callus prominent, blackbrown, reaching to the eyes. No black spots on cheeks and between the antennae. Cheeks and face greywhite, white haired. Palpi slender, olivebrown, black haired. Antennae yellowbrown, first joint long, slightly shorter than the basal annulation of the mainly black third joint. Thorax redbrown, yellowbrown haired. Wings, apical band double, white triangles in the openings of all posterior cells. Usual rosettes present, broken into spots. Basal transverse bars irregular, connected, reaching the hindborder. Legs yellowbrown with 2 yellowbrown, yellowwhite haired rings to middle and hind tibiae. Abdomen blackbrown with distinct, whitishgrey, white haired segmentations and a white triangle on the second segment.

Table of dimensions.

Bodylength	8,8	m.M.
Width of thorax	2,6	„
Width of abdomen	2,8	„
Wingexpanse	20,6	„
Length of abdomen	4,8	„
Length of wing	9	„
Breadth of wing	2,8	„

The Head. (Textfig. 55). Forehead dull cacaobrown, black haired in the middle, yellowbrown haired at sides, index 1,86. Paired spots black, comma-shaped, situated just in front of the blackbrown callus, connected in the middle and forming a horseshoe-shaped figure; seen from the lateral side this figure rests on the callus and resembles a heart. Face and cheeks greywhite, white haired, without black spots. Palpi slender, olivebrown, second joint slightly swollen at base, ending with a long point, black haired. Antennae yellowbrown, first joint long, somewhat incrassate at apex, black haired, second joint short, third joint hardly broader at base, yellowbrown, soon growing darker, blackbrown, stylus black.

Thorax redbrown, hindborder of scutum and lateral borders of the same yellowbrown tomentose, yellowbrown haired. Scutellum yellowwhite tomentose at base, blackbrown along the borders. Scutum with 2 indistinct whitish tomentose longitudinal stripes, stoppingshort at the



Textfig. 55.

H. mediatrifrons s.s. ♀. a. head, b. antenna.

black haired. Tarsalia blackbrown, black haired. Second leg. Coxa and trochanter greybrown, yellowwhite haired. Femur bright yellowbrown, yellow haired, more olivebrown at apex, black haired. Tibia olivebrown, black haired, with 2 yellowbrown, yellowwhite haired rings. First tarsale yellowbrown at base, apex olivebrown, black haired, other tarsalia blackbrown, black haired. Third leg. Coxa dark olivebrown, yellowwhite haired, trochanter yellowbrown, femur yellowbrown, femur similar, broader than the fore and middle femora, yellow haired, with a dorsal row of black hairs, knee dark olivebrown, black haired. Tibia and tarsalia as in second leg.

Abdomen blackbrown, black haired with distinct whitish grey, white haired segmentations and similar lateral borders of tergites; further a faint median, greywhite, white haired triangle is found on the second segment as in *H. lunulata* MACQ. Ventral surface similar. In the second female the palpi are mainly white haired, intermixed with a few black hairs at apex. Median spot on second abdominal segment fainter than in the type.

56. *Haematopota malayensis* RICARDO. (♀) Textfig. 56.

References:

RICARDO, Bull. of Ent. Res. IV, p. 404 (1916).

Habitat:

Type ♀ from Kuala Lumpur, Federated Malay States, STANTON

Coll. BR.M.

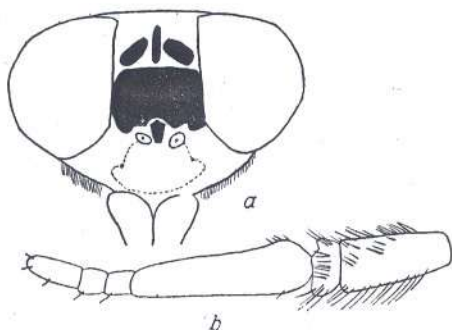
1 ♀ from same locality

„

A species with very typical forehead markings. Forehead grey and yellowish tomentose, paired spots oblique, pointing to the erect, bacilliform unpaired spot, callus brownblack, protuberant, straight on its upper border, indented below; a black spot between the antennae only, no black spots on the white, white haired face and cheeks; palpi yellow, black haired, antennae reddish-yellow with long third joint, basal annulation longer than first and second

suture. Wings with white spots arranged as mentioned. The most apical of both apical bands broken into spots, the second one stretching to the lower cubital branch, interrupted in the submarginal cell. White spots in the centres of the rosettes. Transverse paired spots in all posterior cells. Basal transverse bars connected by a fine stripe, the apical of both bars ends at hindborder in a big white triangle, base of axillary lobus wholly white. Legs. First leg. Coxa olivaceous yellowbrown at base, darker brown at apex, yellow haired. Trochanter and femur blackbrown, black haired. Tibia brownish at extreme base, then white, white haired, apical $\frac{1}{3}$ blackbrown,

joint together. Thorax dark brown with fulvous pubescence. Scutellum greyish tomentose. Wings with single apical, irregular crossband, not reaching the hindborder, triangular spots in the openings of all posterior cells. Legs reddish-yellow with distinct rings on the middle tibiae only, traces of similar rings on the hind tibiae. Abdomen brown, a triangular median grey spot on the second grey segmentation, (signs of white haired spots on 3d and 4th segment?), all segmentations being grey. Length 7 m.M.



Textfig. 56.

H. malayensis Ric. ♀

a. head, b. antenna.

The Head. (Textfig. 56). Forehead, covered with grey and yellowish tomentum, perceptibly narrower at vertex; black spots neither reaching the callus nor the eyes, arranged as mentioned, frontal callus protuberant, black-brown, reaching the eyes, lower border wavy. Palpi yellow, second joint almost the same size throughout, ending in a short obtuse point, short black haired. Antennae reddish-yellow; the first joint more yellow, black haired, cylindrical, 0.39 as long as the third joint, white haired at base, black haired at apex, second joint narrow, yellow, black fringed third joint reddishbrown, basal annulation 1.71 times as long as the narrow stylus.

Thorax dark brown, with traces of appressed fulvous pubescence. Scutellum covered with greyish tomentum, shoulders black haired. Wings with the apical band single, interrupted, not reaching to the hind border of the wing, wavy, reaching only a short way beyond the anterior branch of the third vein; every cell has a white triangular spot on its outer border. Legs reddish yellow, the fore femora appear darker, having thicker black pubescence; the fore tibiae whitish, white haired, the apical third being black; tarsi blackish; the middle tibiae appear blackish, with a pale ring at the base and beyond the middle, but the dark colour appears to be composed of spaces covered with thicker black pubescence, the whole tibiae being really much the same colour as the femora; the tarsi yellowish at base, then dusky; the posterior tibiae very similar to the middle ones, but the second ring is hardly distinct, the base of the tibiae being whitish, the rest reddishyellow, black haired; tarsi as those of the middle pair.

Abdomen brown, black haired, rather a brighter shade than that of the thorax, a very distinct triangular median grey spot on the second segment as in *H. lunulata* Macq., with distinct grey, white haired segmentation to the same segment. In the type specimen seen by me in the British Museum the other segmentations were only white-bordered. RICARDO however mentions in her description signs of white haired spots on the third and fourth segments, which markings I could not find.

GEOGRAPHICAL DISTRIBUTION OF THE SPECIES BELONGING TO THE GENUS HAEMATOPOTA.

The *Haematopota* species are distributed over the Dutch East Indian Archipelago and the neighbouring countries as follows:

British India, including Northern India, Nepal, Bengal, Assam (17 species)

Haematopota annandalei, *assamensis*, *bilineata*, *brevis*, *cana*, *cingalensis*, *dissimilis*, *fasciata*, *fuscifrons*, *immaculata*, *inconspicua*, *indiana*, *javana*, *lata*, *latifascia*, *limbata*, *roralis*.

Ceylon (6 species)

Haematopota brevis, *cingalensis*, *marginata*, *roralis*, *tesselata*, *unizonata*.

Siam, including Burma, Annam, Cambodja (6 species)

Haematopota cilipes, *javana*, *lata*, *pachycera*, *rubida*, *singularis*.

Federated Malay States (8 species)

Haematopota irrorata, *javana*, *lunulata*, *malayensis*, *mediatrifrons*, *pachycera*, *rubida*, *splendens*.

Sumatra (13 species)

Haematopota annulipes, *atriventer*, *confluens*, *equitibiata*, *intermedia*, *irrorata*, *irrorata* subsp. *cristata*, *javana*, *mediatrifrons*, *lunulata*, *nigricans*, *nigrita*, *pungens*, *truncata*.

Java (12 species)

Haematopota cingulata, *elegans*, *ensifer*, *fumigata*, *jacobsoni*, *javana*, *lunulata*, *maculata*, *paucipunctata*, *punctifera*, *pungens*, *tuberculata*.

Borneo (5 species.)

Haematopota atomaria, *borneana*, *irregularis*, *irrorata*, *pungens*.

The number of *Haematopota* species which has a wide geographical distribution seems to be very small, most species being limited to small areas.

THE GENUS *NEOBOLBODIMYIA* RICARDO.

References:

RICARDO, Nova Guinea, Zool., IX, fasc. 3 (1912).

SURCOUF, Genera Insectorum, Fasc. 175, p. 94 (1921).

This Genus, originally created for a single specimen by Miss RICARDO is closely allied to the Genus *Tabanus* L. with which it has in common its general appearance. The body is less pubescent and the shape of the antennae, which are placed on a tubercle and present an incrassate first joint with a dorsal tooth, near it to the Genus *Bolbodimyia* BIGOT, which occurs in Venezuela. The General appearance of the last Genus is however quite distinct.

To this Genus belong two species, which may be defined by the following Key.

KEY 10.

- 1a. Wings nearly wholly brown with some clear spots, body brownblack to black, scutum with 3 longitudinal redbrown stripes, sides and breast black haired, abdomen shining black, hindborder of the first tergite white fringed at sides, ventral surface with white hairfringes to the 2d and 3d segmentations nigra RICARDO.

- b. Wings mainly clear, with some brownblack dots; body black, scutum without longitudinal stripes, unicolourous, sides and breast white haired, abdomen with a median white spot on the first segment, a similar white triangle to the second segment and white, white haired segmentations to the 3d—6th segment with median triangles. Ventral surface white haired
- laticornis* SCHUURMANS STEKHOVEN.

57. *Neobolbodimyia nigra* RICARDO. (♀) Textfig. 57

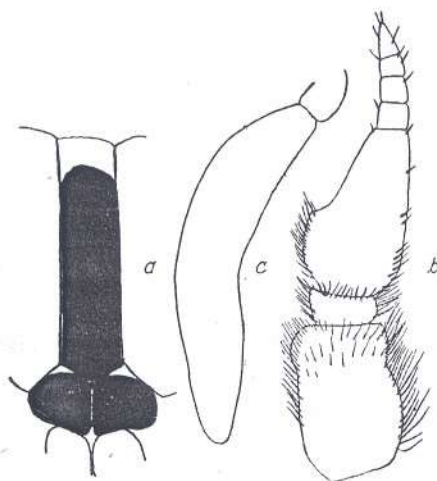
References:

RICARDO, Nova Guinea Zool., Vol. 9, Fasc. 3 (1912).

SURCOUF, Genera Insectorum, Fasc. 175, p. 94 (1921).

Habitat:

Type ♀ from Nova Guinea, Bivak Island 25.2.10, LORENTZ Coll. N.A.M.



Textfig. 57.

N. nigra Ric. ♀

a. head, b. antenna, c. palpe.

The Head. (Textfig. 57). Forehead black, nearly wholly occupied by the black, shining, convex callus, reaching to the eyes. Subcallus prominent, shining black, devoid of pubescence. Cheeks dark velvetybrown, black haired. Beard scanty, black. Face shining black, bare, with deep lateral pits. Palpi black-brown, black haired. Antennae, first joint shining black, swollen, with dorsal spur at apex, black haired; second joint short, third joint with distinct, blunt dorsal tooth, crowned with black hairs, similar pubescence on the opposite border and at the base, velvetyblack, third and first joint equal in size.

Thorax brownblack, black haired, hindborders of scutum brownish, with 3 longitudinal redbrown stripes. Breast and sides black, black haired. Wings intense brown, except a clear triangle at the hindborder, covering a part of the cubital, submarginal, 2d and 1st posterior cell; 5th posterior cell with white centre.

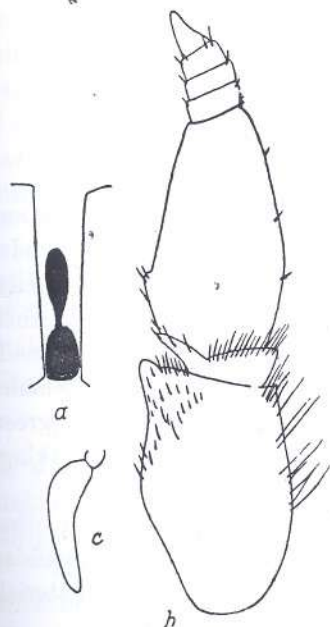
Abdomen shining black, with scanty blackbrown pubescence, hindborder of first segment white fringed at sides. Ventral surface similar, with white hairfringes to the 2d and 3d segment. Length 17 m.M., width of thorax 4.2 m.M., wingexpans^e 36.2 m.M., length of wing 16 m.M., length of abdomen 9.6 m.M.

58. *Neobolbodimyia laticornis* nov. spec. (♀) Textfig. 58.

Habitat:

Type ♀ from Indrulama, South Celebes, October 1895 Coll. N.A.M.

The species is sufficiently characterised in the Key to enable the identification.



Textfig. 58.

N. laticornis s.s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 58). Forehead rather broad, white in front of the callus, elsewhere black haired, 5,1 times as long as it is wide anteriorly, almost 0,33 times as narrow anteriorly than it is at vertex. Callus reaching to the eyes, lower part shining black, prominent, linear extension, dull black, attenuated at base, swollen at apex. Subcallus low, deep velvetybrown as are also the black haired upper cheeks and the upper part of the face. Lower cheeks and lower part of face white, white haired. Beard white. Palpi rather darkbrown, covered with thick grey tomentum; pubescence greywhite, intermixed with black hairs, last ones being especially numerous at the apex of the second joint, which has almost the same width throughout. Antennae, first joint swollen, shining black, broad cylindrical, curved on dorsal surface, with apical dorsal spur, scanty black haired, second joint very short, black, with long dorsal spur, black haired, third joint black, broad and flat, almost toothless, basal annulation 1,7 times as long as its widest part and 2 times as long as long as the stylus.

Thorax black, white tomentose at hindborder of scutum and on the scutellum, covered with long and short, black pubescence and a number of redbrown hairs on foreborder and along the lateral borders of the scutum. Breast and sides sootyblack, white haired. Wings rather clear with a number of black dots; foreborder darkredbrown, prolonged to a similar apical shadow, stigma blackbrown; the brownblack dots are found respectively in front of the curvature of the upper cubital branch, at the apex of the second posterior cell, at the apices of the 1st and 4th posterior cells. Halteres dark redbrown. Legs dark. First leg. Coxa velvetybrown, white haired, trochanter redbrown; femur blackbrown, black haired along the distal lateral border, where one finds also a row of white hairs. Tibia swollen, blackbrown, black haired. Tarsalia black. Second leg, femur blackbrown, white haired, except in the middle of the dorsal surface, where one finds a row of black hairs; tibia blackbrown, black haired, yellow haired near the base, rest black. Third leg, femur identical, tibia reddishblackbrown, black haired on dorsum, yellow haired ventrally.

Abdomen black, mainly black haired. First segment with a median, white haired spot, second segment with a median, white haired very low triangle and other white haired triangles at each side of the segmentation. Third to sixth segment with narrow white, white haired segmentations and median low triangles, distal lateral borders of the same tergites white haired also. Ventral surface black with white segmentations, white haired on all segments, except on the black haired 7th segment.

THE GENUS *TABANUS* LINNAEUS.

References:

- LINNAEUS, Fauna Suec., p. 462 (1761).
 RONDANI, Arch. Zool. Modena, Vol. 3, p. 79 (1863).
 OSTEN SACKEN, Mem. Bost. Soc. Nat. Hist., II, p. 426 (1876).
 ZELLER, Isis, Vol 11, p. 819 (1842).
 WALKER, List of Diptera BR. Mus. (1860).

- MACQUART, Dipt. Exot. (1838—1850).
SZILADY, Ent. Mitteil. Berlin, Vol. 4, p. 93 (1915).
KERTESZ, Cat. Dipt. (1908).
SURCOUF, Genera Insect., Fasc. 175 (1921).
RICARDO, Rec. Ind. Mus., IV, p. 111 (1911).

SURCOUF's monograph on the Tabanidae counts more than 1140 *Tabanus* species and since then this number has increased to over 1200. It is small wonder that a thorough examination of a distinct area yields a large number of species, new to science. As in the other Genera the male and the female are distinguished easily by the fact, that the male possesses a holoptic head, divided into a small-facetted and a large-facetted area, usually different in colour. In the females peculiar eyemarkings, were observed like one or more green crossbands, a green transverse M-figure, the lower half green, or the whole eye green, these markings being visible on fresh specimens only, fading away after death.

These eyemarkings form an easy characteristic, in correlation with other features for the division of the groups. In his description of Brazilian Tabanidae LUTZ did already point to this fact. It is however useless in museum material. Further the following characters are of importance:

1. The forehead, its shape, the relation of its length and width, its pubescence, its markings, the so-called calli, which however may vary to a certain extent in several species. Calli seldom fail. On the vertex a similar callosity may be found, homologous with the ocellar tubercle in other Tabanids.
2. The subcallus or lunula, a triangular space which is covered with tomentum or bare and shining, and prominent in the last instance.
3. The beard and its colour.
4. The shape of the palpi and the colour of their pubescence.
5. The antennae and especially the shape of the third joint, the presence or absence of a tooth, the relation of length and width of the basal annulation, and the relation between the length of the basal annulation and the stylus. Its colour and pubescence.
6. The colour of the scutum and its pubescence, its markings, etc.
7. The wings, the colour of its foreborder, the presence or absence of an appendix or an apical shadow, crossbands or spots.
8. The legs with their typical pubescence, the distribution of colour and especially the colouring of the tibiae.
9. The abdomen with its markings, longitudinal stripes, one or more series of spots, the absence of any spots, the difference in colour between the base and the apex of the abdomen, the presence of paler segmentations, etc.

The larvae of the Dutch East Indian Tabanidae are very insufficiently known and with the characterisation of the different species we stay at the very outset. They are vermiform animals (Confer Textfig. 3), tapering at both

ends, consisting of a head, with its different mouthparts, 3 thoracal segments, with scarce pubescence. The abdominal rings are provided with retractile pseudopodia, beset with hooks and bristles. The respiratory tube ends with 2 stigmata, placed on a vertical cleft close together. The posterior part of each segment may show less diaphane rings, which are characteristic for the different species, but these are distinctly visible in the adult larva only.

The pupa is slender. Thorax with sessile respiratory organs. Abdomen with rows of bristles at the end of the segments. Stigmata situated at the end of the abdomen at the apices of the 6 connected respiratory hills, which are builded differently according to the species to which the larva belongs. Confer: Textfigures. 3a, b. and e.

The imagines of the *Tabanus* species attack horses, buffaloes, cattle and in some instances also human beings. Their bite is painful and severe, the itching, caused by the bite of these animals may last for a long time, and a large drop of blood flows from the wound after the fly has flown away.

The females rest on tree trunks or leaves of trees after their meal, with their heads turned upwards. On the same trees one meets with the males, which are not able to pierce the skin of the mammals, attacked by the females and are said to feed with the juices of flowers and excrements of plants. Sometimes it is very difficult to find them out, since they may be hidden under the luxurious foliage of the tropical vegetation. Experiments on the bionomics of most oriental Tabanids are still wanting up to the present.

It is very difficult to arrange the *Tabanus* species in such a way, that the grouping is representative of the natural relations, which exist between the different species, and all attempts to group the concerned species in a more natural manner, taking into consideration the present state of our knowledge, does not result into something else than a more or less provisional, artificial system. The eyecolour cannot be taken as a general base, as we are acquainted with the eyepattern of a small number of species only. Consult Key B.

So I have tried to base my system upon several characters at the same time, as one will find correlative characters in most species. This method of working allows us to find some of the relations between the different groups, although the given system will not satisfy all workers on Tabanids. Moreover it will be necessary to give in the future another place to several species, which we know superficially only up to this moment. One of the species, representative for each Group is mentioned behind the Groupnumber in Key A.

KEY A.

The Genus *Tabanus*.

- 1a. Abdomen uniformly brown, grey, yellow or black 17
- b. Abdomen ornated with peculiar markings, shaped as longitudinal stripes,

- series of triangles, round spots, transverse bands, paler bases, etc... 2
- 2a. Abdomen with series of round spots, triangles, transverse bands, etc. 8
- b. Abdomen with one or more longitudinal pale stripes..... 3
- 3a. Abdomen presenting a median usually continuous, whitish or brownish-white longitudinal stripe and two usually shorter lateral stripes, reduced in some of the species to a single or a few couples of spots at each side of the median stripe. Tibiae usually brownish or whitish. Eyes in the female sex unicolorous (in rare instances with green crossbands); in the male sex the large-facettèd part usually presents a pale lining, embracing the darker central part, wings missing the appendix in most species
- Group I *striatus*.
- b. Abdomen with a single continuous or interrupted, pale longitudinal stripe 4
- 4a. Abdomen with a single straight-sided median yellowishbrown longitudinal stripe, accompanied by two darker, blackbrown longitudinal bands
- Group II *tricoloratus*.
- b. Abdomen without longitudinal darker stripes accompanying the median stripe 5
- 5a. Wings clear 6
- b. Wings infusate 7
- 6a. Abdomen brown with a median interrupted or continuous paler, white or yellow haired longitudinal stripe, which is not parallel-sided. Eyes not green in the female sex. Beard white or yellowwhite. Wings clear or with an apical shadow. Antennae yellowbrown, ochraceousyellow or black
- Group III *cohaerens*.
- b. Abdominal stripe broad, straight-sided or serrated. Thorax greyish or pollinose yellow. Eyes wholly green in the female sex. Antennae ochraceous yellow to dark brown. Beard yellow or white. Wings clear or with an apical shadow. Legs usually yellowish, with all tibiae largely yellow or white
- Group IV *hybridus*.
7. Wings more or less infusate, seldom paler at hindborder. Abdominal stripe less distinct, restricted to the pubescence. Beard ochraceousyellow, yellowbrown or redbrown. Eyes wholly green or bronze-coloured, compare also Group XXIII
- Group V *chloropis*.
- 8a. Abdomen with a median and (or) lateral series of pale spots and triangles 15
- Abdomen with paler bases or with one or more transverse pale bands 9
- 9a. Abdomen largely pale yellowbrown or yellow at the base and eventually also on one or more transverse stripes. Wings infusate or with an apical shadow only
- Group VI *basalis*.
- b. Abdomen not largely pale at base 10
- 10a. Large species 11

- b. Small or median-sized species 12
- 11a. Abdomen presenting a series of broad, transverse white or yellow stripes, usually elevated in the middle to triangular spots. Eyes without green crossbands. Scutellum allways same colour as scutum. Wings clear. Legs fringed with yellowish or white hairs along the tibiae

Group VII *rufiventris*.

- b. Abdomen with narrow pale median parts of the segmentations or with pale pubescent segmentations or fringes, elevated to median triangles in some species. Scutellum same colour as the scutum or contrasting with it. Eyes wholly green in the female sex. Wings with one or more crossbands
Some species of group XXIV *flexilis*.
- 12a. Forehead provided with 2 calli, which may connect in some instances. Subcallus bare, shining brown or black. Eyes with a single green cross-band 13
- b. Forehead allways with a single callus with a linear extension. Subcallus normal. Eyes without green crossbands 14
- 13a. Antennae usually orangeousyellow on the basal annulation of the third antennal joint. Wings in several species with an apical shadow. Abdomen black or brown, with transverse white or yellowish segmentations to several segments, rarely wanting. Scutellum usually white or yellowish as also the hindborder of the scutum. All tibiae largely white at base

Group IX *bicinctus*.

- 14a. Forehead broad or narrow, when broad the callus is broad, square, linear extension short, falls the forehead is narrow, the callus is club-shaped or elongate, with a longer linear extension. Abdomen black or brown, presenting a single or a series of white or yellow, white or yellow haired segmentations, usually elevated in the middle to triangular spots. Wings clear or with a faint apical shadow
Group VIII *multicinctus*.
- b. The transverse abdominal bands reduced to median triangular or half-moon-shaped, white spots, seldom connected with indistinct, white haired or white fringed segmentations. Wings clear or infusate

Group X *pratti*, *laetus*.

- 15a. Abdomen ornated with one or more series of white or yellow triangles or roundish spots 16
- b. The spots occurring in the median line of the abdomen are black

Group XIII *atripunctatus*.

- 16a. Small species with an extraordinary broad forehead. Callus quadrangular, linear extension, if present, very short. Subcallus shining. Wings clear, appendiculate. Legs largely white on all tibiae. Abdomen dark brown-black with a median series of citronyellow haired spots, bifurcated in one of the species of this Group
Group XI *flaviscutellatus*.
- b. Abdomen with 2 lateral series of whitish spots and a usually indistinct

faint median stripe, broken into small median triangles in other species
Legs pale yellowish. Antennae ochraceousyellow

Group XII *bubalophilus*.

- c. Abdomen brown, with a median series of white, white haired, or yellow, yellow haired triangles, wanting in rare instances. Beard usually yellow. Forehead narrow. Eyes in life green on lower half

Group XIV *immanis*.

- 17a. Forehead missing the callus

Group XV *caesius*.

- b. Frontal callus present 18

- 18a. Wings clear 19

- b. Wings infusate, distinctly brown to blackbrown or yellow 24

- 19a. Subcallus shining 20

- b. Not so 21

20. Abdomen brown, black or grey, black haired in most species, presenting grey fringed segmentations in one of the species. Eyes in life with a transverse green M in the female sex. Forehead narrow. Legs with all tibiae largely white

Group XVII *ceylonicus*.

- 21a. Abdomen yellowbrown, olivaceous or grey. Antennae bright yellow or redyellow on the basal annulation of the third antennal joint in most species 22

- b. Abdomen black, blackbrown, dark brown, redbrown or bluegreen. Third antennal joint darker in most species 23

- 22a. Abdomen uniformly yellow, yellowbrown or olivaceous, yellow haired in most species, black haired in others. Antennae ochraceousyellow to redbrown. Body small to median-sized

Group XVIII *breviusculus*.

- b. Abdomen grey or yellowbrown, white, yellow or black haired, conical in most species. Second antennal joint without a distinct dorsal tooth, third joint redyellow, stylus long. Wings clear, veins yellowbrown, appendix long. Legs yellow or greybrown

Group XVI *auriventer*.

23. Abdomen mainly black haired. In a single species white hairfringes were found on the, not distinctly paler dorsal scutes. Wings clear or almost so, presenting in the last case an apical shadow, appendix present or not. Antennae usually dark

Group XXI *tristis*.

- 24a. Wings partly or wholly black or blackbrown 25

- b. Wings tinged yellow or yellowbrown 26

- 25a. Wings wholly black or blackbrown. Abdomen wholly black or blackbrown, in some species with a paler white tomentose hue over one or more of the basal segments. Forehead narrow. Beard black or dark in most species. Antennae dark. Legs dark. Thorax usually black, seldom yellow or velvetybrown

Group XIX *fumipennis*.

- b. Wings only partly black, with black spots, crossbands, or diffusely infuscated, letting extreme apex and base free 27

26. Dark black, yellow or orangeous species, with uniformly black, yellow orangeous, uniformly black or yellow haired abdomen, presenting seldom paler fringes on the dorsum abdominis. Wings yellow, yellowbrown, seldom redbrown Group XX *fulvissimus*.
- 27a. Wings diffusely brownish. Abdomen havannabrown with one or more black spots on the dorsal scutes. Moreover small inconspicuous yellow or white hairgroups may be found on one or more segments. Compare Group V and XIII Group XXII *brunnipes*.
- b. Wings with one or more crossbands 28
- 28a. Thorax yellowish tomentose, contrasting therefore with the tawny brown or yellowbrown abdomen, which may present median inconspicuous groups of yellow hairs, black haired elsewhere. Wings with a crossband attached to the dark apical shadow letting the wingapex free. Legs with all tibiae largely white, yellow or yellowbrown, compare species of the 5th Group Group XXIII *flavothorax*.
- b. Thorax dark brown, abdomen uniformly brown or with paler median spots or fringes, scutellum same colour as scutum or paler and contrasting with the colour of the scutum. Wings without apical shadow, with distinct crossbands or with a number of brownish spots. Eyes wholly green in life in the female sex. Compare species of Group VII Group XXIV *optatus*.

When one tries to arrange the species after the eyepattern, a small number of groups can be formed, which however does not embrace all species studied, as the eyecolour is known of a relatively small number of females only.

KEY B.

Synopsis of species.

- 1a. Species with the eyes wholly or partly green 2
- b. Species with the eyes uniform in colour, not green, all species not included in this key
- 2a. Eyes partly green 3
- Eyes wholly green Group IV, V, XV, XXIV.
- 3a. Eyes green on lower half Group XIV.
- b. Eyes with one or more, separated or connected, green crossbands . 4
- 4a. Eyes with a single green crossband, forehead with 2 calli Group IX.
- b. Eyes with more green crossbands 5
- 5a. Eyes with a transverse green M Group XVII.
- b. Eyes with 2 or 3 crossbands in the female sex: some species of Group I; in the male sex of all species of group I one finds a peculiar eyepattern, consisting in a pale outline of the large-facetted part, including a paler centre.

GROUP I.

This group is characterised by the abdominal markings, which consist in usually white, white haired, seldom black, straight-sided or serrated longitudinal stripe and 2 complete or incomplete lateral stripes, which are however always shorter than the median stripe. The lateral stripes may be reduced to a few or even a single segment in some species, in one case without lateral stripe (*avittatus*). Body greyish, blackish, blackbrown or brown. Forehead in most species rather narrow, broader in a few species only. Callus egg- to pear shaped, always prolonged into a linear extension, which is separated from it in a few instances only. Eyes in the male sex provided with very typical markings, lower part black, small-faceted, upper part large-faceted, usually with a paler curved band, in the female sex the eyes are usually uniformly coloured with a few exceptions. Wings usually clear, seldom with a darker apical shadow. Appendix almost always absent. Thorax usually with longitudinal paler stripes. In the following key *T. jucundus* Wlk. and *T. rufinotatus* Bigot are to be found, although I doubt, whether they really belong to this group, considering the fact, that the eyes in the female sex differ from those of the other species of the same group. *T. andamanicus* Bigot is excluded from the key, as this species was described after a specimen in very bad condition. The description of the same species is to be found on page 212.

KEY 11.

Synopsis of species.

- 1a. Forehead broad, less than 5 times as long as it is wide anteriorly. Eyes with green crossbands in the female sex or uniform in colour 2
- b. Forehead narrower, index 5—10. Eyes uniformly coloured in the female sex 5
- 2a. Eyes in the female sex with green crossbands..... 3
- b. Eyes in the female sex uniform in colour..... 4
- 3a. Eyes in the female sex with 3 green crossbands, forehead $\frac{1}{3}$ narrower anteriorly than it is wide at vertex, index 4. Callus tuberculous, shining blackbrown, linear extension diamond-shaped, sometimes narrower. Antennae reddishyellow, basal annulation of the third joint rather narrow. Eyes in the male sex as in the male of *T. striatus* F. Abdomen blackish, with a median grey, white haired, longitudinal stripe, beginning on the 3d segment, lateral stripes confined to first 2 segments only

jucundus WALKER.
- b. Eyes in the female sex with 2 green crossbands, in the male sex the paler curved band is not found on the eyes, the black-faceted part does not reach the vertex. Forehead almost the same width throughout, showing two separated or connected calli, lower callus square or hexagonal, upper

- callus oval. Antennae brownblack. Basal annulation of the third joint broad. Abdomen reddishbrown, with 3 distinct longitudinal white stripes, connected mutually at the segmentations **rufinotatus** BIGOT.
4. Forehead slightly narrower anteriorly than it is at vertex, index 4. Callus stout, polygonal, with a stout linear extension. Palpi yellow haired, intermixed with a few black hairs. Abdomen with an almost straight-sided median stripe **calidus** WALKER.
- 5a. Abdomen yellowbrown, with an indistinct median black stripe, interrupted at the segmentations, becoming broader to the apex, ventral surface yellowbrown, yellow haired. Wings clear, first posterior cell closed **annamitus** BIGOT ♂.
- b. Abdomen with whitish or yellowish stripes, wings clear or with an apical shadow, first posterior cell open 6
- 6a. Wings with an apical shadow 7
- b. Wings clear, or with brownish shadows along the veins only, no apical shadow 8
- 7a. Abdomen yellowreddbrown to brownblack, with a reversed anchor-shaped white marking. Forehead rather broad, with a voluminous shining yellow-brown callus **brunnipennis** RICARDO.
- b. A male with reddishyellowbrown to blackbrown abdomen, marked with a narrow, median, yellow haired stripe, running from the base till the end of the 6th segment. No lateral stripes or spots. Ventral surface with white haired segmentations. Eyes in male sex with large-facetted part without dark band. Thorax yellowbrown haired **avittatus** SCHUURMANS STEKHOVEN ♂.
- 8a. Abdomen attenuated to the apex, tawny-reddishbrown, with a narrow, straight-sided median white stripe and shorter lateral stripes **effilatus** SCHUURMANS STEKHOVEN.
- b. Abdomen not attenuated to the apex 9
- 9a. Abdomen with a median stripe and lateral spots, mostly limited to one or a few segments 10
- b. Abdomen with a median stripe and shorter or longer lateral stripes.. 11
- 10a. Abdomen bluishblackbrown, with a median longitudinal white stripe, ending on the 6th segment and roundish white spots on the 2d segment only (in one case on the 2d—4th segment), rather indistinct in some specimens. Callus black, with stout linear extension. Palpi deep reddish-brown, black haired. Wings appearing brownish, first posterior cell slightly narrower at opening **monotaeniatus** BIGOT.
- b. Abdomen blackish, with broad, median, serrated stripe, lateral spots found on the 2d segment only, or appearing on the 1st till 4th segment. Callus chestnutbrown, with filiform linear extension. Palpi brownish yellow-

- white, brownish white haired. Wings clear. In the male the median abdominal stripe is straight-sided **reducens** WALKER.
- 11a. Abdomen greyish blackbrown, with a fountain-shaped white marking, median stripe broad. Callus shell-shaped, with a short, broad, black linear extension **fontinalis** SCHUURMANS STEKHOVEN.
- b. Not such a fountain-shaped marking on the abdomen 12
- 12a. Small-sized species 13
- b. Medium-sized to large-sized species 15
- 13a. Abdomen yellowbrown, short, with the median white haired stripe interrupted or less distinct on the second segment, lateral stripes shorter and more irregular. Ventral surface with blackbrown, black haired patches on the 5th—7th segment. Callus winered, prolonged into a spindle-shaped linear extension. Palpi white haired. Antennae black-tipped **striatus** FABRICIUS.
- b. Abdomen with the median stripe neither interrupted nor less distinct on the 2d segment 14
- 14a. Abdomen blackbrown, elongate, conical, comparatively long, median stripe very distinct on the second segment. Ventral surface yellowbrown, white haired, except on the black haired 7th segment. Callus winered-brown, with narrow, spindle-shaped linear extension, longer than in *T. striatus* F. Antennae almost wholly reddishyellow. Eyes in the male sex with a median darker band **tenens** WALKER.
- b. Eyes showing greater extent of the area of the enlarged facets, all traces of a dark median band being absent in this area. Abdomen reddishbrown, with paler yellowbrown segmentations and a narrow, straight-sided, yellow haired median stripe; lateral stripes composed of isolated spots. Ventral surface yellowbrown, with median, black haired patches on the 3d and following segments **sinicus** WALKER ♂.
- 15a. First posterior cell of the wing closed 16
- b. First posterior cell open 17
- 16a. Palpi yellowbrown, thick black haired. Antennae redbrown, third joint partly redbrown, partly black on its basal annulation. Abdomen with fenestrate markings, composed of the connected median and lateral white haired stripes **fenestratus** SCHUURMANS STEKHOVEN.
- 17a. Forehead almost half as wide anteriorly as it is at vertex 19
- b. Forehead less strong attenuated to the base 18
- 18a. Body greyish violetbrown, violaceous or more yellowbrown, with broad, white, median, serrated longitudinal abdominal stripe and 2 lateral stripes. Callus redbrown to black, egg-shaped, with a fine linear extension. Palpi mainly white haired, intermixed with a smaller or greater number of black hairs. Antennae yellowbrown at base, third joint blackbrown to black **rubidus** WIEDEMANN.

- aa. Body greyish violetbrown rubidus s. str.
 aaa. Body violaceous, bright coloured subform violaceus.
 aaaa. Body yellowbrown subform priscoides.
 b. Similar to *rubidus*, basal annulation of third antennal joint broader, palpi black haired abbreviatus BIGOT.
19. Callus blackbrown, pear-shaped, almost reaching the eyes, linear extension broad. Palpi yellowbrown, black haired. Wings normal. Femora bluishbrown, grey haired. Abdomen, with a median narrow, white, white haired stripe and 2 broader, lateral, white haired stripes. Ventral surface with sides and segmentations yellow haired abscondens WALKER.

Tabanus jucundus WALKER (♀, ♂) Textfig. 59, 60.

References:

WALKER, List Dipt. I, p. 187 (1848)

RICARDO, Rec. Ind. Mus. IV, p. 164 (1911).

Habitat:

Type ♂ and another headless ♂ from Hongkong

Coll. BR.M.

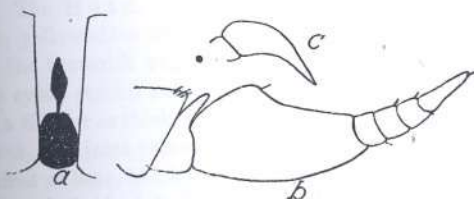
1 ♀ from Hongkong, MACFARLANE

5 ♀♀ „ Kohat, Pundjab and India

1 ♂ and 1 ♀ from Pundaluoya Ceylon, GREEN

In Howlett coll. ♀♀ from Igatpuri, W. Ghats, Bombay Presidency and from Mussoorie, N. India circa 7000 feet high.

WALKER described the male only. Male with eyes, similar to those of *T. striatus*, but the black-facetted part is shaped distinctly. Beard white. Antennae reddishyellow. Palpi pale yellowwhite with a few black hairs on the apex of the 2d joint. Thorax bluishbrown with 2 greyish longitudinal stripes. Legs darkbrown. Abdomen blackbrown with median white, straight-sided longitudinal stripe. Female. Forehead broad, greyish, with broad square callus, reaching to the eyes, linear extension diamond-shaped. Palpi white, white haired, in other respects identical to the male.



Textfig. 59.

T. jucundus Wlk. ♀

a. forehead, b. antenna, c. palpe.

The Female.

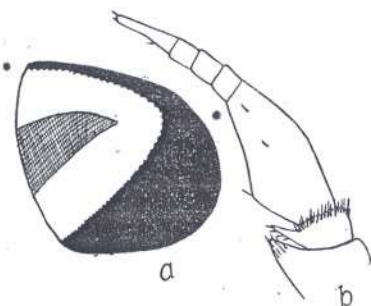
Bodylength 10—11 m.m.

The Head. (Textfig. 59). Eyes with 3 crossbands. Forehead greyish tomentose, black haired, broad, $\frac{1}{3}$ narrower anteriorly than it is at vertex, index 4. Callus square, tuberculous, prominent, shining dark blackbrown, filling up the space between the eyes, prolonged into a diamond-shaped linear

extension. In some specimens, see RICARDO's figure, the linear extension is much narrower. Subcallus, cheeks and face, white, white haired. Beard white. Palpi pale yellowwhite, stout at base, ending in an acute point, white haired. Antennae. First joint whitish tomentose, white haired, second joint reddishyellow as also the third joint, last one with indistinct, obtuse tooth, basal annulation 1,6 times as long as its widest part, 1,2 times as long as the red-brown stylus.

T h o r a x with 2 broad longitudinal white, white haired stripes and grey lateral borders elsewhere blackbrown, black haired. Breast white haired. Legs. Fore femora dark blackbrown, other femora greyish tomentose. Fore tibiae with thick white pubescence on basal half, apex black haired. Middle and hind tibiae more dark olivebrown. All tarsalia black. Wings clear, stigma pale yellow, indistinct.

A b d o m e n blackish, black haired, with a median grey, white haired stripe, starting on the 3d segment, composed of spots, narrower than those in the male. Lateral stripes limited to the first 2 segments, ending abruptly. Lateral borders of tergites white, white haired. Ventral surface dull greybrown, white haired, sixth segment partly, seventh segment wholly black haired.



Textfig. 60.

T. jucundus ♂. a. eye, b. antenna.

The Male.

Length 13 m.M.

The Head. (Textfig. 60). Eyes as mentioned. Beard white. Antennae reddishyellow, first joint white haired, with some black hairs at apex, second joint with a fringe of yellow hairs, third joint with hardly any tooth on basal annulation, which is 2 times as long as its widest part and almost equal in size to the stylus. Palpi with swollen, balloon-shaped 2d joint, mainly white haired with some black hairs at apex.

T h o r a x bluishbrown, with 2 greyish, white haired longitudinal stripes, similar borders, pteropleura and shoulders, in other respects wholly identical with the female. Wings identical, Legs the same.

A b d o m e n blackbrown on dorsum, markings as in the female, ventral surface similar.

60. *Tabanus rufinotatus* BIGOT (♀, ♂) Pl. 5, Fig. 6, Textfig. 61, 62.

Syn. *T. clesteēm* SUMMERS.

T. designatus RICARDO.

T. lineatus TAYLOR.

References:

BIGOT, Mem. Soc. Zool. France V, p. 673 (1892).

SUMMERS, Ann. Mag. Nat. Hist. 10, p. 222 (1912).

RICARDO, Nova Guinea IX, p. 390 (1912).

TAYLOR, Rep. Austr. Inst. Trop. Med., p. 62 (1913).

„ Proc. Linn. Soc. N.S. Wales, p. 41 (1917).

Habitat:

Australia

1 ♀ from Townsville, N. Queensland 1.9. '20, HILL (Textfig. 61 e, f, h) Coll. BR.M.

Nova Guinea

- 3 ♂♂ and 2 ♀♀ from Etna Bay, N. Guinea '04/'05
 resp. type ♂ and ♀ in Coll. N.A.M.
 paratype ♂ and other ♂ in Coll. BR.M. (Textfig. 62 a, b)
 other ♀ in Coll. BR.M.
 1 ♀ from Dutch N. Guinea in Coll. N.A.M.

Arbe islands, Dobo

- 4 ♀♀ from Dobo on horse 25.12.'22 (Textfig. 61 a, b, c, d, g, i)
 Coll. V.S.L.

A small to median-sized greybrown species, with blackish thorax, provided with three longitudinal grey, grey haired stripes. Eyes with 2 green crossbands. Forehead broad, whitish, yellowwhite haired. Two separated or connected black calli. Subcallus blackishbrown. Upper cheeks coffeebrown, lower cheeks and face silverywhite, white haired. Beard white. Palpi short yellowwhite, white and black haired. Antennae brownblack, black haired. Wings clear, with distinct appendix. Legs grey, mainly white haired. Abdomen reddishbrown with three longitudinal white stripes, composed of triangular spots and white segmentations.

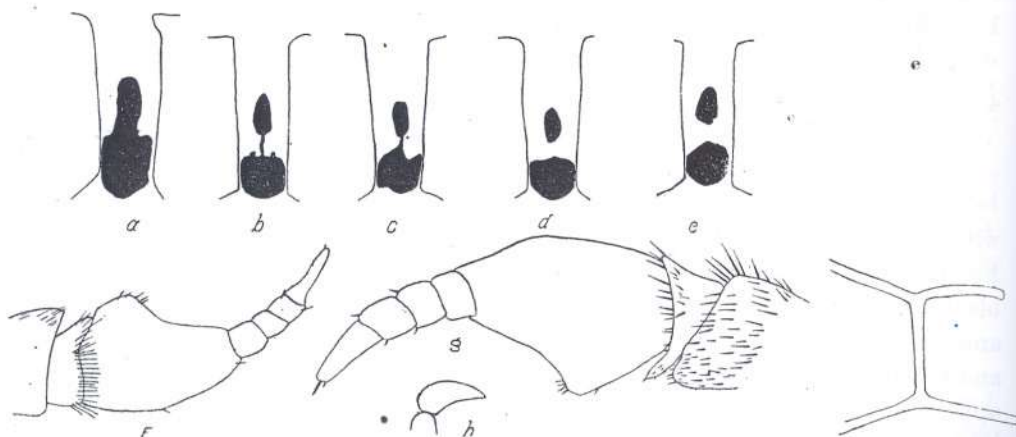
The Female.

Table of dimensions.

Bodylength	varying from 11,5 m.M. to 13,2 m.M.				
Width of thorax	"	"	3,8	"	— 4,2 "
Width of abdomen	"	"	3,8	"	— 4,8 "
Wingexpanse	"	"	21,8	"	— 25,8 "
Length of head	"	"	2	"	— 2,2 "
Length of thorax	"	"	4,2	"	— 5 "
Length of abdomen	"	"	6,4	"	— 8 "
Length of wing	"	"	9	"	— 10,8 "
Breadth of wing	"	"	3,2	"	— 4,2 "
Foreheadindex	"	"	2,75		— 3,3

The Head. (Textfig. 61). Forehead isabellabrown-white, almost the same width throughout, yellowwhite haired, with a margin of black hairs round the second callus and at vertex on the brownish vertex-spot. Basal callus broad, hexagonal, shining black, almost reaching the eyes, second callus black, oval, separated from the first or connected with it by means of a thinner or thicker stripe. Postocular rim white haired. Subcallus, etc. as described. Palpi stout, first joint yellowwhite, white haired, second joint broad at base, pointed at apex, white haired at base, black haired at apex. Antennae mainly black haired. First joint yellowbrown cylindrical, black haired on dorsum, white haired on ventral surface. Second joint brownish, black fringed with broad blunt spine, third joint coffeebrown, very broad on basal annulation, which is 1,3 times as long as its widest part and 1,1 times as long as the narrow stylus. Tooth blunt.

Thorax dark black, with longitudinal grey, white haired stripes, the middle one fine, not reaching to the scutellum the lateral ones broader, reaching the scutellum. Lateral borders of scutum and scutellum grey tomentose, white haired, intermediate parts black haired. Pteropleuron brownish, black haired. Breast grey, grey haired. Wings clear, veins brown.



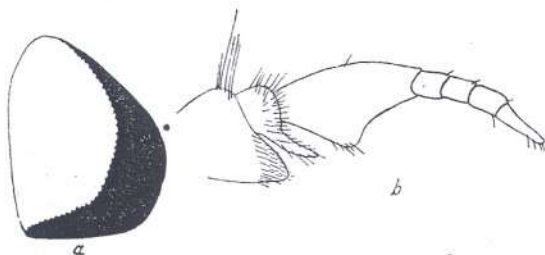
Textfig. 61.

T. rufinotatus BIGOT ♀. a—e. forehead, f, g. antennae, h. palpe, i. wingstructure.

stigma redbrown, appendix long. (Textfig. 61, i). Halteres, stalk brownwhite, club ivorywhite. Legs grey. First leg. Coxa grey, grey haired, trochanter blackbrown, femur grey, white haired, tibia yellowbrown at base, white haired, apex blackbrown, black haired. Tarsalia black. Second leg. Coxa olivebrown, white haired, femur olive-greybrown, white haired, tibia as in first leg, apex narrowly reddishbrown, dorsum black haired, ventral surface white haired, except at apex. Tarsalia redbrown, black haired. Third leg identical.

Abdomen reddishbrown, with 3 continuous whitish, white haired longitudinal stripes. Median stripe running from the 1st till the end of the 6th segment, broadest on the 3d and 4th segment, lateral stripes finer. Borders of tergites grey, white haired, intermediate parts brownblack, black haired. Segmentations narrowly white, white haired. Ventral surface grey, grey haired, segmentations brownish. Seventh segment black, black haired.

The Male.



Textfig. 62.

T. rufinotatus BIGOT ♂. a. eye, b. antenna.

Identical to the female. (Textfig. 62). Median abdominal stripe ending on the 5th, lateral stripes on the 5th segment. Eyes. The small-facetted black part is comparatively narrow and does not extend to the vertex. Palpi creamwhite, white haired, some black hairs occurring on the apex. Antennae slender, third joint yellowbrown, second joint with a rather long dorsal spur. Basal annulation of third joint 1.6 times as long as its widest part, 0.95 times as long as the stylus.

61. *Tabanus calidus* WALKER (♀) Textfig. 63.

References:

WALKER, *Diptera* Saunders. p. 57 (1856)RICARDO, *Rec. Ind. Mus.* IV, p. 157 (1911).

Habitat:

1 ♀ from Asia

Coll. BR.M.

RICARDO brought this female to *T. albimediis* Wlk.; it is however a valid species, note the shape of forehead and callus and the fact, that the abdomen has an almost straight-sided median stripe.

The Head. (Textfig. 63). Forehead about 4 times as long as it is wide anteriorly and only 0,125 narrower anteriorly than it is at vertex. Callus stout, polygonal, with a stout linear extension. Palpi swollen at base, with a long point, pubescence yellow, intermixed with some black hairs. Antennae rather long, first joint black haired on dorsum, elsewhere white haired. Halteres stalk brown, club yellow. The foregoing may suffice to show that *T. calidus* Wlk. really belongs to a distinct species.

52. *Tabanus annamitus* BIGOT (♂). Textfig. 64.

References:

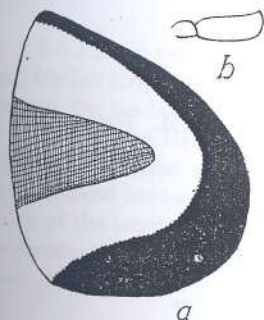
BIGOT, *Mem. Soc. Zool. France* V, p. 630 (1892).RICARDO, *Rec. Ind. Mus.* IV, p. 149 (1911).

Habitat:

Type ♂ from Saigon, Cochin China ex Coll. BIGOT

Coll. BR.M.

A medium-sized species with yellowbrown abdomen, on which an indistinct blackish stripe is seen. Wings clear. First posterior cell closed. Length 15 m.M.



Textfig. 64.

T. annamitus BIGOT ♂
a. eye, b. palpe.

The Head. (Textfig. 64.) Eyes as in *T. striatus* F., the small black facets form a narrow border, which reaches the vertex. Frontal triangle chestnutbrown. Subcallus and face greyish tomentose, white haired. Antennae broken, described as yellow, black at apex, the first 2 joints black haired. Palpi narrow, elongate, yellowwhite haired, with some black hairs at apex.

Thorax blackish grey tomentose. Wings as described. Legs with femora sootygrey, tibiae yellowbrown, posterior femora white haired, other ones black haired.

Abdomen, first segment yellowbrown with a broad sootygrey spot; second segment with longitudinal black stripe, narrowly interrupted at the segmentation, third segment with the same stripe, broader here, similar spots

on the segments 4-6, but 2 times as broad as on the foregoing segments. Ventral surface yellowbrown, yellow haired.

63. *Tabanus brunnipennis* RICARDO (♀) Pl. 6, Fig. 4; Textfig. 65.

References:

RICARDO, Rec. Ind. Mus. IV, p. 160 (1911).

SENIOR WHITE, Dept. Agricult. VII (1922).

AUSTEN, Bull. of Ent. Res. XII, p. 444 (1922).

Habitat:

British India

Type ♀ and 2 other females from Basi, N. Kanara, S. W. India, BELL 1908
Coll. BR.M.

3 ♀♀ from Parli, S. Malabar C. N. coll., 8—20.6.'15 „

1 ♀ „ Gorakhpur U. P. India „

Females from Mohnyin, N. Kanara, Burma and Bangkok, R. SENIOR WHITE,
19.5.'19 Coll. BR.M.

Siam

1 ♀ from Bangkok, FLOWER, 1908 Coll. BR.M.

Isle Java

4 ♀♀ from Kota Krawang, Res. Batavia, 17.11.'21 Coll. V.S.L.

8 ♀♀ „ Tjikampek, Res. Batavia, 5.11.'21

1 ♀ „ Pagiliran, Tjomal, Pekalongan, LAGAS, 10.10.'22 „

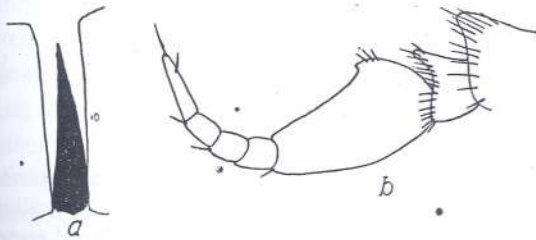
2 ♀♀ „ Batavia, JACOBSON, resp. 10.'07, 12.'07 Coll. N.A.M.

A brown species with very typical abdominal markings, in the shape of a reversed white anchor. Forehead parallel-sided, whitish, white haired. Callus shining yellowbrown, reaching to the eyes, covering almost the whole frons. Subcallus, cheeks and face pale citroneyellow, white haired, beard same colour. Palpi brownishyellow, pointed, black and white haired. Antennae orangeous-yellow, darker at apex with an indistinct tooth. Thorax reddishbrown with traces of longitudinal stripes, legs reddishbrown. Wings with distinct brown foreborder and apical shadow.

Table of dimensions.

Bodylength	varying from 12,8 m.M. to 14,5 m.M. RICARDO				13—15 m.M.
Width of thorax	„	„	4	„	4,2 „
Width of abdomen	„	„	4,5	„	5,2 „
Wingexpanse	„	„	27	„	31,2 „
Length of head	„	„	2	„	2,5 „
Length of thorax	„	„	5	„	6 „
Length of abdomen	„	„	7,2	„	8,5 „
Length of wing	„	„	11,5	„	13,5 „
Breadth of wing	„	„	4	„	5 „
Foreheadindex	„	„	4	„	5,75

The Head. (Textfig. 65). Forehead parallel-sided to 0.33 narrower anteriorly than it is wide at vertex, white tomentose, with a few yellowwhite hairs. Callus broad, very stout, rectangular at base, reaching to the eyes, gradually tapering to a long, sharp point,



Textfig. 65.

T. brunnipennis RIC. ♀. a. forehead, b. antenna.

shining yellowbrown, linear extension winered, darker to the apex. Vertex-spot round, small. Postocular rim yellowbrown. Subcallus, cheeks and face as mentioned. Palpi pale brownishyellow, first joint white haired, second joint with a long acute point, black haired, intermixed with some white hairs. Antennae, first joint pale orangeousyellowbrown, white tomentose, white haired, intermixed with a few black hairs, second joint darker rustybrownyellow, black fringed, with a short dorsal hump, third joint rather broad at base, with a short indistinct tooth, basal annulation warm reddishyellowbrown, 1.64 times as long as its widest part and 0.93 times as long as the blackbrown stylus. Proboscis, stalk redbrown, white haired, sugarflaps blackbrown, black haired.

Thorax violetredbrown, whitish tomentose, black haired, greyishblue tomentose on foreborder with traces of 8 indistinct, greyblue longitudinal stripes. Pteropleuron reddish bismarckbrown, black haired. Scutellum bordered white. Sides and breast reddish, yellow-white haired, mesosternumlobus yellow tomentose. Wings with brown foreborder and similar apical shadow, stigma dull chocolatebrown. Anal cell yellowish. Veins yellowbrown to blackbrown. Halteres, stalk redbrown, club yellowbrown. Legs. First leg, Coxa pale yellowbrown, reddish black at apex, silvery white haired. Femur reddishyellowbrown, black haired, distal lateral border white haired. Tibia redbrown, darker to the apex, black haired on dorsum, distal lateral border white haired, ventral surface uniformly redbrown. Tarsalia deep redbrown, black haired. Second leg, Coxa violetredbrown, trochanter blackbrown, Femur as in first leg with yellowish knee. Tibia cinnamonyellowbrown, dorsum as in fore tibiae, ventral surface white haired, Tarsalia yellowredbrown to black, black haired. Third leg, Coxa redbrown, white haired, trochanter redbrown, femur as in the other legs, Tibia caramelyellowbrown, distal lateral border yellowbrown haired, ventral surface white haired. Tarsalia redbrown, black haired.

Abdomen yellowredbrown on first 2 segments, darker, till deep brownblack to the apex. Median stripe broad, white, straight-sided, broader on the 3d segment, apex paler and narrower. On the border between the first and second segment one finds a white crossband. Further the second segment presents a distinct white roundish spot at each side of the median stripe, the indication of a similar spot is found on the third segment. All markings white haired. Lateral borders of scutellum white haired also. Pubescence elsewhere black. Lateral borders of the tergites 2-6 white haired. Ventral surface redbrown, white haired on the first 3 segments, other segments more blackred, segmentations yellowbrown, seventh segment wholly black haired.

64. *Tabanus avittatus* nov. spec. (♂) Textfig. 66.

Habitat:

1 ♂ from Belgaum, India, Bombay Pres. 6.'96, WATSON Coll. B.R.M.

AUSTEN annotated in the British Museum Collection „Distinguished from *T. tenens* Wlk. inter alia by different shape of enlarged facets in eye of ♂, by the absence of a dark band on this area, by greater length of erect, brownish hairs on dorsum of thorax in same sex and by the fact, that this hair extends right to the anterior margin of thorax and by absence of any distinct trace of a series of elongate grey pollinose spots, forming an interrupted stripe on each side of dorsum of abdomen E. E. AUSTEN. 31.10.'21".



Textfig. 66.
T. avittatus s. s. ♂
eye.

The Head. (Textfig. 66). Eyes yellowbrown, area of black small facets prolonged to the vertex as a narrow line. Subcallus pale yellowbrown, Cheeks yellowishwhite, white haired. Beard same colour. Palpi yellowishbrown, white haired with a fine row of black hairs, running from the apex downwards. Antennae incomplete, first 2 joints yellowbrown, dorsum of first joint thick black haired, second joint black fringed, 3d joint missing.

Thorax dull darkolivebrown, with long yellowbrown pubescence, covering scutum and scutellum. Pteropleuron yellowbrown, yellowbrown haired above, black haired below. Breast and sides brownish grey, white haired. Wings with reddishyellowbrown foreborder, narrow, dark redbrown stigma and brown apical shadow, elsewhere clear, veins dark brown. Halteres stalk yellowbrown, club yellow. Legs. First leg. Coxa yellowbrown,

white haired, trochanter redbrown, femur olivebrown with yellowbrown knee, dorsum black haired, distal lateral border covered with long, thick, white pubescence. Tibia yellowbrown, yellow haired at base, intermixed with some black hairs, apical half redbrown, black haired. Tarsalia blackbrown. Second leg, femur tawnybrown, white haired, with a row of black hairs on dorsum. Tibia olivaceous yellowbrown, yellow haired, with a row of black hairs on dorsum. Tarsalia dark redbrown, black haired. Third leg. Coxa greybrown, white haired, trochanter redbrown, femur yellowbrown, black haired.

Abdomen reddishyellowbrown, black haired on first 4 segments, then blackbrown. A narrow median, yellow haired stripe runs from the base till the 6th segment. Lateral borders of the first 6 tergites yellowbrown, white haired. Ventral surface yellowbrown with reddishbrown, black haired median patches on 3d and 4th segment, blackbrown ones on 5th and 6th segment and an indication of a similar spot on the 2d segment. Segmentations pale yellowbrown, white haired. Seventh segment wholly black haired.

65. *Tabanus effilatus* nov. spec. (♀) Pl. 6, Fig. 2; Textfig. 67.

Habitat:

Isle Madoera

Type ♀ and 5 other ♀♀ from Galis, Pasar on horse 22.7.'22, SCHUURMANS
STEKHOVEN (Textfig. 67 a, c, e) Coll. V.S.L.

Isle Sumatra

154 ♀♀ from Langsar, Gvt. Atjeh, 27.2.'23, C. DIEBEN „

Federated Malay States

4 ♀♀ from Quedah, VAN DE DOES DE BIJE

Coll. L.M.N.H.

1 ♀ „ ?, det. by VAN DER WULP as *T. striatus* F. „

- 1 ♀ „ Selangor, A. L. BUTLER (Textfig. 67 b)
 7 ♀ ♀ „ Singapore 5.24 (Textfig. 67 d, f)

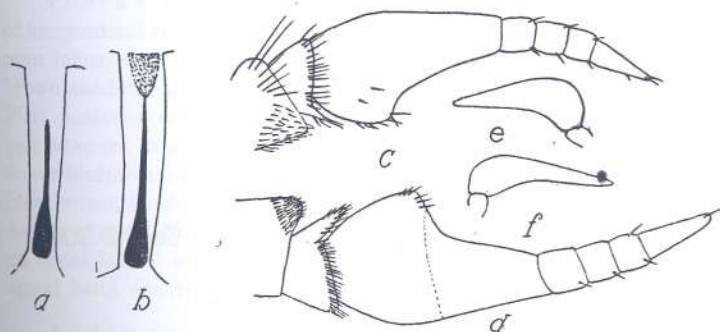
Coll. BR.M.

Coll. R.M.S.

A species, closely allied to *T. rubidus* WIED., but distinguished inter alia by the narrower pointed, effilate, much darker abdomen, provided with narrower longitudinal stripes. Forehead whitish grey. Callus rather narrow with a relatively short brownblack linear extension. Subcallus brownyellow to brownish-white. Cheeks and face same colour or more bluish, white haired. Palpi yellow-brown, long and pointed. Antennae yellowbrown, with blackbrown stylus, tooth blunt. Thorax sootybrown, with 3 longitudinal brownishwhite stripes and whitish borders. Wings clear. Legs brownish, tibiae yellowbrown at base. Abdomen tawny-reddishbrown, effilate, with narrow white, white haired, straight-sided median stripe, ending on the 5th segment. Lateral stripes ending on the 4th segment, white, white haired.

Table of dimensions.

Bodylength	varying from 13,8 m.M. to 17,2 m.M.			
Width of thorax	„	„	4	„ — 5,2 „
Width of abdomen	„	„	4	„ — 5,2 „
Wingexpanse	„	„	27,6	„ — 33,2 „
Length of head	„	„	2	„ — 2,5 „
Length of thorax	„	„	5,1	„ — 6 „
Length of abdomen	„	„	8,2	„ — 11,2 „
Length of wing	„	„	11,8	„ — 14 „
Breadth of wing	„	„	4	„ — 4,5 „
Foreheadindex	„	„	7	



Textfig. 67.

T. effilatus s.s. ♀.

- a, b. forehead, c, d. antenna, the dotted line on d. indicates the limit between the yellowbrown and the blackbrown area,
 e, f. palpi.

The •H e a d.
 (Textfig. 67). Forehead $\frac{1}{3}$ narrower anteriorly than it is wide at vertex, whitishgrey, more brownish at lateral borders, black haired. In most females the lower part of the frons is goldenbrown, upper part grey-white. Vertex spot elliptical, winered. Subcallus, face and cheeks as described above, beard white. Palpi yellowbrown,

slender, second joint swollen at base, ending with a long point, black haired, intermixed with some white hairs, scattered over the surface, first joint wholly white haired. In some of the *Madoera* females yellow hairs are found on the second joint instead of white ones. Antennae yellowbrown on the first joint, pubescence white, with a black hairtuft at apex. Second joint darker olivebrown, black haired, dorsal spur sharp. Third joint reddishyellow at base, darker blackbrown in front of the blunt, black haired tooth. Basal annulation 1.57 times as long as its widest part, 1.2 times as long as the blackbrown stylus. In a single case the whole antennae were blackbrown. Proboscis yellowbrown haired.

Thorax sootybrown, with a fine whitish median longitudinal stripe, two lateral broader brownishwhite, brownishwhite haired stripes and whitish lateral borders. Pubescence elsewhere black, intermixed with some brownishwhite hairs. Tufts at base of wings and more behind and on the border between scutum and scutellum brownishwhite also. Pteropleuron reddishbrown, black haired. Breast and sides brownishgrey, white haired. Wings clear, fore-border yellowbrown, stigma pale havannabrown. Halteres yellowbrown. Legs. First leg, Coxa brownishgrey, white haired, Trochanter redbrown, femur darkbrown, knee yellowbrown, distal lateral border white tomentose, white haired, dorsum black haired. Tibia yellowbrown yellow haired on basal $\frac{2}{3}$, intermixed with some black hairs, apical $\frac{1}{3}$ chocolatebrown, black haired. Tarsalia brownblack, black haired. Second leg, femur tawnybrown with yellowbrown knee, dorsum black haired, lateral borders, dirty white haired. Tibia tawnyolivebrown, black haired above, yellowwhite haired below. Tarsalia redbrown, black haired. Third leg identical.

Abdomen effilate, tawny reddishbrown, median stripe narrow, almost straight-sided, covered with short, yellowwhite and black hairs, running till the end of the 5th segment. On the second segment it is accompanied by a blackish shadow. Lateral stripes paler, more reddishbrown, white haired. Segment 5-7 wholly blackbrown, with more or less yellowbrown segmentations. Lateral borders of tergites yellowwhite, white haired. Ventral surface yellowbrown, white haired on the first 4 segments, other segments darker, blackbrown, black haired, with yellowbrown, yellow and white haired segmentations. In some of the specimens a small whitish spot occurs on the 6th tergite in the middle, whereas usually a greyish hairtuft is found on the first segment at each side of the scutellum. The effilation of the abdomen begins with the 5th segment.

66. *Tabanus monotaeniatus* BIGOT (♀) Textfig. 68.

References:

BIGOT, Mem. Soc. Zool. France V, p. 655 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 159 (1911).

„ Arch. Naturgesch. Bd. 80, p. 123 (1914).

Habitat:

Type ♀ (Textfig. 68) and 4 other females from India Coll. BR.M.

1 ♀ from N. Khasi

3 ♀♀ paratypes from India, Ind. Museum

respectively 1 ♀ on N. Khasi, Assam

2 ♀♀ „ Sibagor

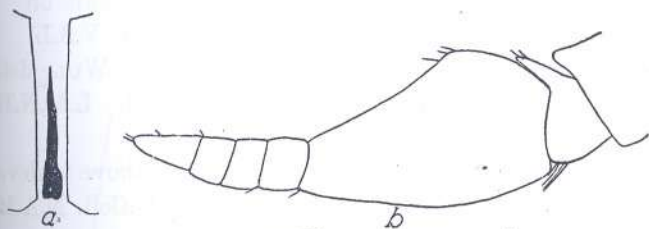
Female specimens from Dibia, Sadia, Khasi Hills District

„ „ from N. Khasi Hills, lower ranges, CHENNELL

Female specimens Nangpoh, Assam

„ „ Java and Assam

A bluishblackbrown species. Forehead greybrown, white haired. Callus black, oval. Subcallus and upper cheeks velvetybrown. Lower cheeks brownish white, white haired. Beard brownishwhite. Palpi stout, deep reddishbrown, black haired. Antennae redbrown, with blunt indistinct tooth. Thorax and abdomen bluishblackbrown. Wings tinged reddishbrown. Legs darkbrown. Abdomen with median longitudinal white stripe and roundish white spots on the second segment, rather indistinct in some specimens. Length of type 18 m.M. other specimens from 14—19,5 m.M.



Textfig. 68.

T. monotaeniatus BIG. ♀. a. forehead, b. antenna.

The Head. (Textfig. 68). Forehead greybrown, white haired in type, it is $\frac{1}{2}$ narrower anteriorly than is at vertex, index 7,25. In another female the index is 5,33, the vertex is brownish. Callus black, oval, not reaching to the eyes, prolonged into a stout linear extension, ending blunt in the

type, more pointed in other females. Subcallus and upper cheeks velvetybrown or paler reddishbrown; as far as can be concluded from the more or less rubbed type, with some black hairs on the upper cheeks. Lower cheeks pale brownish white, white haired. Beard white. Palpi ending in a long, blunt point. Antennae redbrown, black haired on first 2 joints, second joint, with a dark, long spur, third joint redbrown at base, till the indistinct tooth, then black, basal annulation 1,57 times as long as its widest part, 1,36 times as long as the stylus.

Thorax bluishblackbrown, denuded, grey tomentose on foreborder, with indications of longitudinal stripes in one of the paratypes, breast bluishbrown, black haired on mesosternum lobus, elsewhere white haired. Wings with reddishbrown foreborder and very distinct brown shadows along the veins, thus giving a reddishbrown appearance to the whole wing. First posterior cell slightly narrower at opening. Halteres, stalk darkredbrown, club pale yellowbrown. Legs dark. First leg, Coxa greybrown, white haired, trochanter deep redbrown, femur bluishblackbrown, knee yellowbrown, black haired. Tibia redbrown on basal $\frac{2}{3}$, apex blackbrown, black haired. Tarsalia black. Second leg, femur as in fore legs, tibia redbrown, darker at apex, black haired on dorsum, yellow haired below. Third leg, femur white haired on distal lateral border, elsewhere black haired. Tibia yellowbrown, yellow haired at base apical band darker, black haired.

Abdomen same colour as the thorax, with median longitudinal white stripe, ending on the 6th segment. In one of the other females faint bluishwhite tomentose spots are found at each side of the median stripe on the segments 2—4, white haired on the first 2 segments only, as also on the median stripe. Pubescence elsewhere black. Ventral surface with broad, black, black haired longitudinal band and narrower bluishblack, white haired segmentations and sides.

67. *Tabanus reducens* WALKER (♀ ♂) Pl. 5, Fig. 5; Textfig. 69.

References:

WALKER Proc. Linn. Soc. London IV, p. 103 (1360).

SCHUURMANS STEKHOVEN, Treubia V, p. 303 (1924).

,, ,, Buru public. II, p. 5 (1924).

Habitat:

Isle Celebes

- Type ♀ from Celebes, WALKER Coll. BR.M.
 1 ♀ from Pangkili, District Palakka, Watampone, Boni '22, KALIGIS
 (Pl. 5, Fig. 5; Textfig. 69 d.) Coll. V.S.L.
 1 ♀ ,, Batjoe, District Palakka, Watampone, Boni '22, KALIGIS
 2 ♀ ♀ ,, Olsa, District Palakka, Watampone Boni, 1.'23, KALIGIS on
 buffalo (Textfig. 69 e.) Coll. V.S.L.
 1 ♀ from Kwandang, ROSENBERG (labelled *T. rubidus* WIED., v. D. WULF det.)
 Coll. L.M.N.H.

Isle Buru (Molucs)

- 2 ♀ ♀ from Bahlale, N. E. from Leksula in the woods on 300 M. above sealevel
 20./21.1.'22, TOXOPAEUS (Textfig. 69 a, b, c.; Pl. 1, Buru publ. Coll. N.A.M.

Xula Archipelago

- 1 ♀ from Taliaboe, J. W. VAN NOUHUYS Coll. L.M.N.H.

Phillipine Islands

- 6 ♀ ♀ from Manilla, M. B. MITZMAIN, 1923 Coll. BR.M.
 2 ♂ ♂ ,, Manilla, M. B. MITZMAIN, 1923 ,,

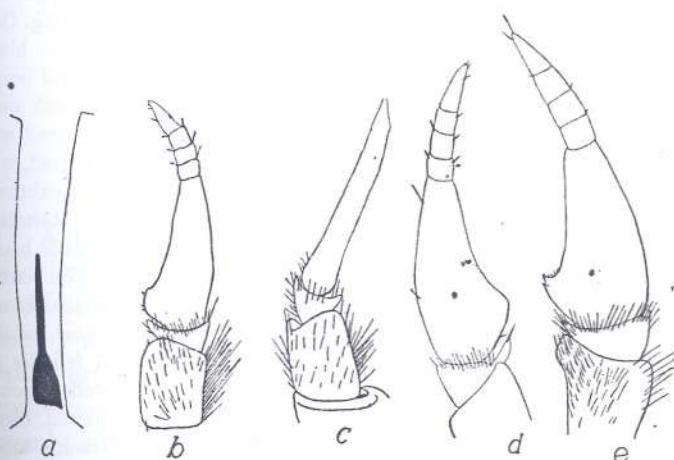
TOXOPAEUS mentions that the wood, where his specimens were caught, was thick and grew upon sandstone. Here and there clear spots were encountered, where the natives felled the trees for culture purposes.

This species varies rather much, especially in respect with the abdominal markings, the lateral stripes being composed of a variable number of spots, the median white haired stripe being serrated at borders and ending on the 6th segment. Thorax and abdomen elsewhere blackish, the thorax presenting 4 whitish stripes. Forehead partly yellow partly redbrown, yellow and black haired, almost the same width throughout. Callus chestnutbrown, pear-shaped, prolonged into a narrow, filiform linear extension. Subcallus brownishwhite, cheeks and face white to yellowishwhite, white haired, intermixed with some black hairs. Palpi brownish yellowwhite, brownish white haired, ending with a long point. Antennae reddishbrown, tooth indistinct, stylus long, black. Legs blackishbrown with roebrown to siennabrown tibiae. Wings clear, foreborder pale yellowbrown, Halteres whitish.

The Female

Table of dimensions.

Bodylength	varying from 14,5 m.M. to 21 m.M.				
Width of thorax	"	"	5,2	"	— 6,2
Width of abdomen	"	"	6	"	— 7,2
Wingexpanse	"	"	33,6	"	— 40,6
Length of Head	"	"	3,2	"	— 3,2
Length of thorax	"	"	6,8	"	— 8,5
Length of abdomen	"	"	8	"	— 12
Length of wing	"	"	14,2	"	— 17,8
Breadth of wing	"	"	4,5	"	— 6,2
Foreheadindex	"	"	5,4	"	— 6,8



Textfig. 69.

T. reducens Wlk. ♀.

a. forehead, b—e. antennae, c. antenna dorsal view

The Head. (Textfig. 69). Forehead yellow, yellow haired on basal 2/3, intermixed with some black hairs (Philippine ♀), apical third redbrown, black haired. Vertexspot triangular, whitish. Anteriorly the forehead is 0,2 to 0,33 narrower than it is wide at vertex. Callus chestnutbrown (wholly black in other females) at base, convex, flattened to the black apex, attenuated and prolonged into a narrow, filiform, pointed linear extension, the latter ending at 1/3 or

1/2 of the length of the forehead from the vertex. In the Burufemales the middle of the greyish-white tomentose frons is covered with a broad row of black hairs, accompanied by a thick, yellowbrown haircovering along the linear extension. Vertexspot wineredbrown, brownishgrey tomentose, black haired, v-shaped. Postocular rim narrow, brownish, black haired. Subcallus brownishwhite or greywhite, blackishbrown at apex. Cheeks snowwhite to greywhite, white haired (one of the Philippine ♀ presented 2 black hairs near the subcallus) Beard rather short silvery white haired. Face with median deep groove, sooty in the middle, borders yellowish, covered with long loose silverygrey hairs, intermixed with some black ones. In one of the Celebes females the face is brownishyellowwhite. Palpi, first joint dirtyyellowbrownwhite to coffeenutbrown, pubescence loose, erect, brownishwhite; second joint same colour, ending with a tridentate point, white haired at base, intermixed with some black hairs, the last increasing in number to the apex, which is wholly black haired. Proboscis, stalk sootygrey, bearing long loose silverywhite hairs, sugarflaps brownblack haired. Antennae dark, first joint redbrown (Philippines) or olivebrown to yellowbrown and blackishbrown (Buru and Celebes), short,

broad at base, blunt at apex, whitishgrey tomentose, black haired on dorsum at apex, some black hairs being intermixed between the white ones at base on dorsum, pubescence elsewhere white to yellowish. Second joint brighter reddishbrown, crescentiform, black fringed. Third joint reddish brown at base (reddishyellow in the Philippine ♀, yellowishbrown in the Celebes ♀) then deepblack, tooth indistinct (Buru) or more distinct (Philippines), crowned with black hairs. Basal annulation 2 times as long as its widest part, 1.4 times as long as the stylus

Thorax black, black haired, intermixed with some yellowish hairs, with 4 distinct greyish white tomentose longitudinal stripes, covered with yellowish and white hairs. A fifth fine, narrow whitish line runs in the middle of the scutum. (The groundcolour of the scutum is more darkolivebrown in the Philippine females) Foreborder of scutum yellowbrown haired. Tufts at base of wings and behind white. Scutellum same colour as scutum with broad whitish, white haired hindborder, black haired on the centre. Pteropleuron reddishbrown to blackish-brown, black haired at base, yellowbrown haired at apex. Sides and breast sootygrey tomentose, white or brownishwhite haired, with some black hairs on the mesosternumlobus. Wings with pale yellowbrown foreborder, similar stigma, a yellowbrown tinged anal cell and brownish shadows along the veins. Halteres, stalk brownblack, club with pale brown margin and whitish centre (pale reddish — to caramellbrown in the Celebes females) Legs. First leg. Coxa bluishgrey tomentose, black at apex, silverygrey haired, Trochanter darkredbrown to black, with brownish apex. Femur black haired on dorsum, knee yellowbrown, distal lateral border dull greybrown, covered with long, flossy, white hairs, intermixed with some black ones, ventral surface bare, shining black. Tibia yellowwhite, silverywhite haired, intermixed with some black hairs on basal 2/3 (Buru) or bright yellowbrown on basal 1/2, yellow haired, with a median row of black hairs (Philippines), extreme base black, apex black (Buru) or blackbrown, (Philippines) black haired. Ventral surface brownishred, white haired on basal half, intermixed with some black hairs, apex black haired, intermixed with some white hairs. Tarsalia black, mainly black haired, intermixed with some white hairs at apex, as well on dorsum as on ventral surface. Second leg, trochanter black with some sparse white hairs on ventral surface. Femur with broad yellowbrown knee, elsewhere brownishblack, grey tomentose, almost wholly greywhite or brownishyellowwhite haired, black hairs small in number in most females (in one of the Buru females dorsum mainly black (haired)). Tibia roebrown or bright yellowbrown, yellowbrownwhite or goldenyellow haired on dorsum, apical fifth black, black haired, distal lateral border yellowwhite haired, intermixed with some black hairs, similarly some black hairs are intermixed on dorsum on the lower part. Ventral surface strawyellowwhite haired on basal part, apex black haired, 2 subequal spurs. Third leg, Coxa as in first and second leg, white haired, reddishbrown haired on lateral borders. Trochanter dark redbrown or black, with some greywhite hairs along the proximal lateral border. Femur grey tomentose, with yellowbrown knee, dorsum mainly black haired (Buru) yellowwhite haired on distal lateral border and at base on dorsum, ventral surface bluishgrey tomentose, brownish yellow haired, or (Philippines) mainly white haired on dorsum with a median irregular row of black hairs. Tibia olivebrown or yellowbrown on basal 4/5 or 5/6, apex black, black haired, as is the rest of dorsum, ventral surface yellow haired. Tarsalia reddishbrown, black haired on dorsum, ventral surface reddishbrown haired.

Abdomen blackish, black haired, with a distinct median white, white haired, longitudinal stripe, composed of spots in the shape of the proglottids of a *Taenia*, ending on the 5th segment, or on the 6th segment. Lateral stripes composed of a variable number of white haired spots, present on the first 4 segments or even reduced to the 2d segment only. Lateral borders of tergites dirty yellowwhite, white haired, intermixed with black hairs on the 7th segment. Ventral surface, with a median longitudinal broad, black, black haired stripe, composed of halfmoon-shaped spots. Sides and segmentations pale greybrown, white haired. Seventh segment wholly black, black haired.

The Male.

The Head. The studied ♂♂ are identical to the female sex. Head holoptic. Eyes from the type as in *T. rubidus* WIED. and *striatus* F. Median, big-faceted part blackbrown, curved band pale creamyyellow, black, small-faceted part prolonged to the vertex. Palpi club-shaped, pale yellow brown, yellowwhite haired, intermixed with a few black hairs on dorsum. Antennae slender, with blunt tooth, basal annulation 2,28 times as long as its widest part, 1,24 times as long as the stylus.

Thorax as in female. Breast mainly redbrown. Femora dark reddishbrown with yellowbrown knees.

Abdomen blackbrown with a much finer median brownish white, white haired straight-sided longitudinal stripe. Lateral spots and lateral borders of tergites similar.

68. *Tabanus fontinalis* nov. spec. (♀) Pl. 6, Fig. 1; Textfig. 70.**Habitat:**

Type ♀ and 11 other females from Djambi, MARSIDI

Coll. V.S.L.

respectively 4 ♀♀ on buffalo on 7.'22

2 ♀♀ „ „ „ 25.9.'22

1 ♀ „ „ „ 1.'23

3 ♀♀ „ cattle on 25.9.'23

1 ♀ „ „ „ 1.'23

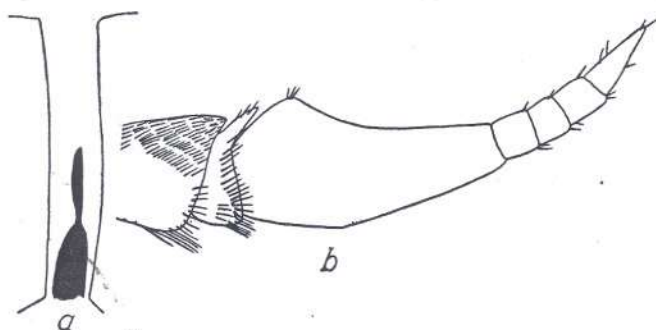
1 ♀ „ horse on 25.9.'22

A big-sized, greyish-blackbrown species, allied to *T. rubidus* WIED.; its blackbrown abdomen, marked with a median milkywhite, parallel-sided, broad longitudinal stripe and 2 lateral stripes, connected at base with the middle one by means of a curved line, the whole resembling a fountain. Forehead rather broad, dirtyyellowishwhite, yellowwhite haired. Callus redbrown, broad, shell-shaped, with a short, broad, black linear extension. Palpi yellowbrown, mainly silverywhite haired. Antennae reddishbrown, stout, with blunt tooth. Subcallus, cheeks and face yellowishwhite, white haired as is the beard. Thorax greyish tomentose with 3 white longitudinal stripes and similar lateral borders. Legs brownish, mainly white haired.

Table of dimensions.

Bodylength	varying from 17,4 m.M. to 19.8 m.M.				
Width of thorax	„	„	5	„	6,2 „
Width of abdomen	„	„	5,8	„	6,8 „
Wingexpanse	„	„	34,6	„	38,6 „
Length of head	„	„	2,6	„	3,5 „
Length of thorax	„	„	6,4	„	8,2 „
Length of abdomen	„	„	8,6	„	12 „
Length of wing	„	„	14,8	„	16,2 „
Breadth of wing	„	„	4,8	„	5,8 „
Foreheadindex	„	„	5,8	„	8,25 „

The Head. (Textfig. 70.) Forehead dirty yellowishwhite, yellowishwhite haired, 0,21—0,3 narrower anteriorly than it is at vertex. Vertex spot irregular, winered, black haired. Callus redbrown at base, black at apex, linear extension ending blunt. Postocular rim



Textfig. 70.

T. fontinalis s.s. ♀ a. forehead, b. antenna.

brown haired. Subcallus, etc. as described, some black hairs are intermixed on the face. Palpi long and slender, ending with an acute point, first joint yellowbrown, white haired, second joint yellowbrownishwhite, silverywhite haired, intermixed with a few black hairs. Antennae first joint reddishbrown to deep winered, white tomentose, black haired on dorsum in the median line and at apex, elsewhere white haired, second joint same colour, with dorsal hump and apical black hairfringe, third joint yellowredbrown at base, then more rustybrown, in other females soon growing black, tooth not very distinct, basal annulation 2 times as long as its widest part, 1,4 times as long as the stylus. Proboscis with black sugarflaps, redbrown and white haired.

T h o r a x grey, with 3 whitishgrey, white haired longitudinal stripes and similar lateral borders. The median stripe does not reach the scutellum. Intermediate areas darker, blackish, grey tomentose, pubescence black and white. Hindborder of scutum covered with long, white hairs. Hairtufts at base of wings and behind white. Scutellum same colour as scutum, with long white hairs along the hindborder. Pteropleuron violet, black haired. Breast and sides bluegrey, white haired. Mesosternum lobus black haired. Wings rather clear, stigma pale brown, veins blackbrown, accompanied by brownish shadows. Halteres stalk redbrown, club brownishwhite. Legs. First leg. Coxa sootygrey, silverywhite haired, femur reddishviolet, black haired on dorsum, distal lateral border greywhite haired, ventral surface bare. Tibia dirtywhite at base, white haired, a row of black hairs runs from the base in the middle on dorsum, apical half black, black haired. Tarsalia black. Second leg, coxa bluishgrey, brown at apex, grey haired, trochanter black, grey haired. Femur as in first leg, distal lateral border flossy white haired, ventral surface bluishgrey, white haired. Tibia mainly white, white haired, apical band black haired, ventral surface dark yellowbrown, white haired, intermixed with some black hairs. Spurs dull black. Tarsalia redbrown, black haired. Third leg. Coxa bluishgrey, silverywhite haired, trochanter violet, brown at apex, greywhite haired, femur violetredbrown, some black hairs at apex on dorsum, elsewhere yellowwhite haired, ventral surface bare. Tibia yellowbrown, dorsum black haired, hairs arranged in rows, distal lateral border with white hairs on basal half, black to the apex, ventral surface white haired. Tarsalia redbrown, black haired.

A b d o m e n, first 3 segments blackbrown, apical segments darker, to black. Median longitudinal stripe milkywhite, parallel-sided, silverywhite haired, ending on the 6th segment. Lateral stripes same colour, white tomentose, ending on the fourth segment, composed of elongate pointed spots, decreasing in size from the second segment onwards. On first segment no whitish tomentum in the course of these stripes, white hairs only. Here median and lateral stripes connect. Lateral borders of tergites whitish, silverywhite haired, especially on the 3d till 6th segment. Ventral surface with a median brownblack, black haired longitudinal band, segmentations and sides brownish, silverywhite haired.

69. *Tabanus striatus* FABRICIUS (♀, ♂) Pl. 4, Fig. 4, 5; Textfig. 71.Syn. *T. partitus* WALK.*T. ruficallosus* BIGOT.*T. ophthalmicus* HAGENBECK.*T. megalops* WLK.

References:

FABRICIUS, Ent. Syst. IV, p. 371 (1794)

,, Syst. Antl., p. 103 (1805).

WIEDEMANN, Dipt. exot. p. 79 (1821).

,, Auss. Zweifl. Ins. I, p. 155 (1828).

VAN DER WULP, Sumatra Exped. Dipt., p. 16 (1881).

,, Notes Leyden Mus. VII, p. 71 (1883).

WALKER, List Dipt. V, Suppl. I, p. 247, 407 (1854).

,, Proc. Linn. Soc. London I, p. 9 (1856).

BIGOT, Mem. Soc. Zool. France V, p. 679 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 149 (1911).

,, Tijdschr. v. Ent. LV, p. 347 (1912).

DE MEIJERE, Tijdschr. v. Ent. LX, p. 295 (1918).

,, Tijdschr. v. Ent. LXVII suppl., p. 56 (1924).

FRASER, Jl. Trop. Vet. Sc. IV, p. 373 (1909).

MITZMAIN, Phil. Jl. Sc. VIII Sect. B., p. 197—221 (1913).

,, Phil. Jl. Sc. VIII Sect. B., p. 223—229 (1913).

AUSTEN, Bull. Ent. Res. XII, p. 445 (1922).

,, Trans. R. Soc. Trop. Med. and Hyg. XV, p. 264 (1922).

SENIOR WHITE, Dept. Agric. VII, (1922).

PRATT, Jl. Vet. Trop. Sc. IV, p. 390 (1909).

FLETCHER, Sc. Rep. Agric. Inst. Pusa 1915/'16, p. 78 (1917).

,, Sc. Rep. Agric. Res. Inst. Pusa 1916/'17, p. 91 (1918).

Habitat:

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

5 ♀ from Manegon, Pidjor Koling, Angkola, TARIP and LOBEL Coll. V.S.L.

respectively 3 ♀ ♀ on buffalo 6.6.'23

2 ♀ ♀ ,, cattle 12.'21

30 ♀ from Pidjor Koling, TARIP, LOBEL and BAKKER Coll. V.S.L.

17 ♀ ♀ from Si Doea doea, Pidjor Koling on buffalo, LOBEL, BAKKER ,, ,,

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923						2		1					3
	,,	1924				3	1	2	4				3		13
	horse	1923						6		1					7
	cattle	1923						7							7
Total						3	1	17	4	2			3		

respectively 5 ♀♀ on 6.6.'23

4 ♀♀ „ 30.6.'23

4 ♀♀ „ 6.8.'23

1 ♀ „ 26.9.'23

3 ♀♀ „ 5.8.'24

1 ♀ from Hoeta Padang, Pidjor Koling, LOBEL 24.12.'24 Coll. V.S.L.

60 ♀♀ from Bintodjoe, Moeara Tais, LOBEL, BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	Buffalo	1923	1	1	1	5		10			8				27
	„	1924				3	1		3						7
	horse	1922												3	3
	„	1923	5	4		3		9							21
	cattle	1923	2												2
Total			9	5	1	11	1	19	3		8			3	

8 ♀♀ from Hoeta Tongga, Moeara Tais, LOBEL Coll. V.S.L.

respectively 1 ♀ on horse 24.12.'22

1 ♀ „ buffalo 30.6.'23

3 ♀♀ „ „ 1.'23

3 ♀♀ „ „ 1.'23

3 ♀♀ „ „ 12.'21

4 ♀♀ from Hoeta Olboeng, Moeara Tais, LOBEL Coll. V.S.L.

respectively 2 ♀♀ on buffalo 24.12.'22

2 ♀♀ „ „ 30.6.'23

5 ♀♀ from Si Pakko, Moeara Tais, LOBEL Coll. V.S.L.

respectively 1 ♀ on buffalo 24.12.'22

4 ♀♀ „ horse 24.12.'22

6 ♀♀ from Moeara Tais, TARIP and BAKKER Coll. V.S.L.

respectively 3 ♀♀ on buffalo 12.'21

1 ♀ „ „ 7.1.'22

2 ♀♀ „ „ 2.11.'24

11 ♀♀ from Si Balapak, Moeara Tais, BAKKER, TARIP Coll. V.S.L.

respectively 3 ♀♀ on buffalo 2.4.'24

2 ♀♀ „ „ 2.5.'24

2 ♀♀ „ „ 6.7.'24

1 ♀ „ „ 5.8.'24

3 ♀♀ „ horse 24.12.'22

33 ♀♀ from Hapesong Lama, Marantjar, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo cattle	1924				2		3	5				1		11
		1923		2	3	2		5			2				14
		1924								2					2
	horse ,,	1923		1		1				2					4
		1924						2							2
Total				3	3	5		10	5	4	2		1		

20 ♀♀ from Si Hitang, Batoe na Doea, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923		1	1	3				1	4				10
	horse	1923	2												2
	cattle	1924					2		6						8
Total			2	1	1	3	2		6	1	4				

1 ♀ from Si Gala gala, Marantjar on cattle 3.8.'23, BAKKER Coll. V.S.L.

3 ♀♀ , Si Galangan, Si Galangan, LOBEL

respectively 1 ♀ on horse 1.'23

2 ♀♀ ,, buffalo 1.'23

1 ♀ from Si Dadi, Si galangan, on buffalo 1.'23, LOBEL Coll. V.S.L.

3 ♀♀ ,, Sofik, Pintoe Padang, on buffalo 2.4.'24, BAKKER Coll. V.S.L.

Total from this Ressort.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	cattle	1921												2	2
	,,	1923	2	2	3	2		12		1	2				24
	,,	1924					2		6	2					10
	buffalo	1921												6	6
	,,	1922	1											6	7
	,,	1923	8	2	2	8		30		6	13				69
	,,	1924				14	4	5	14	4		6			47
	horse	1922											11		11
	,,	1923	8	5		4		15		3					35
	,,	1924						2							2
Total			19	9	5	28	6	64	20	16	15	6	25		213

Ressort Padang Sidempoean, Mantrie Ressort Sibolga
56 ♀ ♀ from Si Boeni boeni, Siboloean, TARIP, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1922			3										3
	"	1923						1	1		2	2			6
	"	1924						2		3			6		11
	cattle	1923					1		1	1		2			5
	"	1924			2		2	1	3					4	12
	horse	1923									1	1			2
	"	1924			1	2	2		1	5			6		17
Total					6	2	5	4	6	9	3	5	16		55

3 ♀ ♀ from Sibabangoen, Anggoli Simanossor, LOBEL Coll. V.S.L.
respectively 2 ♀ on buffalo 27.10.'22
1 ♀ ,, cattle 11.'22.

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea
247 ♀ ♀ from Pasar Goenoeng Toea, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922				33							1	2	36
	"	1923			3		7	5	9	9			5	8	46
	"	1924	4	2	6	2	3	8	1				1		27
	buffalo	1922												3	3
	"	1923			9		6	3	7	5	2		2	6	40
	"	1924	7	5	3	3	3	8							29
	cattle	1922												2	2
	"	1923			1		5	4	8	12			3	1	34
	"	1924	2	10	1	4	5	7				1			30
Total			13	17	23	42	29	35	25	26	2	1	12	22	247

62 ♀ ♀ from Si Paho, Oedjoeng Padang, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923	•		2			10		2				5	19
	„	1924	4		7	3	3	7							24
	buffalo	1923			1			1							2
	„	1924		8	1	1	1	6							17
Total			4	8	11	4	4	24		2				5	62

97 ♀ ♀ from Sawah Bangoenan, Portibi, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922											1		1
	„	1923			10		4		6	8			2	7	37
	„	1924	5	7	9		2	4							27
	buffalo	1923			5		3	2	3	11			4	2	30
	„	1924	2												2
Total			7	7	24		9	6	9	19			7	9	97

3 ♀ ♀ from Poerba Sinomba, LOBEL

Coll. V.S.L.

respectively 1 ♀ on horse 10.'22

1 ♀ „ „ 24.12.'22

1 ♀ „ buffalo 1.'23

1 ♀ from Goenoeng Toea Tongga, on buffalo on 20.11.'22, LOBEL Voll. C.S.L.

1 ♀ from Goenoeng Manaon, Portibi, on buffalo 1.'23, LOBEL Coll. V.S.L.

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922				33						1	2	3	39
	„	1923			15		11	15	15	19	1	1	7	20	104
	„	1924	13	9	23	9	12	15	2	5			7		98
	buffalo	1922			3							2	1	3	9
	„	1923	2		15			9	7	11	16	4	2	6	80
	„	1924	9	13	4	4	4	16		3			6		59
	„	1922											1	2	3
	cattle	1923			1		6	4	9	13		2	3	1	38
	„	1924	2	10	3	4	7	8	3			1	4		42
Total			26	32	64	50	49	65	40	56	5	9	37	39	472

Ressort Padang Sidempoean, Mantrie Ressort Binanga
237 ♀ ♀ from Pasar Siboehoean, Djandi Lobi, LOBEL, BAKKER, TARIP.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922	20												20
		1922										3			3
		1923						4	8	8	1			7	28
	buffalo	1924	6	8	8	9	8	11	2			8	9		69
		1922										6		3	9
		1923						4	9	9			4	8	34
	cattle	1924	8	4	8	10	9	13	2			8	7		69
		1922												1	1
		1923		4											4
Total			34	16	16	19	17	32	21	17	1	25	20	19	237

196 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, LOBEL, BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922										1			1
		1923						7	5	9	2			5	28
	buffalo	1924	9	10	8				7			2	1		37
		1923						5	8	6			1	5	25
		1924	10	7	6	20	17	31	3			6	5		105
Total			19	17	14	20	17	43	23	15	2	9	7	10	196

174 ♀ ♀ from Si Oendol, Paringgonan, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923						10	4	9	2		1	10	36
		1924	7	9	2	10	4	13	3			8	5		61
	buffalo	1923						3	1	10			1	5	20
		1924	9	9	5	9	5	11	2			5	2		57
Total			16	18	7	19	9	37	10	19	2	13	9	15	174

14 ♀ ♀ from Pangkal Dolok, Pangkal Dolok Lama, TARIP and LOBEL

Coll. V.S.L.

respectively 1 ♀ on buffalo 10.'22

2 ♀ ♀ „ „ 23.2.'23

8 ♀ ♀ „ „ 1.'23

3 ♀ ♀ „ horse 23.2.'23

1 ♀ from Binanga without further locality, on horse 10.'22, LOBEL Coll. V.S.L.

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922										5			5
	„	1923		3				21	17	26	5		1	22	95
	„	1924	22	27	18	19	12	31	5			10	15		159
	buffalo	1922										6		3	9
	„	1923	8	2				12	18	25			6	18	89
	„	1924	27	20	19	39	31	55	7			19	14		231
	cattle	1922												1	1
	„	1923		4											4
Total			57	56	37	58	43	119	47	51	5	40	36	44	593

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan

141 ♀ ♀ from Kota Nopan, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922											12		12
	„	1923		9	5	1								2	17
	„	1924	3		8		2								13
	buffalo	1922											1		1
	„	1923	57	7	5	1								7	77
	„	1924	7		2		2								11
	cattle	1923		10											10
Total			67	26	20	2	4						13	9	141

84 ♀ ♀ from Moeara Tagor, Tamiang, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923		6		1			9					9	25
	„	1924	5	2											7
	buffalo	1923		3	6				7		5			10	31
	„	1924	4	2			4								10
	cattle	1923		4	4	1					2				11
Total			9	17	10	2	4		16		7			19	84

5 ♀ ♀ from Moeara Poengkoet, Tamiang, BAKKER

Coll. V.S.L.

respectively 2 ♀ ♀ on horse 28.5.'24

3 ♀ ♀ „ buffalo 28.5.'24

103 ♀ ♀ from Kota Siantar, LOBEL and BAKKER

Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1922										5			5
	„	1923		3	8	6		7				4	2		30
	„	1924	11	7				3							21
	horse	1923				6		7					2		15
	Horse/Buf. Moeara Tagor and K. Siantar	1924		32											32
Total			11	42	8	12		17				9	4		103

10 ♀ ♀ from Salamboe, Pidoli Boekit, on horse 13.3.'24, BAKKER Coll. V.S.L.

5 ♀ ♀ from Kajoe Djati, Kota Siantar, BAKKER

Coll. V.S.L.

respectively 4 ♀ ♀ on buffalo 4.6.'24

1 ♀ „ „ 16.5.'24

3 ♀ ♀ from Manjabar, Panjaboengan Tongga, 15.5.'24 on buffalo, BAKKER

Coll. V.S.L.

19 ♀ ♀ from Kota Nopan, without further locality

respectively 8 ♀ ♀ on 6.'24

11 ♀ ♀ „ 5.'24

23 ♀ ♀ from Panjaboengan, on buffalo 20.1.'22, TARIP Coll. V.S.L.

3 ♀ ♀ „ Pidjangbolang, on buffalo 13.2.'22, LOBEL

„

4 ♀ ♀ „ Tombang Boestak, Manambin, on horse 24.12.'22, LOBEL

Coll. V.S.L.

53 ♀ ♀ ,, Hoeta Nagodang, Manambin, on buffalo 24.12.'22, LOBEL
Coll. V.S.L.

18 ♀ ♀ ,, Si Gengoe, Kota Nopan, BAKKER

respectively 3 ♀ ♀ on horse 11.7.'23

2 ♀ ♀ ,, buffalo 1.10.'23

8 ♀ ♀ ,, ,, 11.7.'23

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922											12	4	16
	,,	1923		15	5	8		7	17				2	11	65
	,,	1924	8	2	18		4								32
	buffalo	1922	23	3								5	1	53	85
	,,	1923	57	13	19	7		7	15		5	6	2	17	148
	,,	1924	11	2	2		13	4							32
	cattle	1923		14	4	1					2				21
Total			99	49	48	16	17	18	32		7	11	17	85	399

84 ♀ ♀ from Porsea, Balige, Distr. Toba, Tapanoeli, VAN DER REEST, 6.2.'22
on buffalo Coll. V.S.L.

5 ♀ ♀ from Hoendoelan Parmaksian, Balige, Tapanoeli, VAN DER REEST,
on buffalo 21.12.'12 Coll. V.S.L.

4 ♀ ♀ from Balige, Tapanoeli, VAN DER REEST, 22 on buffalo
Col. V.S.L.

2 ♀ ♀ from Djambi, MARSIDI
respectively 1 ♀ on buffalo 22.1.'23
1 ♀ ,, horse 25.9.'22
Coll. V.S.L.

Gouvernement Atjeh

6 ♀ ♀ from Langsar, 2.'23, C. DIEBEN Coll. V.S.L.

1 ♀ ,, Meurendoë, 8.2.'23, C. DIEBEN

1 ♀ ,, Atjeh, without further locality, VAN LANGEN Coll. L.M.N.H.

5 ♀ ♀ ,, Lho Nga, Groot Atjeh, 3.'23, DIEBEN Coll. V.S.L.

Residency West Coast of Sumatra

Fort de Kock, JACOBSON

Coll. N.A.M.

respectively 1 ♀ on 11.'13

1 ♀ ,, 6.'14

5 ♀ ♀ ,, 11'2.2 MEERENS

Coll. V.S.L.

1 ♂ ,, 4.'14 JACOBSON

Coll. N.A.M.

1 ♂ ,, 11.'13, JACOBSON.

- 3 ♀ ♀ resp. on 1.'22; 2.'22; 4.'22, JACOBSON 920 M. Coll. N.A.M.
Gouvernement East Coast of Sumatra
- 4 ♀ ♀ from Medan 20 M., DE BUSSY, CORPORAAL Coll. N.A.M.
respectively 1 ♀ on 13.2.'05
1 ♀ „ 22.5.'05
1 ♀ „ 5.'21
1 ♀ „ 4.2.'21
- 1 ♀ from Serdang, VAN DEDEM, 22.9.'09
- 1 ♀ „ Simpang Radjah, Siantar, CORPORAAL 16.8.'21 Coll. N.A.M.
Residency Palembang
- 1 ♀ from Moeara Enim Coll. V.S.L.
- 5 ♀ ♀ Sumatra, without further locality Coll. L.M.N.H.
- 6 ♀ ♀ „ Kajoe Tanan, 6.'07, Dr HAGEN (Textfig. 71 d.e,h) Coll. BR.M.
Isle Nias
- 14 ♀ ♀ from Goenoeng Sitoli, on cattle 4.'22, TARIP Coll. V.S.L.
Isle Java
Residency Batavia
- 9 specimens from Batavia, JACOBSON, SCHUURMANS STEKHOVEN.
respectively 1 ♀ on Batavia on 11.'07, JACOBSON Coll. BR.M.
1 ♂ „ 11.'07, JACOBSON Coll. N.A.M.
1 ♂ „ 9.'07 Coll. N.A.M.
2 ♂♂ „ 12.'07, JACOBSON Coll. L.M.N.H.
1 ♂ and 1 ♀ on 10.'21, SCHUURMANS STEKHOVEN
Coll. V.S.L.
2 ♂♂ on 5.'08, JACOBSON Coll. N.A.M.
- 11 ♀ ♀ from Tjililitan, Horse depot near Batavia, SCHUURMANS STEKHOVEN
Coll. V.S.L.
respectively 2 ♀ ♀ on horse
9 ♀ ♀ „ buffalo
- 1232 ♀ ♀ from Buitenzorg, CORPORAAL, SCHUURMANS STEKHOVEN Coll. V.S.L.
respectively 385 ♀ ♀ on 1.'22 on buffalo Coll. N.A.M.
449 ♀ ♀ „ 4.'34 „ „ Coll. BR.M.
14 ♀ ♀ „ 6.'23 the first 10 days
2 ♂♂ „ 4.'23 on trees
6 ♂♂ „ 5.'23 „ „
5 ♂♂ „ 7.'20 CORPORAAL Coll. N.A.M.
- In June the females became almost suddenly much less numerous and specimens could be found with some difficulty only. Thus June appeared to be the end of the flying season at Buitenzorg.
- 4 ♀ ♀ from Krawang Kota Coll. N.A.M.
respectively 3 ♀ ♀ on 11.'21
1 ♀ „ 5.11.'22
- 1 ♀ from Gempol O. D. Krawang 11.'21 Coll. N.A.M.

- 1 ♀ ,, Tjikampek 11.'21
 10 ♀ ♀ ,, Lamapan, Krawang 11.'21
 1 ♀ ,, Rangkas Dengklok, on buffalo 20.11.'21
 1 ♀ ,, Teloejdjambe, Krawang 11.'21
 4 ♀ ♀ ,, Madja, Tjinangsi, Soebang, Krawang
 respectively 3 ♀ ♀ on 11.'21
 1 ♀ ,, 4.'22 on buffalo
- 1 ♀ from Krawang '19/'20, DU PUY Coll. N.A.M.
 Residency Banjoemas
 3 ♀ ♀ from Karanggobar, Poerwokerto, SCHUURMANS STEKHOVEN Coll. N.A.M.
 Residency Preanger Regencies
 1 ♀ from Sindanglaja, Dr. BOLSIUS Coll. L.M.N.H.
 2 ♀ ♀ ,, Tasikmalaja, LE COULTRE, 24.10.'22 Coll. V.S.L.
 2 ♀ ♀ ,, Tasikmalaja, LE COULTRE, 12.'22
- Residency Cheribon
 1 ♀ from Mandapa, Cheribon, 30.10.'22
- Residency Pekalongan
 2 ♀ ♀ from Pagilaran Tjomal Pekalongan on buffalo
 1 ♀ ,, Gembjang Pekalongan, on cattle 28.9.'22
 1 ♀ ,, Soerodadi Pekalongan, on cattle 10.'22
 1 ♀ ,, Pengarasem Pekalongan, on horse 12.'22
 3 ♀ ♀ ,, Langkap Tegal, LAGAS, on 3.'22 Coll. V.S.L.
 respectively 1 ♀ on horse
 2 ♀ ♀ ,, cattle
- 2 ♀ ♀ from Soemoerpangoeng Tegal, LAGAS
 respectively 1 ♀ on buffalo 3.'22
 1 ♀ ,, horse 3.'22
- 1 ♀ from Laren, Tegal, LAGAS, on horse 3.'22
 2 ♀ ♀ ,, Kaligasan, Kaleda Talang, Tegal '22, LAGAS
 2 ♀ ♀ ,, Pagodjenangan, Tegal 3.'22, LAGAS
 respectively 1 ♀ on horse
 1 ♀ ,, buffalo
- 1 ♀ from Kademangan, Tegal 2.'22, LAGAS
- Residency Semarang
 2 ♀ ♀ from Semarang, Kok, JACOBSON, DRESCHER
 3 ♀ ♀ ,, Karang Soko Semarang '22, Kok Coll. V.S.L.
 1 ♀ ,, Plewan, Semarang on buffalo, Kok '22
 1 ♀ ♀ ,, Bandjir Kanaal, Semarang, Kok '22 on horse
 3 ♀ ♀ ,, Pringgading, Semarang, on Madoerese cattle '22
 21 specimens from Semarang Coll. V.S.L.

- respectively 3 ♀ ♀ on horse '22
 1 ♀ „ Australian cattle 7.6.'22 Coll. V.S.L.
 4 ♀ ♀ from JACOBSON Coll. L.M.N.H.
 2 ♂ ♂ „ JACOBSON „
 1 ♂ „ JACOBSON '08 Coll. N.A.M.
 1 ♀ „ JACOBSON '08 „
 2 ♀ ♀ „ JACOBSON „
 2 ♂ ♂ „ JACOBSON 8.'05 „
 3 ♀ ♀ „ JACOBSON 8.'05 on horse „
 1 ♀ „ DRESCHER 7.'05 „
 1 ♀ „ DRESCHER 5.'05 Coll. L.M.N.H.
- 1 ♂ from Semarang, JACOBSON BR.M. placed under *T. tenens*
 Coll. BR.M.
 1 ♀ „ Salatiga 5.'05, DOCTERS VAN LEEUWEN Coll. L.M.N.H.
- Residency Rembang
 1 ♀ from Bodjonegoro, DE WILDE on cattle 11.6.'22 Coll. V.S.L.
 1 ♀ „ Kalimati, Papringan, Soeghiwaras, Bodjonegoro, on buffalo DE WILDE, 15.11.'12
 1 ♀ from Kedoengbondo, Balen, Bodjonegoro, on cattle 10.2.'23 V.S.L., DE WILDE
 1 ♀ from Soeghiwaras, Bodjonegoro, on buffalo 12.2.'23, DE WILDE
 3 ♀ ♀ „ Bolo, Demak on buffalo '23, DE WILDE V.S.L.
 3 ♀ ♀ „ Boetoel, Widang, Toeban 11.12.'22, DE WILDE
- respectively 1 ♀ on buffalo
 2 ♀ ♀ „ cattle
 2 ♀ ♀ from Koedjoeng, Widang, Toeban 11.12.'22 on cattle, DE WILDE
- Residency Djoejacarta
 10 ♀ ♀ from Berbak, Djoeja '22, LUITJENS Coll. V.S.L.
 4 ♀ ♀ „ Modjosari, Berbak '22, LUITJENS
 3 ♀ ♀ „ Tjandiredjo, Berbak '22, LUITJENS
 2 ♀ ♀ „ Ngemplak, Gandjoeran, Djoeja '22, LUITJENS
- Residency Madioen
 2 ♀ ♀ from '19, SOHNS' coll. Coll. N.A.M.
 1 ♂ „ '19, SOHNS' coll. „
 2 ♂ ♂ „ SOHNS' coll. „
 5 ♀ ♀ „ SOHNS' coll. Coll. V.S.L.
 7 ♂ ♂ „ 4.'23, VAN BERGEN from Madioen Coll. V.S.L.
 1 ♀ „ 4.'33, VAN BERGEN from Madioen „
- Residency Kediri
 2 ♀ ♀ from Blitar 4.3.'22 Coll. V.S.L.
 3 ♀ ♀ „ Blitar on bengalese cattle 4.5.'22
 1 ♀ „ Blitar on buffalo 4.5.'22

Residency Soerabaja

- 4 ♀ ♀ from Modjokerto on 10.2.'23
 2 ♀ ♀ „ Dodangan, Modjokerto on buffalo 28.3.'23
 1 ♀ „ Djetis, Modjokerto on horse 28.3.'23
 1 ♀ „ Sidohardjo, Modjokerto on horse 28.3.'23
 49 ♀ ♀ „ Modjokerto on horse, cattle and buffalo 31.3.'23
 6 ♀ ♀ „ Toenggorono, Modjokerto on buffalo 21.4.'23 Coll. V.S.L.
 18 ♀ ♀ „ Modjokerto „

respectively 8 ♀ ♀ on horse 16.4.'23

3 ♀ ♀ „ cow 16.4.'23

2 ♀ ♀ „ buffalo 16.4.'23

5 ♀ ♀ „ host unknown 4.'23

- 1 ♂ from Soerabaja '98 Coll. L.M.N.H.
 2 ♀ ♀ „ Road of Soerabaja, BUJTENDIJK „
 1 ♀ „ Goenoeng Ardjoeno, HECKMEIJER „

Residency Passeroean

- 1 ♀ from Djangdjangwoelang, Poespo, Tengger on cattle, DOEVE 12.'22
 Coll. V.S.L.
 1 ♀ „ Manggoewan, Pasrepan, Tengger on horse, DOEVE 12.'22
 1 ♀ „ Ampelsari, Pasrepan, Tengger on cattle, DOEVE
 1 ♀ „ Toetoer, Toetoer, Tengger on horse, DOEVE
 1 ♀ „ Poespo, Poespo, Tengger on horse, DOEVE
 2 ♂♂ from Java, without further locality K.Z.V.H. labelled *T. ophthalmicus* Coll. L.M.N.H.
 1 ♀ „ Java, without further locality *T. ruficallosus* BIGOT Coll. BR.M.
 1 ♀ „ Java, unknown locality, Java? Coll. N.A.M.
 1 ♂ „ Java, without further locality, labelled *T. megalops* WLK.
 Coll. BR.M.

Isle Madoera

- 1 ♀ from Proppo 5.2.'22 on cattle Coll. V.S.L.
 2 ♀ ♀ „ Sampang on cattle „
 respectively 1 ♀ on 8.4.'22
 1 ♀ „ 11.5.'22

- 1 ♀ from Pamakasan, house Veterinarian, 11.5.'22
 4 ♀ ♀ „ Pasar Galis on horse 22.7.'22, SCHUURMANS STEKHOVEN

Isle Soembawa

- 1 ♀ from Bima on buffalo 5.5.'22, SORIP TAGOR
 2 ♀ ♀ „ Kempo, SORIP TAGOR
 respectively 1 ♀ on 30.4.'22 on horse
 1 ♀ „ 7.5.'22 „ buffalo
 2 ♀ ♀ from Bango, Kempo on horse 6.5.'22
 3 ♀ ♀ „ Pena Djoengga, Raba on buffalo 13.5.'22

Isle Soemba

- 9 ♀ ♀ from Lewapakoe on horse 13.6.'22, SCHUURMANS STEKHOVEN

Isle Timor

- 1 ♀ from Babaoe on horse 2.7.'22, SCHUURMANS STEKHOVEN

Federated Malay States

- 1 ♀ from Kuala Lumpur, PRATT Coll. BR.M.
 1 ♀ „ Singapore, labelled *T. partitus* WLK. WALLACE coll. (Textfig 71 g)
 1 ♀ „ Selangor, Lara Head, DURHAM „
 3 ♀ ♀ „ Poeloe Bantar F.M.S. labelled *T. ruficallosus* BIGOT (Textfig. 71 b)
 respectively 1 ♀ on 4.2.'10
 1 ♀ „ 6.2.'10
 1 ♀ „ 6.3.'10

Philipine Isles

- 8 spec. (4 ♀ ♀ and 4 ♂♂) from Isle Alabang, MITZMAIN 11.'12 Coll. BR.M.
 4 „ (2 ♀ ♀ and 2 ♂♂) „ Manilla, MITZMAIN 1923 „

China

- 5 spec. (3 ♀ ♀ and 2 ♂♂) from Hengkong, MACFARLANE '12/'13

British India

The Pundjab

- 4 ♀ ♀ on buffalo 26.3.'21, CAPT. CROSS Coll. BR.M.
 1 ♂ from Rawah Pendi on tree CROSS, 26.3.'21 (Textfig. 71 k)
 1 ♀ „ Kohat MONTGOMERY 24.7.'06 (Textfig. 71 c, i, j)
 1 ♀ „ Wuzerabad, HESSING
 1 ♂ „ Pundjab, CROSS on tree 29.8.'21
 2 ♀ ♀ „ Pundjab, CROSS
 1 ♀ „ Ludhiana, CROSS on ox 27.8.'21

British India

- 1 ♂ from N.W. Rooring, HORNE Coll. BR.M.
 1 ♀ „ Bombay, Dr. COOGILL 8.9.'06
 1 ♀ „ Bombay on horse 18.8.'04
 1 ♀ „ Burma, Upper Burma, Kalawa Chindurin 5.'93 (Textfig 71 a)
 1 ♂ „ Burma, Sunderbans, R. SENIOR WHITE 24.2.'15 „
 1 ♂? „ Burma, Dehra Dun, R. SENIOR WHITE 15.8.'15 „

Siam

- 1 ♂ from Bangkok 30.8.'21 BARNES, caught in donor's house at night, attracted by electric light
 1 ♀ from Chiangmai 7.5.'21 on donor's verandah at dusk
 2 ♀ ♀ „ Bangkok

respectively 1 ♀ from '07 WOOLLEY
 1 ♀ „ '11.'19 GODFREY

I agree wholly with Major AUSTEN, where he writes, „Miss RICARDO in her „Revision of the Species of *Tabanus* from the Oriental Region”, involves the identity and synonymy of *Tabanus striatus* in hopeless confusion”. A redescription of this species taking into account the different modifications, observed in the collections, is urgently wanted. Therefore I have redescribed the species after a specimen, present in the British Museum, collected in the Pundjab by Capt. Cross on buffalo on 26.3.'21, determined and compared with the type in Univ. Zool. Mus. Copenhagen by Dr. K. L. HENDRIKSEN on 13.2.'23.

A median-sized to small species of yellowbrown colour, with 3 distinct white haired longitudinal abdominal stripes, the middle one interrupted or less distinct on the second segment. Lateral stripes shorter and more irregular. Forehead redbrown, white haired, with median, winered callus, ending in a spindle-shaped linear extension. Subcallus snowwhite as are cheeks and face, snowwhite haired. Palpi short, yellowishwhite, white haired, broad at base. Antennae yellowishwhite on basal 2 joints, orangeousyellow on the basal annulation of the third joint, stylus black. Thorax grey on foreborder, with 3 greyish longitudinal stripes. Wings clear. Legs yellowishwhite, mainly white haired, tibiae more yellowbrown.

The Female.

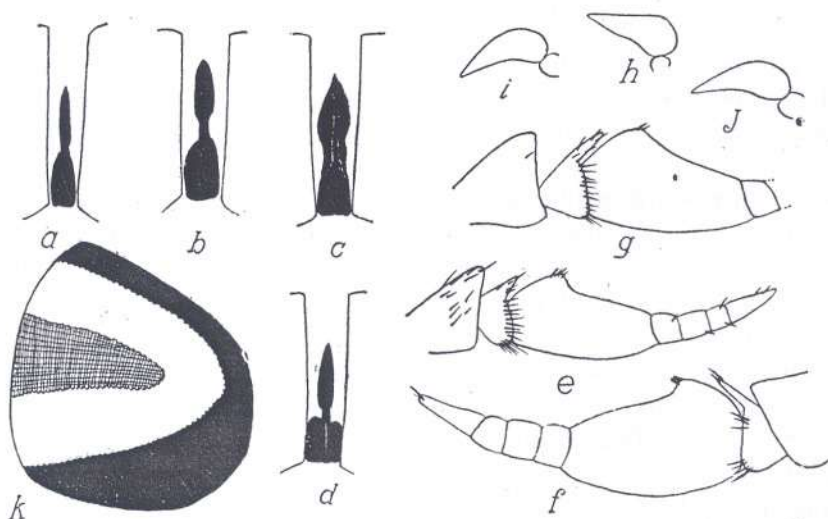
Table of dimensions.

Bodylength	varying from 10,5 m.M. — 15,5 m.M.			
Width of thorax	„	„	3	— 5,2 „
Width of abdomen	„	„	3,5	— 5,5 „
Wingexpanse	„	„	19,2	— 31,5 „
Length of head	„	„	1,6	— 3 „
Length of thorax	„	„	3,8	— 6,5 „
Length of abdomen	„	„	5	— 9,2 „
Length of wing	„	„	9	— 13 „
Breadth of wing	„	„	3	— 5 „
Foreheadindex	„	„	3,8	— 7

The Head. (Textfig. 71). Forehead 0,08—0,3 narrower anteriorly than it is at vertex; the shining, flat, winered callus covers a large part of the forehead, and reaches to the eyes. Subcallus, cheeks and face as mentioned above. Beard same colour. Palpi short yellowishwhite, with an acute point, white haired, with a single black hair on dorsum in the mentioned Pundjabfemale, black hairs in greater number on the palpi of several of the Dutch East Indian females. Antennae: first joint yellowishwhite, white tomentose, white haired, 2d joint similar, apical white hairfringe intermixed with some black hairs, dorsal spur long and narrow. Third joint orangeousyellow, with rather indistinct tooth, crowned with some black hairs, basal annulation 1,53 times as long as its widest part and 1,12 times as long as the darker stylus.

Thorax, foreborder grey tomentose, grey haired. Scutum with 3 longitudinal, broad,

grey, grey haired stripes, broadly grey, white haired lateral borders; elsewhere dull greybrown, black haired. Hairtufts at base of wings and behind white. Pteropleuron browngrey, black and grey haired. Wings clear, stigma yellow, veins reddish. Breast browngrey, white haired.



Textfig. 71.

T. striatus F, ♀, ♂. a—d. forehead, e—g. antennae, i—j. palpi, k. ♂ eye.

Legs. First leg. Coxa grey, white haired. Trochanter brownblack. Femur brownblack on the ventral surface, dorsum black haired, distal lateral border grey tomentose, grey haired, knee yellowbrown. Tibia yellowbrown, white haired on the basal half, black on the extreme base, apex blackbrown, black haired. Tarsalia black. Second leg. Coxa grey, trochanter redbrown, femur grey, knee yellowbrown, white haired. Tibia yellowbrown, pale white haired, with some black hairs at apex and on dorsum in the middle. Tarsalia blackbrown, black haired. Third leg similar, tibia with a few black hairs on the dorsum only and intermixed between the white ones on the distal lateral border, forming a fringe.

A b d o m e n with 3 longitudinal, white, white haired stripes, the middle one composed of a number of spots, beginning with a white haired spot on the first segment; it is interrupted on the second segment and reappears rather broad on the following segments, ending on the 6th segment. Lateral stripes beginning on the first segment and ending on the 4th segment with an acute point, composed of separate white, white haired spots; lateral borders of tergites broadly white, white haired, except on 7th segment, where black hairs prevail. Dorsum elsewhere blackbrown, black haired. Ventral surface pale yellowbrown, white haired on the first 4 segments, 5th—7th segment with median blackbrown, black haired patches, segmentations paler.

Several variations occur. The typical form described above, seems to be restricted to the Northern areas of the Oriental Region, i.e. The Punjab, British India, China. Females caught in the Southern areas show deviations from the type. So I will commence to complete the foregoing description with some particulars, observed in the specimens from Java and the other Soenda-Isles. Eyes in fresh specimens dark violet, covered with a sapphire green glance. Forehead greywhite tomentose, black haired, intermixed with some white hairs, with an oval winered vertexspot. In dried specimens the frons appears to be redbrown, when it was wetted during preparation. Callus liable to much variation, as well in shape as in colour,

the last ranging from winered to black. The callus reaches the eyes in most specimens, is separated from them in others. Linear extension usually spindle-shaped, varying in width, connected with the callus by means of a broad or narrow junction, or — in rare instances only — separated from it. In a peculiar case the linear extension had the shape of a lance, fixed in a lanceshaft by means of an iron ring. The lancehead was olivebrown. Subcallus yellowwhite or brownish, instead of snowwhite in several specimens. Postocular rim white haired. Palpi with a greater number of black hairs on the second joint. Antennae slightly narrower, first joint wholly white haired or with some black hairs at apex, thick black haired on dorsum in a single case. Wings with yellowbrown foreborder and dark yellowbrown stigma. Abdomen dark oakleafbrown on first 2 segments, blackbrown elsewhere, segmentations distinctly yellowbrown. Median stripe paler, but not abruptly interrupted on the 2d segment. Besides one of the specimens showed a reduction of the white stripes on the lateral borders of tergites to the first 4 segments only. Ventral surface with redbrown, longitudinal stripe on the 2d—4th segments, becoming darker on the following 2 segments, first 5 segments wholly yellowwhite haired, 6th segment intermixed with some black hairs, 7th segment wholly black haired.

T. partitus Wlk. from Singapore has a median greywhite stripe on the second segment. Lateral stripes fine, running to the end of the sixth segment. Fore femora dark redbrown. Antennae with a long spur to the second joint, first joint mainly white haired, first 2 joints darker than in the type, third joint reddishyellow, stylus brownred. The given differences do not suffice to separate the described specimens from *T. striatus* F. Other specimens from Malacca have nearly no black hairs on the palpi. Lateral stripes ending on the 5th abdominal segment. In some Javanese specimens the lateral stripes end on the 6th segment. Below I will discuss the differences between *T. striatus* F. and *T. tenens* Wlk.

The Male.

Table of dimensions.

Bodylength	12,8 m.M.
Width of thorax	4,5 „
Width of abdomen	5 „
Wingexpanse	
Length of head	4 „
Length of thorax	5,5 „
Length of abdomen	6,2 „

The Head. (Textfig. 71) Eyes with a brownviolet median part, surrounded by a curved white-yellow band, both areas big-faceted, lower eyepart small-faceted, black, the limits between both parts being covered by green and reddish shades. Subcallus cream — yellowwhite, brown on upper part. Palpi pale, white haired, with some black hairs at apex of the first joint and more on the second joint. Antennae, first joint yellowbrown, yellowwhite haired with some black hairs at apex on dorsum; second joint redbrown, black haired at border; third joint redrustybrown on basal annulation, elsewhere black, tooth distinct. Proboscis, stalk white haired, sugarflaps blackbrown.

Thorax, pale olivebrown, with 3 longitudinal yellowbrown stripes, mainly black haired. Hindborder of scutum yellowishbrown; lateral borders whitish. Scutellum bordered pale yellowbrown. Elsewhere scutum and scutellum are dark olivebrown till dark coffeebrown. Pteropleuron nutbrown, black haired. Breast violetgrey, greywhite haired, mesoster-

numlobus brownishyellow, pubescence black and yellowbrown. Wings clear, with yellow-brown foreborder and darkredbrown stigma. Halteres, club dark caramelbrown, stalk more redbrown. Legs. First leg, Coxa brownishgreywhite, violetbrown on apical border, white haired. Trochanter brownred. Femur as in ♀, with yellowish tomentose, pale yellowbrown haired distal lateral border. Elsewhere similar to the female. Second leg, femur yellowbrown at base, further darker, sooty grey, pubescence yellowbrown, intermixed with some black hairs, knee yellowwhite; ventral surface sootygrey at base, pubescence yellowish. Tibia deep yellowbrown, dorsum black haired, ventral surface yellowbrown haired, 2 spurs at apex. Tarsalia deep brownred, black haired. Third leg, coxa and trochanter nearly similar, femur sootygrey at base, yellowbrown at apex, yellowbrownwhite haired, intermixed with some black hairs at apex. Tibia pale brownyellow, black haired on dorsum, brownyellow haired on ventral surface, intermixed with some black hairs. Tarsalia brownred, black haired.

A b d o m e n conical, more pointed than in the ♀, with a continuous median longitudinal paler stripe, indistinct on the 2d segment, distinct yellowbrown haired on the following 3 segments, the 6th segment showing only a trace of it; dorsum elsewhere black haired. Lateral longitudinal stripes indistinct, reaching the 4th segment. First 2 segments coffeeyellow-brown, paler than the following ones, which are brownblack. The male abdomen is darker than the female abdomen. Ventral surface with blackishbrown tawny longitudinal median, black haired stripe; sides and segmentations yellowbrown, yellowbrown haired.

Discussion.

Major AUSTEN placed a male from Java, Semarang, collected by JACOBSON under the heading *T. tenens* WLK. Another ♂ from Java, labelled *T. megalops* WLK. was placed under the same heading. After a thorough comparison of the males of both species I came to the conclusion that both males belong to *T. striatus* F. and that *T. tenens* WLK. does not occur in Java. The main difference between the males of *T. tenens* WLK. and *T. striatus* F. lies in the abdominal median stripe, which is much narrower in the last species than in *T. tenens* WLK.

The females of both species may be distinguished by the following characters. In *T. tenens* the linear extension is more elongate, not spindle-shaped and longer than in *striatus* F. The antennal stylus shows the same colour as the basal annulation whereas it is always darker in *T. striatus* F. Legs of *T. striatus* darker than in *T. tenens* WLK. The distinct median longitudinal brownish stripe present on the ventral surface of the abdomen of *T. striatus* is not found in *T. tenens*. Major AUSTEN divides both species as follows: „It is distinguishable from *T. tenens* WLK. by the distal margin of the penultimate segment of front tarsi being more deeply notched. In its typical form as represented by specimens from Hongkong, the ♀ of *T. striatus* may be distinguished from that of *tenens*, inter alia, by the shape of the lower callus, which is less elongate, i.e., broader in proportion to its length; by the shape of the 4th and 3d segments of the front tarsi, the sides of these segments, when the front legs are viewed from above, appearing straighter; and by the legs in general being darker, the femora infuscated, and the front tarsi deep black instead of ferrugineous or brownish.”

Bionomics.

Female *T. striatus* are very common and could be caught easily, when feeding on buffalo, horse and cow. It belongs to the species which appear in big numbers and causes much nuisance to their hosts. They generally feed in the morning hours between 8—11 o'clock, and rest on tree trunks during the rest of the day. Here the males sit in the same manner with their head directed downwards. I found them on kapok trees, teak trees and elsewhere. The eggs were laid during experiments in my artificial breeding marsh on the leaf of different grasses, i.e. on rice and on other waterplants. They are deposited in masses, counting from 100—500, generally 2 days after the females have fed. The larvae emerge after 8 days, immediately cast their skin and become larvae of the 2d stage. Now they prey upon all sorts of living beings, present in their neighbourhood and even eat their own brothers and sisters, when no

other animals are at hand. Therefore the number of larvae which reaches maturity after several moults is very small and never a great number of larvae is found together on the same place. In an experiment the whole lifecycle was accomplished in 3 month 3 weeks; the pupal stage was reached after about 3 months 2 weeks.

Therefore I suppose that generally only 2 or 3 generations will be raised during a years time. I regret not to have succeeded in finding larvae in their natural habitats. FLETCHER found eggmasses on any aquatic plants, grown in deep or shallow water or in mud, or on leaves of large trees overhanging water. According to him *T. striatus* has 3 broods per year.

Pathogenicity.

MITZMAIN demonstrated in his experiments, that *T. striatus* F. acts as a mechanical transmitter of surra in the Phillipine Archipelago. His experiments are supported by observations in nature. In the Dutch East Indies up to the present no experiments were accomplished for this purpose, but there is a rather good evidence that the same thing occurs here, since *T. striatus* F. is found in all countries where horse, buffalo or cattle suffer from this disease.

FLETCHER found *T. striatus* capable of transmitting the surra organism, not only by an interrupted feeding, but also by complete feeding. In one experiment with 2 flies it was found capable of transmitting surra as long as 72 hours after feeding on an infected host. Surra is not transmitted hereditarily to the progeny of infected females of *T. striatus* F. *)

70. *Tabanus tenens* WALKER. (♀ ♂) Textfig. 72, 73.

Syn. *T. hilaris* WLK.

References:

- WALKER, Ins. Saunders Dipt., p. 49 (1850).
 „ Ins. Saunders Dipt., p. 49 (1850).
 RICARDO, Rec. Ind. Mus. IV, p. 152 (1911).
 „ Rec. Ind. Mus. IV, p. 153 (1911).
 AUSTEN, Bull. of Ent. Res. XII, p. 445 (1922).
 CROSS and PATEL, Dept. Agr. Pundjab Vet. Bull. 8 (1922).
 FLETCHER, Sci. Repts. Agric. Research Inst. Pusa, p. 95 (1920).
 „ Sci. Repts. Agric. Research Inst. Pusa, p. 91 (1917).
 „ Sci. Repts. Agric. Research Inst. Pusa, p. 78 (1916)

Habitat:

- Type ♀ from East India without further indications
 1 ♀ from N. India, WALKER Coll. BR.M.
 4 ♀ „ India, WROUGHTON
 1 ♀ „ India, coll. SAUNDERS
 11 ♀ ♀ „ Madras, Guinday, 7/8.'13, PATTON (Textfig. 72 a, b and d, e, f)
 1 ♀ „ Madras, Saidapet, Guinday '13, PATTON
 1 ♀ „ Madras, India 1908, PATTON
 1 ♀ „ N. Bengal, India, CAMPBELL 1842

*) Recently NIESCHULZ succeeded in transmitting surra from horse to horse by means of a single specimen of *T. striatus* F.

- 1 ♀ ,, Bengal, Pusa, MAXWELL LE FROY
 1 ♀ ,, Bhogaon, Purnea District N. Bengal, 16.11.'07 resting on tree-trunks during the day, common in the evenings on the stomachs of cows
 Coll. N.A.M.
 1 ♀ from Bandra, India, Dr. JAYAKER 1905 Coll. BR.M.
 2 ♀ ♀ ,, Bassein, near Bombay, H. M. LEFROY
 1 ♀ ,, Bombay, S. India 8.9.'06, COGILL
 1 ♀ ,, Bombay, Poona, S. India 9.9.'06, COGILL
 1 ♀ ,, Calcutta 2.6.'09 Coll. N.A.M.
 1 ♀ ,, Balighai near Puri, Orissa 24.10.'08 ex coll. Ind. Mus.
 Coll. N.A.M.

Isle Ceylon

- 1 ♀ from Zamblegam, 28.9.'90 Coll. BR.M.
 1 ♀ ,, Ceylon, March, GREEN
 1 ♀ ,, Harawesotane 27.12.'01, uncommon, YERBURY
 1 ♀ ,, Colombo 2.'04, GREEN
 2 ♀ ♀ ,, Peryakulam 27.3.'92, YERBURY
 1 ♀ ,, Yalgannuowa 8.'02, GREEN
 1 ♀ ,, Trincomalee 10.'01, Miss BOWDLER SHARP
 1 ♀ ,, Jaffna 1892, YERBURY

Males

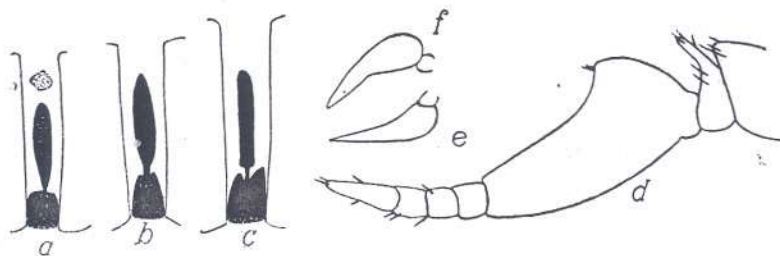
- 1 ♂ *T. tenens* N. W. Province '84, HORNE (Textfig. 73)
 1 ♂ *T. hilaris* India ex coll. SAUNDERS Coll. BR.M.
 2 ♂♂ Madras, Saidapet, Guinday '13, PATTON
 1 ♂ Madras '08
 1 ♂ Bangalore 3000 feet 28.4.'15

As a redescription of this species was urgently wanted, I have redescribed it after one of the females from Madras Guinday 7/8.'13 PATTON. The differences between *T. striatus* F. and *T. tenens* WLK. I have mentioned already under the first species. There I pointed also to the fact, that 2 males *T. megalops* WLK. ♂ and another ♂ from Semarang Java, dont belong to *T. tenens* WLK. to which species AUSTEN had brought them, but really are specimens of *T. striatus* F.

The Female.

The Head. (Textfig. 72). Forehead greywhite, 0.25 narrower than it is at vertex, index 5.1. Callus wineredbrown, reaching to the eyes at base, attenuated to the apex, prolonged into an elongate spindle-shaped linear extension, which is much longer than in *T. striatus* F. Subcallus brownish white. Cheeks and face white, white haired as is the beard. Palpi more slender than in *T. striatus* F., pale yellowbrown, white haired, with a narrow, irregular row of black hairs on the outer rim. Antennae, first joint reddishbrownwhite, white haired, with some black hairs on dorsum at apex. Second joint reddishyellow, with dorsal spur, apical hair-

fringe partly yellow, partly black. Third joint same colour, tooth blunt, more indistinct than in *T. striatus* F., basal annulation 2 times as long as its widest part, 1,4 times as long as the stylus, which is black at extreme apex only.

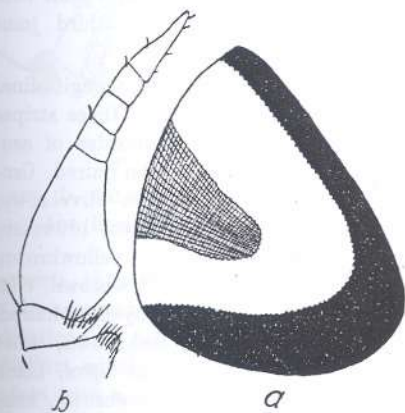


Textfig. 72.

T. tenens WLK. ♀ a-c. forehead, d. antenna, e, f. palpi.

Thorax, brownishgrey on foreborder, with a median fine, grey, white haired longitudinal stripe, not reaching the scutellum, 2 much broader lateral longitudinal, white haired stripes, which reach the scutellum, and grey, white haired lateral borders. Tufts at base of wings and behind white, pubescence elsewhere black. Pteropleuron olivebrown, black haired. Breast and sides whitishbrown, white haired. Wings clear, stigma olivebrown. Halteres yellowbrown. Legs pale. First leg. Coxa white haired. Trochanter reddbrown. Femur olivebrown, white haired. Tibia same colour, white haired, apical band reddbrown, black haired. Tarsalia reddbrown, black haired. Second leg similar, tibia black haired on dorsum. Third leg identical.

Abdomen blackbrown on dorsum, black haired except on the markings, consisting in a median, straight-sided longitudinal stripe, which is very distinct on the second segment and terminates on the 6th segment, the sidestripes, visible till the 6th segment, and the lateral, white haired borders of scutum broadly white in this species. Ventral surface of abdomen yellowbrown, white haired, except on the black haired 7th segment.



Textfig. 73.

T. tenens WLK. ♂
a. eye, b. antenna.

The Male.

Type ♂ from unknown locality, it is more yellowbrown than the female. Eyes as in *T. striatus* F. (Textfig. 73). the shape of the cinnamonbrown-violet, big-faceted median stripe, has a sharp margin as also the curvature of the big-faceted area, where it meets the small facets. Palpi white haired, with a small number of black hairs near the apex. Antennae reddish-yellow, basal annulation of third joint 1,5 times as long as its widest part and 0,9 times as long as the stylus. Fore femora slightly darker than in the female. In other respects it is identical to the female.

T. hilaris WLK. wholly agrees with *T. tenens*, except in the median abdominal stripe, which is obsolete on the second segment and replaced by a number of black hairs.

Bionomics.

CROSS and PATEL proved experimentally that *T. hilaris* = *T. tenens* is capable of direct transmission of camel surra.

FLETCHER observed that *T. hilaris* was common during the rains at Pusa, Bengal. According to his observations the same species oviposited on any aquatic plant, grown in deep or shallow water or in mud, or on leaves of large trees, overhanging water. The larvae have been found to feed upon dead earthworms and are probably cannibals.

71. *Tabanus sinicus* WALKER. (♂) Textfig. 74.

References:

WALKER, List Dipt. Ins. in coll. BR. Mus. I, p. 163 (1848).

RICARDO, Rec. Ind. Mus. IV, p. 150, 152 (1911).

AUSTEN, Bull. of Ent. Res. XII, p. 446. (1922)

Habitat:

Type ♂ from Hongkong, China, J. C. BROWNING

Coll. BR.M.

AUSTEN annotated on a label in the collection: „Allied to *T. striatus* F. but distinguished inter alia by the greater extent of area of enlarged facets in eye of ♂ and absence of all trace of a dark band of this area E. E. AUSTEN 4.11.'21" and further he writes: „It may be added, that *T. sinicus* WLK., the type of which is in the National Collection, though included by Miss RICARDO among the synonyms of *T. striatus* is in reality perfectly distinct.



Textfig. 74.

T. sinicus Wlk. ♂ eye.

The Head. (Textfig. 74). Eyes see above. Subcallus brownish. Cheeks yellowwhite, yellowwhite haired. Beard same colour. Palpi yellowbrown, with numerous black hairs on second joint. Antennae olivebrown, first joint with a great number of black hairs on dorsum, third joint broken off.

Thorax greybrown, black haired, with 2 longitudinal whitish, yellowbrown haired stripes. Each of those stripes presents a median fine redbrown line. Hindborder of scutum and scutellum whitishgrey, reddishbrown haired. Centre of scutellum black haired. Pteropleuron olivebrown, black haired. Breast and sides greyishbrown, brownish-yellow haired. Wings rather clear, foreborder yellowbrown, stigma havannabrown. Halteres, stalk yellowbrown, club white. Legs. First leg. Coxa grey, brownishyellow haired, trochanter blackbrown, femur reddishblackbrown, knee yellowbrown, black haired. Tibia yellowbrown at base, chestnut-coloured at apex, black haired. Tarsalia black haired. Second leg, trochanter redbrown, femur olivebrown, knee yellowbrown, yellowwhite haired, tibia reddishyellowbrown, black haired on dorsum, yellow haired below. Tarsalia dark redbrown, black haired. Third leg identical.

Abdomen reddishbrown with paler yellowbrown segmentations, and longitudinal

stripes. Median stripe, narrow, straight-sided, yellow haired; the yellow haired spots, forming together the lateral stripes, do not connect. Distal lateral borders of tergites yellowbrown, yellowwhite haired. Pubescence elsewhere on dorsum black. Ventral surface yellowbrown, with median black haired rectangular patches on the third and following segments. Segmentations yellowwhite haired.

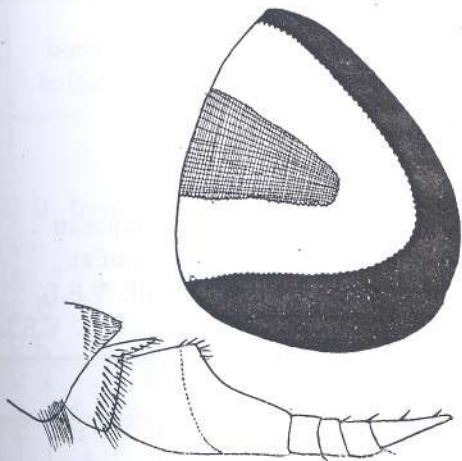
71 *Tabanus fenestratus* nov. spec. (♂) Textfig. 75. *)

Habitat:

Type ♂ from Hongkong, China

Coll. B.R.M.

A male, placed under the heading *T. rubidus* WIED, but apparently belonging to a distinct species. Eyes as in *T. rubidus*. Palpi yellowbrown, thick black haired. Antennae redbrown. Thorax with 3 distinct longitudinal stripes. Hair-tufts at base of wings and behind blackbrown. Wings with first posterior cell closed with a short petiole. Legs with darkbrown femora and darkbrown tibiae, fore tibiae slightly paler at base. Abdomen with very peculiar markings, the spots forming fenestrate figures.



Textfig. 75.

T. fenestratus s. s. ♂

a. eye, b. antenna, the dotted line indicates the limit of the redbrown area.

The Head. (Textfig. 75). Palpi yellowbrown, apex thick black haired. Antennae, first joint almost wholly black haired, third joint redbrown up to the level of the distinct and blunt tooth (dotted line) then black; basal annulation 1,55 times as long as its widest part and of the same size as the stylus.

Thorax with 3 equal broad, white tomentose longitudinal broad stripes, the middle one with a fine brown median stripe, lateral borders of scutum, hindborder of the same, hindborder of scutellum white tomentose also.

Abdomen blackbrown, black haired with yellowbrown segmentations to the first 6 segments. The median stripe is composed of the following spots: a rather narrow straight-sided spot on the second segment, broad triangles on the 3d and 4th segment, connected with the lateral stripes on all 3 segments, thus forming fenestrate figures. Lateral spots on third segment resting sideways on the segmentations, which are narrower than on the segment. On the fourth segment indications of lateral spots hardly visible. Fifth segment presenting a median, narrow, indistinct whitish spot only. Lateral borders of tergites yellowwhite, black haired. Ventral surface with a median longitudinal band, composed of broad black, black haired patches. Segmentations yellowbrown, white haired.

*) As the name *T. fenestratus* is preoccupied by a species, described by MACQUART this species must be named *T. brunnitibiatus*.

73. *Tabanus rubidus* WIEDEMANN. (♀, ♂) Pl. 5, Fig. 1, 2, 4; Textfig. 76, 77.Syn. *T. albimediis* WALKER.*T. vagus* WALKER.*T. umbrosus* WALKER.*Atylotus lacrymans* BIGOT.

References:

WIEDEMAN, Diptera Exot. 69. 14 (1821).

WALKER, Ins. Saundersiana Dipt I, p. 50 (1850).

,, Ins. Saundersiana Dipt. I, p. 48 (1850)

,, Ins. Saundersiana Dipt. I, p. 52 (1850).

,, List Dipt I, p. 176 (1848).

BIGOT, Mem. Soc. Zool. France V, p. 669 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 155—157 (1911).

AUSTEN, Bull. Ent. Res. XII, p. 448 (1922).

,, Trans. R. Soc. Trop. Med. and Hyg., p. 264 (1922).

FRASER, Jl. Trop. Vet. Sci. IV, p. 373 (1909).

PRATT, Jl. Trop. Vet. Sci. IV, p. 390 (1909).

FLETCHER, Rpt. Agric. Res. Inst. and Coll. Pusa, p. 78 (1915/'16).

,, Rpt. Agric. Res. Inst. Coll. Pusa, p. 91 (1916/'17).

,, Rpt. Agric. Res. Inst. Coll. Pusa, p. 41 (1920/'21).

CROSS, Trans. R. Soc. Trop. Med. and Hyg. XVI, p. 469 (1923).

CROSS and PATEL, Dept. Agric. Punjab Vet. Bull. No. 8 (1922)

,, Dept. Agric. Punjab Vet. Bull. No. 2 (1921).

Habitat:

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

1 ♀ from Hoeta Padang, Pidjor Koling, on buffalo 24.12.'22, LOBEL

Coll. V.S.L.

24 ♀ ♀ from Pidjor Koling, Pidjor Koling, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1923						1		1					2
	cattle	1923									4				4
	buffalo	1923						2		7	1				10
	„	1924						3	2	1			1		8
Total						1		6	2	9	5		1		24

7 ♀ ♀ from Si doea doea, Pidjorkoling, BAKKER

Voll. V.S.L.

respectively 2 ♀ ♀ on horse 2.5.'24

2 ♀ ♀ „ „ 6.8.'23

3 ♀ ♀ „ buffalo 26.9.'23

30 ♀♀ from Bintodjoe, Moeara Tais, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922												1	1
	„	1923				1									1
	buffalo	1923		1	1						5				7
	„	1924				5	1	12	2	1					21
Total				1	1	6	1	12	2	1	5			1	30

20 ♀♀ from Si Balapak, Moeara Tais, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922												2	2
	buffalo	1924				6	1	5	4	2					18
Total						6	1	5	4	2				2	20

2 ♀♀ from Moeara Tais, Moeara Tais on buffalo 16.1.'22, TARIP Coll. V.S.L.

1 ♀ „ Moeara Tais, Moeara Tais on buffalo 24.12.'22, LOBEL

1 ♂ „ Hoeta Tongga, Moeara Tais, on buffalo 16.1.'22, TARIP

6 ♀♀ „ Hoeta Tongga, Moeara Tais, on buffalo 1.'23, LOBEL

1 ♀♀ „ Sipakko, Moeara Tais, on horse 24.12.'22, LOBEL Coll. V.S.L.

26 ♀♀ „ Hapesong lama, Marantjar, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	cattle	1923		1		4		1			3				9
	horse	1923				1		1		2					4
	„	1924						3							3
	buffalo	1924				3		5	2						10
Total				1		8		10	2	2	3				26

1 ♀ from Si Gala gala, Marantjar on cattle 3.8.'23, BAKKER

27 ♀♀ „ Si Hitang, Batoe na Doea, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	cattle	1923		2	2										4
	"	1924					2		3						5
	buffalo	1923		2	1	1				5	2				11
	"	1924											6		6
	horse	1923								1					1
Total				4	3	1	2		3	6	1		6		27

5 ♀ ♀ from Sorik, Pintoe Padang on buffalo 2.4.'24, BAKKER Coll. V.S.L.

5 ♀ ♀ " Pidjangbolang on buffalo 13.3.'22, TARIP

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	cattle	1923		3	2	4		1			7				17
	"	1924					2		3						5
	horse	1922											6		6
	"	1923				2		2		4					8
	"	1924					2	3							5
	buffalo	1922	3		5								2		10
	"	1923	2	3	2	1		2		14	11				35
	"	1924				20	2	25	10	4			7		68
Total			5	6	9	27	6	33	13	22	18		7	8	154

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

184 ♀ ♀ from Siboeni boeni, Siboeleean, TARIP, LOBEL, BAKKER, Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1922												37	37
	"	1923					6	5	3	4		1	7	7	33
	"	1924	5		9	5	1	7	6	3			2		38
	horse	1922										1			1
	"	1923			1		3	1	2		1		4	2	14
	"	1924	5		4	1	6		1	1					18
	cattle	1922										2			2
	"	1923			3		4	1	3	1			9	2	23
	"	1924	5		1	1	3		5	1			2		18
Total			15		18	7	23	14	20	10	1	4	24	48	184

8 ♀♀ from Batoe Harimo, Siboeleean, LOBEL

Coll. V.S.L.

respectively 4 ♀♀ on buffalo 11.'22

1 ♀♀ „ „ 21.10.'22

3 ♀♀ „ cattle 19.10.'22

5 ♀♀ from Si Babangoen, Anggoli Simanossor, LOBEL

Coll. V.S.L.

respectively 1 ♀ on cattle 27.10.'22

3 ♀♀ „ „ 11.'22

1 ♀ „ buffalo 11.'22

1 ♀ from Kg. Mela, Sibolga on cattle 12.'22, LOBEL

Coll. V.S.L.

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

Ressort Pasar Goenoeng Toea, Goenoeng Toea

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922										2	2	2	6
	„	1923	4		13		8	6	2	10	8		2	2	55
	„	1924	6	9	3	5	4	1	7			1	4		40
	cattle	1922										1			1
	„	1923	3		17		3	3	1	11	7		3	2	50
	„	1924	8		8	4	2		10				3	2	37
	buffalo	1922				10							2		12
	„	1923	4		10		6	7	1	17			5	3	53
	„	1924	3		7	3	3	1	6			2	5		30
Total			28	9	58	22	26	18	27	38	15	6	26	11	284

183 ♀♀ from Si Paho, Oedjoeng Padang, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923			11			5	9	18	18		4	5	70
	„	1924	3	3	9	3	1		10			3	6		38
	horse	1923			12				4	15	9			5	45
	„	1924	2	8	4	3		5	6			3	4		35
Total			5	11	36	6	1	10	29	33	27	6	10	10	188

84 ♀♀ from Sawah Bangoenan, Portibi, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923			5		3	3	1	1				5	18
	"	1924	8												8
	horse	1923					1	5		10	4		7	3	30
	"	1924	1	3	2	5	2	1	10			1	3		28
Total			9	3	7	5	6	9	11	11	4	1	10	8	84

9 ♀♀ from Goenoeng Toea Tongga, Goenoeng Toea, LOBEL

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922										2	1	1	4
	buffalo	1922											1	1	2
	"	1923	3												3
Total			3									2	2	2	9

1 ♀ from Goenoeng Toea Djoeloe on buffalo 21.11.'22, LOBEL

2 ♀♀ " Aek Bajoer, Soenggarn on horse 25.12.'22, LOBEL

2 ♀♀ " Palakka, Batoe Gana, on horse 27.12.'22, LOBEL

10 ♀♀ " Poerba Sinomba, LOBEL

respectively 1 ♀♀ on horse 24.12.'22

4 ♀♀ " " 1.'23

2 ♀♀ " buffalo 24.12.'22

3 ♀♀ " " 1.'23

4 ♀♀ from Pagaran, Poerba Sinomba on horse 1.'23, LOBEL (Textfig. a)
Coll. V.S.L.

2 ♀♀ " Goenoeng Toea Djae on horse 1.'23, LOBEL

4 ♀♀ " Goenoeng Manaon, Portibi on buffalo 1.'23, LOBEL (Textfig. b)
Coll. V.S.L.

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922										4	3	8	15
	"	1923	14		25		9	11	6	35	21		9	10	140
	"	1924	9	20	9	13	6	7	23				5	11	103
	cattle	1922										1			1
	"	1923	3		17		3	3	1	11	7		3	2	50
	"	1924	8		8	4	2		10				3	2	37
	buffalo	1922				10							4	3	17
	"	1923	18	3	26	3	9	15	11	36	18		9	13	161
	"	1924	14	3	16	6	4	1	16			5	11		76
Total			66	26	101	36	33	37	57	82	46	10	47	49	640

Ressort Padang Sidempoean, Mantrie Ressort Binanga

7 ♀♀ from Pasar Siboehean, Djandi Lobi, LOBEL, TARIP Coll. V.S.L.

respectively 1 ♀ on horse 10.'22

5 ♀♀ ,, buffalo 6.2.'22

1 ♀ ,, ,, 10.'22

1 ♀ from Pangkal Dolok Lama, Pangkal Dolok on buffalo 1.'23, LOBEL

Coll. V.S.L.

9 ♀♀ ,, Hoeta Nopan, Hoeta Nopan, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1923									1				1
	"	1924							2			1	2		5
	buffalo	1924						1	2						3
Total								1	4		1	1	2		9

2 ♀♀ from Pagaran Sihndoeng, Hoeta Nopan, LOBEL

respectively 1 ♀ on buffalo 10.12.'22

1 ♀ ,, horse 10.12.'22

7 ♀♀ from Si Oendol, Paringgonan, BAKKER

respectively 1 ♀ on horse 9.1.'24

3 ♀♀ ,, ,, 3.4.'24

1 ♀ ,, ,, 3.6.'24

1 ♀ ,, ,, 1.7.'24

1 ♀ ,, buffalo 3.6.'24

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
41 ♀ ♀ from Kota Nopan, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923	9	1	4	5								2	21
	"	1924	2				1								3
	horse	1923		1		1									2
	"	1924	6	1			2								9
	cattle	1923			6										6
Total			17	3	10	6	3							2	41

40 ♀ ♀ from Moeara Tagor, Tamiang, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1923			1	1								1	2
	"	1924	5	1											6
	buffalo	1923		1	2	6					4				13
	"	1924	10	1			1								12
	cattle	1923					5				1				6
Total			15	3	3	7	6				5			1	40

3 ♀ ♀ from Salamboe, Pidoli Boekit on horse 13.3.'24, BAKKER

1 ♀ " Manjabar, Panjaboengan Tongga on buffalo 15.5.'24

2 ♀ ♀ " Kajoe Djati, Kota Siantar, BAKKER

respectively 1 ♀ on buffalo 16.5.'24

1 ♀ " " 4.6.'24

21 ♀ ♀ from Kota Siantar, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923		1				2				5			8
	"	1924	3	1											4
Horse/Buf. Moeara Tagor and K. Siantar		1924		9											9
Total			3	11				2				5			21

Kota Nopan without further locality

6 ♀♀ Kota Nopan, BAKKER all in 5.'24

7 ♀♀ from Si Gengoe, Kota Nopan, BAKKER

respectively 6 ♀♀ on buffalo 1.10.'23

1 ♀ „, cattle 1.10.'23

3 ♀♀ from Panjaboengan, 6.2.'22, TARIP

Total from this ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923	9	3	6	11		2			4	11		2	48
	„	1924	15	2			4	1							22
	horse	1923		1	1	2								1	5
	„	1924	11	2	3		2								18
	cattle	1923			6		5				1	1			13
Total			35	8	16	13	11	3			5	12		3	106

5 ♀♀ from Balige on buffalo 3.'22, VAN DER REEST Coll. V.S.L.

18 ♀♀ „, Porsea Balige, on buffalo 3.'22, VAN DER REEST „

19 ♀♀ „, Hoendoelan Parmaksian on buffalo, VAN DER REEST
Isle Nias

22 ♀♀ from Goenoeng Sitoli, TARIP 5.'22 on cattle „
Isle Sumatra

Residency Djambi

3 ♀♀ from Djambi, 1.'23, MARSIDI Coll. V.S.L.
respectively 2 ♀♀ on buffalo
1 ♀ „, horse

Residency Palembang

5 ♀♀ from Moeara Enim, 1922.

Residency Sumatra's West Coast

18 ♀♀ from Fort de Kock, MERENS 11.'22 Coll. V.S.L.
Gvt. Atjeh.

29 ♀♀ from Langsar 26.2.'23, C. DIEBEN (Textfig. 76 g) Coll. V.S.L.
1 ♀ from Sumatra without further localithy Coll. L.M.N.H.
1 ♀ from Street Bangka on Gvts Steamer Brak. at light 16,2 K.M. East
from Tandjong Oelar, Bangka. Wind strong. East 8.6.'23, DAMMER-
MAN (Textfig. 76 e) Coll. B.Z.M.

Isle Java

Residency Batavia

1 ♀ from Moeara Angke, Batavia 4.'08 Coll. N.A.M.

- 1 ♀ from Batavia, JACOBSON 12.'07
 2 ♂♂ „ Batavia, JACOBSON 12.'07
 1 ♂ „ Batavia, JACOBSON 11.'07
 1 ♂ „ Batavia '09
 1 ♂ „ Batavia, JACOBSON 11.'07 Coll. L.M.N.H.
 1 ♂ „ Batavia, JACOBSON 12.'07 Coll. BR.M.
 1 ♂ „ Weltevreden, SCHUURMANS STEKHOVEN in the Medical Research

Laboratories 25.11.'21

- 47 ♀♀ from Djasinga, Kg. Kolang 8.3.'22 on cattle Coll. V.S.L.

- 570 ♀♀ from Djasinga 17.4.'22 Coll. V.S.L.

respectively 360 ♀♀ on buffalo

209 ♀♀ „ horse

- 268 ♀♀ from Tjililitan, Mr. Cornelis, near Batavia, Horse Depot, 11.'21

respectively 171 ♀♀ on buffalo

49 ♀♀ „ cattle

48 ♀♀ „ horse

- 174 ♀♀ from O. D. Djonggol, Distr. Buitenzorg on buffalo 15.4.'22

- 1105 ♀♀ from Buitenzorg, SCHUURMANS STEKHOVEN Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
♀♀ Number	buffalo	1923				669	225	78							972
♂♂	„	1923				1	11								12
♀♀ buff./horse		1921	121												121
Total			121			670	236	78							1105

- 1 ♀ from Buitenzorg, BOIE

Coll. L.M.N.H.

- 1 ♀ „ Buitenzorg, VAN DER WEELE

„

- 106 ♀♀ „ Rangkasdengklok, Krawang

Coll. V.S.L.

respectively 21 ♀♀ on buffalo 9.'21

85 ♀♀ „ „ 11.'21

- 124 ♀♀ from Tjikampek, Krawang

Coll. V.S.L.

respectively 26 ♀♀ on buffalo 5.11.'21

98 ♀♀ „ „ 24.3.'22

- 68 ♀♀ from Kotta Krawang on cattle and buffalo 5.11.'21

- 63 ♀♀ „ Tjinanga, Krawang buffalo 11.'21

- 105 ♀♀ „ Gempol, Krawang on buffalo 11.'21

- 34 ♀♀ „ Lamaran, Krawang on buffalo 11.'21

- 141 ♀♀ „ Telokdjambi, Krawang on buffalo 9.12.'21

- 242 ♀♀ „ Wadas, Telokdjambi on buffalo 11.'21

13 ♀ ♀ from Kademangan, Tegal, LAGAS, 3.'22 on buffalo Coll. V.S.L.

1 ♀ „ Langkap on cattle, LAGAS 2.'22

1 ♀ „ Soemberpangoeng on horse, LAGAS 3.'22

3 ♀ ♀ „ Soemberpangoeng on buffalo, LAGAS 10.'22

2 ♀ ♀ „ Pengarasem, Tegal, LAGAS

respectively 1 ♀ on horse 13.10.'22

1 ♀ „ cattle 12.'22

3 ♀ ♀ from Salem, Tegal, LAGAS on horse 7.10.'22

1 ♀ „ Tjibiroes, Tegal, LAGAS on horse 3.5.'22

1 ♀ „ Djatibarang, Tegal, LAGAS on horse 11.'22

7 ♀ ♀ „ Djatibarang, Tegal, LAGAS on horse 30.10.'22

5 ♀ ♀ „ Kramat, Tegal, LAGAS on buffalo 11.'22

7 ♀ ♀ „ Mandapa

Residency Semarang

26 ♀ ♀ from Semarang, JACOBSON, DRESCHER, KOK

respectively 1 ♀ on cattle 7.6.'22, KOK

Coll. V.S.L.

1 ♀ „ buffalo 7.6.'22

„

6 ♀ ♀ „ horse/buff. 7.6.'22

„

4 ♀ ♀ „ 9/10.'05, JACOBSON

Coll. N.A.M.

2 ♀ ♀ „ 8.'05, JACOBSON

Coll. L.M.N.H.

6 ♀ ♀ „ JACOBSON

„

3 ♂ ♂ „ JACOBSON

„

1 ♀ „ 5.'10, JACOBSON

Coll. N.A.M.

2 ♂ ♂ „ '05, JACOBSON

„

one of them bears the label with note; „superior half of eye with grey spot, whiter towards the margins. After death this spot is brown.”

respectively 1 .. on 5.'05, DRESCHER

Coll. N.A.M.

1 ♀ from Ambarawa, LUDEKING

Coll. L.M.N.H.

Residency Djocjacarta

9 ♀ ♀ from Berbak, Modjosari on cattle, LUITJENS 4.'22 Coll. V.S.L.

1 ♀ „ Tjandiredjo on cattle, LUITJENS 4.'22

„

Residency Rembang

5 ♀ ♀ from Kota Rembang, DE WILDE

respectively 4 ♀ ♀ on horse 11.6.'22

„

1 ♀ „ 6.10.'22 (Textfig. 76 d)

4 ♀ ♀ from Mlangi, Widang, Toeban, DE WILDE

„

respectively 1 ♀ on buffalo 29.11.'22

1 ♀ „ „ 11.12.'22

2 ♀ ♀ „ cattle 11.12.'22

1 ♀ from Ketangan, Widang, Toeban on horse 26.6.'23, DE WILDE

1 ♀ „ Papringan, Kalimati, Soeghiwaras, Bodjonegoro, on cattle

15.11.'22, DE WILDE

Coll. V.S.L.

- 1 ♀ from Soegian, Kedoeng Soember, Soeghiwaras, Bodjonegoro, on cattle
25.11.'22, DE WILDE Coll. V.S.L.
- 1 ♀ from Soeghiwaras, Bodjonegoro on cattle 12.2.'23, DE WILDE
- 1 ♀ from Kedoengbondo, Balen, Bodjonegoro on buffalo 10.2.'23, DE
WILDE Coll. V.S.L.
- 3 ♀ ♀ from Kloempang, Ngasem, Bodjonegoro on buffalo/cattle 13.6.'23,
DE WILDE Coll. V.S.L.
- 30 ♀ ♀ from Peting, Blora on 21.7.'23, DE WILDE ,,
respectively 19 ♀ ♀ on buffalo
11 ♀ ♀ , cattle
- 1 ♀ from Djetis, Blora on buffalo 16.2.'23, DE WILDE Coll. V.S.L.
- 1 ♀ , Randoeblatoeng, Blora on horse 10.2.'23, DE WILDE
- 2 ♀ ♀ , Tenggal, Randoeblatoeng, Blora 10.2.'23, DE WILDE on buffalo
Coll. V.S.L.
- 1 ♀ , Gadjah, Samboeng, Demak on horse '22, DE WILDE
- 1 ♀ , Karangpanden, Demak, on cattle '22, DE WILDE
- 1 ♀ , Dero, Demak on horse '22, DE WILDE
- 1 ♀ , Bolo, Demak on buffalo '22, DE WILDE
- 1 ♀ , Rowih, Wedoeng, Demak on buffalo '22, DE WILDE
- Residency Madioen
- 3 ♀ ♀ from Java, Madioen, SOHNS 1919 Coll. N.A.M.
- 1 ♂ , Java, Madioen, SOHNS 1919 ,
- 1 ♂ , Java, Madioen, SOHNS Coll. V.S.L.
- 5 ♀ , Java, Madioen, SOHNS ,
- 20 ♀ ♀ , Java, Madioen, VAN BERGEN 4.'23 ,
- 7 ♂ ♂ , Java, Madioen, VAN BERGEN 4.'23 ,
- Residency Kediri
- 8 ♀ ♀ from Blitar on cattle/buffalo 4.3.'22 and 4.5.'22, LANKHORST
- Residency Soerabaja
- 1 ♂ from Soerabaja 24.8.'22 ,
- 1 ♂ , Soerabaja 6.'91, WHITE (Textfig. 77) ,
- 36 ♀ ♀ , Modjokerto '23 Coll. BR.M.
- respectively 10 ♀ ♀ on 10.2.'23 Coll. V.S.L.
- 39 ♀ ♀ , horse, buffalo and cattle on 31.3.'23
- 3 ♀ ♀ , cattle 16.4.'23
- 4 ♀ ♀ , buffalo 16.4.'23
- 9 ♀ ♀ from Goenoeng Gedangan, Djogodajoh, Modjokerto on cattle, buffalo
and horse 4.'23
- Residency Pasoeroean
- 2 ♀ ♀ from Malang , HILLEBRAND Coll. L.M.N.H.
- 3 ♀ ♀ , Pasoeroean, KOBUS '02 Coll. N.A.M.
- 2 ♀ ♀ , Waroengdono, Pasoeroean on cattle, SCHUURMANS STEKHOVEN
4.'22 Coll. V.S.L.

- 1 ♀ from Djimbaran, Poespo, Tengger on horse 12.'22, DOEVE
 1 ♀ „ Djangdjangwoelang, Poespo, Tengger on cattle 12.'22, DOEVE
 1 ♀ „ Poespo, Poespo, Tengger on horse 12.'22, DOEVE
 1 ♀ „ Ampelsari, Pasrepan, Tengger on cattle 12.'22, DOEVE
 1 ♀ „ Toetoer, Toetoer, Tengger on cattle 12.'22, DOEVE
 1 ♀ „ Tengger Mountains, DRESCHER 7/8.'98 Coll. N.A.M.
 15 spec. from Java without further locality.

respectively 1 ♀ MULLER, coll. L.M.N.H.

1 ♀ VAN DER WULP, 1880, coll. N.A.M.

1 ♀ JACOBSON, coll. N.A.M.

2 ♀ ♀ BIK, 1920, coll. N.A.M.

1 ♀ BUITENDIJK, 9.'09 on cowskin aboard of steamer
 Coll. L.M.N.H.

2 ♂♂ BUITENDIJK 9.'09 on cowskin aboard of steamer

1 ♂ det. as *T. rufiventris* VAN DER WULP = *T. rubidus*
 WIED.

2 ♂♂ labelled as *T. ophthalmicus* HAGENBECK det. by VAN
 DER WULP Coll. L.M.N.H.

2 ♀ ♀ Java ex coll. BIGOT Coll. BR.M.

1 ♀ W. Java, PIEPERS Coll. N.A.M.

1 ♀ Java? Coll. B.Z.M.

Isle Kangean

- 3 ♀ ♀ from Tambadjangan, Kangean on cattle 15.18.2.'23 Coll. V.S.L.

Isle Madoera

- 2 ♀ ♀ from Larangan on cattle 9.6.'22 Coll. V.S.L.

Isle Soembawa

- 1 ♀ from Dodoe Raba, Bima on buffalo 8.4.'22
 2 ♀ ♀ „ Rabadompoe, Raba on horse 14.6.'22
 2 ♀ ♀ „ Dompoe on horse 17.3.'22
 1 ♀ „ Ngara Koembe, Raba on buffalo 8.4.'22
 1 ♀ „ Tjenggoe, Belo on buffalo 5.5.'22
 2 ♀ ♀ „ Sekoeroe, Monte on buffalo 4.5.'22
 4 ♀ ♀ „ Talabioe, Tente on horse 5.'22

Isle Soemba

- 2 ♀ ♀ from Lewa Pakoe, on horse 28.5.'22, SCHUURMANS STEKHOVEN
 1 ♀ „ Waingapoe in a room circling round the lamp at 6 p. m. 12.7.'23
 S. S. coll. (Textfig. 76 c, i) Coll. V.S.L.

Federated Malay States

- 4 ♀ ♀ present in a collection, received from the RAFFLES museum,
 Singapore 9.'23 Coll. R.M.S.
 2 ♀ ♀ from Singapore, C. BODEN KLOSS „

respectively 1 ♀ on 2.'24

1 ♀ „ 5.'24

1 ♀ from Kuala Lumpur PRATT '08

Coll. BR.M.

1 ♀ „ Singapore, collected by FALSHAW 18.7.'07, „bites horse and cattle,

1 ♀ „ Pelaling 4.6.'10, STANTON

1 ♀ „ Gunung Kledang, Perak 2646 ft. 11.'16.

Coll. R.M.S.

1 ♀ „ Pahang 2500 ft. 1916, HUBBACK '16 on *Rhinoceros sumatrensis*

Cuv.

Coll. BR.M.

Siam

2 ♀ ♀, foot of Doi Sutep (alt. circa 1200 ft.) near Chiangmai, 7/9.4.'21 BARNES coll. BR.M. caught while attaching my horse, a very common fly about horse in this locality”.

British India

1 ♀ from Calcutta, Bengal 7.3.'08 (Textfig. 76 f, k)

Coll. BR.M.

2 ♀ ♀ „ Bombay

”

2 ♀ ♀ „ Madhupur, Bengal, C. PAIVA

Coll. N.A.M.

respectively 1 ♀ from 18.10.09

1 ♀ „ 22.10.'09

3 ♀ ♀ from Saidapet, Guinday, Madras, PATTON '13 (Textfig. 76 h, l)

Coll. BR.M.

1 ♂ „ Saidapet, Guinday, Madras, PATTON '13

Coll. BR.M.

3 ♀ ♀ „ Madras, India '08, PATTON, King Laboratory

1 ♂ „ Madras, labelled *T. tenens*

1 ♀ „ Bangalore, Mysore, S. India biting horses

1 ♀ „ Gujerat India 11.7.'1900

3 ♀ ♀ „ India without further locality, types of *T. priscus* WLK., *T. vagus* WLK. and *T. umbrosus* WLK.

1 ♀ from India, without further ocality

1 ♀ „ India, Nepal

1 ♂ „ N. W. India '94

1 ♂ „ Annam, SURCOUF

4 ♀ ♀ „ Annam, SURCOUF

1 ♂ „ Masar, Burma 6.'20, SENIOR WHITE

The Pundjab

2 ♀ ♀ from Distr. Ghalun 17.6.'21 on camel, Capt. CROSS

1 ♀ „ Noroshera 16.7.1900, Capt. CROSS

Isle Ceylon

1 ♀ from Peradeniya 9.1900

China

1 ♂ from Hongkong (Textfig 77 c)

Coll. BR.M.

3 ♀ ♀ „ Hongkong, MACFARLANE 1918

”

Tabanus rubidus WIEDEMANN varies to a still greater extent than *T. striatus* F. After having described the typical form, female and male, with their slighter variations I will ask attention for a small number of specimens, which deviates more from the type than the usual variations and which I bring therefore to special subforms. The specimens are not found in the foregoing list of the habitats of *T. rubidus* WIEDEMANN but are referred to in special list.

The Female.

T. rubidus WIEDEMANN ♀ is a median- to large-sized *Tabanus*. Forehead greywhite, white haired. Callus redbrown, egg-shaped, with a fine linear extension. Subcallus and upper cheeks pale yellowbrown, lower cheeks and face white, white haired. Beard similar. Palpi yellowwhite, tapering to a long, rather fine point, white haired, intermixed with a smaller or larger number of black hairs. Antennae yellowbrown on first 2 segments, blackbrown to black on the third joint, tooth blunt, distinct. Torax reddishbrown, denuded in the type female, in other females with 3 whitish broad longitudinal stripes. Wings clear. Legs yellowbrownish. Abdomen greyish, with a median white, white haired longitudinal stripe, ending on the 6th segment. Lateral stripe composed of narrow, triangular whitish spots.

Table of dimensions.

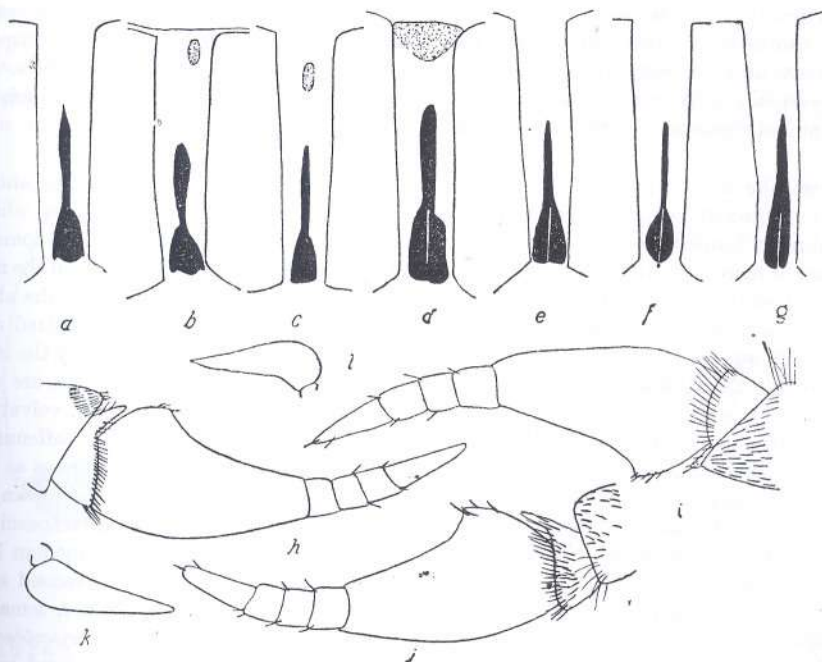
Bodylength	varying between 12,5 and 20,2 m.M.				
Width of thorax	"	"	4	"	6,5 "
Width of abdomen	"	"	4,5	"	7,5 "
Wingexpanse	"	"	25,2	"	42 "
Length of head	"	"	1,8	"	3,8 "
Length of thorax	"	"	5,2	"	8,7 "
Length of abdomen	"	"	6,4	"	12,6 "
Length of wing	"	"	10,6	"	18,5 "
Breadth of wing	"	"	3,6	"	6,4 "
Foreheadindex	"	"	4	"	8

most specimens
between 4 and 7

The Head. (Textfig. 76). Forehead, greyishwhite, white haired, from 0,06—0,42 narrower than it is at vertex, in some specimens nearly the same width throughout. Callus reddishbrown, rather broad egg-shaped, grooved in the middle, not reaching to the eyes, with a fine linear extension. Subcallus, etc. as mentioned. Palpi yellowwhite, second joint swollen at base, tapering to a rather fine point, mainly white haired, intermixed with a few black hairs. Antennae, first joint yellowbrown, white haired, black haired at apex, which protrudes caplike over the likewise yellowbrown second joint, provided with a long, narrow dorsal hump and bearing an apical fringe of black hairs. Third joint yellowbrown at base, then blackbrown, basal annulation 2 times as long as its widest part, 1,42 times as long as the black stylus.

Thorax reddishbrown, deteriorate in the first female of the series in the BR.M., with

3 longitudinal stripes in other specimens. Those stripes are nearly equal in width, white tomentose, white haired. The median one is divided by a median brown line in 2 equal parts. Lateral borders of scutum and hindborder of scutellum whitish, white haired. Tufts at base of wing and behind white. Pubescence elsewhere whitish, intermixed with some black hairs, scutellum similar. Pteropleuron red, black haired. Breast reddishgrey, white haired, mesoster-



Textfig. 76.

T. rubidus WIED ♀ a—g. forehead, h—j. antennae, k. 1. palpi.

numlobus with some black hairs. Wings clear, with brownish shadows along several veins, a well-developed, dark havannabrown stigma and a brownyellow foreborder. Halteres, club ivoryyellow-white, stalk whitish. Legs. First leg. Coxa grey, white haired. Trochanter reddishbrown. Femur pinkishgrey tomentose, knee yellowbrown, dorsum black haired, distal lateral border white haired. Tibia, with extreme base narrowly reddishbrown, basal 2/3 brownishyellow-white, white haired, intermixed with some black hairs, apex blackish chocolatebrown, black haired. Tarsalia blackbrown, black haired. Second leg identical to the first, femur mainly white haired, intermixed with a few black ones. Tibia brownishyellow, white haired, with an irregular median longitudinal row of black hairs on dorsum. Tarsalia reddishbrown, black haired. Third leg identical.

A b d o m e n violetbrown with a median broad, white haired longitudinal stripe, broader than in *T. abbreviatus* BIGOT, narrower on the 6th segment. Lateral stripes white, white haired composed of triangular spots, running till the 6th segment, narrower than in *T. abbreviatus*. Distal lateral borders of tergites yellowbrown, white haired. Ventral surface yellowbrown, white haired, except the black haired 7th segment. Other females with broader lateral stripes.

This form is generally distributed over the Dutch East Indian Archipelago. The foregoing description may however be completed by the following particulars, observed in fresh specimens. Eyes in life violetblue with greenish hue along the borders, Groundcolour of fore-

head violet, yellowgrey tomentose, pubescence mainly white, vertexspot redviolet, black haired. Postocular rim narrow, greywhite haired. Palpi and antennae as in type, some white hairs being intermixed between the black ones, forming the apical fringe to the 2d joint. Proboscis black, stalk pale brownish at base, silvery grey haired, sugarflaps mainly black haired, intermixed with some white hairs. Thorax darker than in the type, the middle longitudinal stripe is narrower than the other ones. Abdomen reddishbrown, grey tomentose on the first 3 segments, paler than the following ones. Grey stripes white haired, intermediate stripes brownblack, black haired. The groundcolour of the median longitudinal stripe being olivebrown and covered with grey tomentum, gives this stripe in some lights a shining velvety-brown appearance. Ventral surface, with median darker longitudinal band, wholly white haired, intermixed with some black hairs on some places.

Just like in *T. striatus* F. variations were observed in the shape of callus and linear extension, the last being narrow or broad, the number of black hairs on the frons, which was goldenbrown tomentose, yellow haired, in females from Pidjangbolang. The abdomen may be broad or more conical, this being due probaly to the state of filling with blood on the moment the insect was caught. In the female from Street Bangka the ventral surface of the abdomen presented a black haired median longitudinal band. Palpi in this ♀ white haired on base of second joint, apex black haired. A female from Waingapoe is characterized by the irregular shape of the longitudinal stripes, found on thorax and abdomen. Those stripes are covered with long, loose white pubescence (Pl. 5, Fig. 4). Forehead pale yellowbrown, velvetybrown to the vertex, black haired. Vertexspot cylindrical, winered. Palpi pale coffenutbrown. Basal annulation of third joint 1,6 times as long as its widest part and 1,1 times as long as the stylus. Pteropleuron thoracis yellowishbrown. Abdomen dark broad, blackbrown, sooty-grey at base. Dorsal median stripe straight-sided and not composed of trapezoid spots as in the type. Ventral surface with a broad havannabrown, black haired median longitudinal band, sides and segmentations yellowbrown, white haired. First and second segment pearlgrey, white haired, nearing it to *T. rubidus* WIED., subform *violaceus*. A female from Larangan forms a transitional form between the type and the subform *priscoides*, which will be described below. The forehead is covered with blackishbrown and yellowish pubescence. Abdomen yellowishbrown, spots and stripes yellowishwhite.

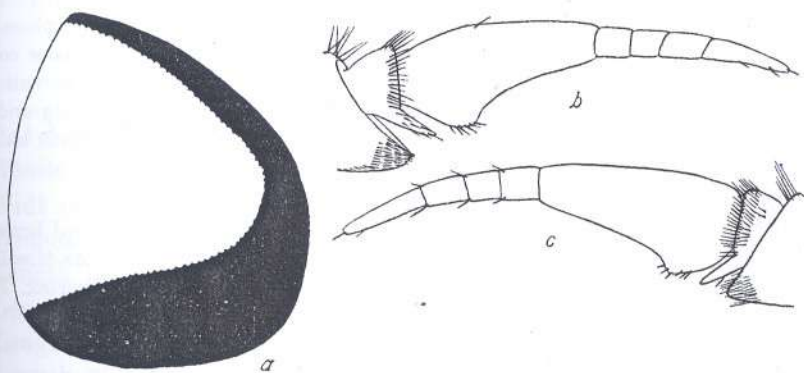
The Male. Pl. 5, Fig. 2.

The British Museum collection contains several males belonging to this species, among which a ♂ from Hongkong, really belonging to this species and another ♂, which is certainly quite distinct and ought to be reckoned to a new species. The male *T. rubidus* WIED. is identical to the female.

Table of dimensions.

Bodylength	varying from 17,5 m.M. to 18 m.M.				
Width of thorax	"	"	5	"	— 6,2 "
Width of abdomen	"	"	5,5	"	— 7 "
Wingexpanse	"	"	31,5	"	— 34,6 "
Length of head	"	"	3,5	"	— 5 "
Length of thorax	"	"	6	"	— 6,8 "
Length of abdomen	"	"	9,4	"	— 10,5 "
Length of wing	"	"	13	"	— 14,4 "
Breadth of wing	"	"	4,5	"	— 5,5 "

The Head. (Textfig. 77). Eyes in fresh specimens (observed at Buitenzorg, confer the Plate) with median, dull violetbrown, large-facetted part, surrounded by an equally big-facetted, greywhite area (clayyellow in dead males), which is narrowest in the angles. Small-facetted lower part violet with bluegreen shade (black in dead specimens). Subcallus with brown apical triangle, wedging in between the eyes, elsewhere creamyyellowwhite as are the cheeks. Pubescence on cheeks and beard yellowwhite or silverywhite. Palpi club-shaped, orangeous or yellowbrown, first joint yellow haired, second joint same pubescence, with a number of black hairs at apex or black haired, intermixed with yellowwhite hairs. Antennae as in the female, second joint more redbrown as is the basal part of the third joint, stylus black, basal annulation 2 times as long as its widest part, equal in size to the black stylus. Proboscis blackbrown, stalk grey white haired, sugarflaps yellowbrown haired



Textfig. 77.

T. rubidus WIED ♂. a. eye, b. c. antennae.

Thorax dark dullbrown with yellowgrey tomentose foreborder and 3 reddishbrown white or brown haired longitudinal stripes, (in some specimens the middle one is rudimentary) connected at hindborder of scutum by means of 2 comma-shaped markings. Pubescence of scutum mainly black, redbrown on the whitish lateral borders. Hindborder of scutellum similar yellowwhite haired. Tufts at base of wings and behind brownishwhite, intermixed with black hairs. Pteropleuron reddishbrown, black haired. Scutellum mainly black haired, intermixed with some yellowbrown hairs. Breast whitishgrey, thickly covered with yellowbrown hairs. some black hairs being found on the mesosternumlobus.

Halteres stalk redbrown, club yellowwhite. Legs darker than in the female sex. First leg. Coxa pale browngrey, apex shining black, trochanter pale yellowbrown, yellowbrown haired. Femur reddishbrown, greywhite tomentose, yellowwhite haired on distal lateral border, dorsum black haired, knee yellowish, ventral surface bare, reddish. Tibia tawny on basal 2/3, black haired, intermixed with some whitish hairs, apex black, black haired. Tarsalia black. Second leg, trochanter blackish redbrown. Femur redbrown, white haired at base, with a row of black hairs running to the yellowbrown knee, distal lateral border white haired, ventral surface yellowbrown haired. Tibia orangebrown, black haired, apical band darker, ventral surface yellow haired. First tarsalia redbrown at base, black haired, other tarsalia black. Third leg, femur dull yellowishbrown with a dorsal row of black hairs, elsewhere yellowwhite haired. Tibia yellowbrown, black haired on dorsum, ventral surface yellowbrown haired. Tarsalia redbrown, black haired.

Abdomen violetbrown with median almost straight-sided stripe, beginning on the first segment with a small whitish spot, distinct on the following four segments, whereas the 6th segment presents the trace of a spot only. Lateral stripes running from the 1st till 5th

segment, composed of whitish tomentose triangles. The mentioned markings and the lateral borders of the tergites yellowishwhite haired. Dorsum elsewhere black haired. Ventral surface with a median, indistinct dullbrown, black haired band, sides and segmentations whitish tomentose, white haired. In another male the abdomen was wholly white haired on its ventral surface, except the seventh segment, which presented some black hairs.

In a male from Weltevreden a median redbrown stripe is found on the ventral surface of the abdomen, composed of redbrown, halfmoon-shaped spots, visible in certain lights only. Pubescence wholly white. A male from Madioen, collected by VAN BERGEN, wetted by incident, did not show the usual eyemarkings. Abdomen conical, dark violetredbrown with narrow median straight-sided stripe. Sidespots rather big, visible till the 4th segment. The male resembles the subform *violaceus*, see below.

A male in the British Museum collection from Soerabaja. 6'91 WHITE was placed aside but is after my opinion a male of *T. rubidus* and wholly identical with the males collected by me on the shores of the Tjisadane near Buitenzorg. They are in bad preservation and so the eyemarkings are not clearly visible, nor the separation between the big and small facettes. Fore tibiae paler at base, yellowish, yellow haired, middle femore black haired on dorsum, elsewhere white haired. Lateral borders of the first 2 tergites yellow haired, other tergites black haired at borders.

A male from Madras resembles very much *T. tenens* Wlk. It is distinguished however in the third antennal joint, which is longer than in this species, stylus black. Fore tarsalia narrower, the big and small eyefacets are not separated very distinctly at vertex. Femora greybrown.

73a. *Tabanus rubidus* WIEDEMANN, subform *violaceus*. (♀) Textfig. 78

Habitat:

Isle Java

Residency Batavia

4 ♀ ♀ from Djasanga Coll. V.S.L.

respectively 3 ♀ ♀ on buffalo 17.4.'22

1 ♀ „ horse 17.4.'22

2 ♀ ♀ from Buitenzorg from the Laboratory Coll. V.S.L.

respectively 1 ♀ from 27.2.'22

1 ♀ „ 10.10.'22

2 ♀ ♀ from Sipandjang, Randoedongkal, Krawang on buffalo 21.11.'22

1 ♀ „ Kodjono, Randoedongkal, Krawang on buffalo 20.11.'22

1 ♀ „ Wadas, Tjeloeckjambe, Krawang on buffalo '22 Coll. V.S.L.

Residency Preanger Regencies

6 ♀ ♀ from Tasikmalaja, LE COULTRE Coll. V.S.L.

respectively 3 ♀ ♀ on 29.7.'22 (Textfig. 78 a)

3 ♀ ♀ „ 24.10.'22

Residency Cheribon

3 ♀ ♀ from Mandapa on 30.10.'22

Residency Pekalongan

1 ♀ from Ardjasari, Tegal on horse 3.'22, LAGAS Coll. V.S.L.

2 ♀ ♀ „ Pengarasem, Tegal on horse 11.'22, LAGAS (Textfig. 78 b, c)

Residency Djocja

2 ♀ ♀ from Berbak, on cattle 4.'22, LUITJENS (Textfig. 78 d)

Residency Passoeroean

1 ♀ from Manggoewan, Pasrepan, Tengger on horse 12.'22, DOEVE

1 ♀ „ Djimbaran, Poespo, Tengger on horse 12.'22 DOEVE

1 ♀ „ Kemiri, Poespo, Tengger on cattle 12.'22 DOEVE

1 ♀ „ Poespo, Poespo, Tengger on horse 12.'22 DOEVE

1 ♀ „ Poengging, Toetoer, Tengger on cattle 12.'22 DOEVE

Federated Malay States

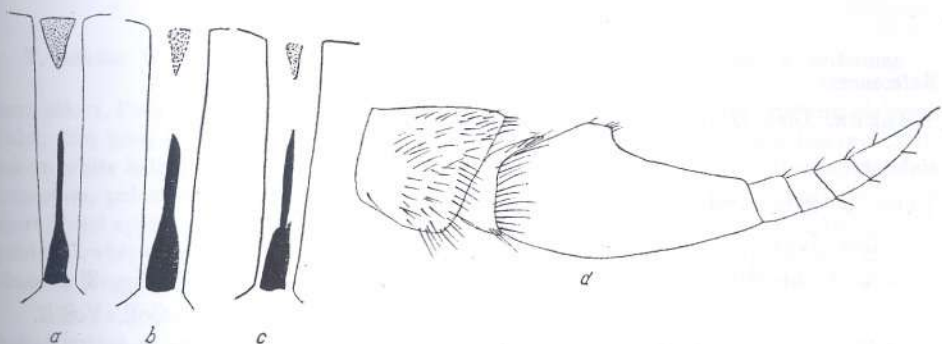
3 ♀ ♀ from Singapore on 5.'24

Coll. R.M.S.

Table of dimensions.

Bodylength	varying from 16,2 to 20 m.M.				
Width of thorax	„	„	5,2	„	— 6,5 „
Width of abdomen	„	„	5,5	„	— 7 „
Wingexpanse	„	„	31,6	„	— 38,9 „
Length of head	„	„	2,5	„	— 3,8 „
Length of thorax	„	„	6,2	„	— 8 „
Length of abdomen	„	„	8,8	„	— 12,2 „
Length of wing	„	„	13,2	„	— 16,2 „
Breadth of wing	„	„	4,2	„	— 5,8 „
Foreheadindex	„	„	5,5	„	— 8,25 „

This and the other subform I took at first for distinct species, but after a thorough comparison with the types in the British Museum collection I came to the conclusion that they were only subforms.



Textfig. 78.

T. rubidus WIED. ♀ subform *violaceus* s.s. a—c. forehead, d. antenna.

The Head. (Textfig. 78). Forehead of *T. rubidus* subform *violaceus* 0,14—0,42 narrower anteriorly than it is at vertex, basal part redbrown, goldenbrown tomentose, then yellow-

brown, pubescence mainly black, with some yellow hairs on the velvety red brown lateral borders. Vertex spot greyish red, connected with the linear extension by means of a similar stripe. Postocular rim narrow, yellow brown. Callus triangular, not reaching to the eyes with a broad linear extension. Subcallus, cheeks and face almost as in type, upper cheeks brownish white as is the upper face, lower face white, pale yellowish white haired. Palpi as in type. Antennae ferrugineous on first 2 joints, dorsum of first joint thick black haired, third joint with distinct tooth, base red brown, then black brown, basal annulation 1.94 times as long as its widest part, 1.41 times as long as the black stylus.

Thorax pale brown violet red, white tomentose, white haired on foreborder, elsewhere black haired. Scutum with 3 indistinct whitish longitudinal stripes and whitish lateral borders. Pubescence as in the type. Pteropleuron brown red, black haired as are the shoulders. Scutellum brown red. Breast violet white, white haired, mesosternum tinged yellow brown, black haired on the lobus. Wings as *T. rubidus* type. Halteres, stalk red brown, club yellow brown. Legs. First Leg. Femur pale brownish-cherry red on ventral surface, pubescence as in type. Second leg. Coxa yellow brown, white haired. Femur with yellow knee, white haired, except a median longitudinal row of black hairs. Tibia pale straw yellow, white haired, red yellow, black haired on the apical ring. Third leg, femur with caramel yellow knee, white haired, intermixed with some black hairs at apex. Tibia dirty yellowish white, dorsum with a few black hairs in the median line, borders fringed with black hairs. Ventral surface white haired, except at the black haired apex ring. Tarsalia red brown, black haired.

Abdomen violet red, with 3 longitudinal white, white haired stripes, of which the middle one is very narrow, broadened slightly at the segmentations, ending on the 6th segment. The first segment shows a small grey white, white haired patch at each side of the scutellum. Lateral stripes composed of elongate, white haired spots, found on the first 4 segments, 5th segment with the indication of a spot, formed by a small number of white hairs. Pubescence, except on the markings black, outside the lateral stripes the abdomen is brown black. Lateral borders of tergites white tomentose, white haired. Ventral surface brick red, with a brown red, black haired median longitudinal band. Sides white, white haired. Seventh segment wholly black haired.

73b. *Tabanus rubidus* WIEDEMANN subform *priscoïdes*. (♀)

Pl. 5, Fig. 3; Textfig. 79.

Syn. *T. priscus* WALKER.

References:

WALKER, List Diptera I, p. 176 (1848).

Habitat:

Type ♀ from India, coll. BR.M. (Textfig. 79 a, d)

Isle Java

2 ♀♀ from Modjokerto on 10.2.'23 (Textfig. 79 b, e; Pl., 5 Fig. 3)

Coll. V.S.L.

2 ♀♀ „ Soemoerpangang, Tegal, LAGAS

respectively 1 ♀ on horse 3.'22

1 ♀ „ buffalo 10.'22

1 ♀ from Kramat, Tegal 11.'12, LAGAS

1 ♀ „ Mandapa Cheribon 30.10.'22 (Textfig. 79 c)

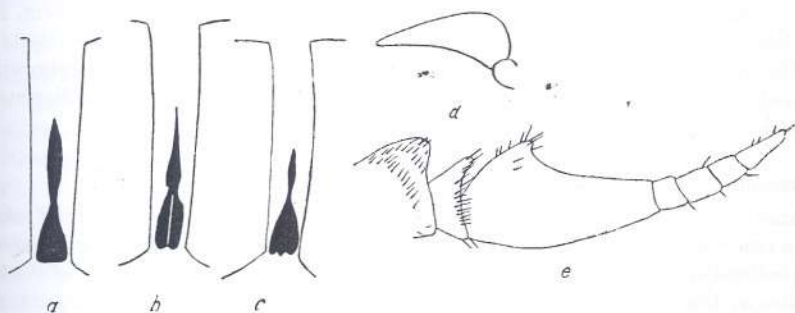
Coll. V.S.L.

Table of dimensions.

Bodylength	varying from 14,8 m.M. to 16 m.M.				
Width of thorax	"	"	5	"	5,8
Width of abdomen	"	"	5,2	"	6
Wingexpanse	"	"	32,4	"	35
Length of head	"	"	2,4	"	3
Length of thorax	"	"	6	"	7,2
Length of abdomen	"	"	8	"	8,5
Length of wing	"	"	13,5	"	13,8
Breadth of wing	"	"	4,5	"	5,2
Foreheadindex	"	"	6,44	"	7

T. rubidus WIEDEMAN, subform *priscoïdes* is a yellowbrownish subform of this generally distributed species.

The Head. (Textfig. 79). Forehead brownishgrey, with some yellowishbrown hairs near the callus, elsewhere thick black haired. Callus violetblack, reversed heart-shaped, with short pointed linear extension. Frons 0,25–0,33 narrower anteriorly than it is at vertex. Subcallus and upper cheeks brownish white, lower cheeks silvery white, white haired. Beard



Textfig. 79.

T. rubidus WIED, subform *priscoïdes*, s. s. ♀ a—c. forehead, d. palpe, e. antennae.

same colour. Face pale brownishwhite, silverywhite haired, almost as in the subform *violaceus*. Palpi, first joint creamyyellowbrown, white haired, second joint, shaped in as the type, same colour, white haired at base, black haired at apex. Antennae, first joint yellowbrown, white tomentose, pubescence, black haired on dorsum, elsewhere yellowwhite. Second joint with short dorsal spur, apical fringe black, intermixed with some yellowbrown white hairs. Third joint yellowbrown on basal annulation, which is 1,8 times as long as its widest part and 1,32 times as long as the black stylus. Tooth distinct, crowned with black hairs.

Thorax brownishgrey, black haired, with 3 rather distinct longitudinal whitish white haired stripes as are also the lateral borders of the scutum. Pteropleuron coffeenutbrown, black haired. Scutellum same colour as scutum bordered with long white hairs. Hairtufts at base of wing and behind white. Sides and breast bluishgrey, white haired, some brownblack hairs being found on the mesosternumlobus. Wings as in *rubidus* type. Halteres, stalk reddbrown, club luteous. Legs. First leg. Coxa brownishgrey, white haired, femur shining reddishblack on ventral surface, knee yellowbrown, dorsum black haired, distal lateral border brownish-

grey tomentose, grey haired. Tibia yellowbrown, yellowbrown haired, intermixed with some black hairs on basal 2/3, then black, black haired. Tarsalia black. Second leg. Coxa and trochanter redbrown, femur sootybrownishgrey, knee yellowbrown, greywhite haired with some black hairs on dorsum, tibia orangebrown, black haired on dorsum in the median line, elsewhere orangebrown haired. First tarsale redbrown, black haired, other tarsalia black. Third leg. Coxa brownishgrey, grey haired, trochanter blackbrown, brown haired, femur as on 2d leg. Tibia identical, dorsum black haired, ventral surface orange haired. Tarsalia identical.

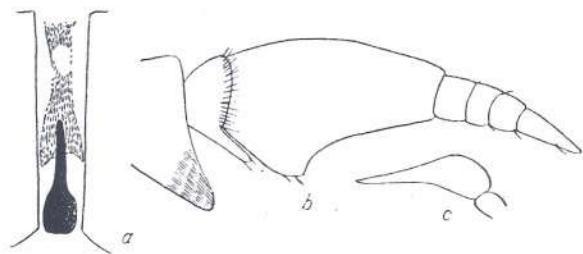
A b d o m e n caramel-coloured, yellowredbrown, black haired, with greybrown, yellow-white haired longitudinal stripes. The median stripe embraces the scutellum forklike and ends slightly narrower on the sixth segment. Lateral stripes orangebrown, orangeyellow haired, ending on the fourth segment, the fifth segment presents a paler tomentose spot only. Lateral borders of tergites white haired till 6th segment. Ventral surface orangerebrown with a median longitudinal row of dark, black haired patches, segmentations and sides paler, covered with whitish pubescence.

The Mandapa female deviates from this scheme in that the forehead is almost wholly yellowbrown haired, with some black hairs on the winered vertexspot only. Subcallus and upper cheeks more brownyellow. Second antennal joint with mainly orange-coloured hair-fringe, intermixed with some black hairs only. Thorax oliveyellowbrown, with 2 redbrown longitudinal stripes, no median stripe, pubescence black and brownishyellow. Fore femora, with a black haired median stripe on dorsum only. Middle tibiae yellowwhite haired. Abdomen orangeyellowbrown, pubescence on the stripes and spots yellowbrown, elsewhere black, intermixed with some yellowbrown hairs. Ventral surface as in the typical *priscoides*.

Some females from Semarang possibly ought to be reckoned to this subform, forehead goldenyellowbrown, yellow and black haired, index 7. Some black hairs are found on the face. Antennae cinnamonyellowbrown with brownblack stylus. Thorax greybrown, black and yellowbrown haired. Abdomen hazelbrown, with yellowwhite elipsoidal median stripe and indistinct lateral stripes.

Discussion:

Tabanus calidus Wlk. (confer Textfig. 63) given by RICARDO as a synonym of *T. albimediis* Wlk. is a true valid species, as I could state by comparison of the types present in the British Museum collection. It is distinguished inter alia by the colour and pubescence of the forehead and its shape, the callus and its linear extension also differ. Third antennal joint with an oblique yellowbrown streak, tooth acute, triangular.



Textfig. 80.

T. vagus Wlk. type ♀.

a. forehead, b. antenna, c. palpe.

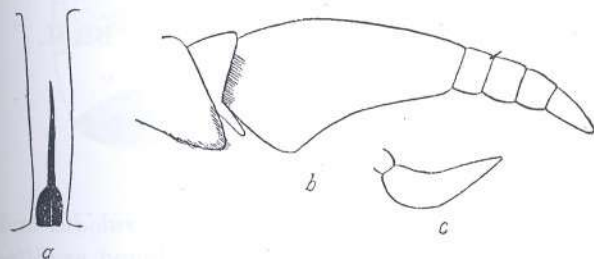
Tabanus vagus WALKER, type (Textfig. 80), identified by RICARDO as a synonym of *T. rubidus* WIEDEMANN is probably also a valid species. Forehead white, white haired at base, then darker, black haired. Vertex with darker, black haired vertexspot. Callus different in shape, more or less cylindrical at base, suddenly attenuated to a fine linear extension. Third antennal joint broader, curved, with a blunt tooth, basal annulation 1,5 times as long as its

widest part, 1,35 times as long as the stylus. Palpi, second joint swollen at base, with a very long, narrow, acute point.

T. umbrosus, (Textfig. 81), *T. priscus* (Textfig. 79) and *T. albimediis* (Textfig. 82) and *A. lacrymans* BIGOT (Textfig. 83) are however forms of *T. rubidus* WIEDEMANN. *T. priscus* is brownishyellow and presents a spindle-shaped linear extension to the callus. *T. umbrosus* WLK. has pinkish-black legs, thorax mainly white haired, abdomen same colour as in *T. priscus*, white haired. *T. albimediis* with longer linear extension, shorter callus, which is straight at its lower end; basal annulation of third antennal joint 1,75 times as long as its widest part, 1,63 times as long as the stylus. Second antennal joint with a more acute apex than in *rubidus* type. One of the Madras females of *T. rubidus* is intermediate in respect to its second palpal joint between *T. rubidus* and *albimediis*. Basal annulation of third joint 1,75 times as long as its widest part, 1,27 times as long as the stylus.



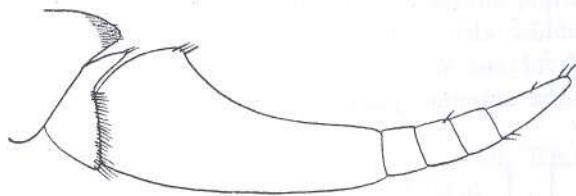
Textfig. 81.
T. umbrosus WLK.
palpe.



Textfig. 82.

T. albimediis WLK. ♀. a. forehead, b. antenna, c. palpe.

longer than 8 days. Further particulars are to be studied. Extensive breeding experiments should solve the question of the synonymy of the described forms. One should accomplish them in different habitats and pay special attention to the influence of humidity and temperature on the colour of the insect. FRASER studied the pathogenicity of *T. vagus* WLK. in the Federated Malay States, but he was not capable to transmit the surra by means of this fly, his failure may however be ascribed to the small number of flies, used in the experiment. In nature the males are found resting on tree-trunks, where the females assemble after having taken their meal.



Textfig. 83.

Atylotus lacrymans BIGOT ♀. antenna.

I found them on the same trees as male and female *T. striatus* F.

FLETCHER observed the egg-laying of the females on leaves of *Polygonum* on the banks of a river. The eggs of *T. rubidus* were highly infested with a Chalcid (*Phanarus* sp.?). The parasites oviposited in the upper and lower layer of eggs, the former producing males and the latter females. The incubation period of the eggs of *T. rubidus* was at Pusa 6 days. *T. rubidus* had 3 broods yearly at Pusa. According to FLETCHER and CROSS and PATEL *T. rubidus* is capable to transmit surra, but not longer than 24 hours after feeding and there are other *Tabanids* such as *T. nemocallosus*, which gave a much greater number of positive results in the experiments, carried out by the latter examiners. They used camels as surra patients. Cross saw that *T. rubidus* carried no infection, 2 to 29 days after the infected feed. One positive result was obtained when the gut contents of one individual, eight hours after an infected feed, was injected subcutaneously into a healthy rabbit. Offspring of infected flies don't carry the disease.

Recently NIESCHULZ succeeded in transmitting surra from horse to horse with 2 specimens of *T. rubidus*.

74. *Tabanus abbreviatus* BIGOT. (♀ ♂) Textfig. 84, 85.Syn. *T. conicus* BIGOT.

References:

BIGOT Mém. Soc. Zool. France V, p. 670 (1892).

,, Soc. Zool. France Y p. 650 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 153 (1911).

SHIRAKI, Tabanidae of Formosa, p. 267 (1918).

Habitat:

Type ♀ from Java (Textfig 84 a, b, c)

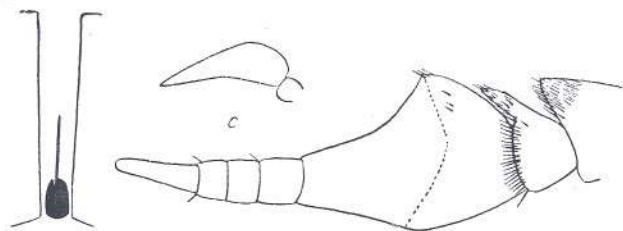
Coll. BR.M.

♂ from Java, JACOBSON

♂ ,, Cambodja, *Atylotus conicus* BIGOT (Textfig. 85 a, b)

♀ ,, Takao, S. Formosa

T. abbreviatus is an uncertain species, very closely allied to *T. rubidus* and distinguished from the latter in subordinate characters only. I found as differences with *T. rubidus* the black haircovering of the palpi, which however is a gradual difference and not an essential one, and the broader basal annulation of the third antennal joint. In how far this is an essential difference in those specimens can only be concluded from breeding experiments. The other differences indicated by SHIRAKI as the more slender palpi, the narrow frontal stripe, darker legs, reddish yellow abdomen might be due to variation in *T. rubidus* also. The male of *T. conicus* BIGOT is to my opinion probably a male of *rubidus* WIED. The only difference is the broader basal annulation of the third antennal joint.



Textfig. 84.

T. abbreviatus BIGOT ♀. a. forehead, b. antenna, c. palpe.

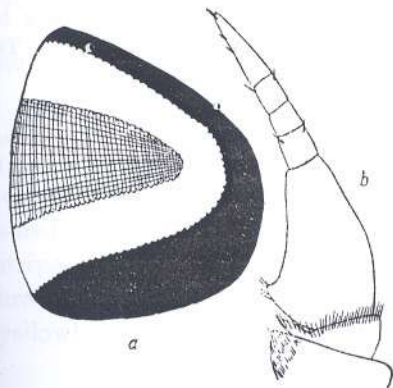
The Female.

BIGOT's type from Java is characterised as follows. Abdomen reddish-yellowbrown, with a median rather narrow, longitudinal white, white haired stripe and 2 lateral stripes of the same colour. Forehead (Textfig 84) 0,26 narrower anteriorly than it is

at vertex, index 7. Palpi yellowbrown with rather acute point, mainly black haired, intermixed with some yellowwhite hairs. Antennae, first joint not protruding caplike over the second joint, dorsal hump of latter broader, third joint much broader than in *T. rubidus*, redbrown till just above the tooth, basal annulation 1,36 times as long as its widest part, 1,1 times as long as the stylus. Legs darker than in *rubidus* according RICARDO. Length of type 16 m.M.

The Male.

The male (Textfig. 85) labelled *T. conicus* BIGOT = *T. abbreviatus* BIGOT is according to AUSTEN 17.11.'22 possibly a male of *T. rubidus* WIED. Subcallus, cheeks and beard as in this species. Palpi brownishyellowwhite, mainly white haired, with a row of black hairs on dorsum. Antennae first joint yellowishbrown, dorsum, black haired at apex and on a row,



Textfig. 85.

T. abbreviatus BIGOT ♂
a. eye, b. antenna.

running to the base, elsewhere white haired, 2d joint darker brown, 3d joint reddishbrown at base, soon growing darker, basal annulation 1,44 times as long as its widest part, 0,91 times as long as the black stylus, tooth blunt. Thorax pale chestnutbrown with 2 rather indistinct greybrown longitudinal stripes, lateral borders and hind-border of scutum. Pteropleuron yellowbrown, black haired. Breast greybrown, white haired, mesosternumlobus black haired. Wings clear, foreborder yellowish, stigma pale yellowbrown. Halteres, stalks redbrown, club yellowwhite. Legs as in *T. rubidus*. Abdomen dull brown with median triangles and indistinct sidespots. Lateral borders of tergites yellowish, dirty white haired. Ventral surface reddishbrown, segmentations yellowbrown, first 2 segments white haired, other segments with median, darker brown, black haired patches. Seventh segment wholly black, black haired.

75. *Tabanus abscondens* WALKER (♀) Textfig. 86.

References:

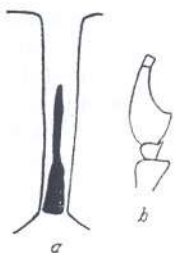
- WALKER, Transact. Entom. Soc. London V, p. 275 (1860).
RICARDO, Rec. Ind. Mus. IV, p. 161 (1911).

Habitat

- | | |
|--|-------------|
| Type ♀ from Burma | Coll. BR.M. |
| 1 ♀ from N. Chin. Hills, Burma 4.'93, WATSON (Textfig. 86 a) | „ |
| 1 ♀ „ Lower Burma Tenasserim 500—1500 feet, 5/6.'94, BINGHAM (Textfig. 86 b) | Coll. BR.M. |
| 1 ♀ from China, Dr. KERTESZ coll. | |

Type ♀, in very bad condition. Forehead with pear-shaped blackbrown callus, linear extension extending on lower half of frontal stripe. Subcallus and upper cheeks redbrown. Lower cheeks and face greywhite, white haired. Beard yellowwhite. Palpi pale yellowbrown, white tomentose, black haired. Antennae wanting in the type, in the Tenasserim specimen they are slender, reddish, tooth prominent. Thorax blackish, breast bluegrey, brownish in places, white haired. Wings clear, with yellowbrown foreborder. Legs brownish. Abdomen reddish, with a narrow white median stripe and 2 broader similar lateral longitudinal stripes. Length 16 m.M., other female 17 m.M.

The Head. (Textfig. 86). Forehead 0.47 narrower anteriorly than it is at vertex, index 7. Linear extension strong. Palpi ending in a long slender point.



Textfig. 86.

T. abscondens Wlk. ♀

a. forehead,
b. antenna.

Thorax blackish, since it was wetted previously. Pteropleuron reddish brown, black haired. Shoulders black haired. Tufts at base of wings and behind white. Wings with red-brown veins. Halteres, stalk darkreddbrown, club luteous. Legs. Femora bluishbrown, grey haired, tibiae yellowbrown at base, more reddbrown at apex. Tarsalia blackbrown.

Abdomen black haired, with a narrow median white, white haired stripe and 2 broader lateral, white haired stripes; ventral ♀ surface, with a longitudinal row of median rectangular, black, black haired spots, sides and segmentations reddishyellowbrown, yellow haired.

76. *Tabanus andamanicus* BIGOT (♀) Textfig. 87.

References:

BIGOT, Mem. Soc. Zool. France V, p. 658 (1892).

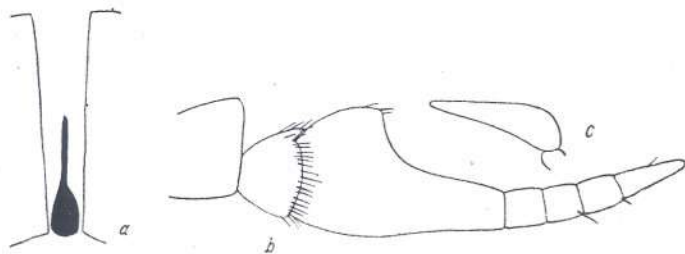
RICARDO, Rec. Ind. Mus. IV, p. 218 (1911).

Habitat:

Type ♀ from Andaman Islands, Bay of Bengal

Coll. BR.M.

The only specimen is in a very deteriorate staté. RICARDO thought it to be identical with *T. fuscicauda* BIGOT, but it is quite certainly distinct, confer shape of forehead, callus, palpi and antennae. Moreover it belongs to quite another group of species and is allied to *T. rubidus* WIED. Forehead, with large pear-shaped, reddishbrown callus, linear extension short, black. Subcallus and upper cheeks reddishbrown, lower cheeks white, white haired. Beard white. Face reddishbrown, white haired. Palpi yellowbrown, with long point. Antennae reddishbrown, darker at apex, black haired. Thorax reddbrown, denuded. Wings clear. Legs brownish. Abdomen, with a narrow median stripe and 2 lateral white stripes. Length 15 m.M.



Textfig. 87.

T. andamanicus BIGOT. ♀ a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 87). Forehead 0.4 narrower anteriorly than it is at vertex, index 6.4. Antennae, third joint reddishbrown at base, soon becoming darker, black beyond the tooth, basal annulation 1.6 times as long as its widest part, 1.12 times as long as the stylus.

Thorax redbrown, pteropleuron black haired, breast sootygrey. Wings, stigma yellowbrown, foreborder yellowbrown, veins darkbrown. Legs. First leg. Coxa grey, white haired, femur blackbrown, black haired on dorsum, white haired on lateral borders. Tibia yellowredbrown at base, blackbrown at apex. Second leg, femur greyish tomentose, knee yellowbrown. Tibia yellowishbrown, black haired on dorsum, yellow haired below. First tarsale blackbrown, black haired, other tarsalia black. Third leg, femur with yellowbrown knee, pubescence as in first leg, base white haired too. Tibia as in second leg.

Abdomen as described, first segment with a greyblack spot at each side of the scutellum.

GROUP II.

The second Group includes up to the present two species only. It is closely allied to the first group, but is characterised at once by the fact, that no lateral stripes are present on the abdomen, which shows a median broad yellow-yellow-brown stripes, accompanied by two blackbrown stripes, rest of abdomen red-yellowbrown.

KEY 12.

Synopsis of species.

1. Thorax havannabrown, with yellowbrown longitudinal stripes, black and yellowbrown haired. Forehead goldenbrown. Callus egg-shaped. Antennae ferrugineous, black-tipped. Palpi cream-coloured, white and black haired. Wings brownish, without appendix. Ventral surface of abdomen redbrown, yellowbrown haired with indistinct darker median shadows

tricoloratus SCHUURMANS STEKHOVEN.

2. Thorax uniformly brown, yellowbrown haired. Antennae, yellowbrown, redbrown haired on basal joints. Palpi yellowwhite, white haired. Wings clear, with a short appendix. Ventral surface of abdomen yellowbrown, yellowwhite haired, except on the 6 median black haired patches

flavimediis SCHUURMANS STEKHOVEN ♂.

77. *Tabanus tricoloratus* nov. spec. (♀) Pl. 6, Fig. 3; Textfig. 88.

Habitat:

Type ♀ from Koedjoeng, O. D. Widang, Distr. Toeban, Res. Rembang, Java 11.12.'22 at 11 o'clock a.m., DE WILDE Coll. V.S.L.

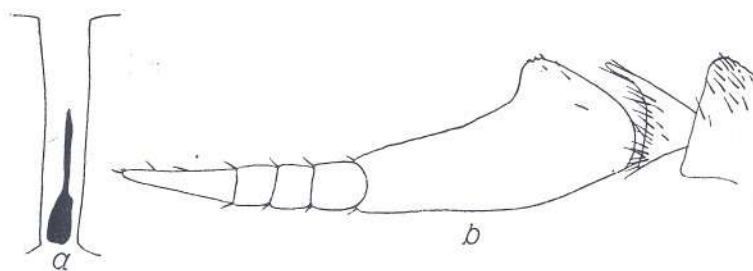
1 ♀ from Boenoet, O. D. Widang, Distr. Toeban, Res. Rembang 16.11.'22 at 11 o'clock a.m. in the neighbourhood of the Wlangi-marsh, DE WILDE Coll. V.S.L.

A beautifully coloured species, allied to *T. flavimediis* SCH. STEKH. but distinguished by the pubescence on the palpi, the thoracal markings, the absence

of an appendix, etc. Forehead dull goldenbrown, brownyellow haired. Callus egg-shaped, castaneous at base, black at apex, with a narrow linear extension. Subcallus pale brownish yellowwhite as are cheeks and face. Beard creamwhite. Palpi cream-coloured, white haired at base, black haired at apex. Antennae ferruginous, apex black. Thorax havannabrown with yellowbrown longitudinal stripes, black and yellowbrown haired. Wings brownish. Legs yellowbrownish. Abdomen with a median, yellowbrown, parallel-sided, yellow haired stripe, accompanied by two blackbrown stripes, groundcolour elsewhere redyellowbrown.

Table of dimensions.

	♀ 1	♀ 2
Bodylength	15,8 m.M.	17 m.M.
Width of thorax	4,8 „	5,5 „
Width of abdomen	5,6 „	6 „
Wingexpanse	34 „	33,9 „
Length of head	2,2 „	2,8 „
Length of thorax	6,2 „	6,2 „
Length of abdomen	8,8 „	9,5 „
Length of wing	14,6 „	14,2 „
Breadth of wing	6,8 „	4,8 „
Foreheadindex	6,2	5,6



Textfig. 88.

T. tricoloratus s. s. ♀. a. forehead, b. antenna.

The Head.
(Textfig. 88). Forehead dull goldenbrown, from 0,1 — 0,25 narrower anteriorly than it is at vertex, brownyellow haired, black haired at vertex, where one finds a winered vertex-spot. Callus as

described. Subcallus pale brownishyellowwhite as are the cheeks and face. Cheeks and beard cream haired. Palpi, first joint cream-coloured, cream haired, intermixed with some black hairs at apex, second joint darker, rather broad, stout, with short, broad, blunt point, mainly yellow haired, intermixed with some scattered black hairs. Antennae bright yellowbrown, black haired on first joint, second joint reddishyellowbrown, black haired, third joint similar, with a blunt tooth, basal annulation 2 times as long as its widest part, 1,13 times as long as the black stylus. Proboscis, stalk white haired, sugarflaps white haired and brownish-black haired.

Thorax havannabrown, with a median fine havannayellowbrown stripe, not reaching to the hindborder of the scutum and 2 lateral similar stripes, lateral borders of the scutum same colour, foreborder grey tomentose. On these markings yellowbrown hairs prevail, pubes-

cence elsewhere black. Tufts at bases of wings and behind yellowbrown. Pteropleuron redyellowbrown, black haired. Breast and sides greyishyellowbrown, yellowbrown haired, mesosternum lobus black haired. Wings with pale yellowbrown foreborder, sienna-coloured stigma, blackbrown veins and pale yellowbrown shadows along several veins. Halteres, stalk redbrown, club chromyyellow. Legs, First leg. Coxa browngrey, cream haired; trochanter greybrown, cream haired; femur mahoganybrown, knee slightly paler, dorsum black haired, ventral surface shining black, tibia curved slightly, white, brownyellow tomentose, brownyellow haired on basal $\frac{2}{3}$, intermixed with some scattered black hairs, extreme base redbrown, apex black, black haired; ventral surface covered with appressed yellow hairs, except on the apical ring. Second leg, Coxa similar. Femur redbrown, knee strawyellow, mainly pale yellow to yellowwhite haired, with a median dorsal row of black hairs. Tibia citron-chromyyellow, pale yellow haired, with a median irregular row of black hairs on the dorsum. Tarsalia redbrown, black haired. Third leg, Coxa and trochanter similar, pale yellow haired, femur violetredbrown, pale yellow haired, with a few black hairs, scattered over the dorsum, tibia identical, as are the tarsalia.

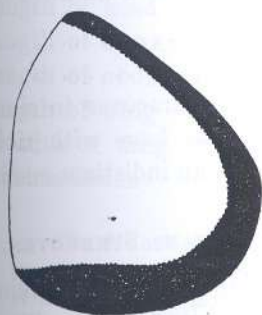
A b d o m e n with the described longitudinal stripes; the median yellow broad stripe ends on the sixth segment, gradually narrowing to the end. On the reddish, sienna coloured lateral borders one finds a paler tomentose spot on each side of the median stripe on the second segment and traces of similar spots on the third. Except the blackbrown, black haired longitudinal stripes the pubescence is mainly ochraceous yellow on the first four tergites, fifth to seventh segment prevailing black haired. First segment with a bluishgrey tomentose spot at each side of the scutellum. Ventral surface redbrown yellowbrown haired with indistinct darker median shadows.

78 *Tabanus flavimedi* nov. spec. (♂). Textfig. 89.

Habitat:

Type ♂ from India, Punjab Distr. Rhud. Pur Camp. coll. by Capt. H. E. Cross,
3. 5. '21 on tree Coll. BR.M.

This species is closely allied to *T. tricoloratus* SCH. STEKHOVEN from Java. It shows the same broad median, straight-sided, yellow haired stripe as was found in this species. It differs however in the following characters:



Textfig. 89.

T. flavimedi s. s. ♂.
eye.

The Head. (Textfig. 89). Eyes yellow, the black-faceted part narrow, reaching to the vertex. Subcallus white, with a brown spot at apex. Cheeks white, white haired. Beard white. Palpi yellowwhite, white haired. Antennae yellowbrown, third joint missing, first joint redbrown haired on dorsum, second joint with dorsal spur and a fringe of black hairs.

Thorax. Scutum uniformly brown, no traces of longitudinal stripes as in *T. tricoloratus* S.S., covered with a down of yellowbrown pubescence. Scutellum same colour as scutum. Pteropleuron yellowbrown, brownish yellow haired. Breast brownish-grey, white haired.

Wings nearly clear, with a short appendix. Foreborder yellowish, stigma pale brown. Halteres pale yellowbrown, club white. Legs, First leg, Coxa pinkish yellowbrown, white haired, Femur above tawnybrown, black haired, below more yellowbrown tomentose, white haired. Tibia blackbrown on

apical half, black haired, basally whitish-yellowbrown, white haired. Tarsalia black. Trochanter yellowbrown. Second leg yellowbrown, white haired on coxa, trochanter, and femur. Tibia pale yellowbrown, covered with whitish pubescence, intermixed with a few black hairs, apical band redbrown, black haired. Tarsalia blackbrown, black haired. Third leg identical. Tibia with blackbrown, black haired apical band and a dorsal row of black hairs. Tarsalia redbrown, black haired.

A b d o m e n reddishyellowbrown, with a broad, blackbrown longitudinal band, separated into two equal parts by a median, straight-sided yellowbrown stripe, ending on the sixth segment. Sides of tergites yellowbrown till the sixth segment. Median stripe and lateral stripes withishyellow haired, elsewhere black haired. Ventral surface yellowbrown, yellowwhite haired, except the 6 median patches of black hairs; seventh segment wholly black haired.

•GROUP III.

The third Group embraces a small number of species, which, although apparently closely allied to the species of the first Group, and perhaps may be brought to this Group in the future, miss the lateral abdominal stripes to be found in all species of the first Group, except in *T. avittatus* SCHUURMANS STEKHOVEN. Up to the present nothing is known about the males of the species, placed under this heading.

KEY 31.

Synopsis of species.

- | | | |
|-----|--|---|
| 1a. | Forehead rather broad, index 5 | 2 |
| b. | Forehead narrow, index 8—11 | 3 |
| 2. | Forehead the same width throughout. Callus square, linear extension short, thick. Abdomen dull redbrown, black haired with a median longitudinal, white haired, straight-sided stripe, the hairs being very numerous at the segmentations, thus giving the stripe an undulating appearance | |
| | undulans SCHUURMANS STEKHOVEN. | |
| 3a. | Median abdominal stripe parallel-sided | 4 |
| b. | Not so | 5 |
| 4. | Subcallus and upper cheeks ochraceous. Antennae ochraceous to cinnamonbrown. Wings with smokybrown apical shadow. Legs with tibiae largely white. Abdomen narrow, deep redbrown, with an indistinct median citroneyellow haired longitudinal stripe | |
| | citripilosus SCHUURMANS STEKHOVEN. | |
| 5a. | Abdomen tawnybrown, with a distinct ellipsoidal, white, longitudinal stripe, the pubescence on this stripe arranged into white triangles. Wings with faint apical shadow. Antennae olivebrown to reddishyellow. Subcallus and upper cheeks pinkishgrey | |
| | cohaerens WALKER. | |
| b. | Abdomen reddishbrown to blackbrown, the median stripe not present | |

on the scutes, but being limited only to the pubescences, the median stripe indistinct, broken or continuous, composed of yellow haired triangular spots on the 1st—6th segment, segmentations yellow fringed. Wings clear. Antennae yellowbrown to ferrugineous. Subcallus and upper cheeks goldenyellowbrown to ferrugineous

brunneothorax SCHUURMANS STEKHOVEN.

79. *Tabanus undulans* nov. spec. (♀) Pl. 8, Fig. 5, Textfig. 90.

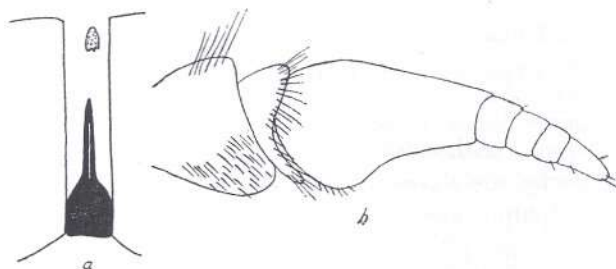
Habitat:

Type ♀ from Isle Doerian, Riouw Archipelago, Street Malacca, DAMMERMAN Coll. B.Z.M.

A medium-sized species, allied to *T. brunnipennis* RIC. but distinguishable at the parallel-sided whitish median abdominal stripe, the absence of lateral spots, the shape of the callus, the colouring of the antennae, etc. Forehead yellowbrown tomentose, black haired. Callus shining mahoganybrown, broad, reaching to the eyes, linear extension short and broad. Subcallus and upper cheeks brownblack to ferrugineous. Lower cheeks and face white, white haired. Palpi yellowish-grey, white and black haired, ending with an acute point. Antennae mainly black. Thorax dull dark olivebrown without longitudinal stripes, black haired. Wings infuscated on foreborder and near the apex. Legs yellowishbrown. Abdomen dull redbrown, darker to the apex, with a median longitudinal stripe.

Table of dimensions.

Bodylength	15,2 m.M.
Width of thorax	4,5 "
Width of abdomen	5 "
Wingexpanse	29,5 "
Length of head	2,5 "
Length of thorax	6 "
Length of abdomen	8,8 "
Length of wing	12,5 "
Breadth of wing	4,5 "
Foreheadindex	5 "



Textfig. 90

T. undulans s.s. ♀. a. forehead, b. antenna.

The Head. (Textfig. 90). Forehead the same width throughout, yellowbrown tomentose, vertexpart darker, redbrown. A greyish tomentose area runs along the linear extension of the callus. Vertexspot black, black haired, pubescence elsewhere blackbrown. Postocular rim sooty, white haired. Subcallus brownblack on upper border, rest as described. Palpi, first joint yellowish-grey, white haired, second joint stout, swollen at base, where it is pale yellowbrown to coffeenut-coloured, white haired, then attenuated, ending with a short, narrow, acute, havannabrown, black haired, point. Antennae dark, first joint protruding caplike over the 2d joint, dorsum violetredbrown, brownblack haired, ventral surface yellowbrown,

yellowwhite haired, second joint yellowbrown, black fringed, dorsal spine long, black. Third joint dark brownblack, without distinct tooth, broad at base, basal annulation 1.51 times as long as its widest part, 1.38 times as long as the stylus.

Thorax dull dark olivebrown, yellowbrown and black hairs being found in equal numbers. Lateral borders whitish tomentose, scutellum same colour as scutum, hindborder yellowwhite haired. Pteropleuron blackish, black haired. Breast bluishgrey, white haired. Mesosternumlobus black haired at hind border. Wings rather dark, with darkbrown shadows along most of the veins and a distinct apical shadow. Stigma reddishbrown, foreborder havanna-brown, no appendix. Veins chocolatebrown. Halteres yellowbrown. Legs. First leg. Coxa bluishgrey, white haired, apex brownish, trochanter shining redbrown, white haired. Femur brownishgrey tomentose, white haired, knee yellowbrown with some black hairs. Tibia basal 7/9 tawnyyellowbrown, clothed with black and pale yellow hairs, apex blackbrown, first tarsale redbrown, black haired, other tarsalia black. Second leg similar, tibia almost wholly pale yellowbrown, black haired, some yellow hairs being intermixed on dorsum, apex reddish-yellowbrown, black haired as is the ventral surface. Tarsalia redbrown, black haired. Third leg identical, tibia reddishyellowbrown, black haired, except on the ventral surface which presents a row of pale yellow hairs.

Abdomen dull reddishbrown, mainly black haired. First segment with a sootygrey spot at each side of the scutellum and a median tuft of pale yellow hairs. Second segment showing a median straight-sided black stripe, bearing at its apical end a pale yellow haired triangle, this longitudinal stripe is continued over the following segments (3-5) where it is white tomentose, and presents white haired, thick triangular hairtufts at the segmentations, thus giving the stripe an undulating appearance. The sixth segment bears a number of yellowwhite hairs, arranged in a stripe. Pubescence elsewhere black. Ventral surface with a median narrow, indistinct yellowbrown to blackbrown, black haired stripe, segmentations yellowbrown, yellow haired, sides bluishgrey tomentose. Lateral borders of tergites yellowbrown, yellow haired.

80. *Tabanus citripilosus* nov. spec. (♀) Pl. 6, Fig. 6; Textfig. 91.

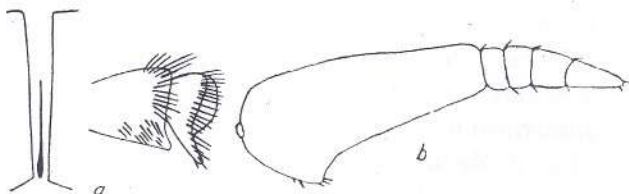
Habitat:

Type ♀ from Djambi on horse or cattle, 4.22, MARSIDI Coll. V. S. L.

A handsome species, allied to *T. puteus* Ric. but distinguishable inter alia by the shape of the forehead, callus and antennae, the colour of the beard and palpi. Forehead narrow, goldenyellowbrown, black haired, intermixed with some yellow hairs at base. Callus ochraceous redbrown, cylindrical, linear extension brownblack. Subcallus and upper cheeks ochraceous, black haired, lower cheeks white, white haired. Beard white. Face goldenyellowbrown, black haired, intermixed with some brownyellow hairs. Palpi pale yellowbrown to reddish yellowbrown, black haired. Antennae ochraceous, black haired on basal joints, third joint cinnamonbrown, tooth indistinct. Thorax pale olivebrown on scutum, citroneyellow and black haired, lateral borders paler. Wings diffuse brownish, with smokybrown apical shadow. Legs brownish, tibiae largely white at base, with dark apices. Abdomen deep redbrown, black haired with a median straight-sided, citroneyellow haired, longitudinal stripe, lateral borders of tergites pale yellow haired.

Table of dimensions.

Bodylength	11	m.M.
Width of thorax	3,5	"
Width of abdomen	3,5	"
Wingexpanse	21,9	"
Length of head	2,2	"
Length of thorax	44,5	"
Length of abdomen	5,6	"
Length of wing	9,2	"
Breadth of wing	3,5	"
Foreheadindex	10,5	"



Textfig. 91.

T. citripilosus s.s. ♀

a. forehead, b. antenna, broken into 2 pieces.

The Head. (Textfig. 91). Forehead $\frac{1}{3}$ narrower anteriorly than it is at vertex, where one finds a bluegrey vertexspot. The linear extension is the centre of a yellowish streak. Callus not reaching to the eyes. Eyes near subcallus with larger facets than on the rest of the surface. Upper cheeks black and brown haired, intermixed with some yellow hairs. Palpi, second joint broad at base, tapering to a long slender point, blunt at extreme apex, inner side pale yellowbrown, mainly yellow haired, with some black hairs near the apex, outer side reddish-yellowbrown, white tomentose, black haired. Proboscis brownblack, stalk white haired, sugarflaps black and pale brown haired. Antennae, first joint reddishrustybrown, white tomentose, black haired, second joint ochraceous-yellow, black haired, dorsal spine acute, black fringed, third joint cinnamonbrown, basal annulation 2,16 times as long as its widest part, 1,77 times as long as the stylus, tooth indistinct.

Thorax. Scutellum same colour as scutum. Pteropleuron dull reddishbrown, pale yellow and black haired. Hairtufts at base of wings and behind citronyellow haired. Breast yellow brown to yellow, bluishgrey tomentose, yellowishwhite to silverygrey haired. Wings, stigma indistinct, darkredbrown, foreborder brown, veins olivebrown, apical shadow smokybrown. Halteres reddishbrown. Legs. First leg. Coxa bluegrey, white haired, femur reddishbrown, dorsum white haired, intermixed with longer black pubescence, distal lateral borders silverywhite haired, intermixed with some black hairs at apex. Tibia yellowwhite, white haired, intermixed with some black hairs on basal $\frac{2}{3}$, apex blackbrown, black haired. Second leg. Coxa greyblue, white haired, trochanter reddishbrown, femur bluishred at base, then pale ochraceous yellowbrown, silverywhite haired, intermixed with some black hairs on the distal lateral border at apex. Tibia yellowwhite, white haired with narrow reddishbrown, black haired apical ring. Spurs blackbrown, subequal. First tarsale yellowwhite, white haired at base, apex reddishbrown, black haired, other tarsalia paler at base, elsewhere brownblack, black haired. Third leg, Coxa and trochanter reddishbrown. Femur bluegrey at base, apical $\frac{2}{3}$ reddish ochraceous-yellowbrown, yellowwhite haired. Tibia strawyellow, white haired, intermixed with some long black hairs on proximal lateral border, apical ring reddishbrown, black haired, ventral surface white haired. First tarsale as in second leg, other tarsalia blackbrown, black haired.

Abdomen incomplete, the last 2 segments are wanting, deepredbrown, darker at the segmentations, with the median longitudinal line covered with citronyellow pubescence. Ventral surface bluegrey, with a reddishbrown hue spread over the bases of the first 2 segments, other segmentations paler, scanty white haired.

81. *Tabanus cohaerens* WALKER (♀) Pl. 7, Fig. 2, Textfig. 92.Syn. *Atylotus picticornis* BIGOT*Atylotus alfourensis* BIGOT.

References:

WALKER, Proc. Linn. Soc. VIII, p. 177 (1865).

KERTESZ, Cat. Tab. (1908).

BIGOT, Mem. Soc. Zool. France V, p. 671 (1892).

,, Mem. Soc. Zool. France V, p. 762 (1892).

Habitat:

Nova Guinea

Type ♀ from Nova Guinea, A. R. WALLACE (Textfig. 92 a, c. d) Coll. BR.M.
other female ♀ ♀ same locality

3 ♀ ♀ from Rivierkamp, LORENTZ

respectively 2 ♀ ♀ on 2.'10

Coll. N.A.M.

1 ♀ ,, 2.'10

Coll. BR.M.

9 ♀ ♀ from Noordrivier, LORENTZ

Coll. N.A.M.

respectively 5 ♀ ♀ on 15/19.5.'07

4 ♀ ♀ ,, 9.'07

4 ♀ ♀ from Varenrivier, LORENTZ

respectively 3 ♀ ♀ on 1.5.'07

Coll. N.A.M.

1 ♀ ,, 1.5.'07

Coll. L.M.N.H.

1 ♀ from Bivakeiland 2.6.'07, LORENTZ

1 ♀ ,, Sabang, 7.'07, LORENTZ

Coll. N.A.M.

1 ♀ ,, Regeneiland 16.2.'10, LORENTZ

,,

3 ♀ ♀ ,, Etnabay '04/'05, LORENTZ

respectively 2 ♀ ♀

Coll. N.A.M.

1 ♀

Coll. BR.M.

3 ♀ ♀ from Dutch Nova Guinea, LORENTZ

Coll. BR.M.

1 ♀ ,, Hollandia V. K.

Coll. N.A.M.

2 ♀ ♀ ,, Hollandia

Coll. B.Z.M.

2 ♀ ♀ ,, Kloofbivak, VERSTEEG, S. Nova Guinea

Coll. N.A.M.

respectively 1 ♀ on 14.10.'12

1 ♀ ,, 18.10.'12

1 ♀ from Tor Rivier, Middleburg 9.10.'11

Coll. B.Z.M.

BIGOT's type of *A. picticornis*

Coll. BR.M.

BIGOT's type of *A. alfourensis*

,,

1 ♀ from Pioniersbivak, W. C. v. HEURN, 8.'20 (Textfig. 92 b, e)

Coll. B.Z.M.

1 ♀ ,, Prauwenbivak, W. C. v. HEURN 8'20

,,

1 ♀ ,, Nova Guinea without locality

,,

Isle Ceram

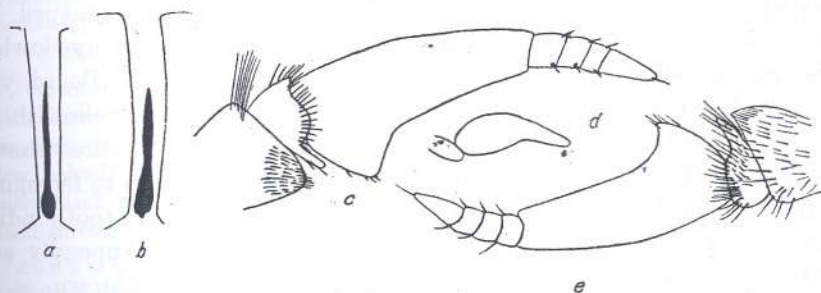
1 ♀ from 18.2.'10, Mrs. DE BEAUFORT

Coll. N.A.M.

1 ♀ ,, 4/6'10 W. Ceram, VAN DEDEM

,,

A rather small species, closely allied to *T. brunneothorax* SCHUURMANS STEKHOVEN. Forehead narrow greywhite, black haired. Callus redbrown, egg-shaped, linear extension long. Subcallus and upper cheeks pinkishgrey, black haired, lower cheeks white, white haired. Beard white. Face yellowish, white haired. Palpi olivebrown, whitish tomentose on the second joint, which is swollen at base, black haired, apex obtuse. Antennae olivebrown, black haired on basal 2 joints, third joint reddish yellow, with distinct tooth. Thorax reddishbrown, with 2 redbrown longitudinal stripes, yellow haired. Wings clear with faint brownish apical shadow. Legs yellowbrown. Abdomen tawnybrown, darker to the apex, black haired, with an elongate spindle-shaped white, white haired longitudinal stripe on the segments 2—6, composed of triangular spots and a grey tomentose, yellowwhite haired dot at each side of the scutellum and a yellow-white hairtuft in the middle of the first segment. Ventral surface with median blackbrown, black haired patches on most segments and yellowbrown, yellow-white haired segmentations. Lateral borders of the 6 tergites yellowwhite haired. Length 11.5 m.M.; Width of thorax 3,6 m.M.; Length of wing 10 m.M.; Wingexpanse 23,6 m.M.



Textfig. 92.

T. cohaerens Wlk. ♀. a, b. forehead, c. e. antennae, d. palpe.

The Head. (Textfig. 92). Forehead 0.4 narrower anteriorly than it is at vertex, index 8,66. Callus mostly redbrown, in other instances it is black at apex, linear extension black. Antennae, second joint with distinct dorsal spine, third joint with distinct tooth, basal annulation 1,8 times as long as its widest part, 1,8 times as long as the stylus.

Thorax, scutum denuded, bluish, yellow haired. Sides yellowbrown, pteropleuron yellowbrown, black haired. Breast bluishgrey, white haired. Wings with yellowbrown foreborder, havannabrown stigma and brown veins. No appendix. Halteres yellowbrown. Legs. First leg. Coxa grey, white haired, trochanter redbrown, femur reddishbrown, black haired knee yellowbrown, tibia yellowbrown, yellow haired on basal half, apex blackbrown, black haired. Tarsalia blackbrown, black haired. Second leg, femur yellowbrown, some black hairs being visible on dorsum, lateral borders and ventral surface white haired, intermixed with some yellow hairs. Tibia yellowbrown, yellow haired below, with a dorsal median longitudinal row of black hairs. First tarsale reddishbrown, black haired, other tarsalia black, black haired. Third leg identical, tibia yellowbrown, black haired on dorsum.

Abdomen as mentioned. Ventral surface, seventh segment wholly black haired. In some females the longitudinal median stripe is broken into separate spots, whereas in other cases it is formed as a continuous straight-sided, more or less ellipsoidal line.

The females of the Mamberamo expedition differ from the foregoing ones in that the forehead is redbrown, yellowbrown and black haired, vertexspot greyblack, black haired. Subcallus and upper cheeks bright redbrown, blackish redbrown haired. Face bordered white, median area brownish, white haired, some black hairs occurring just under the antennae and some others in the middle.

Possibly these females belong to a subform or local race of *T. cohaerens* Wlk.

82. *Tabanus brunneothorax* SCHUURMANS STEKHOVEN. (♀) Textfig. 93.

References:

SCHUURMANS STEKHOVEN, Treubia V, p. 313 (1924).

„ „ Treubia V, p. 313 (1924).

Habitat:

Type and 7 other ♀ ♀ from Buru, TOXOPAEUS, for further particulars see the original.

T. brunneothorax is a medium-sized brown species. Forehead red-brown, vertexspot blackish, brown and blackbrown haired. Callus egg-shaped, black-brown, linear extension long. Subcallus and upper cheeks goldenyellowbrown, blackishbrown haired, lower cheeks bluishgrey, white haired. Beard yellow-white haired. Face greywhite in the middle, lateral borders yellowishbrown, blackbrown haired just underneath the antennae, goldenyellow haired elsewhere. Palpi reddishyellowbrown, black haired. Antennae yellowbrown to ferrugineous, black haired on basal joints, third joint ferrugineous, then black, tooth indistinct. Thorax dark brown, blackbrown and yellowbrown haired. Appendix seldom present. Wings rather clear. Legs brown. Abdomen reddishbrown at base, apex blackbrown, marked with an indistinct stripe, composed of yellow haired triangles on the 1st—6th segments, lateral borders of tergites yellowbrown, yellowwhite haired, segmentations yellow fringed; in some of the specimens the median stripe is continuous, but the yellow pubescence on the same varies in density.

Table of dimensions.

Bodylength	varying from 13,2 m.M. to 16 m.M.			
Width of thorax	„	„	3,8	„ — 5 „
Width of abdomen	„	„	4,8	„ — 5,4 „
Wingexpanse	„	„	27,4	„ — 32,4 „
Length of head	„	„	2	„ — 3,2 „
Length of thorax	„	„	5	„ — 8,5 „
Length of abdomen	„	„	6,2	„ — 9 „
Length of wing	„	„	11,8	„ — 14,2 „
Breadth of wing	„	„	4	„ — 5 „
Foreheadindex	„	„	6,2	„ — 8,6 „



Textfig. 93.

T. brunneothorax s.s. ♀

a. forehead, b. antenna,

c. palpi.

The Head. (Textfig. 93). Forehead $1/5-1/7$ narrower anteriorly. Callus blackbrown to nutshell-brown and pale reddishbrown, gradually tapering to the linear extension. Palpi, first joint dark velvetybrown, brown haired, second joint ending with a long point, black haired, intermixed with yellow hairs. Postocular rim brown haired. Antennae, first joint yellowbrown, dorsum thick black haired, distal lateral border yellowbrown haired, second joint ferrugineous, black fringed, third joint ferrugineous, stylus black.

Thorax darkbrown, clothed with a mixture of blackbrown and yellowbrown hairs, pteropleuron rustybrown, black and reddish rustybrown haired. Breast greywhite haired, mesosternumlobus black haired.

Wings with yellowbrown foreborder, upper and lower basal cell yellowbrown, stigma blackish sooty brown, apex of wing with a sooty stripe. Appendix absent in 6 out of 8 females, the 7th ♀ presents an appendix, the eight ♀ has a distinct appendix on the right wing and a rudimental one on the left wing. Halteres, stalk dark brown, club reddishbrown. Legs. First leg, coxa bluishgrey tomentose, silverygrey haired with brownish hairs along the lateral border, femur deep reddish brown, dorsum black haired, distal lateral border dirty white haired, ventral surface brownyellow haired, tibia yellowbrown, yellowbrown haired, intermixed with some black hairs on basal $3/4$, apex black, black haired, at extreme base one finds a black, black haired ring, tarsalia reddishbrown, black haired. Second leg, coxa bluishgrey, apex brownishgrey, brownish yellowwhite haired, trochanter blackbrown, black and brownishyellowwhite haired, femur yellowbrown, mainly white haired, intermixed with a number of black hairs, tibia yellowbrown, reddish at apex, dorsum black haired, ventral surface ochraceousyellow haired. Third leg, femur violet reddishbrown, dorsum yellowwhite haired, lateral borders black and yellowwhite haired, tibia reddishcaramelbrown, dorsum black haired, ventral surface yellowbrown haired, tarsalia reddishbrown, black haired.

Abdomen as described, ventral surface dark blackbrown, black haired on the median longitudinal dark band, sides and segmentations paler, yellowbrown haired, seventh segment wholly black haired.

In one of the other ♀♀ the abdominal markings are white on the dorsal surface. In some of the specimens the median stripe is continuous, but the haircovering on the composing triangles is seldom equally thick everywhere, which means that on the posterior border black hairs are intermixed, thus giving the impression that the median stripe is not continuous. Viewed in certain lights one can see it as a whole.

T. brunneothorax is allied to *T. cohaerens* Wlk, but differs in the following points, inter alia the callus, the shape of the forehead, the shape of the basal annulation of the third antennal joint and the shape of the abdominal markings.

GROUP IV.

Group IV includes species with a pale, greyish or pollinose yellow thorax, the brownish abdomen presenting a median pale tomentose, yellow or white haired median straight-sided or serrated longitudinal stripe. No lateral stripes. Legs ochraceousyellow or whitish, the tibiae in most species usually largely yellow or white. Wings clear or with an apical shadow, mostly missing an

appendix. Eyes wholly green in most species in the female sex. Antennae ochraceously yellow, or more or less dark brown. Beard yellow or white.

KEY 14.

Synopsis of species.

- | | | |
|-----|---|----|
| 1a. | Median abdominal stripe grey or white, white haired..... | 2 |
| b. | Median abdominal stripe yellow, yellow haired | 3 |
| 2a. | Median abdominal stripe straight-sided, ending on the 6th segment. Forehead narrow, yellowish. Callus triangular, olive brown, linear extension fine and long. Wings with an apical shadow | |
| | <i>hirtistriatus</i> RICARDO. | |
| b. | Median abdominal stripe serrated on the 3d and 4th segment. Forehead broader, golden brown. Callus square, linear extension absent or very short. Wings wholly clear | |
| | <i>canipus</i> SCHUURMANS STEKHOVEN. | |
| 3a. | Abdomen strongly attenuated to the apex, ending blunt | 4 |
| | Abdomen normal | 5 |
| 4. | Abdomen with a broad median yellow, scanty yellow haired longitudinal stripe, ending on the sixth segment. Legs wholly yellow brown. Wings with a distinct apical shadow. Forehead olive brown, the heart-shaped callus gradually passing into the broad linear extension. Beard white | |
| | <i>aurilineatus</i> SCHUURMANS STEKHOVEN. | |
| 5a. | Forehead broad, index 3 | 6 |
| | Forehead narrow, greater than 4 | 7 |
| 6. | Callus rectangular, covering almost the whole frons, or square and provided with a short, club-shaped linear extension. Beard black brown. Wings with an apical shadow, Legs chestnut brown. Abdomen tobacco-brown with a median narrow, straight-sided, yellow white, yellow haired longitudinal stripe | |
| | <i>puteus</i> RICARDO. | |
| 7a. | Callus cylindrical, narrow, almost without any distinct linear extension | 8 |
| b. | Callus egg-shaped, triangular, club-shaped, linear extension distinct.. | 11 |
| 8a. | Abdomen with a broad median longitudinal stripe | 9 |
| b. | Abdomen with a narrow or even a rudimental longitudinal stripe.. | 10 |
| 9a. | Upper cheeks rusty brown, black haired. Antennae, third joint yellow-brown, darker at apex. Thorax pollinose yellow, with traces of 3 yellowish, sulfuryellow haired longitudinal stripes. Legs with cinnamon brown, black haired femora and pale yellow brown, partly golden yellow, partly black haired tibiae. Abdomen, ventral surface white series of median, narrow, dark brown, black haired patches | |
| | <i>hybridus</i> WIEDEMAN. | |
| b. | Upper cheeks ochraceously yellow, yellow white haired. Antennae, third joint wholly red yellow. Thorax pollinose yellow, without longitudinal | |

stripes. Legs with pale orangeous-yellow, mainly yellow haired femora and yellowwhite, white haired tibiae. Abdomen, ventral surface coffee-brown, yellow haired, without ventral black, black haired patches
latifascies SCHUURMANS STEKHOVEN.

- 10a. Median abdominal stripe narrow, ending on the 5th segment. Forehead ochraceousyellow. Linear extension hidden under the ochraceousyellow tomentum. Beard yellowwhite. Palpi, second joint mainly yellowwhite haired. Wings without apical shadow. Legs with strawyellow, yellow-white haired femora
gilvus SCHUURMANS STEKHOVEN.

- b. Median abdominal stripe rudimental (this species might therefore be brought also to the fifth group). Forehead yellowbrown. Linear extension small, separated from the callus. Palpi yellow, black haired. Wings with yellowbrown, yellow haired femora
cylindricollosus SCHUURMANS STEKHOVEN.

- 11a. Median abdominal stripe straight-sided 12
b. Median abdominal stripe serrated 19
12a. Basal annulation, of third antennal joint broad and curved, bearing a prominent tooth 13

- b. Basal annulation of third antennal joint more elongate, tooth indistinct 14
13. Body small. Callus elongate egg-shaped or reversed heart-shaped, linear extension fine. Cheeks greywhite, white haired. Antennae orangeous. Wings appendiculate, without apical shadow. Legs with largely strawyellow, yellow haired tibiae. Abdomen conical, ventral surface brownishyellow, white haired on the first 5 sternites, then blackbrown, black haired
flavitibiatus SCHUURMANS STEKHOVEN.

- 14a. Basal annulation of third antennal joint yellowred, more than 3 times as long as its widest part 15

- b. The same part less slender 16

15. Forehead goldenbrown. Callus with broad linear extension. Thorax yellowbrown, blackbrown haired, intermixed with some goldenyellow hairs. Wings with siennabrown apical shadow. Legs yellowbrown, tibiae yellowwhite haired. Abdomen oakbrown, median abdominal stripe, ending on the 5th segment narrow, ventral surface yellow haired on the first 5 segments
longibasalis SCHUURMANS STEKHOVEN.

- 16a. Subcallus and upper cheeks redbrown, redbrown haired, palpi black haired 17

- b. Upper cheeks white haired, palpi white haired 18

17. Forehead rather broad. Callus egg-shaped, linear extension slender. Antennae, third joint havannabrown. Thorax reddishyellowbrown, yellow haired. Wings brownish, with distinct havannabrown apical shadow, appendix rudimental. Abdominal stripe rather broad, yellow-

brownish, ending on the 5th segment, ventral surface with a median series of blackish, black haired patches

paralleliventer SCHUURMANS STEKHOVEN.

- 18a. Antennae reddishyellow, black tipped. Thorax medlarbrown, fine yellow haired. Wings with fine brown apical shadow. Abdomen with a broad median longitudinal stripe, ending on the sixth segment, ventral surface yellowbrown, white haired on the first segments. Eyes in the male sex with all facets almost equal in size

burmanense SCHUURMANS STEKHOVEN.

- b. Antennae wholly redbrown. Wings deep brown along the foreborder, no shadows along the veins. Thorax chestnutbrown, thick goldenyellow haired. Abdomen with a straight-sided median stripe, in other respects identical to the abdomen of *T. auristriatus* RICARDO

rectilineatus SCHUURMANS STEKHOVEN.

19. Callus egg-shaped, linear extension broad. Antennae, third joint reddishyellowbrown. Thorax chestnutbrown, goldenyellow haired. Abdomen with the serrated median stripe ending on the 5th segment and yellow fringed segmentations, ventral surface reddishbrown, black haired, first 5 segments with yellow haired segmentations **auristriatus** RICARDO.

83. *Tabanus hirtistriatus* RICARDO (♀). Pl. 7 Fig. 4 Textfig. 92.

References:

RICARDO, Rec. Ind. Mus. IV, p. 158 (1911).

SENIOR WHITE, Dept. Agricult. VII (1922).

Habitat:

Type ♀ from Perak, Federated Malay States, STANTON Coll. BR.M.

4 ♀ ♀ from Darien Typus, Negri Sembilan, 2 of which in the Coll. „
Riouw and Lingga Archipelago

6 ♀ ♀ caught on board of the Gouvernements steamer „Brak” at night near
the lights at 0,1 N. Br. and 105 49' East, at 1,3 mile East of Sumatra's
shore, DAMMERMAN coll. on 20.6.'23 Coll. B.Z.M.

Sumatra

7 ♀ ♀ from Si Baho, Oedjoeng Padang, Goenoeng Toea, Padang Sidempoean,
Tapanoeli, LOBEL and BAKKER Coll. V.S.L.

respectively 1 ♀ on horse on 19.'22 (Textfig. 92 a, c, d)

3 ♀ ♀ „ „ 19.7.'23

1 ♀ „ „ „ 31.8.'24

1 ♀ „ buffalo on 3.'23

1 ♀ „ „ „ 22.10.'24

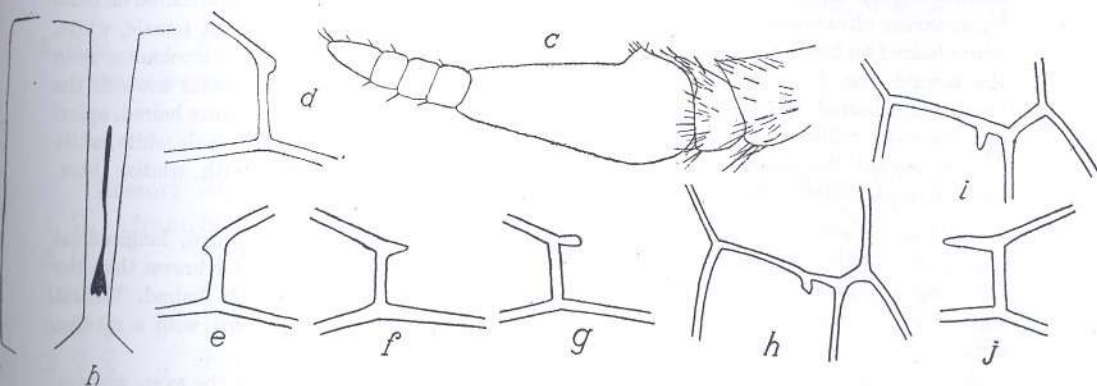
4 ♀ ♀ from Sawah Bangoenan, Portibi, Goenoeng Toea, Padang Sidempoean,
Tapanoeli, LOBEL and BAKKER Coll. V.S.L.

- respectively 1 ♀ on horse on 11.7.'23 Textfig. 92 e, f (right, left wing)
 2 ♀ ♀ „ „ „ 13.7.'23 Textfig. 92 h, i, j
 1 ♀ „ „ „ 23.9.'24 Textfig. 92 g.

T. hirtistriatus Ric. is a small dullbrown-coloured, species. Forehead very narrow, goldenyellow tomentose, brownblack haired, strongly attenuated to the base. Callus narrow, elongate triangular, olivebrown with fine linear extension, often separated from the callus. Subcallus and cheeks ochraceousyellow, upper cheeks brownblack haired, lower cheeks greyish, white haired. Beard white. Face more yellowbrown. Antennae ochraceous orangeousyellow with darker apex and distinct tooth. Palpi pale strawyellow, black haired. Thorax olivegreenbrown, greyish at foreborder without distinct longitudinal stripes, pubescence black and butteryellow. Wings with brown, fumigated foreborder and similar apical shadow. Legs brownish, tibiae pale ivoryyellowwhite, white haired with chocolatebrown, black haired apex. Abdomen with median straight-sided, white haired longitudinal stripe, ventrally brickred, white haired on sides and segmentations and with an indistinct median black band.

Table of dimensions.

Bodylength	varying between 10,8 m.M. and 13,5 m.M.			
Width of thorax	„	„	3,5	4
Width of abdomen	„	„	3,5	1,8
Wingexpanse	„	„	22,5	25,6
Length of head	„	„	1,8	2
Length of thorax	„	„	4,4	5,2
Length of abdomen	„	„	6	8,2
Length of wing	„	„	9,2	10,8
Breadth of wing	„	„	3,5	4,5
Foreheadindex	„	„	10,5	15



Textfig. 92.

T. hirtistriatus Ric. ♀. a, b. forehead, c. antenna, d—j. wingstructures.

The Head. (Textfig. 92). Forehead goldenyellow tomentose, brownblack haired, vertexspot grey, thick black haired. Callus olivebrown at base, black at apex. The linear extension is separated or connected with the callus; in the first case the space between the callus and the visible part of the linear extension is covered with tomentose dust. Subcallus and upper cheeks beautiful ochraceousyellow. An olivebrown spot is found between callus and subcallus. Cheeks and subcallus as mentioned. Face bluegrey in the middle, just underneath the antennae and on the lateral borders it is yellowbrown tomentose, near the mouth it is yellowbrown, brownblack haired. Palpi pale strawyellow, first joint mainly white haired, with some black hairs at apex, second joint slender, not very stout at base, ending with a long, rather acute point, white tomentose with a regular, not thick, black haircovering. Antennae ochraceous orange, first joint slightly paler, owing to the white tomentum, black haired on dorsum at apex, distal lateral border brownblack haired, second joint dull yellowbrown, white tomentose with rather long dorsal hump, black hairs arranged in 2 rows. Third joint ochraceous-orange with somewhat darker apex of the 5th annulation. Basal annulation 1.95 times as long as its widest part and 1.6 times as long as the stylus; tooth distinct, crowned with some black hairs. Proboscis, stalk short, white haired, sugarflaps with brownblack and brown stiff bristles. Postocular rim ochraceousyellow haired.

Thorax with 3 narrow, redbrown longitudinal stripes, faintly indicated on the grey tomentose foreborder, elsewhere olivegreenbrown, black and butteryellow haired, last hairs particularly numerous at the hindborder of the scutum, scattered more diffusely over the rest of the scutum or compressed to tufts at the wingbases and behind them. Scutellum same colour as the scutum, hindborder surrounded with pale butteryellow hairs. Pteropleuron redbrown, black haired. Sides and breast greywhite, white haired. Mesosternum with a yellowbrown hue. Wings as mentioned. RICARDO's type presents a distinct appendix on the left wing only. In other females I did find a similar, more or less rudimental, appendix in one or both wings. So in 14 females 2 had an appendix on the right wing only, 2 others on the left wing only and 6 on both wings. In 2 exceptional cases one of the veins, surrounding the disc cell, presented an appendix. Veins dullbrown, accompanied by pale brown shadows. Halteres rusty brown. Legs. First Leg. Coxa olivebrown, greyish tomentose, white haired. Femur darker olivebrown on dorsum in the middle, black haired, distal lateral borders black haired, with some white hairs more ventrally; Tibia, basal half pale ivoryyellowwhite, white haired, extreme base redbrown, apical half olivaceous chocolatebrown, black haired. First tarsale dull blackbrown, black haired, other tarsalia wholly black. Second leg, Coxa bluegrey, white bordered, trochanter redbrown. Femur pale ochraceous yellow, slightly greyish tomentose at base, the dorsum bears a number of scattered black hairs especially in the median line, pubescence elsewhere greywhite, long on the distal lateral borders. Tibia pale yellow, white haired on basal $\frac{2}{3}$, apexring olivaceous redbrown, black haired, ventrally 2 black spurs. First tarsale, white, white haired on basal part, elsewhere black, black haired. Third leg, Coxa and trochanter as in the second leg, femur bluishgrey on basal half, then dark olivebrown, paler towards the knee, white haired, with some black hairs on the apex. Tibia strawyellow, white haired, apical ring narrow, redbrown, black haired, ventrally wholly white haired, first tarsale white, white haired, except the redbrown, black haired apexring, second tarsale with whitish base, black haired, other tarsalia black.

Abdomen dullbrown, blackbrown haired with median, straight-sided, longitudinal white, white haired stripe from 1st till 6th segment. Base of abdomen paler brown than the following segments, apex nearly black. Lateral borders of tergites white haired. Ventral surface brickredbrown, white haired on segmentations and lateral borders, with a median indistinct browngrey, black haired longitudinal band.

Both females from Darien Typus have a callus, which nearly reaches to the eyes, whereas the callusstripe is rather broad. The median abdominal stripe is only indistinctly visible. So I doubt whether these females really belong to *T. hirtistriatus* RICARDO.

RICARDO mentions a series of males in the Indian Museum Coll. from Burma, which I consider however as belonging to a distinct species, of which SENIOR WHITE has discovered the female, confer *T. burmanense* SCHUURMANS STEKHOVEN.

84. *Tabanus canipus* nov. spec. (♀) Pl. 7, Fig. 1; Textfig. 93.

Habitat:

Sumatra

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan, Res. Tapanoeli,

Type ♀ from Hoeta Nagodang, Manambin, on buffalo, 24.12.'22, LOBEL
Coll. V.S.L.

5 ♀ ♀ from same locality, 24.12.'22, LOBEL

4 ♀ ♀ „ Moeara Tagor, Tamiang, BAKKER

respectively 2 ♀ ♀ on buffalo 30.9.'23

2 ♀ ♀ „ „ 14.5.'24

2 ♀ ♀ from Si Gengoe, on buffalo 1.10.'23, BAKKER

1 ♀ „ Moeara Poengkoet, Tamiang, on horse 26.5.'24, BAKKER

Coll. V.S.L.

5 ♀ ♀ „ Kota Nopan, BAKKER

respectively 2 ♀ ♀ on horse 12.5.'24

2 ♀ ♀ „ „ 26.5.'24

1 ♀ „ buffalo 26.5.'24

4 ♀ ♀ from the Ressort Kota Nopan, without further indications, BAKKER
5.'24 Coll. V.S.L.

1 ♀ from Panjaboengan, Mandailing on buffalo 5.2.'22, TARIP (Textfig. 93 a, d)

Ressort Padang Sidempoean, Mantrie Ressort Binanga, Res. Tapanoeli,

1 ♀ from Hoeta Nopan, Hoeta Nopan on horse 28.8.'24, BAKKER (Textfig. 93 e)

1 ♀ „ Pagaran Sihdoeng, Hoeta Nopan on buffalo 10.12.'22, LOBEL

1 ♀ „ Djandi Lobi, Siboehoean, on buffalo 10.12.'22, LOBEL (Textfig. 93 f.)

Coll. V.S.L.

5 ♀ ♀ „ Si Oendol, Paringgonan, BAKKER

respectively 3 ♀ ♀ on buffalo 18.7.'23

1 ♀ „ „ 14.11.'23

1 ♀ „ horse 18.7.'23

Ressort Radang Sidempoean, Mantrie Ressort Padang Sidempoean,

1 ♀ from Si Gala gala, Marantjar on cow, 3.8.'23, BAKKER (Textfig. 93 c)

2 ♀ ♀ „ Si Hitang, Batoe na Doea on horse 6.8.'23, BAKKER

1 ♀ „ Pidjor Koling, Pidjor Koling on horse 6.8.'23, BAKKER (Textfig. 93 b)

3 ♀ ♀ „ Bintoedjoe, Moeara Tais, on buffalo 26.9.'23, BAKKER

2 ♀ ♀ „ Fort de Kock, MEERENS, 11.'22

Isle Borneo

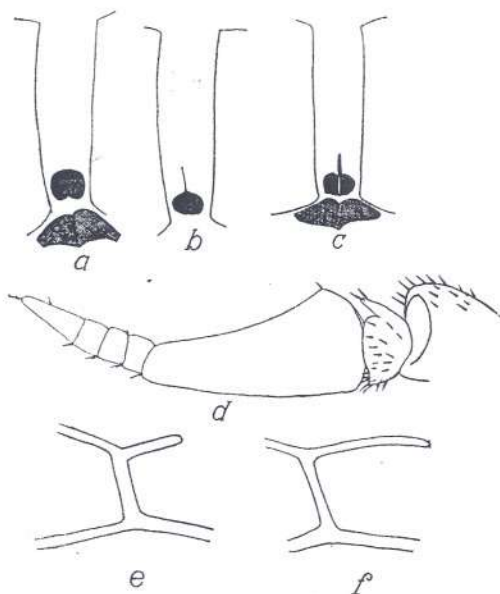
1 ♀ from Upper Sibau River, 6.1894, BUTTIKOEFER

Coll. L.M.N.H.

T. canipus is a small-sized, green-eyed, grey species, with a median whitish, white haired longitudinal stripe, interrupted on some segments of the abdomen. Forehead goldenbrown tomentose to blackbrown. Callus square, nearly always without linear extension. Subcallus blackish, blackbrown haired, upper cheeks goldenbrown, lower cheeks bluishgreyyellow, yellow brown haired. Beard pale yellowwhite. Face yellowbrown. Palpi stout, black and white haired. Antennae pale yellowbrown, with an indistinct tooth. Thorax dull greybrown, yellowbrown and black haired without distinct longitudinal stripes. Wings clear. Legs pale yellowbrownish.

Table of dimensions.

Bodylength	varying from	11	m.M.	—	17	m.M.
Width of thorax	"	"	4	"	—	5
Width of abdomen	"	"	4	"	—	5,2
Wingexpanse	"	"	23,2	"	—	28,6
Length of the head	"	"	1,8	"	—	2,6
Length of thorax	"	"	4,6	"	—	6
Length of abdomen	"	"	6	"	—	8
Length of wing	"	"	9,6	"	—	11,8
Breadth of wing	"	"	3,2	"	—	4,2
Foreheadindex	"	"	3,4	"	—	4,9



Textfig. 93.

T. canipus s.s. ♀

a—c. forehead, d. antenna, e. f. wingstructures

The Head. (Textfig. 94). Eyes green. Forehead goldenbrown tomentose at base, yellowbrown haired, elsewhere darker redbrown, black haired, intermixed with some yellowbrown hairs, in a few specimens it has almost the same width throughout, in others it is 0,12—0,33 narrower anteriorly than it is at vertex. Vertex paler goldenbrown tomentose. Callus square, mahoganybrown, not reaching to the eyes, without linear extension in the type, in other specimens with a short black linear extension. Subcallus dull pale yellowish havannabrown tomentose, shining yellowbrown, when denuded, slightly convex with a median sulcus. Upper cheeks goldenbrown, blackbrown haired, lower cheeks bluishgrey, yellowbrown haired. Beard pale yellowwhite. Face yellowbrown at base, bluishgrey tomentose at apex, pale yellow haired, intermixed with a single brownblack hair. Palpi thickset, pale olivebrown, white haired, intermixed with a few black hairs

at apex, second joint stout, broad at base, tapering to a point, white haired at base, black haired at apex. Antennae, first joint pale yellowbrown, black haired on dorsum, distal lateral border pale yellow haired, second joint same colour, black fringed with a sharp dorsal point, third joint orange, basal annulation 2 times as long as its widest part and 1.56 times as long as the stylus. Tooth indistinct.

Thorax dull greybrown with three indistinct, olivebrown longitudinal stripes, foreborder yellowwhite haired, intermixed with some black hairs, pubescence on the disc greybrown to yellowbrown, intermixed with black hairs. Scutellum same colour as scutum, black haired in the middle. Breast and sides brownishblue, grey tomentose, white haired with some black hairs on the mesosternumlobus. Pteropleuron sooty greybrown, black haired. Wings clear, veins blackbrown, appendix varying from short to long; stigma havannabrown. Halteres, stalk redbrown, club yellowbrown. Legs. First leg. Coxa bright greyish-pinkbrown with dark blackish apex, white haired. Femur blackbrown on ventral surface, bare, with pale yellowbrown hue, knee honeyyellow, dorsum and lateral borders white haired, intermixed with some black hairs on the dorsum, mainly situated in the middle. Tibia pale yellowbrown, white haired, intermixed with some black hairs on the basal part, olivebrown, black haired at apex, ventral surface white haired. Tarsalia dull olivebrown, white haired on the venter, white and black haired on the dorsum. Second leg. Coxa bluegrey, white haired, trochanter redbrown, femur strawyellowwhite haired, some black hairs at apex. Tibia mainly pale yellowwhite, white haired, with a number of black hairs in the middle on dorsum, apex brownish, black fringed, spurs subequal, redbrown. Tarsalia yellowbrown, dorsally black and white haired, ventral surface black fringed. Third leg, Coxa dull pale yellowbrown, white haired. Trochanter olivebrown, white haired, femur strawyellow, white haired, with two fringes of black hairs on dorsum. Tibia brownyellow, at apex, black hairs arranged on the dorsum in longitudinal rows, distal lateral border long yellow haired, intermixed with some black hairs ventral surface yellowwhite haired. Tarsalia caramelyellowbrown, black and white haired, ventrally mainly yellow haired.

Abdomen with a median white stripe over the first 3 segments, continued on the 4th and 5th segment as pointed triangles, the mentioned markings being yellowwhite haired. Moreover the first segment presents a bluishgrey tomentose, white haired spot at each side of the scutellum, connected with the median stripe, so that this seems to be forked. On the segmentations 1 and 3 some yellowwhite hairs appear. The median stripe is accompanied by darker blackish to blackbrown shadows, apex blackbrown, base pale brown, black haired. Lateral borders of tergites yellowbrown, white haired. Ventral surface dullgreybrown with yellowbrown segmentations, white haired. The median pale stripe on the dorsum is variable, so in one of the females the median stripe ends on the 6th segment, in another one the first triangle is found on the 3d segment.

85. *Tabanus aurilineatus* nov. spec. (♂, ♀) Pl. 7, Fig. 5, 6; Textfig. 94, 95.

References:

AUSTEN, Bull. of Ent. Res. XII, p. 451 (1922).

Habitat:

Isle Sumatra

Type ♀ from Meurendoë, Gvt. Atjeh, East Coast, C. DIEBEN 3.'23 (Textfig 94 a.c.)
Coll. V.S.L.

2 ♀ ♀ from Meurendoë, C. DIEBEN 3.'23 (Textfig. 94 b, d) „

Federated Malay States

2 ♀♀ from Tebing Tinggi, Kalantan, 7.'20, v. KNIGHT

Coll. R.M.S.

Type ♂ from Siam, Rumpibun 9.3.'22 (Textfig. 95).

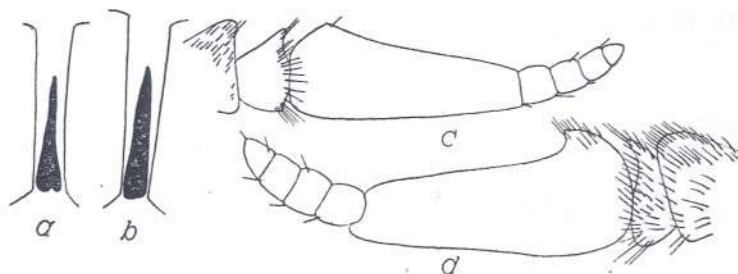
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A yellowish species, closely allied to *T. pugiunculus* AUSTEN but distinguished inter alia in the male sex by the smaller prolongation of the black-facetted part which does not reach the vertex and the narrow, more elongate basal annulation of the third antennal joint. Eyes in the female wholly coppergreen. Forehead rather broad, olivebrown with elongate, heart-shaped, shining yellowbrown callus. Upper cheeks darkredbrown, black haired, lower cheeks yellowishgrey, white haired. Beard white. Face brownishyellowwhite, yellowbrown haired. Palpi long orangeousyellowbrown, black and white haired. Antennae same colour, mainly black haired, tooth more or less indistinct. Thorax hazelnut-yellowbrown with pale yellow pubescence. Wings with distinct brown apical shadow. Legs yellowbrown, yellowbrown haired. Abdomen conical, elongate, ferrugineous to redbrown, with a median rather broad parallel-sided, yellow, yellow haired longitudinal stripe, ending on the sixth segment.

The Female

Table of dimensions.

Bodylength	varying from 13,8 m.M. — 15,8 m.M.				
Width of thorax	„	„	3,8	„	— 5 „
Width of abdomen	„	„	4	„	— 4,2 „
Wingexpanse	„	„	29	„	— 30 „
Length of head	„	„	2	„	— 3 „
Length of thorax	„	„	4,5	„	— 5,2 „
Length of abdomen	„	„	8,5	„	— 9,2 „
Length of wing	„	„	12,5	„	— 13 „
Breadth of wing	„	„	4,5	„	— 4,8 „
Foreheadindex	„	„	5	„	— 5,5 „



Textfig. 94.

T. aurilineatus s.s. ♀. a, b. forehead, c, d. antenna,

The Head. (Textfig. 94). Forehead olivebrown, almost the same width throughout or slightly narrower at base. Callus broad as in *T. brunnipennis* RIC. reaching to the eyes, tapering to a blunt point, darker at apex. Face brown-yellow at sides,

whitish yellow in the middle, yellowbrown haired. Palpi, first joint pale yellowbrown, white

haired at base, black haired at apex, second joint orangeousyellowbrown, long, with long rather acute point, black and yellowbrown haired. Antennae, first joint orangeousbrown-black, black haired, intermixed with some yellowbrown hairs, second joint with a short blunt dorsal hump, black haired, third joint orangeousyellowbrown with an indistinct tooth and a long finger-shaped process, basal annulation 2,1—2,3 times as long as its widest part and 1,8—2 times as long as the darker stylus. In the Malacca females the second joint bears a thicker haircovering and the third joint has a more distinct tooth. Postocular rim greyish, black haired.

Thorax, foreborder dotteryellow, disc more redbrown, yellow tomentose, especially at the lateral borders. No longitudinal stripes, pubescence pale yellow and black. Scutellum same colour as the scutum, darker in the middle than at the dotteryellow borders. Pteropleuron goldenyellowbrown, black haired. Hairtufts at base of wings and behind brownishyellow, shoulders black haired. Sides and breast greyish, pale brownishwhite haired. Wings, foreborder and apical shadow havanabrown, elsewhere pale brownish yellow. Veins yellowbrown. Halteres dark nutbrown. Legs brown to redbrown. First leg, Coxa coffeenutbrown, whitish tomentose, white haired; in the Malacca females there are some black hairs at apex. Femur tawny-leatherbrown, knee yellowbrown, on dorsum black and goldenyellow hairs are intermixed in the type, in the Malacca females it is wholly black haired, distal lateral border yellowwhite and black haired. Tibia yellowbrown, yellowbrown haired on the basal $\frac{2}{3}$, growing darker blackbrown to black on the black haired apex, ventral surface yellowbrown haired, except on the apical black haired ring. First tarsale redbrown, black haired. Other tarsalia black. Second leg Coxa greyish redbrown, trochanter redbrown, femur redbrown, goldenyellowbrown haired with some black hairs at apex. Tibia redbrown, yellowbrown haired, with darker black haired apex. Tarsalia redbrown, black haired. Third leg Coxa greybrown, white haired, trochanter redbrown; femur identical; Tibia similar. Tarsalia redbrown, black haired.

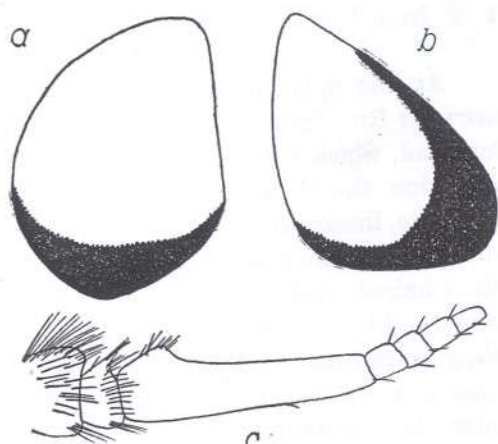
Abdomen long, narrow, black haired, with broad ochraceousyellow, parallel-sided median longitudinal stripe, starting on the second segment and ending on the sixth, covered with rather long, chromyyellow pubescence. First segment more olivebrown, hindborders of tergites reddish brown to blackbrown. Ventral surface reddishyellowbrown, yellowish orange haired, with a median more redbrown, longitudinal band, covering the third and following segments. Fifth to seventh segment blackbrown with yellowbrown segmentations.

The Male

Identical to the female

Table of dimensions

Bodylength	15	m.M.
Width of thorax	4	"
Width of abdomen	4	"
Wingexpanse	29	"
Length of head	2,2	"
Length of thorax	5	"
Length of abdomen	8	"
Length of wing	12,5	"
Breadth of wing	4,4	"



Textfig. 95.

T. aurilineatus s.s. ♂.

a. eye, frontview, b. seen from above, c. antenna.

The Head. (Textfig. 95). Eyes with a narrow area of small facets, not reaching to the vertex, elsewhere the facets are bigger, brown, with short hairs in the interstices. Subcallus pale goldenyellowbrown as the upper cheeks, brown haired. Lower cheeks grey white, beard white. Face yellowbrown, bare. Palpi short, first joint club-shaped, with some yellowbrown hairs at base, black haired at apex, second joint club-shaped, pointed, brown-black haired on dorsum, yellowbrown haired on lateral borders. Proboscis yellowbrown to darker redbrown, brownblack haired. Antennae, first joint cylindrical, pale olivebrown, black haired, with some yellowbrown hairs on the ventral surface. Second joint orangeous-yellowbrown with fine dorsal spur, black haired. Third joint same colour, basal annulation 3,3 times as long as its widest part, 1,78 times as long as the stylus.

Thorax as in the female, wings similar, halteres stalk whitish, club yellowish dull brown. Legs. First leg as in the female, femur wholly black haired. Tibia dark oakbrown with dark havannabrown, black haired apex. First tarsale dark havannabrown, black haired, other tarsalia black. Second leg identical, femur with pale yellowbrown, yellow haired knee elsewhere black haired, distal lateral border yellow haired. First tarsale paler than the following ones, yellowbrown, black haired. Third leg darker than the second.

Abdomen black haired, dark reddish olivebrown with a median yellow, yellow haired parallel-sided stripe, running from the 2d till the end of the the segment. Ventral surface reddishyellowbrown on first 3 segments, elsewhere nearly black, pubescence black with yellow haired segmentations. First sternite with a median yellow haired tuft.

86. *Tabanus puteus* RICARDO. (♀ ♂), Textfig. 96.

References:

RICARDO, Rec. Ind. Mus. IV, p. 165 (1911).

Habitat:

Type ♂ from Ceylon, Veverry, YERBURY, 25.10.'91 (Textfig 96 a)

Coll. BR.M.

another ♂ from Ceylon, Trincomalee

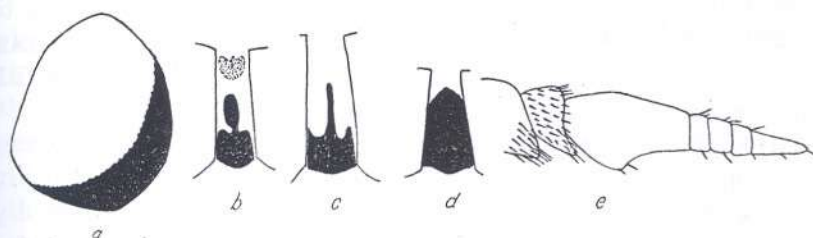
Type ♀ and another ♀ from Hot Wells, Trincomalee, Ceylon 29.10.'91 (Textfig. 96 b, c, e)

Coll. BR.M.

1 ♀ from Colombo (Textfig. 96 d)

„

At first sight one could take *T. puteus* Ric. specimens for those of *T. hirtistriatus* Ric. They are however distinguishable inter alia by the shape of the forehead, which is broad, narrower at vertex, the broad callus, the thick linear extension, the blackbrown beard, etc. Forehead cinnamonbrown, callus almost quadrate, linear extension spathuliform, milkechocolate-brown. Subcallus, cheeks and face reddishbrown, black haired. Beard blackbrown. Palpi short, redbrown, black haired. Antennae pale yellow, scanty black haired on basal joints, third joint bright yellowishred, narrow. Thorax darkbrown, black and yellow haired. Wings with brown apical shadow, no appendix. Legs chestnutbrown. Abdomen tobaccobrown, black haired, with a median narrow, yellowwhite, straight-sided, yellow haired stripe, ending at the end of the sixth segment. Lateral borders of tergites yellow haired. Ventral surface black haired with yellow haired segmentations. Male similar. Length of female 11 m.M.



Textfig. 96.

T. puteus Ric. ♂, ♀. a. male eye, b-e. ♀, b-d. forehead, e. antenna.

The Female.

The Head. (Textfig. 96). Forehead denuded, 0,18 narrower posteriorly than it is at base, index 2,7. Callus convex at base, irregularly curved at upper border. Antennae, basal 2 joints with some black hairs, third joint almost without a tooth, a small angle marking its usual position, basal annulation 1,65 times as long as its widest part, 1 times as long as the stylus.

Thorax darkbrown, denuded in the type, a few black and yellow hairs are visible on the scutum; in unrubbed specimens RICARDO found a cloth of thick short, pale yellow hairs on the scutum. Sides yellowishbrown haired. Scutellum slightly paler. Wings with brown apical shadow, filling up the radial cell only, stigma brown, veins yellowish. Legs chestnut-brown.

Abdomen, as described above.

The Male.

Similar to the female. Eyes with a narrow area of small black facets, not extending to the vertex. (Textfig. 96a.) Second joint of palpi, long black haired. Wings with a distinct, smokybrown apical shadow and brown streaks along the other veins. Upper part of first posterior cell brownish.

87. *Tabanus hybridus* WIEDEMANN (♀) Pl. 7, Fig. 3; Textfig. 97.

References:

WIEDEMANN, Auss. Zweifl. Ins., p. 557, 31 (1828).

WALKER, Proc. Linn. Soc., p. 110 (1857).

RICARDO, Rec. Ind. Mus. IV, p. 162 (1911).

„ Bull. of Ent. Res. VI, p. 406 (1916).

Habitat:

WIEDEMANN's type was from Macao.

1 ♀ bearing a label with the inscription „the true *hybridus* mentioned in the description” from Kuala Lumpur, Malacca, coll. by PRATT 1908 (Textfig. 97a, f)
Coll. BR.M.

1 ♀ identified by RICARDO as *Tabanus auristriatus* Ric., but really belonging to *T. hybridus* from Perak, PRATT (Textfig. 97 b, e, g). Coll. BR.M.

- 1 ♀ identified by RICARDO as *T. hybridus* WIED. really belonging to a new species, see *T. longibasalis* nov. spec. from Hongkong, MACFARLANE 1923.
Coll. BR.M.

In her book RICARDO mentions females from:

Sunghai, S. Perak F.M.S.

Perak, Coll. KERTESZ.

Batu Tiga, F. M. S. STANTON.

Sylhet, Assam

Sarawak Borneo, „a very pale faded specimen, determined by WALKER as this species, is probably correctly identified”

As I had no opportunity to see the last named specimens I dare not say, whether these specimens really belong to *T. hybridus* WIED. or not.

Isle Sumatra

1 ♀ from Wai Lima, (Textfig. 97 h) Lampong Districts, coll. by natives in the jungle 26.11.'21, KARNY Coll. B.Z.M.

1 ♀ from Wai Lima, Lampong Districts, in the jungle at 7 o'clock, noon, 12.11.'21 KARNY Coll. B.Z.M.

2 ♀ ♀ from Si Hitang, Batoe na Doea, Padang Sidempoean, Tapanoeli, LOBEL Coll. V.S.L.

respectively 1 ♀ on 23.2.'23 on buffalo

1 ♀ „ 3.'23 „, cattle (Textfig. 97 c, d)

1 ♀ from Pasar Kota Nopan, Tapanoeli, LOBEL, on horse, 3.'23

Coll. V.S.L.

1 ♀ „ Siboloean, Siboloean, Sibolga on buffalo, 7.9.'24, BAKKER

Coll. V.S.L.

1 ♀ „ Sibolangit, LOERZINGER 1918

Coll. N.A.M.

Isle Borneo

2 ♀ ♀ from Borneo, BUTTIKOFER

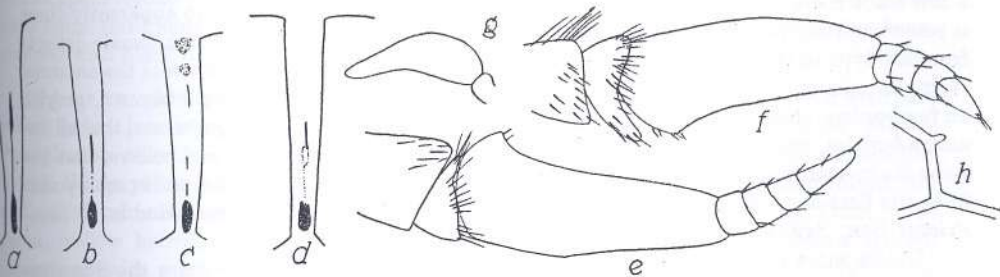
Coll. L.M.N.H.

Tabanus hybridus WIEDEMANN is a green-eyed species, closely allied to *T. auristriatus* RIC. and *T. aurotestaceus* WLK., differing however in the shape of the abdominal stripe, shape of forehead and callus and colouration of the legs. In *T. hybridus* the yellowrustybrown, yellow haired forehead bears a redbrown, cylindrical callus, mostly separated from the narrow, black lineal extension. Upper cheeks rustybrown, black haired, lower cheeks greyishyellowbrown, yellowwhite haired as is the beard. Face rustybrown, black haired. Palpi yellowbrown, black haired. Antennae yellowbrown, with long third joint. Thorax dark blackishbrown, with traces of redbrown, goldenyellow haired longitudinal stripes. Legs yellowishbrown with paler tibiae. Abdomen dark oakbrown, black haired, except on the median broad, goldenyellow haired, straight-sided longitudinal stripe.

Table of dimensions.

Bodylength	varying from 12	m.M.	— 16,5	m.M.
Width of thorax	„	„	3,5	„ — 5,5 „
Width of abdomen	„	„	4	„ — 5,5 „
Wingexpanse	„	„	22,5	„ — 28,1 „
Length of head	„	„	1,6	„ — 2,5 „
Length of thorax	„	„	4,5	„ — 6,5 „
Length of abdomen	„	„	5,8	„ — 9,5 „
Length of wing	„	„	9,5	„ — 11,8 „
Breadth of wing	„	„	3,5	„ — 4,5 „
Foreheadindex	„	„	8,33	— 11,5

The Head. (Textfig. 97). Forehead 0,33—0,5 narrower anteriorly than it is at vertex, wholly dullbrown, black haired in the Kuala Lumpur female, yellow to rustybrown in the Sumatra females, goldenyellow haired at base, dull brown to the vertex with its round blackish vertex spot, covered with black hairs or wholly black haired. Postocular rim goldenyellow haired. Callus redbrown, narrow, cylindrical, elongate, prolonged into a fine black filiform linear extension, often separated from the callus or partly covered with tomentum, broader at apex. Eyes green. Subcallus rustybrown (Kuala Lumpur) or more yellowish (Wai Lima). Upper cheeks rustybrown, black haired. Lower cheeks greyishyellowbrown, goldenyellow haired (Kuala Lumpur) or yellowishwhite haired (Wai Lima). Face rustybrown, black haired (Kuala Lumpur) or butteryellow, pale yellow haired with groups of black hairs just under the antennae (Wai Lima). Beard pale yellow. Palpi first joint pale yellowbrown, yellow haired, second joint stout, ochraceous yellow, broad with a long point, blunt at apex, wholly black haired (Kuala Lumpur) or yellow haired at base, black haired at apex (Wai Lima). Antennae yellowbrown, first joint black haired on dorsum, yellow haired at sides, second joint same colour with a



Textfig. 97.

Tab. hybridus Ric. ♀. a—d, forehead; e, f, antenna, g, palpe, h, wingstructure.

rather thick dorsal spur, fringed by black hairs (Kuala Lumpur). In the female from Wai Lima the first joint is yellow haired at base on dorsum. Third joint ochraceousyellow with a distinct although not very prominent tooth, basal annulation 2,33 times as long as its widest part and 1,75 times as long as the dullbrown stylus. Proboscis, stalk pale reddishbrown with bright redbrown pubescence, sugarflaps black.

Thorax dark blackish brown with indications of redbrown longitudinal stripes, which however are not very distinct, as the thorax was wetted before, covered with short goldenyellow pubescence. Scutellum same colour, similar pubescence, intermixed with a few black hairs only. Pteropleuron brownyellow, black and yellowishbrown haired. Sides and breast

reddishbrown pale yellow and rustybrownyellow haired. (Kuala Lumpur). The Sumatra-females with pollinose tomentum and traces of 3 yellowish, sulfuryellow haired stripes. Wings, foreborder yellowbrown, stigma havannabrown, apical shadow smokybrown. Hind border cinereouslyyellow (Kuala Lumpur). Wings in Wai Lima female pale yellowish with citron yellow veins. Stigma brownish butteryellow. Apex brownish. Hindborder yellowish. Legs rather pale brown. First leg. Coxa yellowbrown, yellow haired; trochanter deep redbrown. Femur ventrally bare cinnamonbrown; dorsum more olivebrown, black haired, distal lateral border with long yellow pubescence, intermixed with some black hairs. Tibia yellowbrown, goldenyellow haired on basal $\frac{2}{3}$, apex chestnutbrown, black haired, prolonged into a median row of black hairs. Second leg. Coxa and trochanter dark redbrown; femur cinnamonbrown, pale yellow haired with a black hairtuft at apex; tibia almost wholly pale yellowbrown with darker apical ring, white haired on ventral surface, dorsum black haired. Spines yellow at base, black at apex. First tarsale redbrown at base, apex black, black haired, other tarsalia black. Third leg. Coxa redbrown. Trochanter cinnamonbrown, yellow haired, femur as in second leg. Tibia olivebrown, with darker apical ring, black haired on dorsum, ventral surface yellow haired till the apical ring. First tarsale red-chestnutbrown, black haired. Other tarsalia black. In the Si Hitang females the tibiae are whitish or yellowishwhite.

A b d o m e n dark olivebrown to blackbrown, black haird, except on the median longitudinal, broad, goldenyellow haired, straight-sided stripe, which runs from the first till the sixth segment and embraces the scutellum with its bifurcated apex. Lateral borders of the first 5 tergites goldenyellow haired. Ventral surface with a series of median narrow, darkbrown, black haired patches, elsewhere yellowbrown, sides and segmentations of the first 5 segments goldenyellow haired. On the sixth sternite the lateral pale border is narrow, goldenyellow haired as is the segmentation. Seventh segment wholly black haired. In the Si Hitang females the pubescence is more yellowwhite on the paler areas on the ventral surface of the abdomen. The second Perak female originally identified as *T. austrialatus* Rrc. was wholly yellow haired on its first 5 abdominal sternites, sixth segment yellow haired at sides and segmentations. In the Wai Lima female the whole abdomen is yellow haired on its ventral surface. Besides its fore femora are paler, black haired on the coffeenutbrown apex only, middle tibiae with a few black hairs in the median range on dorsum, elsewhere yellowwhite. So apparently there is some variation in the specimens, belonging to this species. The second Perak female deflects from the type in that its callus misses nearly wholly the lineal extension, whereas the antennal stylus is coloured as the basal annulation. Thorax in good condition, yellowbrown, greyish on foreborders, thick goldenyellow haired on scutum and scutellum. I am quite sure, that all Sumatra females, mentioned under this heading belong to the same species and believe, that the same is applicable on the other Malacca females, although last specimens deviate in some points from the first ones. A similar variation as occurs in this species was also found in *T. flavistriatus* SCH. STEKH.

Unless more material compels me to separate the Malacca females from the Sumatra-specimens, I am obliged to gather the mentioned specimens under the same heading.

88. *Tabanus latifascies* nov. spec. (♀) Textfig. 98.

Habitat:

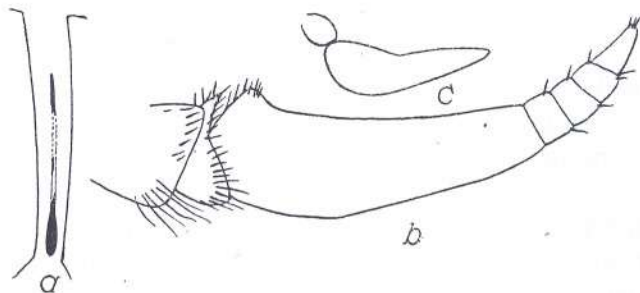
Type ♀ from Borneo, Nanga Raoen, Sintang Distr. 5.'94, J. BUTTIKOEFFER	Coll. L.M.N.H.
1 ♀ from same locality	Coll. L.M.N.H.

An olivebrownyellow species near *T. hybridus* WIED. but distinguished i.a. by the pale pubescence on the upper cheeks, the brighter, mainly yellow-white haired face, the antennae with their pubescence, the brighter-coloured

femora and paler tibiae, the broader abdominal stripe, the yellow fringed segmentations, the absence of black patches on the ventral surface of the abdomen and of longitudinal thoracal stripes.

Table of dimensions.

Bodylength	16	m.M.
Width of thorax	5	"
Width of abdomen	5,2	"
Wingexpanse	30	"
Length of head	2,5	"
Length of thorax	5	"
Length of abdomen	9	"
Length of wing	12,5	"
Breadth of wing	4,5	"



Textfig. 98.

T. latifascies s.s. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 98). Forehead ochraceousyellowbrown, black haired, half as wide anteriorly as it is at vertex, index: 10. Callus yellowbrown, fig-shaped, with a rather long linear extension, covered under the same tomentum as is found on the rest of the frons. Subcallus and upper cheeks ochraceousyellow, yellowwhite haired. Lower cheeks paler, covered with long yellowwhite pubescence. Beard same colour. Face ochraceous yellow, yellowwhite haired, intermixed with some black hairs. Palpi pale yellow, yellowwhite haired, with some black hairs at the apex of the first joint, second joint brownish yellow, broad at base, apex blunt, black haired. Antennae ochraceousyellow, first joint protruding caplike over the second joint, yellow haired, with a number of black hairs on dorsum at apex, second joint same colour, with an apical yellow hairfringe, intermixed with some black hairs; third joint wholly redyellow, basal annulation with a dorsal tooth near the base, crowned with black hairs, 2,7 times as long as its widest part, 2,2 times as long as the stylus.

Thorax pale pollinose-yellow, without longitudinal stripes, thickly covered with pale yellow hairs intermixed with some black pubescence. Scutellum slightly paler yellow. Pteropleuron olivebrown, black haired. Breast and sides yellowbrown, brownishyellow haired. Wings yellowish, foreborder pale yellowbrown with brown shadows along the cubital and radial vein. Halteres, club yellowwhite, stalk olivebrown. Legs. First leg; Coxa orangeous, yellow haired, trochanter olivebrown, femur pale orangeousyellow, yellow haired, intermixed with a few black hairs on dorsum, tibia yellowwhite, white haired, with apical black haired ring; tarsalia velvetybrown, black haired. Second leg similar, tibia uniformly yellowwhite, white haired with narrow olivebrown apex, on dorsum some black hairs are intermixed between the other ones. Third leg, tibia thick black haired on dorsum, elsewhere yellowwhite haired. Tarsalia redbrown, black haired.

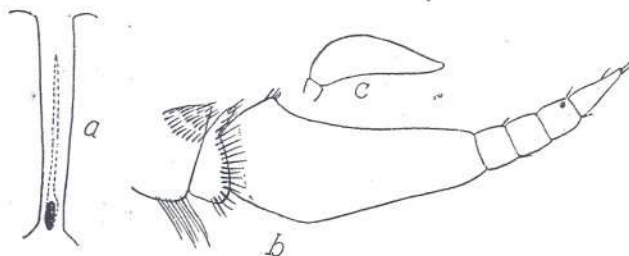
Abdomen, first 2 segments olivebrown, following segments darker, till blackbrown, mainly black haired, with a median broad, straight-sided, yellow haired longitudinal stripe starting on the first and ending on the sixth segment. The stripe is bifurcated on the first segment and shows there 2 yellow haired spots, situated at each side of the scutellum. Other segments yellow haired at sides, segmentations yellow fringed. Between the black pubescence one finds a number of yellow hairs. Ventral surface coffeebrown, yellow haired, without central black, black haired patches, seventh segment black haired. In the second female the second palpal joint presents a number of yellow hairs, scattered between the black ones.

89 *Tabanus gilvus* nov. spec. (♀) Textfig. 99

Habitat:

Type ♀ from Serapki Kur, Sumatra 7.15, E. JACOBSON Coll. N.A.M.

A yellowbrown-striated, yellow haired species, closely allied to *T. hirtistriatus* Ric. differing i.a. in the colour of the abdomen with its paler base, the pale yellow legs, the colour and the shape of the palpi and antennae, etc. Forehead ochraceousyellow, black haired. Callus linear, olivebrown, linear extension hidden under ochraceousyellow tomentum, as are also the subcallus and the upper cheeks. Cheeks and face yellowwhite haired, beard same colour. Palpi yellowbrown, yellowwhite haired, second joint almost the same width throughout, yellowwhite and black haired. Antennae yellowbrown to redyellow. Thorax yellowbrown, yellow haired, with 3 fine redbrown longitudinal stripes. Wings almost clear, without apical shadow. Abdomen broad, with a median longitudinal stripe. Length 12 m.M.; Width of thorax 4 m.M.; Wingexpanse 26 m.M.; Length of wing 11 m.M.



Textfig. 99.

T. gilvus s. s. ♀ a. forehead, b. antennae, c. palpe.

out, blunt at apex, yellowwhite haired, intermixed with some black hairs at apex. Antennae, first 2 joints pale yellowbrown, yellow haired, except some black hairs at the apex of the 2d joint. Third joint redyellow, basal annulation 2,1 times as long as its widest part, 1,5 times as long as the brown stylus; Tooth inconspicuous.

Thorax, see above, scutum and scutellum same colour, similar pubescence, pteropleuron pale havannabrown, black haired. Sides and breast brownishyellow, yellow to yellowbrown haired. Wings almost clear, without apical shadow or appendix, veins yellowbrown, foreborder yellow, stigma pale brownish. Halteres yellowbrown. Legs pale. First leg. Coxa paleyellowbrown, yellowwhite haired, trochanter olivebrown, femur strawyellow, yellowwhite haired, tibia white, white haired, on basal $\frac{4}{5}$, apex olivebrown with scattered black pubescence. Tarsalia brown, black haired. Second leg nearly identical, tibia with some black hairs in the median line on dorsum, apical ring very narrow, black haired. First tarsale pale olivebrown at base, elsewhere blackbrown black haired, like all other tarsalia. Hind tibiae pale olivebrown, black haired on dorsum, ventral surface yellowwhite haired. Tarsalia olivebrown, yellow haired below, black haired on dorsum.

Abdomen broad, pale havannabrown on first 2 segments, then tawnybrown, black haired, except on the longitudinal, yellow haired, straight-sided stripe, which embraces the

The Head. Textfig. 99

Frons ochraceousyellow, black haired. Foreheadindex 8,2, Forehead 0,3 narrower anteriorly than it is at vertex. Subcallus and cheeks as mentioned; face ochraceousyellow on the upper border, paler to the mouth, yellowwhite haired. Palpi yellowbrown, yellowwhite haired, second joint broad at base, stout, almost the same width throughout.

scutellum on the 1st segment and ends on the 5th segment. Lateral borders of first 5 tergites yellow, yellowwhite haired. Ventral surface yellowbrown, yellowwhite haired on the first 5 segments, 6th segment black haired at base, 7th segment wholly black haired.

90 *Tabanus cylindricollosus* nov. spec. (♀) Textfig. 100.

References:

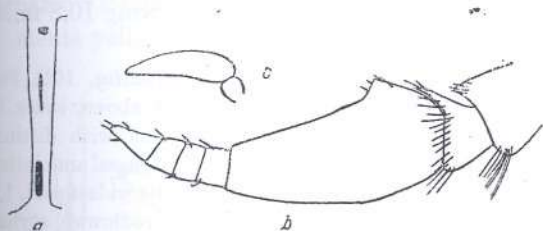
RICARDO, Rec. Ind. Mus. IV, p. 217 (1911).

Habitat:

Type ♀ from Sarawak, SAUNDERS

Coll. BR. M.

A small species. Forehead yellowbrown. Callus cylindrical, dark olivebrown, linear extension separated from it. Subcallus and upper cheeks yellowishbrown. Lower cheeks greywhite, white haired. Beard yellow. Face yellowbrown to yellowwhite, yellow haired, some black hairs just below the antennae. Palpi yellow, black haired, apex blunt. Antennae, orangeous yellow, orangeousyellow haired on first segment, second joint black fringed; third joint with indistinct tooth. Thorax greybrownish, yellow haired with 3 indistinct, longitudinal stripes. Wings with redbrown apical shadow. Legs, femora yellowbrown, yellow haired, tibiae white at base. Abdomen olivaceous-yellowbrown, yellow haired, a median longitudinal stripe indicated.



Textfig. 100.

T. cylindricollosus s.s. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 100) Forehead 0,25 narrower anteriorly than it is at vertex, index 8. Vertex spot square. Palpi with slender second joint. Third antennal joint with small triangular tooth, basal annulation 1,9 times as long as the widest part, 1,7 times as long as the stylus.

Thorax greybrownish, yellow haired, intermixed with black hairs, breast brownishgrey, white haired.

Wings with yellowbrown veins and

reddishbrown apical shadow, filling up radial cell and upper part of cubital cell. No appendix. Halteres, stalk blackbrown, club yellow. Legs. First leg. Coxa whitish brownyellow, yellow haired. Trochanter and femur yellowbrown, yellow haired. Tibia white, white haired at base, apex olivebrown, black haired. Tarsalia blackbrown, black haired. Second leg identical, tibia with a narrower, black haired apical band. Third leg, femur white haired. Tibia yellowbrown, yellow haired below, black haired on dorsum. Tarsalia blackbrown, black haired.

Abdomen, dorsum olive-yellowbrown, yellow haired, with a trace of a median longitudinal stripe. Hairs rubbed on the larger part of the dorsum. Ventral surface yellowbrown, yellow haired, except on the sixth segment, which bears a large number of black hairs and on the 7th segment, which is wholly black haired.

This specimen is probably the same about which RICARDO wrote under *T. borniensis* Ric., "another specimen from Sarawak, has a label in WALKER's handwriting „hybridus“, but I believe it to be a specimen of this species". The mentioned female neither belongs to

T. hybridus WIED. nor to *T. borniensis* RIC., confer the shape of the frons, the colouring of the abdomen, etc. Although I have not seen RONDANI's type I come to the conclusion after a comparison of the descriptions that the above mentioned female belongs to a distinct species.

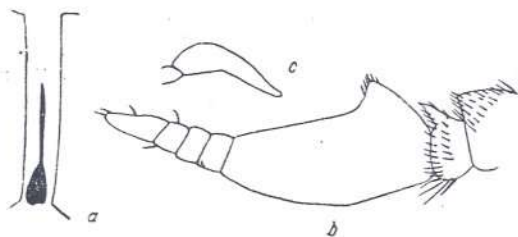
91 *Tabanus flavitibiatus* nov. spec. (♀) Textfig. 101

Habitat:

Type ♀ from Deli, Sumatra, DE BUSSY

Coll. N.A.M.

A small species. Forehead redbrown, yellowbrown at base, black haired. Callus elongate egg-shaped, redbrown, linear extension black, accompanied at each side by a row of yellowbrown hairs. Subcallus pale ferrugineous. Cheeks greywhite, white haired. Beard white. Face brownishgrey, white haired. Palpi dull olivaceous yellowbrown, second joint acuminate, mainly black haired. Antennae orangeousyellowbrown on basal joints, first joint mainly yellowwhite haired, black haired at apex, second joint black fringed, third joint reddish-yellow, tooth distinct. Thorax brownblack, yellowbrown haired. Wings clear, appendix present. Tibiae pale yellowish. Abdomen conical, tawny yellowbrown, black haired, on 4 basal segments, more blackbrown to the apex. A narrow longitudinal, straight-sided, yellow haired stripe runs over the dorsum and ends on the 5th segment, 6th segment with a small, yellowhaired median dot. Lateral borders of the first 6 tergites yellowbrown, yellow haired. Bodylength: 11,2 m.M.; Width of thorax 4 m.M.; Wingexpanse 25,6 m.M.; Length of wing 10,8 m.M.



Textfig. 101.

T. flavitibiatus s.s. ♀.

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 101). Forehead as mentioned above, index 6. Antennae, second joint with distinct dorsal spine, third joint, basal annulation 1,8 times as long as its widest part, 1,6 times as long as the redbrown stylus. Palpi, first joint white haired, second joint, swollen at the white haired base, elsewhere black haired, halfway suddenly tapering to an acute long point.

Thorax as indicated, pteropleuron dull havannabrown, black haired.

Breast and sides blueblack, white haired. Wings clear, veins yellowbrown, foreborder pale yellowbrown, stigma pale havannabrown, appendix distinct on the right wing, indicated only on the left wing. Legs. First leg. Coxa yellowbrown, apex olivebrown, white haired, femur blackbrown, black haired on dorsum, white haired at apex and along the distal lateral border, knee yellowbrown. Tibia brownishwhite, white haired on basal half, intermixed with a few black hairs, apex blackbrown, black haired. Second leg. Coxa redbrown, white haired, trochanter redbrown, femur sootygrey at base, largely brownish yellow at apex, mainly white haired, except at base on dorsum, where one finds a median row of black hairs. Tibia strawyellow, yellow haired, apical ring redbrown, black haired; a median irregular row of black hairs runs dorsally from this band to the base. Tarsalia blackbrown, black haired. Third leg, femur almost wholly white haired, tibia slightly darker than in the second leg, dorsum black haired, ventral surface yellow haired, except at the apical ring, which is black haired. Tarsalia dark redbrown, black haired.

Abdomen as described, ventral surface brownishyellow on the first 5, white haired segments, following segments blackbrown, black haired.

92. *Tabanus longibasalis* nov. spec. (♀) Textfig. 102.

References:

RICARDO, Bull. of Ent. Res. VI, p. 406 (1916).

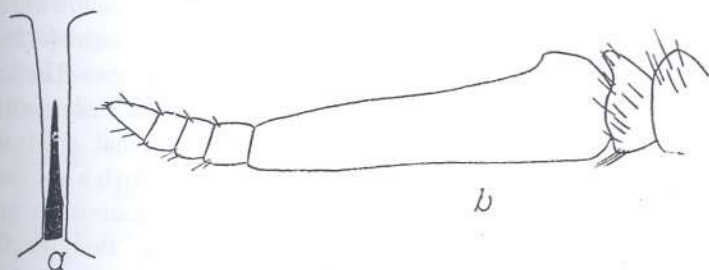
Habitat:

Type ♀ from Hongkong 1913, Dr. H. MACFARLANE

Coll. BR.M.

Under the heading *T. hybridus* WIED. I mentioned a female, that apparently did not belong to the species, which the label indicated, but to a new species for which I propose the name *T. longibasalis* nov. spec. It differs from *T. hybridus* WIED. i.a. by the broader forehead and the shape of callus, palpi and antennae.

The forehead is rather narrow, goldenbrown, black haired. Callus reddishbrown, cylindrical nearly reaching to the eyes, with a strong linear extension. Subcallus and upper cheeks rusty yellowbrown, black haired. Lower cheeks and face white, white haired. Palpi stout, triangular, mainly black haired. Antennae very slender, with long yellowred basal annulation to the third joint. Thorax yellowbrown without longitudinal striations, goldenyellow and black haired. Wings faintly yellowbrown, with siennabrown apical shadow. Legs mainly yellowbrown. Abdomen oakbrown, with yellow haired, yellowbrown, narrow longitudinal stripe ending on the 5th segment. Ventral surface, first 5 segments yellow haired, rest black haired. About the same size as *T. hybridus* WIED.



Textfig. 102.

T. longibasalis s. s. ♀. a. forehead, b. antenna.

The Head. (Textfig. 102). Forehead 9 times as long as it is wide anteriorly, 0,35 narrower anteriorly than it is at vertex, golden brown, darker at vertex. Callus as described, linear extension ending in a

sharp point. Face slightly brownish to the mouth. Palpi stout, first joint yellowwhite haired, second joint almost triangular, tapering to a rather sharp point, white haired at extreme base, elsewhere prevailing black. Antennae very slender, first two joints yellowbrown, black haired, third joint yellowred with an indistinct tooth, basal annulation 3,24 times as long as its widest part, 2,35 times as long as the stylus, the extreme apex of which is somewhat darker only.

Thorax yellowbrown, with a golden hue, foreborder greyish tomentose, scutum blackbrown haired, intermixed with some yellow hairs, occurring especially at the hindborder of the scutum and at base of wings and behind. Shoulders and pteropleura thick black haired. Breast brownishgrey, white haired. Wings tinged faintly yellowbrown, foreborder reddishbrown, apical shadow siennabrown, stigma deep redbrown. Halteres dark redbrown. Legs.

First leg; Coxa pale yellowbrown, brownishwhite haired, trochanter blackbrown; femur yellowishredbrown, knee yellowwhite, black haired; tibia yellowbrown, yellowwhite haired at base, apical half blackbrown, black haired, extreme base reddishbrown; tarsalia black. Second leg missing. Third leg; Coxa greybrown, yellow haired, trochanter redbrown, femur deep-redbrown, black haired, with a fringe of yellow hairs along the distal lateral border. Tibia yellowbrown at extreme base, elsewhere deep redbrown, black haired. Tarsalia redbrown, black haired.

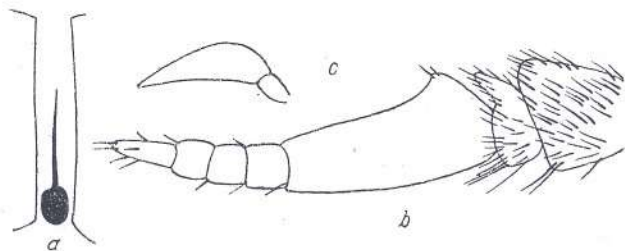
Abdomen oakbrown, darker, blackbrown to the apex, especially on the 6th and 7th segment, which are black haired. Starting on the 1st segment from a small goldenyellow haired triangle one finds a median, pale yellowbrown, straight-sided, yellow haired longitudinal stripe on the following segments, terminating on the 5th segment. First 5 tergites, yellow haired on the lateral borders, black haired elsewhere. Ventral surface pale oakbrown, pubescence as mentioned.

93. *Tabanus paralleliventer* nov. spec. (♀) Textfig. 103.

Habitat:

Type ♀ from Sumatra, Bengkoelen, Soeban Ajam, 7. 16, E. JACOBSON
Coll. N.A.M.

A species, labelled by RICARDO as *T. fulvimedius* WALKER, but quite certainly distinct, differing from WALKER's type inter alia in the shape of the frontal callus, the colouring of the abdomen and its markings. Forehead rather broad, redbrown to blackbrown, black haired. Callus reversed egg-shaped, caramelbrown, linear extension black. Subcallus and upper cheeks reddish-yellowbrown, redbrown haired, lower cheeks and face greywhite, yellowwhite haired. Beard same colour, Palpi yellowbrown, yellow and black haired. Antennae ochraceousyellow, black haired, third joint havannabrown. Thorax reddishyellowbrown, yellowbrown haired, grey tomentose on foreborder, with 3 longitudinal stripes. Wings brownish with havannabrown apical shadow, appendix rudimental. Legs brown. Abdomen tawny, black haired, with a median rather broad longitudinal, straight-sided, yellowbrown, yellow haired stripe, ending on the 5th segment, lateral borders yellowwhite haired. Bodylength 14,8 m.M.; Width of thorax 4,2 m.M.; Wingexpanse 32,6 m.M.; Length of wing 14,2 m.M.; Length of abdomen 8,8 m.M.



Textfig. 103.

T. paralleliventer s. s. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 103)

Forehead, almost the same width throughout, yellowish-redbrown at base, more blackbrown, black haired to the vertex, index 5,7. Callus with linear extension extending on lower half of forehead. Subcallus, etc. as described. Palpi yellowbrown, first joint yellow haired, second joint broad at base, tapering to a long rather

acute point, mainly black haired, intermixed with some yellow hairs at base. Antennae, first joint ochraceousyellow, scanty black haired, second joint dull pale havannabrown, black haired, third joint dusker havannabrown, basal annulation 2 times as long as its widest part, 1,2 times as long as the blackbrown stylus. Tooth indistinct, blunt.

T h o r a x reddishyellowbrown, grey tomentose on foreborder, yellow haired, intermixed with some redbrown hairs, scutum presenting 3 distinct, redbrown longitudinal stripes, middle one narrowest, none of them reaching the scutellum. Lateral borders of scutum and scutellum paler yellowbrown, latter redbrown haired at base, yellowbrown haired at hindborder. Sides and breast pale greybrown-white, brownish white haired. Wings brownish, foreborder redbrown, stigma deep havannabrown, apical shadow including radial and cubital cells same colour with paler centres. Appendix rudimental. Halteres dark havannabrown. Legs. First leg. Coxa yellowbrown, yellow haired, trochanter tawny, femur tawny, blackbrown haired on dorsum, distal lateral border brownyellow tomentose, yellowbrown haired. Tibia yellowish-olivebrown on basal $\frac{1}{3}$, extreme base blackbrown, apex dark olivebrown, black haired, ventral surface yellow haired. Tarsalia black, black haired. Second leg. Coxa tawny, femur sooty olivebrown, mainly yellowbrown haired, with a median row of black hairs on dorsum. Tibia as in first leg, apex darker, blackbrown, black haired. First tarsale yellowbrown at base, black haired, other tarsalia black, black haired. Third leg. Coxa brownish grey, yellow haired, trochanter yellowbrown, yellow haired, femur dusky yellowbrown, yellow haired, with some black hairs at apex and in the middle. Tibia olivaceousyellowbrown on basal half, apex blackbrown, dorsum black haired, ventral surface yellow haired on basal half, elsewhere black haired. Tarsalia black, black haired.

A b d o m e n as described, lateral borders of the first 5 tergites yellowwhite haired. Ventral surface reddishyellowbrown with a median series of blackish, black haired patches. Segmentations greywhite, yellowwhite haired as are the sides. Seventh segment wholly black haired.

94. *Tabanus burmanense* nov. spec. (♀, ♂) Textfig. 104.

References:

- RICARDO, Rec. Ind. Mus. IV, p. 159 (1911).
SENIOR WHITE, Dept. Agricult. VII (1922).

Habitat:

- Type ♂ from Dawna Hills, Lower Burma, ANNANDALE, 4.3.'08 Coll. BR.M.
2 other males from the same locality (hovering over cart track in bright sun") Coll. Ind. Mus.
3 ♀ ♀ from Mohyin Burma, R. SENIOR WHITE, 18.5.'19 Coll. BR.M.

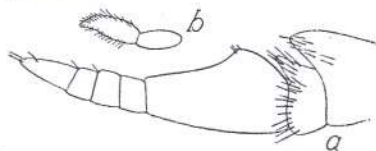
The male type differs from *T. hirtistriatus* RIC. i.a. by the much narrower apical wingshadow. Halteres darker. Antennae with blunter dorsal hump to the second joint, first annulation of the third joint broader than in the female of *T. hirtistriatus* RIC. It is a general rule, that in the male sex in the Genus *Tabanus* the third joint is narrower than in the female sex. This speaks against the synonymy of this species with *T. hirtistriatus* RIC. Pubescence of scutum and scutellum more uniformly yellow. Colour of abdomen and its markings distinct.

The Female.

SENIOR WHITE describes the female as follows: They differ from RICARDO's descrip-

tion in the frons, which is much less narrowed anteriorly, almost parallel; the extension of the callus sometimes reaching the vertex; the palpi practically without black pubescence, and the first 2 antennal joints with only a trace of such; the front tibiae are only yellow basally, and in one specimen the posterior tibiae are only black at the apex. The abdomen is more yellow than the description would indicate, the specimens would agree better with the description of the series of males from the Dawnat Range, Tenerasserim, doubtfully referred to this species by RICARDO, and possibly two very closely allied species are involved, one of which still lacks a name. It must be mentioned that SENIOR WHITE brought the females to *T. hirtistriatus* RICARDO.

The Male.



Textfig. 104.

T. burmanense S.S. ♂
a. antenna, b. palpe.

The Head. (Textfig. 104 a, b): Eyes with all the facets almost of the same size. It appears to me however, that there exists a very narrow black stripe, starting at the lower posterior eyeangle and ending not far from the vertex. Subcallus and upper cheeks rustybrown, first part with yellowbrown apex. Cheeks white haired. Beard same colour. Palpi chineseyellow with a long second joint, ending in a point, white haired, intermixed with some black hairs. In one of the other females one single black hair only is visible.

Antennae, first joint reddish-yellowbrown, dorsum black haired, distal lateral border yellowwhite haired; second joint with a distinct dorsal hump, black fringed at apical border only; Basal annulation of third joint reddishyellow, apparently broader than in the female of *T. hirtistriatus* Ric., 1,76 times as long as its widest part and 1,08 times as long as the black stylus, tooth blunt.

Thorax medlarbrown, with fine yellow hair covering all over the scutum and scutellum. Pteropleuron bright redbrown, white and black haired. Breast and sides grey, white haired. Wings with fine, brown apical shadow, foreborder yellowbrown, stigma siennabrown. In one of the 3 studied males the left wing presents an appendix. Halteres, club yellowbrown, stalk darkbrown. Legs. First leg. Coxa pale yellowbrown, grey haired, trochanter blackbrown, femur leathery yellowbrown, yellowwhite haired, with some black hairs at apex. Tibia same colour, yellow haired, darker at the black haired apex. Tarsalia blackbrown, black haired. Second leg almost identical, tibia slightly darker at apex. Third leg, tibia olivebrown, black haired, first tarsale same colour, other tarsalia darker.

Abdomen with median, broad, yellow haired, straight-sided longitudinal stripe, ending on the 6th segment. Dorsum olivebrown, blackbrown to the apex, black haired. Lateral borders of the first 6 tergites yellowbrown, white haired; ventral surface yellowbrown, yellowbrown haired on first 5 segments, 6th and 7th segment blackish. Apart from the mentioned differences of this species with *T. hirtistriatus* Ric., *T. burmanense* nov. spec. has a habitat which is widely separated from that of *T. hirtistriatus* Ric. and therefore the described males and females undoubtedly belong to another species.

95. *Tabanus rectilineatus* nov. spec. (♀) Textfig. 105.

Habitat:

Type ♀ from S. Malabar

Coll. BR.M.

The species may be distinguished from *T. auristriatus* Ric. to which it

was brought by Dr. MARSHALL i.a. by the colour and shape of forehead, shape of the callus, pubescence of palpi, colour of abdomen and the shape of the median longitudinal stripe. Eyes dark green. About the same size as *T. auristriatus* Ric.



The Head. (Textfig. 105). Forehead yellowbrown almost the same width throughout, index 4,7. Callus triangular, leatherbrown, linear extension rather short, distinctly separated from the callus. Vertexspot roundish. Cheeks almost wholly white haired. Palpi similar to those in the foregoing species, yellowwhite haired with some black hairs at apex. Antennae, with an almost wholly redbrown stylus, apical annulation black.

Textfig. 105. The Thorax similar to that in *T. auristriatus* Ric., greyish on foreborder with a median longitudinal blackbrown stripe. Wings less brown, with a deep brown shadow along the foreborder only, no shadows accompanying the veins. Halteres reddishbrown. Legs. First leg, femur bluish grey, knee white-yellow, white haired along the distal lateral border, tibia pale yellowwhite at base, yellow haired, black brown, black haired at apex. Second leg femur white haired, tibia similar. Third leg identical.

Abdomen with a straight-sided median stripe, dark olivebrown on the first 4 segments but much paler than in the RICARDO species, fifth and sixth segment black.

• 96. *Tabanus auristriatus* RICARDO (♀) Textfig. 106.

References:

RICARDO, Rec. Ind. Mus. IV, p. 161 (1911).

Habitat:

Type ♀ from Gersoppa, N. Kanara, India 14.6.'07, T. R. BELL

Coll. B.R.M.

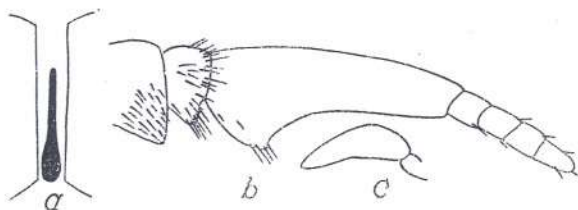
3 other females from same locality, coll resp. on 13 6.'07 and 20.6.'07

Coll. B.R.M.

1 ♀ identified by Dr. MARSHALL as belonging to this species, captured in S. Malabar ought to be brought to a new species, See *T. rectilineatus* nov. spec.

Coll. B.R.M.

T. auristriatus is a chestnutbrown species with partly goldenyellowbrown, partly blackbrown forehead. Callus blackish yellowbrown, egg-shaped, with strong blackbrown linear extension. Subcallus and upper cheeks reddish rustybrown, blackbrown haired. Lower cheeks white, white haired. Beard white. Face greywhite, mainly black haired. Palpi yellowbrown, black haired. Antennae rather narrow, reddish yellowbrown, with a distinct tooth. Thorax chestnutbrown, goldenyellow haired, without longitudinal stripes. Wings with dark apical shadow. Legs brownish. Abdomen blackbrown, with a median longitudinal stripe composed of reddishgoldenyellow triangles, segmentations yellow fringed. Length of type 14 m.M. other specimens from 11—13,5 m.M.



Textfig. 106,

T. auristriatus Ric. ♀.

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 106), Forehead goldenyellowbrown at base, blackbrown on the apical half, beyond the callus stripe, 0,25 narrower anteriorly than it is at vertex, foreheadindex 7. Callus prominent, egg-shaped, shining blackishbrown, not reaching to the eyes with a strong linear extension. Subcallus and cheeks as described. Face with brownish streak on upper border, black-

brown haired. Epistoma greywhite at sides, rustybrown in the middle, black haired. Palpi long, first joint yellowbrown, yellowbrown haired, with some black hairs intermixed at apex, second joint yellowbrown, white tomentose, black haired, swollen at base, ending in a long blunt point. Antennae, first joint dark olivebrown, bordered white, black haired, second joint same colour, with a rudimental spur, black fringed. Third joint reddishyellowbrown with a distinct triangular tooth, crowned with black hairs, basal annulation 2,45 times as long as its widest part and 2,45 times as long as the black stylus.

Thorax chestnubrown, thickly clothed with goldenyellow hairs. Scutellum more yellowbrown at borders, goldenyellow haired, intermixed with some black hairs. Breast grey and pale olivebrown, especially on the mesosternumlobus, white haired. Wings with a dark-brown apical shadow, foreborder burnt sienna coloured, stigma dark reddishbrown, rest of wing brownish with shadows along the veins. Halteres dark havannabrown. Legs. First leg. Coxa olivebrown at base, covered with loose yellowwhite hairs, growing dark bluish olivebrown to the apex, extreme apex blackish. Trochanter black. Femur dark havannabrown, knee yellowbrown, black haired. Tibia swollen, olivebrown at base, blackbrown on apical half, black haired. Tarsalia black, black haired. Second leg, trochanter blackbrown, coxa yellowbrown; femur dark blackbrown, black haired ventral surface more reddishbrown. Tibia dark havannabrown, black haired. First tarsale paler at base than at apex, black haired, other tarsalia wholly black. Third leg identical.

Abdomen dark, almost blackbrown, with a median stripe of reddishgoldenyellow haired triangles, blunted above. Therefore the stripe is serrated, occurring on the 2d-5th segment. The first segment presents a median square blotch of goldenyellow hairs. Segmentations narrowly paler, fringed with goldenyellow pubescence. Lateral borders of tergites narrowly yellow haired. Dorsum elsewhere black haired. Ventral surface reddishbrown, darker to the apex, black haired, first five segmentations yellow haired.

GROUP V.

The species belonging to this Group are green-eyed and brown- to black-brown-bodied. Wings dark infuscated, or paler and with an apical shadow. Forehead narrow. Subcallus, cheeks and face ochraceousyellow or yellowbrown, respectively redbrown. Beard ochraceousyellow, or citronyellow, respectively yellowbrown or redbrown. Legs with ochraceousyellow, strawyellow or yellowbrown tibiae. The median abdominal stripe is less distinct than in the species of the 4th Group, limited to the pubescence, so that when the abdomen is rubbed, the longitudinal stripes are mostly invisible.

KEY 15.

Synopsis of species.

- 1a. Beard ochraceousyellow or citroneyellow 2
 b. Beard darker, yellowbrown or redbrown 7
- 2a. Legs with bright ochraceousyellow tibiae 3
 b. Legs with the tibiae paler, strawyellow or yellowwhite 4
3. Abdomen deep blackbrown, paler at base, with a median, straight-sided, ochraceousyellow haired stripe, limited to the first 2 segments, some yellow hairs on the following 2 segments, in the median line. Ventral surface with a median black, black haired longitudinal band, running over the first 4 sternites, segmentations goldenyellow haired. Beard ochraceousyellow
chloropis SCHUURMANS STEKHOVEN.
- 4a. Abdomen with a continuous, yellow haired stripe 5
 b. Abdomen with a rudimental paler stripe 6
- 5a. Median abdominal stripe serrated, starting at the base of the abdomen, becoming broader to the apex, ending on the sixth segment, ventral surface pale olivebrown, ochraceousyellow haired. Forehead ochraceousyellow. Cheeks goldenyellow. Beard citroneyellow. Wings brownish, paler at apex, appendix present or absent *flavistriatus* SCHUURMANS STEKHOVEN.
- b. Median abdominal stripe straight-sided, starting on the 3d segment and extending to the 6th segment, ventral surface reddishbrown, yellow haired. Forehead yellowbrown. Cheeks ochraceousyellow haired. Beard ochraceousyellow. Wings with an apical shadow only, no appendix
auribundus SCHUURMANS STEKHOVEN.
6. Abdomen havannabrown, with a median paler stripe on the scanty yellow haired 2d to 5th segment, ventral surface with a darkbrown, black haired longitudinal band, segmentations white haired. Beard citroneyellow. Wings tinged brownish, apex paler *fusciventer* SCHUURMANS STEKHOVEN.
- 7a. Forehead redbrown. Beard redbrown. Thorax redbrown haired. Wings redbrown. Legs with white tibiae. Abdomen blackbrown, with a median yellow haired longitudinal stripe on the basal 2 segments. Lateral borders of the first 2 tergites yellowishbrown *birmanicus* RICARDO.
- b. Forehead darkbrown. Beard yellowbrown. Thorax yellowbrown haired. Wings tawny-yellowbrown, with darker apical shadow. Legs with yellowbrown tibiae. Abdomen tawny-redbrown, with a faint median straight-sided yellowbrown, yellow haired stripe, found on the first 2 or the first 5 segments, lateral borders of the first 4 tergites yellow haired
angustistriatus SCHUURMANS STEKHOVEN.

97. *Tabanus chloropis* nov. spec. (♀) Pl. 8, Fig. 1; Textfig. 107.

References:

BIGOT, Mém. Soc. Zool. France V, p. 653 (1892).

SHIRAKI, Tabanidae of Formosa, p. 420 (1918).

Habitat:

Isle Java

Type ♀ from Goenoeng Boender, Mountain Salak 1000 M. Res. Batavia on cattle 23.6.'22, BUBBERMAN Coll. V.S.L.

1 ♀ from Goenoeng Boender, on Bengalese Cattle 20.5.'23, SCHUURMANS STEKHOVEN (Textfig. 107a.) Coll. V.S.L.

1 ♀ from Goenoeng Gedeh '01 Coll. B.Z.M.

7 ♀♀ „ Gamboeng, Tea Estate, G. Tiloe 1400 M. 5.'23, KERKHOVEN, Preanger Reg. (Textfig. 107 b, c, d, e.) Coll. V.S.L.

1 ♀ „ Java, SOHNS Coll. N.A.M.

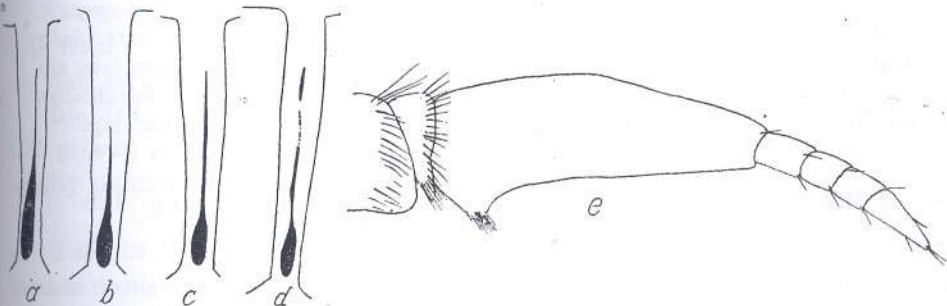
1 ♀ from Hills S. from Batang, Pekalongan, lower ranges, 1919, SOHNS Coll. N.A.M.

T. chloropis is a beautiful, green-eyed, medium-sized, dark brown species. Forehead narrow, reddish rustybrown. Callus blackbrown, egg-shaped, with a long linear extension. Subcallus, cheeks and face ochraceous yellow, ochreyellow haired, intermixed with some black hairs. Beard similar. Palpi yellowish-redbrown, black haired. Antennae bright ochraceous, apex darker, tooth distinct, black haired. Thorax dull redbrown, with traces of longitudinal stripes, black and goldenbrown haired. Wings blackish. Legs dark with ochreyellow tibiae. Abdomen deep black, with an interrupted median, yellow haired stripe on the first 2 segments; yellow hairfringes to the 1st—4th segmentations and yellow-haired lateral borders to the first 4 tergites. Ventral surface yellow haired on sides and segmentations of first 4 segments, elsewhere black, black haired.

Table of dimensions.

Bodylength	varying from 14,8 m.M. to 17 m.M.					
Width of thorax	„	„	5,2	„	— 6	„
Width of abdomen	„	„	5	„	— 6,2	„
Wingexpanse	„	„	32,8	„	— 36,4	„
Length of head	„	„	2,2	„	— 3,2	„
Length of thorax	„	„	5,2	„	— 6,8	„
Length of abdomen	„	„	8,5	„	— 9,2	„
Length of wing	„	„	13,5	„	— 15,2	„
Breadth of wing	„	„	4,8	„	— 5,5	„
Foreheadindex	„	„	8,8	„	— 10	„

The Head. (Textfig. 107). Forehead reddishrustybrown at base, darker, velvetybrown at apex, black haired, $\frac{1}{3}$ — $\frac{1}{2}$ narrower anteriorly than it is at vertex. Vertexspot present. Callus egg- to pear-shaped, black, not reaching the eyes, prolonged into a long, black linear extension, which reaches the vertex in some specimens, but does not surpass $\frac{1}{2}$ of the frontal stripe in others. In rare cases it is broken into pieces, especially in those instances, where the linear extension reaches the vertex as a longitudinal ridge, but is covered with tomentum



Textfig. 107.

T. chloropis S. S. a—d. forehead, e. antenna.

in several places. Eyes wholly green. Subcallus, etc. as described. Upper cheeks black haired, lower cheeks yellow haired. On the face some black hairs occur in the neighbourhood of the jowls. Postocular rim black haired. Palpi, first joint redbrown, covered with long loose redbrown hairs, second joint ending in a blunt point, thick black haired, Antennae, first joint ferruginous, yellowbrown tomentose, black haired, second joint redbrown, black haired, dorsal hump blunt, third joint reddish yellowbrown, basal annulation 2,26 times as long as its widest part, 1,6 times as long as the blackish stylus, tooth conspicuous, crowned with a rather great number of black hairs. Proboscis black, stalk goldenbrown haired, sugarflaps black haired.

Thorax deep dull redbrown to chocolatebrown, covered with a down of goldenyellowbrown hairs, intermixed with some black hairs, foreborder of scutum yellowbrown tomentose, longitudinal stripes of which the middle one is the narrowest, redbrown, rather indistinct. Tufts at base of wings and behind goldenredbrown, pteropleuron black haired below, clothed with short redcopper-golden hairs at apex. Lateral borders of scutum black haired. Scutellum same colour as scutum, black fringed at hind border. Breast reddish goldenyellowbrown, black haired on mesosternumlobus. Wings blackish, with rusty-redbrown foreborder, blackbrown stigma, clearer centres in most cells, paler sootygrey hindborder and redbrown wing-base. Antesquama greyblack, squama redbrown. Halteres stalk brown, club yellowbrown. Legs First leg. Coxa ochraceous, black tomentose at apex, goldenyellow haired, femur black, black haired, intermixed with some yellowwhite hairs at apex, tibia blackish at extreme base, then ochraceous yellow, black and redbrown haired, apical third black, black haired. Second leg. Coxa yellowbrown, brown haired, trochanter blackbrown, femur dull brown, black haired in the middle on apical half of dorsum, basal half yellowbrown haired, pubescence elsewhere goldenyellowbrown, very long and thick on distal lateral border, knee yellowbrown, yellowbrown haired, ventral surface sooty grey tomentose. Tibia pale redbrown, apical ring redbrown, dorsum black haired, ventral surface ochraceous, yellowbrown haired. Tarsalia black, black haired. Third leg. Coxa sooty redbrown, golden yellowbrown haired, trochanter black, black haired, femur black, clothed with copperreddish pubescence; proximal lateral border black haired. Tibia pale redbrown, black at apex, black haired on dorsum, ventral surface coppered haired. Tarsalia redbrown.

Abdomen deep black on dorsum, first 2 segments paler, brownish, with a straight-sided median stripe of ochraceous hairs, first segment with a small ochraceousyellow haired spot at each side of the scutellum, first four segmentations narrowly yellow fringed, same pubescence on the lateral borders of the first 3 tergites. Pubescence elsewhere black. In some specimens the yellow hairs are wanting on the first 4 segmentations or reduced to a median group of hairs on each segment. Ventral surface presenting a median black, black haired longitudinal stripe on the first 4 segments, interrupted at the segmentations, which are paler, reddish goldenyellow haired. Sides dull brown, yellow haired, following segments wholly black, black haired. *T. chloropis* is closely allied to *T. birmanicus* BIGOT but differs inter alia in the shape of the forehead, which is narrower, the colouring and pubescence of the subcallus, cheeks and face, the colour and pubescence of the tibiae, and the abdominal markings.

98. *Tabanus flavistriatus* nov. spec. (♀) Pl. 8, Fig. 2; Textfig. 108.

Habitat:

- Type ♀ from Sumatra, Lampong Districts, Wai Lima captured in shrub near the tent at 11 h.a.m., KARNY 17.11.'21 (Textfig. 108 b). Coll. B.Z.M.
- 2 ♀♀ from jungle near Sibolga, Tapanoeli, no cattle in the neighbourhood
BUBBERMAN, 2.'22 Coll. V.S.L.
- 1 ♀ from Siboeni-boeni, Siboloean, Sibolga, Tapanoeli, on buffalo (Textfig. 108 i), BUBBERMAN, 2.'22 Coll. V.S.L.
- 4 ♀♀ from Pangkal Dolok, Binanga, Tapanoeli, LOBEL ,,
respectively 1 on horse 10.'22 (Textfig. 108 e)
1 ,, ,, 23.2.'23
1 ,, buffalo 1.'23
1 ,, ,, 23.2.'23
- 4 ♀♀ from Pasar Sibohoean, Djandi Lobi, Binanga, Tapanoeli, LOBEL, BAKKER
respectively 3 on buffalo 4.6.'23 (Textfig. 108 j)
1 ,, ,, 27.8.'24
- 3 ♀♀ from Si Oendol, Paringgonan, Binanga, Tapanoeli, BAKKER
respectively 2 on buffalo 26.8.'24
1 ,, horse 24.9.'24
- 2 ♀♀ from Hoeta Nopan, Hoeta Nopan, Binanga, Tapanoeli, BAKKER
respectively 1 on buffalo 28.8.'24
1 ,, ,, 27.10.'24
- 2 ♀♀ from Kota Nopan, Tapanoeli, LOBEL Coll. V.S.L.
respectively 1 on buffalo 26.11.'22 (Textfig. 108. g)
1 ,, ,, 24.4.'23
1 ,, horse 3.'23
- 3 ♀♀ from Hoeta Nagodang, Manambin, Kota Nopan, Tapanoeli, on buffalo,
LOBEL, 24.12.'22 (Textfig. 108 c. d. f.) Coll. V.S.L.
- 2 ♀♀ from Moeara Tagor, Tamiang, Kota Nopan, Tapanoeli, on buffalo,
LOBEL, Coll. V.S.L.
respectively 1 on cattle 3.'23
1 ,, horse 11.7.'23

- 1 ♀ from Hapesong Lama, Marantjar, Kota Nopan, Tapanoeli, on cattle,
3,'23 (Textfig. 108 a) Coll. V.S.L.
- 1 ♀ from Sipengoe, Kota Nopan, Tapanoeli, on buffalo, BAKKER, 2.10.'23
Coll. V.S.L.
- 1 ♀ from Pidjor Koling, Pidjor Koling, Padang Sidempoean, Tapanoeli, on
horse, LOBEL, 6.8.'23 Coll. V.S.L.
- 1 ♀ from Penantin, Kaban Djahe, Sumatra's East Coast, on buffalo, VAN
DER REEST, 4.'23 Coll. V.S.L.
Isle Java
- 1 ♀ present in the late Dr. SOHN's collection was probably captured on Java,
locality unknown (Textfig. 108 h. k).

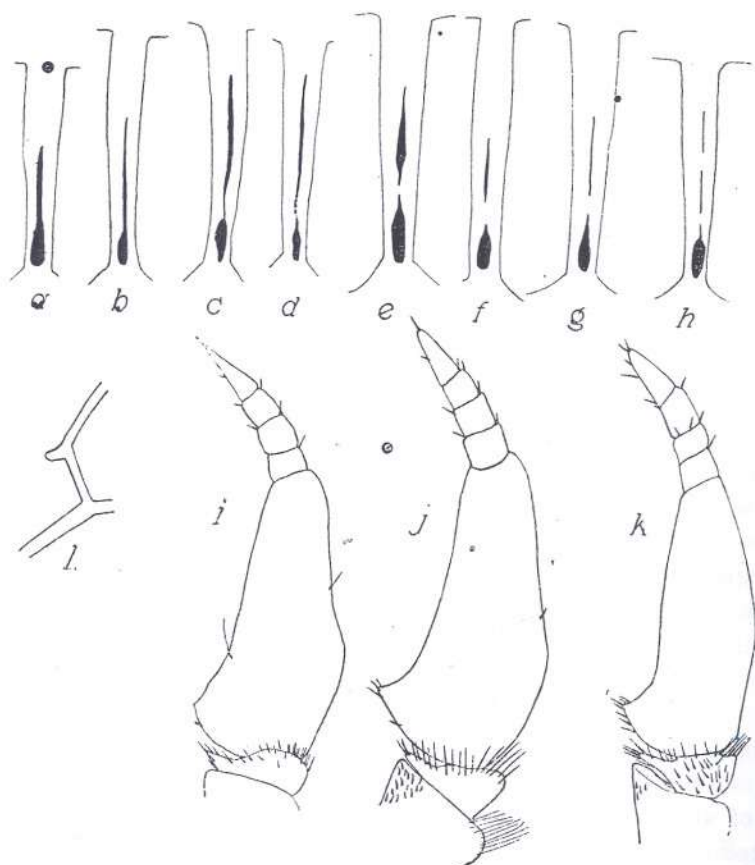
Tabanus flavistriatus is a beautiful, green-eyed olivebrown species. Forehead narrow, ochraceous-yellow, callus pearl-shaped, olivebrown, with a thread-like, fine, long linear extension, often not connected. Subcallus, face and cheeks goldenyellow. Beard pale citron-yellow. Palpi yellow, black haired. Antennae ochraceous, with short blunt tooth, darker at apex. Thorax rustybrown, black and goldenyellow haired with traces of longitudinal stripes. Wings smoky, apex paler, appendix sometimes apparent. Halteres luteous. Legs pale, femora brownish orange, tibiae strawyellow, hind tibiae darker, Abdomen olivebrown at base, blackbrown to the apex, black haired, with a median longitudinal, yellow haired stripe, extending to the sixth segment, broader and serrated on the 3 last segments. Ventral surface pale olivebrown, bright ochraceous-yellow haired, black haired on the seventh segment.

Table of dimensions.

Bodylength	varying from 12,5 m.M. — 16,2 m.M.			
Width of thorax	„	„	3,8	„ — 5,6 „
Width of abdomen	„	„	4,2	„ — 6 „
Wingexpanse	„	„	24,8	„ — 32 „
Length of head	„	„	2	„ — 3 „
Length of thorax	„	„	5	„ — 7 „
Length of abdomen	„	„	6,5	„ — 9,5 „
Length of wing	„	„	10,5	„ — 13,2 „
Breadth of wing	„	„	3,2	„ — 5,2 „
Foreheadindex	„	„	7,5	— 10

The Head. (Textfig. 108). Forehead narrow, from 0,2 to 0,4 narrower at base than it is at vertex, goldenbrown, with slightly darker, chocolatebrownish borders, black haired. Callus olivebrown to darkreddbrown, pearl-shaped, effilated to a threadlike, rather long blackbrown linear extension, callus as well as the extension being variable in shape, connected or separated; in this case a lower, tomentum-covered ridge connects callus and linear extension. Subcallus rustybrown, goldenyellow tomentose. Upper cheeks rustybrown, black haird, lower cheeks citron-

yellow to ochraceousyellow. Beard ranging from pale citroneyellow, yellowish white, ochraceous yellow to brownyellow. Face brownish goldenyellow or ochraceous yellow with a tuft of black hairs underneath each antenna, median part of face yellow and black haired in most specimens, in others the whole face is black haired. Postocular rim yellowbrown, rustybrown and black-brown haired. Palpi orangeous-bright ochreyellow, first joint clothed with orangeous pubescence, intermixed with some black hairs at apex, second joint long and stout, ending in a blunt



Textfig. 108.

T. flavistriatus s. s. ♀. a—h. forehead, i—k. antenna, l. wingstructure.

point, black haired, with some orangeousyellow hairs at base. Antennae, pale strawyellow, first joint strongly black haired at apex on dorsum, black pubescence scanty at base, lateral borders orangeyellow haired, second joint brighter ochraceousyellow, with dorsal black spine, black fringed at apex, third joint orangeous cinnamonyellow, with short blunt tooth, crowned with black hairs, basal annulation long and slender, 2,1 times as long as its widest part and 1,7 times as long as the darker redbrown to black stylus. Proboscis, stalk orangeousyellow haired, sugarflaps darker, redbrown haired.

Thorax rustybrown, with traces of a median fine longitudinal redbrown stripe and 2 other broader lateral stripes, covered with black and goldenyellow pubescence, short on disc, long and mainly goldenyellow at sides and along the hindborder of the scutum and the scutellum. Lateral borders of scutum pale yellow tomentose, groundcolour ochraceousyellow-

brown. Hairtufts at base of wings and behind goldenyellow. Shoulders redbrown haired. Pteropleuron darker than the scutum, black haired, with some short yellow hairs at upper border. Sides and breast strawyellow, orangeousyellow haired. Wings, foreborder siennabrown, prolonged by a smokybrown to brownblack apical shadow, stigma havannayellowbrown, base of wing yellowish, elsewhere yellowbrown, hindborder greyish brown. In 13% of the studied females an appendix was present either on one or on both wings. Halteres, stalk redbrown, club yellowbrown. Legs. First leg, Coxa orangeousyellow, brownblack at apex, orange haired; trochanter blackbrown; femur brownish orange, orange haired, with some black hairs intermixed at apex, and a long fringe at lateral borders; in one of the other females the whole dorsum of the femur was black haired; tibia pale strawyellow, yellow haired, with narrow havannabrown apical, black haired ring. Tarsalia havannabrown, black haired. Second leg, Coxa yellowbrown, yellow haired, trochanter redbrown, femur as in first leg, but brighter, orangeyellow, orange haired, with some black hairs at apex; tibia more yellow than in the fore tibiae, orange haired, with a fringe of yellow hairs, intermixed with black hairs along the distal lateral border, ventral spines black, a number of black hairs is found on the dorsum in the middle, apical ring reddishbrown, black haired. Tarsalia olivebrown, black haired, first tarsale paler at base than at apex. Third leg identical, tibia orange, ochraceous haired on dorsum, ventrally orange haired. Tarsalia reddish olivebrown, black haired.

Abdomen olivebrown on first three segments, darker to almost black to the apex, mainly black haired on dorsum with a median, longitudinal, goldenyellow haired stripe, starting on the first segment; it stops in most specimens on the fifth segment and is continued in some specimens on the 6th segment, being very distinct at the segmentations, fainter however on the disc of the segments, its lateral borders being serrated. Lateral borders of first 2 tergites olivebrown, yellow haired, paler yellowbrown on the following three segments, yellow haired, intermixed with black hairs. Ventral surface pale olivebrown, orangeyellow haired, seventh segment black haired.

The described species differs from *T. auristriatus* Ric. to which it is closely allied in the shape of the forehead and its callus, the colour of the beard, breast and ventral surface of the abdomen. *T. aurotestaceus* Wlk. is much greater in size and differs further in the colouring of wings and fore femora and the width of the abdominal stripe.

99. *Tabanus auribundus* nov. spec. (♀) Pl. 8, Fig. 3; Textfig. 109.

References:

- MACQUART, Dipt. Exot. I, p. 78, 31 (1821).
 „ Auss. Zweifl. Ins. I, p. 154 (1828).
 „ Dipt. Exot. (I), 1, p. 129, 16 (1838).

Habitat:

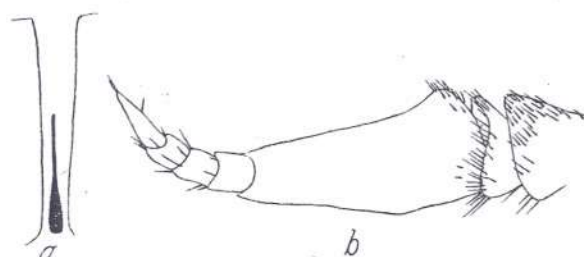
Type ♀ and 2 other females from Gamboeng, Tea Estate on Goenoeng Tiloe,
 Preanger Refencjes, on horse 5.23, KERKHOVEN Coll. V.S.L.

T. auribundus, closely allied to *T. flavistriatus* SCHUURMANS STEKHOVEN, is distinguishable from it by the brighter, ochraceousyellow colour on face and cheeks, the more acuminate palpi, the bright ochraceous tibiae, the abdominal stripe being straight-sided and extending on the 3d till 6th segment, beginning at the 2d segmentation, base of abdomen brighter. Eyes green. Forehead narrow, yellowbrown, black haired. Callus dull olivebrown, club-

shaped, linear extension rather short. Subcallus, cheeks and face bright ochraceousyellowbrown, upper cheeks black haired, lower cheeks ochraceousyellow haired. Beard same colour. Palpi ochraceousyellow, black haired. Antennae same colour, basal joints paler, tooth indistinct. Thorax reddish yellowbrown, with 3 indistinct redbrown narrow longitudinal stripes, goldenyellow and black haired. Breast ochraceousyellow haired. Wings with apical shadow, no appendix. Abdomen basal $2\frac{1}{2}$ segments reddishbrown, following segments darker, blackbrown to the apex.

Table of dimensions.

Bodylength	varying from 13 m.M. to 15,5 m.M.			
Width of thorax	„	„	4	„ — 5,2 „
Width of abdomen	„	„	4,5	„ — 5,6 „
Wingexpanse	„	„	24	„ — 39,5 „
Length of head	„	„	2,2	„ — 2,5 „
Length of thorax	„	„	4,5	„ — 6 „
Length of abdomen	„	„	7,5	„ — 9,2 „
Length of wing	„	„	10	„ — 17,5 „
Breadth of wing	„	„	3,8	„ — 5 „
Foreheadindex	„	„	9	„ — 10,8 „



Textfig. 109.

T. auribundus s. s. ♀. a. forehead, b. antenna.

The Head. (Textfig. 109). Forehead 0,37—0,44 narrower anteriorly than it is at vertex, vertexspot sootygrey tomentose, thick black haired. Callus dull olivebrown at base, darker, almost black at apex in the type, wholly olivebrown in one of the other females. Face black haired. Palpi, first joint pale ochraceousyellow, yellow haired, second joint paler, ending with a slender point, thick black haired. Probosis black, stalk

yellowbrown haired, sugarflaps yellowbrown and black haired. Antennae, first joint pale yellowbrown, black haired on dorsum at apex and in the median line, elsewhere yellow haired, second joint reddishyellowbrown, black fringed, dorsal spine long. Third joint slightly curved, basal annulation 2 times as long as its widest part, 1,4 times as long as the yellow reddish-black tipped stylus, tooth blunt, black haired. Postocular rim yellow, redbrown haired. Eyes green.

Thorax reddishyellowbrown, hind border and lateral borders paler, disc black haired, intermixed with a large number of golden-copperyellow, hairs, which are longer at hindborder of scutum and on tufts at base of wings than elsewhere. Scutellum same colour as scutum, hindborder paler, goldenyellowbrown haired, intermixed with a few black hairs. Pteropleuron and shoulders black haired, breast and sides goldenyellowbrown, ochraceousyellow haired. Wings, foreborder redbrown, stigma havannabrown, apical shadow smokybrown. Halteres

redbrown. Legs. First leg. Coxa butteryellow, goldenyellow haired, apical border black; trochanter blackbrown, femur yellowbrown, ochraceousyellow haired, some black hairs at apex. Tibia pale yellowwhite at base, then more yellowbrown, apical ring darker, wholly yellow haired, intermixed with some black hairs on dorsum. Tarsalia redbrown, black haired, first tarsale ochraceousyellow on ventral surface. Second leg. Coxa yellowbrown, yellow haired. Trochanter redbrown, femur ochraceousyellow, yellow haired. Tibia paler yellow, yellow haired, with a few black hairs on dorsum at apex. Tarsalia yellowbrown, black haired, first tarsale yellow haired on ventral surface. Third leg, tibia with a dorsal median row of black hairs, elsewhere yellow haired.

Abdomen showing all gradations from pale to dark redbrown, black haired. Median stripe straight-sided. Lateral borders of the first 5 tergites yellow haired. Ventral surface reddishbrown, yellow haired, some black hairs being intermixed on the 6th segment, 7th segment wholly black haired.

In one of the other females the median stripe is only distinctly visible on the 3d and 4th segment, the stripe being reduced on the other segments to small groups of yellow hairs on the 2d and 5th segmentation.

T. auribundus is allied to *T. ardens* WIED. WIEDEMANN's description of the latter species mentions, that the palpi are pale brownish, forehead ochrebrown, disc of scutum with ferrugineousyellow longitudinal stripes. First abdominal segment with median goldenyellow haired spot, halteres goldenyellow. Although the points of resemblance are great, it is not possible for me to bring both species, which originated both from Java, to the same species. In the male, described by MACQUART, the longitudinal stripes of the scutum were not visible, therefore it is doubtful if this male belongs to the same species.

100. *Tabanus fusciventer* nov. spec. (♀) Pl. 8, Fig. 4; TEXTFIG. 110.

Habitat:

Isle Sumatra

Type ♀ from Si Boeni boeni, Siboloean, Sibolga, Tapanoeli 12.'22, LOBEL
on cattle Coll. V.S.L.

4 ♀ ♀ from Si Boeni boeni, Siboloean, Sibolga, LOBEL and BAKKER
respectively 1 ♀ on cattle 3.'22
1 ♀ „ buffalo 15.6.'23
1 ♀ „ cattle 28.6.'23
1 ♀ „ buffalo 8.8.'24

6 ♀ ♀ from Kampong Mela, Sibolga 12.'22, LOBEL (Textfig. 110 a, b, d.)

1 ♀ „ Binanga, Tapanoeli on horse 10.'22, LOBEL

1 ♀ „ Kajoe Djati, Kota Siantar, Kota Nopan, Tapanoeli on buffalo,
BAKKER 4.6.'24

1 ♀ from Kota Nopan without further indication on buffalo 11.5.'24, BAKKER

1 ♀ „ Moeara Tagor, Tamiang, Kota Nopan on buffalo LOBEL (Text-
fig. 110 c. e.)

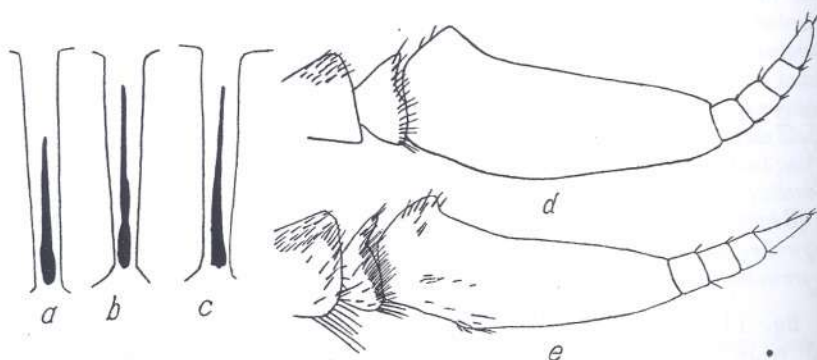
1 ♀ from Sumatra, locality unknown Coll. L.M.N.H.

A green-eyed brownish species, resembling to *T. brunnipes* SCHUURMANS STEKHOVEN. Forehead narrow, dark velvetybrown, goldenyellow haired. Callus narrow, cylindrical, deep redbrown to blackbrown, tapering to the long fine linear

extension. Subcallus and upper cheeks chromyellorredbrown, black haired. Lower cheeks ochraceous, citroneyellow haired. Beard same colour. Face chrom-orangeyellow, black haired just under the antennae and on the sootyblack tomentose lateral borders, median area yellow haired. Palpi tawnyyellowbrown, brownyellow tomentose, black haired, apex broad. Antennae orangeousyellowbrown, black haired on basal joints, third joint reddishyellowbrown, darker, at apex, tooth indistinct. Thorax velvetybrown, mainly black haired without longitudinal stripes, lateral borders paler goldenbrown. Wings with havanna-brown apical shadow, base yellowishbrown. Legs with dark femora and pale brownishstrawyyellow tibiae. Abdomen unicolorous reddish havannabrown, black haired, with a median paler stripe on the segments 2—5. Lateral borders of tergites yellow haired. Ventral surface with darkbrown, black haired, longitudinal band, whitish, white haired, segmentations and yellowish-brickred, brownwhite haired sides.

Table of dimensions.

Bodylength	varying from 14,6 m.M. to 16,2 m.M.				
Width of thorax	„	„	4,5	„	— 5,2 „
Width of abdomen	„	„	4,5	„	— 5,5 „
Wingexpanse	„	„	27,8	„	— 31,6 „
Length of head	„	„	2,5	„	— 3,2 „
Length of thorax	„	„	5	„	— 6,5 „
Length of abdomen	„	„	7,5	„	— 9 „
Length of wing	„	„	11,5	„	— 13,2 „
Breadth of wing	„	„	4,2	„	— 5,2 „
Foreheadindex	„	„	8,8	„	— 11,6



Textfig. 110.

T. fusciventer s. s. ♀. a—c. forehead, d, e. antenna.

The Head. (Textfig. 110). Forehead 0,4—0,5 narrower anteriorly than it is at vertex. In the type callus and linear extension are not sharply separated, in other specimens they

are. Palpi, first joint, clothed with black and brown pubescence, second joint stout, ending with a broad, blunt point, brownyellow tomentose, black haired. Antennae, first joint orangeous yellowbrown, pale yellowish tomentose, dorsum black haired, distal lateral borders and ventral surface pale yellowishbrown haired, second joint yellowredbrown, black fringed, dorsal hump blunt, third joint yellowbrown at base up to the upper border of the indistinct blunt tooth, then darker, basal annulation 2.4 times as long as its widest part, 2.1 times as long as the black stylus. Proboscis, stalk brownyellow and black haired, sugarflaps black, black haired, intermixed with some reddishbrown hairs. Postoculair rim yellowbrown haired. Eyes as far, as may be concluded from dried specimens, wholly green in life.

Thorax, scutum black haired, intermixed with some yellowbrown hairs, on rubbed spots the darkbrownblack groundcolour is visible. Pteropleuron dull bismarckbrown, black haired. Tufts at base of wings and behind pale yellowbrown. Sides and breast brownish bluish-grey, pale yellowishbrown haired, mesosternumlobus goldenbrown. Wings, foreborder yellowbrown, stigma dark havannabrown, apical shadow and a large part of the hindborder dark havannabrown. Base of wing yellowishbrown. Halteres, stalk dark velvetybrown, club shining blackbrown. Legs. First leg. Coxa yellowbrownish, grey tomentose, brownishyellowwhite haired; trochanter sootygrey, dull brownish haired, femur piceous, dorsum black haired, some bismarckbrown hairs being intermixed at the distal lateral border, knee slightly yellowbrown. Tibia redbrown at extreme base, then dirty brownishwhite, yellow haired, intermixed with black hairs, apical $\frac{1}{3}$ olivebrown to blackbrown, black haired, ventral surface yellow haired, tarsalia black. Second leg. Coxa greybrown, yellowbrown haired, trochanter blackbrown. Femur brownish black, hoary tomentose on lateral borders, dorsum black haired, distal lateral border yellow haired, knee ochraceousyellow. Tibia strawyellow, strawyellow haired, intermixed with some black hairs on basal $\frac{3}{4}$, apex blackishbrown, black haired, ventral surface yellow haired. First tarsale orangeousredbrown at base, then black, other tarsalia black. Third leg. Coxa greyblue to slateblue, borders brownish, pale brown haired. Femur black, yellowbrown tomentose on lateral borders, brownishyellow haired, except on dorsum in the middle, where one finds a row of black hairs, knee yellowbrown. Tibia strawyellow, apexring covering less than $\frac{1}{4}$, reddishbrown, dorsum black haired, ventral surface yellow haired at base, black haired on the apical ring only. First tarsale darkbrown, black haired, other tarsalia wholly black.

Abdomen almost unicolorous reddish havannabrown, broad, rounded at apex, with a median goldenbrown longitudinal stripe running over the 2d—5th segment, segmentations narrowly paler. On first segment one finds a yellow spot at each side of the scutellum. Lateral borders of the first 6 tergites paler, yellowish, yellow haired. Ventral surface as mentioned. Segmentations whitish, white haired. Sides brownwhite haired. In one of the females yellow hairs are intermixed between the black hairs on the longitudinal band.

101. *Tabanus birmanicus* BIGOT (♀) Textfig. 111.

References:

- BIGOT, Mem. Soc. Zool. France V, p. 653 (1892).
 RICARDO, Rec. Ind. Mus. IV, p. 200 (1911).
 SHIRAKI, Tabanidae of Formosa, p. 420 (1918).

Habitat:

Type ♀ from Burma

Coll. B.R.M.

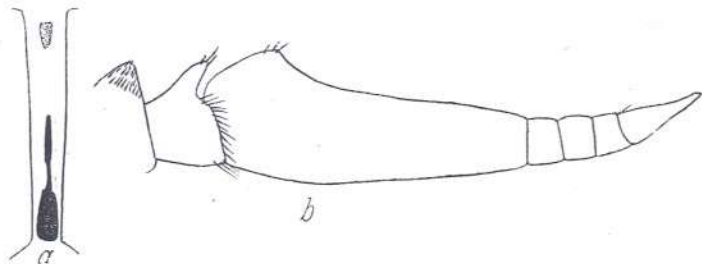
♀ ♀ from Ningpoh, India, H. MAXWELL LE FROY

1 ♀ from Lushai Hills, Burma, KERTESZ

- 1 ♀ „ Kuala Lumpur, London School Trop. Med.
 1 ♀ „ Formosa, Kusuksu in Koshun Cho 21.5.'18, YOSHINO?

SHIRAKI coll.

A medium-sized, redbrown species. Forehead redbrown. Callus redbrown, pear-shaped, with short black linear extension. Subcallus, cheeks and face redbrown, redbrown haired as is the beard. Palpi reddishbrown, black haired. Antennae brown, long and slender, with inconspicuous tooth. Thorax redbrown, redbrown haired. Wings redbrown. Legs with blackbrown femora and white tibiae. Abdomen blackbrown, with a median stripe of yellowish hairs on the first 2 segments. Length of type 18 m.M., other females 16—19 m.M.



Textfig. 111.

T. birmanicus BIGOT ♀. a. forehead, b. antenna.

The Head.
 (Textfig. 111). Forehead redbrown, 0,25 narrower, anteriorly than it is at vertex, index 7,6. Callus as described, almost reaching to the eyes. Vertex spot triangular, narrow. Subcallus, etc. bright reddishbrown, similar

pubescence. Palpi reddishbrown, stout, with an obtuse point, black haired. Antennae slender, first 2 joints dark havannabrown, black haired, second joint with acute dorsal spur, third joint bright reddishyellow, darker at extreme apex, basal annulation long, 2,45 times as long as its widest part, 1,7 times as long as the stylus, tooth not very prominent, visible at base of annulation.

Thorax redbrown, redbrown haired. Pteropleuron reddish, black haired. Breast and sides redbrown, dark redbrown haired, black haired on mesosternum lobus. Wings tinged redbrown, with clearer centres in some of the cells. Stigma burnt siennabrown. Legs. Femora dark blackbrown with yellowbrown knees, black haired, fore tibiae swollen, curved, brownish at extreme base, then white, white haired, apical band brownish, this apical band, being the broadest on the fore tibiae, is much narrower on the middle and hind tibiae, which are mainly white, white haired. Tarsalia redbrown, black haired.

Abdomen blackbrown, black haired, except on the described median stripe. Lateral borders of the first 2 tergites yellowish-brown.

SHIRAKI's female is distinguished i.a. by the narrower forehead, the shorter linear extension, the paler, deep yellow haired thorax, the darker pubescence on face and cheeks, the paler antennae with their shorter stylus, the paler palpi and the darker legs, with a greater number of black hairs on the apices of the tibiae. Eyes in life copper green. Therefore I doubt whether his specimen really belongs to *T. birmanicus* BIGOT and think it is distinct.

102. *Tabanus angustistriatus* nov. spec. (♀) Textfig. 112.*

Habitat:

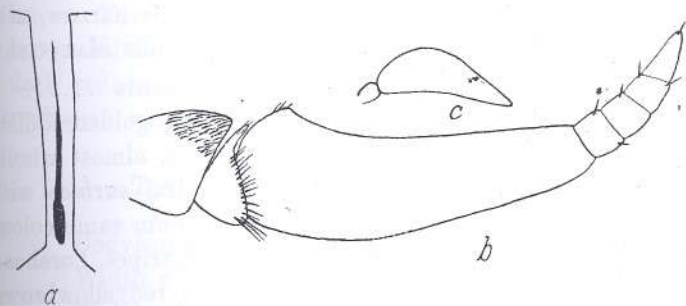
Isle Sumatra

Type ♀ from Moeara Sako, 10.'15, JACOBSON

Coll. N.A.M.

- 1 ♀ from Hoeta Nopan, Hoeta Nopan, Binanga, Tapanoeli on buffalo 22.9.'23,
 BAKKER Coll. V.S.L.
 1 ♀ from Balun, Padang Highlands 6.'14, JACOBSON Coll. N.A.M.

A species allied to *T. chloropis* SCHUURMANS STEKHOVEN and *T. fusciventer* SCHUURMANS STEKHOVEN, distinguished from the latter inter alia by the shape of the palpi. Forehead darkbrown, black haired. Callus elongate, oval redbrown, linear extension black. Subcallus leatherbrown, cheeks paler yellowbrown, upper cheeks black haired; lower cheeks and beard yellowbrown haired. Face black haired. Palpi yellowbrown, yellowbrown to black haired. Antennae yellowbrown to havannabrown, black haired. Thorax yellowish havannabrown, with 2 indistinct redbrown longitudinal stripes, scutum mainly reddish yellowbrown haired. Wings tawny-yellowbrown with darker apical shadow. Legs yellowbrown, yellowbrown and black haired. Abdomen tawnyredbrown, black haired, with faint median straight-sided yellowbrown, yellow haired median stripe present on the 1st till 5th segment. Lateral borders of the first 4 tergites yellow haired. Length 15,5 m.M. Wingsexpanse 31 m.M. Width of thorax 5 m.M; Length of wing 13 m.M. Length of abdomen 8,5 m.M.



Textfig. 112.

T. angustistriatus s. s. ♀. a. forehead, b. antenna, c. palpe.

Antennae, first 2 joints yellowbrown, black haired, first joint protruding caplike over the second joint, third joint dull havannabrown, basal annulation 2,5 times as long as its widest part, 2 times as long as the black stylus, tooth indistinct, situated near the base.

Thorax reddishyellowbrown haired, intermixed with some black hairs. Pteropleuron reddish havannabrown, black haired. Scutellum slightly paler than scutum, yellowbrown tomentose, yellow haired. Sides and breast brownish grey, yellowbrown haired. Wings tawny-brown in type, especially on cubital and radial cells, brown shadows accompanying the other veins, foreborder reddishyellowbrown. In the second female the wing is almost wholly infuscated, except at extreme apex, paler centres in some of the cells. Halteres dark tawny brown. Legs. First leg. Coxa brownishgrey, pale brownishyellow haired, trochanter blackbrown, femur similar, knee yellowbrown, black haired. Tibia dirtyyellowbrown, yellowwhite haired on basal half, apex blackbrown, black haired. Tarsalia black, black haired. Second leg, coxa yellowbrown, femur tawny, knee yellowbrown, dorsum yellowbrown haired, except some black hairs at apex. Tibia yellowbrown, black haired, apex blackbrown. Tarsalia blackbrown,

The Head.
 (Textfig. 112). Forehead darkbrown, 0.27 anteriorly than it is at vertex, with a darker median shadow, index 9. Callus, etc. as described. Palpi, first joint yellowbrown haired, second joint stout at base, tapering to an acute point, black haired.

black haired. Third leg. Coxa grey, yellowbrown haired, trochanter blackbrown, black haired, femur blackishyellowbrown, black haired on dorsum in the median row, elsewhere yellowbrown haired. Tibia pale yellowbrown at base, redbrown at apex, black haired on dorsum, yellowwhite haired below. Tarsalia redbrown, black haired.

A b d o m e n tawnyredbrown, black haired, with a pale yellowbrown tomentose stripe, only visible in the type on the first 2 segments, occurring on the first 5 segments in the other female, this stripe being yellow haired, pubescence thicker at the segmentations. Lateral borders as mentioned. Ventral surface with a median series of blackbrown, black haired patches on the segments 2—6 Sides and segmentations yellowbrown, yellow haired.

GROUP. VI.

This group includes all species with a bicolourous abdomen, with the basal segments whitish of rustybrown, contrasting with the following darkbrown or black segments. Wings wholly brownish or with darker apex only.

KEY. 16.

- 1a. First two abdominal segments waxyyellow, yellow haired, following segments blackbrown with yellow haired segmentations, ventral surface with white fringed segmentations. Scutellum yellowbrown, paler than the blackbrown scutum. Forehead dark velvetybrown, narrow, with narrow, redbrown callus and black linear extension **basalis** MACQUART.
- b. Abdomen reddish yellowbrown on the first 3 or 4 segments 2
- 2a. First 3 or 4 abdominal segments redyellowbrown with goldenreddishyellowbrown pubescence; following segments blackbrown, almost wholly black haired, without distinctly paler hairfringes, ventral surface with small yellow hairgroups on the 2d—4th segment. Scutellum same colour as scutum, last part dull redbrown with pale longitudinal stripes. Forehead dull brown, rather broad, callus chestnutbrown, tibiae redyellowbrown **chrysater** SCHUURMANS STEKHOVEN.
- b. Abdomen ochraceous reddish yellow on the first 3 segments, goldenyellow haired, elsewhere blackbrown, black haired, ventral surface wholly blackbrown, black haired. Scutum without paler longitudinal stripes, same colour as the chocolatebrown scutellum. Forehead rather narrow, deep velvetybrown, black haired. Callus brownblack. Tibiae black **ochroäter** SCHUURMANS STEKHOVEN.

103. *Tabanus basalis* MACQUART (♀, ♂) Pl. 9, Fig. 3, Textfig. 113.

Syn.: Tabanus batavus RICARDO.

References:

RICARDO, Tijdschr. v. Ent. LV, p. 349 (1912).

DE MEYERE, Tijdschr. v. Ent. LX, p. 296 (1918).

MACQUART, Dipt. Exot. I, p. 139 (1838).

VAN DER WULP, Notes Leyden Mus. VII, p. 72,26 (1885).

RICARDO, Rec. Ind. Mus. IV, p. 147 (1911).

DE MEYERE, Tijdschr. v. Ent. LXVII, p. 56, suppl. (1924).

Habitat:

Type ♀ from East India

Paris Museum

2 ♀ ♀ from Sumatra, without further locality, VAN LANSBERGE, VAN DER WULP
det.

Coll. L.M.N.H.

1 ♀ from Java, XANTUS, type *T. batavus* RIC.

Coll. N.A.M.

1 ♀ „ Java, Madioen? from the late Dr. SOHNS' collection

Coll. V.S.L.

1 ♀ „ Java, Hills, South from Batang, lower ranges, Res. Pekalongan,
SOHNS leg '19

Coll. N.A.M.

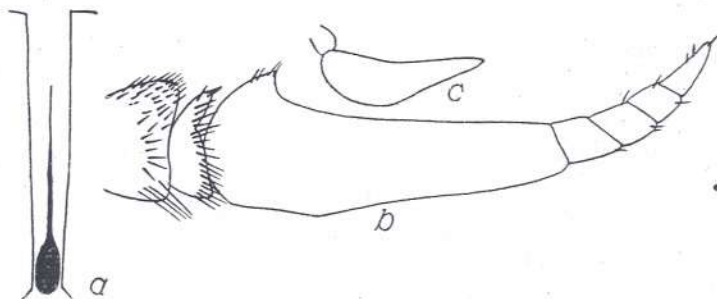
A very characteristic species, distinguished at once by the first 2 waxy-yellow, yellow haired abdominal segments, the rest of the abdomen being black-brown, black haired, with pale yellowwhite hairfringes to the 3d and 4th segment, ventral surface with yellow, yellow haired first segment, elsewhere as on dorsum, with white hairfringes to the 2—4th segment. Thorax dark blackbrown, with traces of longitudinal redbrown stripes, paler lateral borders, scutellum yellow-brown. Forehead narrow, blackbrown, black haired with cylindrical, yellow-brown callus, linear extension black. Subcallus, cheeks and face darkredbrown, dark redbrown haired. Palpi dark redbrown, black haired. Antennae dark-redbrown with a small tooth.

Table of dimensions.

Bodylength	16,5 m.M.
Width of thorax	5,5 „
Width of abdomen	6,2 „
Wingexpanse	33,5 „
Length of head	2,5 „
Length of thorax	7 „
Length of abdomen	9,5 „
Length of wing	14 „
Breadth of wing	5 „
Foreheadindex	9,1

The Head. (Textfig. 113). Forehead dark velvetybrown to blackbrown, black haired, 0,46 narrower anteriorly than it is at vertex. Callus cylindrical, shining yellowbrown to redbrown, nearly reaching the eyes, prolonged into a long black linear extension, nearly reaching to the vertex, the extreme apex however is hidden under the tomentum of the forehead. Cheeks and face as mentioned, upper cheeks black haired, on the face some yellowbrown hairs are intermixed between the redbrown ones. Beard dark redbrown. Palpi dark redbrown, first joint blackish, redbrown haired, second joint stout, with long acute

point, black haired. Proboscis black. Antennae dark redbrown, black haired, third joint slender with small tooth at base, basal annulation 2,5 times as long as its widest part and 2 times as long as the stylus. Postocular rim blackbrown haired.



Textfig. 113.

T. basalis Macq. ♀, a. forehead, b. antenna, c. palpe.

Thorax dark blackbrown, scutellum yellowbrown, pale yellowbrown haired, as are also the paler longitudinal stripes and the lateral yellowbrown borders of the scutum. Pteropleuron yellowbrown, black haired. Breast and sides dull reddish-vannabrown, black

haired, mesosternumlobus yellow haired at borders. Wings, foreborder reddishyellow, stigma violet-redbrown, apical shadow reddish yellowbrown, extreme apex paler. Hindborder brownish yellow, veins yellowbrown at the base of the wings, more redbrown to the apex. Halteres, stalk redbrown, club reddish yellowbrown. Legs. First leg; Coxa blackbrown, black haired, trochanter shining redbrown, as is also the femur, black haired; tibia redbrown at extreme base, yellowishbrown on basal half, blackbrown at apex, wholly black haired. Tarsalia black, black haired. Second leg, femur blackbrown, black haired, knee olivebrown, distal lateral border yellow haired. Tibia redbrown, black haired. Tarsalia black. Third leg. Coxa dull redbrown, greybrown tomentose on proximal lateral border, yellowbrown haired; femur dark redbrown, knee olivebrown, with yellow haired distal lateral border. Tibia yellowbrown at base, redblackbrown at apex, black haired. Tarsalia black.

Abdomen waxyyellow on the first 2 segments, orangeyellow haired, white fringed at the segmentations, other segments blackbrown, black haired with white fringes to the 3d and 4th segment, ventral surface as described. *Tabanus batavus* RICARDO and *T. basalis* MACQUART show such a farreaching conformity, that a separation of both species is not justifiable, the only difference I can find in the literature is, that according to RICARDO the first posterior cell is closed.

I have not seen the male, RICARDO mentions in her description, in any of the collections. The male is similar to the female, large facets of eyes reach beyond the apex of the frontal triangle, but do not reach the vertex, a narrow border of the small facets extending to the vertex. Abdomen with the anterior border of third segment also yellowish. Not impossible the male mentioned here is the same as the male of *T. chrysater* SCH. STEKH. and when this is true this male ought to be separated from *T. basalis* MACQ.

103. *Tabanus chrysater* nov. spec. (♀, ♂) Pl. 9, Fig 15; Textfig. 114.

Habitat:

Type ♀ from Madioen, Java, VAN BERGEN 4.'23

Coll. V.S.L.

1 ♀ from Semarang, Java 12.'10

Coll. N.A.M.

Type ♂ from Buitenzorg, Java, HUBER 7.11.'22 on the wall of the horsestable

Coll. V.S.L.

1 ♂ from Tandjong Morawa, Serdang, Sumatra, HAGEN

Coll. L.M.N.H.

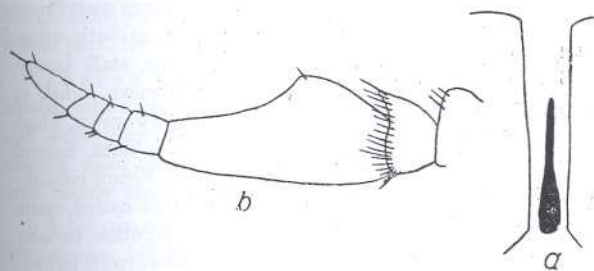
A beautiful species with bicolourous abdomen. Forehead dull brown, black haired. Callus chestnutbrown, cylindrical with a broad linear extension. Subcallus, cheeks and face chocolatebrown, black haired. Beard black. Palpi stout, redbrown, black haired. Antennae reddish yellowbrown, stylus black. Thorax dullredbrown with 2 paler longitudinal stripes. Wings brownish with darker apical shadow, no appendix. Legs brownblack with redyellowbrown tibiae. Male identical, eyes yellowbrown with lower small-facetted part black.

Table of dimensions.

	♀	♂
Bodylength	16,8 m.M.	17,2 m.M.
Width of thorax	5 ,,	5,8 ,,
Width of abdomen	6 ,,	5,8 ,,
Wingexpanse	34 ,,	34,8 ,,
Length of head	2,2 ,,	3,5 ,,
Length of thorax	6,8 ,,	5,6 ,,
Length of abdomen	9,5 ,,	9,5 ,,
Length of wing	14,5 ,,	14,5 ,,
Breadth of wing	6,2 ,,	4,8 ,,
Foreheadindex	5,4	..

The Female.

The Head. (Textfig. 114). Forehead 0,16 narrower anteriorly than it is at vertex, black haired. Callus chestnutbrown with a tapering, rather broad, similar coloured linear extension.



Textfig. 114.

T. chrysater s.s. ♀. a. forehead, b. antenna.

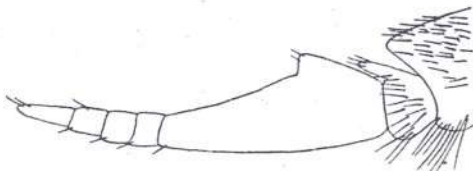
Subcallus, etc. as mentioned. Beard black or blackbrown. Palpi, first joint redbrown, black haired, second joint rather stout, long, with a blunt point, redbrown, black haired. Antennae reddishyellowbrown, with a rather indistinct tooth to the third antennal joint, basal annulation almost 2,1 times as long as its widest part and 1,36 times as long as the black stylus.

Thorax dark dull redbrown, greyish tomentose on foreborder, with 2 longitudinal pale redbrown stripes and paler lateral borders. Pubescence mainly yellowishbrown, intermixed with black hairs, particularly numerous at the hindborder. Hairtufts at the bases of the wings and behind yellow. Scutellum same colour as scutum, yellow haired. Breast and sides greybrown, black haired. Wings reddishbrown, foreborder redbrown, stigma havannabrown, apical shadow smoky brown. Wings elsewhere brownish with clear centres in some of the

cells No appendix. In the type ♀ one of the branches of the fourth longitudinal vein does not reach the hindborder of the wing. Halteres yellowbrown. Legs brownblack. First leg, Femur blackbrown or dark violetbrown with yellowbrown knee; middle and hind femora similar. Fore tibiae pale yellowisholivebrown at base, blackbrown at apex, black haired. Middle tibiae leatherbrown, black haired. Hind tibiae yellowredbrown.

A b d o m e n yellowish orangeredbrown on the first 3 or 4 segments, mainly yellow haired, bases of 3d and 4th segment darker, more blackbrown, with some black hairs intermixed between the others. The Semarang females show a group of black hairs in the middle of the second segment. Second to fourth segmentation of the same female broadly yellow haired, 5th and 6th segmentations yellow fringed also. Segment 5—7 in the type blackbrown, black haired, except a few yellow hairs on the middle of the 5th and 6th segment at the segmentations. Ventral surface blackbrown, black haired, except small yellow hairgroups on the 2d—4th segments.

The Male.



Textfig. 115

T. chrysater s. s. ♂. antenna.

The Head. (Textfig. 115). Eyes redbrown on the big-faceted largest part, surrounded by a black area, broad anteriorly, narrow at vertex. Subcallus and cheeks redbrown, black haired. Face velvetybrown. Beard black. Proboscis short, black with yellowbrown upper border. Palpi dull brown, club-shaped, black haired. Antennae, first joint cylindrical, coffeenutbrown, black haired, second joint similar, black

fringed, third joint yellowbrown with a distinct tooth, crowned with black hairs, basal annulation 2,26 times as long as its widest part, 1,6 times as long as the blackishbrown stylus.

T h o r a x tawny dullredbrown, slightly greyishyellowbrown on foreborder with 2 pale reddishbrown stripes and similar lateral borders. Foreborder pale yellowishbrown haired, pubescence elsewhere long, loose, brownblack. Scutellum same colour as scutum. Pteropleuron dull redbrown. Breast dark, dull hazelbrown, blackbrown haired. Wings rustybrown on foreborder and stigma, apical shadow blackishbrown. Appendix present on both wings. Wings elsewhere brownish with clearer centres in some of the cells. Halteres, stalk tawny, club yellowbrown. Legs. First leg, Coxa yellowbrown, trochanter blackishbrown, black at apex, black and redbrown haired. Femur intensive black, shining, knee yellowbrown, black haired. Tibia pale hazelbrown on basal half, apex black, black haired. Tarsalia black. Second leg. Coxa pale violetbrown, blackbrown haired. Trochanter black, black haired. Femur reddishbrownblack at base, apex more yellowish, black haired. Tibia yellowbrown, black haired, spurs yellow at base, black at apex. First tarsale yellowbrown at base, apex black, other tarsalia black, all black haired. Third leg. Coxa dull coffeenutbrown, black and yellowbrown haired. Trochanter redbrown. Femur blackbrown, knee yellowbrown, black haired. Tibia redbrown, somewhat yellowish at base, black haired. Tarsalia redbrown, black haired.

A b d o m e n. First 4 segments yellowbrown, first segment with a yellow haired spot at each side of the scutellum, second segment black haired, goldenyellow haired at segmentation, 3d and 4th segment with blackbrown, black haired bases, hindborders reddishgoldenyellow haired, both parts equal wide. Fifth to seventh segment black, black haired. Lateral borders of tergites black haired. Ventral surface, 1st segment tawny, 2d and 3d segment blackbrown in the middle, segmentations paler, black haired. 4th—7th segment black, black haired.

105. *Tabanus ochroäter* nov. spec. (♀) Textfig. 116.

Habitat:

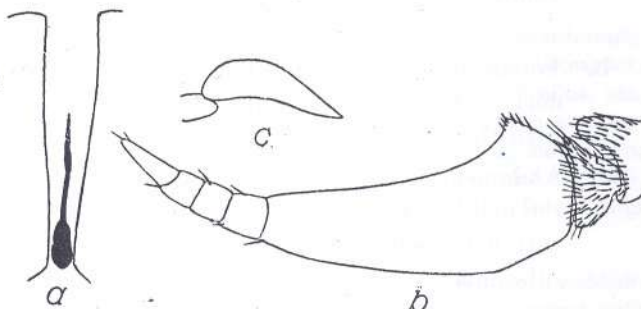
Type ♀ from Sumatra, Goenoeng Teleman 6.9'17, EDW. JACOBSON

Coll. N.A.M.

RICARDO labelled this specimen „local form of *T. batavus* Ric.” It differs however in the colour of the abdomen and its pubescence, the colour of the scutellum, etc.

Table of dimensions.

Bodylength	16	m.M.
Width of thorax	5,2	„
Width of abdomen	5,8	„
Wingexpanse	30,2	„
Length of head	2,8	„
Length of thorax	5	„
Length of abdomen	8,2	„
Length of wing	12,5	„
Breadth of wing	4,6	„
Foreheadindex	8,5	„



Textfig. 116.

T. ochroäter s. s. ♀. a. forehead, b. antenna. c. palpe.

The Head. (Textfig. 116). Forehead rather narrow, deep velvetybrown, almost 0,4 narrower anteriorly it is at vertex, black haired. Callus brownblack, almost reaching the eyes, with a fine black linear extension. Subcallus, cheeks and face velvetybrown, black haired. Beard same colour. Palpi dark havannabrown, black haired, second joint stout at base, attenuated to a rather acute point. Antennae, first 2 joints dull pale havannabrown, black haired, third joint curved, with a distinct tooth, basal annulation 2,2 times as long as its widest part, 1,8 times as long as the black stylus.

Thorax dark chocolatebrown, scutellum same colour as scutum, reddishyellowgolden haired, intermixed with a few black hairs. Pteropleuron paler brown, black haired. Breast and sides deep redbrown, black haired. Legs reddishbrownblack, black haired, fore tibiae slightly paler at base. Wings as in *Tabanus basalis* MACQ.; apical shadow smoky brown with clearer centres in the cells. Halteres olivebrown.

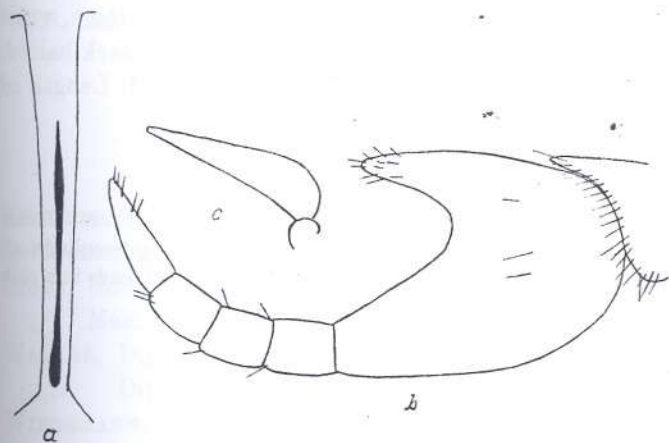
Abdomen orangeous redyellow, goldenyellow haired on the first 2 segments, rest blackbrown, black haired. Ventral surface wholly blackbrown, black haired.

GROUP VII.

Large species with broad transverse white or yellow bands on the abdomen, usually elevated in the middle to triangular spots, clothed with white or yellow pubescence. Forehead narrow or broad. Eyes without green crossbands. Scutellum always the same colour as the scutum. Legs with the tibiae fringed with thick yellow or white hairs. Wings clear or yellowbrown.

A large handsome species. Forehead, cheeks, face and subcallus orangeous-goldenyellow, goldenyellow haired. Beard same colour. Callus and linear extension reddishbrown. Palpi slender, yellowreddishbrown, orangeousyellow haired. Antennae yellowbrown, duskier at apex, tooth very prominent, black haired. Thorax reddishrustybrown with traces of longitudinal stripes, redbrown and black haired, with goldenyellow hairtufts at base of wings and behind. Breast yellowbrown, yellow haired. Wings yellowbrown, first posterior cell narrower at opening. Legs reddishyellowbrown, partly yellow haired. Abdomen blackbrown, black haired, with goldenyellow haired segmentations. Bodylength 23—26 m M.

The Head. (Textfig. 117). Forehead orangeous-goldenyellow, only half as wide anteriorly as it is at vertex, yellow haired at base, blackbrown haired at vertex on the oval vertexspot, index 12.5. Callus reddishbrown, hardly broader than the linear extension. Subcallus, etc. as described. Palpi slender, ending with a long point, reddishbrown, clothed with orangeous-yellow pubescence, intermixed with black hairs. Antennae, first joint cupuliform, yellowbrown, black haired, second joint black fringed, third joint reddishyellow, basal annulation 1.4 time, as long as its widest part, some length as the stylus, which is blackish at apex. Tooth long pointed, black, black haired.



Textfig. 117.

T. aurivittatus RIC. ♀. a. forehead, b. antenna, c. palpe.

yellow haired at sides, some redbrown hairs on dorsum. Tibia yellowbrown, yellow haired. Tarsalia brown, black haired. Second leg identical, femur yellowbrown haired. Third leg similar. Coxa rustybrown, yellow and black haired, femur blackish redbrown, with some black hairs on dorsum, elsewhere yellow haired. Tibia dark redbrown, black haired on dorsum with thick, yellowred hairfringes, intermixed with some black hairs. Tarsalia blackbrown.

Abdomen blackbrown, black haired, except on the broad goldenyellow haired segmentations. First segment wholly goldenyellow haired, 2d till 4th segment with broad yellow haired bands, produced in the middle to a triangular point, similar segmentations on the 5th segment 6th and 7th segment narrower goldenyellow. Ventral surface identical, without the median triangles, first sternite wholly yellowbrown, yellow haired, other sternites, yellow banded; intermediate parts blackbrown, black haired.

Thorax reddish-rustybrown, covered with short redbrown and black pubescence, showing traces of longitudinal stripes. Pteropleuron paler, black haired. Tufts at base of wings and behind goldenyellow. Breast yellowbrown, yellow haired. Halteres yellowbrown. Wings yellowbrown, foreborder dark yellowbrown, first posterior cell distinctly narrower at opening. Stigma faint. Legs. First leg. Coxa yellow, golden haired; trochanter redbrown, femur reddish yellowbrown,

107. *Tabanus servillei* MACQUART (♀) Textfig. 118.syn. *T. pyrausta* WALKER.

References:

MACQUART, Dipt. Exot. I, p. 132, 13 (1838).

WALKER, Liszt Dipt. Brit. Mus V, p. 246 (1854).

,, Zoologist VIII, Appendix LXV (1850).

,, List Dipt. Brit. Mus. V, p. 246 (1854).

RICARDO, Rec. Ind. Mus. V, p. 188. (1911).

MACQUART'S type ♀ from E. India (Textfig. 118).

Coll. BR.M.

1 ♀ from Java, M. SERVILE

,,

WALKER'S ♀ from Mr. ARBENT'S Coll.

,,

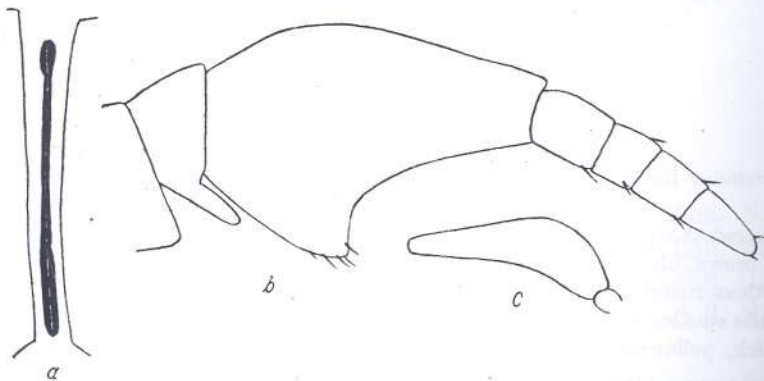
♂ type from Mr. ARGENT'S Coll. Java

,,

A large-sized goldenyellow species. Forehead redbrown, narrow. Callus redbrown, linear extension redbrown, long, broad. Subcallus, cheeks and face redbrown, blackbrown haired. Beard deep redbrown. Palpi stout, with obtuse point, black haired. Antennae black, with prominent tooth. Thorax rustybrown, black haired. Legs blackbrown; black haired. Wings reddishyellowbrown, veins rustybrown, first posterior cell closed. Abdomen dark blackbrown, black haired, first 4 segmentations paler rusty-yellowbrown, goldenyellow haired. Length of females 22—25 m.M. ♂ 21 m.M.

The Female.

The Head. (Textfig. 118). Forehead redbrown, dark redbrown haired, almost double as wide at vertex, as it is anteriorly, index 10. Callus redbrown, narrow, elongate cylindrical, grooved in the middle, hardly broader than the grooved linear extension, which ends in a club



Textfig. 118.

T. servillei MACQ. ♀. a. forehead, b. antenna, c. palpe.

at vertex. Subcallus, etc. as described. Palpi large, second joint, brownish, white tomentos at base, then black, stout, widest in their middle portion, ending with an obtuse point, black

haired. Antennae stout, first joint reddish, black haired, second joint blackbrown, black haired, third joint broad, black basal annulation curved, about 1.4 times as long as its widest part, 1.25 times as long as the stylus, tooth very prominent, blunt, crowned with a few black hairs.

Thorax dusky rustybrown, black haired. According RICARDO some yellow hairs are scattered over the scutum, sides black haired, breast same colour as scutum, greyishblue tomentose on mesosternumlobus, clothed with long, yellow pubescence and some brown hairs. Scutellum similar as scutum. Wings as described, first posterior cell, with a long petiole. Stigma yellowish. Legs darkbrown, black haired.

Abdomen broad, with reddishbrown, black haired lateral borders of tergites. First segment greyish tomentose, rest of dorsum as mentioned. Ventral surface blackbrown to velvety-brown, black haired, segmentations 1—4 white, white haired on the 2d—4th segmentation.

The Male.

Similar to the female, Eyes, small-faceted part covering about 1/3 of the eyesurface, this area being not prolonged to the vertex. Subcalles and face paler than in the female. Palpi dark olivebrown, black haired.

108. *Tabanus rufiventris* FABRICIUS (♀, ♂) Pl. 10, Fig. 2; Textfig. 119.

Syn. *T. leucosparsus* BIGOT.

T. sanguineus WALKER.

T. assamensis BIGOT.

T. crassus ♂ WALKER.

References:

FABRICIUS, Syst. Antl. 96, (1805).

BIGOT, Nouv. Arch. Mus. Hist. Nat. Paris (3) II, p. 203 (1890).

„ Mém. Soc. Zool. France V, p. 653 (1892).

WALKER, Dipt. Saunders. I, p. 54 (1850).

„ Dipt. Saunders. I, p. 50 (1850).

WIEDEMANN, Dipt. Exot., p. 66 (1821).

„ Auss. Zweifl. Ins. I, p. 118 (1828).

RICARDO, Rec. Ind. Mus. IV, p. 194 (1911).

„ Rec. Ind. Mus. IV, p. 189 (1911).

„ Rec. Ind. Mus. IV, p. 185 (1911).

„ Bull. Ent. Res. VI (1916).

ISAAC, Mem. Dept. Agric. India, Ent. Ser. VIII, p. 53—62 (1924).

RICARDO, Ann. Hist. Nat. Mus. Nat. Hung. XI, p. 170 (1913).

„ Ann. Hist. Nat. Mus. Nat. Hung. XI, p. 170 (1913).

VAN DER WULP, Cat. Dipt. South Asia, p. 60 (1896).

SHIRAKI, Tabanidae of Formosa, p. 343 (1918).

„ Tabanidae of Formosa, p. 330 (1918).

KRÖBER, Die Fliegen der Palearktischen Region Lief. 8 p. 125 (1925)

Habitat:

Type ♀ from East India

Coll. Mus. Dom Lund

Isle Sumatra

• Residency Tapanoeli

Coll. V.S.L.

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

2 ♀ ♀ from Moeara Tais, Moeara Tais on buffalo, LOBEL and BAKKER
respectively 1 ♀ on 16.1.'22

1 ♀ „ 2.11.'24

1 ♀ from Si Balapak, Moeara Tais on buffalo 2.11.'24, BAKKER

1 ♀ „ Hoeta Tongga, Moeara Tais on horse 8.1.'23, LOBEL

2 ♀ ♀ „ Bintoejoe, Moeara Tais on buffalo, LOBEL and BAKKER
respectively 1 ♀ on 1.'23

1 ♀ „ 7.9.'23

2 ♀ ♀ from Hapesong, Marantjar on horse 3.8.'23, BAKKER

1 ♀ „ Si Hitang, Batoe na Doea on horse 6.8.'23, BAKKER

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

1 ♀ from Batoe Harimo, Siboloean Sibolga on buffalo 10.'22, LOBEL

Ressort Padang Sidempoean, Mantrie Ressort Binanga

3 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, BAKKER

respectively 2 ♀ ♀ on horse 2.5.'24

1 ♀ ♀ „ buffalo 2.5.'24

2 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, on buffalo, LOBEL and BAKKER
respectively 1 ♀ on 10.'22

1 ♀ „ 2.6.'24

1 ♀ from Si Oendol, Paringgonan on buffalo 10.12.'22, LOBEL

1 ♀ „ Pagaran Sihndoeng, Hoeta Nopan on buffalo 10.12.'22, LOBEL

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

2 ♀ ♀ from Goenoeng Toea, Goenoeng Tongga Toea, LOBEL and TARIP
respectively 1 ♀ on horse 23.11.'22

1 ♀ „ buffalo 17.4.'22

1 ♀ from Hoeta Rimbaroe, Pqerba Sinomba on buffalo 10.'22, LOBEL

5 ♀ ♀ „ Goenoeng Toea, Goenoeng Toea on buffalo, BAKKER
respectively 2 ♀ ♀ on 4.11.'23

1 ♀ „ 7.12.'23

1 ♀ „ 10.4.'24

1 ♀ „ 20.7.'24

8 ♀ ♀ from Sawah Bangoenan, Portibi, LOBEL and BAKKER

respectively 1 ♀ on horse 23.11.'22

3 ♀ ♀ „ „ 20.5.'23

1 ♀ „ „ 11.11.'23

1 ♀ „ buffalo 14.7.'23

2 ♀ ♀ „ „ 8.12.'23

- 8 ♀ ♀ from Si Paho, Oedjoeng Padang on buffalo, BAKKER
 respectively 1 ♀ on 15.6.'23
 1 ♀ „ 30.9.'23
 5 ♀ ♀ „ 10.1.'24
 1 ♀ „ 23.4.'24

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan

- 3 ♀ ♀ from Kota Siantar, Kota Nopan on buffalo 10.'22, LOBEL
 1 ♀ „ Moeara Poengkoet, Tamiang on horse 28.5.'24, BAKKER
 1 ♀ from Hoeta Nagodang, Manambin on buffalo 24.12.'22, LOBEL

Gvt. Sumatra's East Coast

- 4 ♀ ♀ from Road between Pangkalan Brandan-Bindjei 5.5.'22, EYKMAN
 1 ♀ „ Hoendoelan Parmaksian, Balige, Tapanoei on buffalo 6.12.'21
 VAN DER REEST

Isle Nias

- 1 ♀ from Goenoeng Sitoli on cattle 5.'22, TARIP

Isle Java

WALKER'S Type from Java

Residency Batavia

- 1 ♀ from Djasinga 17.4.'22 on buffalo
 2 ♀ ♀ „ Tjikampek 24.3.'22 on buffalo
 11 ♀ ♀ „ Buitenzorg, SCHUURMANS STEKHOVEN on buffalo
 respectively 1 ♀ on 28.1.'22
 1 ♀ „ 4.2.'22
 1 ♀ „ 10.2.'22
 1 ♀ „ 2.3.'22
 1 ♀ „ 30.1.'23
 1 ♀ „ 9.4.'23
 1 ♀ „ 13.4.'23
 1 ♀ „ 14.4.'23
 1 ♀ „ 2.5.'23
 1 ♀ „ 7.5.'23
 1 ♀ „ 29.5.'23

Residency Pekalongan

- 1 ♀ from Tadjoe Lingga, Pekalongan 30.10.'22, LAGAS
 1 ♀ „ Koeripan, Pekalongan 25.11.'22 on buffalo, LAGAS
 1 ♀ „ Randoedongkal, Kodjono, Pekalongan 29.11.'22, on buffalo, LAGAS

Residency Preanger Regencies

- 1 ♀ from Tasikmalaja, Karangnoenggal on buffalo 24.2.'22, LE COULTRE

Residency Madioen

- 1 ♀ from Madioen, VAN BERGEN 4.'23
 2 ♀ ♀ „ Madioen? SOHNS

Federated Malay States

Females from Kelantan

- „ „ Darien Typus
 „ „ Negri Sembilan
 „ „ Kuala Lumpur
 „ „ Jelebu

British India, Assam and Burma

1 ♀ from Madras Presidency near Kodai Kanal 1920, PATTON Coll. BR.M.

Females from Pusa, Bengal, HOWLETT

- „ „ Khasi Hills 1000—3000 feet, HOWLETT

BIGOT type from Assam

Females from Lushai Hills Burma

Males (*crassus*) from E. India

- „ from N. Kanara, India BELL in bungalow
 „ „ Pusa, Bengal in bungalow

China

Females from Hongkong

Coll. BR.M.

12 females from Hongkong, MACFARLANE 1913

4 males (*crassus*) from Hongkong, MACFARLANE 1913

Japan Formosa

Southern Parts of Formosa Takao-Koshun June, July

2 females on road near the seashore, Bosan District

2 males (*crassus*) from Takao 27 July

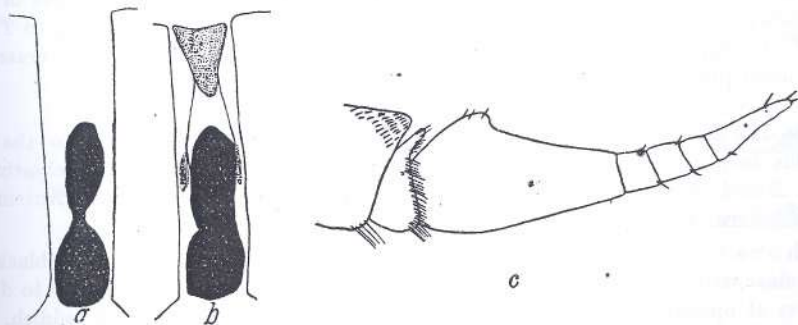
Tabanus rufiventris is a large-sized species. Forehead broad, almost the same width throughout, yellowish white tomentose, yellow white haired, intermixed with some black hairs, latter especially on the large triangular redbrown vertexspot and the 2 fine velvetybrown stripes, which run downwards and end in large oval, velvetybrown spots, situated at the apex of the linear extension. Callus prominent, shining redbrown to chestnutbrown, almost reaching the eyes, linear extension broad, stout. Subcallus white, cheeks ivorywhite, pale yellowish silvery white haired as is the beard. Face pale yellowbrown at upper border, elsewhere white, white haired. Palpi stout, pale yellowbrown, black haired at apex, yellowwhite haired at base. Antennae rustyyellowbrown, black haired on basal joints, third joint same colour at base, then black, tooth blunt, black haired. Thorax lilacgrey, white and black haired. Wings clear, first posterior cell slightly narrower at opening. Legs with tibiae largely white, white haired at base, apices black, black haired. Abdomen reddishbrown-blackbrown with white tomentose, white haired segmentations to the first 5 segments, those being elevated in the middle to whitish, white haired triangles and widened to the lateral borders which they embrace on most tergites. First segment with a median quadrangular, white haired spot. Ventral surface, with a median,

longitudinal dark, black haired band, composed of halfmoon-shaped spots, elsewhere pale brown, yellowishwhite haired. Segments 6 and 7 black haired.

The Female.

Table of dimensions.

Bodylength	varying from 12,2 m.M. to 19,5 m.M.			
Width of thorax	"	"	5,6	" — 6,5
Width of abdomen	"	"	6,5	" — 8,2
Wingexpanse	"	"	36	" — 40,5
Length of head	"	"	2,5	" — 3,5
Length of thorax	"	"	7	" — 8
Length of abdomen	"	"	8	" — 11,2
Length of wing	"	"	15,2	" — 17
Breadth of wing	"	"	5,2	" — 6,5
Foreheadindex	"	"	4	" — 5,66



Textfig. 119.

T. rufiventris F. ♀. a, b. forehead, c. antenna.

The Head. (Textfig. 119.) Forehead, almost the same width throughout to 0,25 narrower anteriorly than it is at vertex. The linear extension is very broad and almost reaches the eyes in some specimens, in rare instances it is separated from the callus or its connection with the callus is broader than usual. Palpi, first long yellowwhite haired, pale yellowbrown, white tomentose, second joint broad at base, where it is yellowwhite haired, apex ending acuminate, black haired. Proboscis clothed with brownblack, whitish and yellowbrown hairs. Antennae first joint rustyyellowbrown, white tomentose, black haired on dorsum, distal lateral border and ventral surface yellowwhite haired, second joint black fringed. Third joint dull redbrown at base, then black, basal annulation 1,71 times as long as its widest part, only slightly longer than the stylus. Tooth indistinct.

Thorax violetgrey, white tomentose, clothed with short black and white hairs. Tufts at base of wings and behind silverywhite, scutellum same colour as scutum, silverywhite haired, intermixed with black hairs, long white hairs being present at the hindborder. Pteropleuron violetgrey, black haired at lower border, white haired at vertex. Breast and sides thick silverywhite haired. Wings clear, stigma yellowbrown, veins redbrown. Halteres, stalk ivory-coloured, club yellowbrown. Legs. First leg. Coxa brownish, greywhite haired. Trochanter similar, silverywhite haired. Femur darkblack on ventral surface, dorsum grey-

brown tomentose, especially at the distal lateral, dirtybrownwhite haired border, black haired in the middle. Tibia curved, extreme base brownish, then white, white haired, apical third black, black haired. Tarsalia black, black haired. Second leg. Coxa greybrown, greybrown haired, with an apical rim of black hairs, trochanter redbrown, femur black haired on dorsum, distal lateral border dirtywhite haired, ventral surface bismarckbrown. Tibia white, white haired, with a black haired, narrow, black apical ring. Tarsalia black, black haired. Third leg. Coxa greybrown, black and white haired, trochanter redbrown, femur redbrown, pubescence as in second leg, some black hairs being intermixed between the white ones at distal lateral border. Tibia white, white haired on basal $\frac{2}{3}$, intermixed with some black hairs, distal lateral border white fringed, intermixed with some black hairs. Tarsalia black.

A b d o m e n, the 2 basal segments reddishbrown, following segments darker, segmentations as described. Ventral surface brown, black haired, the halfmoon-shaped spots are found on the 3d—6th segment.

The Male.

Up to the present *T. crassus* WALKER was described as a distinct species. It differs in several important points from *T. rufiventris* F. so that one is inclined to join the opinion of former examiners. Lately however ISAAC, whose paper was inaccessible to me, has bred *T. rufiventris* F. He found during these breeding experiments that the males of *T. rufiventris* were wholly identical with the males formerly described as belonging to *T. crassus* WLK. Following his experiments I will embody the description of the male *T. crassus* WLK. in the description of *T. rufiventris* WLK.

The Head The small-facetted part of the eyes is not prolonged to the vertex. Subcallus deep velvetybrown. Face and cheeks yellowish brown tomentose, chestnutbrown haired. Beard same colour. Palpi black, grey tomentose, black haired. Antennae dull reddish yellow, third joint narrow, slender, with a small tooth.

T h o r a x reddish brown or blackishbrown, yellowish brown tomentose, black haired. Wings clear, stigma hardly apparent, pale yellow, first posterior cell slightly to distinctly narrower at opening, no appendix. Legs appearing black, but often dull reddish, covered with thick, close black pubescence, the femora and hind tibiae with longer black fringes.

A b d o m e n reddishbrown to blackishbrown, basal 2 segments violet reddish, hoary tomentose, the segmentations very indistinctly paler, pubescence on dorsum close, black at sides black, under side more reddishbrown.

I regret to have had no opportunity for a comparison of ISAAC's statements about *T. crassus* WLK. with my notations, whereas the method of breeding is also very important in this respect and I wished to know whether he really started his experiments with an eggmass, deposited by a well determined female of *T. rufiventris* F. or experimented with larvae, caught at random in their natural surroundings.

109. *Tabanus pseudorufiventris* nov. spec. (♀) Textfig. 120.

Habitat:

Type ♀ from Pasar Goenoeng Toea, Goenoeng Toea, Tapanoeli, Sumatra, on cattle 20. 10. '24 BAKKER. Coll. V.S.L.

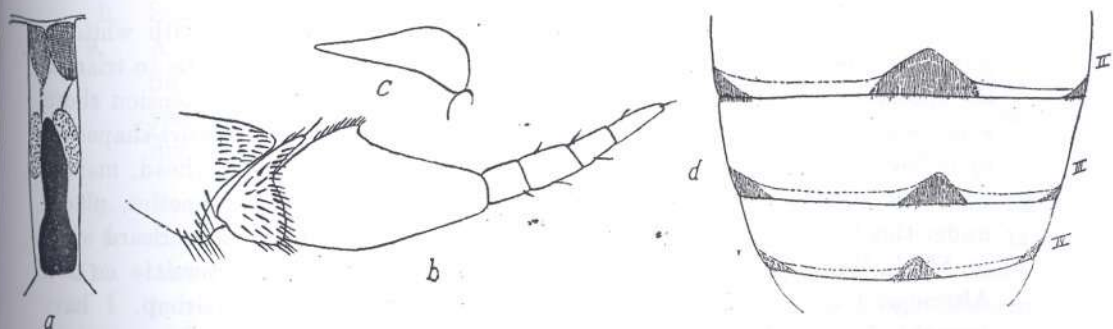
1 ♀ from same locality on horse 17. 7. '24 BAKKER.

1 ♀ „ Si Doea Doea, Pidjor Koling 5. 8. '24.

Coll. V.S.L.

A species closely allied to *T. rufiventris* FABRICIUS and possibly even a subspecies of the same species, distinguishable inter alia by the more prominent callus with its broader linear extension, the brown spot on the cheeks and the lower angle of the subcallus, the acuminate palpi, the abdomen with its much lower segmentations and its small median triangles and the distribution of the black and white hairs on the ventral surface of the same, thorax more pinkish in *T. rufiventris* F. Length 17,5 m.M.; Width of thorax 6 m.M.; Wingexpanse 38 m.M.; Length 16 m.M.; length of abdomen 10,6 m.M.

The Head (Text fig. 120). Forehead almost the same width throughout, index 4,4. Frons brownishwhite tomentose, blackbrown haired, white haired along the callus and its linear extension. Vertexspot large, black, black haired, forming a triangle incised at its apex, composed of two black triangles, separated by a paler tomentose groove; from the lateral borders of the vertexspot 2 fine brown shadows run towards the apex of the linear extension, connecting the latter structure with the eyes by means of a larger brown spot. Callus mahoganybrown, almost reaching the eyes. Subcallus white, brownish towards the chocolatebrown,



Textfig. 120.

T. pseudorufiventris s. s. ♀. a. forehead. b. antenna, c. palpe, d. abdomen.

black haired upper cheeks. Lower cheeks and face white, snowwhite haired. Beard thick white. Palpi pinkish olivebrown, darker to the apex, first joint white haired, second joint broad at base, ending into a long slender acute point, basal half white haired, apex black haired. Antennae blackbrown, black haired, first joint projecting caplike over the second joint, bluewhite tomentose, black haired, with some white hairs on the ventral surface, second joint short, with distinct dorsal spur, black fringed, third joint with blunt, black haired tooth on the basal annulation, which is 1,6 times as long as its widest part and 1,3 times as long as the stylus.

Thorax bluishgrey, mainly black haired, with 3 fine redbrown longitudinal stripes, hindborder of scutum similar, lateral borders of scutum olivaceousbrown, scutellum same colour as scutum, Pteropleuron white and black haired, tufts at base of wings white. Sides and breast brownishwhite, white haired, mesosternum lobus black haired. Legs. First leg. Coxa grey white, white haired, apical border blackbrown, black haired, trochanter brownblack, femur idem, black haired, the knee is narrowly paler, tibia blackbrown, black haired at extreme base, then white, white haired on basal $\frac{2}{3}$, apex blackbrown, black haired, tarsalia black, black haired. Second leg, femur, dorsum black haired, brownish white haired along the distal lateral border and on the venter, tibia identical, white, white haired on basal $\frac{3}{4}$. Third leg. Coxa white haired at base, black haired at apex, femur and tibia as in the 2d leg.

Abdomen bluishredbrown, black haired, with broad, white tomentose segmentations, broad and distinct on the 2d—4th segment, narrower and less distinct on the 1st, 5th and 6th segment, elevated to low median white haired triangles on the 2d—4th segment, decreasing in size from the second to the fourth segment, 5th segment with a few white hairs at the segmentation in the middle, intermixed between the black ones; first segment with a small group of white hairs in the middle. Besides the pale segmentations widen to the lateral borders of the tergites, where they form triangular elevations, clothed with white hairs on the 1st—4th segment, lateral borders of tergites black haired elsewhere. Ventral surface with a median dull brownblack, black haired longitudinal stripe, composed of quadrangular to halfmoon-shaped patches on the 1st—5th segment, segmentations narrowly and sides broadly bluishwhite tomentose, the latter wholly so on the 2d segment, 3d segment with a small, 4th segment with a broad and huge brown spot in the upper lateral angle of the scute at each side of the segment, 5th and sixth segment with scanty white hairs at the segmentations, 6th segment black haired, with a narrow, white tomentose segmentation, widened to the lateral borders.

GROUP VIII.

Small or median-sized, black or brown species. Abdomen with white or yellow, white or yellow haired segmentations, elevated in the middle to triangular spots. In a number of species the callus is square, linear extension short, spindle-shaped, in other species the callus is bottle-shaped, heart-shaped or cylindrical. The black, white-banded species with the broad forehead, marked with the square callus, etc. form a natural group, the other species, placed under this heading are brought here from a practical point of view. Beard white or black. Wings clear, or with a faint apical shadow, appendiculate or not. Although I am not quite sure, that it really belongs to this Group, I have brought *T. immixtus* WLK. to this Group.

KEY 18.

Synopsis of species.

- 1a. Abdomen with yellow haired segmentations 17
- b. Abdomen with white, white haired segmentations 2
- 2a. Abdomen with a single white transverse band, covering the hindborder of the first segment and overlapping on the second segment..... 3
- b. Abdomen with a number of white segmentations 4
3. A small-sized redbrown species. Forehead broad with a square or triangular redbrown callus. Cheeks brownish. Antennae yellowredbrown, tooth indistinct. Legs redbrown, black haired *basifasciatus* DE MEYERE.
- 4a. Callus square, broad, linear extension short 5
- b. Callus shaped otherwise 8
- 5a. Segmentations parallel-sided 6
- b. Segmentations elevated in the middle to triangular spots 7

6. Palpi, second joint mainly white haired, intermixed with some black hairs* at apex. Antennae, coffeebrown at base, tooth distinct. Thorax bluishblack. Legs with all tibiae widely white

equicinctus SCHUURMANS STEKHOVEN.

- 7a. Antennae with a distinct tooth, basal annulation of third joint curved, first joint projecting caplike over the second joint. Thorax black, black haired. Wings without appendix. Legs with brownblack tibiae. Abdominal segmentations narrowly white

multicinctus SCHUURMANS STEKHOVEN.

- b. Antennal tooth indistinct, third joint narrower, first joint not covering the second joint. Thorax with 2 white longitudinal stripes and grey lateral borders. Appendix present. All tibiae yellowbrown on basal 2/3 or more. Abdominal bands broader

oxyceratus BIGOT.

- 8a. Abdominal segmentations elevated in the middle to huge or low triangles

10

- b. Segmentations parallel-sided

9

9. A greyish species. Forehead with broad cylindrical brownblack callus. Subcallus and upper cheeks ferrugineous, lower cheeks yellowbrown, yellowbrown haired. Beard same colour. Wings with rudimental appendix

griseiventer SCHUURMANS STEKHOVEN.

- 10a. Beard white

12

- b. Beard black

11

- 11a. Antennae dark velvetybrown. Thorax slateblue to chestnutbrown, black haired, foreborder, hindborder and the lateral borders of the scutum grey tomentose, white haired. Wings with brown apical shadow. Abdomen chestnutbrown, with white segmentations to all segments, except the 7th, ventral surface blackbrown, with white haired segmentations to the 2d to 4th segment

khasiensis RICARDO.

- b. Antennae reddishbrown, third joint redyellow at base, then darker. Thorax walnutbrown, blackbrown haired, white tomentose along the hindborder of the scutum. Wings clear. Abdomen chocolatebrown, with narrow, white haired segmentations to the first 4 segments. Ventral surface uniformly blackbrown, black haired, without paler segmentations

raffrayi BIGOT.

- 12a. Palpi orangeousyellow, mainly yellow haired

13

- b. Palpi yellowbrown to brownblack, mainly black haired

14

13. Body velvetybrown. Callus reversed heart-shaped, reddishbrown. Subcallus and upper cheeks rustybrown, black haired. Antennae brown to reddishbrown, tooth indistinct, legs brown. Abdomen pointed, reddishbrown, first 5 segments with white haired median huge triangles. Lateral borders of the first 5 tergites yellow haired

discrepans RICARDO.

- 14a. Body small 16
 Body median-sized 15
15. Forehead white, white haired. Callus shining winered, without distinct linear extension. Subcallus white, with velvetybrown lateral streaks. Antennal tooth distinct. Legs with yellowishbrown tibiae. Wings with a small number of brown dots round the veins. Abdomen elongate, median spots halfmoon-shaped **selene** SCHUURMANS STEKHOVEN.
- 16a. Callus piceous, bottle-shaped. Thorax slateblack to dark chestnutbrown, black haired, lateral borders of scutum white, white haired. Wings brownish, with a faint apical shadow
latisegmentatus SCHUURMANS STEKHOVEN.
- b. Callus stout, brownblack, with a broad linear extension. Thorax brown, scanty yellow haired at hindborder of scutum. Wings with a distinct rustybrown apical shadow **sylvioides** WALKER.
- 17a. Abdomen with broad, yellow haired segmentations, elevated in the middle to triangular spots 18
- b. Segmentations without median triangles 19
- 18a. Forehead rather narrow. Callus cylindrical, brown. Cheeks and face orangeouslyyellow haired. Beard goldenyellow. Thorax yellow and black haired. Legs with tibiae largely white, yellow haired
auricingulatus SCHUURMANS STEKHOVEN.
- b. Callus blackbrown, elongate. Cheeks and face yellowishwhite, yellow-white haired. Beard yellowwhite. Thorax greyish brown, yellowish haired, with whitish longitudinal stripes and similar lateral borders. Legs with yellowbrown tibiae **immixtus** WALKER.
- 19a. Small species, shorter than 10 m.M. 20
- b. Median-sized species 21
20. Body yellowbrown. Eyes in the male sex with a narrow, black-facetten border, reaching to the vertex. Beard white. Antennae, third joint redyellow, black tipped. Thorax greyish-blue, yellowbrown tomentose, yellow haired. Abdomen yellowbrown, black haired, yellow haired on the segmentations 2-5. Legs brown, with yellowish tibiae
papouinus WALKER ♂
- 21a. Lower cheeks greywhite, white haired. Beard white. Thorax walnutbrown, grey tomentose on foreborder, reddishbrown and black haired. Legs blackbrown, tibiae yellowwhite to yellowbrown at base, black tipped. Abdomen yellowbrown at base, darker at apex, with a lentiform black spot on the second segment **fuscicauda** BIGOT.
- b. Lower cheeks pale yellow, scanty black haired, beard yellowbrownish. Thorax blackbrown, yellow haired. Tibiae yellowbrown. Abdomen reddishbrown to blackbrown, segmentations orangeous haired, no lentiform spot on the 2d segment **inflatipalpis** SCHUURMANS STEKHOVEN.

110. *Tabanus basifasciatus* DE MEIJERE (♀). Pl. 18, Fig. 4; Textfig. 121.

References:

DE MEIJERE, Tijdschr. v. Ent. LVIII, p. 107 (1915).

Habitat:

Type ♀ from the Bivak on the Bougainville Mountains 525 M. 1.6.'10 V.K.

Coll. N.A.M.

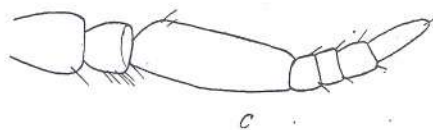
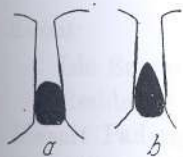
2 ♀ ♀ from same locality

Coll. B.Z.M.

A small-sized, redbrown species, with a peculiar white crossband, covering the hindborder of the first and the foreborder of the second abdominal segment. Forehead broad, with a square or triangular redbrown callus, reaching to the eyes, narrower at vertex. Subcallus, cheeks and face brownish. Palpi redbrown, black haired. Antennae yellowredbrown, black-tipped, black haired, tooth indistinct. Thorax redbrown, black haired, with paler yellow haired pteropleuron and paler tomentose hindborder of scutum. Wings clear, yellowish, without appendix. Legs redbrown.

Table of dimensions.

	♀ 1		♀ 2
Bodylength	7,8 m.M.	8	m.M.
Width of thorax	2,4 „	2,5	„
Width of abdomen	2,8 „	3	„
Wingexpanse	19,4 „	18,5	„
Length of head	1,2 „	1,5	„
Length of thorax	2,8 „	3	„
Length of abdomen	4,8 „	4,5	„
Length of wing	8,5 „	8,5	„
Breadth of wing	3 „	3	„
Foreheadindex	2,88	2,75	



Textfig. 121.

T. basifasciatus DE MEIJERE ♀. a, b. forehead, c. antenna.

club-shaped to cylindrical, black haired, second joint short, without dorsal hump, black fringed, third joint without a tooth, at the same point some black hairs were found, base redbrown, then growing darker to black, basal annulation 3 times as long as its widest part, almost 1,1 times as long as the black stylus.

The Head. (Textfig. 121). Forehead 1/3 to 1/2 narrower at vertex as it is wide at base. Callus, etc. as mentioned. Palpi short, pointed, black haired. Antennae, first joint

club-shaped to cylindrical, black haired, second joint short, without dorsal hump, black fringed, third joint without a tooth, at the same point some black hairs were found, base redbrown, then growing darker to black, basal annulation 3 times as long as its widest part, almost 1,1 times as long as the black stylus.

Thorax (wetted?), redbrown, pteropleuron yellowbrown, yellow haired; hind border of scutum whitish tomentose. Scutellum same colour as scutum. Halteres redbrown. Wings rather clear, slightly yellowish, foreborder yellowbrown, stigma burnt-sienna-coloured, veins yellowbrown. Legs. First leg, trochanter and femur redbrownblack, knee slightly paler, brownred. Tibia redbrown, black haired. Tarsalia black. Second leg. Coxa, trochanter and femur black, knee caramelbrownish. Tibia blackishredbrown, tarsalia black. Third leg, femur and tibia dark redbrown, black haired. Tarsalia black.

Abdomen as mentioned above.

111. *Tabanus equicinctus* nov. spec. (♀) Pl. 10, Fig. 4; Textfig. 122.

Habitat:

Siam Peninsular

Type ♀ from Nakon Sri Tamarat, Khao Rama Kam, 1200 Feet 23.2.'22,

I XAVIER

Coll. R.M.S.

1 ♀ from Khao Tong 300 Ft. 21.2.'22, XAVIER

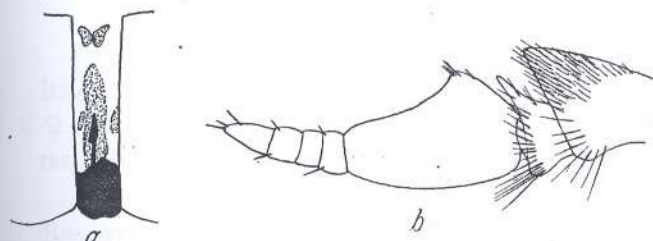
The species is characterized by the 5 narrow, rather faint, white haired bands, (on 2d—6th segment) surrounding the black abdomen. Forehead broad, brownish greywhite, black haired. Callus irregular, square, reaching to the eyes, brownblack linear extension short, pointed. Subcallus dull pale violet-coffeebrown. Cheek white, white haired. Beard silverywhite. Face greywhite, silvery white haired. Palpi short, greyish, second joint white haired at base, at apex black hairs are intermixed. Antennae, basal joints coffeebrown, black haired, third joint darker, broad, tooth distinct, blunt. Thorax bluishblack with whitish borders black haired, white haired on the borders. Wings clear, no appendix, anal cell closed just before the wingborder. Legs with all tibiae widely white, apices black, black haired.

Table of dimensions.

	♀ 1		♀ 2
Bodylength	13	m.M.	13,2 m.M.
Width of thorax	4	„	4,5 „
Width of abdomen	4,2	„	4,5 „
Wingexpanse	27	„	27,5 „
Length of head	2	„	3 „
Length of thorax	5,5	„	5,8 „
Length of abdomen	6,5	„	7,5 „
Length of wing	11,5	„	11,5 „
Breadth of wing	4	„	4,8 „
Foreheadindex	4		4

The **Head**. (Textfig. 122). Forehead almost the same width throughout. The linear extension forms the centre of a chocolatebrown spot. At each side of this spot resting on

the eye borders one finds another dark small spot, whereas at vertex another dark triangular spot occurs, composed of 2 comma-shaped patches. Interjacent areas brownishgreywhite tomentose. Postocular rim white and black haired. At upper cheeks just under the subcallus some black hairs are found. Palpi short, first joint clothed with loose, long, white hairs, second joint stout at base, ending rather acute, silverywhite haired at base, at apex some black hairs are intermixed. Antennae. First joint coffeebrown, whitish tomentose, dorsum black haired, distal lateral border and ventral surface mainly white haired. Second joint dull havannabrown, black fringed, dorsal hump distinct, pointed. Third joint broad at base, dull havannabrown, basal annulation $1\frac{1}{2}$ times as long as its widest part, 1.4 times as long as the stylus. Proboscis short, black.



Textfig. 122.

T. equicinctus s. s. ♀. a. forehead, b. antenna.

Thorax dark slate-blueblack, black haired, scutum with traces of longitudinal stripes, lateral borders whitish tomentose, white haired. Scutellum slightly paler than the scutum, blueblack, white tomentose. Pteropleuron black haired. Sides and breast bluegrey, white haired. Wings clear, veins brown, stigma pale havannabrown, no appendix. Halteres brownblack. Legs. First leg. Coxa bluegrey, greywhite haired, trochanter brownblack. Femur similar, black haired on dorsum, at extreme apex and on distal lateral border white hairs are intermixed. Knee narrowly yellowbrown. Tibia swollen, reddishbrown at extreme base, then white, white haired, apical $\frac{1}{8}$ black, black haired. Tarsalia black. Second leg. Trochanter dark redbrown, femur slateblue, knee yellowbrown, pubescence as on fore femora. Tibia narrowly yellowbrown at extreme base, then white, white haired, apical ring very narrow, black, black haired. Third leg identical, femur mainly white haired, intermixed with some black hairs.

abdomen blackbrown, black haired, white haired on the broad, parallel-sided, white segmentations to the 2d till 6th segments. Second segment wholly bluishgrey tomentose on dorsum, lateral borders of the first 2 tergites bluishgrey tomentose, white haired, lateral borders of other tergites black haired. Ventral surface bluegrey tomentose on basal 2 segments, following 4 segments black, black haired, with narrow white, white haired segmentations.

112. *Tabanus multicinctus* nov. spec. (♀) Pl. 10, Fig. 3; Textfig. 123.

Habitat:

Isle Sumatra

Residency Tapanoei

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan Coll. V.S.L.

Type ♀ and 3 other females from Hoeta Nagodang, Manambin, on buffalo 24.12.'22, LOBEL

6 ♀♀ from Tombang Boestak, Manambin, LOBEL

respectively 5 ♀♀ on horse 24.11.'22 (Textfig. 123 c, f, g, i.)

1 ♀ „ buffalo 26.11.'22

- 41 ♀ ♀ from Kota Nopan, Kota Nopan, LOBEL and BAKKER
 respectively 10 ♀ ♀ on horse 23—26.11.'22 (Textfig. 123 a, b, d, h.)
 1 ♀ " " 3.'23
 1 ♀ " " 24.4.'23
 10 ♀ ♀ " " 10.3.'24
 1 ♀ " " 26.5.'24
 18 ♀ ♀ " buffalo 10.3.'24
- 11 ♀ ♀ from Moeara Tagor, Tamiang, LOBEL
 respectively 3 ♀ ♀ on horse 21.2.'23
 3 ♀ ♀ " buffalo 21.2.'23
 1 ♀ " cattle 21.2.'23
 3 ♀ ♀ " horse 3.'23
 1 ♀ " cattle 27.4.'23
- 1 ♀ from Kota Siantar, Kota Nopan on horse 29.4.'23, LOBEL
- 4 ♀ ♀ " Moeara Poengkoet, Tamiang, BAKKER
 respectively 3 ♀ ♀ on buffalo 28.5.'24
 1 ♀ " horse 28.5.'24
- 2 ♀ ♀ from Ressort Kota Nopan, without further locality 5.'24, BAKKER
 Ressort Padang Sidempoean, Mantrie Ressort Binanga
- 11 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1923						2							2
	"	1924			2										2
	buffalo	1922												1	1
	"	1923						1		2			1		4
	"	1924			2										2
Total					4			3		2			1	1	11

- 22 ♀ ♀ from Pangkal Dolok, Pangkal Dolok Lama, LOBEL

respectively 11 ♀ ♀ from buffalo 14.12.'22

2 ♀ ♀ " " 1.'23

2 ♀ ♀ " " 23.2.'23

1 ♀ " horse 10.'22

6 ♀ ♀ " " 23.3.'23

- 27 ♀ ♀ from Si Oendol, Paringgonan, BAKKER, LOBEL

respectively 2 ♀ ♀ on buffalo 25.6.'23

1 ♀ " " 18.7.'23

4 ♀♀	„ „	14.11.'23
5 ♀♀	„ „	1/2.3.'24
8 ♀♀	„ horse	14.11.'23
7 ♀♀	„ „	1/2.3.'24

21 ♀♀ from Hoeta Nopan, Hoeta Nopan, BAKKER and LOBEL

respectively 8 ♀♀ on buffalo 12.11.'23

1 ♀ „ „ 3.12.'23

2 ♀♀ „ „ 4.3.'24

7 ♀♀ „ horse 13.11.'23

2 ♀♀ „ „ 4.3.'24

1 ♀ „ „ 3.7.'24

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

3 ♀♀ from Hapesong Lama, Marantjar, LOBEL

respectively 2 ♀♀ on horse 30.4.'23

1 ♀ „ cattle 30.4.'23

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

1 ♀ from Siboloean, Siboloean on cattle 9.6.'24, BAKKER

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

1 ♀ from Si Paho, Oedjoeng Padang on horse 2.3.'23, LOBEL

1 ♀ „ Batoe Gana, Goenoeng Toea on horse 26.12.'22, LOBEL

1 ♀ „ Goenoeng Teleman 5.'17, JACOBSON

Coll. N.A.M.

5 ♀♀ „ Fort de Koek 11.'22, MEERENS

Coll. V.S.L.

Isle Java?

1 ♀ from SOHN'S Collection, without, locality Madioen?

Coll. V.S.L.

Siam

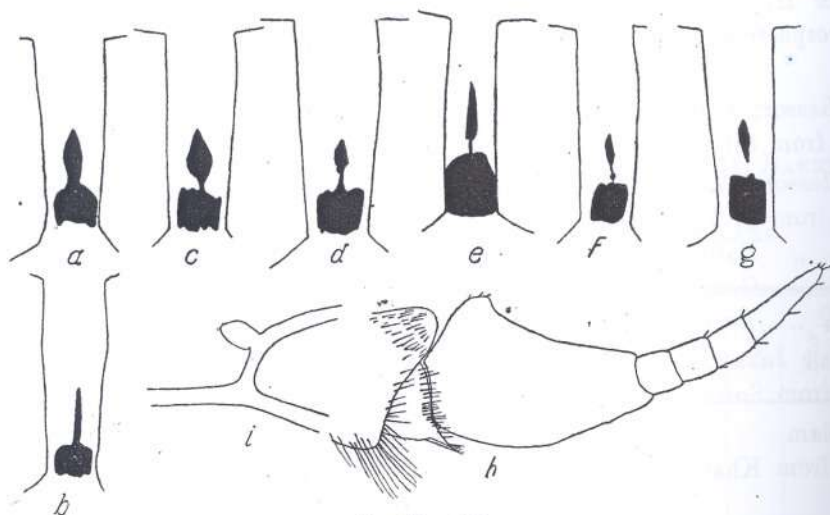
1 ♀ from Khao Tong J. X. 4.2.'22 (Textfig. 123 e.)

Coll. R.M.S.

T. multicinctus is a black species with white banded abdomen. Forehad broad, velvetybrown, black haired. Callus square, shining black, not reaching the eyes, linear extension short, keeled, connected with the callus or separated from it. Subcallus and upper cheeks velvetybrown, blackbrown haired, lower cheeks white, white haired. Beard thick, white. Face brownish at apex, rest dirtywhite, brownishwhite haired. Palpi stout, pale yellowbrown, black haired, apex blunt. Antennae dullbrown to brownishblack on basal joints, mainly black haired, third joint broad, black. Thorax black, black haired. Tufts at base of wings and behind white. Wings rather clear, no appendix. Legs dark, black haired. Abdomen with a white tomentose spot at each side of the scutellum on the first segment, narrow white, white haired segmentations, elevated in the middle to low triangles on the 1st—6th segment. Ventral surface black, black haired with white, white haired segmentations. Lateral borders of tergites white haired.

Table of dimensions.

Bodylength	varying from 11,2 m.M. to 14,8 m.M.				
Width of thorax	"	"	4	"	5,4
Width of abdomen	"	"	4,5	"	5,5
Wingexpanse	"	"	24	"	32,2
Length of head	"	"	2	"	8
Length of thorax	"	"	5,2	"	6,4
Length of abdomen	"	"	5,8	"	8,8
Length of wing	"	"	10	"	13,5
Breadth of wing	"	"	3,8	"	4,8
Foreheadindex	"	"	3,37	"	4,5



Textfig. 123.

T. multicinctus s. s. ♀. a-g. forehead, h. antenna, i. wingstructure.

The Head. (Textfig. 123). Forehead 0,11—0,33 narrower anteriorly than it is at vertex. Callus convex. Beard brownish dirtywhite. Palpi stout, second joint blue tomentose, black haired, yellowbrown haired at base, first joint dirty brownwhite haired, intermixed with some black hairs at apex. Antennae, first joint dullbrown, dorsum black haired, distal lateral border and venter white haired, intermixed with some black hairs, second joint brownish-black, black fringed, third joint black, basal annulation broad, 1,42 times as long as its widest part, 0,94 times as long as the stylus, tooth prominent, blunt.

Thorax black, with indistinct whitish longitudinal stripes, scutum black haired, except the mentioned white hairtufts. Scutellum same colour as scutum, white tomentose at hindborder, mainly black haired. Pteropleuron black haired. Breast and sides cream-coloured, dirty brownishwhite haired, mesosternumlobus black haired. Wings with dark chocolatebrown veins, foreborder pale yellowbrown, pale brown shadows accompanying the veins, stigma havannabrown. Halteres, stalk blackbrown, club piceous. Legs. First leg. Coxa and trochanter dull brown, dirtywhite haired, femur black, dorsum black haired, distal lateral border white haired, intermixed with some black hairs. Tibia black, brownish at base, dorsum black haired,

intermixed with some white hairs, distal lateral border clothed with erect, black and a large number of short white hairs. Tarsalia black, with a median row of white hairs on dorsum, elsewhere black haired. Second leg. Coxa black, trochanter black-redbrown, black haired. Femur black, dorsum black haired, knee yellowbrown, white haired, intermixed with some longer black hairs, distal lateral border white haired. Tibia brownblack, dorsum black haired, proximal lateral short silverywhite haired, ventral surface short silverywhite haired, spurs redbrown at base, black at apex. Tarsalia black. Third leg. Coxa greyblack, white and black haired, trochanter black, black haired, femur with redbrown apex, pubescence on dorsum black, lateral borders and ventral surface white haired. Tibia, blackbrown at base, black at apex, dorsum black haired, distal lateral border white haired, proximal lateral border white and black haired. Tarsalia black.

Abdomen, blackbrown at base, black at apex, markings as mentioned above. Segmentations broadened to the lateral borders.

113. *Tabanus oxyceratus* BIGOT (♀) Textfig. 124.

References:

BIGOT, Mém. Soc. Zool. France V, p. 652 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 195 (1911).

SENIOR WHITE, Dept. Agric. VII (1922)

Habitat:

Type ♀ from India (Textfig. 124).

Coll. B.R.M.

2 ♀♀ from Upper Burma, N. Chin. Hills, Fort White 6000 feet, 4.'23, WATSON

3 ♀♀ „ Cheena Forest, Hymalayans, India, 7500' feet, GILES

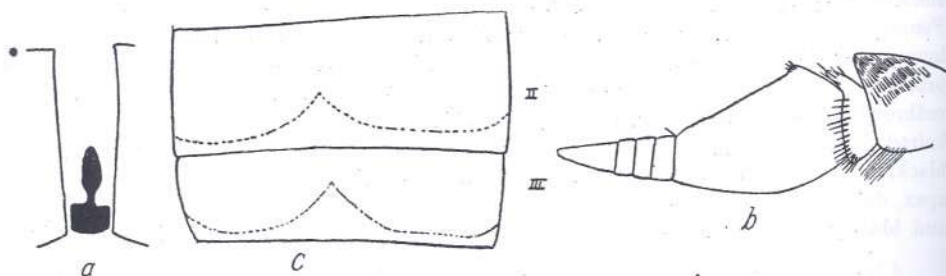
Other females from Mussoorie, India in Indian Museum

2 ♀♀ and 1 ♂ from Masuri, Burma caught on 6.'20 resp. 17.5.'20

T. oxyceratus BIG. is distinguished at once from the allied species by the abdominal markings, the segmentations being elevated in the middle to distinct triangles. Length 13 m.M. other females 11—12½ m.M. Forehead broad, brown. Callus square, with spindle-shaped, short linear extension. Subcallus and upper cheeks brown, lower cheeks white, white haired. Beard white. Palpi reddish-yellow, black haired, narrower than in *T. khasiensis* RIC. Antennae reddish, basal joints black haired, third joint with indistinct tooth. Thorax with 2 white longitudinal stripes, grey bordered along the scutum as well as along the scutellum. Breast white haired. Wings hyaline, appendix present. All tibiae yellowbrown on basal $\frac{2}{3}$ or more. Abdomen black, black haired, first segmentation narrow, with a blotch of white hairs in the middle, other segmentations broader. reddishyellow, with large broad median triangles, white haired. Ventral surface with pale white, white haired segmentations to the segments 2—6.

The Head. (Textfig. 124). Forehead $\frac{1}{5}$ narrower anteriorly than it is at vertex, index 4. Palpi black haired, intermixed with some white hairs. Antennae, second joint very

small, third joint basal annulation 1,4 times as long as its widest part, 1,4 times as long as the narrow stylus.



Textfig. 124.

T. oxyceratus BIGOT ♀. a. forehead, b. antenna, c. abdomen.

Thorax. Wings, foreborder clear, stigma yellow. Halteres redbrown. Legs. Femora black or brownblack, black haired. I could not find the white pubescence on hind femora RICARDO mentioned. Tibiae yellowbrown, whitish haired on basal $\frac{2}{3}$ or more, this area being the largest on the middle tibiae, apices redbrown, black haired.

Abdomen as described above.

114. *Tabanus griseiventer* nov. spec. (♀) Textfig. 125.

Habitat:

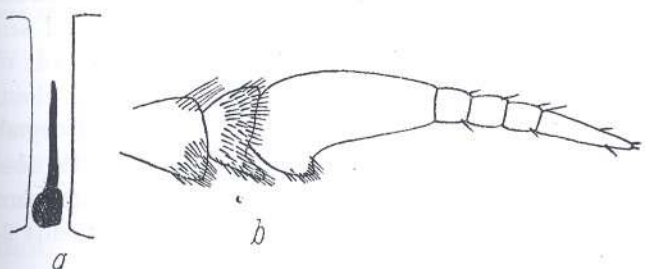
Type ♀ from Nova Guinea. Noord Rivier, LORENTZ 5.'07 Coll. N.A.M.

A grey species. Forehead almost parallel-sided, grey at base, with a median redbrown shadow, black haired. Callus brownblack, broad cylindrical, linear extension black. Subcallus and upper cheeks ferrugineous. Lower cheeks yellowbrown, yellowbrown haired. Beard yellowbrown. Palpi brownyellow, brownyellow haired at base, black haired at apex. Antennae reddishyellow, black haired on basal joints, third joint redyellow at base, then darker blackishbrown. Thorax sootygrey, black and yellowwhite haired. Wings clear, with rudimental appendix. Legs brownish. Abdomen sootygrey on basal 2 segments, following segments more blackbrown, sootygrey tomentose, thus giving the abdomen a greyish appearance, with paler brownishgrey, white haired segmentations, black haired elsewhere. Ventral surface identical, with white segmentations to the segments 1—6. Bodylength 11.2 m.M.; Width of thorax 5 m.M.; Wingsexpanse 27.4 m.M.; Length of wing 11.2 m.M.; Length of abdomen 7 m.M.

The Head. (Textfig. 125). Forehead the same width throughout, index 4,6 Callus shining brownblack, grooved in the middle, tapering to the extension. Palpi, second joint swollen at base, ending with a long point, inner border havannabrown, outer border sootygrey, yellow haired at base, elsewhere black haired. Antennae, third joint curved, basal annulation 1,7 times as long as its widest part, 0.88 times as long as the black stylus, tooth distinct black haired.

Thorax with scanty pubescence (owing to denudation), black and yellowwhite haired. Tufts at base of wings and behind yellowwhite. Pteropleuron grey, black haired. Breast

and sides brownish grey, yellowbrown haired. Wings clear, stigma yellowbrown. Legs. First leg. Coxa sooty grey, yellowbrown haired, trochanter brownblack, femur brownblack, knee reddish yellow, black haired. Tibia redbrown at base, blackbrown at apex, black haired.



Textfig. 125.

T. griseiventer s. s. ♀. a. forehead, b. antenna.

Tarsalia black. Second leg. Coxa and trochanter blue-grey, femur similar, blackish on basal half, apical half yellowbrown, yellow haired, intermixed with some black hairs at apex. Tibia oliveyellowbrown, reddishbrown at apex, dorsum black haired, ventral surface yellow haired. Third leg. Coxa trochanter and lower half of femur brown-

black, apex of femur yellowbrown, black haired, distal lateral border redbrown, tibia as in second leg. First tarsale redbrown, black haired. Other tarsalia black.

Abdomen as described above.

115. *Tabanus khasiensis* RICARDO (♀) Textfig. 126.

References:

RICARDO Ann. Mag. Nat. Hist. (8) III, p. 487 (1909).

„ Rec. Ind. Mus. IV, p. 193 (1911).

Habitat:

India

Type ♀ from Assam, Khasi Hills 1000—3000 Feet, HOWLETT Coll. BR.M.

2 ♀♀ same locality (Textfig. 126 a, c, d.)

Federated Malay States

1 ♀ from Penang, RIDLEY

Isle Sumatra

2 ♀♀ from Sinabang, Simalur, JACOBSON

respectively 1 ♀ on 2.13 Coll. BR.M.

1 ♀ „ 4.13 Coll. N.A.M.

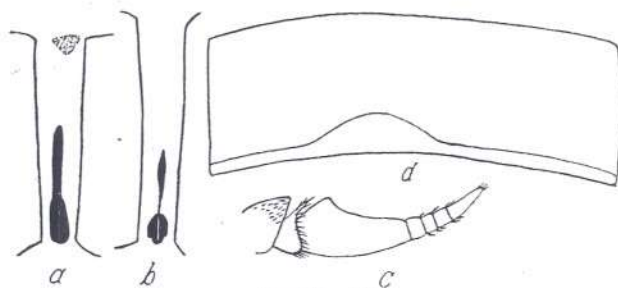
3 ♀♀ from Hoendoelan Parmaksian, Balige, on buffalo VAN DER REEST 21.12.12
(Textfig. 126 b.) Coll. V.S.L.

T. khasiensis Ric. is distinguishable from *T. oxyceratus* Big. to which it is closely allied by the narrower forehead, the callusshape, the halfmoon-shaped triangles on the abdomen, the stouter palpi, the slenderer antennae, the absence of an appendix, etc. Forehead velvetybrown, blackbrown haired. Callus brown or shining black, elongate oval or pear-shaped, linear extension broad. Subcallus and cheeks velvetybrown, velvetybrown haired, intermixed with some black hairs, face greyblue on middle area, lateral borders velvetybrown, black haired. Beard black. Palpi dark havannabrown, wholly black haired, second

joint bluishgrey tomentose on outer border. Antennae dark velvetybrown, black haired on basal joints, third joint dark redbrown at base, black at apex, second joint with long spine. Thorax slateblue-chestnutbrown, black haired, with deepbrown longitudinal stripes, foreborder and lateral borders of scutum and the hindborder of the scutellum, greywhite tomentose, white haired. Wings with brown apical shadow and brown foreborder. Legs dark. Abdomen chestnutbrown, black haired, with pale white, white haired segmentations to all segments, except the seventh, segmentations slightly elevated in the middle on the 2d—5th segment. Lateral borders of tergites showing white hairtufts. Ventral surface blackbrown, black haired, with white haired segmentations to the segments 2—4.

Table of dimensions.

Bodylength	varying from 12,2 m.M. to 13 m.M.					
Width of thorax	"	"	4	"	—	4,4
Width of abdomen	"	"	4,2	"	—	4,8
Wingexpanse	"	"	26	"	—	28,4
Length of head	"	"	2,5	"	—	3
Length of thorax	"	"	4,7	"	—	5
Length of abdomen	"	"	6,5	"	—	7,2
Length of wing	"	"	11	"	—	12
Breadth of wing	"	"	4	"	—	4,2
Foreheadindex	"	"	5	"	—	7



Textfig. 126.

T. khasiensis RIC. ♀. a, b. forehead, c. antenna, d. abdomen.

third joint with distinct tooth, basal annulation 1,75 times as long as its widest part, 1,2 times as long as the stylus. Proboscis black, stalk yellowbrown haired, sugarflaps redbrown haired.

Thorax chestnutbrown with slateblue hue. Tufts at base of wings white. Breast brownishblueblack, grey tomentose, white haired, mesosternum lobus black haired. Scutellum deep chestnutbrown, black haired at base, hindborder bluegrey tomentose, white haired. Wings without appendix, stigma havannayellowbrown. Halteres, stalk redbrown, club yellowwhite. Legs. First leg. Coxa black, femur blackbrown, black haired, knee yellowbrown, tibia yellowbrown at base, blackbrown to the apex, black haired. Tarsalia black. Second leg. Femur

The Head. (Textfig. 126). Forehead 0,2—0,3 narrower anteriorly than it is at vertex. The linear extension of the callus was pointed in one of the Sumatra females. In one of the Balige females the callus with its linear extension had the shape of a pistil. Palpi, second joint stout, ending with a long, rather acute point. Antennae,

black haired on dorsum, white haired on distal lateral border, tibia redbrown at base, black-brown at apex, black haired. Tarsalia black. Third leg identical.

A b d o m e n as mentioned. Segmentations almost parallel-sided, except in the middle, where they are slightly elevated.

116. *Tabanus raffrayi* BIGOT (♀) Textfig. 127.

References:

BIGOT, Mém. Soc. Zool. France V, p. 690 (1892).

RICARDO, Nova Guineæ IX, p. 402 (1912).

Habitat:

Type ♀ from Nova Guinea

A small walnutbrown species. Forehead greybrown. Callus blackbrown, broad, not reaching to the eyes, pointed at apex. Subcallus, cheeks and face pale velvetybrown, blackbrown haired. Beard blackbrown. Palpi reddishblackbrown, black haired, long, apex blunt. Antennae redbrown, black haired on basal joints, third joint redyellow at base, then darker, bearing a prominent tooth. Thorax walnutbrown, blackbrown haired, hindborder of scutum whitish tomentose. Breast dull, buff white haired. Wings clear. Legs brown to blackbrown, uniformly black haired. Abdomen chocolatebrown, with narrow white, white haired segmentations to the first 4 segments, elevated in the middle to white haired triangles. Ventral surface uniformly blackbrown without paler segmentations or white pubescece.



Textfig. 127.
T. raffrayi BIG. ♀
a. forehead
b. palpe.

The Head. (Textfig. 127). Forehead slightly narrower at vertex, than it is at base, index 5,4.

Thorax walnutbrown, breast white haired, mesosternum lobus dark blackbrown, black haired. Halteres, stalk yellowish, club blackbrown. Legs brown. First leg. Coxa and femur chocolatebrown, tibia blackbrown, tarsalia black. Second leg brighter, more dark redbrown. Third leg the same.

A b d o m e n black haired on the darkbrown areas, white haired on the mentioned segmentations.

117. *Tabanus discrepans* RICARDO (♀) Textfig. 128.

References:

RICARDO, Rec. Ind. Mus. IV, p. 185 (1911).

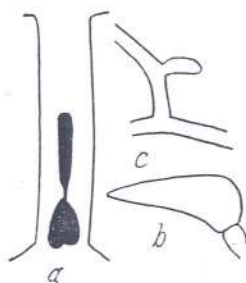
Habitat:

Type ♀ from Ceylon, Trincomalee 2.10.'90, YERBURY
another ♀ from same locality 18.11.'91

Coll. BR.M.

A violetbrown species. Forehead rustybrown, black haired. Callus reversed

heart-shaped, redbrown. Subcallus and upper cheeks rustybrown, black haired. Lower cheeks yellowwhite, yellowwhite haired. Beard same colour. Face pale yellowbrown, white haired. Palpi falciform, orangeousyellow, mainly yellow haired. Antennae brown to redbrown, black haired, tooth indistinct. Thorax violetredbrown, grey tomentose on foreborder, black and yellowwhite haired. Wings with rudimental appendix. Legs brown. Abdomen pointed, redbrown, black haired, with median huge, pale brown, white haired triangles and white haired segmentations to the first 5 segments, lateral borders of the same tergites yellow haired. Length of type 20 m.M; the other ♀ 18 m.M.



Textfig 128.

T. discrepans Ric. ♀
a. forehead, b. palpe,
c. wingstructure

The Head. (Textfig. 128). Forehead, almost the same width throughout, index 4. Callus not reaching to the eyes, linear extension sausage-shaped, connected with the callus by means of a threadlike connective. Face white haired with some black hairs just underneath the antennae. Palpi stout at base, ending in a sharp point, yellow haired, intermixed with black hairs. Antennae, first joint pale brown, black haired, second joint redbrown, black fringed, dorsalspur distinct, third joint broken off in type, redbrown in the other ♀, basal annulation 2 times as long as the widest part, 1,3 times as long as the black stylus.

Thorax, scutum with a faint blackish longitudinal stripe. Sides and breast pale redbrown, white haired. Wings with redbrown veins and foreborder, stigma sienna brown, reddishbrown shadows accompanying the veins. Halteres, stalk dark havanna-brown, club pale luteous. Legs. First leg. Coxa pale brown, pale yellowwhite haired, trochanter redbrown. Femur blackishredbrown, knee yellowbrown, white haired. Tibia yellowbrown on basal 1/2, black and yellow haired, apex dark blackbrown, black haired. Tarsalia black haired. Second leg, femur violetreddish, knee yellowbrown, white haired, tibia more reddish as in second leg, dorsum black haired, sides and ventral surface yellow haired. First tarsale redbrown, other tarsalia black. Third leg identical, tibia redbrown, black haired on dorsum, yellow haired below.

Abdomen as described, the sixth tergite probably possesses also a white hairfringe. ventral surface reddishyellowbrown, with median, black haired rectangular patches on the 1st-4th segment, sides and segmentations yellow haired.

118. *Tabanus selene* nov. spec. (♀) Textfig. 129.

Habitat:

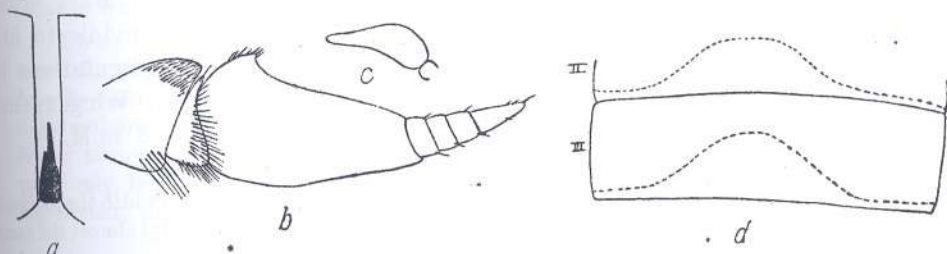
Type ♀ from Dutch Nova Guinea, LORENTZ

Coll. N.A.M.

A blackish species, resembling *T. triangularis* v. D. WULF, distinguished inter alia by the shape of the callus, the shape and pubescence of the palpi, the absence of longitudinal stripes on the thorax, the absence of an appendix, the colouration of the legs, the shape and distribution of the triangles and paler segmentations on the abdomen. Forehead whitish, mainly white haired. Callus shining winered, without distinct linear extension. Subcallus white, with velvetybrown streaks, face white, upper cheeks narrowly brownish, black haired,

lower cheeks white, white haired, Beard white. Palpi yellowbrown, swollen at base, with a narrower rather long point, white and black haired. Antennae black, black haired, tooth distinct. Thorax winered, without distinct longitudinal stripes, black haired along the lateral borders. Legs with purplish or yellowbrown femora and yellowishbrown tibiae. Wings clear, with some brown dots along several veins. Abdomen dark blackbrown, with halfmoon-shaped white spots and white, white haired segmentations to all sixth segments. Length 16.2 m.M.; Width of thorax 5 m.M.; Wingsexpanse 31 m.M.; Lengt of wing 13 m.M.; Length of abdomen 10 m.M.

The H e a d. (Textfig. 129). Forehead almost the same width throughout, white haired, some black hairs being found at vertex, index 6.5. Callus shining winered, triangular to pear-shaped, rather convex, almost missing the linear extension. Subcallus white, with a narrow,



Textfig. 129.

T. selene s.s. ♀. a. forehead, b. antenna, c. palpe, d. abdomen.

velvetybrown streak just under the callus and another broader one above the antennae. Palpi pale yellowbrown, second joint swollen at base, where it is white haired, apex blunt, black haired. Antennae, first joint protruding caplike over the second, both black haired. Third joint, basal annulation 1.6 times as long as its widest part, 1.66 times as long as the stylus Tooth distinct, black haired.

Thorax winered, white tomentose, black and white haired, the latter being found especially at the hindborder of the scutum and along the lateral borders of the same. Scutellum similar, hindborder pale red, foreborder bluish red, white haired. Pteropleuron pink, black haired. Breast bluegrey, white haired. Mososternumlobus reddish, white haired also. Wings clear, foreborder pale yellow, stigma yellowbrown, brownish dots are found at the apices of the radial and cubital veins and at the base of the latter. Halteres yellowbrown. Legs brownish. First leg. Coxa bluishgrey, white haired, trochanter brownishred, white haired. Femur, dorsum purplish, black haired, distal lateral border white haired, knee yellowbrown. Tibia blackish at extreme base, then yellowbrown, white haired, intermixed with a median row of black hairs on basal half, apex blackbrown, black haired. Tarsalia black. Second leg. Femur, dorsum purplish, scanty black haired, elsewhere yellowbrown, white haired. Tibia yellowbrown, yellow haired at base, apex reddbrown, black haired. Tarsalia black. Third leg similar. Tibia on dorsum with black hairs in rows.

Abdomen dark blackbrown, black haired, markings white haired, segmentations to the first 6 segments distinctly white. Lateral borders of the first 5 tergites white, white haired. Ventral surface greyblue, white haired on first segment, other segments with median, black, black haired areas, segmentations and sides white, white haired. Second segment white at base also.

119. *Tabanus latisegmentatus* nov. spec. (♀) Textfig. 130.**Habitat:**

Type ♀ from S. Nova Guinea Heubelbivak 800 M. 7/15.11.'09, LORENTZ
Coll. N.A.M.

A blackbrown species. Forehead blackbrown, black haired. Callus bottle-shaped, shining, piceous. Subcallus peculiar in shape, havannabrown. Cheeks and face sootygrey, white haired. Palpi slender, brownblack, black haired, almost the same width throughout. Antennae incomplete, brownblack, black haired on basal joints. Thorax slateblack on foreborder of scutum, then dark chestnutbrown, black haired. Lateral borders of scutum behind the suture white, white haired. Wings brownish, with a faint apical shadow. Legs havannabrown, black haired. Abdomen blackbrown, black haired, with rather broad paler tomentose, white haired segmentations, elevated in the middle to low triangles. Ventral surface with similar white, white haired segmentations to the sternites. Bodylength 9.8 m.M.; Width of thorax 3 m.M.; Wingexpanse 22.6 m.M.; Length of wing 9.8 m.M.; Length of abdomen 5.8 m.M.



Textfig. 130
T. latiseg-
mentatus
s. s. ♀
forehead.

The Head. (Textfig. 130.). Forehead almost the same width throughout, blackbrown, white tomentose along the callus, index 4. Palpi almost the same width throughout, not swollen at the base.

Thorax. Scutum rubbed, probably formerly black haired, Lateral borders formerly white haired, white tomentose. Sides and breast havannabrown, grey tomentose, white haired, mesosternumlobus blackbrown haired. Pteropleuron dark havannabrown, black haired. Wings brownish, foreborder yellowbrown, stigma burnt sienna-coloured. Halteres havannabrown. Legs. First leg. Coxa havannabrown, white haired, femur, tibia and tarsalia havannabrown, black haired. Middle and hind legs similar, the latter slightly darker only.

Abdomen blackbrown, it was wetted before, coloured as mentioned. Ventral surface distinct white tomentose on the first 4 segments, the following segments were wetted before.

120. *Tabanus sylvioides* WALKER (♀) Textfig. 131.**References:**

WALKER, Proc. Linn. Soc. London VII, p. 206 (1864).
RICARDO, Nova Guinea IX (1914).

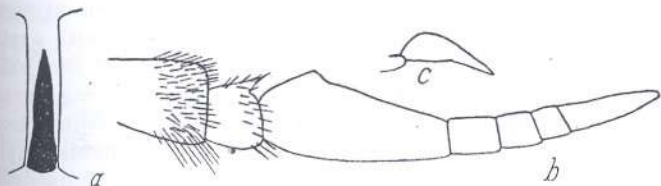
Habitat:

Type ♀ from Mysol, A. R. WALLACE

Coll. BR.M.

A brown species. Forehead brownblack, denuded. Callus stout, brownblack, broad, with a broad, pointed linear extension. Subcallus and upper cheeks redbrown, lower cheeks and face white, white haired. Beard white. Palpi dark

havannabrown, black haired. Antennae narrow, dark. Thorax brown, with scanty yellow pubescence at hindborder. Wings with rustybrown apical shadow. Legs tawny. Abdomen havannabrown with white segmentations.



Textfig. 131.

T. sylvioides Wlk. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 131). Forehead, almost the same width throughout, index 4. Callus nearly reaching the eyes. Palpi swollen at base, ending in a fine point. Antennae, first joint cylindrical, second joint with a short dorsal spur and a double apical fringe

of black hairs, third joint narrow, with an indistinct triangular tooth, basal annulation 2,1 times as long as its widest part, 0,87 times as long as the stylus.

Thorax as described, breast greybrown. Wings with the apical shadow surrounding especially the upper and lower branch of the cubital vein, filling up the radial cell, but letting free the centres of the cubital and the submarginal cell. Foreborder deep redbrown. Halteres deep redbrown. Legs brownish. First leg. Coxa whitishgrey, white haired. trochanter and femur tawny redbrown, tibia redbrown, black haired, tarsalia black. Second leg slightly paler only, femur white haired at sides, first-tarsale blackbrown, other tarsalia black. Third leg similar, slightly darker only.

121. *Tabanus auricingulatus*-nov. spec. (♀) Textfig. 132.

References:

VAN DER WULP, Sumatra Exped. Dipt. 17, (1881)

Habitat:

Type ♀ from Air Gaung Ketjil, Sumatra 8.'16, JACOBSON Coll. N.A.M.

1 ♀ from Goenoeng Singgalang, Sumatra 2000 M. 6.'15, JACOBSON „

1 ♀ „ same locality 1800 M., JACOBSON '25

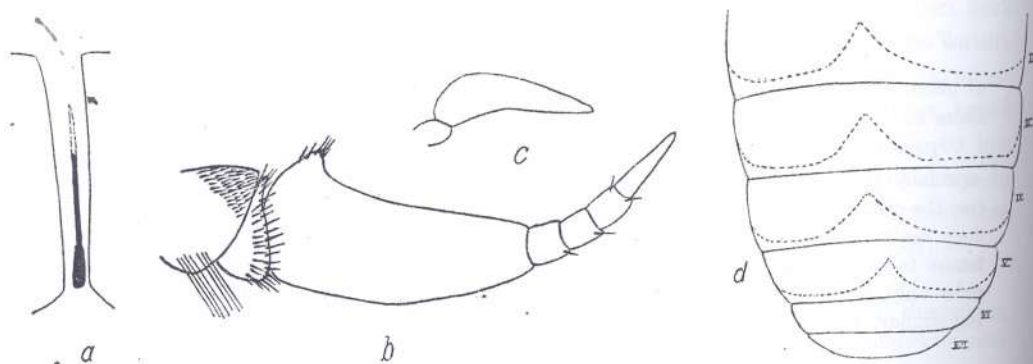
1 ♀ „ Lebong 5.78 labelled *T. incultus* VAN DER WULP (Textfig. 133)

Coll. L.M.N.H.

The abdomen of the first 2 specimens is deteriorate, the third specimen is however in excellent condition. Forehead orangeousbrown, long black haired. Callus leatherbrown, partly covered with orangeousbrown tomentum, linear extension fine, black. Subcallus, cheeks and face orangeousredbrown, orangeous yellow to golden yellow haired. Beard same colour. Palpi orangeousbrown, orangeousyellow haired at base, black haired at apex. Antennae dull olivebrown on first joint, second joint redyellow, both black haired, third joint redyellow, black tipped. Thorax chamois-leatherbrown, with a median redbrown longitudinal stripe, yellow haired, intermixed with black hairs. Wings brownish-grey. Legs darkbrown, with paler yellow haired tibiae. Abdomen deepredbrown at base, then blackbrown, markings consisting in broad yellowbrown, golden

yellow haired segmentations, elevated in the middle to huge triangles on the first five or six segments. Length 14,2 m.M.; Width of thorax 5,6 m.M.; Wingexpanse 31,6 m.M.; Length of wing 13 m.M.; Length of abdomen 8,8 m.M.

The Head. (Textfig. 132). Forehead 0.4 narrower anteriorly than it is at vertex, index 9. Palpi, first joint yellow haired, second joint broad at base, ending with a rather short, acute point, orangeous haired at base, apex black haired. Antennae, first joint yellow tomentose, black haired, protruding caplike over the second joint, the latter being very narrow, provided with a long dorsal spur and black hairfringe, third joint with distinct tooth, basal annulation 1,8 times as long as its widest part, 1,34 times as long as the black stylus.



Textfig. 132.

T. auriclingulatus s.s. ♀. a. forehead, b. antenna, c. palpe, d. abdomen.

Thorax chamoisleatherbrown to reddishbrown, yellowish on foreborder. Scutum golden yellow haired, intermixed with some black hairs, the yellow hairs being especially narrower at the hind border of the scutum, Sides an breast yellowbrown, goldenyellow haired, pteropleuron dull havannabrown, black haired. Wings with yellowbrown foreborder and burnt sienna stigma, brown shadows accompanying most veins, halteres havannabrown. Legs. First leg. Coxa greybrown, yellow haired, trochanter blackbrown, femur blackbrown, black haired on dorsum, distal lateral border havannabrown tomentose, thick yellow haired, knee yellowbrown. Tibia brownishyellow white, intermixed with a few black hairs, yellow haired on the basal 3/4, apex blackbrown, black haired, extreme base blackbrown also. Tarsalia black, black haired. Second leg identical, femur slate-bluebrown, mainly yellow haired, knee yellowbrown, scanty black haired, tibia yellowwhite, yellow haired, apex deep olivebrown, black haired, extreme base blackbrown, black haired, connected with the apical ring by means of a row of black hairs; Third leg, tibia more brownishwhite, dorsum black haired.

Abdomen as described, lateral borders of the first 4 tergites narrowly yellow haired, Ventral surface yellowbrown, yellow haired on basal 2 segments, other segments blackbrown. black haired, segmentations yellowbrown, yellow haired.

From *T. rufidens* BIG. *T. auriclingulatus* differs in the colour of the frontal stripe, and callus, the absence of an appendix, the colour of the tibiae, with their pubescence and the colour of the abdomen. From *T. sapporoensis* SHIR. it may be divided by the shape of forehead and callus, the shining subcallus, etc..

122. *Tabanus immixtus* WALKER (♀). Textfig. 133

References:

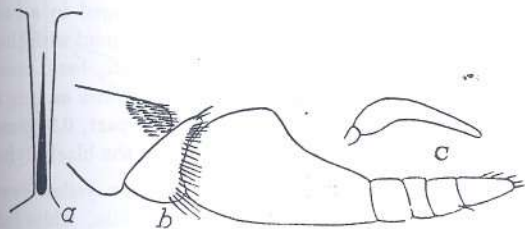
WALKER, Proc. Linn. Soc. London, IV, p. 103 (1860).

Habitat:

Type ♀ from Celebes, Makassar

Coll. BR.M.

T. immixtus resembles *T. brunneothorax* SCHUURMANS STEKHOVEN. Forehead brownish, rather narrow, Callus blackbrown, elongate, prolonged to a fine point. Subcallus reddishbrown. Cheeks and face yellowishwhite, yellowwhite haired. Beard yellowwhite. Palpi yellowbrown, black haired, provided with a long point. Antennae reddishbrown, black haired on basal 2 joints, third joint rather broad at base, redbrown at base only, then black, tooth blunt. Thorax greyish brown yellowish haired, with traces of 2 white longitudinal stripes and whitish lateral borders. Wings with yellowbrown shadows along the veins. Legs, femora chocolatebrown, tibiae yellowbrown. Abdomen redbrown to blackbrown, black haired, with broad, pale yellowbrown segmentations, elevated in the middle to huge yellow haired triangles on the first 6 segments.



Textfig. 133.

T. immixtus WLK. ♀.

a. forehead, b. antenna, c. palpe.

yellowwhite haired. Wings, foreborder yellowbrown, stigma pale yellowhavannabrown. Legs. First leg. Coxa brownishgrey, yellowwhite haired, trochanter dark redbrown, femur chocolatebrown, black haired, knee yellowbrown. Tibia yellowbrown, ochraceousyellow haired at base, apical half blackbrown, black haired. Tarsalia, blackbrown, black haired. Second leg. Femur tawny-reddishbrown, mainly yellowwhite haired, some black hairs at apex, knee yellowbrown, tibia yellowbrown, ochraceousyellow haired, apical band narrow reddishbrown, black haired. Tarsalia redbrown, black haired. Third leg identical, tibia with a greater number of black hairs on dorsum.

Abdomen. Distal lateral borders of tergites yellowbrown, yellowwhite haired. Ventral surface pale yellowbrown, with reddish, black haired median patches, forming together a longitudinal dark band. Sides and segmentations yellowwhite haired.

The Head. (Textfig. 133.) Forehead 0,38 narrower anteriorly than it is at vertex, index 8,5. Palpi, second joint swollen at base. Antennae, first joint protruding caplike over the second joint. Third joint, basal annulation 1,7 times as long as its widest part, 1,4 times as long as the stylus.

Thorax. Pteropleuron black haired. Scutum clothed with yellowish pubescence. Sides and breast brownishgrey,

123. *Tabanus papouinus* WALKER (♂) Textfig. 134.

References:

WALKER, Proc. Linn. Soc. London, VIII, p. 108 (1865).

OSTEN SACKEN, Ann. Mus. Civ. Genova XVI, p. 418 (1882).

RICARDO, Nova Guinea IX, p. 401 (1914).

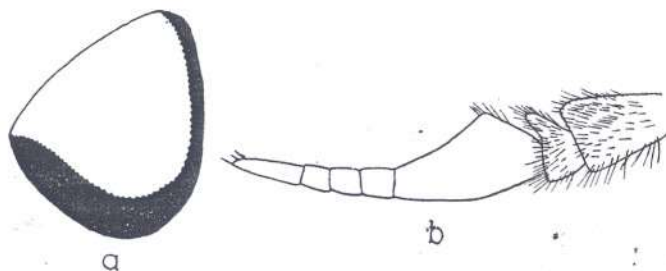
Habitat:

Nova Guinea

Type ♂ WALLACE

Coll. BR.M.

A yellowbrown species. Eyes with narrow, black, small-faceted border, extending to the vertex. Subcallus and upper cheeks olivebrown, lower cheeks white, white haired. Beard white. Palpi olivebrown, yellowish haired, black haired at apex. Antennae olivebrown, black haired on basal joints, third joint redyellow, stylus black. Thorax greyishblue, yellowbrown tomentose, yellow haired. Wings clear, veins olivebrown. Abdomen yellowbrown, blackbrown haired with yellow haired segmentations to the 2d—5th segments, apex darker blackbrown. Legs brown. Length 9 m.M.



Textfig. 134.

T. papouinus Wlk. ♀. a. eye, b. antenna.

The Head. (Textfig. 133). Antennae, first joint long, cylindrical, second joint with broad dorsal spur, the black hairs being arranged in several rows, third joint with black haired tooth, basal annulation 1.9 times as long as its widest part, 0.95 times as long as the black stylus.

Thorax yellowbrown haired, this pubescence being fairly long on the scutellum. Breast greywhite, white haired. Wings with well developed siennabrown stigma. Legs. First leg. Coxa greybrown, yellowwhite haired, femur blackishredbrown, blackbrown haired, tibia yellowbrown, darker on apical half. Tarsalia blackish olivebrown, black haired. Second leg, femur yellowbrown, yellow haired, tibia yellowish, pale olivebrown, with a black hairrow just behind the first tarsale. First tarsale olivebrown, black haired, other tarsalia black. Third leg tawnybrown, femur with a row of black hairs on dorsum, elsewhere yellowwhite haired, tibia yellowbrown, yellow haired, with a dark olivebrown, black haired apical margin. Tarsalia as in second leg.

Abdomen dark yellowbrown on basal 2 segments, darker on following segments. Ventral surface reddishbrown, yellowwhite haired on the basal 2 segments, yellow haired on the second segmentation, following segments blackbrown, black haired on disc, segmentations yellowwhite haired. Last 2 segments wholly blackbrown, black haired.

124. *Tabanus fuscicauda* BIGOT. (♀) Textfig. 135.

References:

BIGOT, Mém. Soc. Zool. France V, p. 658 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 217 (1911).

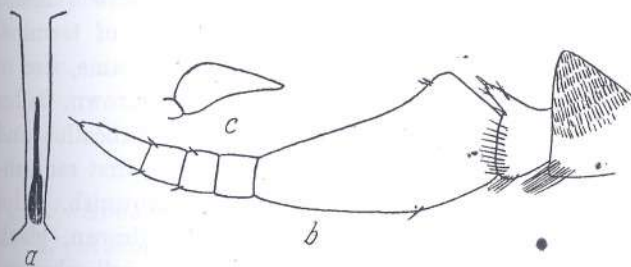
Habitat:

Type ♀ from Ceylon

Coll. BR.M.

3 ♀♀ from Pundaluoya Ceylon, GREEN
 respectively 1 ♀ on 3.'97
 2 ♀♀ „ , 90

A walnutbrown species. Forehead dullbrown. Callus elongate cylindrical, redbrown, grooved in the middle, linear extension thick, pointed. Subcallus and upper cheeks redbrown, black haired, lower cheeks greywhite, white haired. Beard white. Face white, some black hairs occurring on it, just under the antennae, elsewhere white haired. Palpi yellowbrown, mainly yellow haired. Antennae olivebrown to reddishbrown, black haired on dorsum, third joint reddishbrown at base, then black. Tooth prominent, blunt. Thorax walnutbrown, grey tomentose on foreborder, elsewhere reddishbrown and black haired. Wings clear. Legs blackbrown, tibiae black-tipped, yellow-white to yellowbrown at base. Abdomen yellowbrown at base, dark at apex, with a lentiform, black spot on second segment. pubescence black, segmentations yellowbrown, yellow haired. Length of type 15 m.M., other females 14—15 m.M.



Textfig. 135.

T. fuscicauda BIGOT ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 135). Forehead 0,4 narrower anteriorly than it is at vertex, index 9,1. Callus almost reaching to the eyes. Palpi, first joint yellow haired, second joint swollen at base, mainly yellow haired, intermixed with some black hairs at apex. Antennae, first joint olivebrown, black haired on dorsum, yellowbrown haired

at distal lateral border and on ventral surface, second joint reddishbrown, black fringed, dorsal spine distinct; third joint reddishbrown at base, soon growing darker, stylus black, basal annulation 1,88 times as long as its widest part, 1,3 times as long as the stylus.

Thorax dark walnutbrown, with median darker longitudinal stripe, scutum grey tomentose on foreborder, scutellum same colour as scutum, greyish tomentose at hindborder. Tufts at base of wings white. Pteropleuron yellowbrown, black haired. Breast and sides bluishgrey, with brown streaks, white haired. Wings clear, veins brown, foreborder yellowbrown. Halteres, stalk blackbrown, club pale yellowbrown. Legs. First leg. Coxa greybrown white haired, trochanter blackbrown, femur blackbrown, black haired, knee yellowbrown. Tibia swollen, white, white haired at base, intermixed with some black hairs, apical half broad, blackish, black haired. Tarsalia black. Second leg. Femur similar, dorsum black haired, distal lateral border white haired, tibia brownish yellowwhite, yellow haired at base, blackbrown, black haired on apical band. First tarsale darkredbrown at base, black at apex, black haired. Other tarsalia black. Third leg, femur similar, tibia yellowbrown at base, apical band redbrown, dorsum black haired, ventral surface yellow haired. Tarsalia redbrown, black haired.

Abdomen black haired, yellowbrown on basal 2 segments, darker, more blackish-redbrown on following segments. A small, grey haired spot occurs on the first segment at

each side of the scutellum. Second segment with a median black, black haired, longitudinal lentiform spot. Segmentations yellowbrown, yellow haired, some yellow hairs being found also on the segments 2—4 on the discs in the median line. Lateral borders of the first 4 tergites yellowbrown, yellow haired, following segments partly black, partly yellow haired at lateral borders. Ventral surface dark redbrown, black haired in the median line, sides and segmentations to the first 6 segments yellowbrown, yellow haired. Seventh segment wholly black haired.

In her Revision of the Oriental Tabanidae RICARDO regards *T. andamanicus* BIGOT as a synonym of *T. fuscicauda* BIGOT. It is however quite distinct, confer also my description of this species. The Kajoe Tanan females from Sumatra placed by Ricardo under this heading are also different and belong to my new species *T. brunnipes* SCHUURMANS STEKHOVEN, see there.

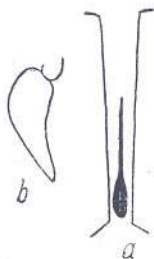
125. *Tabanus inflatipalpis* nov. spec. (♀) Textfig. 136.

Habitat:

Type female from Peradenyia, Ceylon, GREEN 2.1900

Coll. BR.M.

This female placed by RICARDO under the heading *T. fuscicauda* BIGOT is certainly distinct. AUSTEN annotated: „closely allied to *T. fuscicauda* BIGOT but apparently distinct, note i.a. hairclothing on outer surface of terminal segment of palpi, colouration of pleurae and haircovering of the same, size of wingstigma, narrower front tarsi E. E. A. 14.11.'22". Forehead dullbrown. Callus oval, redbrown, grooved in the middle, linear extension fine. Subcallus and upper cheeks rustybrown, lower cheeks and face pale yellow, the first reddish-yellow haired, the latter scanty black haired. Beard yellowbrownish. Palpi yellowbrown, partly yellow, partly black haired. Antennae redbrown, black haired. Thorax blackbrown, yellow haired. Wings clear, veins yellowbrown. Legs with yellowbrown tibiae. Abdomen reddish brown, blackbrown to the apex, with pale, orange haired segmentations till the sixth segment. Lateral borders of tergites yellowbrown, yellow haired. Venter with a black median, black haired longitudinal band and yellowbrown, yellow haired sides and segmentations.



Textfig. 136.
T. inflatipalpis
s. s. ♀
a. forehead,
b. palpe.

The Head. (Textfig. 136). Forehead 0.45 narrower anteriorly than it is at vertex, index 9.3. Callus not reaching to the eyes. Palpi, first joint yellow haired, second joint swollen at base, where it is yellow haired, elsewhere black haired. The point is longer than in *T. fuscicauda* BIGOT.

Thorax as mentioned. Scutum and scutellum same colour, pteropleuron redbrown, black haired. Breast ferrugineous, yellowbrown haired. Wings, foreborder yellowbrown, stigma dark brown. Halteres stalk redbrown, club yellowwhite. Legs. First leg. Coxa pale brown, brown haired, trochanter and femur blackbrown, black haired, the latter with a yellowbrown knee. Tibia yellowredbrown, yellow haired, intermixed with some black hairs on basal half, apex reddishblackbrown, black haired. Tarsalia black. Second leg. Femur sootybrown, yellow haired below and on distal lateral border, black haired on dorsum, knee yellowbrown. Tibia

yellowbrown, orangeyellow haired with a median row of black hairs on dorsum, apical ring darker brown, black haired. Tarsalia blackbrown, black haired. Third leg. Femur almost wholly yellow haired, intermixed with some black hairs. Tibia yellowbrown with blackbrown apical ring, black haired on dorsum, yellow haired below, except on the black haired apex.

A b d o m e n reddishbrown at base, blackbrown to the apex. Ventral surface with black, black haired, median longitudinal band. Sides and segmentations till 5th segment yellowbrown, yellow haired, sixth segment yellowbrown, yellow haired at segmentation only.

GROUP IX.

Beautifully coloured species, most of which characterised by the white or yellow, respectively white or yellow haired abdominal bands, seldom unicolorous. Eyes in life with a single green crossband at the level of the lower frontal callus. Forehead with 2 calli, which however may be connected. Subcallus always bare, shining yellowbrown, blackbrown or black. Beard yellowish or white. Antennae usually bright redyellow or ochraceous, redbrown in other species. Thorax in most species with a bluishgrey foreborder, hindborder of scutum and the whole scutellum in the same species pale white or yellowish. Legs with all tibiae largely white, white haired or yellowish and yellow haired.

KEY 19.

Synopsis of species.

- 1a. Abdomen uniformly brown 2
- b. Abdomen distinctly banded with white or yellow segmentations.. 3
2. Subcallus pale yellowbrown. Upper cheeks orangeous-redbrown; lower cheeks white. Scutellum same colour as scutum. Wings with distinct brownish apical shadow. Abdomen with traces of yellow haired spots on the 2d—5th segmentation **flavicornis** SCHUURMANS STEKHOVEN.
- 3a. Abdomen black, abdominal bands always white, white haired.... 4
- b. Abdomen brown or yellowbrown, darker at apex, abdominal bands yellow or white, yellow or white haired 9
- 4a. Abdomen with 6 broad bands 5
- b. Number of white bands smaller 6
- 5a. Foreheadindex 3. Upper callus almost the same width as the lower one. Beard yellowish white. Antennae, basal annulation broad, with hardly any tooth. Second to fourth abdominal band broad, the following ones narrower **laticinctus** SCHUURMANS STEKHOVEN.
- b. Foreheadindex 4.1. Upper callus much narrower than the lower callus. Beard white. Antennae, basal annulation narrower, tooth slightly more distinct. First abdominal segment with a faint greyish, black haired segmentation, following segmentations till the 6th almost parallel-sided **sexcinctus** RICARDO.

- 6a. Wings with a distinct apical shadow, without an appendix, palpi white haired 8
- b. Wings clear, without apical shadow, appendix usually present. Palpi mainly black haired. 7
7. Body small, usually shorter than 10 m.M. Subcallus ochraceously yellow-brown. Cheeks pale yellowishbrown, white haired. Antennal tooth distinct. Foreborder of scutum bluegrey, with 3 longitudinal stripes. Second abdominal segment usually with a median, white spot and similar lateral triangles. Abdominal bands distinctly elevated to triangular spots on the 3d and 4th segment, those on the 5th and 6th segment with lower median triangles. **albivittatus** SCHUURMANS STEKHOVEN.
- 8a. Upper callus surrounded by a dark brown spot. Upper cheeks chestnutbrown, black haired. Palpi brownish. Abdominal bands broad, occurring on the 3d and 4th segment only, slightly elevated in the middle; second segment with lateral white triangles **bicinctus** RICARDO.
- b. Not such a brown spot round the upper callus. Cheeks sootygrey, black and white haired. Palpi greyblue. Third and 4th abdominal segments white banded, those bands being elevated in the middle to distinct triangular spots; 5th and 6th segment with narrower, white fringed segmentations **griseipalpis** SCHUURMANS STEKHOVEN.
- 9a. Segmentations white haired 10
- b. Segmentations yellow haired 11
10. Subcallus deep havannabrown. Upper cheeks redbrown. Palpi, second joint white haired at base, black haired at apex. Scutellum white, yellow haired. Wings with brown apical shadow. Legs with all tibiae largely white at base. Abdomen nutbrown on basal segments, then darker, blackbrown. Segments 3—6 with broad, white, parallelsided bands **albicinctus** SCHUURMANS STEKHOVEN.
- 11a. Abdomen with a median, small or large, black spot or stripe on the 2d segment 12
- b. No such a median black spot 15
- 12a. Median spot large and huge 13
- Median spot or stripe small 14
13. Foreheadindex 4—5.4. Upper cheeks mummibrown. Subcallus chestnutbrown. Wings with distinct appendix, with or without an apical shadow. Legs with all tibiae largely cream-buff, silvery white haired. Abdomen, 2d segment with a median and 2 lateral white triangles, 3d and 4th segment with broad, white, yellow haired bands, 5th and 6th segment yellow white fringed **insidiator** AUSTEN
- 14a. Foreheadindex 4—7.1. Upper cheeks brownish. Subcallus black. Legs with all tibiae largely white, white and yellowbrown haired. Wings with apical shadow, appendix wanting. Abdomen, 2d segment with median

black spot a median, yellow haired triangle and 2 lateral similar spots; yellow, yellow haired bands to be found on the 3d—6th segment, broadest on the 3d and 4th segment **flavivittatus** SCHUURMANS STEKHOVEN.

- b. Foreheadindex 5.2. Subcallus dark redbrown. Upper cheeks shining redbrown, blackbrown haired. Wings as in *flavivittatus*. Legs with all tibiae largely white, white haired. Second abdominal segment with a median black stripe, a median white and 2 similar white, white haired lateral spots; 3d and 4th segment with rather broad white, yellow haired bands **bombayensis** SCHUURMANS STEKHOVEN.

- 15a. Abdomen with 2 broad yellow bands only, with or without a complementary yellow hairfringe to one or more segments, tibiae white haired 16

- b. Abdomen with a larger number of yellow bands, tibiae yellow haired 17

16. Foreheadindex 4. Subcallus chocolatebrown. Upper cheeks same colour, black haired. Palpi white haired. Wings with apical shadow and appendix. Abdomen with 2 yellow bands, respectively on the 3d and 4th segment, 6th segment yellow fringed **leucocnematus** BIGOT.

- 17a. Forehead broad, index 3—3.5. Lower callus and the cinnamonbrown subcallus separated by a rather large distance. Upper cheeks dark yellow-brown. Palpi mainly black haired. Wings without apical shadow, with or without appendix. Tibiae largely yellow. Abdomen with broad bands to the 2d—6th segment, 1st and 7th segment yellow fringed

flavicinctus RICARDO.

- b. Foreheadindex 4.8. Subcallus yellowbrown or dark olivebrown. Upper cheeks brown. Palpi reddishyellow, yellow haired. Hindborder of scutum and the whole scutellum brownyellow, yellow haired. Wings without apical shadow or appendix. All segments except the 7th yellow haired **imparicallosus** SCHUURMANS STEKHOVEN.

126. *Tabanus flavicornis* nov. spec. (♀) Pl. 11, Fig. 5; Textfig. 137.

Habitat:

Isle Sumatra

Residency Tapanoeli

Ressort Padang. Sidempoean, Mantrie Ressort Kota Nopan.

Type ♀ from Moeara Tagor, Tamiang on horse 11.7.'23, LOBEL Coll. V.S.L.

Ressort Padang Sidempoean, Mantrie Ressort Binanga

6 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, LOBEL and BAKKER

respectively 1 ♀ on buffalo 2.6.'24

1 ♀ „ „ 22.9.'24

2 ♀ ♀ „ „ 3.7.'24

2 ♀ ♀ „ horse 22.9.'24

12 ♀ ♀ from Si Oendol, Paringgonan, BAKKER

respectively 1 ♀ on horse 26.8.'23

3 ♀ ♀ „ „ 24.9.'24

7 ♀ ♀ „ buffalo 24.9.'24

1 ♀ „ „ 3.6.'24

3 ♀ ♀ from Siboehean, Djandi Lobi, BAKKER

respectively 1 ♀ on buffalo 27.8.'23

1 ♀ „ „ 23.9.'24

1 ♀ „ horse 1.6.'24

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

2 ♀ ♀ from Siboeni boeni, Siboeleean, BAKKER

respectively 1 ♀ on cattle 28.8.'23

1 ♀ „ horse 8.8.'24

2 ♀ ♀ from Kajoe Tanan, Dr. HAGEN 10.6.'07

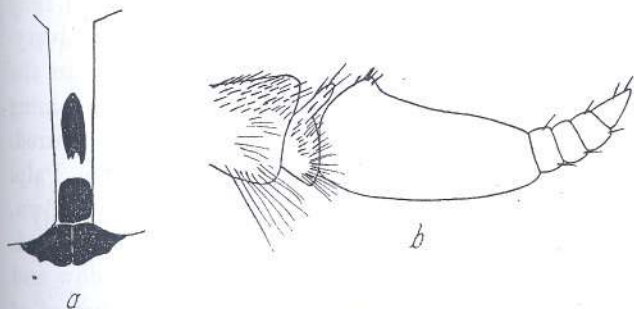
Coll. BR.M.

T. flavicornis is a handsome, small, uniformly brown species. Forehead dull yellowbrown or greywhite, white haired at base, rustybrown, black haired at vertex. Two calli. Lower callus orangeous yellowbrown, square, reaching to the eyes, upper callus oval, redbrown, much narrower than the first one. Subcallus bare, shining pale yellowbrown. Upper cheeks orangeous-redbrown, lower cheeks white, white haired. Beard white. Middle portion of the face greywhite, white haired, borders brownish. Eyes with a single coppergreen crossband. Palpi yellowbrown white, white haired at base, apex black haired. Antennae reddishyellow, mainly black haired. Thorax dull chocolatebrown, whitish at lateral borders, scutellum same colour as scutum. Breast white, white haired. Legs brown, with all tibiae largely white, white haired. Wings greyishbrown, with distinct smokybrown apical shadows. Abdomen reddishbrown at base, darker at apex, black haired, with traces of yellow haired spots on the 2d till 5th segment. Ventral surface yellowbrown with yellow haired segmentations.

Table of dimensions.

Bodylength	12,5 m.M.
Width of thorax	4 „
Width of abdomen	4,5 „
Wingexpanse	26,4 — 28,2 m.M.
Length of head	2,5 m.M.
Length of thorax	5 „
Length of abdomen	6,5 „
Length of wing	12 „
Breadth of wing	4 „
Foreheadindex	4,88 — 5,2

The Head. (Textfig. 137.) Forehead almost the same width throughout, yellowbrown to velvetybrown. Lower callus, grooved in some specimens, separated from the subcallus by a narrow space, covered with yellowbrown tomentum. Subcallus, etc. as described. Palpi, First joint yellowbrown, white haired, intermixed with some black hairs at apex, second joint coffeebrown, white tomentose, thus appearing pale violetbrown, white haired at base, black



Textfig. 137.

T. flavicornis s. s. ♀. a. forehead, b. antenna.

haired at apex, where some black hairs are intermixed, base stout, apex ending with a blunt point. Antennae, first joint shining leatherybrown, black haired on dorsum, ventral surface whitish tomentose, white haired, some white hairs occurring at the distal lateral border, intermixed between the black ones. Second joint same colour, black haired over the whole surface, dorsal hump long.

Third joint reddish orangeyellow on basal annulation, which is 1,7 times as long as its widest part, 1,75 times as long as the dusky yellowbrown stylus, tooth conspicuous, blunt, black haired. Proboscis dull yellowish violetbrown, stalk black haired.

Thorax, scutum dull violetbrown, foreborder whitish tomentose as are also the lateral borders. Disc of scutum black and rustybrown haired. Tufts at base of wings and behind white. Pteropleuron violet-coffeebrown, black haired. Breast and sides bluishgrey, white haired. Mesosternumlobus black haired. Scutellum same colour as scutum, white haired along the hind border. Wings. Foreborder yellowbrown. Stigma reddbrown. Apical shadow including the radial and cubital cells. No appendix. Halteres havannabrown. Legs. First leg. Coxa bluish grey tomentose, white haired, with some black hairs at apex. Trochanter dull havannabrown, femur violetred, coffeebrown on dorsum, which is white haired at base, black haired at apex, distal lateral border black haired, intermixed with some white ones. Tibia, basal $\frac{7}{8}$ white, white haired, intermixed with some black hairs, extreme base reddbrown, apical ring blackbrown, black haired. Tarsalia black. Second leg identical. Femur violetpink on ventral surface, yellowbrown, yellow haired on dorsum, with some black hairs at apex. Tibia almost wholly pale yellowbrown, white haired, extreme apex dark olivebrown, black haired, some black hairs being found at the extreme base also. First tarsale pale havannabrown, black haired, other tarsalia black. Third leg. Femur coffeebrown, yellowwhite and black haired, apex yellowbrown, white haired, ventral surface violetbrown, proximal lateral border black haired. Tibia strawyellowwhite, white haired, extreme apex reddishbrown, black haired, this pubescence prolonged to the base as a median row of black hairs. First tarsale reddbrown to olivebrown, black haired, other tarsalia black.

Abdomen uniformly brown, basal segments dark olivebrown, apex more blackbrown, black haired, except on the mentioned yellowish-coppered haired indications of median spots. Sixth segment with similar hairs at the same spots. Ventral surface with a median blackbrown, black haired longitudinal band, lateral borders coffeebrown, yellow haired, as are the segmentations. Seventh segment wholly black.

126. *Tabanus laticinctus* nov. spec. (♀) Textfig. 138.

Habitat:

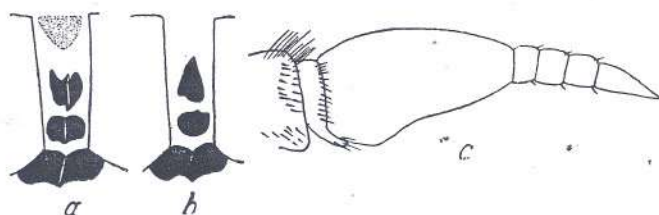
Type ♀ from the Pundjab, Capt. Cross

Coll. BR.M.

Other females from the same locality

Coll. BR.M.

A black species, closely allied to *T. sexcinctus* Ric. but distinguishable at once by the broader annulation of the third antennal joint, which hardly bears any tooth. Abdomen with six comparatively broad, white segmentations. Forehead wider than in *T. sexcinctus* Ric. Calli distinctly shaped, separated from each other and from the subcallus by equal wide spaces. Forehead grey, velvety-brown round the upper callus. Lower callus black, quadrate, grooved in the middle, second callus square, heart-shaped or even indistinct. Subcallus shining black, bare, prominent, convex. Upper cheeks velvetybrown, black haired. Lower cheeks and face dirty white, white haired. Beard yellowish white. Palpi brownishgrey, mainly white haired. Antennae with basal joints olivebrown, black haired. Thorax blackish, black haired. Scutellum bluishgreywhite, rubbed. Sides and breast greyish, white haired. Wings clear, without apical shadow and appendix. Legs with all tibiae largely white, white haired. Ventral surface of abdomen white haired on basal 2 segments, other segments, with white haired segmentations only, black haired elsewhere.



Textfig. 138.

T. laticinctus s. s. ♀. a, b. forehead, c. antenna.

The Head. (Textfig. 138). Forehead almost the same width throughout or $\frac{1}{5}$ narrower anteriorly than it is at vertex, index 3. Vertex spot triangular, dark brown. Lower callus almost reaching to the eyes. Palpi brownish, bluish grey tomentose, second joint grey haired at base, then

black haired, apex brownish, white haired. Second antennal joint very narrow with a distinct dorsal spine, third joint reddishbrown, broad on basal annulation with barely any tooth, basal annulation 1,7 times as long as its widest part, 1,3 times as long as the black stylus.

Thorax, scutum as mentioned. Pteropleuron bluishgrey, black haired. Wings clear, foreborder clear, stigma pale yellowbrown. Halteres blackbrown. Legs. First leg. Femur blueblack, bluewhite tomentose, knee pale yellow, dorsum black haired, distal lateral border yellowwhite haired, intermixed with some black hairs. Middle and hind femora similar, fore tibiae white, white haired on basal $\frac{3}{4}$, apical band black, black haired, this band being twice as broad as in the middle and hind tibiae, which show a similar pubescence. Haircovering in this species less thick than in the allied species.

Abdomen with 6 distinct white rings, most of them being rather broad, first white segmentation narrow, distinctly greywhite, those on 2d till 4th segment broad, equal in size, following ones narrower. Seventh segment without pale segmentation. Remainder of dorsum blackbrown, black haired. Ventral surface as described, basal 2 segments bluishgrey, white haired.

127. *Tabanus sexcinctus* RICARDO (♀) Textfig. 139.

References:

RICARDO, Rec. Ind. Mus. IV, p. 133 (1911).

SHIRAKI, *Tabanidae* of Formosa, p. 234 (1918).

SENIOR WHITE, Rep. Dept. Agric. VII 9122).

Habitat:

Type ♀ from Lushai Hills Burma, MAC LEOD

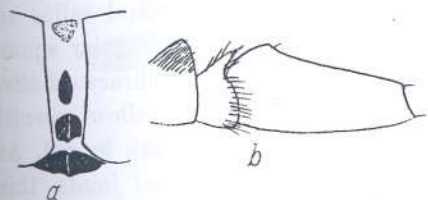
Coll. BR.M.

1 pair of ♀♀ from Masuri, Burma, SENIOR WHITE 21.5.'20

1 pair of ♀♀ from Masuri, Burma, SENIOR WHITE 29.6.'20

1 ♀ from Rano. S. Formosa, SHIRAKI

A small blackbrown species, distinguished from *T. bicinctus* Ric. inter alia by the number and shape of the white segmentations on dorsum abdominis, those being almost parallel-sided, slightly elevated in the middle only, present on the 2d till 6th segment, first segmentation faintly greyish. Forehead dirty-grey, yellowishwhite haired at base, cinnamonbrown, black haired at vertex. Two calli. Lower callus square, shining black, not reaching the eyes, broadly separated from the bare, prominent, shining brownblack subcallus. Upper callus pear-shaped, black. Upper cheeks brown, black haired. Lower cheeks and face white, white haired. Beard white. Palpi pale brownish, mainly white haired. Antennae olivebrown, black haired on basal joints, third joint reddish dull brown. Thorax chestnutbrown, foreborder, sides and hindborder of scutum and scutellum bluishgrey, white haired. Wings clear, without appendix. Legs brownish, tibiae largely white. Ventral surface of abdomen bluishgrey, white haired on basal 2 segments, rest blackbrown, black haired, with broad white, white haired segmentations. Seventh segment wholly black. Length 11 m.M.



Textfig. 139.

T. sezcinctus Ric. ♀. a. forehead, b. antenna.

The Head. (Textfig. 139). Forehead 0,3 narrower anteriorly than it is wide at vertex, index 4,1, vertexspot dark, blackish, black haired. Upper callus widely separated from the lower callus. Post ocular rim grey, black haired. Palpi pale brownish on inner side, outer surface silverygrey, white haired, intermixed with some black hairs. Antennae olivebrown on basal 2 joints, first joint black haired on dorsum, white haired on distal lateral border, third joint incomplete, basal annulation 2 times as long as its widest part.

Thorax chestnutbrown, foreborder narrowly bluishgrey, grey haired. Hindborder of scutum narrowly greywhite, white haired, intermixed with some black hairs. Disc elsewhere black haired. Scutellum brownish at base, hindborder broadly bluishgrey, white haired, intermixed with some black hairs. Breast and sides bluishgrey, white haired. Pteropleuron violet-brown, greyblue on foreborder, black haired. Halteres dark chocolatebrown. Legs. First leg. Coxa greyish, white haired, trochanter shining blackbrown, femur blackbrown, knee yellowbrown, dorsum black haired, distal lateral border bluish grey, greywhite haired. Tibia brownish, slightly swollen at extreme base, then white, white haired, apex narrowly black, black haired. Tarsalia black. Second leg, trochanter redbrown, femur greyblue, white haired, rest as in first leg. Third leg identical.

Abdomen blackbrown, first segment, with a faint greyish stripe at segmentation, white, white haired segmentations to the segments 2—6. Lateral borders of tergites bluishgrey. white haired. Ventral surface as mentioned.

SHIRAKI's description almost wholly agrees with the foregoing notes. His specimen was only 9.5 m.M. long, possessed a yellowish shining subcallus, upper cheeks yellowish, bearing scanty brownish pubescence, basal joints pale yellow. So it is very probable, that this specimen belongs to this species, especially when one takes into account that the colour of the subcallus may vary considerably in some species.

128. *Tabanus albivittatus* nov. spec. (♀) Pl. 11, Fig. 1; Textfig. 140.

Habitat:

Isle Java

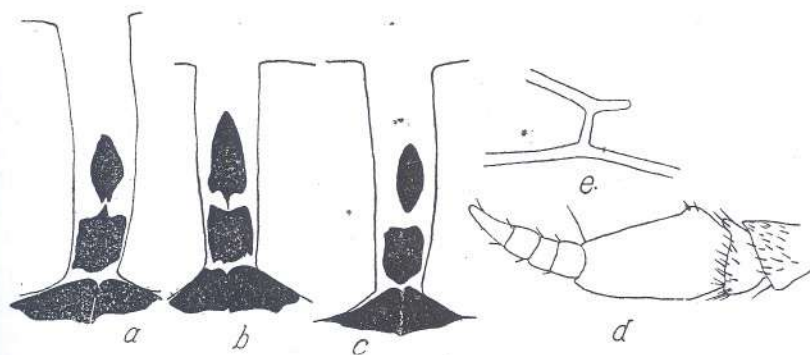
- Type ♀ and 12 other ♀ ♀ from Gamboeng, Tea-factory on Goenoeng Tiloe, Preanger Regencies on horse, caught in the morning till 1 o'clock p.m. and in the afternoon at sunset on sunny days 25.9.'22, SCHUURMANS STEKHOVEN (Textfig. 140 b) Coll. V.S.L.
- 1 ♀ same locality, KERKHOVEN on horse 20.5.'23, KERKHOVEN Coll. V.S.L.
- 1 ♀ from Djimbaran, O.D. Poespo, Tengger, Res. Pasoeroean on horse 12.'22 (Textfig. 140 c, d, e)
- 11 ♀ from Tempoeran, O.D. Pasrepan, Tengger, etc. on cattle 12.'22, DOEVE
- 3 ♀ ♀ „ Kronto, Loembang, Tengger on cattle 12.'22, DOEVE (Textfig. 140 a)
- 1 ♀ „ Panditan, Loembang on cattle 12.'22, DOEVE Coll. V.S.L.

T. albivittatus S.S. is a small species, mostly shorter than 10 m.M. Forehead yellowishbrown tomentose, dark chocolatebrown round the second callus and on the vertex, yellowbrown and black haired. Lower callus irregular square, upper callus lanceolate or lentiform, black. Subcallus shining ochraceous-olive-brown. Face pale yellowbrown, silverywhite haired. Cheeks pale yellowbrownish, creamwhite haired. Beard silverywhite. Palpi coffeebrown, black haired. Antennae yellowbrown to reddishbrown, black haired on the basal joints, third joint reddishyellowbrown, darker at apex, tooth distinct. Eyes with a single green crossband. Thorax, foreborder bluishgrey, with 3 longitudinal stripes, a brownish median one and 2 lateral white or brownish ones. Pteropleura white. Disc black, black haired, hindborder of scutum white, white haired, scutellum wholly white. Wings clear, without apical shadow, appendiculate, the appendix seldom wanting on one or both wings. Legs with all tibiae largely white. Abdomen dark chocolatebrown to black, black haired, lateral borders of the first segment white haired, similar hairs to be found on a median round or triangular spot on the second segment and on lateral triangles on the same segment; on the bands, elevated in the middle to a triangular spot at the segmentations of the 3d and 4th segment; on similar bands on the 5th and 6th segment, the first with a small median triangle, seventh segment black and white fringed.

Table of dimensions.

Bodylength	varying from	8,4 m.M.	to	10,6 m.M.
Width of thorax	"	2,5	"	4
Width of abdomen	"	3,2	"	4,8
Wingexpanse	"	18,8	"	23,2
Length of head	"	1,5	"	2,5
Length of thorax	"	3,4	"	4,8
Length of abdomen	"	4	"	5,5
Length of wing	"	8	"	10,2
Breadth of wing	"	2,6	"	3,5
Foreheadindex	"	3,2	"	5,5

The Head. (Textfig. 140). Forehead almost the same width throughout, yellowbrown haired along the borders, black haired in the middle and on the vertexspot. Upper callus usually separated from the lower callus by a wide space, in other instances both calli are connected by a more or less thick line. Palpi, first joint pale yellowbrown, long white haired, second joint coffeebrown, black haired, intermixed with some white hairs at base. Antennae, first joint yellowbrown, dorsum black haired, distal lateral border and ventral surface yellow-



Textfig. 140.

T. albivittatus s. s. ♀. a—c. forehead, d. antenna, e. wingstructure.

brown haired, second joint reddishbrown, black fringed, with blunt dorsal hump. Third joint reddishyellowbrown, basal annulation 1,5 times as long as its widest part, stylus dusky reddishbrown to black, the colour of the third joint may vary from caramelyellowbrown with a reddishbrown stylus to sienna-coloured. Proboscis brownblack, stalk whitishyellow haired, sugarflaps yellowbrown haired. Postocular rim black haired. In fresh specimens the eyes show a single green crossband at the level of the lower callus; when the female is dead for some hours the green colour spreads over the lower part of the eyesurface and the extreme base grows reddishbrown, see the coloured plate.

Thorax as described; foreborder brownyellow haired, intermixed with a few black hairs. Breast and sides pale yellowbrownwhite, white haired. Wings hyaline, slightly sooty-grey at apex, foreborder yellowbrown, stigma dark brown, veins blackbrown. Halteres, stalk olivebrown, club brownblack. Legs. First leg. Coxa pale yellowbrown, darker at apex, white haired, femur violet-dark yellowbrown, dorsum black haired, on the ventral surface some yellowwhite hairs are intermixed between the black ones. Tibia white, white haired, inter-

mixed with some black hairs on lower 2/3, apex black, black haired, extreme base brownish. Tarsalia black, black haired. Second leg. Coxa redbrown, white tomentose, white haired, trochanter similar, femur ochraceousyellowbrown with a median dorsal row of black hairs, white haired elsewhere, tibia with a wider white part, tarsalia brown, black haired. Third leg, coxa pale brownyellow, yellowwhite haired, trochanter darker, olivebrown, black bordered, white haired, femur similar, white haired, tibia identical, with a median row of black hairs on dorsum, elsewhere white haired, except on the apical dark ring. Tarsalia black, black haired.

A b d o m e n as described, ventral surface sooty, white haired, with some black hairs on 6th and 7th sternite. The abdominal markings show the following variations. The median spot on the 2d segment may be indistinct or reduced to a fringe of a few white hairs, in a single case I found a median longitudinal whitish stripe on the 2d segment. Further the elevations on the 3d and 4th segment may appear halfmoon-shaped instead of triangular. In some specimens the median elevations of the 5th and 6th segment are almost or wholly wanting.

129. *Tabanus bicinctus* RICARDO (♀) Textfig. 141.

References:

RICARDO, Rec. Ind. Mus. IV, p. 132 (1911).

SHIRAKI, Tabanidae of Formosa, p. 240 (1918).

Habitat:

India

Type ♀ from Kadras Jungle, N. Kanara, India, BELL 1908 Coll. BR.M.

1 ♀ from Madras Presidency near Kodaikanal, PATTON 1920, S. India

1 ♀ „ Bombay, S. India, Pres. Mahabaleshwar 25.5.'07, COGILL

Federated Malay States

1 ♀ from Sungei Krudda, Sungei Siput, Perak '07, PRATT Coll. BR.M.

1 ♀ „ Iras, Pahang 27.7.'02, DURHAM

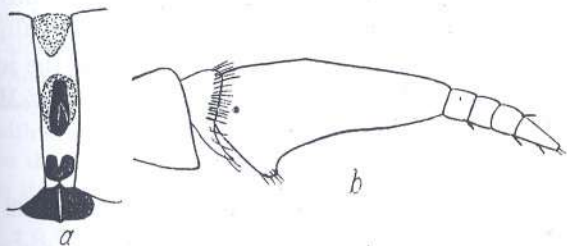
Formosa

1 ♀ Rono, March, S. Formosa?

5 ♀ ♀ „ Naniwa 25.7 Giran District N. Formosa?

A black species with 2 rather broad, white haired bands on the 3d and 4th abdominal segments only, those being slightly elevated in the middle, first segment with a white haired dot at each side of the middle, 2d segment with two white triangles at the segmentations at the lateral borders of the tergite. Dorsum elsewhere black haired. Ventral surface with white haired bands on the 3d and 4th segments. Forehead almost wholly pure white, slightly darker near the vertex, white haired, darker spots black haired. Two calli, both furrowed in the middle. Lower callus square, chestnut-blackbrown, connected with the shining chestnut-blackbrown subcallus by means of a fine stripe. Upper callus black, pear-shaped, forming the centre of a darkbrown roundish area, reaching the eyes. Vertexspot blackbrown. Upper cheeks chestnutbrown, black haired, lower cheeks and face white, white haired. Beard white. Palpi brownish, mainly white haired. Antennae dark redbrown, black haired on basal joints, third joint brighter reddish with prominent tooth. Thorax wholly bluishgrey,

white haired in front of the suture, then blackbrown, black haired. Hindborder of scutum and scutellum white, white haired. Wings with darkbrown apical shadow, no appendix. Legs with all tibiae largely white. Length type 18 m.M. other females 10—18 m.M. SHIRAKI's females 9,5—10 m.M.



Textfig. 141.

T. bicinctus Ric. ♀. a. forehead, d. antenna.

2 times as long as its widest part, 1,8 times as long as the dark stylus. Tooth prominent, black haired.

T h o r a x with median longitudinal, narrow, brown stripe, the hindborder of the scutum, beginning at the base of wings white, white haired. Pteropleuron pinkish dirty white with dark brown hindborder, black and yellowwhite haired. Breast and sides greywhite, white haired. Wings with broad, very distinct apical darkbrown shadow, foreborder yellowbrown, stigma well developed, dark havannabrown. Legs. First leg. Coxa black on dorsum, white haired, trochanter brown, femur brownblack, black haired, tibia swollen, extreme base brownish, then white, white haired, apical band narrow, brown, black haired. Tarsalia black, black haired. Second leg. Coxa and trochanter brownblack, femur black haired on dorsum, white haired on distal lateral border, tibia almost wholly white, white haired, apical band black, black haired. Rest identical.

A b d o m e n blackbrown, black haired, except on the white, white haired markings, which were mentioned above. Ventral surface dark chocolatebrown on the 3d—7th segment, paler on the basal 2 segments, mainly black haired. Second segment slatebluishbrown, some white hairs being scattered between the black ones. Segmentations of 3d and 4th segment, band-shaped.

SHIRAKI's females differ from the type in that the forehead distinctly contracts from the vertex to the frontal eyeangles, the upper callus being half as wide as the lower callus, the almost wholly black haircovering of the palpi, the presence of a recurrent veinlet in most of his specimens, the presence of a median white spot on the middle of the second abdominal segment and the white hind marginal bands of the last 3 segments; ventral surface, the 2 basal segments wholly dusted with whitish grey, all segments, except the seventh with whitish bands, which are not elevated in the middle. All those differences make it doubtful to me if SHIRAKI's females really belong to *T. bicinctus* Ric. The group to which this and other species belong contains several species which are closely allied and can be separated only by thorough observation and comparison of the different species, which I will show further during the description of the Javanese and Sumatra species of the same group, which although they might be brought at first to *T. bicinctus* Ric. appear to be distinct after longer observation.

RICARDO points to variations in the abdominal markings, which SHIRAKI observed also.

180. *Tabanus griseipalpis* nov. spec. (♀) Pl. 11, Fig. 2; Textfig. 142.

Habitat:

Isle Sumatra

Type ♀ and one other ♀ from Panjaboengan, Mandailing, Padang Sidempoen, Tapanoeli, Sumatra 5.2.'22, TARIP Coll. V.S.L.

1 ♀ from Wai Lima, Lampong Districts on Rubber and Coffee Estate, altitude 400 M. in the neighbourhood of the encampment at the border of the jungle 11.11.'21, KARNY Coll. B.Z.M.

Isle Java

2 ♀ ♀ from Goenoeng Salak

1 ♀ „ Gamboeng, Tea Estate, G. Tiloe 1400 M. on horse 23.9.'22 SCHUURMANS STEKHOVEN Coll. V.S.L.

Siam Peninsula

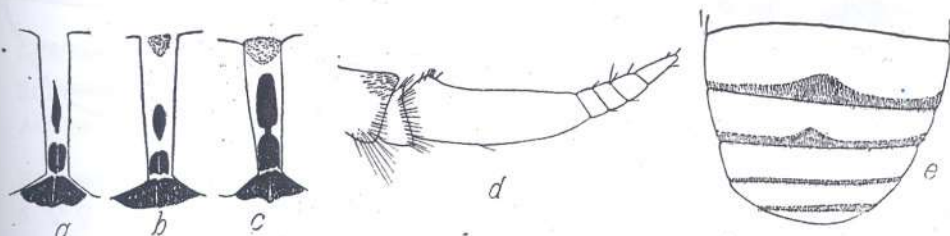
1 ♀ from Nakon Sri Tamarat, Khao Lung 1500—2000 Feet 16.3.'22, PENDLEBURY Coll. BR.M.

T. griseipalpis nov. spec. is distinguishable from the allied species by the wings with a distinct brownish apical shadow, appendix absent. Abdomen dark brownish black, black haired, with distinct white segmentations elevated to a small triangular spot on the 3d and 4th segment, fifth and sixth segment narrowly paler at segmentations, white fringed only, second segment with small, white haired triangles in the posterior lateral angles. Forehead dark, paler at base, calli connected or separated, black or brownish black, subcallus shining brown-black. Cheeks and face white, white haired. Eyes with a green crossband at the level of the lower callus. Thorax greywhite, white haired on foreborder without longitudinal stripes, hindborder narrowly white tomentose, white haired, remainder of scutum blackbrown, black haired. Scutellum white, white haired. Legs with all tibiae largely white, white haired at base.

Table of dimensions.

Bodylength	varying from 10,8 m.M. to 12 m.M.				
Width of thorax	„	„	4	„	— 4,5 „
Width of abdomen	„	„	4,2	„	— 5,2 „
Wingexpanse	„	„	19	„	— 24,9 „
Length of head	„	„	1,8	„	— 2,2 „
Length of thorax	„	„	4,2	„	— 4,8 „
Length of abdomen	„	„	6	„	— 6,5 „
Length of wing	„	„	7,5	„	— 10,2 „
Breadth of wing	„	„	8,6	„	— 4 „
Foreheadindex	„	„	5,5	„	— 7,33 „

The Head. (Textfig. 142). Forehead dark black, mainly black haired, with some yellow-white hairs along the borders. In the Siam female the lower part of the forehead was grey tomentose, upper part more brownish, vertexspot triangular, blackishbrown, black haired. Postocular rim black haired. Lower callus rectangular, deep chestnutbrown to black, grooved in the middle, separated from the subcallus by a narrow space only; upper callus black, narrow, lentiform in the type ♀, broader and connected with the lower callus in the Siam female. Subcallus brownblack or dark reddbrown. Cheeks greywhite. Beard greywhite. Face black, black haired just under the antennae, white, white haired to the mouth. Proboscis black. Palpi slender, with a long blunt point, first joint (Siam ♀) brownish grey, greywhite haired with some black hairs at apex, second joint dark havannabrown on inner border, outer border sootyblack, mainly black haired, white haired at base or (in type ♀) violetbrown, clothed with a rather large number of white and black hairs. Antennae, leatherbrown, black haired on the basal joints, third joint darkreddbrown, tooth blunt, basal annulation 2,6 times as long as its widest part, 1,65 times as long as the darker, blackish stylus.



Textfig. 142.

T. griseipalpis s. s. ♀. a—c. forehead, d. antenna, e. abdomen.

Thorax, marked as mentioned, on the dark area, some goldenbrown hairs are intermixed between the black ones. Breast and sides white haired. Wings, foreborder yellowbrown, stigma reddishbrown. Basal cells and anal cell slightly tinged brownish. Halteres blackbrown. Legs. First leg. Coxa greyblue, silverywhite haired, femur deep black, black haired, tibia blackbrown, black haired at extreme base, then white, white haired on basal 3/4, apex black, black haired, tarsalia black. Second leg. Coxa similar, trochanter reddbrown, femur, with some white hairs intermixed between the black ones at the distal lateral border, tibia with still narrower black haired dark apical band. Third leg identical.

Abdomen, brownish black at base, darker black at apex. Second segment without a median white spot at the segmentation. Ventral surface, greyblue, white haired on the basal 2 segments, 3d to 7th segment brownblack, black haired at base, segmentations white, white haired.

The Gamboeng female differs from the other specimens, in that the palpi are wholly black haired. Wings almost without an apical shadow. Forehead grey at base, dark velvety-brown beyond the second callus. Abdomen with the broadest white segmentations on the 3d and 4th segment, slightly lower than in the type, the white hairfringe on the 5th segment apparently rubbed, no white border to this segment, 6th segment with a white hairfringes only. In the shape of its callus this specimen is a transitionary form between the type ♀ and the Siam ♀.

131. *Tabanus albicinctus* nov. spec. (♀) Textfig. 143.

Habitat:

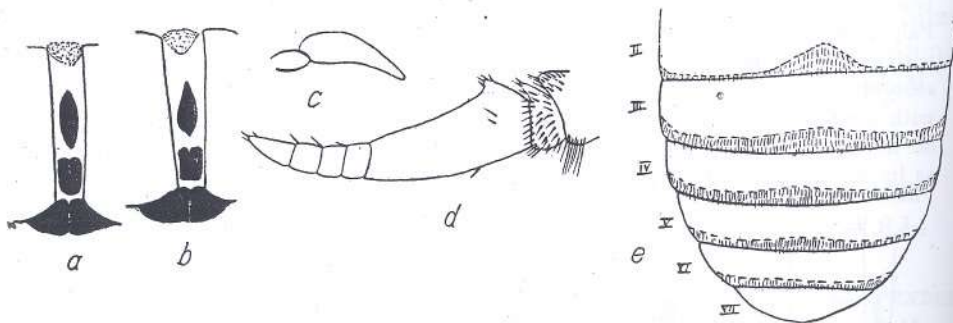
Type ♀ from Srandol, Semarang, Java 8.'09, JACOBSON

Coll. N.A.M.

1 ♀ from Sibolangit, Sumatra 1918, LOERZING

„

This species brought by Miss RICARDO to *T. flavicinctus* RIC. is a distinct species, confer the colour of the beard, the colour of hindborder of scutum and scutellum. Wings with distinct apical shadow. Legs with all tibiae largely white, white haired. Abdomen with broad white, white haired segmentations to 3d—4th segments, narrower ones to the 5th and 6th segments.



Textfig. 143.

T. albicinctus s. s. ♀. a, b. forehead, c. palpe, d. antenna, e. abdomen.

The Head. (Textfig. 143). Forehead in the type ♀ white on basal half, upper half velvetybrown, black haired, round the vertexspot one finds a grey tomentose streak. The frons on the Sumatra ♀ is darker, probably by rubbing and almost wholly devoid of pubescence. Lower callus square, blackbrown, prominent, grooved in the middle, reaching the eyes, separated from the shining yellowbrown (Java ♀) or blackbrown (Sumatra ♀) subcallus by a narrow, brownishwhite space. Upper callus spindle-shaped, black, slightly narrower only than the lower callus. Upper cheeks reddbrown. Lower cheeks and face pure white, white haired. Beard white. Palpi olivebrown, first joint white haired, some black hairs at apex, second joint falciform, swollen at base, more acute at apex, white haired at base, apex black haired in the Sumatra female, type ♀ palpi yellowwhite, wholly white haired. Antennae, reddishyellowbrown on basal joints in the type ♀ in the Sumatra ♀ the first joint is havannabrown, black haired, protruding caplike over the second joint, with a short dorsal black spur, black fringed; third joint reddish-havannabrown, 2 times as long as its widest part, 1,3 times as long as the blackbrown stylus, in the type the stylus is yellowbrown.

Thorax, scutum chocolateblackbrown, brownblack haired behind the suture, foreborder bluegrey tomentose, white haired (type) yellow haired in the Sumatra ♀. Pteropleuron pale olivebrown, black haired at base, apex yellow haired; hind border of scutum white, yellow haired. Breast and sides bluishgrey, white haired, except a dot of hairs at base of wings, which is black. Scutellum white, white haired in the type, in the other ♀ yellow haired. Wings with distinct apical shadow, foreborder yellowbrown. Halteres chocolatebrown. Legs. First leg. Coxa grey, white haired, apex brownish, black haired, femur blackbrown, black haired, tibia white-reddishbrown at extreme base, then white, white haired on basal 4/5, apex blackbrown, black haired. Tarsalia black. Second leg similar, the tibiae with larger white part than on the first leg, third leg with some black hairs intermixed between the white ones on the tibiae. In the type ♀ the femora are paler, black haired, with a few white hairs at apex on fore femora, middle femora with a distinct, white haired apical ring, hind femora mainly white haired, with some black hairs on dorsum in the middle.

Abdomen, basal 2 or 3 segments nutbrown, darker to blackbrown to the apex,

black haired, first segment white fringed at sides at the segmentation only. Second segment narrowly white fringed at segmentation, 3d—6th segmentation parallel-sided, broadly white, white haired. Lateral borders of first segment white haired, other segments partly white, partly black haired at the lateral borders, ventral surface brickred, white haired on basal 3 segments, then blackbrown, black haired, white haired at segmentations, sixth and seventh segment wholly black haired. In the Sumatra females the lateral borders of the first 2 tergites are white haired, remainder of abdomen as in the type ♀.

The main differences between the mentioned females consist in the pubescence of the palpi, the colour of the antennae, the number of white hairs to be found on the femora which are moreover paler in the type ♀, but before more material is available I think it the best to bring both specimens under the same heading.

132. *Tabanus insidiator* AUSTEN (♀) Textfig. 144.

References:

- SURCOUF, Bull. Soc. Ent., p. 13 (1922).
AUSTEN, Bull. Ent. Res. XII, p. 437 (1922).

Habitat:

5 ♀ ♀ from Doi Chom Chang, near Chiangmai, N. Siam 5000 Ft. 16.4.'21,
BARNES Coll. BR.M.

Donor noted: „Taken while attacking me as I was walking through some jungle. This fly, the bite of which is quite painful, is very common in the jungle on the mountain”.

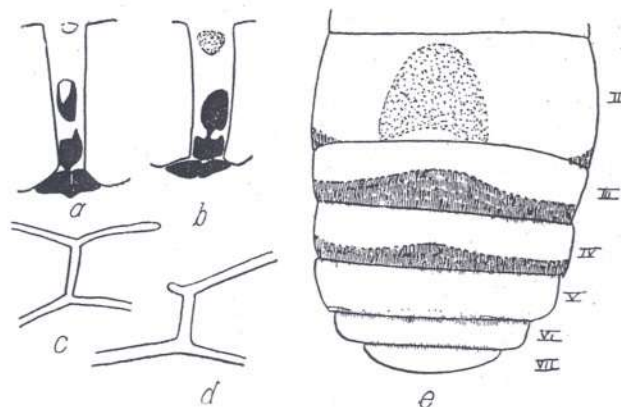
AUSTEN annotated in the British Museum Collection. „Closely allied to and superficially closely resembling *T. tonglai* SURCOUF, the type and paratype of which were taken in the Laos Protectorate at Tongla 30.4.'18 by VITALIS AT SALVAZA. Apart from its somewhat smaller size the ♀ of *T. insidiator* is distinguished from the ♀ of *T. tonglai* by the distal segment of the palpi being more dusky and more acuminate (the corresponding segment in the case of *T. tonglai* is isabella-coloured and also broader and blunter at the tip) and by the two pale transverse bands of the abdomen being distinctly deeper”.

From *T. leucocnematus* BIG. *T. insidiator* is distinguished „by the frontal calli being wider apart, by the expanded portion of the third segment of the antennae being shorter and also deeper at base; by the short appressed hair, clothing the scutellum, by the median triangular expansions of the abdominal bands in question being smaller, by the black or blackish brown tips of the front tibiae being at least twice as deep, etc.

From *T. bombayensis* SCHUURMANS STEKHOVEN, *T. insidiator* is distinguishable by the fact, that the yellow haired segmentation to the third segment is broader in the latter species, whereas the fourth segmentation is much narrower in the same species than the corresponding segmentation in *T. bombayensis*.

Second segment showing a blackish oval shadow, fifth and sixth segment yellow fringed only. Length 10 to 10.6 m.M.; Length of wing 9.4 to 10 m.M.

The Head. (Textfig. 144). Forehead, clothed above with minute black hairs. At apex an ill defined dusky patch is visible but no ocellar tubercle. Frons 0.36 narrower anteriorly than it is at vertex, index 5.4 in the type, 4 in one of other specimens. Frontal calli blackish brown, lower callus quadrate or shield-shaped, reaching the eyes at one side, and to the shining



Textfig. 144,

T. insidiator AUSTEN ♀.

a, b. forehead, c, d. wingstructure, e. abdomen.

chestnutbrown, bare subcallus by means of a point. Upper callus blackbrown, incomplete in the type, very broad in one of the paratypes, mostly widely separated from the basal one. In one of the paratypes both calli are connected. Upper cheeks mummibrown pollinose. Lower cheeks and face grey, pale yellowish haired. Beard same colour. Palpi very dark olivebrown, slatebluishgrey tomentose, mainly black haired, intermixed with some white hairs. Antennae dark reddishbrown on third joint, apex black.

Thorax. Hindborder of scutum whitishyellow haired, foreborder narrowly brownish, disc black, black haired. Pteropleuron redbrown, yellowwhite and black haired. Wings without apical shadow in the type female, in one of the other females it is present, stigma brown, appendix distinct, varying in length, absent in one of the females of the collection. Legs with tibiae largely cream-buff, clothed with fine glistening silvery hairs, apices of the same black or black-brown, black haired.

Abdomen darker brown on the basal segments as in the other allied species. Second segment with a median huge broad blackish shadow, below it at the segmentation one finds a median whitish triangle, a similar lateral triangle is found near the lateral border of this tergite. Third and fourth segment with white, yellow haired segmentations. Fifth and sixth segment yellow fringed. Dorsum elsewhere black, black haired. Ventral surface yellowbrown, yellowish haired, other segments chocolatebrown, except on the segmentations, which are yellowbrown, yellow haired on the segments 3-6. One of the other females does not show the median white triangle on the dorsum of the second segment, whereas the fifth and sixth tergites present white hairfringes instead of yellow ones.

133. *Tabanus flavivittatus* nov. spec. (♀, ♂). Pl. 11, Fig. 3, 4; Textfig. 145.

Habitat:

Isle Java

Type female and 32 other females from Gamboeng, Tea Estate on Goenoeng Tiloe, Res. Preanger Regencies 1450 M. on horse, KERKHOVEN and SCHUURMANS STEKHOVEN (Textfig. 145 b.)

Coll. V.S.L.

respectively 25 ♀ ♀ on 25/30.9.'22

2 ♀ ♀ „ 23.10.'22

5 ♀ ♀ „ 5.5.'23

Type ♂ from same locality, caught in the grass at 7 a.m. Coll. V.S.L.

13 ♀ ♀ Goenoeng Boender, Slope Mountain Salak 900 M. Res. Batavia on Bengalese cattle, swarming between 4—6 p. m., BUBBERMAN and SCHUURMANS STEKHOVEN Coll. V.S.L.

respectively 12 ♀ ♀ on '23

1 ♀ „ 6.'22

1 ♀ from Tempoeran, O.D. Pasrepan, Tengger. Res. Pasoeroean on cattle 12.'22, DOEVE (Textfig. 145 a, c.) Coll. V.S.L.

1 ♀ from Ampelsari, O.D. Pasrepan, Tengger. Res. Pasoeroean on cattle 12.'22, DOEVE Coll. V.S.L.

1 ♀ from Toetoer, O. D. Toetoer, Tengger. Res. Pasoeroean on cattle 12.'22, DOEVE Coll. V.S.L.

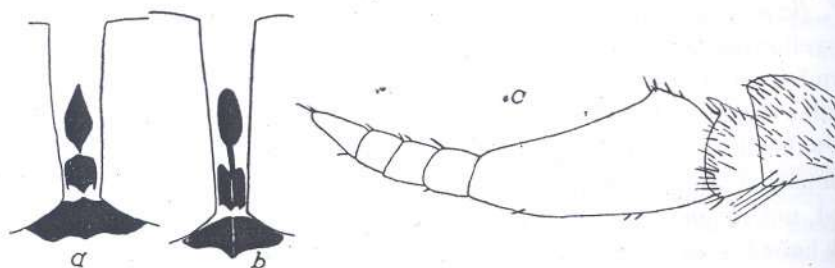
This species, occurring always in mountaneous regions belongs to the group of *T. flavicinctus* BIG. The species is small- to median-sized. Forehead dull pale yellowbrown, yellowbrown haired at base, velvetybrown at apex, blackbrown haired. Two calli. Lower callus black to redbrown, grooved in the middle, irregular square, almost reaching the eyes, separated from the black, shining bare subcallus by a narrow space. Upper callus separated from the lower one or connected with it by means of a more or less broad stripe, black, lanceolate, keeled, not much narrower than the lower one. Upper cheeks brownish, brown-black haired, lower cheeks and face yellowish, yellowwhite haired. Beard yellow-white or silverywhite. In the Tengger females the lower cheeks were bluishgrey tomentose, white haired. Palpi black, black haired on second joint. Antennae slender, basal joints dull tawny, to slightly reddish, black haired, third joint yellowredbrown at base then blackbrown, tooth distinct. Thorax reddishyellowbrown, grey tomentose, mainly goldenbrown haired on foreborder, showing 3 indistinct redbrown longitudinal stripes, hindborder of scutum pale yellowish tomentose, yellow haired. Scutum elsewhere dark chocolatebrown, black haired. Scutellum reddishyellow, goldenbrown haired. Wings rather clear, with or without an apicalshadow. No appendix. Legs with all tibiae largely white, white haired. Abdomen redbrown black haired on basal 2 segments. First segment fringed yellow at the sides near the lateral borders, no median triangle, 2d and following segments yellow, with goldenyellow haired segmentations, these being elevated in the middle to triangular spots, broadest on the 3d and 4th segment, broken on the second segment. A blackish spot is found on the middle of the second segment. Lateral border of first tergite yellow haired. Ventral surface darkredbrown with paler segmentations, yellowwhite haired.

The Female

Table of dimensions.

Bodylength	varying from 10,6 m.M. to 18,5 m.M.				
Width of thorax	"	"	3,6	"	— 4,8
Width of abdomen	"	"	4,2	"	— 5,4
Wingexpanse	"	"	25	"	— 29
Length of head	"	"	1,8	"	— 2,5
Length of thorax	"	"	4,8	"	— 5,5
Length of abdomen	"	"	6	"	— 8,2
Length of wing	"	"	10,5	"	— 12,5
Breadth of wing	"	"	3,5	"	— 5
Foreheadindex	"	"	4,36	—	7,1

The Head. (Textfig. 145). Eyes with a single green crossband, starting at the level of the lower callus. Forehead $\frac{1}{6}$ to $\frac{1}{3}$ narrower anteriorly than it is at vertex. Vertexspot oval, dark. Apart from the mentioned pubescence one may find some yellow hairs along the lateral borders of the frontal stripe. Palpi black, first joint long, white haired, second joint stout



Textfig. 145.

T. flavivittatus s. s. ♀. a, b. forehead, c. antenna.

at base, ending with a blunt point, thick black haired, with a number of long brownishyellow hairs along the distal border. Antennae slender, first joint reddish tawny, black haired on dorsum, white or yellowwhite haired along the distal lateral border and on ventral surface, second joint slightly darker, black fringed, dorsal hump short. Third joint yellowishbrown at base, soon growing darker blackbrown, basal annulation about 2 times as long as its widest part, 1,7 times as long as the blackishbrown stylus. Tooth distinct, black haired, some black hairs occurring on the ventral side of the third joint. Proboscis dull black, stalk yellowwhite haired, intermixed with some black hairs, sugarflaps brownblack haired.

Thorax. Foreborder of scutum greybrown tomentose, goldenbrown haired, intermixed with some black hairs. Tufts at base of wings and behind black, hindborder of scutum reddishgoldenbrown. Scutellum gilded, pollenbrown haired, intermixed with some black hairs. Pteropleuron reddishbrown, black haired, with some yellowbrown hairs along the borders. Breast and sides pale yellowishbrown to white, whitehaired. Wings, foreborder yellowbrown, stigma blackbrown. Base of wings, including the basal cells and the anal cell pale yellowbrown. Apical shadow brownish, distinct in some females, reduced in others to brownish shadows along the radial and the upper branch of the cubital vein. Hindborder of wings greyish. Legs.

First leg. Coxa bluishgrey tomentose, apex brownblack, pubescence long silverygrey. Femur violet deepredbrown to black, black haired on dorsum, distal lateral border long yellowbrown haired, intermixed with some black hairs. Knee narrowly whitish. Tibia narrowly black at extreme base, then white, white haired, intermixed with some black hairs, apical $\frac{1}{3}$ black, black haired. Tarsalia black. Second leg. Coxa redbrown yellowbrown haired, trochanter brownblack, black haired. Femur olivebrown at base, black to the apex, dorsum black haired, intermixed with some ferrugineous hairs, distal lateral border long copperred and white haired, ventral surface scanty yellowbrown haired. Tibia narrowly ferrugineous at extreme base, then largely yellowwhite, pale yellowbrown haired, intermixed with some black hairs, apical ring narrow redrustybrown to black, black haired. Femur as in second leg, yellowbrown haired at base on dorsum, rest of dorsum black haired, distal lateral border yellowbrown haired. Tibia as in second leg, with two longitudinal rows of black hairs on dorsum running over the whole surface, intermixed with yellowbrown hairs, ventral surface mainly yellowbrown haired on the white part, intermixed with some black hairs. Tarsalia dark redbrown, black haired.

• **A b d o m e n** as described, redbrown at base, then blackbrown. On the second segment the segmentation does not border the whole segment, but is broken into a median yellow haired triangle and 2 yellow haired lateral stripes near the lateral borders of the same tergite. Triangular elevations on the following segments blunt and low. Segmentations on the 5th and 6th segment narrower than on the foregoing segments, where they are widened to the sides. Dorsum elsewhere black haired. In some of the specimens I found a few yellow hairs on the first tergite at each side of the scutellum. In a single case the second segmentation was not broken into a median spot and lateral stripes.

The Male.

Eyes with large facets yellowbrown, occupying more than $\frac{3}{4}$ of the eyesurface, lower small-facetted part black, prolonged to the vertex. Antennae paler yellowbrown than in the ♀. Scutum covered with a plum of yellowish down.

Table of dimensions.

Bodylength	12,2 m.M.
Width of thorax	4 „
Width of abdomen	4,2 „
Wingexpanse	27 „
Length of head	2 „
Length of thorax	5 „
Length of abdomen	6,2 „
Length of wing	11,5 „
Breadth of wing	5 „

The Head. Subcallus shining black, grooved in the middle. Cheeks cinnamonbrown, brownish yellow haired. Beard same colour. Palpi club-shaped, reddishbrown, with a rather large number of black hairs on the second joint. Antennae, First joint bright yellowbrown, black haired on dorsum, yellow haired along the distal lateral border and on ventral surface, second joint same colour, black fringed, third joint long rather narrow, reddishbrown at base, then blackishbrown, tooth inconspicuous. Proboscis black, redbrown haired.

Thorax reddishyellow haired with paler foreborder, dark rustybrown redbrown haired disc, scutellum as in the female, slightly darker at base, reddishyellow haired. Pteropleuron clothed with long orangeousred hairs. Breast whitish, white haired, sides redbrown haired. Wings and halteres as in the female. Legs. First leg. Coxa yellowbrown haired. Tibia brownish-yellowwhite, yellowwhite haired on basal $\frac{2}{3}$, except at extreme base, which is black haired and on the black haired apical ring. Middle tibiae with a median row of black hairs on dorsum, which is mainly yellowwhite, covered with goldenbrownyellow pubescence. Hind tibiae mainly goldenyellow haired. Other particulars as in the female.

Abdomen conical, basal 3 segments redbrown, black haired, remainder of dorsum blackbrown, black haired, except on markings. First segment, with a dark median blackish shadow, showing further a group of copperyellow hairs at each side of the scutellum and orangeousredbrown haired lateral borders. Second segment as in the female, with a median, yellow haired triangle and yellow haired stripes near the lateral borders, which are not connected with the mentioned triangle. Third and fourth segment with yellow, yellow haired segmentations, elevated in the middle to small triangles. Fifth and sixth segment with narrow band-shaped, yellow haired segmentations. Ventral surface as in the female.

134. *Tabanus bombayensis* nov. spec. (♀) Textfig. 146.

Habitat:

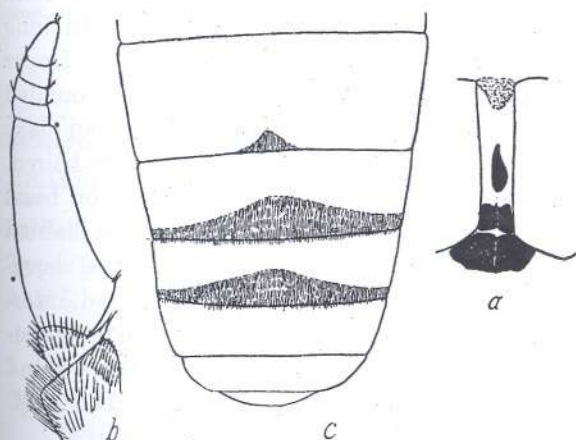
Type ♀ and 4 other females from Bombay, S. India, Malabaleswar 24.3.'07,
COGILL Coll. BR.M.

AUSTEN annotated, „closely allied to *T. leucocnematus* BIGOT, distinguished in the female sex by the upper frontal callus being more lineal and by the absence of an appendix. Abdominal markings on the third and fourth segment much narrower, only slightly elevated in the middle; on the second segment one finds an indication of paler segmentation, no white hairfringe on 6th segment. Third antennal joint much more slender than in *T. leucocnematus*”. Forehead brownish grey tomentose, black haired. Vertexspot blackbrown. Two calli. Lower callus, blackbrown, irregular square, almost resting upon the shining base, convex; dark redbrown to blackbrown subcallus. Upper callus lenti-form, black, connected with the lower one by means of a fine grooflet. Upper callus barely half as wide as the lower one. Upper cheeks shining redbrown, blackbrown haired. Lower cheeks, face and beard white, white haired. Palpi stout, brownish white and black haired. Antennae yellowbrown, black haired on basal joint, third joint reddish. Thorax bluishgrey tomentose, yellowbrown haired on foreborder, disc chocolatebrown, black haired, hindborder whitish tomentose, reddish yellowbrown haired at sides. Wings with apical shadow. Legs with all tibiae largely white. Ventral surface of abdomen with white haired segmentations to the segments 2—4.

The Head. (Textfig. 146). Forehead almost the same width throughout, $\frac{1}{3}$ narrower anteriorly than it is at vertex, greyish tomentose, with a brownish streak beyond the upper callus, index 5.2. Lower callus reaching to the eyes, bearing a shallow median groove. Postocular rim white haired. Palpi rather stout, first joint brownish, white haired, second joint bluishgrey tomentose, white haired at base, apex acute, black haired. Antennae, first joint yellow-

brown, black haired, produced caplike over the second joint, latter provided with a triple fringe of black hairs; third joint narrow, basal annulation 2,1 times as long as its widest part, 1,8 times as long as the darker stylus, tooth small, inconspicuous. Proboscis darkbrown, black haired.

Thorax, grey tomentose on foreborder till the suture, clothed with rather long yellow-



Textfig. 146.

T. bombayensis s. s. ♀.

a. forehead, b. antenna, c. abdomen.

haired. Tarsalia black, black haired. Second-leg. Coxa bluishbrown, femur blackish, deep reddbrown, black haired. Tibia with very narrow olivebrown, black haired apex, extreme base brownish, rest white, thick white haired. Tarsalia reddbrown, black haired. Third leg, femur as in second leg, tibia thick white haired on the large white band, apical shadow narrow, black haired. Tarsalia as in 2d leg.

Abdomen rather narrow, ending broad, basal 3 segments reddishbrown, black haired as in *T. flavicinctus* Ric. Second segment with median longitudinal black stripe, thick black haired; at the segmentation one finds a small, triangular greyish tomentose spot in the middle and at each side near the lateral border a triangular white, white haired spot, third and fourth segment with distinct white, yellowish haired segmentations, only slightly elevated in the middle. Following segments blackbrown, black haired. Ventral surface reddishyellowbrown on basal 3 segments, then darker, black haired, with white haired segmentations to the 2d-4th segment.

One of the other females shows a slightly broader upper frontal callus, another female presents a narrow white segmentation to the 5th abdominal segment.

135. *Tabanus leucocnematus* BIGOT (♀) Textfig. 147.

References:

BIGOT, Mem. Soc. Zool. France VII, p. 656 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 131 (1911).

Habitat:

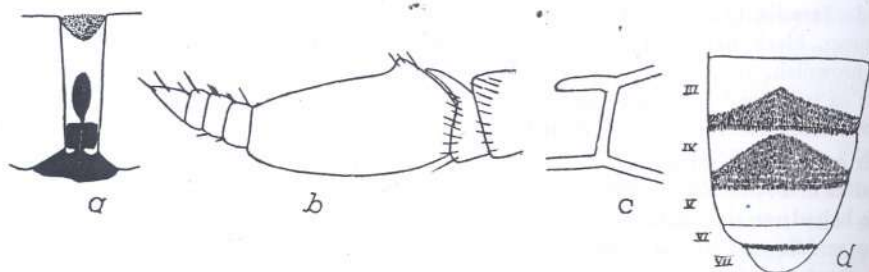
Type ♀, now headless, from India ex Coll. BIGOT

Coll. BR.M.

1 ♀ from Assam, Kolasil, Lushai Hills 30.7.'04, MACLEOD

One of the most characteristic features of this species, when compared with the allied species, are the very broad, yellow segmentations on the third and fourth segment, which almost reach to the borders of the foregoing segments. Specimens larger in size than those of *T. flavicinctus* Ric., to which *T. leucocnematus* Big. is closely allied. Forehead brownish sooty-greyblack. Two calli. Lower callus square, shining black, furrowed in the middle, almost reaching to the eyes, resting on the shining, dark chocolatebrown, bare subcallus. Upper callus lentiform, shining black, connected with the lower callus, surrounded with a bismarckbrown band, extending across the forehead. Vertexspot dark chestnutbrown, black haired. Palpi sootygrey to nutbrown, mainly white haired, intermixed with some black hairs. Antennae olivebrown, black haired on basal joints, third joint reddishyellow. Upper cheeks chocolatebrown, black haired. Lower cheeks and face white, white haired. Beard white. Thorax dark chocolatebrown, brown haired on disc, foreborder grey tomentose, black haired, intermixed with some yellowbrown hairs, hindborder of scutum and the whole scutellum yellow haired. Wings brownish or yellowish, with distinct apical shadow and appendix. Legs with all tibiae largely white, white haired. Length 11,2 m.M.

The Head. (Textfig. 147). Forehead 0,17 narrower anteriorly than it is at vertex, index 4. Spaces between vertex spot and upper callus and between the lower limit of the upper callus and the lower callus grey tomentose. Postocular rim black haired. Palpi, first



Textfig. 147.

T. leucocnematus Big. ♀. a. forehead, c. antenna, c. wingstructure, d. abdomen.

joint sootygrey, silvery white haired, second joint ending rather acute, inner border nutbrown, outer border whitish tomentose, mainly white haired, intermixed with some black hairs. Antennae, second joint with a long dorsal spur, third joint, basal annulation 1,7 times as long as its widest part, 1,9 times as long as the stylus, tooth black haired.

Thorax. On the brownish foreborder 3 longitudinal brown stripes are visible. Pteropleuron pinkish yellow, black haired on lower border, upper border yellow haired. Sides and breast sooty grey, white haired. Wings, foreborder brownishyellow, stigma pale havanna-brown. Veins olivebrown. Appendix large. Legs. First leg. Coxa greyish, white haired, trochanter black brown, femur similar, knee yellowbrown, wholly black haired. Tibia brownish at extreme base, then largely white, white haired, apical band narrow, brownblack, black haired. Tarsalia black. Second leg similar, tarsalia redbrown, black haired. Third leg, Coxa with brown, black haired upper border, apex of femur white haired. Tarsalia redbrown, black haired, intermixed with a few white hairs.

Abdomen darkbrown, black haired, 3d segment with triangular broad goldenyellow haired segmentation. Segmentation to fourth segment more halfmoon-shaped. Sixth segment yellow fringed at segmentation. Lateral borders of the first 2 tergites yellow haired, 3d, 4th and 6th tergite partly so. Ventral surface, greyish on second segment, segmentation brownish, pubescence white. Following segments (3—6) darkbrown, black haired, with yellowbrown, yellow haired segmentations, broadest on the 3d and 4th segment, narrower on the following ones, which are fringed with yellowbrown hairs only.

136. *Tabanus flavicinctus* RICARDO (♀, ♂) Textfig. 148, 149.

References:

RICARDO, Rec. Ind. Mus. IV, p. 130 (1911).

Habitat:

Type ♀ from Shillong, Assam, HOWLETT (Textfig. 148 b, d.) Coll. B.R.M.

3 ♀ ♀ from N. Khasi Hills, Lower Ranges, CHENNEL '96 „

(Textfig. 148 a, c, e.)

1 ♀ „ Nilgiris

Type ♂ from India, N. Khasi Hills, Lower Ranges, CHENNEL

Textfig. 149.)

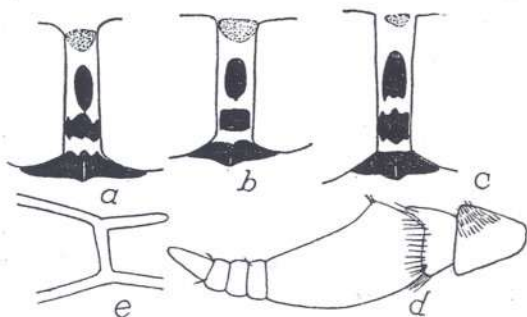
Coll. B.R.M.

A yellowish species, closely allied to *T. leucocnematus* BIGOT and *T. bombayensis* SCHUURMANS STEKHOVEN. Forehead broader than in the latter species. From *T. leucocnematus* it is distinguishable by the distance, which the calli and the subcallus separate. Shape of calli and of antennae as in *T. leucocnematus*. Forehead greyish on lower portion, apex darkbrown, Two calli. Lower callus irregular square, black, distinctly separated from the cinnamonbrown shining, bare subcallus, upper callus broad, almost as wide as the lower one, black, lancet-shaped. Upper cheeks dark, lower cheeks and face pale yellowbrown, yellowwhite haired. Beard similar. Palpi reddishyellowbrown, mainly black haired on the second joint, which ends acute. Antennae reddishbrown, black haired on basal joints, third joint dark reddbrown. Thorax, foreborder greyishbrown, yellowbrown haired, with traces of 3 longitudinal stripes, disc chocolatebrown, black haired. Hindborder of scutum and scutellum yellowbrown, reddish yellow haired, breast yellow haired. Wings without apical shadow, appendix present or absent. Legs, with all tibiae largely brownyellow, yellow haired. Abdomen with a yellow hairfringe to the first segment, each of the following segments with comparatively broad, yellow haired segmentations, seventh segment yellow fringed too. Ventral surface yellow haired at the segmentations, which are particularly distinct on the segments 5 and 6. Length 9—10 m.M. Male identical. Black-faceted eyepart, prolonged to the vertex.

The Female.

The Head. (Textfig. 148). Forehead almost the same width throughout, index 3—3.5. In some of the specimens both calli are connected. Palpi reddishyellowbrown, first joint

reddishyellow haired, intermixed with some black hairs at apex, second joint broad at base, halfway suddenly tapering to a rather acuminate apex, outer border black haired, intermixed with reddishyellow hairs, which are particularly numerous at the base. In one of the other females from Khasi Hills the palpi are almost wholly clothed with long, yellow pubescence.



Textfig. 148.

T. flavicinctus Ric. ♀.

a—c. forehead, d. antenna, e. wingstructure.

Antennae as described; first joint black haired on dorsum, ventral surface covered with long loose yellow pubescence, second joint with short blunt tooth, third joint dark redbrown, rather broad at base, basal annulation 1.7 times as long as its widest part, 1.5 times as long as the narrow redbrown stylus, tooth blunt. Proboscis, stalk yellowishbrown tomentose.

Thorax as described. Pteropleuron ferrugineous, yellowbrown haired. Scutellum wholly yellowbrown, yellowbrown haired. Breast and sides greyish yellow, yellow haired. Wings clear, foreborder yellowish, veins brown. Halteres

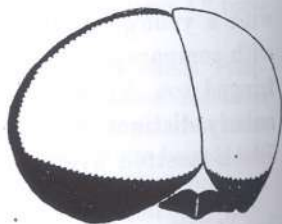
redbrown. Legs. First leg. Coxa brownishgrey, darker at apex, yellowish haired, trochanter dark mahoganybrown, femur shining blackbrown, black haired on dorsum, thick yellow fringed at distal lateral border, knee yellowbrown. Tibia brownyellow, yellow haired on basal $\frac{2}{3}$, apex blackbrown, black haired. Tarsalia blackbrown, black haired. Second leg. Coxa brownish red as also the trochanter, femur blackishbrown, dorsum yellow haired at base, then black haired, intermixed with yellow hairs, distal lateral border thick yellow fringed, knee yellowbrown. Tibia almost wholly yellowbrown, yellow haired, apex slightly darker, black haired. Tarsalia redbrown, black haired. Third leg identical, femur redbrown at extreme base, then darker, yellow haired at apex and on distal lateral border, elsewhere black haired, knee yellowbrown. Tibia yellowbrown, yellow haired, apical band blackbrown, black haired, further a row of black hairs is visible on dorsum in the middle. Tarsalia black.

Abdomen in the type in bad condition, basal segments paler than the following ones. Markings as mentioned. Ventral surface black haired with paler segmentations, distinctly yellow haired on the 5th and 6th segment only. Lateral borders of tergites partly black, partly yellow haired. In one of the N. Khasi Hills females the dorsal segmentations show slight elevations, which are not present in the other females.

The Male.

The Head. (Textfig. 149). A bad specimen, missing the abdomen. Eyes with small black, small-faceted eye-part as described. Subcallus prominent, shining, dark. Cheeks pale yellowbrown, yellowbrown haired. Beard yellow. Antennae incomplete, first joint violetbrown, black haired on dorsum, distal lateral border and venter yellow haired, second joint pale yellowbrown, black fringed, spur short. Palpi yellowbrown, second joint brighter than the first, yellow haired, intermixed with some black hairs. Proboscis black, stalk yellow haired.

Thorax as in the female. Wings with yellowishbrown foreborder, pale yellowbrown veins and pale brown stigma. Legs paler than in the female type, tibiae more whitish. First leg. Coxa pale olivebrown, dirty brown, white



Textfig. 149.

T. flavicinctus Ric. ♂. The head.

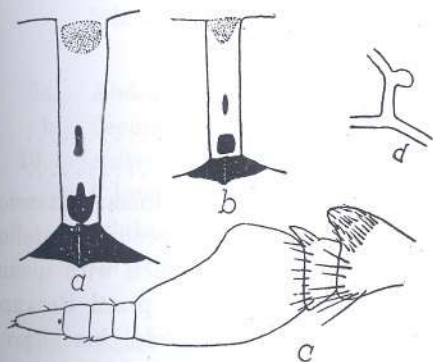
haired, trochanter dark reddish brown, black haired, femur dark, shining reddish brown, with yellowish brown knee, wholly black haired. Tibia, extreme base blackish brown, black haired, then whitish yellow, white haired, intermixed with some black hairs, apex blackish brown, black haired. Tarsalia black. Second leg. Coxa brownish yellow, yellow haired, trochanter yellowish, femur black haired on dorsum, except at extreme apex and base and along the distal lateral border, which are yellow haired, tibia almost wholly white, white haired, extreme base brownish, apex reddish brown, black haired. Tarsalia reddish brown, black haired. Third leg. Coxa yellowish brown, yellow haired, trochanter pale olive brown, black haired, femur reddish olive brown, tibia almost wholly white, white haired, with black apical ring. Tarsalia blackish brown, black haired.

137. *Tabanus imparicallosus* nov. spec. (♀) Textfig. 150.

Habitat:

Type ♀ and another female from Bombay, S. India, Pres. Mahabaleshwar
23.V.'07, COGILL Coll. BR.M.

AUSTEN wrote on a label, attached to the type, „allied to *T. flavicinctus* RIC., distinguished in the female sex by narrower front-shape, shape of frontal calli and colouration of hair on terminal segment of palpi.” Forehead yellowish brown, reddish at vertex, black and yellow haired. Lower callus shield-shaped, dark reddish brown, prolonged at upper border, not reaching to the eyes, resting on the prominent yellowish brown or dark olive brown, shining, bare subcallus, widely separated from the very narrow upper callus. Vertex spot black, triangular. Upper cheeks brown, lower cheeks and face yellowish white, white haired. Beard yellowish. Palpi pale reddish yellow, acuminate, mainly yellow haired, intermixed with a few black hairs. Antennae, basal joints yellowish brown to red yellow, black haired, third joint reddish brown. Thorax greyish on foreborder of the yellowish brown haired scutum, disc dark, hindborder of scutum and the whole scutellum yellow. Wings clear. Legs with all tibiae largely brownish yellow, yellow haired, with darker, black haired apices. Abdomen dark, with paler reddish brown segmentations.



Textfig. 150.

T. imparicallosus s. s. ♀.

a, b, forehead, c, wing structure.

The Head. (Textfig. 150). Forehead $\frac{1}{4}$ narrower anteriorly than it is at vertex, index 4.8. Palpi, second joint, broad at base, tapering to an acute point, yellow haired, intermixed with some black hairs. Antennae, first joint yellowish brown, dorsum black haired, distal lateral border and ventral surface white haired, second joint reddish brown with dorsal spine, third joint reddish brown at base, then darker, blackish brown, basal annulation 1.2 times as long as its widest part, 1.3 times as long as the stylus.

Thorax, had been moistened on dorsum, was probably greyish on foreborder, presenting 3 rather distinct longitudinal stripes, pubescence scanty yellowish brown, behind the suture the ground colour is dark. Lateral borders

paler, scutellum and hindborder of scutum yellow. Pteropleuron black and yellow haired. Wings clear, foreborder pale brownishyellow, stigma paler brown. Veins brown. Legs. First leg. Coxa bluishgrey, brown at apex, greyishyellow haired. Trochanter dark havannabrown. Femur dark olivebrown at base, black to the apex, knee yellowbrown, dorsum black haired, distal lateral border yellowbrown haired, intermixed with some black hairs. Knee yellowish haired. Tibia yellowbrown, yellow haired on basal $\frac{2}{3}$, apex blackbrown, black haired. Tarsalia blackbrown, black haired. Second leg, femur yellowbrown at extreme base, then havanna-brown, mainly yellow haired, yellowbrown haired at apex. Tibia almost wholly brownishyellow, yellow haired, apical ring narrow, blackbrown, black haired. Third leg. Coxa yellowbrown, greyishyellow haired, trochanter yellowbrown, femur blackishbrown, paler at base and apex.

Abdomen had been moistened in the type, dark, with paler reddishbrown segmentations. Ventral surface yellowbrown, yellow haired; 7th segment black haired. In the second ♀ the abdomen was better and so the fifth segmentation appeared as pale yellow, yellow haired, elevated in the middle to a triangle. I suppose therefore that in well preserved specimens, all segmentations till the sixth segment, which had a parallel-sided segmentation have yellow, yellow haired segmentations, whereas the bases of the segments are dark, black haired. Seventh segment wholly black haired. In the second female the wings showed a rudimentary appendix, the lower callus was square, the upper one linear. Antennae reddishyellow on basal annulation, stylus dark reddishbrown.

GROUP X.

To this Group I brought a number of dark, brown or black species, of which the abdomen presents a series of median white, white haired spots, shaped as triangles or halfmoon-shaped spots, restricted to a few segments only in rare cases. In a single species, apparently also belonging to the same group the segmentations were white, white haired. Wings clear or infusate. When the wings are infusate the species possess moreover fringes of white hairs at the segmentations, those fringes being however not connected with the median triangles.

KEY 20.

Synopsis of species.

- | | | |
|-----|--|---|
| 1a. | Wings infusate | 2 |
| b. | Wings clear | 3 |
| 2a. | Callus broad, black, gradually passing into the thick linear extension. Beard orangeous yellow. Palpi and antennae orangeous. Scutellum brickred. Legs darkbrown with orangeous tibiae. Abdomen with median triangles and lateral fringes on the 2d—6th segment pratti RICARDO. | |
| b. | Callus narrow, linear extension fine. Beard black. Palpi blackbrown. Antennae black. Hindborder of scutum and scutellum greyish tomentose. Abdomen with median triangles on the 2d—4th segment only speculum WALKER. | |

- 3a. A small white spot on the 2d, large white spots on the 3d and 4th segment only 4
- b. The median spots distributed over a greater number of segments 5
4. Thorax violetbrown. Abdomen redbrown, the halfmoon-shaped white spot on the 4th segment is connected with the lateral borders by means of a paler segmentation. Lateral borders of the first 2 tergites white haired .. **significans** RICARDO.
- 5a. Beard black 6
- b. Beard white or citroneyellow 7
6. Subcallus ferrugineous. Face and cheeks dull brown, black haired. Antennae dark brown, tooth prominent. Wings appendiculate. Legs black-brown, black haired. Abdomen with white hairtufts on the 1st—5th segments and white haired lateral borders tot the same tergites **indistinctus** BIGOT.
- 7a. Scutellum wholly white 8
- b. Scutellum same colour as scutum, never wholly white 9
- 8a. Callus with narrow linear extension. Palpi white haired. Antennae black-brown to black, basal annulation of third joint broad. Scutum with 2 longitudinal white stripes, similar foreborder and lateral borders. Legs with pale yellowbrown femora and tibiae. Wings without appendix, apical shadow fine. Abdomen with white, black haired segmentations to the first 6 segments, elevated to triangular white haired spots on the 1st, 3d—5th segments, 2d segment white fringed in the middle **albidosegmentatus** SCHUURMANS STEKHOVEN.
- b. Linear extension broad. Palpi black haired. Antennae redbrown, basal annulation of the redyellow 3d joint narrow, without distinct tooth. Scutum without longitudinal stripes. Wings appendiculate, apical shadow distinct. Legs dark brown. Abdomen with distinct white triangles on the 2d—4th segment, similar triangles, but lower and less distinct on the 5th and 5th segment, no continuous white segmentations **laetus** DE MEIJERE.
- 9a. Abdomen with 3 half circular white spots on the 2d segment.... 10
- b. Second abdominal segment with a median white spot only 11
10. Antennae blackbrown, tooth very prominent. Scutum reddishbrown with 2 longitudinal white stripes. Abdomen redbrown to blackbrown, median white spots on 2d—5th segment, the lateral half-circular white spots on the 2d segment directing upwards their straight sides **semicirculus** RICARDO.
- 11a. Basal annulation of the 3d antennal joint narrow; linear extension furrowed at apex 12
- b. Basal annulation broad 13
12. Antennae redbrown. Thorax chestnutbrown, scutum greyish on fore-

- border, with traces of longitudinal stripes. Legs yellowbrown. Small white haired triangles occur on the 2d—5th abdominal segments, lateral borders of the first 5 tergites white haired **divisus** RICARDO.
- 13a. Callus irregular square, linear extension fine. Subcallus and upper cheeks brownish, black haired. Antennae black. Scutum greyishblack with 3 distinct longitudinal white stripes, connected sideways with the pale lateral borders. Wings appendiculate. The triangles on the 3d and 4th segments are the broadest, those on the 5th and 6th segment are smaller and without white pubescence **exagens** WALKER.
- b. Callus and linear extension forming together a club-shaped structure, linear extension stout. Subcallus and cheeks white, white haired. Antennae redbrown. Thorax chestnutbrown with 2 longitudinal white stripes, hindborder of scutum white as also its lateral borders. Abdomen with white, halfmoon-shaped spots on the 1st—6th abdominal segments **albithorax** RICARDO.
- c. Femora redbrown, white haired, beard white **albithorax** s. str.
- d. Femora reddish-yellowbrown, yellow haired, beard white var. **flavifemur**.
- e. Femora blackbrown, black haired, beard white var. **brunnifemur**.
- f. Legs brownblack, black haired, beard citroneyellow var. **citribarbus**.

138. *Tabanus pratti* RICARDO (♀) Pl. 15; Fig. 1, Textfig. 151.

References:

RICARDO, Rec. Ind. Mus. IV, p. 143 (1911)

Habitat:

Type ♀ from Kelantan, Malacca 1904, ROLLE (Textfig 151 c.) Coll. BR.M.

1 ♀ from Batu Tiga, Selangor, PRATT Coll. London SC.TR.M.

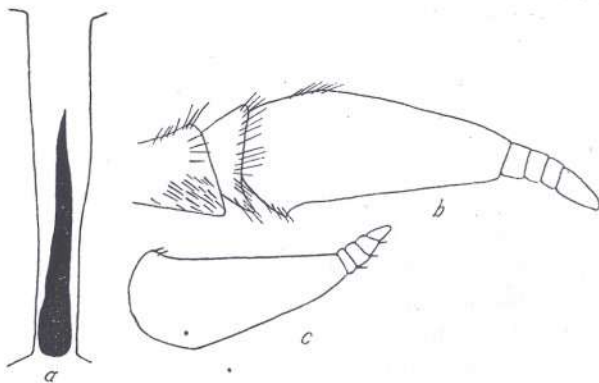
1 ♀ „ Johore (Textfig. 151 a, b) Coll. R.M.S.

RICARDO mentions 1 ♀ from Sarawak, Borneo 1908, WILLINGTON

A large, dark dull brown to blackbrown species, with a more or less brickred scutellum. Abdomen with low, white haired triangles on the middle of the 2d till 6th segment and white haired segmentations at sides of tergites on the same segments, ventral surface black, with white segmentations, pubescence elsewhere black. Wings brownish, with brown diffuse apical shadow, presenting clearer areas in the centres of most cells. Forehead narrow. Callus dark black, linear extension broad, pointed at apex. Subcallus and upper cheeks dull redbrown, lower cheeks and face orangeousyellow, same pubescence, Beard orangeousyellow. Palpi dull orangeous, ending in a blunt point, black haired. Antennae havannabrown on basal 2 joints, then orangeous. Legs dark brown with paler orangeous tibiae.

Table of dimensions.

Bodylength	23—24 m.M.
Width of thorax	7,5 "
Width of abdomen	7,5 "
Wingexpanse	40,5 "
Length of head	4 "
Length of thorax	8,5 "
Length of abdomen	13 "
Length of wing	16,5 "
Breadth of wing	7 "
Foreheadindex	7 "



Textfig. 151.

T. pratti Ric. ♀. a. forehead, b. c. antennae.

The Head. (Textfig. 151). Forehead $\frac{1}{3}$ narrower anteriorly than it is at vertex, dull brown. Callus broad, black, gradually prolonged into the broad linear extension, which extends on more than $\frac{2}{3}$ of the frontal stripe. Subcallus, etc. as described. Palpi, first joint yellow-brown, orangeousyellow haired, second joint stout at base, suddenly drooping to a slender point, thick black haired. Antennae havannabrown, black haired on the first 2 joints, third joint yellowbrown to orangeous, slightly darker at apex, basal annulation 2 times as long as its widest part, 3,56 times as long as the stylus in the type female, in another female the same indices were respectively 2,2 and 2,5. Tooth black haired, similar hairs on opposite side of the basal annulation.

Thorax darkbrown, scutellum denuded, reddish,* black haired as the scutum (in un-rubbed specimens). Pteropleuron black haired. Breast reddbrown in the middle, yellowbrown to the sides, clothed with orangeousyellow pubescence. Wings darkbrown, extreme apex and hindborder paler. Disc cell with clear space, similar paler centres in the cubital and sub-marginal cell. Foreborder dark reddishbrown, stigma blackbrown, first posterior cell slightly narrower at opening. Halteres dull brown. Legs. First leg. Coxa reddbrown, black haired, trochanter dark reddbrown, femur brownblack, black haired, tibia havannabrown at extreme base, then orangeousyellowwhite, yellow haired, intermixed with a few black hairs on basal half, apex black, black haired. Tarsalia black. Other legs identical.

Abdomen reddishblackbrown, with narrow whitish, white haired segmentations, composed of median triangles and lateral stripes, becoming broader to the lateral borders, median spots and segmentations not connected, no such markings on the first segment, tergites black haired elsewhere. Ventral surface chocolatebrown, black haired, with broader white haired segmentations. In the type no median white spots are found on the tergites, but narrow, white haired fringes in tufts at each side of the middle only.

From *T. fuscicornis* Ric. to which it is allied, *T. pratti* is separated inter alia by the abdominal markings, the first tergite presenting a large median white triangular hairtuft, other triangles on the segments 2—6 larger and higher, the lateral white haired fringes do not reach so far inside in the latter species as in *T. pratti*. Antennae wholly black and much smaller in size. Disc cell of wing open at base.

139. *Tabanus speculum* WALKER. (♀, ♂) Textfig. 152

References:

WALKER, Proc. Linn. Soc. London, V, p. 258 (1861).

Habitat:

Type ♀ from Makassar, Celebes, A. R. WALLACE

Coll. BR.M.

1 ♀ from Toli Toli, Celebes 11/12.'95

"

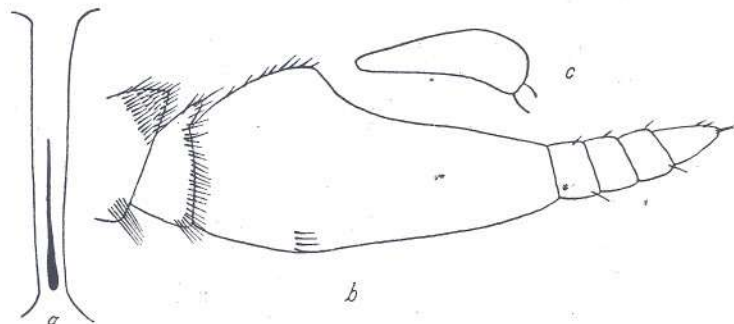
1 ♀ „ Celebes

Coll. N.A.M.

1 ♂ „ Celebes

"

A species, resembling in general appearance to *T. pratti* Ric., but easily recognisable by its beautifully painted wings, with clear fenestrae in the dark brown colour. Forehead long and narrow, blackbrown, black haired. Callus black, narrow. Subcallus rustybrown. Cheeks blackbrown, black haired. Face dirtywhite, black haired. Beard black. Palpi blackbrown, ending obtuse, black haired. Antennae black, black haired on its basal joints, then dull velvety-brown. Thorax blackbrown, blackbrown haired, scutum whitish tomentose at hindborder. Wings with first posterior cell closed. Legs chocolatebrown, brown haired. Abdomen dark chocolatebrown haired, white triangles and white, white haired lateral fringes being found on the 2d till 4th segments.



Textfig. 152.

T. speculum Wlk. ♀. a. forehead, b. antenna, c. palpe.

second joint stout, broad at base, ending in an obtuse point, black haired. Antennae, first joint protruding caplike over the 2d joint, third joint dark velvety-dullbrown, basal annulation almost 2 times as long as its widest part, 2,1 times as long as the black stylus. Tooth blunt, not prominent.

T h o r a x blackbrown, blackbrown haired, scutellum paler, blackbrown at base, greyish-white tomentose, white haired at hind border. Tufts at base of wings and behind thick, white. A tuft in front of the wings just under the pteropleuron white haired also. Breast blackbrown, darkbrown haired. Wings darkbrown, paler on disc cell and at apex; first posterior cell closed with a comparatively long petiole. Halteres, stalk blackbrown, club white. Legs chocolatebrown, brown haired, femora more blackbrown.

A b d o m e n blackbrown, clothed with dark chocolatebrown pubescence, segments 2-4 with median low, broad, white, white haired triangles, at sides, — but not connected with the triangles — fine white haired stripes are to be found. Ventral surface similar, 2d-4th segment with white haired segmentations.

The Male.

Identical to the female.

The Female

The Head. (Textfig. 152). Forehead as indicated, $\frac{1}{3}$ narrower anteriorly than it is at vertex, index 8,2. Callus black, hardly broader than the linear extension. Subcallus, etc. as mentioned. Upper border of face blackbrown, lower part dirty white. Palpi,

140. *Tabanus significans* RICARDO (♀) Textfig. 153.

References:

RICARDO, Rec. Ind. Mus. IV, p. 182 (1911).

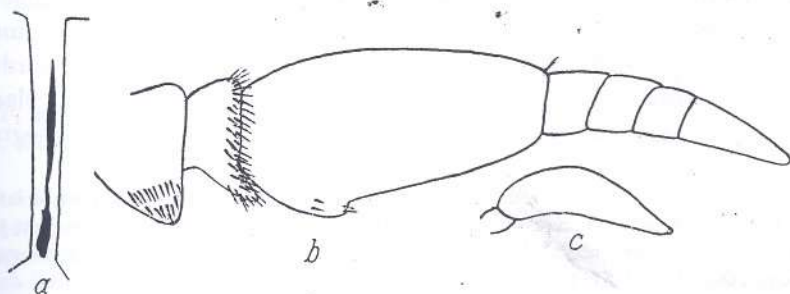
Habitat:

Type ♀ and another female from Kuala Lumpur. F. M. S. PRATT. Coll. Lond. Sc. Trop. Med.

1 ♀ from Darien Typus F. M. S., STANTON Coll. BR.M.

1 ♀ „ Baseht Bandar 28.3.'20, CORPORAAL (Textfig. 153) Coll. N.A.M.

A typically marked species. Forehead narrow, white at base, chestnutbrown at apex, black haired. Callus narrow, oval leatherbrown, linear extension long. Subcallus brownishwhite. Upper cheeks redbrown, scanty black haired, lower cheeks and face white, white haired. Beard white. Palpi brownishwhite, white haired, black haired at apex. Antennae olivebrown, black haired on basal 2 joints, third joint red. Thorax dull violetbrown, with 3 fine darkbrown longitudinal stripes, black haired, scutellum white haired as is the breast. Legs brownish, with widely white, white haired tibiae. Abdomen redbrown, with a median round white spot on the second, a larger roundish white spot on the third and a halfmoon-shaped white spot on the 4th segment. Lateral borders of first 2 tergites white haired, pubescence elsewhere black. Length 18 m.M.



Textfig. 153.

T. significans RIC. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 153). Forehead 0.4 narrower anteriorly than it is at vertex, black haired, index 8. Subcallus, etc. as described. Palpi first joint brownishwhite, white haired, intermixed with some black hairs at apex, second joint brownishwhite to olivebrown, stout, white haired at base, apical half triangular, ending in a point, black haired. Antennae with a long spur to the second joint; third joint broad and flat on basal annulation, which is 1.34 times as long as its widest part, 1.21 times as long as the slightly darker stylus. Tooth indistinct.

Thorax as mentioned, lateral and hind borders of scutum white tomentose, black haired. Tufts at base of wings and behind white. Scutellum brownish at base, hindborder broadly white tomentose, white haired. Breast and sides brownish white, white haired. Pteropleuron black haired. Wings pale yellowbrown on foreborder, stigma burnt sienna coloured. At the offspring of the upper cubital branch one finds a prominent small brown shadow,

fainter brown shadows along the outlines of the disc cell. Halteres redbrown. Legs. First leg. Coxa brownish white, white haired, trochanter redbrown, femur yellowbrown, black haired on dorsum, distal lateral border brownishwhite haired, intermixed with some black hairs. Tibia incrassate, reddishyellowbrown, black haired at extreme base, then white, white haired on basal $\frac{2}{3}$, apex blackbrown, black haired. Tarsalia black, black haired. Other legs similar.

Abdomen redbrown, black haired, the markings as described above, at lateral borders of the first 2 tergites, small white, white haired spots are visible, pubescence elsewhere black, ventral surface tawny, black haired.

141. *Tabanus indistinctus* BIGOT (♀). Textfig. 154.

References:

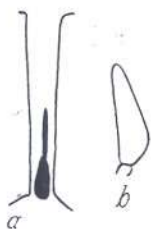
BIGOT, Mem. Soc. Zool. France V, p. 698 (1892).

RICARDO, Nova Guinea IX, p. 394 (1914).

Habitat:

Type ♀ from Doré, Nova Guinea

The specimen after which this species was described is very badly conserved. *T. indistinctus* BIG. is closely allied to *T. divisus* RIC. Length 14 m.m. Forehead rustybrown. Callus pear-shaped, olivebrown, linear extension short. Subcallus rustybrown. Face and cheeks dull brown, black haired. Beard black. Palpi stout, black haired. Antennae darkbrown with prominent tooth. Thorax olivaceousbrown. Wings clear, appendiculate. Legs blackishbrown, black haired. Abdomen brown, black haired, with small white hairtufts at the segmentations of the 1st—5th segment in the median line, lateral borders of the same tergites white haired also. Ventral surface blackbrown, black haired, with white hairfringes to the first 5 segments.



Textfig. 154.

T. indistinctus

BIG. ♀.

a. forehead

c. palpe.

The Head. (Textfig. 154). Forehead 0.4 narrower anteriorly as it is wide at vertex, index 8.3. Palpi ending blunt. Antennae, first joint olivebrown, black haired, projecting caplike over the black fringed second joint, third joint reddishyellow at base, then black.

Thorax, scutum and scutellum olivaceousbrown, almost wholly denuded, with a few black and white hairs only. Breast brown, black haired, intermixed with a few white hairs. Wings with olivebrown veins.

Abdomen brown, black haired, with white hairtufts on the mentioned spots.

142. *Tabanus albidosegmentatus* nov. spec. (♀) Textfig. 155.

Habitat:

Type ♀ Dutch Nova Guinea, LORENTZ

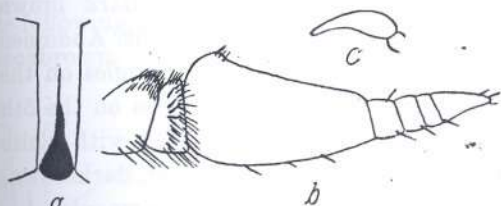
Coll. N.A.M.

1 ♀ from Heuvelbivak, S. Nova Guinea, LORENTZ 7/15.9.'09

„

A species closely allied to *T. laetus* DE MEIJERE but distinguishable inter

alia by the shape of the callus, the colour of the forehead, colour and shape of palpi, etc. Forehead whitish, white haired at base, bismarckbrown, black-brown haired at vertex. Callus almost square, blackbrown, linear extension narrow, pointed. Subcallus and upper cheeks velvetybrown. Lower cheeks and face white, white haired. Beard white. Palpi pinkish pale yellowbrown, white haired. Antennae blackbrown, black haired on basal joints, third joint black. Thorax velvetybrown, with 2 longitudinal starch-coloured, white haired stripes, similar foreborder and lateral borders. Scutellum white. Wings clear, with fine brownish apical shadow. Legs with pale yellowbrown femora and tibiae. Abdomen blackbrown, black haired, with fine, white segmentations to the 1st till 6th segments, these being elevated in the middle to triangular white, white haired, spots on the 1st and 3d—5th segments, 2d segment white fringed in the middle. Ventral surface greywhite on first segment, following segments till the 7th segment blackbrown, black haired at base, with broad white, white haired segmentations. Length 9,2 m.M; Width of thorax 3 m.M; Wingexpanse 21 m.M; Length of wing 9 m.M.



Txf. 155.

T. albodosegmentatus s. s. ♀.

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 155). Forehead almost the same width throughout, index 4,5. Postocular rim black haired. Palpi, first joint yellowbrown, second joint pinkish pale yellowbrown, swollen at base, ending in a long, blunt point, white haired. Antennae third joint black, broad at base, basal annulation 1,7 times as long as its widest part, 2,2 times as long as the short, narrow stylus. Tooth indistinct.

Thorax as described. Pteropleuron starch-coloured. Breast greywhite, silverywhite haired. Wings clear, stigma yellowbrown, no appendix. Halteres, stalk pale brown, club blackbrown. Legs. First leg. Coxa greywhite, white haired, trochanter blackbrown, femur blackbrown, black haired on dorsum, distal lateral border white haired, knee yellowbrown. Tibia dark yellowbrown at base, then blackbrown, black haired. Tarsalia black. Second leg. Femur purplish at base, apical half pale yellowbrown, almost wholly white haired, except on a median longitudinal row of black hairs on dorsum. Tibia yellowbrown, yellow haired, apical ring black haired. First tarsale yellowbrown at base, apex blackbrown, black haired, other tarsalia black. Third leg. Femur grey tomentose at base, apical half yellowbrown, white haired allover. Tibia yellowbrown at base, apical ring blackbrown, black haired on dorsum, ventral surface yellow haired. Tarsalia blackbrown, black haired.

Abdomen as mentioned. Lateral borders of tergites white, white haired.

143. *Tabanus laetus* DE MEIJERE (♀). Textfig. 156

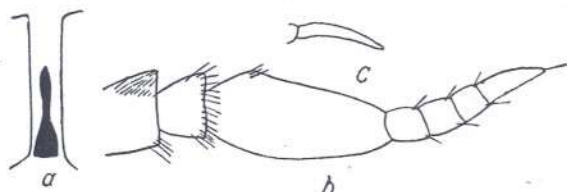
References:

- DE MEIJERE, Nova Guinea V, p. 74 (1906).
RICARDO, Nova Guinea IX, p. 391 (1914).

Habitat:

Type ♀	from N. Guinea '05	Coll. N.A.M.
7 ♀♀	from Etna Bay '04/'05	Coll. N.A.M.
2 ♀♀	„ D. N. Guinea, LORENTZ	
2 ♀♀	„ S. N. Guinea Rivierkamp 2.'10	„
2 ♀♀	„ Kloofbivak, VERSTEEG '12—'13	
1 ♀	„ Bivak on the Bougainville Mountains 526 M. 1.6.'10 V. K.	
1 ♀	„ S. N. Guinea, Heuvelbivak, LORENTZ 7—15.11.'09 cotype	
		• Coll. BR.M.

A blackbrown small species with beautiful dotted thorax and abdomen, scutellum white, scutum castaneous in the middle, white at sides. Forehead parallel-sided, dark. Callus blackbrown, prominent, with broad, spathuliform linear extension. Subcallus and upper cheeks velvetybrown. Lower cheeks and face white, white haired. Beard white. Palpi narrow, ending in a sharp point, dark brown, black haired. Antennae narrow, reddbrown, without distinct tooth, third joint yellowred at base, black tipped, black haired. Legs dark brown. Wings with distinct brown apical shadow. Appendix usually present. Abdomen blackbrown, black haired, with median white, white haired triangles on the segments 2—4, similar but lower and less distinct whitish triangles on the 5th and 6th segment. Lateral borders of the first 5 tergites provided with white triangles. No continuous white segmentations. Ventral surface darkbrown, black haired, with broad white segmentations to the first 5 segments.



Textfig. 136.

T. laetus DE MEIJ. ♀. a. forehead, b. antenna, c. palpe.

times as long as its widest part, 1,1 times as long as the stylus.

Thorax, middle portion of scutum denuded, pale castaneous, black haired. Sides white, white haired. Scutellum white. Pteropleuron partly white, partly brown. Breast white, white haired. Wings with a darkbrown apical shadow, filling up the whole radial cell, the apex of the cubital cell, following the branch of the cubital vein. Veins darkbrown. Foreborder siennabrown. Halteres dark reddbrown, club blackbrown. Legs, first leg. Coxa and trochanter cacao-brown, brown haired, femur blackbrown, tibia slightly paler brown on the basal half, apex blackbrown, black haired. Tarsalia similar. Second and third leg. Coxae grey, brown haired, femora blackbrown, middle tibiae yellowbrown, with blackbrown apices, hind tibiae darker. First tarsale of the second leg yellowishbrown, other tarsalia black.

Abdomen as described above.

The Head. (Textfig. 156). Forehead same width throughout, index 4,2. Callus blackbrown, pear-shaped, with peculiar linear extension. Subcallus, etc. as mentioned above. Antennae, first and second joint reddbrown, black haired. third joint with a very indistinct tooth, base yellowred, then black, basal annulation 2,1

144. *Tabanus semicirculus* RIC. (♀). Textfig. 157.

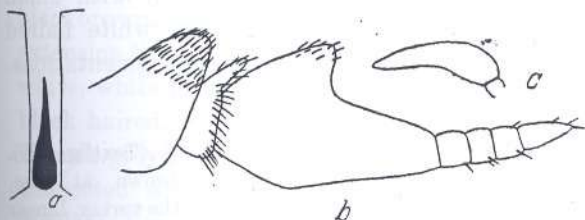
References:

RICARDO, Nova Guinea IX, p. 392 (1914).

Habitat:

Type ♀ and another ♀ from St. Joseph River Madew Br. N. Guinea 2000—3000 Feet, STALKER 1909 Coll. BR.M.

A dark brownish species. Forehead broad, blackbrown. Callus reddish-brown, cylindrical at base, gradually tapering to a point. Subcallus and upper cheeks yellowish, face and lower cheeks white, white haired. Beard white. Palpi olivebrown, black haired. Antennae blackbrown. Thorax reddishbrown with 2 greyishwhite longitudinal, white haired stripes. Wings appendiculate, with fine brown apical shadow. Legs brownish, with white haired femora. Abdomen redbrown at base, then blackbrown, black haired, with 3 white haired half circular spots on the second segment and a series of similar spots on the following segments, situated in the middle of the segments. Ventral surface blackbrown, with white fringed segmentations. Length 13,5 m.m.



Textfig. 157.

T. semicirculus RIC. ♀. a. forehead, b. antenna, c. palpe joint with distinct dorsal hump.

Thorax as described, breast brown, white haired. Wings with yellowish foreborder and blackbrown stigma, other peculiarities as mentioned. Legs brownish, femora white haired, tibiae white haired below, black on dorsum, with some white hairs on the fore tibiae on dorsum at base.

Abdomen redbrown to blackbrown, black haired. The second segment has at its base two half circular, white, white haired spots, directed to the scutellum with their straight sides, a third half circular spot is situated on the same segment in the middle at the hind border similar spots are to be found on the 3d—5th segment in the median line, forming together almost a stripe.

The Head. (Textfig. 157). Forehead broad, almost the same width throughout, index 4,7. Callus not reaching the eyes. Subcallus, etc. as mentioned above. Palpi swollen at base, with a long, not very sharp point. Antennae blackbrown, third joint curved, basal annulation 1,47 times as long as its widest part, 1,6 times as long as the stylus, tooth blunt, second

145. *Tabanus divisus* RICARDO (♀). Textfig. 158.

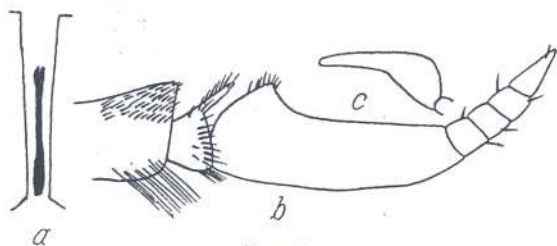
References:

RICARDO, Nova Guinea IX, p. 391 (1914).

Habitat:

Type ♀	from S. N. Guinea Noord Rivier 9.'09,	LORENTZ	Coll. BR.M.
11 ♀♀	from same locality 9.'09		Coll. N.A.M.
4 ♀♀	„ same locality 5.'07		„
3 ♀♀	„ Rivierkamp 2.'10,	LORENTZ	
1 ♀	„ Bivak Island 1.'10		
1 ♀	„ Bivak Island, 12.'09		
1 ♀	„ Digoel '04/'05 N.N. Guinea		
1 ♀	„ Regen Island 20.12.'09		
1 ♀	„ Regen Island 16.2.'10		
3 ♀♀	„ Etna Bay '04/'05		
3 ♀♀	„ Etna Bay '04/'05		
2 ♀♀	„ Lutch N. Guinea		

A medium-sized, brown species. Forehead brown, black haired. Callus black, hardly broader than the linear extension. Subcallus and upper cheeks redbrown, black haired, lower cheeks and face white haired. Beard white. Palpi olivebrown, black haired. Antennae redbrown, black tipped. Thorax chestnutbrown, black haired, with greyish foreborder and traces of whitish longitudinal stripes. Legs yellowbrown. Abdomen blackbrown, black haired, with small white haired triangles on the segments 2—5 and olivebrown, white haired lateral borders to the first 5 tergites. First 5 sternites with yellow segmentations.



Textfig. 158.

T. divisus RIC. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 158). Forehead greybrown at base, blackbrown to the vertex. Linear extension furrowed at apex. Palpi olivebrown, white tomentose, swollen at base, ending with a long, blunt point. Antennae redbrown on basal joints, second joint with a long spur, third joint redyellow, basal annulations 2.4 times as long as its widest part, 1.7 times as long as the black stylus.

Thorax chestnutbrown, with grey tomentose foreborder and traces of three longitudinal grey stripes. Scutellum blackbrown, breast rustygreybrown. Wings with a redbrown apical shadow, filling up the radial and cubital cells, foreborder blackishbrown, stigma dark havannabrown. Legs. First leg. Coxa grey, white haired, femur dark brown, black haired on dorsum, distal lateral border white haired, knee yellowbrown. Tibia yellowbrown, yellowbrown haired at base, apex blackbrown, black haired, extreme base blackbrown also. Tarsalia black. Second leg, femur blackish at base, then yellowbrown, with a row of black hairs of on dorsum, elsewhere white haired. Tibia yellowbrown, black haired on dorsum, yellow haired below. Third leg similar.

Abdomen blackbrown, black haired with the mentioned markings.

146. *Tabanus exagens* WALKER (♀) Textfig. 159

References:

WALKER, Proc. Linn. Soc. VII, p. 205 (1864).

RICARDO, Nova Guinea IX, p. 390 (1914).

Habitat:

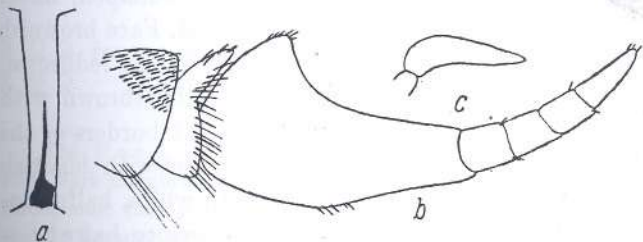
Type ♀ from Mysol A. R. WALLACE

Another ♀ from same locality

Species described after a ♀ from S. Nova Guinea, LORENTZ Regen Island 16.2.'10

	Coll. BR.M.
1 ♀ from same locality 18.10.'09	Coll. N.A.M.
1 ♀ „ Bivak Island 25.2.'10	Coll. BR.M.
1 ♀ „ Bivak Island 10.11.'09	Coll. BR.M.
12 ♀ ♀ from Bivak (1 ♀ from 12.'09; 6 ♀ ♀ from 1.'10; 1 ♀ from 25.1.'10;	
1 ♀ from 15.2.'10; 2 ♀ ♀ from 25.2.'10)	Coll. N.A.M.
1 ♀ from Alkmaar 10.'09	Coll. N.A.M.
1 ♀ „ Heuvel Bivak 7.15.'11.'09 800 M.	
2 ♀ ♀ from Dutch N. Guinea, LORENTZ	Coll. N.A.M.

A greyish-black, medium-sized species, with parallel-sided whitish to greyish blackbrown, black haired forehead. Callus irregular, square, blackbrown, linear extension fine. Subcallus and upper cheeks brownish, black haired. Lower cheeks white, white haired. Beard white. Palpi greyish tomentose, olivebrown at base, black haired. Antennae black, black haired, third joint with prominent tooth. Thorax greyish black, with 3 distinct white, white haired longitudinal stripes, connected with the pale lateral borders of the scutum. Wings clear, appendiculate. Legs blackbrown. Abdomen blackbrown, with a median series of grey triangles. Length 16 m.M. and not 26 m.M. as RICARDO mentions.



Textfig. 159.

T. exagens Wlk. ♀. a. forehead, b. antenna, c. palpe.

joint ending with an obtuse point, black haired. Antennae, second joint with thick dorsal spur, third joint rather broad, tooth blunt, prominent, crowned with black hairs, similar hairs being found on the opposite border, basal annulation 1,5 times as long as its widest part, 1,3 times as long as the black stylus.

The Head. (Textfig. 159). Forehead 0,2 narrower anteriorly as it at vertex, white at base, median part black, sides greyish, scanty white haired, upper part greyish blackbrown, black haired, index 6. Subcallus, etc. as described above. Palpi, first joint white haired, second

Thorax as described, median grey stripe split by means of a fine redbrown line. Lateral

stripes connected by means of connectives with the lateral white, white haired borders. Scutum black haired on the darker parts. Pteropleuron redbrown, black haired. Sides and breast greywhite, white haired, some black hairs being found on the mesosternumlobus. Wings with brown veins, appendix unequal on both wings. Legs. First leg. Coxa grey, white haired, apex blackbrown, black haired. Trochanter blackbrown, femur black, black haired. Tibia blackbrown, black haired, slightly paler at base, distal lateral border scanty yellow haired. Tarsalia black haired, black. Second leg similar, tibia paler than in the first leg. Third leg. Femur grey tomentose, black haired, distal lateral border white haired. Tibia blackbrown, dorsum black haired, white haired on venter. First tarsale blackbrown, black haired, other tarsalia black.

A b d o m e n blackbrown to black, black haired, grey haired on the markings. At each side of the scutellum one finds a grey tomentose, grey haired spot on the first segment. A similar square blotch is found on the same segment in the middle. Base of second segment white-grey tomentose, connected with the median huge and broad, white haired triangle on the same segment. Third and fourth segment with large white median triangles. Fifth and sixth segment black haired with traces of median whitish triangles, presenting however no white pubescence. Lateral borders of the first 4 tergites grey tomentose, white haired, those of the following segments black. Ventral surface brownblack, first four segments black, black haired in the middle, white haired at sides only.

147. *Tabanus albithorax* RICARDO (♀). Textfig. 160.

References:

RICARDO, Nova Guinea IX, p. 391 (1914).

Habitat.

Type female (*T. albithorax* s.str.) from Iwaka River, D: N. Guinea, WOLLASTON
Coll. BR.M.

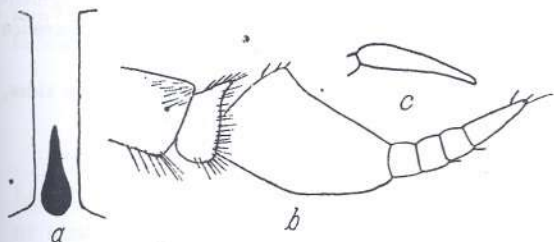
- | | | |
|-------|--|--------------|
| 1 ♀ | from Heuvel Bivak S. N. Guinea, LORENTZ 800 M. 7—15.11.'09 | |
| 2 ♀ ♀ | „ Heuvel Bivak | Coll. B.Z.M. |
| 3 ♀ ♀ | „ Hoofd Bivak K. A. River 12.16.11.'10 | „ |

T. albithorax Ric. s.str. is a small species. Forehead parallel-sided, velvetybrown, black haired. Callus chestnutbrown, broad, club-shaped, linear extension short, broad. Subcallus and cheeks white, white haired. Face brownish white. Beard white. Palpi long, blackbrown, black haired. Antennae redbrown, black haired, broad on third joint, tooth distinct. Thorax chestnutbrown with 2 white longitudinal stripes, hindborder of scutum and lateral borders of the same white. Scutellum dark chestnutbrown. Wings clear. Legs with blackish tibiae and redbrown femora. Abdomen chestnutbrown with white, halfmoon-shaped spots on the segments 1—6. Ventral surface white, white haired.

Table of dimensions.

Bodylength	varying from 10,2 m.M. to 11,5 m.M.				
Width of thorax	„	„	4	„	— 4,2 „
Width of abdomen	„	„	4,5	„	
Wingexpanse	„	„	22,6	„	— 25,2 „

Length of head	varying from	2	m.M.	to	2,5	„
Length of thorax	„	4,2	„	—	4,8	„
Length of abdomen	„	5	„	—	6,5	„
Length of wing	„	9,2	„	—	10,5	„
Breadth of wing	„	3,8	„	—	4	„
Foreheadindex	„	3,8		—	4,1	



Textfig. 160.

T. albithorax Ric. ♀. a. forehead, b. antenna, c. palpe

pinkishbrown, sides yellowwhite. Wings with brown veins and havannabrown stigma. Halteres reddishbrown. Legs. First leg. Coxa greybrownwhite, white haired. Femur reddishbrown, long white haired. Tibia reddishbrown, paler at base, black haired. Tarsalia blackbrown. Second leg similar to the third leg.

A b d o m e n chestnutbrown, black haired, halfmoon-shaped median spots white, white haired, the spot on the second segment is the largest, those on the following segments decreasing in size, till upon the sixth segment, lateral borders of the first 5 tergites white, white haired. Ventral surface white, white haired.

147b. *Tabanus albithorax* Ric. (♀) var. *flavifemur*.

Habitat:

Type ♀ from Heuvel Bivak S. N. Guinea, LORENTZ 800 M. 7—15.11.'09

Coll. BR.M.

2 ♀ ♀ from same locality

Coll. BR.M.

5 ♀ ♀ „ same locality

Coll. N.A.M.

The Head. Forehead, callus, subcallus and face as in the type from *T. albithorax* s.str. Palpi dark olivebrown to oakbrown, black haired, second joint long, almost the same width throughout, first joint dark dull brown, white haired. Antennae, first joint cylindrical, slightly broader at apex, dark olivebrown, white tomentose, black haired, 2d joint similar, 3d joint dark brown, slightly paler on the basal annulation, which is 1,55 times as long as its widest part and 1,1 times as long as the narrow stylus.

Thorax dark chocolatebrown, markings on the scutum as described above, the longitudinal stripes being finer than the connectives with the pteropleura. The broad, white hindborder of the scutum is yellow haired as are the pteropleura and the sides. Breast pinkish, white tomentose, white haired. Legs yellowish olivebrown. From these I will mention only the differences with the type species. First leg. Femur reddish olivebrown, yellow haired. Tibia yellow-tawny at base, yellow and black haired, apex blackbrown, black haired. Tarsalia

blackbrown. Second leg, femur reddish yellowbrown, distal lateral border white haired, pubescence elsewhere yellow. Tibia as in the first leg, basal part yellow and black haired, apical part narrow, blackbrown, black haired. First tarsale slightly paler than the other ones. Third leg. Femur similar, tibia tawny olivebrown-blackbrown, dorsum black haired.

A b d o m e n reddishbrown on basal 2 segments, then blackbrown, black haired, except on the markings, which consist in white triangles on all 7 segments, the largest one to be found on the second segment, decreasing in size on the following segments. Lateral borders of the first 4 tergites with white, white haired triangles. Ventral surface, basal 2 segments wholly white, white haired, 2d segment with a chocolatebrown streak, other segments blackbrown, with white, white haired segmentations. Dorsum abdominis without white segmentations. On the venter the black or brown markings are limited to the skeleton, pubescence white everywhere.

One of these females has a narrower white hindborder of scutum, pubescence on sides, pteropleuron and hindborder of scutum paler yellow, abdominal triangles smaller.

147c. *Tabanus albithorax* RIC. (♀) var. *brunnifemur*.

Habitat:

Type ♀ from Dutch N. Guinea, LORENTZ	Coll. N.A.M.
1 ♀ from S. N. Guinea, BEAUFORT	"
2 other ♀ ♀ from same locality, one of them with snowwhite cheeks	Coll. N.A.M.
2 ♀ ♀ from same locality, VERSTEEG 15.11.'12	
1 ♀ „ same locality, VERSTEEGH 9.11.'12	
1 ♀ „ Alkmaar, S. N. Guinea 10.'09	
1 ♀ „ Kloof Bivak	

The **Head**. Subcallus, cheeks and face brownishgrey, greywhite haired. Beard greywhite.

Thorax Scutum narrowly white at hindborder, elsewhere brownblack, the longitudinal stripes described in the foregoing forms are not to be found in this variety, but a faint rather broad, grey median band only, subdivided into two parts by a fine brown stripe, which however does not reach the foreborder of the scutum. Pteropleuron yellowbrown, reddish-yellow haired. Breast brownishgrey, white haired, mesosternumlobus yellowbrown, yellow haired. Legs. First leg. Coxa brownblack, white haired, trochanter blackbrown, femur blackbrown, black haired, tibia blackbrown, black haired. Other legs similar, blackbrown, black haired.

A b d o m e n blackbrown, black haired, with median white, white haired triangles and narrow white, white haired segmentations to all segments, largest on the 2d segment, all triangles being lower than in the type species. Lateral borders of the first 6 tergites white haired.

147d. *Tabanus albithorax* RIC. (♀) var. *citribarbus*.

Habitat:

Type ♀ from Heuvel Bivak S. N. Guinea 800 M. 7—15.11.'09	Coll. N.A.M.
1 ♀ from same locality	Coll. BR.M.
1 ♀ „ N. Guinea, VERSTEEGH 18.11.'12	
1 ♀ „ Alkmaar 2.10.'10	

The Head. Forehead white, white haired with velvetybrown vertexspot. Callus black, same shape as in type species with rather long linear extension. Subcallus, face and upper cheeks white. In the female collected by VERSTEEGH the subcallus was yellowish. Beard bright citroneyellow. Antennae blackbrown.

Thorax with two longitudinal distinct white stripes, connected sideway with the pteropleuron Hindborder of scutum provided with a curved white, yellow haired band. Pteropleuron white, yellow haired. Sides and breast yellow, goldenyellow haired. Legs brown-black. Fore coxae blackbrown, greywhite tomentose at base, white haired, apex black haired.

Abdomen with markings identical to those in the foregoing variety, with the exception of the 2d segmentation, which is black haired. Ventral surface with broad, white segmentations. In the female collected by VERSTEEGH the abdominal triangles are yellow haired,

GROUP XI.

This Group includes only 2 very peculiar species, characterised by the broad, velvetybrown, black haired forehead, the square callus, the reduction or absence of the linear extension, the bare, shining yellowbrown or havanna-brown subcallus, the citroneyellow and black haired thorax, the largely white legs, the appendiculate clear wings and the dark abdomen with its series of white, mainly citroneyellow haired spots.

KEY 21.

Synopsis of species.

- A. Abdomen chestnutbrown, with a continuous series of white, citroneyellow haired spots, that on the second segment triangular, reaching the hindborder of the first segment, those on the 3d—6th segments lower, halfmoon-shaped; triangular yellow haired spots are present at the lateral borders of the 2d—6th tergites *flaviscutellatus* SCHUURMANS STEKHOVEN.
- B. Abdomen with a median heart-shaped, citroneyellow haired spot on the 1st and 2d segment, 3d and 4th segment with 2 smaller citroneyellow haired spots each, yellow haired triangles visible at the lateral borders of the 1st—5th tergite *bilateralis* SCHUURMANS STEKHOVEN.

178. *Tabanus flaviscutellatus* nov. spec. (♀, ♂) Pl. 11, Fig. 6,

Textfig. 161, 162.

Habitat:

Isle Sumatra

Type ♀ from Porsea, Balige on buffalo 12.'21, VAN DER REEST (Textfig. 161 a, c)
Coll. V.S.L.

3 ♀♀ from Hoendoelan Parmaksian, Balige on buffalo 21.12.'21, VAN DER REEST
Coll. V.S.L.

1 ♀ from Hoeta Nopan, Hoeta Nopan, Binanga, Tapanoeli on horse 28.8.'23,
BAKKER Coll. V.S.L.

2 ♀♀ from Si Oendol, Paringgonan, Binanga, Tapanoeli, BAKKER

respectively 1 ♀ on buffalo 1.5.'24 (Textfig. 161b).

1 ♀ „ horse 1.6.'24

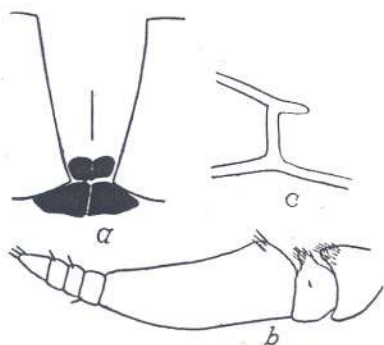
Type ♂ from Goenoeng Teleman, JACOBSON (Textfig. 162). Coll. N.A.M.

A small, beautiful chocolatebrown to chestnutbrown species, distinguished at once from other species by the very characteristical golden-citronyellow haired median abdominal spots. Forehead, broad at vertex, much narrower at base, thus forming a triangular space, velvetybrown, brownblack haired. Callus shining dark olivebrown, rectangular, separated from the filiform linear extension. Subcallus bare, shining ochraceousyellowbrown, often darker at sides than in the middle. Cheeks and face white, white haired. Beard white. Palpi yellowish white, silverywhite haired, intermixed with some black hairs. Antennae rustybrown with long basal annulation of third joint. Thorax chocolatebrown, citronyellow haired, intermixed with some black hairs. Breast white. Legs pale whitish, white haired. Abdomen as mentioned, ventral surface pinkish-white. Wings appendiculate.

The Female.

Table of dimensions.

Bodylength	varying from 10	m.M. to 11	m.M.
Width of thorax	4	— 4	„
Width of abdomen	4	— 4,2	„
Wingexpanse	22,4	— 24	„
Length of head	2	— 2,5	„
Length of thorax	4,2	— 5	„
Length of abdomen	5	— 6	„
Length of wing	9,2	— 10	„
Breadth of wing	3	— 3,2	„
Foreheadindex	3,33	— 5,5	„



Textfig. 161

T. flaviscutellatus s. s. ♀

a. forehead, b. antenna, c. wingstructure

The Head. (Textfig. 161). Forehead deep velvetybrown, brownblack haired, with a range of yellow hairs at the lateral borders, frons 0,5—0,7 narrower anteriorly than it is wide at vertex. Callus rectangular, grooved in the middle, where it is shining yellowbrown, lateral borders more olivebrown, in type female; in a second female it was ochraceousyellow at base, dark-brown at apex, third and fourth female with respectively wholly brownblack or wholly ochraceousyellow calluses. Linear extension filiform, mostly separated from the callus; in the fourth female it was connected with the latter structure. Subcallus varying in colour, like the callus, from wholly ochraceousyellowbrown to ochraceousyellow in the middle with olivebrown lateral borders. Postocular rim dirty brownish white, brownblack haired. Cheeks, etc. as mentioned.

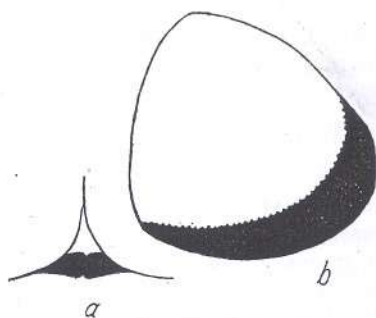
Palpi yellowishwhite, clothed with shaggy silverywhite pubescence, intermixed with some black hairs, second joint triangular, broad at base, with an acute, short point. Antennae, first joint pale rustybrown to yellowbrown, white tomentose, black haired on dorsum, distal lateral border covered with long yellowwhite pubescence. Second joint same colour, provided with a double fringe of black hairs. Third joint deep ferrugineous at base, basal annulation 2 times as long as its widest part, 1,7 times as long as the darkbrown stylus. Tooth indistinct, blunt. Proboscis pale brown, resembling in colour fresh dates, thick white haired.

Thorax deep chocolatebrown to dark velvetybrown, thick citroneyellow haired, intermixed with a few black hairs. Pteropleuron ochrebrown, black haired. Scutellum same colour as scutum, white tomentose, citron-yellow haired at hind border, black haired at base. Sides and breast white, yellowwhite haired. Wings greyish, foreborder clear, stigma yellowishbrown. Veins blackbrown. Appendices long, in one of the females it is present on the right wing only. Halteres coffeenutbrown. Legs. First leg. Coxa pinkish, covered with flossy white hairs. Femur same colour. Tibia white, white haired, apex pale brown, hazelnut-coloured, distal lateral border black haired. Tarsalia pale brown tomentose, white haired, intermixed with some black hairs. Pulvilli yellowbrown. Second leg identical. Tibia caramelbrown at extreme base, then white, white haired, apex blackbrown, white haired, distal lateral border white haired, intermixed with some back hairs, similar hairs occur in the middle on dorsum. First tarsale dirty white at base, apex violet-palebrown, white haired. Other tarsalia identical. Third leg. Femur pink, white haired on ventral surface, on dorsum and at distal lateral border some black hairs are intermixed. Tibia identical. Tarsalia violetbrown, without basal white rings.

Abdomen dull chestnutbrown on basal 2 segments, following segments darker chocolate- to blackbrown, dark parts black haired. The first segment presents a median square, golden-citroneyellow-coloured hairtuft, 2d till 6th segment with halfmoon-shaped white median spots, clothed with citroneyellow pubescence; near the lateral borders of the same tergites, at the segmentations citroneyellow haired triangles are found. Seventh segment wholly black haired, ventral surface pinkish white, citronwhite haired on 2d till 6th segment, segmentations yellowwhite, yellow haired. Seventh segment black haired.

The Male.

Bodylength	10	m.M.
Width of thorax	3,5	"
Width of abdomen	3,6	"
Wingexpanse	22,5	"
Length of head	2	"
Length of thorax	4,2	"
Length of abdomen	5	"
Length of wing	9,5	"
Breadth of wing	3	"



Textfig. 162.

T. flaviscutellatus s.s. ♂
a. subcallus, b. eye.

The Head. (Textfig. 162). Eyes violetbrown, lower $\frac{1}{3}$ black, not reaching the vertex, composed of small facets. Postocular rim black haired. Subcallus pale violetbrown, bare, shining, short. Palpi yellowish starchwhite, clothed with long white hairs, some black hairs being visible at apex. Antennae, first joint pale olivebrown, white haired, a number of black

hairs occurring at apex, second joint same colour, third joint wholly tawny reddishyellow, basal annulation 2 times as long as its widest part, 1.8 times as long as the stylus, tooth indistinct.

Thorax dull darkbrown, covered with thick, golden-citronyellow pubescence, wholly identical to that of the female. Wings similar. Halteres brownishwhite. Legs almost as in the female. Fore tarsalia dull olivebrown, black haired on dorsum, white haired at lateral borders and below. Hind tibiae black haired on the olivebrown, narrow apical band, elsewhere silvery white haired.

Abdomen chocolatebrown, basal 2 segments paler than following segments. First segment with a median square citronyellow haired spot, 2d segment with a diabolo-shaped (a toy), citronyellow haired spot, following four segments with halfmoon-shaped spots as in the female. Lateral citronyellow haired triangles on the 2d till 6th segment. Lateral borders of tergites pale brownish white, silverywhite haired. Ventral surface white, silverywhite haired with yellow haired segmentations. Seventh segment wholly white haired.

149. *Tabanus bilateralis* nov. spec. (♀) Textfig. 163.

Habitat:

Isle Sumatra

Type ♀ from Si Paho, Oedjoeng Padang, Goenoeng Toea, Tapanoeli, on buffalo
22.10.'24, BAKKER Coll. V.S.L.

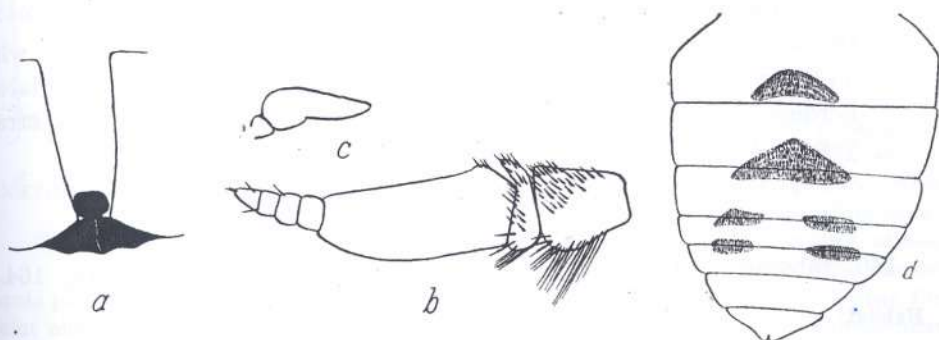
1 ♀ from Pasar Goenoeng Toea, G. Toea, Tapanoeli, on horse 22.11.'24, BAKKER
Coll. V.S.L.

A splendid species, closely allied to *T. flaviscutellatus* SCHUURMANS STEKHOVEN, distinguishable at the abdominal markings, the darker antennae, darker callus and subcallus. Forehead dark velvetybrown, black haired. Callus shining reddish havannabrown, crescentiform. Subcallus same colour, bare, shining. Face and cheeks white, thick white haired. Palpi as in the foregoing species. Antennae pale brown, mainly black haired on basal joints, third joint dark havannabrown. Thorax dark velvetyblackbrown, black haired, except on the 3 citronyellow haired longitudinal bands. Scutellum same pubescence. Breast white haired. Wings with short appendix. Legs mainly white. Length 11,2 m.M.

The Head. (Textfig. 163). Forehead very broad at vertex, barely half as wide at base as it is at vertex, dark dull velvetybrown, black haired, index 4,7. Callus as described, with a shallow groove in the middle, its convex border resting on the subcallus. Palpi pale yellowishwhite, second joint broad at base, ending with a rather acute point, silverywhite haired, intermixed with some black hairs. Antennae, first joint pale brown, white tomentose, dorsum black haired, ventral surface white haired, second joint similar, black fringed, third joint with hardly any tooth at the basal annulation, which is 2,2 times as long as its widest part and ± 2 times as long as the short, black stylus.

Thorax dark velvetyblackbrown, reddishbrown on foreborder, dorsum as described, the median, yellow haired stripe is connected with the citrongoldenyellow pubescence on the scutellum, the lateral stripes ending in thick white hairtufts at the level of the suture. Epimeron prothoracis white, white haired. Tufts at base of wings and behind white. Breast similar. Wings clear, appendix short, foreborder pale yellowish, stigma pale olivebrown.

Legs. First leg. Coxa white, white haired, trochanter brown, white haired, femur white, white haired, with some black hairs at the yellowbrown apex. Tibia yellowbrown at extreme base, then white, white haired, thick fringes being found at the distal lateral borders, apex narrowly pale brownblack. Tarsalia brownish-olive, white haired, intermixed with some black hairs. Second leg similar, first tarsale yellowwhite at base, other tarsalia yellowbrown, white haired. Third leg as the first.



Textfig. 163.

T. bilateralis s.s. ♀ a. forehead, b. antenna, c. palpe, d. abdomen.

Abdomen brownblack, black haired, first segment with a median, citroneyellow haired, heart-shaped spot, second spot low, broad, not connected with the spot on the first segment third and fourth segment presenting 2 citroneyellow haired spots at the segmentation, one at each side of the middle. On the 1st—5th segment small, yellow haired triangles occur at the segmentations near the lateral borders of the tergites. When the animal is rubbed the dorsum of the abdomen presents a halfmoon-shaped white spot on the first segment at the segmentations. Second segment with a low white median triangle, connected with the lateral borders of the tergite by means of a fine white segmentation, in the type this white stripe was hidden under black pubescence. Third and fourth segmentations fine, white, with low elevations in the middle, fifth segmentation formed by an indistinct pale stripe, interrupted in places. Ventral surface in both females white, yellowwhite haired.

GROUP XII.

Group XII includes all species with at least 2 series of white or yellowish round spots on the abdomen, usually accompanied by a median series of indistinct spots, arranged to a sort of stripe. Antennae ochraceousyellow. Callus usually square, linear extension present. Subcallus and upper cheeks goldenbrown. Lower cheeks and face white. Legs yellowbrown, white haired, slightly darker at apex of tibiae only.

KEY 22.

Synopsis of species.

- | | |
|--|---|
| 1a. Abdomen grey | 2 |
| b. Abdomen siennabrown or olivebrown | 3 |
| 2. Callus square, without distinct linear extension. Palpi pale yellowwhite, | |

white haired. Antennae yellow, white haired on basal joints. Thorax brownishgrey, with 4 longitudinal stripes

albopunctatus SCHUURMANS STEKHOVEN.

3a. Callus with distinct linear extension. Palpi pale reddishbrown, white haired. Scutum with 3 pale longitudinal stripes. Abdominal spots goldenyellow, goldenyellow haired **aurifer** SCHUURMANS STEKHOVEN.

b. Callus with spoon-shaped linear extension. Palpi yellowishwhite, white and black haired. Scutum with 3 longitudinal pale stripes, similar lateral borders and hindborder. Scutellum bordered white also. Legs strawyellow, tarsalia similar. Abdominal spots white

bubalophilus SCHUURMANS STEKHOVEN.

150. *Tabanus albopunctatus* nov. spec. (♀) Pl. 10, Fig. 6; Textfig. 164.

Habitat:

Isle Java

Type ♀ and 5 other females from Tasikmalaja, Parigi on 7.11.'22, LE COULTRE
Coll. V.S.L.

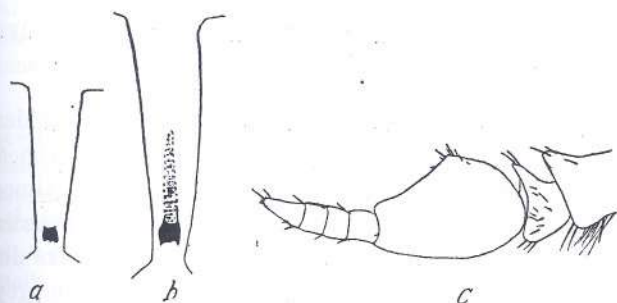
1 ♀ female from Tasikmalaja 12.1.'23, LE COULTRE

A greyish species allied to *T. bubalophilus* SCHUURMANS STEKHOVEN, but distinguished inter alia by the shape of the forehead and callus, the colour of the tarsalia, the clearer wings, the shape of the palpi and the more slategrey appearance of the animal. Frons goldenbrown tomentose, brownblack haired. Callus square, black, without distinct linear extension. Subcallus and upper cheeks dull old goldenbrown, Lower cheeks and face greywhite, white haired. Beard white. Palpi pale yellowwhite, white haired, slender, with acute apex. Antennae ochraceousyellow, basal joints mainly yellowwhite haired, third joint broad. Thorax brownish grey with 4 longitudinal stripes, abdomen with a faint median whitish stripe and 2 lateral rows of whitish patches on the first 6 segments. Legs brownishyellow, mainly white haired.

Table of dimensions.

Bodylength	varying from 10,5 m.M. to 11,8 m.M.				
Width of thorax	"	"	3,5	"	— 3,8
Width of abdomen	"	"	3,5	"	— 4,6
Wingexpanse	"	"	19,9	"	— 23,2
Length of head	"	"	1,8	"	— 2
Length of thorax	"	"	4	"	— 5
Length of abdomen	"	"	6	"	— 6,2
Length of wing	"	"	8,2	"	— 9,8
Foreheadindex	"	"	6	"	— 7

The Head. (Textfig. 164). Forehead 0.41–0.53 narrower anteriorly than it is at



Textfig. 164.

T. albopunctatus s. s. ♀ a. b. forehead, c. antenna.

vertex. Vertex spot triangular, black, surrounded by a white tomentose ring. A few yellow hairs are found along the lateral borders of the forehead. Callus square, black, not reaching the eyes, prolonged into a tomentose-covered ridge in one of the specimens only, in all others without linear extension. Subcallus, etc. as described. Palpi pale yellow-white, first joint white haired, second joint swollen at base, tapering to a long slender,

acute point, white haired, intermixed with a few white hairs near the apex. Antennae first joint oblong, cylindrical, pale ochraceous yellow tomentose, yellowishwhite haired, intermixed with a small number of black hairs on dorsum, second joint orangeousyellow, black fringed. Third joint bright orangeous yellow, basal annulation curved, broad, 1.4 times as long as its widest part, 1.25 times as long as the reddishbrown stylus. Tooth indistinct. Proboscis violetbrown, black haired. Postocular rim grey, white and black haired.

Thorax sooty brownish-slategrey, with 4 indistinct, greywhite longitudinal stripes, the lateral borders included, foreborder of scutum whitish, scutum greywhite haired, intermixed with black hairs. Pteropleuron sootygrey, black haired. Breast and sides bluishgrey tomentose, white haired. Scutellum same colour as the scutum. In one of the females the scutum presents a fine median black longitudinal stripe. Wings clear, veins olivebrown, stigma pale havannabrown. Halteres, stalk yellow, club violetbrown. Legs. First leg. Coxa greyish-white, white haired. Trochanter similar, with brownish hue. Femur blackbrown on ventral surface, lateral borders greyish white tomentose, knee yellowbrown, mainly white haired, with an irregular row of black hairs on the dorsum. Tibia old goldenbrown, white haired, with a median row of black hairs on dorsum, apex redbrown, black haired. First tarsale yellowish at base, apex redbrown, dorsum black haired, lateral borders yellow haired. Second leg. Coxa bluishgrey, reddishbrown at apex, white haired. Trochanter olivebrown, white haired. Femur yellowbrown, greyish tomentose, white haired, some black hairs at apex on dorsum. Tibia dull oliveaceousyellowbrown, white haired, apex darker, black haired. On the basal part one finds a median irregular row of black hairs on the dorsum, distal lateral border black haired. Spurs redbrown. First tarsale yellowwhite, other tarsalia redbrown, black haired. Third leg, femur with olivebrown knee, elsewhere as in second leg. Tibia pale yellowbrown, black haired, distal lateral border fringed with short white hairs, intermixed with some longer black hairs. Tarsalia yellowbrown to redbrown, first tarsale paler at base apex redbrown, dorsum black haired, ventral surface yellowbrown haired.

Abdomen sootygrey, whitish, white haired at the segmentations. A median faint narrow, white longitudinal stripe is indicated, formed by small groups of white hairs on the first 3 or 4 segments. Further one finds 2 series of white tomentose, white haired, lateral spots, on the first 6 segments, lateral borders of the same tergites, greywhite haired. Dorsum elsewhere black haired. Ventral surface grey, silverywhite haired, more distinctly so on the segmentations. In some specimens the abdomen shows reddishbrown areas on the first 2 segments.

151. *Tabanus aurifer* nov. spec. (♀) Pl. 10, Fig. 1, Textfig. 165.

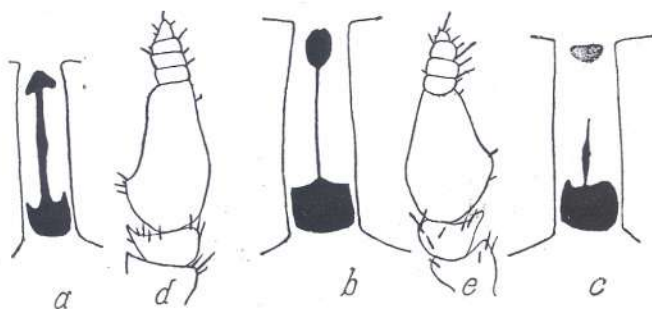
Habitat:

Type ♀ and 2 other females from Manoelai, Timor on 12.'22 at 2 p.m., PROPPE
Coll. V.S.L.

A small siennabrown species, with 2 series of pale goldenyellow, goldenyellow haired roundish spots and a series of median, indistinct triangles. Forehead broad goldenbrown, black and yellowbrown haired. Callus square, black, almost reaching to the eyes, with fine linear extension. Vertexspot broad blackbrown, shining, connected with the callus in 2 cases. Subcallus and upper cheeks dull pale goldenbrown. Lower cheeks white, white haired. Beard white. Face grey-white in the middle, yellowish on lateral borders, white haired. Palpi pale reddishbrown, second joint white tomentose, white haired, black haired near the apex. Antennae pale ochraceousyellowbrown, third joint broad, tooth indistinct, stylus black. Thorax grey tomentose, with 3 longitudinal pale stripes and whitish lateral borders. Wings fine yellowish, veins yellowbrown. Legs yellowbrown.

Table of dimensions.

	♀ 1	♀ 2
Bodylength	9,5 m.M.	8,8 m.M.
Width of thorax	3 „	3 „
Width of abdomen	3,5 „	3,8 „
Wingexpanse	19 „	18,6 „
Length of head	1,5 „	1,5 „
Length of thorax	3,6 „	3,5 „
Length of abdomen	5,2 „	5 „
Length of wing	8 „	7,8 „
Breadth of wing	3,2 „	2,8 „
Foreheadindex	3	3,25



Textfig. 165.

T. aurifer s.s. ♀ a—c. forehead, d. e. antennae.

The Head. (Textfig. 165). Forehead 0,11—0,20 narrower at vertex than it is at base, goldenbrown tomentose, black haired, intermixed with some yellowbrown hairs. Similar hairs on vertexspot. Postocular rim white, white haired. Callus convex. Palpi, first joint slightly reddishbrown, white haired, intermixed with some black hairs at apex, second joint

white tomentose, white haired at base, black haired at apex, which is rather blunt. Proboscis,

stalk white haired, sugarflaps brownblack, brownblack haired. Antennae, first joint pale ochraceous, white haired on dorsum, intermixed with some black hairs, distal lateral border white haired, second joint bright ochraceousyellowbrown, yellow tomentose; third joint, basal annulation 1,4 times as long as its widest part, 2 times as long as the redbrown stylus, tooth indistinct.

Thorax bluishgrey tomentose, yellowbrown haired on foreborder of scutum. Three greyish, white tomentose longitudinal stripes run from the foreborder to the scutellum. Lateral borders of scutum and scutellum pale brownyellow to yellowwhite, pale yellowbrown haired, intermixed with long white pubescence. Disc terracottabrown, back haired. Pteropleuron pale olivebrown, black haired. Breast and sides greyblue with brown areas, white haired. Wings clear yellowish, veins yellowbrown to pale olivebrown. Stigma dusky yellowbrown. Halteres, stalk redbrown, club luteous. Legs. First leg. Coxa greybrown, white haired, trochanter yellowisholivebrown, white haired. Femur violet olivebrown, black haired on dorsum, distal lateral border grey tomentose, white haired, knee brownyellow. Tibia brownyellow, yellow and white haired, intermixed with some black hairs on basal $\frac{2}{3}$, apex deep redbrown, black haired, ventral surface yellowwhite haired, tarsalia redbrown, black haired. Second leg. Coxa bluegrey, brown at apex, femur brownish strawyellow, dorsum with violet hue, white haired, intermixed with some black hairs. Tibia redbrownyellow, yellow haired, intermixed with some black hairs, apex redbrown, black haired, ventral surface yellow haired, except at the apical ring. First tarsale yellowish at base, apex redbrown, black haired, other tarsalia redbrown, black haired. Third leg, femur oliveaceous yellowbrown, pubescence white, some black hairs intermixed on dorsum. Tibia strawyellowbrown, white haired, with a median row of black hairs on dorsum, apexring redbrown, black haired. Tarsalia havannabrownyellow, black haired.

Abdomen siennabrown, black haired, darker to the apex, segmentations cream-coloured. The median row of triangles extends till the 5th segment, an indication of a similar triangle being found on the sixth segment. Lateral spots round, golden-cream-yellowwhite haired, those on the 1st and sixth segment indistinctly visible, lateral borders of tergites broadly yellow haired. First segment bluishgrey tomentose near the median spot. Ventral surface white haired, with a median redbrown longitudinal band, segmentations paler, sides pale brown.

152. *Tabanus bubalophilus* nov. spec. (♀) Pl. 10, Fig. 5; Textfig. 166.

Habitat:

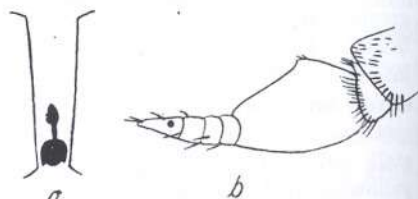
Type ♀ from Djambi, Sumatra on buffalo 4.22, MARSIDI Coll. V.S.L.

A slender olivebrown species, closely allied to *T. albopunctatus* SCHUURMANS STEKHOVEN from Java, differing however in the general colouring and other peculiarities, see there. Forehead yellowbrown, yellowwhite haired at base, black haired at vertex. Callus dark olivebrown, irregular square, linear extension spoon-shaped. Subcallus and upper cheeks dull ochraceous brown, lower cheeks and face white, white haired. Beard white. Palpi yellowishwhite, black and white haired. Antennae ochraceousyellow black haired, on basal joints, third joint broad, reddish dotteryellow. Thorax pale violetredbrown, black haired, with 3 whitish, white haired longitudinal stripes and similar lateral borders and hind-border of scutum and scutellum. Wings clear, veins yellowbrown. Legs straw-

yellow. Abdomen reddish yellowbrown, darker at apex, with 2 rows of lateral round white spots and a median row of indistinct similar dots.

Table of dimensions.

Bodylength	12,6 m.M.
Width of thorax	3,5 „
Width of abdomen	3,5 „
Wingexpanse	22,3 „
Length of head	2 „
Length of thorax	4 „
Length of abdomen	8 „
Length of wing	9,4 „
Breadth of wing	3.5 „
Foreheadindex	4,25



Textfig. 166.

T. bubalophilus s. s. ♀
a. forehead, b. antenna.

The Head. (Textfig. 166). Forehead $\frac{1}{3}$ narrower anteriorly than it is at vertex. Vertex-spot winered, triangular. Palpi, second joint stout at base, ventral outline straight, outer border strongly curved, ending acute. Proboscis yellowwhite haired on stalk, redbrown haired on sugarflaps. Antennae, basal annulation 1,3 times as long as its widest part, 1,13 times as long as the darker stylus. Tooth short.

Thorax as described, tufts at base of wings and behind white. Pteropleuron strawberryred, black haired. Sides and breast silverywhite haired. Wings clear, stigma coffeenutbrown. Halteres, stalk redbrown, club ochraceousyellow. Legs. First leg. Coxa violet pinkish ochraceousyellow, silverywhite haired. Femur same colour, dorsum black haired, distal lateral, border long white haired. Tibia pale yellowwhite, with a violet shadow, apex ochraceousyellow, dorsum provided with a row of black hairs, ventral surface mainly white haired, intermixed with some black hairs. Tarsalia ochraceousyellow, black haired. Second leg. Coxa greybrown, trochanter ochraceousbrown, femur violet-yellowbrown, white haired, some black hairs occurring at apex. Tibia pale yellowwhite, apex ochraceousyellow, dorsum black haired, ventral surface white haired, intermixed with a few black hairs. Spurs yellowbrown at base, black at apex. First tarsale pale yellowwhite, following ones ochraceous, black haired. Third leg. Coxa and trochanter coffeenutbrown, white haired. Femur similar, black haired at apex, yellowbrown haired elsewhere. Tibia strawyellow, apex redbrown, pubescence as on second leg. Tarsalia ochraceous-caramel-coloured, thick black haired.

Abdomen broad at apex, reddishyellowbrown on the basal 3 segments, darker dull greybrown to the apex. The mentioned lateral series of white spots are found on the segments 2—6. Lateral borders of tergites white, white haired. Further one finds a median row of white, white haired dots on the segments 1—6. Ventral surface, basal 2 segments redbrown, other segments brownish, with redbrown segmentations, pubescence on venter short, white.

GROUP XIII.

Group XIII is a heterogenous one. In the first place the material, serving as a base for this Group was very, but moreover several types are in bad condition and are partly or almost wholly rubbed. Therefore it is very difficult to me to give a short diagnose of the Group, as was done in other cases. The species possess

a median series of black spots on the back of their abdomen. Moreover white triangles or paler segmentations may occur in the same species. So some of the species show points of resemblance with species belonging to the first Group, whereas others look like species of the XIVth Group.

Possibly future researchers will embody species, brought by me under this heading in other groups, when more material is available. *T. pallidiventer* nov. spec. is not included in the Key.

KEY 23.

Synopsis of species.

- 1a. Median black spots occurring on at least 5 or 6 segments 2
- b. Number of black spots smaller 3
- 2a. Abdomen yellow-reddishbrown with square black spots, forming together a more less continuous stripe, covering the first 6 segments: Upper cheeks orangeousbrown, yellowbrown haired. Lower cheeks and beard white
atripunctatus SCHUURMANS STEKHOVEN.
- b. Abdominal spots roundish, blackbrown, occurring on the 2d—6th segments, not forming a more or less continuous stripe, segmentations white, yellowwhite haired. Eyes with the small-faceted part not prolonged to the vertex. Upper cheeks brownish-grey, black haired. Lower cheeks and beard brownishyellow haired
soembawensis SCHUURMANS STEKHOVEN ♂.
- 3a. Black spots or shadows on the first two segments..... 4
- b. Black spots arranged otherwise 5
4. Eyes with all facets equal. Upper cheeks black haired. Beard yellowish-brown. Antennae reddishbrown. Thorax with 2 reddishbrown longitudinal stripes. Legs with blackbrown femora and yellowbrown tibiae. Abdomen reddishbrown to blackbrown, first 5 segmentations yellow-fringed, elevated in the middle to yellowwhite triangular spots *spoliatus* WALKER ♂.
- 5a. Black triangular spots on the 2d—4th segments at base 6
- b. Black spots arranged otherwise 7
- 6a. Eyes with the small-faceted area prolonged to the vertex as a narrow border. Palpi cinnamonbrown, yellow haired, intermixed with a few black hairs at apex. Antennae with a distinct, but not very prominent tooth
mentitus. WALKER ♂.
- b. Palpi yellowbrown, blunt at apex, black haired. Antennae with a prominent tooth. Abdomen brownred on basal 4 segments, then blackbrown, with a series of low, yellowwhite haired triangles on the segments 2—5. Lateral borders of the first 5 tergites yellow haired
atrisignatus SCHUURMANS STEKHOVEN.
- 7a. Palpi reddishbrown, black or yellow haired. Antennae reddishbrown, third joint

yellowred at base, then duskyredbrown. Wings appendiculate. Abdomen with triangular white, white haired spots on the 1st—5th segment, resting upon these triangles one finds reversed black triangles on the 2d—5th segments

monilifer BIGOT.

- b. Palpi brownishwhite, acuminate, yellow haired at base, apex black haired. Antennae olivebrown, third joint redyellow. Wings without appendix. Abdomen dark olivebrown, bases of 3d—6th segments blackish. White hairs are scattered between the black ones and not arranged to triangular spots

subhirtus RICARDO.

153. *Tabanus atripunctatus* nov. spec. (♀). Pl. 6, Fig. 5; Textfig. 167.

Habitat:

Type ♀ and 3 other ♀ ♀ from Java, Dessa Koeto, Pekalongan on buffalo 27.9.'22 Coll. V.S.L.

2 ♀ ♀ from Dessa Krojo, Pekalongan 27.9.'22 on buffalo

6 ♀ ♀ „ Randoedongkal, Pekalongan on horse 27.9.'22 (Textfig. 167b).

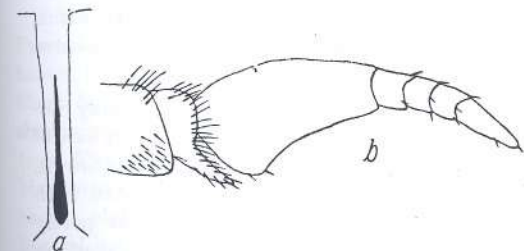
1 ♀ „ Tasikmalaja 29.7.'22 (Textfig. 167a).

A median-sized species. Forehead narrow, goldenbrown, yellow haired. Callus dark redbrown, pear-shaped, linear extension long, blackredbrown. Subcallus goldenyellowbrown, upper cheeks orangeousbrown, yellowbrown haired, lower cheeks white, white haired, face yellowish, white haired. Beard white. Palpi cinnamonbrown, ending blunt, yellow and black haired. Antenna yellowredbrown, black haired on basal joints, third joint darker to black, with inconspicuous tooth. Thorax deep blackbrown, brownyellow tomentose, black and brownish haired. Wings brownish. Legs reddishyellowbrown. Abdomen yellowredbrown, darker to the apex, black haired, with a median series of blackish square spots, on the segments 1—6 forming a more or less continuous stripe.

Table of dimensions.

Bodylength	varying from 14,5 m.M. to 17 m.M.			
Width of thorax	„	„	4,4 „ — 5,2 „	„
Width of abdomen	„	„	4,8 „ — 6 „	„
Wingexpanse	„	„	29,4 „ — 33 „	„
Length of head	„	„	2 „ — 2,8 „	„
Length of thorax	„	„	5,8 „ — 6,8 „	„
Length of abdomen	„	„	7 „ — 10,2 „	„
Length of wing	„	„	12,2 „ — 14 „	„
Breadth of wing	„	„	4 „ — 5 „	„
Foreheadindex	„	„	6,5 „ — 8,6 „	„

The Head. (Textfig. 167). Forehead 0,11—0,25 narrower anteriorly than it is at vertex, vertexspot small. Postocular rim yellow haired. Palpi, first yellowbrown haired, second joint swollen at base, yellow and black haired. Antennae, first joint yellowredbrown, dorsum black haired, distal lateral border and ventral surface yellowbrown haired, second joint redbrown, black fringed, third joint redbrown at base, then duskier, basal annulation 1,64 times as long as its widest part, 1,1 times as long as the black stylus. Proboscis, stalk yellowbrown or white haired, sugarflaps black and brownyellow haired.



Textfig. 167.

T. atripunctatus s. s. ♀. a. forehead, b. antenna.

dorsum black haired, distal lateral border pale yellowbrown haired, intermixed with some black hairs, knee orangeousredbrown. Tibia pale brownish yellow, yellow brownish haired, intermixed with a few black hairs on basal $\frac{2}{3}$, apex redbrown, black haired, ventral surface yellowbrown haired. Tarsalia redbrown, black haired. Second leg. Coxa greyish dull redbrown, brownyellow haired, trochanter deep violetbrown, yellow haired, femur blackish at base, then orangeous, yellowwhite haired, intermixed with a few black hairs. Tibia same colour, paler orange to strawyellow, yellowwhite haired, redbrown at extreme base and at the black haired apex. First tarsale redbrown, black haired, other tarsalia black, black haired also. Third leg. Coxa and trochanter yellowwhite haired, femur blackish leatherbrown, mainly yellow haired. Tibia orangeousyellowbrown, dorsum black haired, ventral surface yellowbrown haired.

Abdomen conical, black haired, on the first segment one finds a yellowwhite spot at each side of the scutellum, segmentations reddish orangeousyellowbrown. Lateral borders of tergites yellow haired. Ventral surface orangeousyellowbrown, yellowbrown haired, seventh segment wholly black haired.

154. *Tabanus soembawensis* nov. spec. (♂) Textfig. 168.

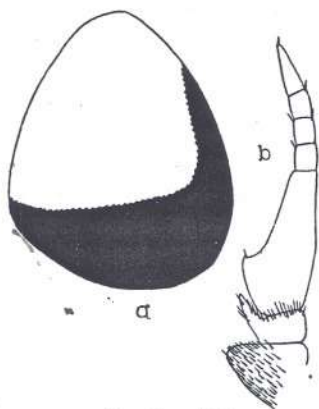
Habitat:

Type ♂ from Soembawa, VAN LANSBERG

Coll. L.M.N.H.

A species allied to *T. atrisignatus* SCHUURMANS STEKHOVEN, but distinguishable inter alia by the pubescence on the cheeks, the colouration of the wings, the colour and pubescence of the tibiae, the shape of the abdomen and its markings, etc. Small-faceted eyepart large, covering almost the half of the eyesurface, not extending to the vertex. Subcallus dull yellowbrown, blackbrown at apex. Cheeks and face brownish grey, upper cheeks black haired, lower cheeks and beard brownishyellow haired. Palpi dirty yellowbrown, black haired. Antennae yellowbrown to redyellow and black, black haired. Thorax brown, dark brown haired, breast yellow haired. Wings brownish. Legs dark brown, mainly

black haired. Abdomen tawnyyellowbrown to blackbrown, black haired, segmentations white, yellowwhite haired. Body length 17.8 m.M.; Width of thorax 7 m.M.; Wingexpanse 39 m.M.; Length of wing 16 m.M.; Length of abdomen 11 m.M.



Textfig. 168.

T. soembawensis s. s. ♂.

a. eye, b. antenna.

The Head. (Textfig. 168), Eyes dark, as described, subcallus, etc. idem. Antennae first joint yellowbrown, grey tomentose, black haired, second joint reddishyellowbrown, black fringed, dorsal spur long, third joint redyellow at base till the level of the prominent triangular tooth, then black, basal annulation 2 times as long as its widest part, about as long as the black stylus.

Thorax blackbrown, brownblack haired, mainly rubbed, remainder of tomentum velvetybrown. Tufts at base of wings and behind yellow, pteropleuron reddishyellowbrown, black haired. Sides and breast greybrown, clothed with long, loose, yellow pubescence, mesosternumlobus partly black haired. Wings brownish, distinct brown shadows accompanying all veins, foreborder yellowbrown, stigma burnt-sienna coloured. Halteres yellowbrown. Legs. First leg. Coxa greybrown, blackbrown at apex, whitish-yellow haired. Trochanter reddbrown, yellow haired. Femur blackbrown, apex reddish, dorsum black haired, distal lateral

border brownish tomentose, yellow haired. Tibia reddishyellowbrown at base, apical half blackbrown, dorsum black haired, ventral surface yellow haired on basal half only, rest black haired. Second leg, femur, blackbrown, knee yellowbrown, dorsum black haired on apical half, yellow haired at base and along the distal lateral border, tibia with narrower apical band, dorsum black haired, ventral surface yellow haired. Tarsalia as in first leg, black, black haired. Third leg similar, tibia with thick dorsal black hairfringes.

Abdomen tawnyyellowbrown on first 4 segments, following segments blackbrown, black haired, except on the white, yellow haired segmentations and on the distal lateral borders of the tergites. Roundish blackbrown shadows are visible on the 2d till 6th segment in the middle, not forming a more or less continuous stripe. Ventral surface identical, first segment wholly yellow haired, second segment yellow haired at base and at segmentation, remainder black haired, following segmentat till the 6th, black haired at base, yellow haired on the segmentations.

155. *Tabanus spoliatus* WALKER (♂)

References:

WALKER, Proc. Linn. Soc. London, IV, p. 103 (1860).

Habitat:

Type ♂ and another ♂ from Celebes, Macassar, A. R. WALLACE Coll. BR.M.

Resembling in general appearance to *T. rubidus* WIED., but differing from it inter alia by the absence of the lateral abdominal stripes, and the presence of a black spot on the second abdominal segment. Eyes with all facets equal. Subcallus brownishgrey, cheeks grey, upper cheeks black haired, lower cheeks grey haired. Beard yellowishbrown. Palpi club-shaped, yellowbrown yellow haired at base, black haired at apex. Antennae reddishbrown. Thorax greybrown, especially so on foreborder, with 2 reddbrown longitudinal stripes, blackbrown haired. Wings clear. Legs with blackbrown femora and yellowbrown tibiae.

Abdomen reddishyellowbrown, black haired, on first 4 segments, blackbrown to the apex, on first 5 segments median yellowwhite triangles are present connected with the yellowfringed segmentations, which are broader at the lateral borders, but do not embrace them.

The Head. Antennae, first joint black haired on dorsum, ventral surface reddbrown haired, second joint black fringed, dorsal spine rather long, third joint broken off.

Thorax, grey on foreborder of scutum, disc brownish, hindborder white tomentose. Pteropleuron yellowbrown, black haired. Hindborder of scutum and scutellum isabella-yellowbrown haired. Sides and breast brownishyellow tomentose, grey haired, mesosternumlobus black haired. Wings clear, foreborder yellowbrown, stigma havannabrown, reddishbrown shadows accompanying the reddishbrown veins. Halteres, stalk reddishbrown, club yellowwhite. Legs. First leg. Coxa greyishbrown, dirty yellowishbrown haired, trochanter reddbrown, femur blackbrown, black haired, knee yellowbrown. Tibia blackbrown at extreme base, then yellowbrown, clothed with some yellow hairs, apex dark blackbrown, black haired. Tarsalia black, Second leg. femur identical, tibia with larger yellowbrown portion, first tarsale blackbrown, black haired. Third leg. Coxa greybrown, yellow haired, trochanter blackbrown, femur black haired on dorsum, some goldenyellow hairs being visible at apex, distal lateral border yellowbrown haired. Tibia yellowbrown, apex olivebrown, dorsum black haired, ventral surface yellow haired. First tarsale reddbrown, black haired, other tarsalia black.

Abdomen. Second segment with a median black spot, first segment with a blackish shadow and a median yellowwhite hairtuft, triangular spots occurring on the following segments till the fifth segment. Lateral borders of tergites partly black, partly yellow haired. The sixth tergite shows some yellowish hairs at the segmentation, intermixed between the black hairs. Ventral surface reddishyellowbrown, black haired, segmentations yellowwhite haired, seventh segment wholly black haired.

156. *Tabanus mentitus* WALKER. (♂) Textfig. 169.

References:

WALKER, List Diptera I, p. 162 (1848).

RICARDO, Rec. Ind. Mus. IV, p. 175 (1911).

Habitat:

Type ♂ from China

This species is closely allied to *T. monilifer* BIGOT.



Textfig. 169.

T. mentitus Wlk. ♂. a. eye, b. antenna, the dotted line indicates the limit between yellow and black area.

The Head. (Textfig. 169). Eyes with large black-faceted part, covering 2/3 of the whole surface, small facets reaching the vertex. Palpi cinnamonbrown, yellow haired, with a few black hairs at apex only. Antennae, second joint with distinct spur, third joint, stylus broken off, reddish-yellow at base, then, beyond

the distinct tooth, black, basal annulation 2,4 times as long as its widest part.

Thorax. Wings tinged yellowishbrown.

Abdomen with white triangles on the 2d—4th segment, reversed black triangles resting upon them. Last 3 segments black. Ventral surface reddishyellowbrown, yellow haired.

157. *Tabanus atrisignatus* nov. spec. (♀). Textfig. 170.

Habitat

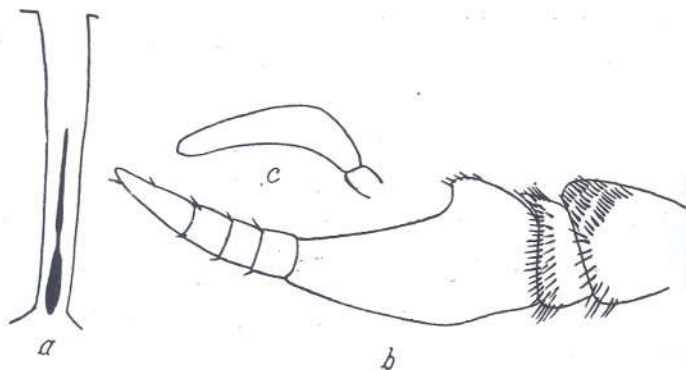
Type ♀ and another ♀ from Soemelata, North Celebes, SCHROEDER

Coll. L.M.N.H.

T. atrisignatus is closely allied to *T. fuscomaculatus* Ric. distinguishable inter alia by the colour and shape of the palpi, the colour of the tibiae, the absence of an appendix, etc. Forehead narrow, dull velvetybrown, black haired. Callus elongate cylindrical, mahoganybrown, linear extension long. Subcallus and upper cheeks dull pale havannabrown, yellowwhite haired. Lower cheeks greyishyellow, white haired. Beard white. Face brownishyellow, yellowwhite haired, with some black hairs at base. Palpi yellowbrown, black haired. Antennae reddishyellowbrown, black haired, third joint with a distinct tooth, darker at apex. Thorax dark havannabrown, yellowbrown and black haired. Legs with blackbrown femora and more or less yellowbrown tibiae. Abdomen brownred on the basal 4 segments, then blackbrown, black haired, with a series of low, yellowwhite haired triangles on the segments 2—5. At the base of the 2d and 3d or of the 2d—4th segment one finds a median black triangular spot. Lateral borders of the first 5 tergites yellow haired. Length 19 m.M.; Width of thorax 6,2 m.M. Wingexpanse 38,6 m.M.; Length of wings 6,2 m.M.; Length of abdomen 11 m.M.

The Head. (Textfig. 170). Forehead 0.34 narrower anteriorly than it is at vertex index 9,4. Callus not reaching to the eyes. Palpi yellowbrown, first joint yellowwhite haired, intermixed with some black hairs at apex, second joint slightly swollen at base, ending with a long, blunt point, black haired. Antennae, first joint reddishyellowbrown, first joint protruding caplike over the second, brownred joint, both black haired, the latter bearing a distinct dorsal spur. Third joint brownred at base, then blackbrown, basal annulation 1,7 times as long as its widest part, 1,3 times as long as the black stylus. Tooth broad triangular.

Thorax. Scutum as described, foreborder of the same dull velvetybrown tomentose. Tufts at base of wings and behind brownishyellowwhite. Pteropleuron mainly black haired, Scutellum same colour as scutum. Sides and breast greyish sootybrown, yellowwhite haired, mesosternumlobus black haired. Wings grey, foreborder yellowbrown, stigma dull yellow.



Textfig. 170.

T. atrisignatus Ric. ♀. a. forehead, b. antenna, c. palpe.

lowbrown. No appendix present. All posterior cells widely open. Halteres yellowbrown. Legs. First leg. Coxa dull greybrown, brownishyellowwhite haired, trochanter blackbrown, femur blackbrown, black haired on dorsum, dark havannabrown tomentose, brownishyellowwhite haired at distal lateral border, intermixed with some black hairs especially at upper border. Tibia reddishyellow, yellow haired, intermixed with some black hairs on basal 1/4, then blackbrown, black haired. Tarsalia black, black haired. Second leg, trochanter greyishredbrown, yellowwhite haired, femur dull blackbrown, yellowwhite haired at base along the distal lateral border, middle portion black haired, knee bright yellowbrown, orangeousyellow haired. Tibia bright yellowbrown, reddishyellowbrown at apex, dorsum black haired, ventral surface orangeousyellow haired, tarsalia blackbrown, black haired. Third leg, femur sooty blackbrown, grey tomentose, mainly yellow haired except on dorsum near the base, where one finds a row of black hairs. Tibia as in second leg, darker, blackbrown on the apical ring, dorsum black haired ventral surface orangeousyellow haired. Tarsalia indentical.

A b d o m e n as described above. Segmentations to the 2d to 5th segment pale yellowbrown. First segment with a median group of yellowwhite hairs and two other similar groups, one at each side of the scutellum. I mentioned already the black spots, to be found in the type ♀ on the 3d and 2d segment only, in the other ♀ on the 2d—4th segment. Ventral surface reddishyellowbrown on the first 4 segments, those being yellow haired at sides and segmentations, middle portion mainly yellow haired, intermixed with a number of black hairs. Following 2 segments blackishred to blackbrown, black haired at bases, yellowbrown, yellow haired at the segmentations. Seventh segment wholly black haired. Second ♀ darker on the ventral surface, bases of the 3d—6th segment reddishbrown, black haired, segmentations yellow haired.

158. *Tabanus monilifer* BIGOT (♀). Textfig. 171.

References:

- BIGOT, Mém. Soc. Zool. de France V, p. 654 (1892).
RICARDO, Rec. Ind. Mus. IV, p. 173 (1911).

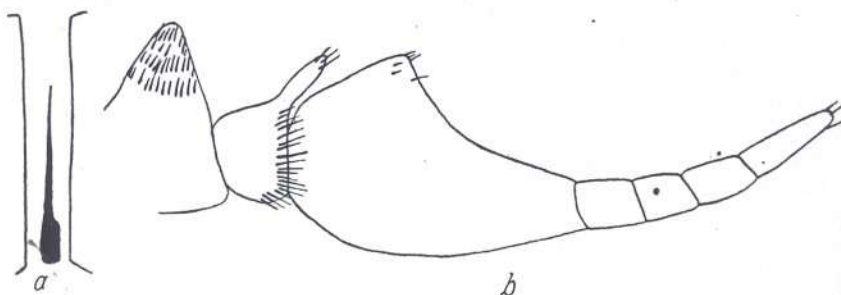
Habitat:

- | | |
|---|-------------|
| Type ♀ from India, Assam, N. Khasi Hills, BIGOT | Coll. BR.M. |
| 1 ♀ from Khasi Hills '96, GOODWIN AUSTEN | |
| 1 ♀ „ Khasi Hills '96, SLADEN '98 | |
| 1 ♀ „ Khasi Hills, lower Ranges, CHENNEL '96 | |
| 2 ♀ ♀ „ Kolaw, S. Shen. States, 400 Feet, 4.'14, MACKWOOD | |

A brownish species, closely allied to *T. mentitus* Wlk., distinguished inter alia by the much broader basal annulation of the third antennal joint, colour and pubescence of the palpi, and pubescence of the abdomen. The type ♀ is slightly denuded, so I will give its description, perfected with the particulars, taken from the other females.

The Head. (Textfig. 171). Forehead yellowishbrown, almost the same width throughout, index 5.4. Callus redbrown, elongate cylindrical, not reaching the eyes, linear extension long, pointed. Subcallus as frons. Beard yellowwhite. Palpi redbrown, ending in a short, rather acute point, black haired in the type. In one of the MACKWOOD females they were almost wholly yellow, mainly yellow haired, intermixed with a few black hairs. Antennae (the first

MACKWOOD ...) redbrown, black haired on first and second joint, the latter with long dorsal spur, third joint yellowed at base, then dusky redbrown, basal annulation 1,4 times as long as its widest part, 1,1 times as long as the darkedbrown, blackish stylus. Tooth distinct, blunt.



Textfig. 171.

T. monilifer BIGOT ♀. a. forehead, b. antenna.

T h o r a x covered with mould. Breast slateblue, yellowbrown haired. Wings with yellowbrown foreborder and brown shadows along the veins, appendix long. Legs brownish. First leg. Coxa brownishgrey, yellowgrey haired, trochanter blackbrown, femur dull olivebrown, dirty olivebrown haired, knee yellowbrown. Tibia yellowbrown, yellow haired on basal 2/3, then blackbrown, black haired. Tarsalia black. Second leg missing. Third leg. Coxa bluishgrey, yellowwhite haired, intermixed with some redbrown hairs. Femur velvety-blackbrown, black haired on dorsum, white haired on distal lateral border, knee yellowbrown, yellow haired. Tibia redbrown, darker at apex, dorsum black haired, rustybrown haired below.

A b d o m e n reddishyellow, darker at apex, marked with a number of median triangular, white, white haired spots on the 1st—5th segment, resting on them, except on the 1st segment, reversed black triangles are to be found. The sixth segment apparently also possesses a similar white hairtuft. Ventral surface brownish, with a row of median black, black haired patches, sides and segmentations redbrown, yellow haired.

159. *Tabanus subhirtus* RICARDO. (♀) Textfig. 172.

Syn. *Atylotus cinerascens* BIGOT nomen bis lectum.

References:

BIGOT, Mém. Soc. Zool. France V, p. 669 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 219 (1911).

Habitat:

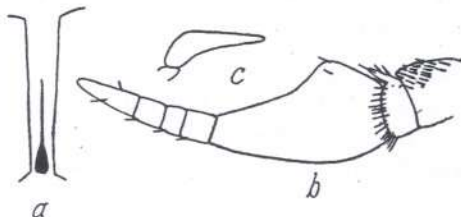
Type ♀ from Java, ex Coll. BIGOT

Coll. BR. M.

A brownish species. Forehead pale yellowwhite, brownishyellow tomentose, black haired, intermixed with some yellow hairs. Callus pear-shaped, dark yellowbrown, linear extension filiform. Cheeks and face greywhite, white haired, Beard white. Palpi brownishwhite, acuminate, yellowwhite haired at base, apex black haired. Antennae olivebrown, black haired on basal joints, third joint redyellow. Thorax browngrey, yellowwhite and black haired on scutum

and scutellum. Wings clear. Legs brownish. Abdomen dark olivebrown, bases of the 3d till 6th segments blackish. Length 12 m.M.

The Head. (Textfig. 172). Forehead 1/3 narrower anteriorly than it is at vertex, index 6.6. Callus not reaching to the eyes. Face with a small number of black hairs just under the antennae, elsewhere black haired. Palpi, second joint swollen at base, ending in a fine point, yellow haired at base, apex black haired, intermixed with some yellowwhite hairs. Antennae, first joint black haired on dorsum, intermixed with a number of yellow hairs, which are especially numerous along the lateral borders and on the ventral surface, second joint black fringed, dorsal spine distinct, third joint, basal annulation 1.66 times as long as its widest part, only indistinctly longer than the slightly darker stylus, which is black tipped. Tooth blunt, situated near the base, provided with 2 black hairs.



Textfig. 172.

T. subhirtis RIC. ♀.

a. forehead, b. antenna, c. palpe.

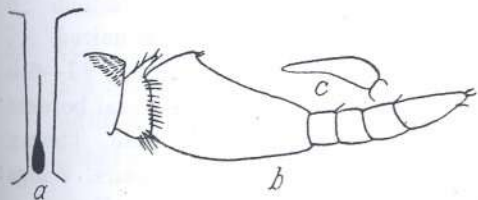
Thorax browngrey on foreborder, yellowwhite haired, intermixed with black hairs. Scutellum same colour. Pteropleuron reddbrown, black haired. Breast grey, dirtywhite haired. Halteres reddbrown. Wings clear, veins dark dark yellowbrown, stigma pale yellowbrown. Legs. First leg. Coxa greybrown, white haired, femur olivebrown, black haired on dorsum, distal lateral border white haired. Tibia whitish at extreme base, then olivebrown, apex darker brown, black haired. Tarsalia black. Second leg. Coxa, trochanter and femur oliveyellowbrown, white haired on femur, tibia same colour, yellowwhite haired below, with a median row of black hairs on dorsum. Tarsalia reddbrown, black haired. Third leg identical, tibia white haired below, black haired on dorsum. Tarsalia black haired.

Abdomen as mentioned, black and white haired, the white hairs being scattered regularly over the segments, ventral surface greybrown, olivebrown at these segmentations, yellowwhite haired, intermixed with black hairs. Seventh segment with a small number of white hairs only.

160. *Tabanus pallidiventer* nov. spec. (♀) Textfig. 173.

In the British Museum Collection I studied a second female from Bengal, placed by RICARDO under the same heading. AUSTEN annotated: „Regarded by Miss RICARDO as belonging to *T. subhirtus*, but apparently distinct, confer the frontal callus in ♀ and hairs on dorsum of thorax, especially scutellum E. A. 22.11.'22 nov. spec.?"

Some particulars may be mentioned.



Textfig. 173.

T. pallidiventer s.s. ♀.

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 173). Subcallus reddishbrown, as are the upper cheeks. Lower cheeks greywhite, white haired. Palpi yellowwhite, pubescence as in *subhirtus* type. The differences between the frontal calli of both specimens are unnoticeable.

Thorax grey on foreborder, rest pale olivebrown, yellow and black haired, scutellum bordered yellowish, clothed with longer pubescence. Legs as in *subhirtus* type.

Abdomen with a darker broad median, mainly black haired area, intermixed with a few yellow hairs, each segment till the 5th presents a paler yellowbrown, mainly yellow haired stripe, lateral borders of tergites 1-6 yellowwhite haired. Ventral surface yellowwhite haired.

The abdomen shows a quite distinct aspect as was found in *T. subhirtus* and although the differences of the other bodyparts are small and the specimens were in rather bad condition, so that several parts in *T. subhirtus* BIGOT could be described superficially only, I believe AUSTEN has right to separate this specimen from *T. subhirtus* BIGOT.

GROUP XIV.

This Group embraces all species with a usually brown or yellowbrown, body, the abdomen being ornated with a median series of white or yellow haired triangles or halfmoon-shaped spots, segmentations often paler than the remainder of the segments. Eyes in life green on lower half. Forehead narrow. Antennae usually dark. Beard white, yellowwhite or ochraceousyellow. Legs with the tibiae usually dark yellowbrown. Wings in most species clear and without appendix, in other species showing brown shadows along the veins.

KEY 24.

Synopsis of species.

- | | | |
|-----|---|---|
| 1a. | Median abdominal spots white haired | 2 |
| b. | Median abdominal spots yellow haired | 9 |
| 2a. | Beard dark reddbrown | 3 |
| b. | Beard white or yellowwhite | 4 |
| 3. | Antennae blackish. Thorax dark brownblack, black haired. Wings brownish. Legs dark chestnutbrown. Median abdominal triangles occurring on the segments 1-5, silvery-white haired, posterior angles of dorsal scutes white fringed, 2d segment with a black, straight-sided stripe
<i>argentsignatus</i> SCHUURMANS STEKHOVEN. | |
| 4a. | Abdominal spots distinct | 5 |
| b. | Abdominal spots indistinct | 8 |
| 5a. | Lateral borders of abdominal tergites, wholly or partly white haired | 6 |
| b. | Lateral borders of abdominal tergites wholly or partly yellow haired | 7 |
| 6a. | Abdomen with a median series of huge white triangles on the 2d-6th segments and a square white blotch on the first segment. Lateral borders of first 5 tergites yellowbrown, white haired. Palpi obtuse. Thorax chestnutbrown, black haired, intermixed with some white hairs. Wings brownish along the veins
<i>indianus</i> RICARDO. | |
| b. | Segmentations with fine white hairfringes, elevated to rather low triangles on the 2d till 5th segments, 1st and 6th segment with median white | |

hairtufts. Lateral borders of first 3 tergites white haired. Callus reaching the eyes. Palpi acuminate. Thorax greyishbrown, black and yellow-white haired. Wings clear **dissimilis** RICARDO.

- 7a. Abdomen broad, dull chestnutbrown, with median white, white haired triangles on the 2d to 6th segments, lateral borders of the 2d—5th tergites with yellow hairtufts, ventral surface with yellow haired segmentations to the 2d to 5th segments. Callus not reaching the eyes. Palpi obtuse. Wings faintly tinged brown **factiosus** WALKER.
- b. Abdomen reddishyellowbrown, black haired, median spots, beginning on the 3d segment in the type ♀, white haired, in another ♀, the segmentations 2—5 are pale, yellow haired; elevated to median yellow haired triangles, lateral borders of tergites yellowwhite haired. Palpi as in *dissimilis* **ignobilis** RONDANI.
8. Body median-sized. Callus cylindrical. Lower cheeks reddishyellowwhite haired. Beard pale yellowbrown. Antennal tooth distinct. Abdomen brickred at base, then chestnutbrown, second segment with a median dark shadow. Abdominal triangles occurring on the 2d to 6th segments. Lateral borders of the first 5 tergites yellow haired **albitriangularis** SCHUURMANS STEKHOVEN.
- 9a. Median abdominal spots very low and indistinct 10
- b. Median spots triangular or halfmoon-shaped, always larger..... 11
10. Callus club-shaped, redbrown to black; linear extension long. Lower cheeks yellowbrown, black and yellow haired. Beard pale brownish white. Antennae redbrown, slender, tooth distinct. Abdomen dull redbrown, with median low copper-redyellow tufts at the 2d to 5th segments; 1st segment with a median group of yellowbrown hairs, lateral borders of the first 5 tergites yellowbrown haired **incultus** VAN DER WULF
- 11a. Beard blackbrown 12
- b. Beard ochraceousyellow, pale yellow or yellowwhite..... 13
- 12a. A brownblack species. Cheeks chocolatebrown, black haired. Legs blackbrown, black haired. Abdomen reddish blackbrown with median small goldenbrown haired, halfmoon-shaped spots on the first 5 segments, ventral surface: segmentations yellow fringed **succurvus** WALKER.
- b. Eyes with voluminous small-faceted part, not reaching the vertex, face and cheeks ferrugineous, blackbrown haired. Thorax reddishbrown, redbrown haired, breast yellowbrown haired. Wings brownish to reddishbrown. Abdomen bright redbrown, segmentations yellowbrown haired **ceramensis** SCHUURMANS STEKHOVEN. ♂
- 13a. Abdomen with peculiar white, triangular or halfmoon-shaped spots, embraced by darker shadows 14
- b. Not so 17

- 14a. Abdominal markings triangular 16
 b. Abdominal markings halfmoon-shaped 15
- 15a. Beard yellow. Thorax with 2 longitudinal blackbrown stripes. Wings brownish. Abdomen with the median spots yellowwhite haired, occurring on the 5d—5th segment, other median yellow hairtufts being found on the 1st and 6th segment. Lateral borders of tergites with yellowbrown, yellow haired triangles **parallelifrons** SCHUURMANS STEKHOVEN.
- b. Beard bright ochraceousyellow. Cheeks and face ochraceousyellow haired. Thorax reddish-blackbrown, goldenbrownyellow haired, intermixed with black hairs. Wings rather clear, first posterior cell narrower at opening. Legs black. Abdomen with a quadrangular goldenyellow haired spot on the first segment, other markings on the 2d—5th segment covered with the same pubescence, lateral borders of tergites with yellow haired triangles **brunneus** MACQUART.
16. Beard yellowbrown. Cheeks and face yellowbrown haired. Abdomen with narrowly paler, copper-redyellow haired segmentations, elevated to median, distinct triangles on the 3d till 6th segments; lateral borders of the same tergites marked with yellow haired triangles, first segment with a median yellow hairtuft **malayensis** RICARDO.
- 18a. Median spots on a small number of segments (2) only 18
 b. Number of median spots greater 19
- 18a. Abdomen pale yellowbrown on basal 3 segments, then blackbrown, 1st and 2d segments with yellowwhite haired median tufts and similar lateral borders, venter yellow haired on basal 3 sternites, rest black haired. Wings with fine apical shadow. Scutum yellow haired, scutellum black haired. Cheeks mummibrown, black haired. Beard black and white **fulgidus** RICARDO.
- b. Abdomen reddishblackbrown, second segment with a black longitudinal shadow, 4th and 5th segment with median yellow hairtufts, ventral surface with a median blackbrown band, sides and segmentations yellow haired. Wings clear. Eyes with a narrow small-facettled border reaching to the vertex **extricans** WALKER ♂.
- 19a. The hairs at the segmentations not distinctly arranged to triangles, moreover many yellow hairs are scattered over the dorsal scutes.... 20
 b. Median abdominal triangles distinct and generally rather high.... 21
 c. Median abdominal spots low and sometimes indistinctly triangular 28
20. Abdomen uniformly redbrown, black haired, yellow hairs are sattered over the dorsal scutes and condensed to indistinct median spots on the 2d—5th segments. Lateral borders of tergites yellow haired. Ventral surface, sides and segmentations broadly yellow haired, elsewhere black haired. Wings pale brown. Legs yellowbrown. Beard yellowishwhite **aurisparsus** SCHUURMANS STEKHOVEN.

- 21a. Abdomen voluminous, ending broad 22
 b. Abdomen less swollen, conical or blunt, narrower..... 23
 22a. Upper cheeks ferrugineous, black haired. Beard pollen yellow. Abdomen short and broad, with faint triangular, yellow haired median spots on the 2d—5th segments, a median square tuft on the first and a yellow tuft on the sixth segment. Segmentations yellow fringed. Lateral borders of tergites black haired nexus WALKER.

- b. Upper cheeks redbrown, lower cheeks yellowbrown, yellowbrown haired. Beard same colour. Thorax grey tomentose on foreborder, elsewhere dark havannabrown, red-yellowbrown haired. Wings brownish, first posterior cell slightly narrower at opening. Abdomen longer, ending blunt, tawnyredbrown, black haired, with median, redyellowbrown haired triangles on the 1st till 6th segments, same pubescence on the triangles at the lateral borders of the first 5 tergites

lativenter SCHUURMANS STEKHOVEN.

- 23a. Segmentations yellow haired or yellow fringed 24
 b. Yellow hairs restricted to the median spots 25
 24a. Cheeks and face greybrown, yellow haired. Body yellowbrown. Abdomen tawny on basal 5 segments, then blackbrown, segmentations of the first 5 segments white, yellowbrown haired, median triangles comparatively low, 6th segment with a median white triangle only, lateral borders of the first 5 tergites yellowbrown, yellow haired

flavitriangularis SCHUURMANS STEKHOVEN.

- b. Forehead very narrow, index 6,9—11. Callus reaching almost to the eyes, usually gradually tapering to the linear extension. Cheeks and face pale yellow to orangeousyellow, yellowwhite haired. Beard yellowwhite. Palpi obtuse. Wings brownish, first posterior cell slightly narrower at opening. Legs greybrown. Abdomen short, orangeousyellowbrown, segmentations and markings yellow haired, other yellow hairs being scattered usually other the discs of the dorsal scutes. Lateral borders of tergites yellow and black haired. Male with the black-faceted eyepart narrow fumifer WALKER.

- 25a. Median spots high and narrow 26
 b. Median spots lower and broader 27
 26. Foreheadindex 7,7—10. Beard white. Palpi obtuse. Legs dark. Abdomen mahoganybrown, elongate, narrow, the usual pale yellow haired markings on the 1st to 5th sement, lateral borders of tergites black haired, except in the tufts of white hairs at the lateral borders of the 3d and 4th segment angustitriangularis SCHUURMANS STEKHOVEN.

27. Foreheadindex 6,2—8,8. Beard yellowwhite. Palpi acuminate. A rather wide distance separates eyes and callus. Callus and linear extension not

- passing gradually into each other. Abdominal markings yellow haired, lateral borders of tergites yellow haired also **immanis** WIEDEMANN.
- 28a. Foreheadindex 5—5,8 29
- b. Foreheadindex 7 30
- 29a. Callus broad, pear-shaped, linear extension short, broad. Palpi slender, ending in a long blunt point, yellow haired. Wings with the first posterior cell slightly narrower at opening. Abdominal segmentations with indistinct yellow haired median triangles **internus** WALKER.
- b. Callus shield-shaped, linear extension fine, pointed. Beard yellowwhite. Palpi acuminate, yellow haired, intermixed with a few black hairs. Abdomen with white median triangles and paler segmentations, lateral borders of first 6 tergites yellow haired, ventral surface yellowwhite haired on first 5 sternites, 6th segment black haired, segmentation yellow haired **rubicundus** MACQUART.
- 30a. Abdomen blackbrown with triangular white, yellow haired median spots on the 2d—5th segments, venter brown, yellow haired. Callus cylindrical. Cheeks ferrugineous. Beard dirty brown. Palpi obtuse. Wings tinged brownish **laotianus** BIGOT.
- b. Abdomen paler 31
- 31a. Body redbrown. Subcallus and upper cheeks ferrugineous, black haired, lower cheeks yellowishwhitegrey, brown haired. Beard greyishwhite to yellowbrown. Palpi yellowbrown. Scutum reddishbrown, yellowish-redbrown haired. Wings with the first posterior cell slightly narrower at opening. Abdomen dark redbrown with median low yellow hairtufts on the 2d—4th or 1st—6th segments. Lateral borders of tergites yellow haired **serus** WALKER.
- b. Body tawnybrown. Subcallus, cheeks and face dark redbrown, black haired. Beard white, intermixed with a number of blackbrown hairs near the mouth. Palpi redbrown. Scutum brown, with traces of longitudinal stripes, black and redyellow haired. Abdomen tawnybrown with small yellow hairtufts on the 1st—5th segments and lateral fringes, not reaching to the middle on the 2d—4th segments, lateral borders of tergites black haired **rubriventris** MACQUART.

161. *Tabanus argentsignatus* nov. spec. (♀). Textfig. 174.

Habitat:

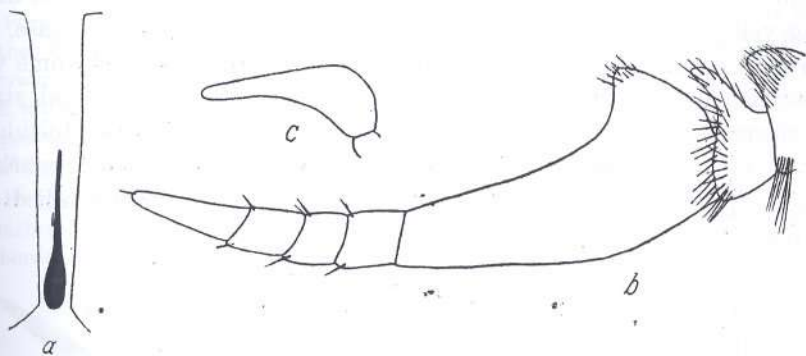
Type ♀ from Timor, Koepang 16.5.'90, WALKER

Coll. B.R.M.

On a label, attached to this specimen Major AUSTEN wrote: „allied to *T. brunneus* MACQ. (nec THUNB.) but distinguished in the female sex inter alia by somewhat larger frontal callus, by absence of short, appressed, glistening

golden hairs on dorsum of thorax, by median triangles on dorsum of abdomen, being reduced in size, and clothed with silverywhite, instead of buffyyellow hairs, by pale markings on posterior angles of dorsal abdominal scutes, consisting simply of small fringes of silvery white hairs on the first 4 segments, and by the groundcolour of the venter being entirely black or blackishbrown."

The Head. (Textfig. 174). Forehead darkredbrown, 0,4 narrower than it is at vertex index 8,55. Callus egg-shaped, reddbrown, linear extension short. Subcallus and upper cheeks reddbrown, lower cheeks and face bluishgrey, dark reddbrown haired. Beard same colour. Palpi swollen at base, ending with a slender blunt point, dark reddbrown, black haired. Antennae blackish, black haired, second joint with a rather long blunt dorsal hump and a double hair-fringe, third joint with distinct tooth, basal annulation 1,8 times as long as its widest part, 1,18 times as long as the stylus.



Textfig. 174.

T. argentisignatus s.s. ♀. a. forehead, b. antenna, c. palpe.

Thorax dark brownblack, black haired. Pteropleuron paler reddishbrown. Breast pale chocolatebrown, white haired, mesosternumlobus dark blackbrown, black haired. Wings brownish, foreborder reddishyellowbrown, stigma large, yellowbrownred. Halteres, stalk reddishbrown, club yellowwhite. Legs reddbrown. First leg. Coxa dull reddbrown, reddbrown and white haired, trochanter reddishbrown, femur, tibia and tarsalia chestnutbrown, blackbrown haired. Second leg missing. Third leg incomplete, coxa and trochanter greyreddbrown, blackbrown haired, femur chestnutbrown, same pubescence.

Abdomen reddbrown to blackbrown, black haired, with the mentioned markings on the first 5 segments and a median black, straight-sided stripe on the second segment, venter reddbrown, black haired, segmentations to the first 4 segments paler, white haired.

162. *Tabanus indianus* RICARDO. (♀) Textfig. 175, 176.

References:

RICARDO, Rec. Ind. Mus. IV, p. 175 (1911).

„ Ann. Hist. Nat. Mus. Nat. Hung. XI, p. 169 (1913).

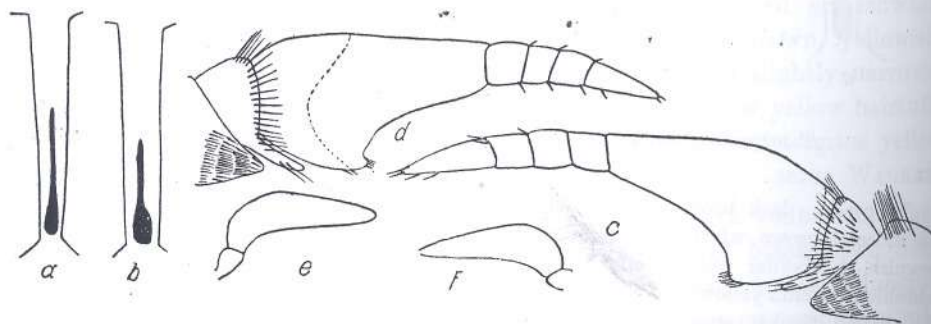
SHIRAKI, Bloods. Ins. of Formosa, Tabanidae, p. 284 (1918).

WALKER, List Dipt. I, p. 162 (1848).

Habitat:

Type ♀ from Kanara, India 13.5.'07, BELL (Textfig. 175 a, c, e, g). Coll. BR.M.
 7 other ♀♀ from same locality, coll on 11.5.'07 and 13.5.'07, WROUGHTON
 2 ♀♀ from Takao, Formosa 1907, SAUTER (Textfig. 175 b, f). Coll. BR.M.
 1 ♀ same locality, DICKSON
 6 ♀♀ from Hongkong, MACKFARLANE 1913 (Textfig. 175 d)
 ♂ from Takao, Formosa 1907, SAUTER (Textfig. 176)

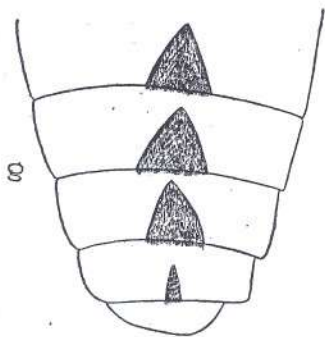
A narrow abdomined species, the abdomen bearing a series of huge white, white haired triangles on the 2—6th segment. Forehead narrow, reddishbrown, black haired. Callus elongate, pear-shaped, redbrown, linear extension reddish. Subcallus, upper cheeks and face pale goldenbrown tomentose. Lower cheeks white, white haired. Beard white. Palpi yellowbrown, thick black haired. Antennae yellowbrown, black haired, third joint reddishyellow at base, then blackbrown. Thorax chestnutbrown, black haired, intermixed with some white hairs, hairtufts at base of wings white. Scutum with 3 longitudinal stripes. Wings brownish along the veins. Legs brownblack. Abdomen reddishbrown on basal segments, darker to the apex, black haired, except on the markings. Bodylength type ♀ 20 m.M., others 17—22 m.M. This species is allied to *T. angustitriangularis* SCHUURMANS STEKHOVEN.



Textfig. 175,

T. indianus Ric. ♀.

a, b. forehead, c. d. antenna, the dotted line indicates the limit of the redbrown area, e. f. palpi, g. abdomen.



The Head. (Textfig. 175). Forehead 0.43 narrower anteriorly than it is at vertex, white brown in the middle, reddishbrown at sides and vertex, index 10.3. Palpi ending in a blunt point. Antennae, first joint pale yellowbrown, dorsum black haired, distal lateral border yellow haired, second joint dark redbrown, black fringed, dorsal hump long, third joint with distinct tooth, basal annulation 1.7 times as long as its widest part, 1.1 times as long as the stylus.

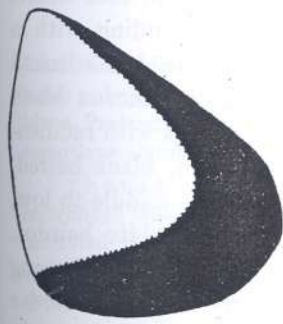
Thorax with a black median narrow stripe and 2 more lateral yellowbrown stripes. Pteropleuron reddishbrown, scutellum reddish. Breast slateblue, grey white haired, sides

reddishbrown. Wings with the first posterior cell distinctly narrower at opening. Halteres, stalk white, club darkbrown. Legs. First leg. Coxa blackbrown, white haired, trochanter black-reddishbrown, femur brownblack, black haired, knee yellowbrown, tibia yellowbrown, white haired on basal half, extreme base dark reddbrown, apex blackbrown, black haired. Tarsalia black. Second leg. Coxa bluishgreybrown, femur blackbrown, white haired, knee yellowbrown. Tibia yellowbrown on basal 2/3, blackbrown at apex, dorsum black haired, ventral surface yellow haired. Third leg identical, tibia reddishyellowbrown, apex blackbrown, black haired, ventral surface yellow haired. Tarsalia black, black haired.

Abdomen (Textfig, 175g) as described, first segment with a median white spot, white triangles on the following segments. Lateral borders of the first 5 tergites yellowbrown, white haired. Segmentations not white fringed. The apices of the median spot almost reach the borders of the foregoing segments. Ventral surface blackbrown, black haired in the middle, sides more reddishbrown, white haired on the first 5 segments. Sixth and seventh segment wholly black haired.

The Formosa females differ from the type in several points, so that it appears doubtful to me if they belong to the same species. Foreheadindex of the Formosa females 6.1, forehead 0.21 narrower anteriorly than it is at vertex. Antennae wholly black haired, upper cheeks black and white haired. Abdomen with a black longitudinal spot on the 2d and 3d segment, resting upon the white haired spots, segmentations narrowly paler, whitish, white haired, on the 4th—6th segment, dark patches surround the white spots. Thorax more grey haired.

The Hongkong female differs from the type in that the thorax is more grey haired, marked with 2 rather broad, greywhite longitudinal stripes and distinct, white tomentose triangles at hind border of scutum, connected by fine white streaks. In all other instances this ♀ is identical with the type.



Textfig. 176.

T. indianus Ric. ♂ eye.

The Male. (Textfig. 176).

RICARDO identifies the male of *T. mentitus* with the male of the Formosa species, determined by SHIRAKI as *T. indianus* Ric. As to me however female and male of the Formosa species *T. indianus* have nothing to do with *T. indianus* type. By a comparison with the ♂ of *T. mentitus* I found that the extension of the large-faceted area of the eyes is much greater in *T. mentitus* than in *T. indianus*. Palpi of the Formosa ♂ white haired, with a few black hairs at apex. Black spots on the 2d—4th abdominal segments.

163. *Tabanus dissimilis* RICARDO (♀). Pl. 13, Fig. 4; Textfig. 177.

References:

RICARDO, Rec. Ind. Mus. IV, p. 180 (1911).

Habitat:

Federated Malay States

Type ♀ from Selangor, BUTLER

Coll. BR.M.

2 ♀♀ from same locality MEADE WALDO 22.2.'08

Coll. BR.M.

9 ♀♀ „ Singapore RIDLEY in Coll. BR.M., resp. collected in 1895, 1900, 1901, 1902, 1903, 1904

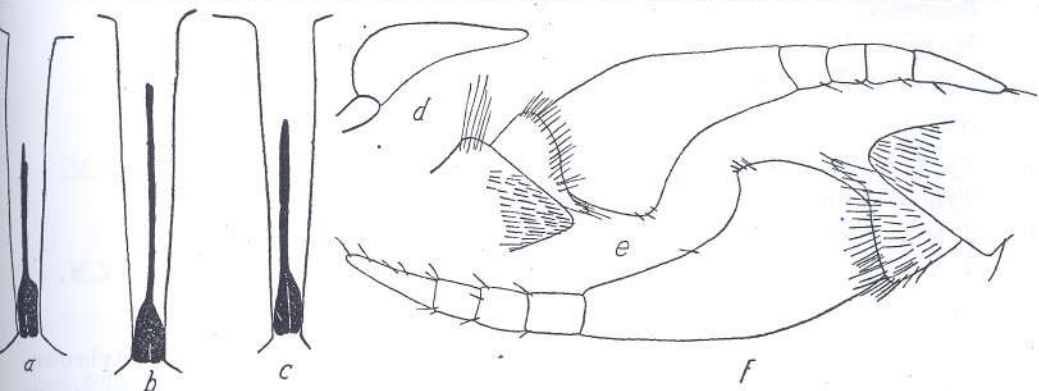
3 ♀ ♀	from Singapore in	Coll. R.M.S.
1 ♀	„ Singapore light house	Coll. R.M.S.
1 ♀	„ Singapore Race course,	Coll. R.M.S.
1 ♀	„ Singapore 4.'10, BUITENDIJK	Coll. L.M.N.H.
1 ♀	„ Poeloe Pisang, Light house 8.'22	Coll. R.M.S.
3 ♀ ♀	„ Ponggol 6.'10	Coll. R.M.S.
1 ♀	„ Poeloe Ayer, Maribau 5.'23	Coll. R.M.S.
1 ♀	„ Queddah, Malacca, V. DE DOES DE BYE	Coll. L.M.N.H.
3 ♀ ♀	„ Poeloe Doerian, Riouw Archipelago 6.'23, DAMMERMAN	Coll. B.Z.M.
Sumatra		
1 ♀	from Padang Deli, BUTTIKOEFER 1895	Coll. L.M.N.H.
Borneo		
1 ♀	from Silam, N. Borneo 1892	Coll. BR.M.
1 ♀	„ Sarawak, HORSBURGH '55	„
2 ♀ ♀	„ Sandakan Baai, Sugut. N.O. Borneo, PRAKKE	Coll. L.M.N.H.

A reddishbrown species with greyishbrown thorax. Forehead slightly narrower than in *T. ignobilis* RONDANI, pale yellowbrown to dark velvetybrown, black haired. Callus blackbrown, reaching to the eyes, linear extension long. Subcallus and upper cheeks goldenyellowbrown. Lower cheeks and face white, white haired. Beard white. Palpi yellowbrown, black haired, ending with a rather sharp point. Antennae tawnybrown, greyblue tomentose, black haired on first joint, 2d joint redbrown, third joint with blunt tooth. Thorax black haired, intermixed with some yellowwhite hairs. Wings clear. Legs with reddishbrown femora and yellowbrown tibiae. Abdomen reddishbrown, black haired, segmentations 2—5, with a fine white hairfringe, elevated in the middle to low, white haired triangles. First and 6th segment with a median white hairdot. Lateral borders of the first 3 tergites yellowbrown, white haired, following segments black haired, intermixed with some white hairs at lateral border

Table of dimensions.

Bodylength	varying from 18,2 m.M. to 23 m.M.			
Width of thorax	„	„	6	„ — 7,5 „
Width of abdomen	„	„	6	„ — 8 „
Wingexpanse	„	„	40,5	„ — 46,5 „
Length of head	„	„	3	„ — 4,5 „
Length of thorax	„	„	6,5	„ — 9 „
Length of abdomen	„	„	10	„ — 12,5 „
Length of wing	„	„	17	„ — 19,5 „
Breadth of wing	„	„	6	„ — 7 „
Foreheadindex	„	„	9,25	„ — 13

The Head. (Textfig. 177). Forehead paler along the linear extension. Callus paler, and more plain at base than at vertex, furrowed in the middle, vertex whitish haired, intermixed with black hairs. Beard white and black, pale yellow in the type female. Face grey in the middle, violetgrey just underneath the antennae, where it is black haired, lateral borders and a small spot near the mouth yellowbrownish, white haired, intermixed with a few black hairs near the mouth. Palpi long and slender, first joint greyish yellowbrown, white haired, with some black hairs at apex, second joint yellowbrown on inner border, whitish tomentose at outer border, therefore appearing violet-coffeehutbrown, black haired, intermixed with some white hairs. Antennae, first joint protruding caplike over the second, darkredbrown joint, the latter being provided with a long dorsal tooth, bearing a triple fringe of black hairs, third



Textfig. 177.

T. dissimilis Ric. ♀. a—c. forehead, d. palpe, e, f. antennae.

joint dark yellowish havannabrown at base, darker to the apex, basal annulation 1,66—1,77 times as long as its widest part, 1,44—1,22 times as long as the dull olivebrown stylus, tooth blunt. Proboscis, stalk coffeenutbrown with slateblue streaks, black and yellow white haired, sugarflaps slateblue to velvetybrown, brown haired.

Thorax greyishbrown in the type, sooty dullgreybrown in the Riouw ♀, black haired, intermixed with some whitish hairs, at foreborder indistinctly paler, longitudinal stripes are indicated, the middle one darker in the middle. Pteropleuron reddishbrown, black haired. Scutellum dull yellowishbrown, yellowish blackbrown haired, intermixed with some yellowwhite hairs, similar hairs in the tufts at base of wings. Sides and breast pale yellowish brown, white haired, hindborder of mesosternumlobus violet, black haired. Wings clear, foreborder and stigma yellowbrown. Halteres orangeous chromyyellow. Legs. First leg. Coxa silverygrey, white haired, apex brown, black haired, trochanter blackbrown. Femur blackbrown, black haired, distal lateral border greybrown tomentose, clothed with black and some dirtywhite hairs, knee yellowbrown. Tibia reddishyellowbrown, black haired, intermixed with some white hairs on basal $\frac{2}{3}$, apex black. Tarsalia black. Second leg, trochanter dark yellowbrown, black haired, intermixed with white hairs, femur sootybrown, pubescence as in fore femora, tibia almost wholly reddishyellowbrown, apex blackbrown, dorsum black haired, ventral surface yellowwhite haired on basal $\frac{1}{2}$. First tarsale reddishbrown, other tarsalia black, all black haired. Third leg. Coxa bluishgrey, mainly black haired, some white hairs intermixed, trochanter reddishbrown, black haired, with some white hairs at base, femur slateblue, dorsum black haired, white haired at base, distal lateral border white haired, intermixed with some black hairs, knee yellowreddishbrown. Tibia reddishyellowbrown, darker at apex, dorsum black haired, ventral surface white haired on basal $\frac{2}{3}$. First tarsale blackbrown, other tarsalia black.

Abdomen as described, first segment with a brownishgreywhite hairtuft at each side of the scutellum. Ventral surface, first segment yellowbrown, second segment bluishgrey tomentose at lateral borders. In the middle one finds a dark band, composed of separate black haired patches, segmentations yellowbrown, white fringed. Sixth and seventh segment wholly white haired.

In the type ♀ the lateral borders of the first 4 tergites are white haired.

164. *Tabanus factiosus* WALKER. (♀, ♂) Textfig. 178.

References:

WALKER, Proc. Linn. Soc. London IV, p. 102 (1859).

RICARDO, Rec. Ind. Mus. IV, p. 179 (1911).

Habitat:

Type ♀ from Macassar, Celebes, SAUNDERS

Coll. BR.M.

Type ♂ from Celebes

2 ♀ ♀ from Negros, Philippines White, Head.

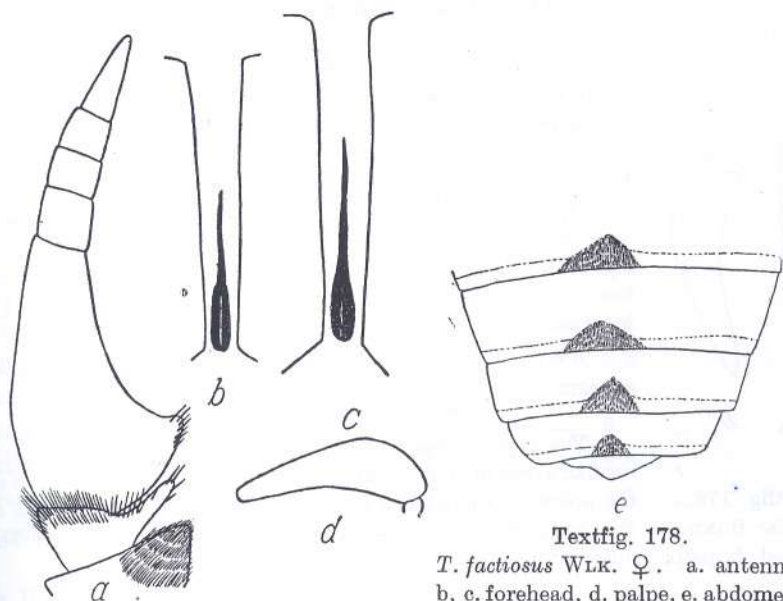
2 ♀ ♀ „ Menado, Celebes

Coll. B.Z.M.

A species, closely allied to *T. fumifer*. Forehead narrow, pale velvetybrown. Callus black, elongate, grooved in the middle, linear extension short. Subcallus and upper cheeks coffeenutbrown. Lower cheeks and face brownishwhite. Beard brownishyellowwhite. Palpi yellowbrown black haired. Antennae olivebrown to reddishyellow, black haired. Thorax dark olivaceousbrown, greyish tomentose, with traces of 3 longitudinal stripes, black and brownish white haired. Wings faintly tinged brown. Legs darkbrown. Abdomen broad, dull chestnutbrown, black haired, with median white, white haired triangles on the 2d—6th segments, lateral borders of the 2d-5th tergite with yellow hairtufts. Length 23 m.M.

The Head. (Textfig. 178). Forehead 0,4 narrower anteriorly than it is at vertex, index 8,5. Callus not reaching to the eyes. Palpi swollen at base, tapering to a long blunt point. Antennae, first joint olivebrown, dorsum black haired, lateral borders pale yellowbrown, haired, second joint reddishyellow, black fringed, third joint reddishyellow at base, then black, basal annulation 1,56 times as long as its widest part, 1,1 times as long as the stylus.

Thorax as described. Pteropleuron reddish. Breast and sides brownish grey, white haired, mesosternumlobus black haired. Wings, foreborder yellowishbrown, stigma narrow, siennabrown, veins dark redbrown. Halteres, stalk dark redbrown, club white. Legs. First leg. Coxa yellowbrownish, pale brown haired, femur dull chocolatebrown, dorsum black haired, distal lateral border white haired, knee orangeousyellow. Tibia swollen, yellowwhite, yellow haired on basal 2/3, then blackbrown, black haired, tarsalia black. Second leg, femur blackbrown, dorsum black haired, lateral borders white haired, ventral surface greybrown tomentose, grey haired, knee orangeousyellow, tibia dark reddishyellow, blackish at apex, dorsum black haired, ventral surface yellow haired, tarsalia black. Third leg. Coxa yellowbrown, black haired at apex, trochanter reddishbrown, yellow haired, femur as in second leg, as also the tibia, first tarsale redbrown, black haired, other tarsalia black.



Textfig. 178.

T. factiosus Wlk. ♀. a. antenna,
b, c. forehead, d. palpe, e. abdomen.

Abdomen (Textfig. 178 c.) broad, dull chestnutbrown, black haired, first segment with a grey hairtuft at each side of the scutellum, other spots distributed as mentioned. Ventral surface reddbrown, black haired, segmentations 2—5 paler, yellow haired.

165. *Tabanus ignobilis* RONDANI (♀). Textfig. 179.

References:

RONDANI, Ann. Mus. Civ. Genova VII, p. 457 (1875).

RIVARDO, Rec. Ind. Mus. IV, p. 180 (1911).

Habitat:

Type ♀ from Sarawak

Nat. Hist. Mus. Genova

1 ♀ from N. Borneo, Sandakan CATOR (Textfig. 179). Coll. BR.M.

A reddish species, closely allied to *T. dissimilis* Ric. Forehead broad, linear extension reaching halfway the vertex. Cheeks and face greywhite, white haired. Palpi as in *T. dissimilis* Ric. Thorax wholly denuded in the Sandakan ♀, reddish, tufts at base of wings whitish. Wings clear. Legs with reddishbrown femora and yellowreddbrown tibiae. Abdomen reddish yellowbrown, black haired, with paler yellow haired segmentations, elevated to median, yellow haired triangles on the segments 2—5. Lateral borders of tergites yellowwhite haired. Length 15.—20 m.m.

RICARDO declares the Sandakan ♀ identical with the Type in the Genova Museum. I doubt whether this supposition holds right, see under the discussion.

The Head. (Textfig. 179). Forehead half as wide anteriorly as it is at vertex index 10.6.



Textfig. 179.

T. ignobilis ROND ♀. the type specimen linear, so possibly both specimens belong to different species.

Thorax almost wholly denuded, breast and sides greybrown, white haired, mesosternum lobus violetgrey, black haired. Wings with yellowbrown foreborder and havannabrown stigma. Halteres yellowbrown. Legs. First leg. Coxa greybrown, grey haired, femur reddishbrown to mahoganybrown, black haired, distal lateral border white haired, knee yellowbrown. Tibia darkyellowredbrown on basal half, apex redbrown, dorsum black haired, venter yellow haired. Second leg, femur reddishyellowbrown at base, black hairs in the median line on dorsum, white haired elsewhere, tibia similar. Third leg identical, yellowwhite haired below.

Abdomen as described. Ventral surface reddishyellowbrown at segmentations and partly so on lateral borders.

The type differs with the described Sandakan female in that the median series of spots is white haired, beginning on the third segment, the apices of the femora being blackish. RONDANI calls the callus of

166. *Tabanus albitriangularis* nov. spec. (♀) Pl. 13, Fig. 5; Textfig. 180.

Habitat:

Type ♀ and 2 other ♀♀ from Federated Malay States, Batu Tiga, 16.2.'10, STANTON (Textfig. 180 a, b, e, g, h.) Coll. BR.M.

Isle Sumatra

1 ♀ from, Porsea, Balige, Tapanoeli, on buffalo 12.'21, VAN DER REEST (Textfig. 180 b.) Coll. V.S.L.

1 ♀ „ Salemboe, Pidoli Boekit, Kota Nopan, Tapanoeli on horse 13.3.'24, BAKKER „

10 ♀♀ from Djambi MARSIDI

respectively 4 ♀♀ on buffalo 4.'22

2 ♀♀ „ „ 25.9.'22 (Textfig. 180 f. c.)

2 ♀♀ „ horse 4.'22 (Textfig. 180 d.)

2 ♀♀ „ „ 25.9.'22

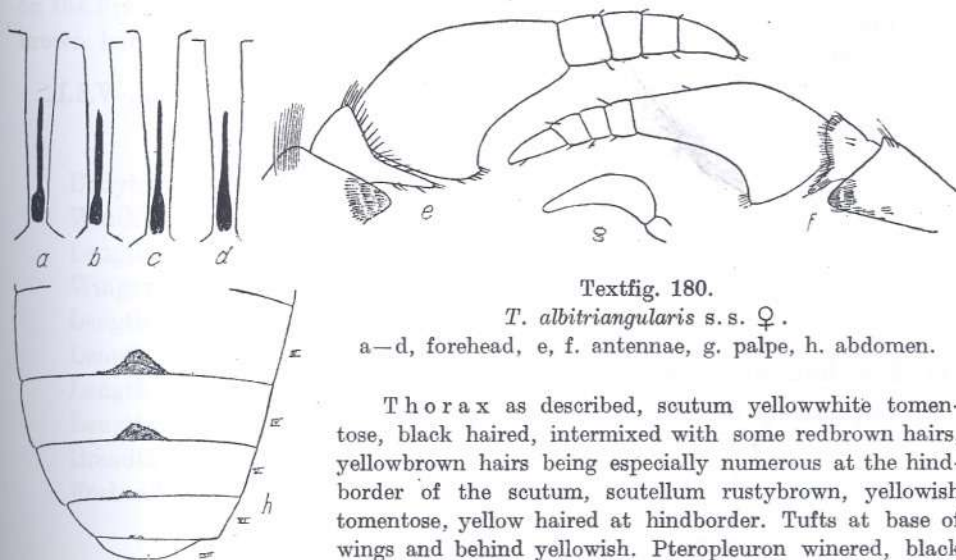
The label attached to the type in the BR.M. mentioned: „*Tabanus*, form between *T. fumifer* and *malayensis*, det. by RICARDO.” Eyes bluegreen on lower half. Forehead darkbrown, black haired. Callus darkbrown, cylindrical, linear extension broad and long. Subcallus and upper cheeks redbrown, black haired. Lower cheeks greywhite, reddishyellowwhite haired. Face darkbrown, black haired on upper border, yellowwhite haired elsewhere. Beard pale yellowbrown. Palpi yellowbrown, black haired, ending with a blunt point. Antennae redbrown, black haired, third joint with distinct tooth. Thorax medlarbrown with 3 longitudinal redbrown stripes and paler lateral borders, mainly black haired.

Wings shadowed along the veins, legs olivebrown to blackbrown. Abdomen chestnutbrown, with a median series of white triangles, not clothed with yellow hairs, dorsum elsewhere black haired. Lateral borders of the first 5 tergites yellow haired.

Table of dimensions.

Bodylength	varying from 13,6 m.M. to 16 m.M.				
Width of thorax	"	"	4	"	5,2
Width of abdomen	"	"	4,2	"	5,2
Wingexpanse	"	"	27,2	"	31,6
Length of head	"	"	2	"	3,2
Length of thorax	"	"	5	"	6,5
Length of abdomen	"	"	7,2	"	9
Length of wing	"	"	11,2	"	12,8
Breadth of wing	"	"	4	"	4,5
Foreheadindex	"	"	6,85	"	10,1

The Head. (Textfig. 189). Forehead, 0,24—0,5 narrower anteriorly than it is at vertex. Callus grooved in the middle, not reaching to the eyes, linear extension extending on 2/3 of the frons. Palpi, first joint yellowbrown haired with some black hairs at apex, second joint swollen at base, black haired. Antennae, first joint blackbrown, black haired, with a few white hairs at base on dorsum, second joint redbrown, black haired, dorsal spur long, third joint redbrown at extreme base, then black, basal annulation 1,46 times as long as its widest part, 1,2 times as long as the stylus. Postocular rim brown haired.



Textfig. 180.

T. albitriangularis s. s. ♀.

a—d, forehead, e, f. antennae, g. palpe, h. abdomen.

Thorax as described, scutum yellowwhite tomentose, black haired, intermixed with some redbrown hairs, yellowbrown hairs being especially numerous at the hindborder of the scutum, scutellum rustybrown, yellowish tomentose, yellow haired at hindborder. Tufts at base of wings and behind yellowish. Pteropleuron winered, black haired. Breast and sides bluishgrey, with brown streaks, reddishbrown haired, mesosternum lobus black haired. Wings, foreborder reddishyellowbrown, stigma dark havannabrown, intensive brown shadows accompany the upper veins, remainder

of wing diffuse brown, apex indistinctly paler, veins chocolatebrown. Halteres, stalk dark-brown, club violetyellowbrown. Legs. First leg. Coxa yellowbrown, greywhite haired, trochanter reddbrown, femur blackbrown, black haired, distal lateral border pale yellowbrown haired knee yellowbrown, tibia reddbrown, paler at base, black haired, tarsalia reddbrown, black haired. Second leg, coxa violet-sootybrown, caramelbrown haired, trochanter dark reddish-brown, reddishyellowwhite haired, remainder identical as in first leg, third leg similar, tibia reddbrown, tarsalia black.

A b d o m e n (Textfig. 180 h.) brickred on basal 2 joints with a median darker shadow in the middle of the second segment, following segments darker, blackbrown. First segment, with a median square, yellow haired patch. Median white triangles to be found on the 2d-6th segment, segmentations narrowly yellowish, distinct on the segments 3-6, widened at lateral borders to small lateral copperyellow haired triangles. Ventral surface, first segment reddishbrown, following segments reddishbrown, yellow haired at lateral borders and segmentations, median areas black, black haired.

The Djambi females differ from the described scheme, in that the tibiae are more ochraceousyellow, upper cheeks yellowbrown, reddbrown haired, median abdominal spots yellowish, lateral borders of tergites silverywhite haired, ventral surface similar.

167. *Tabanus incultus* VAN DER WULP. (♀) Pl. 17, Fig. 1; Textfig. 181.

VAN DER WULP, Sumatra Exped. Dipt. 17, pl. I, fig. 8 (1881).

RICARDO, Rec. Ind. Mus. IV, p. 199 (1911).

Habitat:

Type ♀ from Lebong, Sumatra 5.'78

Coll. L.M.N.H.

1 ♀ from Solok, Padang 1907, STOLZ

„

Residency Tapanoeli

Ressort Padang Sidempoean, Mantrie Ressort Binanga

22 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, BAKKER

Coll. V.S.L.

respectively 1 ♀ on buffalo 22.8.'23 (Textfig. 181).

8 ♀ ♀ „ „ 22.9.'24

2 ♀ ♀ „ „ 3.6.'24

3 ♀ ♀ „ „ 2.6.'24

2 ♀ ♀ „ „ 27.10.'24

5 ♀ ♀ „ horse 22.9.'24

1 ♀ „ „ 27.10.'24

11 ♀ ♀ from Si Oendol, Paringgonan, BAKKER

respectively 3 ♀ ♀ on horse 24.9.'24

3 ♀ ♀ „ „ 3.6.'24

1 ♀ „ „ 1.7.'24

2 ♀ ♀ „ buffalo 24.9.'24

1 ♀ „ „ 29.10.'24

1 ♀ „ „ 26.11.'24

28 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, BAKKER

respectively	8 ♀ ♀	on horse	23.9.'24
	2 ♀ ♀	„ „	2.6.'24
	4 ♀ ♀	„ „	1.6.'24
	1 ♀	„ „	24.11.'24
	9 ♀ ♀	„ buffalo	23.9.'24
	2 ♀ ♀	„ „	2.6.'24
	2 ♀ ♀	„ „	1.6.'24

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan

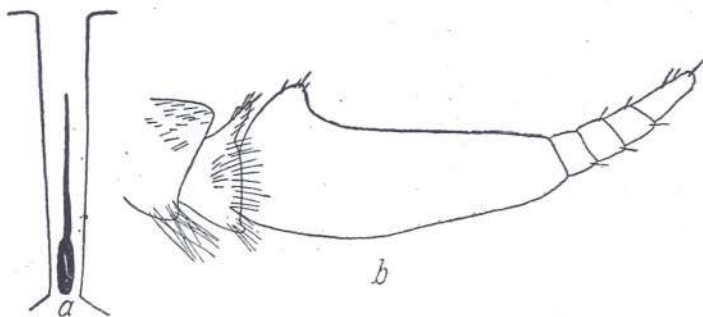
5 ♀ ♀	from Kota Nopan, BAKKER	5.'24
2 ♀ ♀	„ Kota Siantar, BAKKER	4.6.'24
1 ♀	„ Kajoe Djati, Kota Nopan, BAKKER	

A brown species, allied to *T. albitriangularis* SCHUURMANS STEKHOVEN, distinguishable by the shape of the antennae, callus and abdominal, white haired markings, colour of palpi and tibiae. Forehead dark goldenbrown, black haired. Callus club-shaped, redbrown to black, linear extension long. Subcallus and upper cheeks redbrown, black haired. Lower cheeks yellowbrown as is the face, the later black haired at upper border, black and yellow haired below. Beard, pale brownishwhite. Palpi olivebrown to deep redbrown, black haired on second joint. Antennae redbrown, slender, black haired, third joint with distinct tooth. Thorax dark havannabrown, black and copper-red haired. Legs yellowbrownish. Abdomen dull redbrown, black haired, with a series of median copperedyellow hairgroups on the 2d—5th segments, and a median group of yellowbrown hairs on the first segment. Lateral borders of the first 5 tergites yellowbrown, yellowbrown haired.

Table of dimensions.

Bodylength	17,5	m.M.
Width of thorax	5,8	„
Length of abdomen	6,5	„
Wingexpanse	37,4	„
Length of head	3,5	„
Length of thorax	6,5	„
Length of abdomen	10,2	„
Length of wing	15,8	„
Breadth of wing	5,5	„
Foreheadindex	8,9	

The Head. (Textfig. 181). Forehead 0,36 narrower anteriorly than is at vertex. Postocular rim black haired. Beard brownishwhite, intermixed with some black hairs. Palpi first joint olivebrown, yellowbrown haired, with some black hairs at apex, second joint



Textfig. 181.

T. incultus v. D. WULF ♀. a. forehead, b. antenna.

deep redbrown on inner border, outer border bluish tomentose, thick black, ending with a blunt point. Antennae, first joint yellowish walnutbrown, black haired, second joint same colour, black fringed, with a sharp dorsal spur, third joint redbrown on basal annulation, which is 2,1 times as long as its widest part, 2 times as long as the black stylus.

Thorax as mentioned. Tufts at base of wings and behind redbrown. Lateral borders of scutum yellowish tomentose; pteropleuron yellowbrown, black haired. Sides and breast yellowbrown, pale yellowbrown haired, mesosternumbolus black haired. Wings brownish by the brownish shadows along the veins, foreborder yellowbrown, stigma dark havannabrown. Halteres dull redbrown. Legs. First leg. Coxa yellowbrown, yellowbrown haired, trochanter blackbrown. Femur idem, black haired, distal lateral border redbrown tomentose, knee yellowbrown, tibia redbrown at extreme base, then pale yellowbrown, yellowbrown haired, with a median row of black hairs on the basal 2/3, apex dark redbrown, black haired, ventral surface yellowbrown haired. Tarsalia black. Second leg, femur, dorsum blackisholivebrown, black haired in the middle, except at base, which is yellowbrown haired, like the lateral borders, ventral surface sootygrey at base, then bright yellowbrown, tibia yellowbrown on basal 2/3, apex more olivebrown, dorsum black haired, ventral surface yellowwhite haired. First tarsale olivebrown, black haired, other tarsalia black. Third leg identical, tibia yellowishredbrown, apex slightly darker, dorsum black haired, ventral surface yellowbrown haired. Rest identical.

Abdomen as described. First segment with a yellowbrown haired spot at each side of the scutellum. Ventral surface paler yellowishredbrown, yellowwhite haired, with a median longitudinal blackbrown band, composed of halfmoon-shaped, black haired spots.

168. *Tabanus succurvus* WALKER (♀, ♂). Textfig. 182.

References:

WALKER, Proc. Linn. Soc. London IV, p. 102 (1860).

SCHUURMANS STEKHOVEN, Buru Publications II, p. 12 (1924).

„ „ Treubia, V, p. 310 (1924), Pl. II, Fig. 2.

Habitat:

Type ♀ and ♂ from Macassar, Celebes

Coll. BR.M.

1 ♀ from Wakuna Delta, Buru 20.12.22, TOXOPAEUS

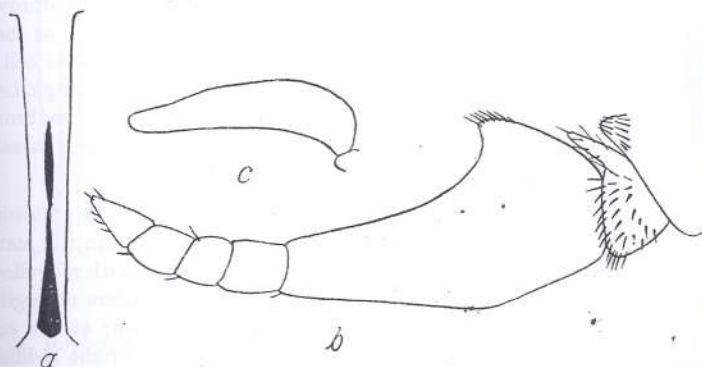
Coll. N.A.M.

A large brownblack species. Forehead narrow, dark chocolatebrown, goldenbrown haired. Callus deep blackbrown, elongated triangular, linear extension fine. Subcallus and face reddish velvetybrown. Cheeks chocolatebrown, black haired. Beard blackbrown. Palpi pale reddish yellowbrown, black haired. An-

tennae reddish blackbrown, black haired, third joint with distinct tooth. Thorax dull velvetybrown tomentose, black haired, with goldenbrown hairs in the tufts at base of wings. Legs blackbrown, black haired, tibiae hazelbrown at base. Wings brownish. Abdomen black reddishbrown, with goldenbrown haired, small, halfmoon-shaped triangles in the middle of the first 5 segments. Ventral surface with some yellowish hairs at segmentations. Male identical. Bodylength 21,5 m.M.; Width of thorax 6,5 m.M.; Wingexpanse 40,5 m.M.; Length of wing 17 m.M.; Foreheadindex 13.

The Female.

The Head. (Textfig. 182). Forehead barely half as wide anteriorly as it is at vertex. Callus grooved in the middle at apex. Antennae, first joint blackbrown, black haired, second joint reddishbrown, black fringed, third joint with blunt tooth.



Textfig. 182.

T. succurvus WLK. ♀. a. forehead, b. antenna, c. palpe.

Thorax as described, breast golden brown haired, mesosternum lobus black haired, pteropleuron goldenbrown haired. Wings brown. Halteres, stalk reddishbrown, club yellowbrown. Legs. First leg. Coxa black and goldenbrown haired, femur black, black haired, knee yellowbrown. Tibia hazelbrown at base, then black, black haired.

Tarsalia black-brown, black haired. Second leg identical, coxa black haired, femur goldenbrown haired at lateral border, tibia hazelbrown on basal 3/5, elsewhere black, black haired, tarsalia reddish brown, black haired. Third leg similar, tibia reddish bismarckbrown on basal half only.

Abdomen as described. Besides one finds a dark yellow hairgroup at each side of the scutellum.

The types present in the Br. Museum were partly rubbed, thus missing the median abdominal triangles.

The Male.

Identical to the female, abdomen longer, mahogany-redbrown, black haired.

The Head. Eyes with facets nearly all equal. Cheeks velvetybrown, black haired. Beard blackbrown. Palpi redbrown, black haired. Legs dark.

169. *Tabanus ceramensis* nov. spec. (♂). Textfig. 183.

Habitat:

Type ♂ from Ceram A. R. WALLACE

Coll. BR.M.

A reddishbrown species, bearing on a label, written by RICARDO, the fol-

lowing note; „this species bears a label of *T. serus* Wlk. in WALKER's handwriting, but it is not *T. serus* Wlk". Eyes with volominous small-facettèd part, subcallus, face and cheeks rustybrown, blackbrown haired. Beard reddish blackbrown. Palpi dark havannabrown, black haired. Antennae redbrown, black haired. Thorax reddishbrown, thick redbrown haired, breast yellowbrown haired. Wings brownish to reddishbrown. Legs dark velvetybrown, black haired. Abdomen first 4 segments bright redbrown, black haired, segmentations probably yellowbrown haired, remainder of abdomen blackbrown. Same size as *T. serus* Wlk.



Textfig. 183.
T. ceramensis s. s. ♂
eye.

The Head. (Textfig. 183). The black, small-facettèd area does not reach the vertex. Subcallus, etc. as described. Antennae incomplete, basal annulations redbrown, black haired. Thorax mainly rubbed on scutum, remainder of pubescence redbrown. Breast dark velvetybrown, yellowbrown haired. Wings as mentioned, the middle of the 3 veins, which runs from the disc cell to the hindborder, does not reach the hindborder on both wings. Legs uniformly dark. First leg. Coxa velvetybrown, dark redbrown haired. All femora and tibiae blackbrown, black haired. Tarsalia black.

Abdomen bright redbrown on first 4 segments, following segments blackbrown. As far as can be concluded from the mainly rubbed specimen, the segmentations were clothed with redyellowbrown hairs, pubescence elsewhere black, lateral borders of tergites black haired. Ventral surface similar to the dorsum; at the segmentations and scattered over the disc between the black hairs one finds bright reddishyellowbrown hairs.

170. *Tabanus parallelifrons* nov. spec. (♀). Textfig. 184.

Habitat:

Type ♀ and another ♀ from Sintang, Borneo 8.'94, Dr. GOEDHUIS

Coll. L.M.N.H.

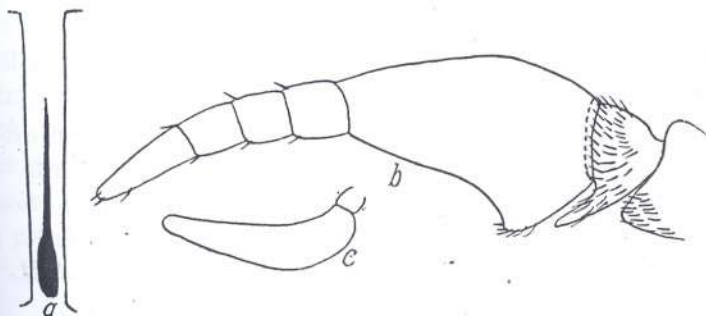
1 ♀ from Pidjorkoling, Tapanoeli Sumatra on buffalo, 5.8.'24 BAKKER

Coll. V.S.L.

A species closely allied to *T. brunneus* and *T. malayensis* Ric. Forehead almost the same width throughout, brown, black haired. Callus brownred, pear-shaped, linear extension fine black. Subcallus and upper cheeks pale brownish yellow, lower cheeks and face paler, pale yellow haired. Palpi dull havannabrown, black haired on second joint. Antennae dark bismarckbrown to redbrown, mainly black haired on basal 2 joints, third joint reddishbrown to black, tooth blunt, broad. Thorax darkredbrown, black haired, with two blackbrown longitudinal stripes. Wings brownish. Legs brown to blackbrown, with reddishyellowbrown tibiae. Abdomen velvetybrown, conical, black haired, with a series of median low, white, yellow haired halfmoon-shaped spots on the 2d—5th segment, a small tuft of yellow hairs on the first and a small indistinct

yellow hairgroup in the middle of the sixth segment, black shadows accompanying the white spots. Lateral borders of tergites with yellowbrown, yellow haired triangles. Length 18 m.M.; Width of thorax 5,8 m.M.; Wingexpanse 35,8 m.M.; Length of wing 15 m.M. Length of abdomen 9,8 m.M.

The Head. (Textfig. 184). Forehead whitishbrown at base, redbrown at apex, index 8,5. Vertexspot brownblack. Palpi, first joint yellow haired, with some black hairs at apex, second joint dull redbrown to havannabrown, ending blunt. Antennae as mentioned, second joint with long dorsal spur third joint narrowly reddishbrown at extreme base, then black, basal annulation 1,4 times as long as its widest part, 0,9 times as long as the stylus.



Textfig. 184.

T. parallelelfrons s.s. ♀.

a. forehead, b. antenna, the dotted line indicates the limit of the redbrown area, c. palpe.

Thorax black haired, intermixed with some yellowwhite hairs. Pteropleuron pale havannabrown, whitish tomentose at apex, black haired. Breast and sides greybrown, whitishyellow haired, mesosternumlobus black haired. Scutellum yellow haired at lateral borders. Wings brownish, foreborder yellowbrown, stigma pale havannabrown. Halteres reddish olivebrown.

Legs. First leg. Coxa brownishgrey, yellowwhite haired, trochanter redbrown, femur blackbrown, black haired, distal lateral border greybrown, olivaceousyellowbrown haired, knee yellowbrown. Tibia blackbrown, black haired at extreme base, then dirty yellowbrown scanty black haired, intermixed with yellow hairs on basal half, apex blackbrown, black haired. Tarsalia blackbrown, black haired. Second leg similar, femur yellow haired on venter and along the distal lateral border, tibia dirtyreddishyellowbrown on basal $\frac{2}{3}$, then blackbrown, mainly black haired on dorsum, intermixed with yellow hairs, ventral surface yellow haired on basal half. Third leg identical, femur black haired on dorsum in the middle only.

Abdomen as described, first segment with a small dot of yellow hairs at each side of the scutellum. Ventral surface with a median redbrown stripe, composed of halfmoon-shaped, black haired spots, elsewhere yellowbrown, yellow haired. Seventh segment wholly black haired.

171. *Tabanus brunneus* MACQUART (♀, ♂). Pl. 12, Fig. 1; Textfig. 185, 186.

Syn.: *Tabanus javanus* VAN DER WULF.

References:

MACQUART, Suites a BUFFON I, p. 203 (1834).

„ Dipt. Exot. I, p. 132 (1838).

RICARDO, Rec. Ind. Mus. IV, p. 176 (1911).

Habitat:

Isle Java

Type ♀ from Java

5 ♀ ♀ from Java K.W.V.H. (labelled as *T. javanus* VAN DER WULP)
Coll. L.M.N.H.1 ♀ „ Mount Panggerango, Préanger Regencies 2400 M., DOCTERS VAN
LEEuwEN 5.'21 Coll. B.Z.M.

1 ♀ from Goenoeng Malabar, Préanger Regencies, 9.'06 Coll. B.Z.M.

2 ♀ ♀ „ Gamboeng, Tea Estate on Goenoeng Tiloe, Préanger 1400 M. on
horse 5.'23, SCHUURMANS STEKHOVEN Coll. V.S.L.

1 ♀ from Préanger Regencies '06 Coll. N.A.M.

1 ♀ „ Wijnkoopsbaai '08. JACOBSON

Residency Batavia

2 ♀ ♀ from Djasinga 4.'22 Coll. V.S.L.

6 ♀ ♀ „ Goenoeng Boender, Goenoeng Salak 900 M. on bengalese cattle
20.5.'23, SCHUURMANS STEKHOVEN Coll. V.S.L.1 ♀ from Goenoeng Salak, falsely identified by Miss RICARDO as *T. factiosus*
WIED. Coll. N.A.M.

1 ♀ from Buitenzorg 1881 Coll. N.A.M.

1 ♀ „ Java, named *T. javanus* VAN DER WULP „

1 ♀ „ Java

1 ♀ „ without locality

Isle Sumatra

Res. Lampong Districts

4 ♀ ♀ from Wai Lima jungle 400 M. 11.11.'21, KARNY Coll. B.Z.M.

Residency Tapanoeli

4 ♀ ♀ from Tapanoeli Coll. B.Z.M.

Ressort Padang, Sidempoean, Mantrie Ressort Padang Sidempoean.

2 ♀ ♀ from Si Hitang, Batoe na Doea on buffalo 3.'23, LOBEL Coll. V.S.L.

1 ♀ „ same locality on cow 3.'23, LOBEL

1 ♀ „ Bintodjoe, Moeara Tais on buffalo 3.'23, LOBEL

1 ♀ „ same locality on horse 3.'23

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

3 ♀ ♀ from Siboeni Boeni, Siboloean, LOBEL and BAKKER
respectively 1 ♀ on buffalo 23.7.'23

1 ♀ „ „ 17.1.'24

1 ♀ „ horse 7.11.'23

Ressort Padang Sidempoean, Mantrie Ressort Binanga

1 ♀ from Si Oendol, Paringgonan 26.8.'23 on horse, BAKKER

1 ♀ „ Hoeta Nopan, Hoeta Nopan 3.5.'24 on buffalo, BAKKER

1 ♀ „ Malayan Archipelago 27.2.'21, RICARDO Coll. BR.M.

Federated Malay States

1 ♀ from Pahang 2500 Feet on *Rhinoceros* falsely identified by Miss RICARDO as *T. malayensis* RICARDO.

A large brown species, with eyes green on lower half. Forehead golden-brown, velvetybrown and black haired. Callus redbrown to black, broad egg-shaped, linear extension long. Subcallus, cheeks and face goldenbrownyellow to yellow, ochraceousyellow haired. Beard same colour. Palpi yellowbrown, black haired. Antennae dark black, black haired. Thorax reddish blackbrown, goldenbrownyellow haired, intermixed with black hairs. Wings rather clear, first posterior cell narrower at opening. Legs black. Abdomen reddish velvetybrown to brownblack, black haired, with a quadrangular, yellow haired spot on the first segment in the middle and typical whitish, goldenyellow haired, halfmoon-shaped median spots on the 2d—5th segment, embraced by velvety-black, black haired, half circular shadows. Lateral borders of tergites marked with yellow haired triangles.

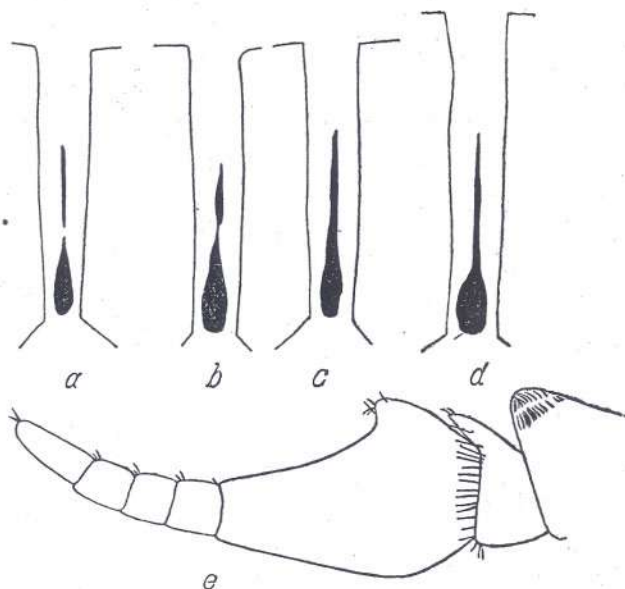
The Female.

Table of dimensions.

Bodylength	varying from 17	m.M. to 21,5	m.M.
Width of thorax	5,5	—	7,5
Width of abdomen	6,5	—	8,2
Wingexpanse	34,8	—	43,5
Length of head	2,5	—	4
Length of thorax	7,4	—	9
Length of abdomen	9,2	—	12
Length of wing	14,5	—	18
Breadth of wing	6,1	—	9,75
Foreheadindex	4,8	—	8

The Head. (Textfig. 185). Forehead with velvetybrown hairs along the borders, elsewhere black haired, vertexspot triangular. Callus redbrown to black, not reaching the eyes. Subcallus goldenbrown to yolkyellow. Palpi goldenbrown on outer border, goldenyellow on inner border, ending with an acute point. Antennae yellow tomentose on basal joint, third joint with a strong tooth, basal annulation 1,3 times as long as its widest part, 1,09 times as long as the stylus, proboscis goldenyellow haired.

Thorax greyish tomentose, goldenbrownyellow haired on foreborder, same pubescence on hindborder of scutum and along the lateral borders, intermixed with black hairs. Tufts at base of wings goldenyellow haired. Pteropleuron brownred, goldenyellow and black haired. Sides and breast yolkyellow, goldenyellow haired, mesosternumlobus black haired. Wings rather clear, foreborder yellowbrown, stigma siennabrown, siennabrown shadows along the veins. Halteres, stalk dark redbrown, club redyellowbrown. Legs. First leg. Coxa yolkyellow haired, trochanter similar, femur black, black haired, distal lateral border yolkyellow haired, rest of leg black. Second leg. Coxa yellowbrown, black at apex, black haired, trochanter



Textfig. 185.

T. brunneus MACQ. ♀. a-d. forehead, e. antenna.

series of median, dark, halfmoon-shaped black haired spots. goldenyellow haired.

The Male.

Type ♂ from Java

1 ♂ from Fort de Kock, W. Coast Sumatra 920 M. '25 JACOBSON

Male almost wholly identical with the female

The Head. (Textfig. 186). Eyes with a rather broad area of small black facets. Palpi reddishbrown, mainly black haired, intermixed with some white hairs, first joint with some black hairs at apex. Upper cheeks black haired. Lower cheeks and beard yellow haired.

Thorax with a dark median longitudinal stripe, reaching the scutellum, hind border of scutum yellowbrown tomentose. Pteropleuron and mesosternumlobus deep brown, black haired. Breast brown with grey stripes.

Abdomen, the halfmoon-shaped spots are huge.



Textfig. 186.

T. brunneus MACQ ♂. eye.

172. *Tabanus malayensis* RICARDO (♀). Pl. 12, Fig. 2; Textfig. 187.

References:

RICARDO, Rec. Ind. Mus. IV, p. 178 (1911).

Habitat:

Federated Malay States

Type ♀ and 10 other ♀♀ from Darien Typus, Negri Sembilan, F.M.S., on a new road, running through jungle 2/3.'08, STANTON

Coll. BR.M.

redbrown, femur golden-brownyellow yolkyellow haired tomentose on distal lateral border, dorsum black haired, with a yellow hairtuft at base. Tibia black, brownish at base, black haired. Third leg. Coxa goldenyellow tomentose, yolkyellow haired, trochanter redbrown, goldenyellow haired, femur as in second leg, except a goldenyellow apical ring. Tibia redbrown at base.

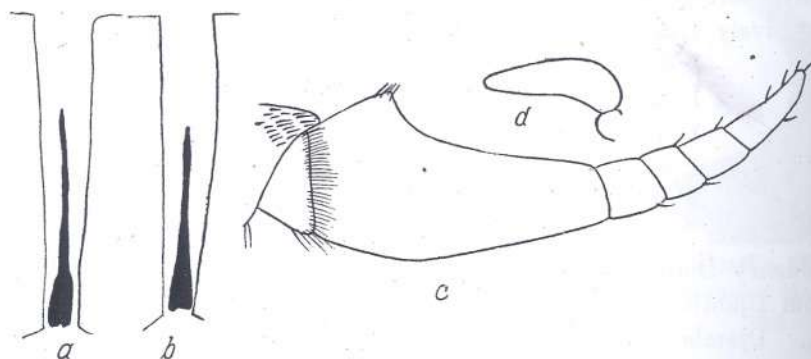
Abdomen as described, first 3 segments reddish velvetybrown, following segments darker or blackbrown, black haired. Sixth segment with a median group of yellow hairs. Ventral surface with a

- 1 ♀ from Kuala Kubu, STANTON 23.2.'10
 1 ♀ „ Batu Tiga 16.2.'10
 1 ♀ „ Kuala Lumpur, Selangor '03, DURHAM
 3 ♀ ♀ „ Singapore, RIDLEY '04
- Isle Sumatra
 Gouvt. Sumatra's East Coast
- 1 ♀ from Sibolangit 550 M. '17, LOERZING Coll. N.A.M.
 2 ♀ ♀ „ Kajoe Tanan, Dr. HAGEN '07 Coll. BR.M.
 1 ♀ „ Tandjong Morawa, Serdang Coll. L.M.N.H.
- Residency Tapanoei, Ressort Padang Sidempoean
 Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean
- 2 ♀ ♀ from Angkola, Moeara Tais on buffalo 12.'21, TARIP Coll. V.S.L.
 2 ♀ ♀ „ Hoeta Tongga, Moeara Tais on buffalo 12.'21, TARIP
 Ressort Padang Sidempoean, Mantrie Ressort Binanga
- 3 ♀ ♀ from Hoeta Nopan, H. Nopan on horse, BAKKER
 respectively 1 ♀ on 22.9.'23
 1 ♀ „ 5.1.'24
 1 ♀ „ 25.11.'24
- 1 ♀ from Binanga 1.'23, LOBEL
 2 ♀ ♀ „ Siboehoean on horse 27.1.'22, TARIP
 1 ♀ „ Siboehoean, Djandi Lobi on buffalo 11.12.'22, LOBEL (Textfig. 187 a, c.)
- Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea
- 1 ♀ from Pasar Siteorat, Halongonan on horse 1.'23, LOBEL
 Ressort Padang Sidempoean, Mantrie Ressort Sibolga
- 6 ♀ ♀ from Siboeloeian, Sibolga, LOBEL and BAKKER
 respectively 1 ♀ on horse 3.'23
 1 ♀ „ „ 23.5.'23
 1 ♀ „ „ 28.6.'23
 1 ♀ „ „ 8.8.'24
 1 ♀ „ cow 12.'22
 1 ♀ „ „ 6.9.'23
- 1 ♀ from Pasar Toeka, Siboeloeian on horse 3.'23, LOBEL
- Residency Djambi
- 1 ♀ from Djambi on horse 5.'22, MARSIDI
 1 ♀ „ Djambi on buffalo 21.1.'23, MARSIDI (Textfig. 187 b.)
 1 ♀ „ Sumatra Coll. L.M.N.H.
- Riouw Archipelago
- 1 ♀ from Riouw, labelled *T. javanus* WIED. Coll. L.M.N.H.
- Isle Nias
- 1 ♀ from Lahewa on horse 4.'22, TARIP Coll. V.S.L.
- Isle Java
- 1 ♀ from Pengarasem, Tegal, LAGAS on horse Coll. V.S.L.

T. malayensis Ric. is closely allied to *T. brunneus* Macq. but distinguishable inter alia by the smaller size, the more pointed triangles on the abdominal scutes. Forehead goldenbrown, yellowbrown and black haired. Callus narrow, oval darkredbrown, linear extension strong, black. Subcallus, face and cheeks yellowbrown, yellowbrown haired. Beard same colour. Palpi reddishyellowbrown, black haired. Antennae blackbrown, black haired. Thorax blackbrown, reddish-velvetybrown tomentose, black and yellowbrown haired. Wings brownish. Legs blackish. Abdomen blackishbrown-reddishyellowbrown, black haired, segmentations narrowly paler, copperredyellow haired, elevated to median triangles on the 2d—6th segments. Lateral borders of the same tergites marked with small, yellow haired triangles. First segment with a median dot of yellow hairs, the median triangles being embraced partly by blackish shadows.

Table of dimensions.

Bodylength	varying from 15,5 m.M. to 19,5 m.M.				
Width of thorax	"	"	4,2	"	— 6,5 "
Width of abdomen	"	"	5,8	"	— 7,5 "
Wingexpanse	"	"	81	"	— 88,9 "
Length of head	"	"	2,2	"	— 3,8 "
Length of thorax	"	"	6	"	— 7,5 "
Length of abdomen	"	"	8,2	"	— 11,5 "
Length of wing	"	"	19,2	"	— 16,2 "
Breadth of wing	"	"	3,6	"	— 6,5 "
Foreheadindex	"	"	7,2	"	— 10,3 "



Textfig. 187.

T. malayensis Ric. ♀. a, b. forehead, b. antenna, c. palpe.

The Head. (Textfig. 187). Forehead 0.16—0.5 narrower anteriorly than it is at vertex, goldenbrown, blackish to the vertex, yellowbrown and black haired. Postocular rim orangeous and black haired. Callus narrow, oval to triangular, furrowed at base, darkred-brown. Palpi, first joint reddishyellowbrown, yellowbrown haired, intermixed with some

black hairs, second joint ending with a blunt point, black haired, intermixed with some black hairs. Antennae black, pale brown tomentose, first joint thick black haired, projecting caplike over the second, black haired joint, third joint slightly brown at base, then black, tooth distinct, basal annulation 1.36 times as long as its broadest part, 1.21 times as long as the stylus. Eyes in life green on lower half.

Thorax blackbrown, reddishvelvetybrown tomentose, black and yellowbrown haired. Hairtufts at base of wings and behind orangeous, as also on the borders of the scutum. Pteropleuron reddishblackbrown, black haired. Sides and breast greyishyellowbrown, pale yellow brown haired. Wings brownish, stigma yellowbrown, foreborder brownyellow. Veins darkbrown to blackbrown. Halteres, stalk reddbrown, club yellowbrown. Legs. First leg. Coxa yellowbrown tomentose, yellowbrown haired, femur violetblack, black haired, distal lateral border yellowbrown tomentose, yellowbrown haired, knee yellow. Tibia basal $\frac{1}{3}$ yellowbrown, apex reddbrown to black, black haired. Tarsalia black. Second leg, femur mainly yellowbrown haired, tibia paler, yellowbrown on basal $\frac{2}{3}$, rest reddbrown, black haired. Tarsalia reddbrown black haired. Third leg identical, tibia yellowbrown at base only, then reddbrown, dorsum black haired, ventral surface goldenyellowbrown haired.

Abdomen as described. The triangles are accompanied by darker oval spots. Ventral surface showing a median dark longitudinal band, composed of halfmoon-shaped, black haired patches, rest of abdomen golden-copperyellow haired.

As a variation of the described scheme the median triangle on the sixth segment may be absent in some of the specimens, instead of copperredyellow, the pubescence of those triangles may be goldenyellow, in the type ♀ the darker shadows on the dorsum abdominis were absent, like in some other ♀♀, in others the yellow hairfringes at the segmentations were not visible.

173. *Tabanus fulgidus* RICARDO (♀). Textfig. 188.

References:

RICARDO, Nova Guinea IX, p. 402 (1914).

Habitat:

Type ♀ and other ♀ from Heuvel Bivak 800 M. 7—15.11.'09, LORENTZ

Coll. N.A.M.

2 ♀♀ from same locality

Coll. BR.M.

1 ♀ „ Dutch N. Guinea

„

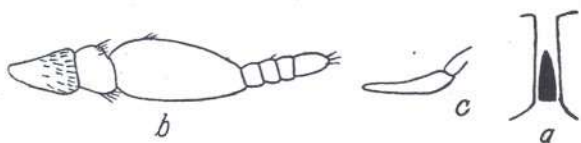
1 ♀ „ S. Nova Guinea VERSTEEG '12/'13

Coll. L.M.N.H.

One of the smallest species from this Region. Forehead darkbrown. Callus broad, shell-shaped, chestnutbrown. Subcallus yellowbrown. Face and a part of the cheeks shining chestnutbrown, cheeks elsewhere mummybrown, black haired. Beard black and white haired. Palpi narrow, blackishbrown, black haired. Thorax olivaceousyellowbrown, yellow haired, scutellum darker, black haired. Legs blackbrown. Wings clear, with a fine brown apical shadow. Abdomen pale yellowbrown on basal 3 segments, then blackbrown, black haired, except on the pale yellowwhite hairtufts in the middle of the first and second segment and on the yellow haired distal lateral borders of the first tergites. Ventral surface wholly yellow haired on the first 3 sternites, black haired elsewhere.

The Head. (Textfig. 188). Forehead almost the same width throughout, index 3,2. Callus almost reaching to the eyes.

Thorax, scutum rather denuded. Scutellum blackish olivaceous yellowbrown, black



Textfig. 188.

T. fulgidus Ric. ♀. a. forehead, b. antenna, c. palpe.

haired. Breast orangeousyellowbrown. Wings with pale brown veins and pale siennabrown stigma. Halteres, stalk yellowbrown, club blackbrown. Legs uniformly blackbrown, black haired. First leg slightly paler on the coxa, which is more olivebrown.

Abdomen as described above.

174. *Tabanus extricans* WALKER (♂). Textfig. 189.

References:

WALKER, Proc. Linn. Soc. London V, p. 275 (1861).

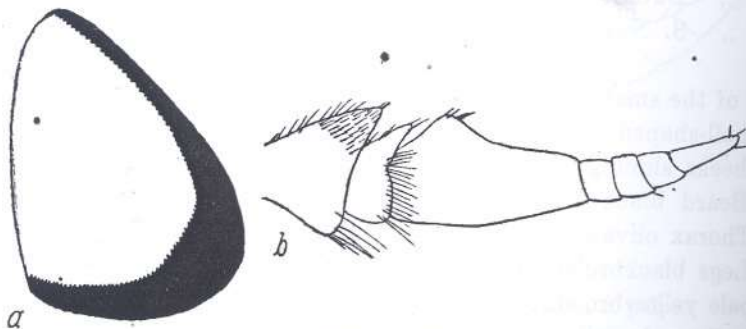
RICARDO, Nova Guinea IX, p. 399 (1914).

Habitat:

Type ♂ from Batchian (Batjan) Mollucs, A. R. WALLACE Coll. BR.M.

A blackish to redbrown species. Eyes with narrow small-facettled part reaching to the vertex. Subcallus and upper cheeks rusty redbrown, black haired. Beard dirty white. Palpi yellowbrown, yellow haired, black haired at apex. Antennae dark olivaceous redbrown to black, black haired. Thorax brown. Wings clear. Legs with blackbrown femora and redbrown tibiae. Abdomen reddish blackbrown with a black longitudinal shadow on the second segment, 4th and 5th segment, with median, yellow hairtufts, lateral borders of the first 5 tergites yellow haired. Ventral surface with a median blackbrown longitudinal band, segmentations and sides redbrown, thick yellow haired.

The Head. (Textfig. 189). Antennae, first joint protuding caplike over the second



Textfig. 189.

T. extricans Wlk. ♂. a. eye, b. antenna.

joint, which shows a distinct dorsal spur, third joint brown at base, then black, tooth blunt, distinct, basal annulation 1,7 times as long as its widest part, 1,1 times as long as the stylus.

Thorax brown, breast greybrown, brownish white haired, black haired on mesosternumlobus. Wings with yellowbrown foreborder and stigma. Halteres redbrown. Legs. First leg. Coxa grey, grey haired, femur blackbrown, yellowwhite haired along the distal lateral border, tibia redbrown to blackbrown, yellowred haired at base, then black haired. Tarsalia black. Second leg. Coxa and trochanter redbrown, white haired, femur brighter redbrown, almost wholly grey haired, some black hairs are to be seen on dorsum. Tibia tawny, black haired on dorsum, yellowred haired below, first tarsale deep redbrown, black haired. Other tarsalia black. Third leg almost identical, femur black haired on dorsum, knee yellowbrown.

Abdomen deteriorate, colour and distribution of the pubescence as described. Ventral surface mainly black haired on the darker areas.

175. *Tabanus aurisparsus* nov. spec. (♀) Pl. 13, Fig. 1; Textfig. 190.

Habitat:

Type ♀ caught on the walls of Dr. BUBBERMANN's house in Kota Paris, Buitenzorg, BUBBERMAN 25.2.'23 Coll. V.S.L.

3 ♀ ♀ caught on the walls of the Veterinary State Laboratories, SCHUURMANS STEKHOVEN

respectively 1 ♀ on 31.9.'22

1 ♀ „ 2.11.'22

1 ♀ „ 31.8.'23

7 other ♀ ♀ caught at Buitenzorg, resp. on 30.1.'22; 23.1.'22; 24.1.'22; 10.2.'22; 24.11.'22 and on 13.2.'23

1 ♀ from Tandjong Priok, 4.'10, BUITENDIJK

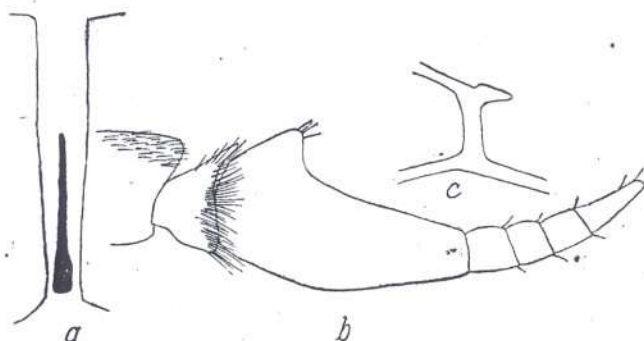
A species of the *T. fumifer* Group, characterised by the uniformly redbrown, black haired abdomen, over which goldenyellow hairs are scattered, particularly numerous at the segmentations. Eyes green on lower half. Forehead velvety-redbrown, yellowbrown and black haired. Callus redbrown, cylindrical, linear extension thick. Subcallus and upper cheeks ferrugineous, lower cheeks pale yellowish. Beard yellowishwhite. Face yellowbrown, yellow haired, with some black hairs, just underneath the antennae. Palpi pale violetbrown, whitish tomentose, black and brown haired. Antennae, yellowbrown, black haired on basal 2 joints, third joint sootyblack, tooth distinct. Thorax darkbrown, with blackish median stripe, and 2 lateral redbrown longitudinal stripes, lateral borders of scutum yellowbrownish, pubescence on scutum brown, intermixed with black. Wings pale brown. Legs yellowbrown.

Table of dimensions.

Bodylength	varying from 15,2 m.M. to 18,8 m.M.				
Width of thorax	„	„	5,2	„	— 6,5 „
Width of abdomen	„	„	5,2	„	— 7 „
Wingexpanse	„	„	33,2	„	— 38,1 „

Length of head	varying from	2,5 m.M.	to	3,8 m.M.
Length of thorax	"	6,2	"	7,8
Length of abdomen	"	8,2	"	10,8
Length of wing	"	14	"	15,8
Breadth of wing	"	4,2	"	6,2
Foreheadindex	"	7	"	8,5

The Head. (Textfig. 190). Forehead 0,25—0,33 narrower anteriorly than it is at vertex. Postocular rim yellowbrown. Palpi, first joint reddishyellowbrown, dull yellowbrown haired, second joint as mentioned above, ending with a long blunt point, proboscis, stalk pale dull brown haired, sugarflaps black and yellowbrown haired. Antennae, first joint black haired on dorsum, ventral surface yellow haired, second joint redbrownblack, black fringed, third joint redbrown at base, then black, basal annulation 1,78 as long as its widest part, 1,3 times as long as the stylus.



Textfig. 190.

T. aurisparsus s. s. ♀.

a. forehead, b. antenna, c. wingstructure.

Thorax. Scutum mainly yellowbrown haired, intermixed with black hairs. Pteropleuron dull violetbrown, black haired, yellowbrown haired at apex. Sides and breast pale brownishyellow haired, groundcolour isabella-brown, mesosternumlobus black haired. Wings with reddishcaramelbrown stigma. Halteres, stalk reddishbrown, club yellowish-burnt sienna. Legs. First leg. Coxa bluegrey tomentose, dull pale brown haired, some grey hairs visible at

base. Trochanter dull greyishyellowbrown, pale brown haired, femur blackbrown, black haired, distal lateral border greybrown tomentose, brownyellow haired, intermixed with some black hairs, knee yellowbrown. Tibia brownish at extreme base, then dirty yellowbrown, copperred-brown haired, intermixed with some black hairs on basal 3/4, apex black, black haired. Tarsalia black. Second leg. Coxa reddishbrown, greybrown at apex, femur dull bluegrey-brown, yellowbrown haired on dorsum, intermixed with a few black hairs, ventral surface caramel-yellowbrown, bluegrey tomentose. Tibia strawyellow, reddish at apex, ochraceousyellow haired, except on dorsum in the middle, where one finds an irregular row of black hairs. First tarsale redbrown at base, then black, black haired. Third leg identical, tibia with some ochraceous-yellow hairs on dorsum at base, remainder of dorsum black haired, ventral surface yellow haired. Tarsalia redbrown, black haired.

Abdomen dark redbrown. First segment with a small yellow haired spot at each side of the scutellum, a similar spot is indicated on the second segment. Lateral borders of tergites yellow haired. Ventral surface with a faint median, black haired longitudinal shadow, some yellow hairs being intermixed between the black ones. Sides and segmentations broad yellow haired. Seventh segment wholly black haired. In another ♀ median indistinct, scanty yellow haired spots are to be found on the 2d—5th segment. One of the females presents moreover a rudimental appendix.

176. *Tabanus nexus* WALKER (♀). Pl. 13, Fig. 2; Textfig. 191.

References:

WALKER, Proc. Linn. Soc. I, p. 110 (1875).

RICARDO, Rec. Ind. Mus. IV, p. 181 (1911).

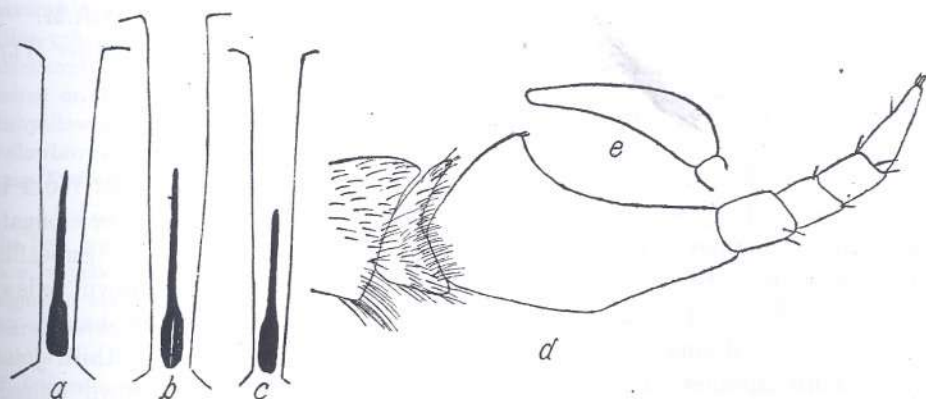
Habitat:

Type ♀ from Sarawak, Borneo, SAUNDERS '68 (Textfig. 191 a, e). Coll. BR.M.

1 ♀ from Djambi Sumatra 21.1.'23, MARSIDI (Textfig. 191 b, d). Coll. V.S.L.

1 ♀ „ Si Paho, Oedjoeng Padang, Goenoeng Toea, Tapanoeli on buffalo, 15.6.'23, LOBEL (Textfig. 191 c).

A species, according to RICARDO, closely allied to *T. ignobilis* RONDANI. I don't however agree with her opinion, since the abdomen does hardly show any white spots on the rubbed places. Eyes green on lower half. Forehead rather broad, dark velvetybrown, brownblack haired. Callus elongate piriform, chestnutbrown, redbrown or black, linear extension long. Subcallus goldenyellowbrown, upper cheeks ferrugineous, black haired. Lower cheeks and face dottedyellow, yellowwhite haired. Beard pollen yellow. Palpi stout, yellowbrown, black haired. Antennae redbrown, black haired. Thorax dark redbrown, with 3 indistinct longitudinal stripes, black and redbrown haired. Legs brown. Abdomen dull redbrown with triangular, yellow haired spots on the segments 2—5, a square similar spot on the 1st segment and a yellow hairtuft on the sixth segment. Segmentations fine, yellow fringed. Bodylength 20—22,5 m.M., Width of thorax 7—7,8 m.M., Wingexpanse 41—46,5 m.M. Length of wing 17—19,5 m.M.



Textfig. 191.

T. nexus Wlk. ♀. a—c. forehead, d. antenna, e. palpe.

The Head. (Textfig. 191). Forehead 0,28—0,37 narrower anteriorly than it is at vertex, index 8,2—9,5. Along the lateral borders yellowbrown hairs are visible, pubescence elsewhere blackbrown. Palpi stout, first joint orangeousred haired, with some black hairs

at apex, second joint swollen at base, ending with a long slender blunt point, base yellow haired, rest black haired. Antennae, first joint dull darkredbrown, black haired, second joint paler brownred, black fringed, with a long dorsal hump, third joint brownred at base, soon growing black, with distinct, blunt tooth, basal annulation 1.4–1.76 times as long as its widest part, 1.1 times as long as the stylus.

Thorax dark reddbrown to dark velvetybrown with a median blackbrown and 2 lateral goldenbrown stripes. Lateral borders of scutum and scutellum similar, reddbrown haired. Pubescence on dorsum black and redyellow or reddbrown, the latter especially on the mentioned markings, and on the tufts at base of wings. Scutellum same colour as scutum. Wings with distinct brown shadows along the veins. Halteres with luteous club, stalk reddbrown. Legs. First leg. Coxa bluegrey tomentose, pale velvetybrown at apex, brownyellow haired, femur darker than in *T. dissimilis* Ric., blackbrown, black haired, knee yellowbrown, distal lateral border brownyellow tomentose, olivaceous yellowbrown haired. Tibia velvetybrown on basal 1/2, apex black, dorsum black haired, yellow haired below. Tarsalia black. Second leg. Coxa greybrown, yellowbrown haired, trochanter brownblack, femur more yellowbrown in the type ..., distal lateral border white haired, black haired elsewhere, in the Sumatra females the femur of the second leg is identical with that of the first leg. Tibia reddishyellowbrown, with darker apex, black haired. Third leg identical.

Abdomen, marked as described, with a series of faint, broad-based, copperred-yellow haired triangles, tergites elsewhere black haired, segmentations black haired, intermixed with some reddbrown hairs. Lateral borders of tergites black haired. Ventral surface yellowbrown, with a median, not very distinct longitudinal band, composed of black haired rectangular spots, sides and segmentations white haired in the type, brownyellow haired in the other females.

177. *Tabanus lativenter* nov. spec. (♀). (Textfig. 192).

Habitat:

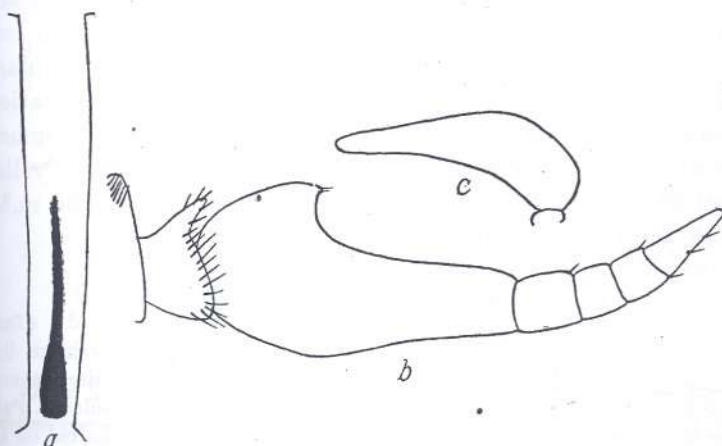
Type ♀ from Sintang, Borneo, 25.6.'09, LORENTZ, another label attached to the same specimen, said Java, low hills, South from Batang, Pekalongan, SOHNS 1919. (Textfig. 192 a, b). Coll. N.A.M.

2 ♀ ♀ from Djongkong, Borneo 1.7.'09, LORENTZ, labelled as *T. fumifer* WLK. (Textfig. 192 b).

1 ♀ from Borneo, without further indications

A species allied to *T. fumifer* WLK. resembling also *T. geniculatus* WULF in some respects. Forehead reddbrown, black haired. Callus blackbrown, elongate pear-shaped, distinctly separated from the black linear extension. Subcallus and upper cheeks reddbrown. Lower cheeks and face pale yellowbrown, yellowbrown haired. Beard same colour. Palpi yellowbrown, black haired on second joint. Antennae brownred, black haired on basal joints, third joint black, tooth distinct. Thorax dark havannabrown, redyellowbrown haired, foreborder grey tomentose, three longitudinal indistinct stripes are visible. Wings brownish, first posterior cell slightly narrower at opening. Legs darkbrown with yellowbrown tibiae. Abdomen tawnyreddbrown, black haired, except on the series of redyellowbrown haired median triangles on the segments 1–6 and on the yellowbrown, redyellowbrown haired triangles at the lateral borders of

the 1st till 5th segments. Bodylength 22,5 m.M.; Width of thorax 7,5 m.M.; Wingexpanse 46,5 m.M.; Length of wing 19,5 m.M.; Length of abdomen 14 m.M.



Textfig. 192.

T. lativenter s.s. ♀. a. forehead, b. antenna, c. palpe.

second joint dark redbrown, black fringed, dorsal spur long, black, third joint, basal annulation 1,8 times as long as its widest part, 1,27 times as long as the stylus, tooth distinct.

Thorax, for description of scutum see above. Lateral borders of scutum grey tomentose, black haired. Tufts at base of wings and behind redbrown, Pteropleuron violet, black haired. Scutellum redbrown, black haired. Sides and breast sootybrown, yellow haired, mesosternum lobus black haired. Wings with yellowbrown foreborder and pale havannabrown stigma. Halteres, stalk brownyellow, club ivorywhite. Legs. First leg. Coxa greybrown, yellow haired, trochanter blackbrown, femur black haired on dorsum, distal lateral border dull havannabrown, yellowbrown haired on basal 2/3, apex black haired, knee yellowbrown. Tibia yellowbrown, yellowwhite haired on basal 2/3, intermixed with some black hairs, apex blackbrown, black haired, tarsalia black, black haired. Second leg, femur sootyblack, black haired on dorsum, distal lateral border yellowbrown haired, knee yellowbrown, tibia red-dishyellowbrown, with blackbrown apical ring, black haired on dorsum, ventral surface red-yellowbrown haired. Third leg, trochanter yellowbrown haired, femur as in second leg, black hairs limited to the dorsum in the middle. Tibia and tarsalia identical.

Abdomen broad and stout, black haired, except on the described marking. Further the first segment presents a havannabrown spot at each side of the scutellum. Ventral surface redyellowbrown, black haired on basal 2 segments, segmentations yellow haired. Other segments blackbrown at base, black haired, segmentations broad olivebrown, yellowbrown haired, seventh segment wholly black haired. In one of the Djongkong females the middle one of the 3 branches of the postanal vein does not reach the hindborder of the wing. *T. lativenter* is closely allied to *T. pauper* ROND. but differs in the colour of pubescence on head and face and the colour of the breast

178. *Tabanus flavitriangularis* nov. spec. (♀). Textfig. 193.

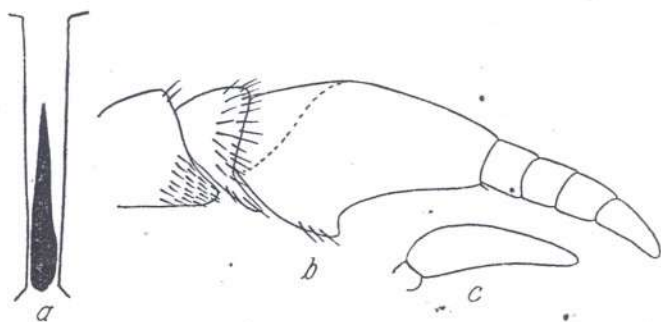
Habitat:

Type ♀ from Sumatra, Goenoeng Sahilan, KLEIWEG DE ZWAAN '07

Coll: N.A.M.

The Head.
(Textfig. 192). Fore-head 0.27 narrower anteriorly than it is at vertex, index 5,3 Palpi, first joint yellowwhite haired, intermixed with a number of black hairs at apex, second joint stout, swollen at base, where one finds some yellow hairs, tapering to an obtuse large point, black haired. Antennae, first joint brown-red, yellow tomentose, black haired,

A yellowbrown species. Forehead yellowbrown, yellow haired. Callus olivebrown, cylindrical, linear extension redbrown. Cheeks and face greybrown, yellow haired. Palpi dull havannabrown, black haired on second joint. Antennae reddishyellowbrown, black haired on basal joints, third joint redbrown to blackbrown, with distinct tooth. Thorax dull havannabrown, redbrown haired. Legs blackbrown. Abdomen tawny-yellowbrown on basal 5 segments, then blackbrown, black haired, except on the white, yellowbrown haired segmentations to the first 5 segments, elevated in the middle to low triangles, sixth segment with a median white triangle, lateral borders of tergites yellowbrown, yellow haired. Bodylength 18 mM.; Width of thorax 6 m.M.; Wingexpanse 36 m.M.; Length of wing 15 m.M.; Length of abdomen 10 m.M.



Textfig. 193.

T. flavitriangularis s. s. ♀

a. forehead, b. antenna the dotted line indicates the limit of the redbrown area, c. palpe.

The Head. (Textfig. 193). Forehead 0.25 narrower anteriorly than it is at vertex, index 8. Palpi yellowbrown haired on the 1st joint, second joint broad at base, ending in a broad point, black haired. Antennae, third joint redbrown at extreme base, then blackbrown, basal annulation 1.56 times as long as its widest part, 1.23 times as long as the black stylus.

Thorax. Scutum as mentioned. Pteropleuron violetbrown, black haired. Tufts at base of wings and behind sides bluishgrey, yellowbrown haired. Wings brownish. Halteres yellowbrown. Legs blackbrown. First leg. Coxa greybrown, yellowbrown haired, trochanter blackbrown, femur same colour, black haired, yellow haired on distal lateral border. Tibia blackbrown, slightly paler at base, black haired. Tarsalia black. Second leg, femur black, knee yellowbrown, pubescence as in fore femora, tibia redbrown at base, blackbrown at apex, black haired, third leg similar.

Abdomen as mentioned. Ventral surface yellowbrown, yellow haired at the segmentations and sides of the first 4 segments, median areas of the same segments black haired. Fifth and sixth segments with yellow haired segmentations only. Seventh segment wholly black haired.

179. *Tabanus fumifer* WALKER (♀, ♂) Pl. 12, Fig. 6; Textfig. 194, 195.

References:

- WALKER, Proc. Linn. Soc. I, p. ... (1857).
 RICARDO, Rec. Ind. Mus. IV, p. 177 (1911).
 PRATT, Jl. Trop. Vet. Sc. IV, p. 390 (1909).

Habitat:

Isle Borneo

- Type ♀ from Sarawak, Borneo WALLACE (Textfig. 194 f, n) Coll. BR.M.
 2 ♀ ♀ from Sarawak, WELLINGTON Coll. BR.M.
 some ♀ ♀ from Martapoera Tanah Intan, TARIP (Textfig. 194 s) Coll. V.S.L.
 1 ♀ from Mahakkam 1894 NIEUWENHUIS Coll. L.M.N.H.
 1 ♀ „ Djonkong 1.7.'09 LORENTZ „

Isle Sumatra

Residency Tapanoeli

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

- 1 ♀ from Padang Sidempoean 12.'22, LOBEL Coll. V.S.L.
 7 ♀ ♀ „ from Si Doea Doea, Pidjorkoling, BAKKER
 respectively 1 ♀ on buffalo 26.9.'23
 3 ♀ ♀ „ „ 5.8.'24
 3 ♀ ♀ „ horse 2.5.'24
 12 ♀ ♀ from Pidjor Koling, Pidjor Koling, BAKKER, LOBEL on buffalo

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number		1923						1			1				2
	„	1924				2	1	1	1	1	1		4		10
Total						2	1	1	1	1	2		4		12

- 10 ♀ ♀ from Hoeta Padang, Pidjor Koling on buffalo 24.12.'22, LOBEL
 Textfig. 194 i.

- 6 ♀ ♀ „ Bintoedjoe, Moeara Tais, LOBEL, BAKKER

respectively 1 ♀ on horse 20.2.'23

1 ♀ „ „ 3.'23

1 ♀ „ buffalo 20.2.'23

2 ♀ ♀ „ „ 7.9.'23

1 ♀ „ „ 5.8.'24

- 2 ♀ ♀ from Hoeta Tongga, Moeara Tais, LOBEL

respectively 1 ♀ on horse 1.'23

1 ♀ „ buffalo 30.6.'23

- 2 ♀ ♀ from Hoeta Olboeng, Moeara Tais on buffalo, LOBEL

respectively 1 ♀ on 24.12.'22 (Textfig. 194 e)

1 ♀ „ 30.6.'23

- 3 ♀ ♀ from Si Balapak, Moeara Tais BAKKER

respectively 1 ♀ on buffalo, 7.9.'23

1 ♀ „ „ 2.11.'24

1 ♀ „ horse 24.12.'22

10 ♀ ♀ from Hapesong Lama, Marantjar, LOBEL, BAKKER
respectively 3 ♀ ♀ on cattle 23.2.'23 (Textfig. 194 u)

2 ♀ ♀ „ „ 28.9.'23

1 ♀ „ buffalo 27.2.'23

2 ♀ ♀ „ „ 5.4.'24

1 ♀ „ „ 14.11.'24

1 ♀ „ cattle 2.9.'23

1 ♀ from Angkola, TARIP 16.1.'22

11 ♀ ♀ „ Si Hitang, Batoe na Doea, LOBEL, BAKKER

respectively 3 ♀ ♀ on cattle 23.2.'23

1 ♀ „ „ 2.5.'24

1 ♀ „ buffalo 1.'23

1 ♀ „ „ 23.2.'23

1 ♀ „ „ 3.'23

3 ♀ ♀ „ „ 7.9.'23

1 ♀ „ „ 2.11.'24

1 ♀ from Si Dadi, Si Galangan on buffalo 1.'23, LOBEL

1 ♀ „ Si Galangan, Si Galangan on buffalo, LOBEL 1.'23 (Textfig. 194 c)

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

40 ♀ ♀ from Si Boeni boeni, Siboloean, Sibolga, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1924	3						2				1		6
	cattle	1922										1	1		2
	„	1923											2	5	7
	„	1924	3					1	3	2					9
	horse	1922										2			2
	„	1923												2	2
	„	1924	5					2	1	1					9
Total			11					3	6	3		3	4	7	37

3 ♀ ♀ same locality on buffalo, no date

2 ♀ ♀ from Anggoli Simanossor, Si Babangoen on horse 27.10.'22, LOBEL
(Textfig. 194 f, h, j.)

2 ♀ ♀ „ Kampong Mela, Sibolga on cattle 12.'22, LOBEL

4 ♀ ♀ „ Batoe Harimo, Siboloean, Sibolga, LOBEL

respectively 2 ♀ ♀ on buffalo 10.'22

1 ♀ „ cattle 10.'22

1 ♀ „ „ 19.10.'22 (Textfig. 194 g.)

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

46 ♀ ♀ from Pasar Goenoeng Toea, Goenoeng Toea, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923									1				1
	"	1924				3			1			8	4		16
	cattle	1922				1									1
	"	1923									2			4	6
	"	1924				1						6	5		12
	horse	1923									1				1
	"	1924										7	2		9
Total						5			1		4	21	11	4	46

1 ♀ from same locality on buffalo without date

4 ♀♀ „ Goenoeng Toea Tongga LOBEL

respectively 3 .. ♀ on horse 23.12.'22 (Textfig. 194 b)

1 ♀ „ „ 10.'22

3 ♀♀ from Pasar Sipionget, Sipionget on horse 1.'23, LOBEL

29 ♀♀ „ Sawah Bangoenan, Portibi on horse, BAKKER Coll. V.S.L.

respectively 1 ♀ on 27.8.'23

3 ♀♀ „ 23.9.'23

9 ♀♀ „ 17.4.'24

9 ♀♀ „ 19.10.'24

7 ♀♀ „ 21.11.'24

1 ♀ from Poerba Sinomba on buffalo 24.12.'22, LOBEL

7 ♀♀ „ Hoeta Rimbaroe, Poerba Sinomba, LOBEL

respectively 4 ♀♀ on horse 10.'22

3 ♀♀ „ buffalo 10.'22

1 ♀ from Pagaran Sihndoeng, Poerba Sinomba on horse 24.11.'22, LOBEL

1 ♀ „ Pagaran Sihndoeng, Poerba Sinomba on horse 10.12.'22, LOBEL

85 ♀♀ „ Si Paho, Oedjoeng Padang, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1922										4			4
	"	1923			3			3		1	1		6	10	24
	"	1924	2			19						3	4		28
	horse	1922										4			4
	"	1923			3			1		2			3		9
	"	1924	1	2		2						5	6		16
Total			3	2	6	21		4		3	1	16	19	10	85

Ressort Padang Sidempoean Mantrie Ressort Binanga

- 3 ♀ ♀ from Binanga on horse 10.'22
 3 ♀ ♀ „ Binanga on horse 8.12.'22, LOBEL
 1 ♀ „ Binanga 1.'23, LOBEL
 13 ♀ ♀ „ Pangkal Dolok, Pangkal Dolok Lama, LOBEL

respectively 12 ♀ ♀ on buffalo 14.12.'22

1 ♀ „ horse 10.'22

- 13 ♀ ♀ from Si Oendol, Paringgonan, BAKKER

respectively 1 ♀ on horse 18.7.'23

3 ♀ ♀ „ „ 26.11.'24

1 ♀ „ buffalo 18.7.'23

1 ♀ „ „ 26.8.'23

1 ♀ „ „ 14.11.'23

1 ♀ „ „ 6.12.'23

2 ♀ ♀ „ „ 1.2.'24

3 ♀ ♀ „ „ 4.6.'24

- 10 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, LOBEL, BAKKER

respectively 1 ♀ on horse 10.'22

1 ♀ „ „ 16.7.'23

1 ♀ „ „ 26.8.'23

3 ♀ ♀ „ „ 25.11.'24

1 ♀ „ buffalo 4.2.'24

1 ♀ „ „ 27.10.'24

2 ♀ ♀ „ „ 25.11.'24

- 13 ♀ ♀ from Pasar Si Boehoean, Djandi Lobi, LOBEL, BAKKER

respectively 4 ♀ ♀ on cattle 6.2.'23

2 ♀ ♀ „ horse 2.12.'23

2 ♀ ♀ „ buffalo 2.12.'23

2 ♀ ♀ „ „ 2.1.'24

1 ♀ „ „ 5.2.'24

1 ♀ „ „ 2.6.'24

1 ♀ „ „ 24.11.'24

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan

- 12 ♀ ♀ from Kota Nopan, Kota Nopan, LOBEL, BAKKER

respectively 1 ♀ on buffalo 23.2.'23

3 ♀ ♀ „ „ 3.'23

3 ♀ ♀ „ „ 25.4.'23

2 ♀ ♀ „ horse 4.1.'24

1 ♀ „ „ 12.5.'24

1 ♀ „ „ 2.'24

- 4 ♀ ♀ from Moeara Tagor, Tamiang, LOBEL

- respectively 2 ♀ ♀ on cattle 27.4.'23
 2 ♀ ♀ „ buffalo 27.4.'23
- 5 ♀ ♀ from Pidjangbolang, LOBEL
 respectively 1 ♀ on buffalo '22
 4 ♀ ♀ „ „ 13.3.'22
- 3 ♀ ♀ from Kota Siantar on buffalo, LOBEL
 respectively 1 ♀ on 10.'22
 2 ♀ ♀ „ 27.2.'23
- 2 ♀ ♀ from Manjabar, Panjaboenggan Tongga on buffalo 15.5.'24, BAKKER
 4 ♀ ♀ „ Panjaboengan '21, TARIP
 1 ♀ „ Balige 3.'22 on buffalo Coll. V.S.L.
 5 ♀ ♀ „ Langsar, Gvt. Atjeh DIEBEN
 Gvt. Sumatra's East Coast
- 2 ♀ ♀ from Serdang, Sumatra, v. DEDEM 30.9.'09, labelled *T. brunneus* MACQ.
 Coll. N.A.M.
- 1 ♀ „ Sibolangit 550 M., CORPORAAL 30.10.'21 Coll. N.A.M.
 1 ♀ „ aboard Gvt. Steamer BRAK 1,3 MILES East from Sumatra,
 DAMMERMAN (Textfig. 194 a, r) Coll. B.Z.M.
- 1 ♀ „ Negri Baroe, CORPORAAL Coll. N.A.M.
 1 ♀ „ Sibigo, Simalur, JACOBSON „
 1 ♀ „ Sinabang, Simalur, JACOBSON „
 4 ♀ ♀ „ Fort de Kock MEERENS 11.'22 Coll. V.S.L.
 1 ♀ „ aboard of Mail Steamer, Street Malacca 11.'10, BUITENDIJK
 Coll. L.M.N.H.
- 1 ♀ „ Street Bangka, BUITENDIJK 5.'10 „
 Residency Djambi
- 1 ♀ from Djambi 1919, DOUGLAS Coll. N.A.M.
 1 ♀ „ Sumatra, FORBES Coll. BR.M.
 Isle Nias
- 2 ♀ ♀ from Goenoeng Sitoli 4.'22, TARIP Coll. V.S.L.
 Isle Java
- 1 ♀ from Java, JACOBSON Coll. N.A.M.
 Federated Malay States
- 1 ♀ from Singapore, RIDLEY 1904 (Textfig. 194 m, o) Coll. BR.M.
 4 ♀ ♀ „ Singapore 5.'24 Coll. R.M.S.
 1 ♀ „ Quedah, Malacca, v. DE DOES DE BIJE Coll. L.M.N.H.
 1 ♀ „ Goenoeng Tampin 29.6.'20 Coll. R.M.S.
 9 ♀ ♀ „ Darien Typus 1909, STANTON (Textfig. 194 p) Coll. BR.M.
 1 ♀ „ Selangor, BUTLER „
 1 ♀ „ Sungei Besi, Selangor 4.7.'02 (Textfig. 194 k) „
 1 ♂ „ Kukub, S. Johore, FORBES 1909 (Textfig. 195) „
 11 ♀ ♀ „ Batu Tiga, STANTON „
 respectively 9 ♀ ♀ on 1.'09 Textfig. 194 a, l, g)

1 ♀ „ 17.2.'10 (Textfig. 194 t)

1 ♀ „ 15.5.'10

T. fumifer WALKER is one of the most difficult species of the oriental region. Frinstens the type ♀ is in very bad condition and can hardly be defined, as the abdomen has been rubbed and dont present one of the characteristical markings, typical for the Group, to which this species belongs. Further it is quite obvious that the type ♀ and the type ♂ dont belong to the same species. The latter whose abdomen is in excellent condition has no triangles whatever on this bodypart, and ought to be brought to another species, confer *T. lentsignatus* SCHUURMANS STEKHOVEN.

Finally the type ♀ does deviate in several respects from the other ♀ ♀ placed under the same heading in the BR.M. Coll.; therefore possibly the type ♀ belongs to a species, distinct from the species to which the other females belong; in this case the only representant of *T. fumifer* would be the ♀ described by WALKER, which ♀ can not be redescribed as it has almost no characteristical features, which may give a trustworthy definition, and the other specimens belong to quite another species. Another possibility is that all specimens belong to the same species but form distinct local races; this supposition could only be solved by breeding experiments. To overcome the difficulties I have brought all specimens mentioned here to the same species, named *T. fumifer* provisionally, in the hope that future breeding experiments will solve the questions raised. Then possibly other species as *T. angustitriangularis* SCH. STEKH. and *T. aurisparsus* SCH. STEKH. will likewise appear as subforms of *T. fumifer* WALKER or the species *T. fumifer* WALKER will be subdivided into a yet larger number of subspecies. Now I will describe the species *T. fumifer* after my observations on the Sumatra specimens and those of the BR.M. collection.

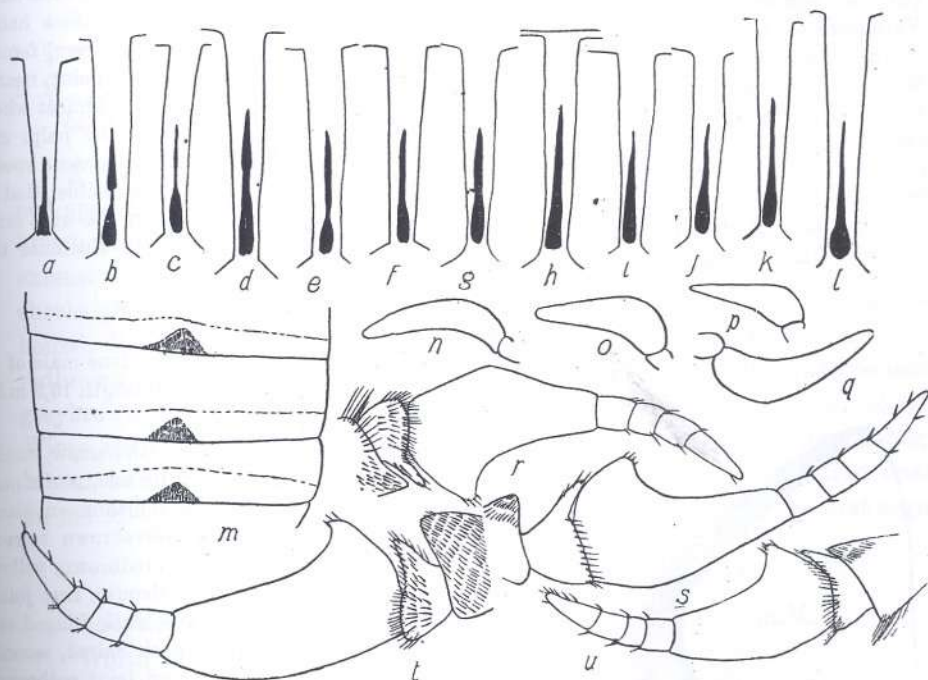
T. fumifer WALKER is a brownish species. Eyes bluegreen on lower half. Callus redbrown to black, more cylindrical, almost reaching to the eyes, linear extension thick and long, the callus usually gradually tapers to the linear extension. Forehead goldenyellowbrown, yellow and black haired, usually narrower at base than in *T. immanis* WIED. Subcallus cheeks and face pale yellow to orangeousyellow, yellowwhite haired, upper cheeks sometimes with a row of black hairs. Beard yellowwhite. Palpi ending blunt, yellowbrown, black and yellow haired. Antennae rustystyredbrown, black haired on basal joints, third joint redbrown at base, then black, tooth distinct. Thorax medlarbrown to dull coffeebrown, bluegrey, yellowbrown haired on foreborder, with 3 indistinct brownish stripes, elsewhere black and yellowbrown haired. Wings brownish, first posterior cell slightly narrower at opening. Legs greybrown. Abdomen orangeousyellowbrown to tawnybrown with a median series of yellow haired triangles, yellow haired segmentations and in a number of specimens yellow hairs, scattered between the black ones on the disc of the segments. In the male sex the black-facetted eyepart is narrow.

The Female.

Table of dimensions.

Bodylength	varying from 14,4 m.M. to 21,5 m.M. in one ex-				
Width of thorax	„	„	4,2	„	— 7 „
Width of abdomen	„	„	4,6	„	— 8 „
Wingexpanse	„	„	27,2	„	— 41,8 „
Length of head	„	„	1,8	„	— 4,2 „
Length of thorax	„	„	5,2	„	— 8,8 „
Length of abdomen	„	„	7,8	„	— 12 „
Length of wing	„	„	11,6	„	— 17,4 „
Breadth of wing	„	„	3,8	„	— 6,2 „
Foreheadindex	„	„	6,9	„	— 11

The Head. (Textfig. 194). Forehead 0,20—0,50 narrower anteriorly than it is at vertex, yellow haired at base, brown to black haired at vertex. Face yellowwhite haired with some



Textfig. 194.

T. fumifer Wlk. ♀. a—l. forehead, n—q. palpi, r—u. antennae, m. abdomen.

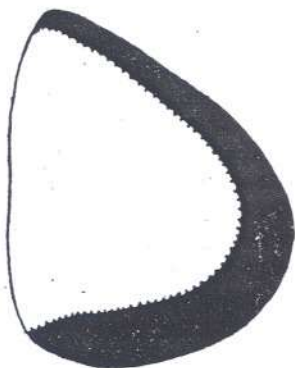
black hairs just underneath the antennae. Palpi redbrown in the type ♀, very stout and almost the same width throughout, with a long black haired blunt point, first joint yellow haired with some black hairs at apex; in the other females they are pale yellowbrown, first joint yellowwhite haired, second joint black haired, intermixed with some yellow hairs. Antennae, basal joints rusty redbrown, black haired, third joint as described.

T h o r a x as mentioned. Pteropleuron reddishhazelbrown, black haired. Hindborder of scutum long brownishyellow haired as also the tufts at base of wings and behind. Sides and breast brownishgrey, dirtywhite to yellowwhite haired, mesosternumlobus yellowishbrown. Wings brownish, foreborder yellowbrown as also the stigma. Halteres, stalk reddbrown, club yellowbrown. Legs. First leg. Coxa greybrown, redbrown at apex, dirtyyellowwhite haired, trochanter identical, femur, dorsum black haired, distal lateral border greybrown tomentose, white haired, tibia, black at extreme base, then dirty-yellowwhite, white haired, intermixed with a number of black hairs on the basal half, apical $1/3-1/5$ black, black haired. Tarsalia black, black haired. Second leg. Femur blackgreybrown, mainly yellowwhite haired, intermixed with a number of black hairs on dorsum, knee yellowbrown. Tibia pale brownyellow yellow haired, intermixed with some black hairs on dorsum, apexring redbrown, black haired. Tarsalia black. Third leg, femur without black hairs on dorsum, tibia brownyellow, with redbrown apical ring, dorsum black haired, ventral surface goldenyellow haired.

A b d o m e n orangeouslyyellowbrown, darker to the apex, black haired, first segment with a median square group of yellow hairs, the described triangles being found on the 2d—5th segment, sixth segment, yellow fringed at segmentation only, no triangle. Lateral borders of tergites with rectangular triangles, all segmentations except the 7th yellow fringed. In some of the Sumatra females yellow hairs are intermixed between the black ones on the disc of the dorsal scutes. Ventral surface with a median series of half-moon-shaped, black haired patches; segmentations and sides goldenyellow haired, 7th segment wholly black haired. Variations on the described scheme occur, to which I did point already. In several females the beard was darker, more yellowbrown, in others the palpi have a less blunt point, nearing thus to *T. immanis* WIED. In the type ♀ the ventral surface of the abdomen is almost wholly black haired, except at the segmentations, which are yellow haired. Finally the palpi may be mainly yellow haired in some specimens, and so on. It is clear that the present species is liable to much variation, and one would be inclined to ask, if it is not possible, that *T. immanis* and *T. fumifer* are varieties of the same species, when one considers the wide range of variation of *T. fumifer* WALKER. As I remarked, it is urgently wanted to elucidate this point by making extensive breeding experiments.

The Male.

Above I said, that WALKER's type ♂ belongs to a distinct species. The true male of *T. fumifer* Wlk. I consider to be a ♂ from Kukub, S. W. Johore, RIDLEY. Bodylength 16,5 m.M.



Textfig. 195.

T. fumifer Wlk. ♂. eye.

The H e a d. (Textfig. 195). Eyes with narrow, small-faceted area, extending to the vertex by means of a narrow border. Subcallus and upper cheeks reddishbrown, black haired. Lower cheeks bluishgrey, silky olivebrown haired. Beard yellowbrown. Face yellowish. Palpi redbrown, yellow haired, black haired at apex. Antennae slender, first joint redbrown, protruding caplike over the black fringed second joint, grey tomentose, dorsum black haired, second joint with a rather long dorsal hump, third joint redbrown at base, then black, basal annulation 2,44 times as long as its widest part.

T h o r a x havannabrown, black and yellowbrown haired, with 3 redbrown, longitudinal stripes, hindborder of scutum, as also the lateral borders of the scutellum yellowbrown tomentose. Pteropleuron reddishbrown, black haired.

Breast and sides bismarckbrown, with sootyblack streaks, olivebrown haired, mesosternumlobus thick black haired. Wings with faint shadows accom-

panying the veins. Legs. First leg. Coxa greybrown, olivebrown haired, femur black, black haired, knee yellowbrown, tibia dark olivebrown, darker at apex, black haired. Tarsalia black. Second leg, femur more havannabrown, knee yellowbrown, pubescence yellow, intermixed with some black hairs, tibia yellowbrown with blackishbrown apical ring, dorsum mainly black haired, except some yellow hairs at base, ventral surface yellow haired. Tarsalia blackbrown, black haired. Third leg identical, femur bluishblack, mainly yellowbrown haired, with a median row of black hairs on dorsum, knee reddish yellowbrown, tibia dark olivebrown, dorsum black haired, ventral surface yellow haired.

A b d o m e n denuded, the triangles as in the female, lateral borders of tergites black haired with yellow tufts at the 2d—5th segmentation. Ventral surface mainly black haired, segmentations 1—5 yellow haired. The male from *T. fumifer* differs from the male of *T. immanis* WIED. mainly in the surface of the small-faceted part, which is somewhat broader in the first species, in the colour of the wings, which are slightly paler, and in the colour of the femora, etc.

180. *Tabanus angustitriangularis* nov. spec. (♀) Pl 12, Fig. 3, 4, Textfig. 196.

Habitat:

Type ♀ from Java, Tjiloeear, Kaoem Pandak, near Buitenzorg on buffalo 7.4.'22,

SCHUURMANS STEKHOVEN (Pl. 12, Fig. 3; Textfig. 196) Coll. V.S.L.

1 ♀ from Sumatra, Djambi, MARSIDI 25.9.'23 (Pl. 12, Fig. 4) Coll. V.S.L.

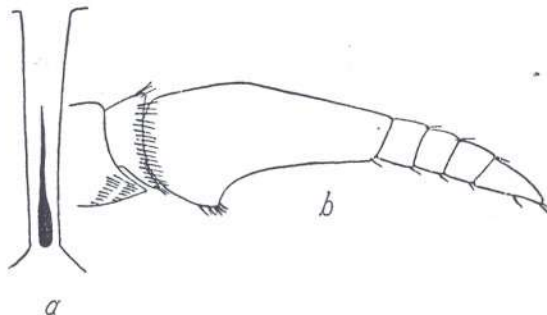
1 ♀ „ Goenoeng Toea, Si Paho, Oedjoeng Padang, Tapanoeli, Sumatra on buffalo 15.6.'23, LOBEL.

A species belonging to the *T. fumifer* Group, distinguished from the mentioned species by the typical abdominal markings. Forehead dull brown, yellowbrown and black haired. Callus redbrown to blackbrown, club-shaped, linear extension short. Subcallus and upper cheeks ferrugineous yellowbrown, lower cheeks greywhite, white haired, face yellowishwhite to pale yellowbrown, white haired. Beard white. Palpi stout, yellowbrown, black haired. Antennae dark redbrown, black haired on basal joints, third joint black, tooth distinct. Thorax greybrown, black and yellowbrown haired, with 3 redbrown longitudinal stripes. Wings with brown shadows along the veins. Legs dark. Abdomen mahoganybrown, basal segments paler, with narrow elongate, pale yellow haired triangles on the 2d—5th segment and a median group of similar hairs on the first segment.

Table of dimensions.

Bodylength	varying from 13,8 m.M. to 15,2 m.M.				
Width of abdomen	„	„	4,5	„	— 5,5 „
Wingexpanse	„	„	26,5	„	— 32,5 „
Length of head	„	„	2	„	— 2,5 „
Length of thorax	„	„	5,2	„	— 6 „
Length of abdomen	„	„	7,5	„	— 8,2 „
Length of wing	„	„	11,5	„	— 13,5 „
Breadth of wing	„	„	4,5	„	— 5,5 „
Foreheadindex	„	„	7,7	„	— 10 „

The Head. (Textfig. 196). Eyes green on lower half. Forehead 0,3—0,4 narrower anteriorly than it is at vertex, yellowbrown haired at base, black at vertex, near the black vertexspot. Postocular rim yellowwhite haired. Palpi, first joint pale brownishgrey, yellowish-white haired, with some black hairs at apex, second joint pale olivebrown, grey tomentose, slender, ending blunt, black haired. Antennae, third joint redbrown at extreme base, then black, basal annulation 1,7—1,8 times as long as its widest part, 1,45 times as long as the black stylus. Proboscis, stalk grey haired, sugartlaps black.



Textfig. 196

T. angustitriangularis s. s. ♀. a. forehead, b. antenna

border dull brownblack, white haired, tibia brownish white, white haired on basal half, then brownblack, black haired. Tarslia black. Second leg, femur sootybrown-grey, white haired, with a row of black hairs in the middle on dorsum, knee yellowbrown; tibia yellowbrown, yellowwhite haired, intermixed with black hairs, apex black-redbrown, black haired, tarsalia brownblack, black haired. Third leg, trochanter redbrown, black and white haired, femur same colour as in second leg, dorsum white haired at base, rest of dorsum black haired, tibia as in second leg, black haired on dorsum, yellowwhite haired on ventral surface at base. First tarsale blackredbrown, black haired, other tarsalia black.

Abdomen paler on basal 2 segments than to the apex, which is almost blackbrown, black haired, markings as mentioned, first segment bearing moreover a group of sootygrey hairs at each side of the scutellum. Lateral borders of tergites black haired, except a tuft of white hairs at the lateral borders of the 3d and 4th segments. The triangles are elongate and narrow and almost reach each other in the Djambi ♀, in the Java ♀ broader and not so huge. In the Goenoeng Toea ♀ the segmentations are yellow fringed. Ventral surface with a median tawnybrown, black haired band, sides and segmentations yellowbrown, yellowwhite haired. seventh segment wholly black.

In the Djambi ♀ the abdomen is darker than in the Java ♀, wings clearer, the sixth segment of this female bears on its dorsal scute a distinct triangle, these differences do not suffice to separate the specimen from this species.

181. *Tabanus immanis* WIEDEMANN. (♀, ♂) Pl. 12, Fig. 5; Textfig. 197, 198.

Syn. *T. univentris* WALKER.

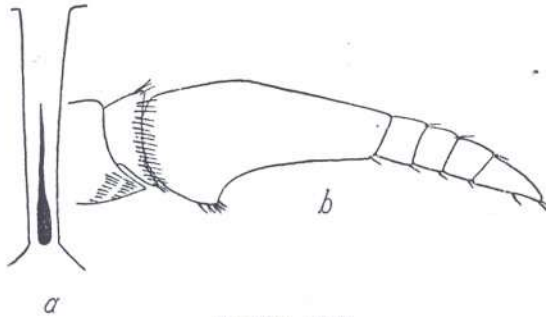
T. stantoni RICARDO.

References:

WALKER, List Dipt. I, p. 151 (1848).

„ Proc. Linn. Soc. London I, p. 9 (1857).

The Head. (Textfig. 196). Eyes green on lower half. Forehead 0,3—0,4 narrower anteriorly than it is at vertex, yellowbrown haired at base, black at vertex, near the black vertexspot. Postocular rim yellowwhite haired. Palpi, first joint pale brownishgrey, yellowish-white haired, with some black hairs at apex, second joint pale olivebrown, grey tomentose, slender, ending blunt, black haired. Antennae, third joint redbrown at extreme base, then black, basal annulation 1,7—1,8 times as long as its widest part, 1,45 times as long as the black stylus. Proboscis, stalk grey haired, sugartlaps black.



Textfig. 196

T. angustitriangularis s. s. ♀. a. forehead, b. antenna

border dull brownblack, white haired, tibia brownish white, white haired on basal half, then brownblack, black haired. Tarslia black. Second leg, femur sootybrown-grey, white haired, with a row of black hairs in the middle on dorsum, knee yellowbrown; tibia yellowbrown, yellowwhite haired, intermixed with black hairs, apex black-redbrown, black haired, tarsalia brownblack, black haired. Third leg, trochanter redbrown, black and white haired, femur same colour as in second leg, dorsum white haired at base, rest of dorsum black haired, tibia as in second leg, black haired on dorsum, yellowwhite haired on ventral surface at base. First tarsale blackredbrown, black haired, other tarsalia black.

Abdomen paler on basal 2 segments than to the apex, which is almost blackbrown, black haired, markings as mentioned, first segment bearing moreover a group of sootygrey hairs at each side of the scutellum. Lateral borders of tergites black haired, except a tuft of white hairs at the lateral borders of the 3d and 4th segments. The triangles are elongate and narrow and almost reach each other in the Djambi ♀, in the Java ♀ broader and not so huge. In the Goenoeng Toea ♀ the segmentations are yellow fringed. Ventral surface with a median tawnybrown, black haired band, sides and segmentations yellowbrown, yellowwhite haired. seventh segment wholly black.

In the Djambi ♀ the abdomen is darker than in the Java ♀, wings clearer, the sixth segment of this female bears on its dorsal scute a distinct triangle, these differences do not suffice to separate the specimen from this species.

181. *Tabanus immanis* WIEDEMANN. (♀, ♂) Pl. 12, Fig. 5; Textfig. 197, 198.

Syn. *T. univentris* WALKER.

T. stantoni RICARDO.

References:

WALKER, List Dipt. I, p. 151 (1848).

„ Proc. Linn. Soc. London I, p. 9 (1857).

RONDANI, Ann. Mus. Civ. Genova VII, p. 457 (1875).

RICARDO, Rec. Ind. Mus. IV, p. 206 (1911).

„ Rec. Ind. Mus. IV, p. 174 (1911).

„ Rec. Ind. Mus. IV, p. 168 (1911).

WIEDEMANN, Auss. Zweifl. Ins. I, p. 123, 17 (1828)

VAN DER WULP, Sumatra Exped. Dipt. (1881).

„ Notes Leyden Mus. VII, p. 71 (1885).

NIESCHULZ, Nederl. Ind. Bladen v. Diergeneesk. etc. XXXVII, p. 535 (1925).

Hanitat:

Isle Java

Type ♀ from Java *Tabanus immanis* WIED.

3 ♀ ♀ from Java K. v. H. labelled *T. immanis* WIED.

Coll. L.M.N.H.

1 ♀ „ Semarang, DRESCHER 3.'00

Coll. N.A.M.

1 ♀ „ Java JACOBSON

1 ♀ „ Semarang 6.'91

Coll. BR.M.

Isle Sumatra

Residency Tapanoei

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

36 ♀ ♀ from Bintoejdje, Moeara Tais, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923	5	1	4	1		3			4				18
	„	1924					1		3	1					5
	horse	1923	2	1	4									5	12
	cattle	1923	1												1
Total			8	2	8	1	1	3	3	1	4			5	36

9 ♀ ♀ from Hoeta Tongga, Moeara Tais, TARIP and LOBEL Coll. V.S.L.

respectively 1 ♀ on buffalo 1.'23

1 ♀ „ „ 30.6.'23

7 ♀ ♀ „ horse 24.12.'22

3 ♀ ♀ from Hoeta Olboeng, Moeara Tais, TARIP, LOBEL on buffalo

respectively 2 ♀ ♀ on 24.12.'22

1 ♀ „ 30.6.'23

29 ♀ ♀ from Si Balapak, Moeara Tais, LOBEL, BAKKER Coll. V.S.L.

respectively 4 ♀ ♀ on horse 24.12.'22

6 ♀ ♀ „ buffalo 7.9.'23

5 ♀ ♀ „ „ 2.5.'24

3 ♀♀ „ „ 3.6.'24
 2 ♀♀ „ „ 6.7.'24
 2 ♀♀ „ „ 5.8.'24
 7 ♀♀ „ „ 2.11.'24

4 ♀♀ from Moeara Tais, Moeara Tais on buffalo 2.11.'24 Coll. V.S.L.

9 ♀♀ „ Si Pakko, Moeara Tais 24.12.'22, TARIP „

respectively 3 ♀♀ on horse

6 ♀♀ „ buffalo

31 ♀♀ from Pidjor Koling, Pidjor Koling, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923						1		3	11				15
	„	1924					2	2	2	3			2		11
	horse	1923								4					4
	cattle	1923						1							1
Total							2	4	2	10	11		2		31

12 ♀♀ from Si Doea Doea, Pidjor Koling, LOBEL and BAKKER Coll. V.S.L.

respectively 4 ♀♀ on 26.9.'23 on buffalo

2 ♀♀ „ 30.6.'23 „ „

1 ♀ „ 6.6.'23 „ „

1 ♀ „ 6.8.'23 „ „

4 ♀♀ „ 2.5.'24 „ horse

4 ♀♀ from Hoeta Padang, Pidjor Koling, on buffalo 24.12.'22, LOBEL

1 ♀ „ Manegon, Pidjor Koling on buffalo 6.6.'23, LOBEL

6 ♀♀ „ Si Gala Gala, Marantjar on cattle 3.8.'23, BAKKER

42 ♀♀ „ Hapesong Lama, Marantjar, LOBEL and BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1923		1	1			3		2					7
	cattle	1923		2	1	8		11		4					26
	buffalo	1924				2			2				5		7
Total				3	2	10		14	2	2	2		5		42

32 ♀ ♀ from Si Hitang, Batoe na Doea, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923	1	4	4	1				7	4				21
	"	1924											2		2
	cattle	1923		3	3										6
	"	1924					2								2
	horse	1923	1												1
Total			2	7	7	1	2			7	4		2		32

6 ♀ ♀ from Si Dadi, Si Galangan, TARIP

Coll. V.S.L.

respectively 4 ♀ ♀ on horse 1.'23

2 ♀ ♀ „ buffalo 1.'23

3 ♀ ♀ from Si Galangan, Si Galangan TARIP

Coll. V.S.L.

respectively 2 ♀ ♀ on horse 1.'23

1 ♀ „ buffalo 1.'23

22 ♀ ♀ from Angkola 16.1.'22, TARIP

Coll. V.S.L.

Total from this Ressort

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1922												10	10
	"	1923	10	5	8	2		10		11	18				64
	"	1924				2	8	5	9	6			20		50
	cattle	1923	1	5	4	8		12		6	4				40
	"	1924					2								2
	horse	1922												14	14
	"	1923	9	2	5			3		6				5	30
	"	1924					4								4
Total			20	12	17	12	14	30	9	29	22		20	29	214

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

190 ♀♀ from Si Boeni boeni, Siboloean, TARIP, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1922										2			2
	"	1923				8	2	2	2	6		8		1	29
	"	1924			1	5	6		5	2					19
	horse	1922										1		4	5
	"	1923			5		6	8	7	10	4	7	2	6	55
	"	1924				1		8	5	1					15
	cattle	1922												10	10
	"	1923			4	6	5	3	4	6	1	2	2		38
	"	1924			1		3		4	11					19
	host														
	unknown	1922	3												3
Total			3		11	20	22	21	27	36	5	20	4	21	190

Further from same locality 2 ♀♀ from buffalo '22

11 ♀♀ from Saroedik on horse 24.2.'23

16 ♀♀ ,, Kg Mela 12.'22

respectively 8 ♀♀ on cattle

8 ♀♀ ,, buffalo

5 ♀♀ from Pasar Toeka, Siboloean 3.'23 on horse

8 ♀♀ ,, Poring, Siboloean 3.'23 on buffalo

11 ♀♀ ,, Si Babangoen, Anggoli Simanossor

Coll. V.S.L.

respectively 1 ♀ on buffalo 27.10.'22 (Textfig. 197 b)

7 ♀♀ ,, horse 27.10.'22

3 ♀♀ ,, cattle 27.10.'22

Ressort Padang Sidempoean; Mantrie Ressort Goenoeng Toea

1 ♀ from Pasar Goenoeng Toea, Goenoeng Toea on buffalo 9.4.'24

Ressort Padang Sidempoean, Mantrie Ressort Binanga

22 ♀♀ from Pasar Si Boehoean, Djandi Lobi LOBEL, BAKKER

respectively 2 ♀♀ on buffalo 5.2.'24

2 ♀♀ ,, ,, 2.7.'24

1 ♀ ,, ,, 15.7.'23

11 ♀♀ ,, ,, 27.8.'23

1 ♀ ,, ,, 23.9.'23

1 ♀ ,, ,, 12.12.'22

2 ♀ ♀ „ horse 4.6.'23

1 ♀ „ „ 23.8.'23

1 ♀ „ cattle 6.2.'22

33 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, LOBEL, BAKKER

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1922										8			8
	„	1923						3	1	5	1				10
	„	1924		2				1							3
	horse	1922										3			3
	„	1923						1		5			1		7
	„	1924							2						2
Total				2				5	3	10	1	11	1		33

1 ♀ from Pagaran Sihndoeng, Hoeta Nopan, Binanga on buffalo, 10.12.'22,
LOBEL

21 ♀ ♀ from Si Oendol, Paringgonan, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923						1	1	1					3
	„	1924					2	1					2		5
	horse	1923								6			1		7
	„	1924					4		2						6
Total							6	2	3	7			3		21

2 ♀ ♀ from Binanga, Binanga, LOBEL, Coll. V.S.L. on horse
respectively 1 ♀ on 10.'22

1 ♀ „ 8.12.'22

22 ♀ ♀ from Pangkal Dolok Lama, Pangkal Dolok on buffalo, LOBEL
respectively 2 ♀ ♀ on 10.'22

16 ♀ ♀ „ 14.12.'22

4 ♀ „ 23.2.'23

Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan

8 ♀ ♀ from Pasar Kota Nopan Kota Nopan, LOBEL, BAKKER

- respectively 4 ♀ ♀ on buffalo 1.'23
 1 ♀ „ „ 23.2.'23
 1 ♀ „ „ 16.5.'24
 3 ♀ ♀ „ horse 3.12.'23
- 3 ♀ ♀ from Si Gengoe, Kota Nopan on cattle 1.10.'23, BAKKER
 1 ♀ „ Kota Siantar on horse 27.6.'23, BOBEL
 1 ♀ „ Manambin, Hoeta Nagodang on buffalo 24.12.'22, LOBEL
 5 ♀ ♀ „ Moeara Tagor, Tamiang on cattle, LOBEL, BAKKER
 respectively 1 ♀ on 21.2.'23
 4 ♀ ♀ „ 30.9.'23
- 1 ♀ from Manjabar, Panjaboengan on buffalo 15.5.'24, BAKKER
 2 ♀ ♀ „ Panjaboengan on buffalo 6.2.'22, LOBEL
 1 ♀ „ Pidjangbolang on buffalo '22
 1 ♀ „ Tapanoeli, HANTASIDUS Coll. N.A.M.
 6 ♀ ♀ „ Hoendoelan Parmaksian, Balige on buffalo 21.1.'22 Coll. V.S.L.
- Residency Djambi
- 61 ♀ ♀ from Djambi MARSIDI Coll. V.S.L.
 respectively 14 ♀ ♀ on buffalo 5.'22
 9 ♀ ♀ „ „ 25.9.'22
 4 ♀ ♀ „ „ 21.1.'22
 1 ♀ „ horse 4.'22
 3 ♀ ♀ „ „ 21.1.'23
 9 ♀ ♀ „ horse and cattle 5.'22
 13 ♀ ♀ „ cattle 25.9.'22
 1 ♀ „ „ 21.1.'23
- 1 ♀ from Djambi labelled *T. immanis*, AALBERTS Coll. L.M.N.H.
 Residency Lampong Districts
- 1 ♀ from Soekadana, Lampongs, I. C. v. HASSELT Coll. L.M.N.H.
 Gvt. East Coast Sumatra
- 3 ♀ ♀ from Tandjong Morawa, Serdang, Dr. HAGEN Coll. L.M.N.H.
 2 ♀ ♀ „ Deli, DE BUSSY 1912 Coll. N.A.M.
 2 ♀ ♀ „ East Coast Sumatra, Deli 27/28.8.'22, TOXOPAEUS Coll. N.A.M.
 1 ♀ „ Kepala Roessa, Bindjei, Deli 8.'22 jungle „
 1 ♀ ♀ „ Tandjong Merah, CORPORAAL; 2 ♀ ♀ on 18.12.'18 and 8 ♀ ♀ on 10.5.'21 Coll. N.A.M.
- 1 ♀ from Sibolangit, LOERZING 1917 „
 1 ♀ „ same locality 550 M. 1917 „
 3 ♀ ♀ „ Sinabang, Simalur 2.'13, JACOBSON „
- Type ♂ from same locality 1913, JACOBSON Coll. BR.M.
 1 ♀ from same locality, labelled *T. brunneus* Coll. L.M.N.H.
 2 ♀ ♀ „ Bandar, borders of the jungle, CORPORAAL 10.3.'20 Coll. N.A.M.
 1 ♀ „ same locality 14.4.'20, CORPORAAL Coll. BR.M.
 2 ♀ ♀ „ Poeloe Babi, Simaloer 4.'13, JACOBSON Coll. N.A.M.

- 1 ♀ „ same locality 4.'13, JACOBSON Coll. L.M.N.H.
 5 ♀ ♀ „ Road Bindjei-Pangkalan Brandan 5.'22, EYKMAN Coll. V.S.L.

Residency Sumatra's West Coast

- 1 ♀ from Solok, Padang Highlands 11.'07 Coll. L.M.N.H.
 1 ♀ „ Silago 6.'77, labelled *T. immanis* WIED.
 1 ♀ „ Fort de Kock, 920 M. 19.'20, JACOBSON Coll. N.A.M.
 1 ♀ „ Sumatra, without further locality, labelled *T. immanis* WIED.
 2 ♀ ♀ Langsar, Atjeh. DIEBEN Coll. V.S.L.

Riouw Archipelago

- 1 ♀ from Riouw 6,5 miles East from Kateman, Sumatra, caught aboard of the
 Gvt.'s steamer BRAK, DAMMERMAN Coll. B.Z.M.

Isle Nias

- 13 ♀ ♀ from Lahewa on horse 4.'22, TARIP Coll. V.S.L.
 2 ♀ ♀ „ Goenoeng Sitoli on cattle 4.'22, TARIP

Isle Borneo

T. univentrtris WLK. type pres. by the admirality 1844 (Textfig 197 a), Coll. B.R.M.

Federated Malay States

- 8 ♀ ♀ from Batu Tiga, Labuan Padang 23.12.'07, PRATT Coll. BR.M.
 1 ♀ „ Batu Tiga 15.5.'10 Coll. BR.M.
 1 ♀ „ same locality, Klene Road, STANTON
 2 ♀ ♀ „ Pelaling 4.6.'13
 2 ♀ ♀ „ Kuala Kubu 2.2.'10
 1 ♀ „ Selangor, Kuala Lumpur, DURHAM 1903
 1 ♀ „ same locality 1896
 1 ♀ „ Salangor 11.12.'09 Coll. F.M.S.M.
 1 ♀ „ Selangor 6.'21 Coll. F.M.S.M.
 1 ♀ „ Selangor 10.5.'09 Coll. F.M.S.M.
 1 ♀ „ Sei Chemabang, N. R. Bulok, Beluka 150 Feet 6.'21, ABRAHAMS
 Coll. F.M.S.M.

Tabanus immanis WIEDEMANN is closely allied to and hardly distinguishable from *T. fumifer* WALKER. Both species are liable to variation and give therefore many difficulties in their identification, especially when the body of the specimens is partly rubbed. A good solution of the problems, involved in these species could be given by breeding experiments only. Therefore the solution given by me does not pretend to be anything more than a provisional one.

T. immanis WIEDEMANN may be distinguished according to my observations by the narrower, longer, conical abdomen, ornated with a median series of yellow haired triangles, not extending on the segmentations. Forehead broader than in the allied species, the callus being separated from the eyes by a wider distance, callus and linear extension usually visible as distinct parts, not passing gradually into each other. Palpi more pointed. As the types of the different species mentioned here are all in bad condition I will redescribe the species after a specimen, present in the V.S.L. collection.

Eyes bluegreen on lower half in the female sex. Forehead yellowish havanna-brown, mainly black haired. Callus oblongate egg-shaped, pointed, redbrown linear extension narrow, black. Subcallus and cheeks orangeousyellowbrown, yellowwhite haired. Beard same colour, intermixed with some redbrown hairs, Face pale yellow, yellowwhite haired, with a number of black hairs, just underneath the antennae. Palpi yellowbrown to rustybrown, ending with a long, rather acute point, black haired. Antennae redbrown, black haired on basal joints, third joint redbrown at base, then velvetyblack, with distinct tooth. Thorax deep olivebrown, goldenyellow tomentose, black and yellowbrown haired, a median fine redbrown longitudinal stripe and 2 more distinct, broader lateral yellowbrown stripes are visible. Wings brownish, first posterior cell slightly narrower at opening. Legs yellowbrown. Abdomen dull redbrown, darker to the apex, with the mentioned triangles on the 2d—5th segment, a square median group of yellow hairs on the first segment and sometimes the indication of a triangle on the sixth segment. Lateral borders of tergites yellow haired. Pubescence elsewhere black.

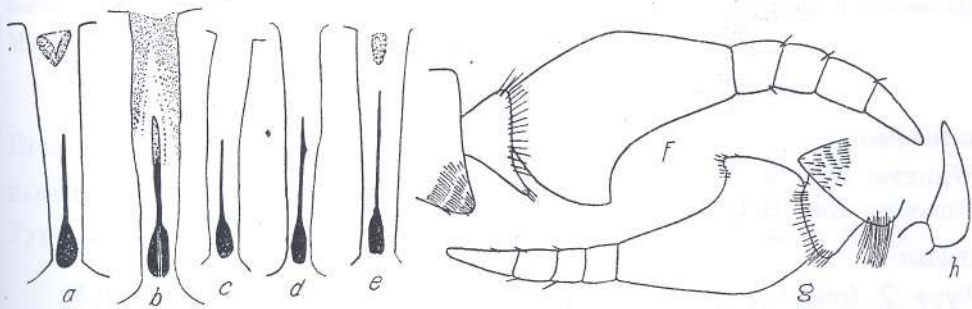
Table of dimensions.

Bodylength	varying from 14,2 m.M. to 23,2 m.M. most speci-
Width of thorax	„ „ 5 „ — 7,2 „ mens be-
Width of thorax	„ „ 5,2 „ — 8,2 „ tween 17
Wingexpanse	„ „ 33,1 „ — 42,2 „ m.M. and 22
Length of head	„ „ 2 „ — 5 „ m.M.
Length of thorax	„ „ 6,2 „ — 8,6 „
Length of abdomen	„ „ 8,2 „ — 13,5 „
Length of wing	„ „ 13,6 „ — 18 „
Breadth of wing	„ „ 4,6 „ — 6,2 „
Foreheadindex	„ „ 6,16 — 8,8

The Head. (Textfig. 197). Forehead almost the same width throughout to 0,35 narrower anteriorly than it is at vertex, yellowish havannabrown, black haired, brown haired along the borders. Palpi, first joint yellowbrown, yellowbrown haired, with some black hairs at apex, second joint rustybrown, swollen at base, ending with a rather acute point, black haired, with some yellowbrown hairs at base. Antennae, first 2 joints redbrown, the first protruding caplike over the second, dorsum black haired, ventral surface yellowbrown haired, second joint with acute dorsal hump, black fringed, third joint redbrown at base, then velvetyblack, tooth prominent, crowned with black hairs, basal annulation 1,4 times as long as its widest part, 1,1 times as long as the black stylus.

Thorax dull deep olivebrown, bearing the mentioned stripes, black haired, intermixed with some yellowbrown hairs, those being especially numerous in the hairtufts at the base of the wings. Pteropleuron reddish or hazelbrown, black haired. Sides and breast greybrown, yellowwhite haired, mesosternumlobus black haired. Scutellum same colour as scutum, goldenbrown tomentose black haired in the middle, borders goldenyellowbrown haired. Wings,

foreborder pale brownyellow, brownish shadows accompanying the veins, stigma pale brown. In rare instances an appendix may be present on one wing or on both. Halteres, stalk yellow-brown, club redbrown. Legs. First leg. Coxa greyishyellowbrown, pale yellowbrown haired, apex blackbrown, trochanter blackbrown, femur black, dorsum black haired, distal lateral border brownyellow tomentose, pollenyellow haired. Tibia yellowbrown at base, apex black,



Textfig. 197.

T. immanis WIED ♀. a—e. forehead, f, g. antennae, h. palpe.

black haired, intermixed with a small number of yellowbrown hairs. Tarsalia black, black haired. Second leg, trochanter dull bismarckbrown, yellow haired, tibia ochraceousbrownyellow at base, apex narrowly black, dorsum black haired, ventral surface goldenyellow haired, tarsalia black. Third leg, femur black haired on dorsum, except on base and apex, where one finds yellowbrown hairs, basal 2/3 of tibia yellowbrown, apex black, dorsum black haired, venter yellow haired.

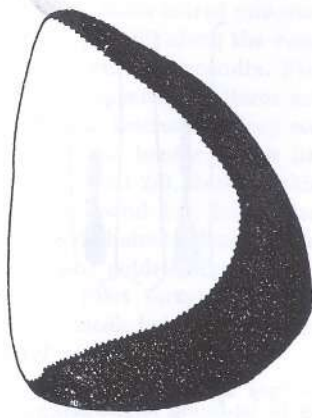
Abdomen dull redbrown, darker to the apex, markings as described. First segment with a roundish, yellow haired spot at each side of the scutellum. Ventral surface with a longitudinal band of black, black haired patches, segmentations and sides goldenyellow haired. Seventh segment wholly black haired. When the abdomen is rubbed it is leatherbrown and wholly devoid of triangles.

The Male.

Type ♂ from Sinabang Coll. B.R.M.

The Head. (Textfig. 198). Eyes as figured. Subcallus reddishbrown. Cheeks brownishwhite, white haired. Beard same colour. Palpi yellowbrown, mainly yellow-white haired, black haired at apex only. Antennae as in the ♀, first joint white tomentose, dorsum brownblack haired, lateral borders white haired, third joint yellowred at extreme base, then black, tooth distinct.

Thorax dullbrown, with 3 longitudinal stripes and paler lateral borders of the scutum. Tufts at base of wings and behind brownishwhite, breast and sides yellowishgrey, white haired. Wings with brown shadows along the veins. Legs. First leg. Coxa greywhite, femur, dorsum black haired, distal lateral border brownishgrey tomentose. Tibia dark blackbrown, black haired at apex, base reddishbrown. Second leg, femur black haired on



Textfig. 198.

T. immanis WIED ♂. eye

dorsum at apex, elsewhere whitegrey haired, tibia reddishblackbrown, black haired on dorsum, yellow haired below. Third leg identical.

Abdomen as in the female, conical in shape.

Pathogenicity Recently NIESCHULZ succeeded in transmitting mechanically the surra from horse to horse by means of 25 flies of this species; the incubation period of the disease was 8 days.

182. *Tabanus internus* WALKER (♀). Textfig. 199.

References:

WALKER, List Dipt. I, p. 164 (1848).

RICARDO, Rec. Ind. Mus. IV, p. 173 (1911).

Habiatt:

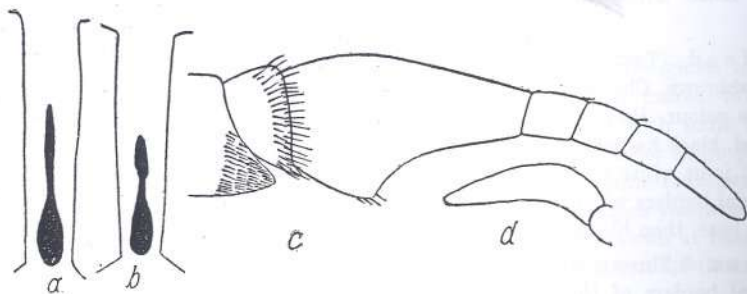
Type ♀ from India, Sylhet, 1845 (Textfig. 199 a, d) Coll. BR.M.

2 ♀♀ from Dibia, Khasi Hills Distr., CHENELL 1896 (Textfig. 199 b, c)

1 ♀ „ unknown locality

RICARDO placed *T. internus* Wlk. under *T. rubicundus* MACQUART as a synonym. In a note Maj. AUSTEN 3.11.'22 pointed to the fact, that the 4 ♀♀ above (that is *T. monilifer* type ♀ and the first 3 ♀♀ of *T. internus* Wlk.) show certain differences in the frontal callus. This species may however be distinguished from *T. rubicundus* MACQ. by the distinct callus, the shape of the palpi, which are blunter and bear a greater number of black hairs. First posterior cell of the wing distinctly narrower at opening.

The Head. (Textfig. 199). Forehead broad, black haired, 1/5 to 1/3 narrower anteriorly than it is at vertex, index 5,2—5,8. Callus broad, pear-shaped, not reaching the eyes, linear extension, short, broad. Palpi slender, ending with a long, blunt point, yellow haired. Antennae



Textfig. 199.

T. internus Wlk. ♀. a, b. forehead, d. antenna, c. palpe.

only to be found in the last ♀. First joint projecting caplike over the second with its dorsal spur, third joint reddishyellow at base, underneath the blunt tooth, then black, basal annulation 1,6 times as long as its widest part, 0,95 times as long as the stylus.

Abdomen ornated with indistinct yellow haired triangles at the segmentations, so that it shows much resemblance with the abdomen of *T. fumifer* RIC. In one of the ♀♀ from Dibia the abdomen is effiliated at apex.

183. *Tabanus rubicundus* MACQUART. (♀) Textfig. 200.

References-

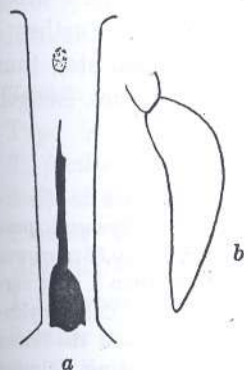
- MACQUART, Dipt. Exot. Suppl. I, p. 160 (1846).
 „ Dipt. Exot. Suppl. III, p. 170 (1847).
 „ Dipt. Exot. Suppl. V) p. 47 (1855).
 RICARDO, Rec. Ind. Mus. IV, p. 172 (1911).

Habitat:

Type ♀ from India, BIGOT

Coll. BR.M.

The type is denuded and has a brown appearance. As to my opinion *T. rubicundus* and *monilifer* are not synonyms. Length 17—18 m.M.



Textfig. 200.

T. rubicundus MACQ. ♀
 a. forehead, b. palpe.

The Head. (Textfig. 200). Forehead similar to that of *T. monilifer* BIGOT, velvetybrown, 0,2 narrower anteriorly than it is at vertex, index 5. Callus dark reddishbrown to blackbrown, shield-shaped, linear extension fine, pointed. Vertexspot roundish. Subcallus and upper cheeks reddishbrown, lower cheeks whitish, white haired. Beard yellowwhite. Palpi quite distinctly shaped as those of *T. monilifer* BIG., first joint yellowish, covered with long yellow hairs, second joint ending with a long, rather sharp point, yellow haired, intermixed with a few black hairs. Antennae reddishyellowbrown on basal joints, first joint black, haired on dorsum, distal lateral border yellow haired, second joint with long dorsal spur, black fringed, third joint missing.

Thorax darkbrown, with 3 indistinct redbrown longitudinal stripes. Pteropleuron redbrown, black haired. Breast greyish-redbrown, rustybrown haired, except on the black haired mesosternumlobus. Wings tinged reddishbrown, especially along the veins, foreborder yellowbrown, stigma siennabrown. No appendix. First posterior cell not distinctly narrower at opening. Halteres red-

dishrustybrown. Legs. First leg. Coxa darkgreybrown, brown haired, trochanter deep red-brown, femur pinkishredbrown, black haired on dorsum, distal lateral border yellow haired, knee yellowbrown, tibia yellowbrown, goldenyellow haired on basal 2/3, dark blackish at extreme base, apex blackbrown, black haired. Tarsalia black. Second leg, femur dark chestnutbrown, bluishgrey tomentose on ventral surface, dorsum black haired at base, goldenyellow haired elsewhere. Tibia as in first leg, apex more redbrown, goldenyellow haired, except on dorsum, where one finds a median row of black hairs. First tarsale redbrown, black haired, other tarsalia broken off. Third leg identical. Tibia black haired on dorsum, goldenyellow haired below.

Abdomen denuded, black haired, with white median triangles and paler segmentations, lateral borders of the first 6 tergites yellow haired. Ventral surface yellow white haired, segmentations pale, sixth segment black haired, except on the yellow haired segmentation. Seventh segment wholly black.

184. *Tabanus laotianus* BIGOT. (♀) Textfig. 201.

References:

BIGOT, Nouv. Arch. Mus. Hist. Nat. Paris (3) II, p. 205 (1890).

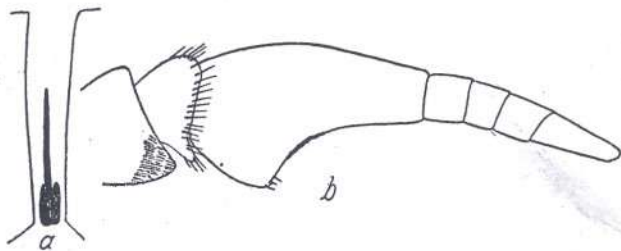
RICARDO, Rec. Ind. Mus. IV, p. 226 (1911).

Habitat:

Type ♀ from India, Chargoie Valley, Sylhet, AUSTEN FR. '91 Coll. BR.M. Another ♀ from same locality, labelled with the following remark, „this and other Indian species of Tabanids are known to the teaplanter as elephant-flies”.

1 ♀ from same locality

Major AUSTEN annotated „allied to and perhaps a form of *Tabanus rubicundus* MACQ. Differing in the ♀ sex, owing to terminal segment of palpi, being more dusky and clothed on outer side with black hairs and to the wingstigma being darker and more pronounced 2.11.'22 by comparison with type”. Further I will point to the shape of frontal stripe, colour of cheeks and beard, etc., thus believing that *T. laotianus* BIG. and *T. rubicundus* are distinct species. Length 16 m.M.



Textfig. 201.

T. laotianus BIG. ♀. a. forehead, b. antenna.

The Head. (Textfig. 201). Forehead pale yellowbrown, 0,36 narrower anteriorly than it is at vertex, index 7. Callus cylindrical, this and the linear extension being almost identical to those of *T. rubicundus* MACQ. Subcallus redbrown. Cheeks ferruginous. Beard dirty brownish. Palpi dark olivebrown, second joint vel-

vetybrown, slender, ending with a long obtuse point. Antennae, first joint pale yellowbrown, projecting caplike over the second dark olivebrown, black fringed joint, dorsum of first joint black haired, ventral surface yellow haired, second joint bearing a short dorsal hump, third joint dusky brown, tooth blunt, basal annulation 1,6 times as long as its widest part, 1,1 times as the blackbrown stylus.

Thorax in bad condition in all specimens, blackish. Pteropleuron yellowbrown, black haired. Wings, foreborder rustybrown, stigma pronounced, dark yellowbrown, shadows along the veins rustybrown, therefore the whole wing is tinged rustybrown, paler in the centres of the cells. Halteres redyellowbrown. Legs. First leg almost black, tibia yellowbrown yellow haired on basal half, apex blackbrown, black haired. Second leg, femur blackbrown, black haired, distal lateral border yellowbrown haired, knee yellowbrown, tibia yellowbrown,

yellowbrown haired, intermixed with a median row of black hairs, apical ring darker, black haired, first tarsale reddishbrown, black haired, other tarsalia black. Third leg identical tibia dark olivebrown, black haired on dorsum, ventral surface yellowbrown haired, first tarsale blackbrown, other tarsalia black.

Abdomen blackbrown, missing the median triangles in the type ♀, the other ♀ presents small triangular white, yellow haired median spots on the 2—6th segments, dorsum elsewhere black haired. Venter brown, yellow haired.

185. *Tabanus serus* WALKER (♀) Pl. 13, Fig. 3, Textfig. 202.

Syn. *Tabanus facilis* WALKER.

Atylotus laglaizei BIGOT.

Referendes:

WALKER, Proceedings Linn. Soc. London VI, p. 20 (1862).

„ Proceedings Linn Soc. London VII, p. 206 (1864).

BIGOT, Mem. Soc. Zool. France V, p. 673 (1893).

RICARDO, Bijdragen tot de Dierkunde, Afl. 19 (1913).

Habitat:

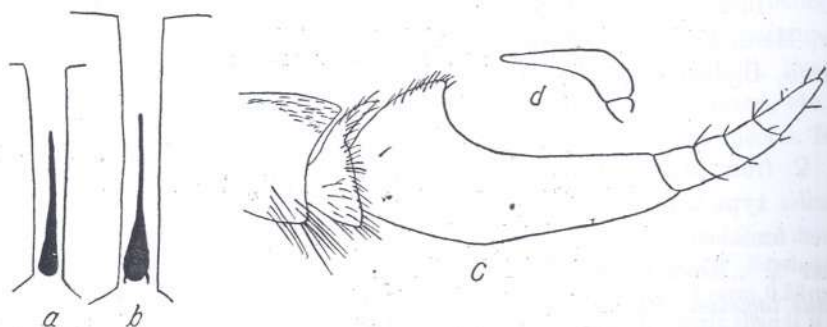
Type ♀ from Mysol, A. R. WALLACE	Coll. B.R.M.
<i>T. facilis</i> type ♀ from Mysol, A. R. WALLACE (Textfig. 202 a, d)	„
2 other females „, Mysol, A. R. WALLACE	„
1 other ♀ „, Nova Guinea, A. R. WALLACE	„
<i>Atylotus laglaizei</i> , BIGOT from Isle of Waigeo	„
1 ♀ from Waigeo 24.12.'09, DE BEAUFORT	Coll. N.A.M.
2 other ♀ ♀ same locality	„
2 ♀ ♀ from Dutch Nova Guinea, LORENTZ 1910	„
1 ♀ „, Pionierbivak, N.N. Guinea 8.'20, VAN HEURN	Coll. B.Z.M.
31 ♀ ♀ „, Prauwenbivak N.N. Guinea, VAN HEURN (Textfig. 202 b, c).	
respectively 3 ♀ ♀ on 8.'20	Coll. B.Z.M.
23 ♀ ♀ „ 9.'20	Coll. N.A.M.
5 ♀ ♀ „ 11.'20	Coll. N.A.M.

A medium-sized redbrown species. Forehead rustybrown. Callus club-shaped, redbrown, gradually tapering to the redbrown long linear extension. Subcallus and upper cheeks rustybrown, black haired. Lower cheeks yellowish white-grey, brown haired. Face greybrown. Beard greyishwhite to yellowbrown. Palpi yellowbrown, black haired. Antennae redbrown, black haired. Thorax redbrown, denuded. Breast yellowwhite haired. Wings faintly reddishbrown, without appendix. Legs yellow- to redbrown. Abdomen dark redbrown with small tufts of yellowish hairs on the segments 2—4, respectively 1—6.

Table of dimensions.

Bodylength	varying from 17	m.M.	to 17,8	m.M.
Width of thorax	„ „	5,8	„ —	6,2 „
Width of abdomen	„ „	6,8	„ —	7,2 „
Wingexpanse	„ „	34,8	„ —	37,8 „
Length of head	„ „	3	„ —	4 „
Length of thorax	„ „	6,5	„ —	7,2 „
Length of abdomen	„ „	8,5	„ —	10 „
Length of wing	„ „	14,5	„ —	15,8 „
Breadth of wing	„ „	5,5	„ —	5,8 „
Foreheadindex	„ „	7,33	„ —	7,77

The Head. (Textfig. 202). Forehead rustybrown, 0,27 narrower anteriorly than it is wide at vertex. Callus club-shaped, linear extension long, pointed. Subcallus, etc. as described, lower cheeks yellowish brown haired. Face white haired in the middle, some black hairs oc-



Textfig. 202.

T. serus WLK ♀. a, b. forehead, c. antenna, d. palpe.

curing just under the antennae. Palpi yellowbrown, rather long, pointed, swollen at base of second joint, black haired, first joint mainly yellowbrown haired. Antennae dark reddbrown, black haired on basal 2 joints, second joint with long blunt dorsal spine, third joint, basal annulation reddish yellow, 1,6—2 times as long as its widest part, 1,6 times as long as the dark reddbrown stylus. Tooth prominent black haired.

Th o r a x denuded, reddishbrown in type, in other females it appears dark rustybrown, bluishgreywhite tomentose on foreborder, presenting a median fine black longitudinal line and 2 lateral indistinct narrow reddbrown longitudinal stripes, pubescence mainly yellowish-reddbrown, intermixed with a smaller number of black hairs. Lateral borders of scutum yellowbrown tomentose. Pteropleuron olivebrownyellow, whitish tomentose, black haired on lower border, elsewhere yellowbrown haired. Scutellum same colour as scutum, shoulders black haired, breast greybrown, yellowwhite or yellowbrown haired; mesosternumlobus partly black haired. Wings faintly reddishbrown, with clearer areas in centres of cells, foreborder yellowbrown, stigma dark havannabrown. Apex of wing slightly fumigated in some females, first posterior cell slightly narrower at opening. Appendix absent. In one of the N. N. Guinea females a rudimental appendix was found on the left wing. Halteres reddishyellowbrown. Legs. First leg. Coxa greybrown, yellowbrown haired, femur reddbrown, black haired, distal lateral border black haired, intermixed with some yellowbrown hairs, tibia orangeousred-

brown on basal half or $\frac{2}{3}$, blackbrown, black haired on apical band. Tarsalia black. Second leg, femur redbrown, white haired, some black hairs at apex. In the N. N. Guinea females it is black haired on dorsum, intermixed with some goldenyellow hairs, distal lateral border almost exclusively orangeousgoldenyellow haired, intermixed with some black hairs, ventral surface yellow haired. Tibia redbrown, black haired on dorsum, redyellow haired below. First tarsale same colour as tibia, black haired, other tarsalia blackbrown, black haired. Third leg similar.

A b d o m e n dark redbrown, small tufts of yellow hairs being visible on the segments 2—4, other segments being rubbed in the middle, elsewhere black haired. Ventral surface with a median row of black, black haired patches. Sides and segmentations reddish, yellow haired. Lateral borders of first 5 tergites yellow haired. In the fresh N. N. Guinea females the dorsum is browned, paler on the first 2 segments, darker to the apex, black haired on dorsum, except at segmentations 1—6, which show low median yellowbrown haired triangles. Ventral surface brighter, orangeousyellow haired at the segmentations, sides of sternites yellowbrown. Median patches black haired. Seventh segment wholly black haired.

Although there exist some differences between the females, caught in the different habitats, I believe they belong to the same species.

186. *Tabanus rubriventris* MACQUART (♀). Textfig. 203.

Syn. *T. novaeguineensis* RICARDO.

References:

- MACQUART, Dipt. Exot. I, p. 135 (1838).
DE MEIJERE, Nova Guinea V, p. 75 (1906).
RICARDO, Nova Guinea, IX, p. 399 (1914).

Hanitat:

Type ♀ from Lorentz River

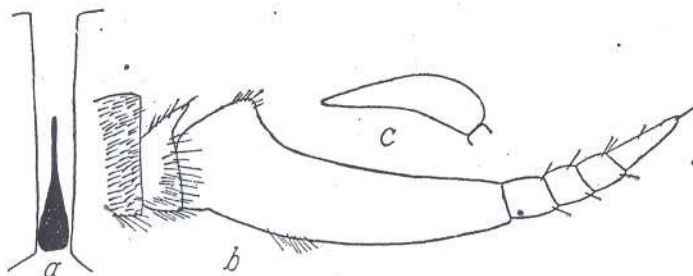
Several ♀♀ from S. N. Guinea, Bivak Island 10.09

Resembling to *T. serus* Ric. in general appearance. A tawnybrown species, Forehead almost parallel-sided, blackish. Callus broad, redbrown. Subcallus, cheeks and face dark redbrown, black haired. Beard white, intermixed with a number of blackbrown hairs near the mouth. Palpi redbrown, black haired. Antennae redbrown, black haired. Thorax brown, with traces of longitudinal stripes, black and redyellow haired. Wings pale brownish. Legs redbrown. Abdomen tawnybrown, black haired, with small yellow hairtufts on the first to fifth segment in the median line, lateral fringes, not reaching to the middle, present on the 2d—4th segment. Lateral borders of tergites black haired.

The Head. (Textfig. 203). Forehead blackish by wetting, 0,28 narrower anteriorly than it is at vertex, index 7,4. Palpi swollen at base, ending with a short, rather blunt point. Antennae, third joint yellowreddish on basal annulation, which is 2,6 times as long as its widest part, tooth blunt, crowned with black hairs, whereas the opposite side presents also a number of black hairs. Stylus blackbrown.

Thorax brown, with traces of 2 longitudinal blackbrown stripes. Pteropleuron redbrown, black haired. Hairtufts near the bases of the wings reddishyellow. Breast dull redbrown,

dirty white haired. Mesosternum lobus black haired. On a second female the scutum shows three distinct longitudinal stripes, a whitish tomentose hue at hindborder and similar lateral borders. Wings pale brownish, stigma yellowbrown, veins dark brown, no appendix. Halteres, stalk blackbrown, club yellowbrown. Legs. First leg. Coxa greybrown, black haired, trochanter dark



Textfig. 203.

T. rubriventris Macq. ♀, a. forehead, b. antenna, c. palpe.

blackbrown, femur reddishblackbrown, black haired, knee paler, Tibia reddbrown, black haired, with a narrow blackbrown apical ring, on ventral surface some redyellow hairs are to be seen at the base, tarsalia blackbrown, black haired. Second leg, femur reddbrown, black haired, knee yellowbrown, tibia similar,

redyellow haired below, black haired on dorsum tarsalia reddbrown, black haired. Third leg identical, femur with a row of white hairs on the distal lateral border.

Abdomen, tawnybrown at base, then blackbrown, the second segment presents a median black hairtuft. The lateral yellow hairtufts at the segmentations are arranged as in *T. pratti* Ric., they are however lower. Ventral surface reddishbrown on basal 2 segments, then blackbrown, black haired, except on the 2d—5th segmentations, which are white haired, a small fringe of white hairs is to be seen at the 6th segmentation.

GROUP XV.

Both species belonging to this Group have a greyish, white or yellow haired body, a broad forehead, without any callosity, yellow antennae and palpi, clear, glassy wings with yellowbrown veins and a distinct appendix, yellowbrown legs and a greyish abdomen with yellow or whitish segmentations.

KEY 25.

Synopsis of species.

- A. Forehead white haired. Subcallus reddishwhite. Palpi cream-coloured. Antennae pale yellowish. Thorax grey. Abdomen bluishgrey, with brown, yellow haired segmentations caesius WALKER.
- B. Forehead black haired. Subcallus white. Palpi pale brownish yellow. Antennae bright ochraceous, tooth distinct. Thorax dark slate-brownblack, brownyellow haired. Abdomen dull greyish brownblack, with paler segmentations, and the first segment narrowly, the second broadly yellowbrown at lateral border erythrocephalus VAN DER WULP.

187. *Tabanus caesius* WALKER (♀). Textfig. 204.Syn. *T. leucopterus* WULF.

References:

- WALKER, List Dipt. Brit. Mus. I, p. 80 (1848).
 VAN DER WULF, Tijdschr. v. Ent. XI, p. 98 (1868).

Habitat:

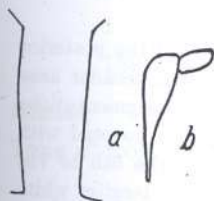
Type ♀ from VAN DER WULF from Aru Islands ROSENBERG. Coll. L.M.N.H.
 2 ♀ ♀ from Nova Guinea, H. KUEHN in KERTESZ Coll. Now in Coll. BR.M.

A rather small species. Forehead white, without calli, white haired. Subcallus reddish white, cheeks and face white, white haired. Beard white. Palpi cream-coloured, ending in a fine, long point, mainly white haired, with some black hairs on outer border of second joint. Antennae pale yellowish, yellow haired. Thorax grey. Legs yellowbrown. Wings clear, with well developed appendix, veins yellowbrown. Abdomen bluishgrey with brown, yellow haired segmentations, underside similar. Length 12 m.M.

The Head. (Textfig. 204). Forehead narrower at vertex, index 2,3. Postocular rim white haired. Palpi swollen at base of second joint. Antennae as described. According to VAN DER WULF the third joint is slightly incised on dorsum. Eyes green, appearing purplish in some lights.

Thorax grey, scutum very denuded, scutellum same colour, pteropleuron yellowbrown. Breast grey, yellowwhite haired. Wings clear, with pale yellowbrown stigma. Halteres, stalk reddishbrown, club white. Legs yellowbrown. First leg. Coxa yellowgrey, trochanter yellowbrown, femur yellowbrown, some black hairs on dorsum, distal lateral border white haired, elsewhere yellow haired. Tibia redbrown, yellowwhite haired. Tarsalia same colour. Second leg wholly yellowbrown. Third leg. Coxa greywhite, white haired. Trochanter reddishbrown, femur yellowbrown, white haired, tibia same colour, yellow haired below, black haired on dorsum. Tarsalia redbrown, black haired.

Abdomen as described.



* Textfig. 208.

T. caesius Wlk. ♀

a. foreleg, b. palpe.

188. *Tabanus erythrocephalus* VAN DER WULF (♀) Textfig. 205.

References:

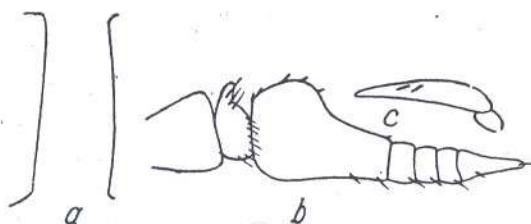
VAN DER WULF, Tijdschr. v. Ent. XI, p. 99 (1868).

Habitat:

Type ♀ from N. East Halmaheira, Molucs, BERNSTEIN Coll. L.M.N.H.

Forehead broad, yellowgrey, black haired. Subcallus, cheeks and face white, white haired. Beard white. Palpi slender, acuminate, pale brownish

yellow, white haired, intermixed with a couple of black hairs on their outer border (see fig. 205). Antennae pale brownyellow to ochraceousyellow, tooth blunt, distinct. Thorax slate-brownblack, brownyellow haired. Wings glassy, veins yellowbrown. Abdomen same colour as thorax, segmentations paler, dull brown, brownishyellowwhite haired. Legs yellowbrown, femora white haired, tibiae black haired on dorsum, yellow haired below. Length 13 m.M.; Wing-expanse 26 m.M.



Textfig. 205.

T. erythrocephalus WULF ♀
a. forehead b. antenna, c. palpe.

The Head. (Textfig. 205). Fore-head slightly narrower at vertex than it is at base, index 2.4. Face deep yellowbrown in the middle, lateral borders white tomentose, white haired, some black hairs just under the antennae. The face is bordered sideways by a brownish spot. Antennae, first joint projecting caplike over the second joint, yellowbrown, white tomentose, white haired, second joint bright ochraceousyellow, some black hairs occurring round the dorsal hump, white haired elsewhere,

third joint broad and flat, ochraceous yellow, basal annulation 1.4 times as long as its widest part, as long as the more tawny stylus.

Thorax as mentioned. Lateral borders of scutum dull pale havannabrown, white tomentose. Pteropleuron similar, white haired. Breast and sides bluegrey, white haired, a few brownish straks are visible here. Halteres yellowbrown. Legs as mentioned, femur with a few black hairs on dorsum at apex, first tarsale slightly darker yellowbrown, black haired, other tarsalia tawny, black haired, the tarsalia of the middle legs are slightly paler than those of the fore legs.

Abdomen blackbrown on the bases of all segments, a small section at the posterior border of the segment, extending to the lateral borders of the tergite and a broader area of the tergite yellowbrown, first segmentation narrowly yellowbrown, all other segmentations yellowwhite, black and yellow haired, the discs of the tergites being regularly covered with yellowwhite, rather long pubescence, black hairs particularly numerous on the 5th to 7th segment. Apex of seventh segment white fringed. Lateral borders of the first 5 tergites white haired, 6th and 7th segment black haired at their lateral borders. Ventral surface white haired, 6th and 7th segment, black haired at their lateral borders. Ventral surface bluegrey, yellowwhite haired on all 6 segments, segmentations yellowbrown, on the 6th segment some black hairs are intermixed, 7th segment wholly black haired at base.

T. erythrocephalus is distinguishable from the other species of this Group by the brighter coloured antennae, bearing a more distinct tooth, the paler pubescence, the colour of the halteres, the darker tarsi, etc.

GROUP XVI.

The species belonging to this Group are characterised by the narrow, long antennae, with usually peculiar long stylus, basal annulation hardly without any tooth. Forehead in the female sex broad. Wings clear, veins yellowbrown, appendix usually long. Legs yellow- or greybrown.

KEY 26.

Synopsis of species.

- 1a. Abdomen greybrown or grey, ending blunt or acute 2
 b. Abdomen yellowbrown 3
- 2a. Abdomen grey, white haired, pointed. Eyes with black, small-facettèd area prolonged to the vertex as a narrow border. Antennae, third joint wholly ochraceousyellow **platybasianulatus** SCHUURMANS STEKHOVEN ♂.
- b. Abdomen greybtown, ending blunt, bases of segments black haired, segmentations yellowwhite fringed. Forehead broad, callus broad, square, linear extension short. Antennae, third joint redyellow, stylus blackish redbrown; thorax grey, white haired
longirostris SCHUURMANS STEKHOVEN ♂.
- 3a. Abdomen pointed, conical, yellow haired, without distinct broad black stripe, palpi yellow haired. Scutum olivebrownyellow, yellow haired. Legs yellowbrown, tibiae black haired on dorsum, yellow haired below. Eyes in the male sex with a small-facettèd area, not prolonged to the vertex
auriventer SCHUURMANS STEKHOVEN ♂.
- b. Abdomen ending blunt, with a broad median black stripe, palpi mainly black haired. Scutum greyishbrown, yellowbrown haired. Legs darker olivebrown, tibiae wholly black haired, the black area not reaching to the vertex
griseithorax SCHUURMANS STEKHOVEN ♂.

189. *Tabanus platybasianulatus* nov. spec. (♂). Textfig. 206.

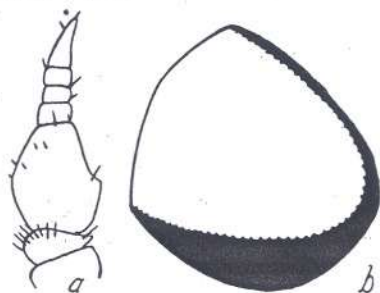
Habitat:

Type ♂ from Isle Leyden, Bay of Batavia, Java 4.'24, DOCTERS VAN LEEUWEN
 Coll. N.A.M.

A small, grey species with a conical elongate brownishgrey, white haired abdomen. Black, small-facettèd area prolonged to the vertex as a narrow border. Subcallus, cheeks and face white, white haired. Palpi pale brownish yellow, acuminate, white haired. Antennae pale ochraceousyellow to tawny yellowbrown, third joint without a distinct tooth, stylus long. Thorax grey, white haired. Wings clear, appendix distinct. Legs olivaceousyellowbrown, white haired. Length 12,5 m.M. Wingexpanse 21,5 m.M.

The Head. (Textfig. 206). Large-facettèd eyepart redbrown. Eyes hairy. Antennae, first joint pale ochraceousyellow, white tomentose, white haired, prolonged caplike over the second joint, which is white fringed at apex, intermixed with some black hairs, third joint tawny yellowbrown, basal annulation broad, 1,2 times as long as its widest part, as long as the long and narrow stylus, which has the same colour as the basal annulation.

Thorax. Scutum grey, white haired. Pteropleuron greyish olivebrown, white haired. Scutellum same colour as scutum as also sides and breast. Wings clear with pale yellowbrown veins, a yellowish foreborder and similar stigma. Appendix distinct. Halteres pale yellow-



Textfig. 206.

T. platybasiannulatus s. s. ♂
a. antenna, b. eye.

brown. Legs. First leg. Coxa pale yellowbrown, white tomentose, white haired, trochanter and femur yellowbrown, white haired, tibia darker olivebrown, shadowed to the apex, dorsum clothed with appressed black hairs, venter white haired, tarsalia identical. Second and third leg similar, spurs to the middle tibiae olivebrown, black-tipped.

Abdomen slender, ending acute, brownish-grey, almost wholly white haired, except on the sixth and seventh segment, which present some black hairs in the middle, the latter being slightly darker than the foregoing segments. Ventral surface identical, wholly white haired, some black hairs being intermixed on the seventh segment at apex.

190. *Tabanus longirostris* nov. spec. (♀). Pl. 18, Fig. 3; Textfig. 207.

Habitat:

Type ♀ from Isle Nias from Goenoeng Sitoli 4.'22, TARIP Coll. V.S.L.

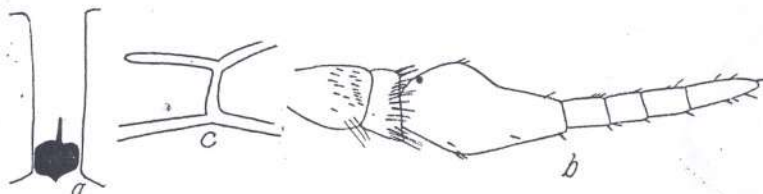
1 ♀ from Isle Sebesi, Street Soenda 29.11.'20, DAMMERMAN Coll. N.A.M.

This species is closely allied to *T. platybasiannulatus* SCHUURMANS STEKHOVEN, distinguishable inter alia by the shape of the abdomen, the pubescence of the same part, the colour and pubescence of the legs, etc. Forehead broad, parallel-sided, black haired. Callus broad, black, square, reaching the eyes, linear extension short. Subcallus and cheeks olivaceous brownwhite, white haired. Beard white. Palpi pale yellow, acuminate, white haired, intermixed with some black hairs. Antennae reddishyellow, basal annulation of third joint brighter than the stylus, provided with a blunt dorsal hump. Thorax browngrey, white and black haired, pteropleuron black haired. Halteres blackbrown or yellowbrown. Legs darker yellowbrown than in *T. platybasiannulatus*. Abdomen olivebrown, black haired, with paler yellowwhite fringed segmentations.

Table of dimensions.

Bodylength	11,5 m.M.
Width of thorax	3 "
Width of abdomen	3,6 "
Wingexpanse	24 "
Length of head	2 "
Length of thorax	4,2 "
Length of abdomen	7 "
Length of wing	10,5 "
Breadth of wing	3,5 "
Foreheadindex	2,85

The Head. (Textfig. 207). Forehead goldenbrown, black haired. Palpi, second joint swollen at base, tapering to a rather acute apex. Antennae; first joint olivebrown, black haired on dorsum, ventral surface white haired, second joint same colour, black fringed, no dorsal spine, third joint reddishyellow on basal annulation, which is broad and flat, 1,8 times as long as its widest part, 0,81 times as long as the long, narrow, blackish redbrown stylus, tooth indistinct, black haired, some black hairs also occurring on the ventral curvature of the same annulation.



Textfig. 207.

T. longirostris s.s. ♀. a. forehead, b. antenna, c. palpe.

Thorax as mentioned, pteropleuron black and white haired. Scutellum same colour as the scutum. Sides and breast greyish brownwhite, greywhite haired. Wings clear, foreborder yellowbrown, stigma dull brown, veins yellowbrown. Appendices long. Legs. First leg. Coxa brownish, greyblue tomentose, apex velvetybrown, wholly silverygrey haired, femur pale violetbrown, dorsum mainly black haired, intermixed with some white ones, distal lateral border long black haired, intermixed with greywhite hairs, tibia yellowbrown on basal $\frac{1}{3}$, then reddishbrown, dorsum black haired, scanty yellow haired below. Tarsalia blackbrown, black haired.

Second leg. Coxa greybrown, grey haired, trochanter reddishbrown, black and grey haired, femur pale violetbrown on ventral surface, dorsum olivebrown, mainly pale yellowbrownwhite haired, intermixed with some black hairs on dorsum, tibia yellowbrown, darker at apex, dorsum black haired, ventral surface yellow haired, tarsalia dark yellowbrown, black haired. Third leg. Coxa greyblue, grey haired, trochanter redbrown, redbrown haired, femur olivebrown, apex more russetbrown, yellowbrown haired, tibia olivebrown, dorsum thick black haired, distal lateral border grey white haired, ventral surface black and yellowwhite haired, tarsalia yellowbrown, black haired.

Abdomen ending blunt, greyish olivebrown, black haired (when wetted grey-black) segmentations pale brownwhite haired, distal lateral borders of tergites white haired, and on the Sebesi female I found a median fine stripe of white hairs on the segments 1-6. Ventral surface greyblue, brownish tomentose, yellowbrown haired in the Nias ♀, white haired in the Sebesi ♀, segmentations paler brown.

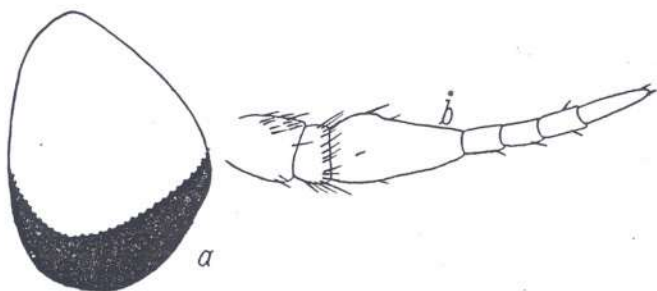
191. *Tabanus auriventer* nov. spec. (♂). Textfig. 208.

Habitat:

Type ♂ and another ♂ from Isle Sebesi, Street Soenda 29.9.'20, DAMMERMAN Coll. N.A.M.

A small, yellowbrown species; eyes with small-facettated part narrow, prolongation not reaching to the vertex. Subcallus, cheeks and face yellowgrey, white haired. Beard yellowwhite. Palpi yellow haired. Antennae yellowbrown,

with long yellowbrown stylus and indistinct tooth. Thorax olivebrownishyellow, yellow haired. Wings clear, with appendix. Legs yellowbrown, tibiae black haired above, yellow haired below. Abdomen conical, dark yellowbrown to dark olivebrown, mainly yellow haired, ventral surface yellow haired. Length 12 m.M.; Wingexpanse 23,1 m.M.



Textfig. 208.

T. auriventer s.s. ♂. a. eye, b. antenna.

The Head. (Textfig. 208). Palpi yellow, pale yellow haired. Antennae, first joint, black haired on dorsum, with yellowish pubescence on lateral borders, second joint reddishyellow brown, black fringed. Third joint redyellow, without a distinct tooth, basal annulation broad at base, 2 times as long as its widest part and 0,7 times as long as the yellowbrown stylus.

Thorax, scutum and scutellum olivebrownishyellow, yellow haired, intermixed with some black hairs, pteropleuron yellowbrown, yellow haired. Breast greybrown, pale yellow haired. Wings clear, foreborder and stigma yellowbrown, veins same colour. Halteres dull brown. Legs yellowbrown. First leg. Coxa and trochanter yellowbrown, pale yellow haired, femur similar, yellow haired, intermixed with some black hairs in the median line on dorsum, tibia olivebrown, black haired on dorsum, yellow haired below, tarsalia similar. Second and third leg identical.

Abdomen elongate, conical, pointed at apex, first 2 segments dark yellowbrown, following segments dark olivebrown, yellow haired, on the sixth segment some black hairs are intermixed, seventh segment black haired, ventral surface yellowbrown, yellow haired, apex slightly darker. The second ♂ has a median black shadow on the dorsum abdominis.

192. *Tabanus griseithorax* nov. spec. (♂). Textfig. 209.

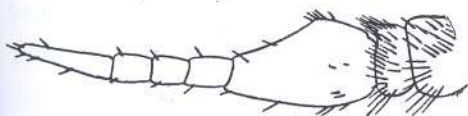
Habitat:

Type ♂ from Sumatra, Laboean Badjan, Simalur 6.13, JACOBSON

A small yellowbrown species, closely allied to *T. auriventer* S.S., distinguished inter alia by the palpi with their darker pubescence, the paler legs and the shape of the abdomen, which ends more blunt, and is broader than in *T. auriventer* S.S. Length 10 m.M.; Wingexpanse 23,1 m.M.

The Head. (Textfig. 209). Eyes redbrown, lower third black, small-faceted, with a small point, not reaching to the vertex. Subcallus and cheeks white, yellowwhite haired. Beard same colour. Palpi olivebrown, second joint pointed at apex, yellowbrown haired at base, black haired on apical half. Antennae, first joint pale olivebrown, dorsum black haired, ventral surface haired; with some white hairs at base, 2d joint pale olivebrown, black haired, third joint redyellow, basal annulation 1,65 times as long as its widest part, 0,65 times as long as the long, brownblack stylus.

Thorax grey on foreborder, hind border grey tomentose, partly rubbed, yellow-brown haired. Scutellum same colour as scutum, the latter with a fine median brown longitudinal line. Pteropleuron brownishgrey, brown haired. Sides brownishyellow, brownishyellow haired, breast grey, white haired. Wings as in *T. auriventer*, appendix shorter. Halteres, stalk brownishwhite, club olivebrown. Legs. First



Textfig. 209.

T. griseithorax s. s. ♂. antenna.

leg. Coxa pale brownishgrey, white haired, trochanter leatherybrown, femur olivebrown, knee yellowbrown, dorsum black haired, distal lateral border yellowwhite haired. Tibia dark olivebrown, black haired as also the tarsalia. Second leg, trochanter and femur yellowbrown, the latter with a few

black hairs on dorsum at apex, elsewhere yellow haired, tibia and tarsalia as in first leg, some yellowwhite hairs being intermixed between the black ones on the ventral surface of the tibia at base. Third leg. Coxa blackishbrowngrey, yellowish haired, trochanter redbrown, femur yellowbrown, yellow haired, some black hairs on dorsum at apex, tibia similar.

Abdomen redyellowbrown, with a median broad blackish stripe, widening to the apex, yellow haired, fifth to seventh segment intermixed with some black hairs, ventral surface yellowbrown, brownishyellow haired on basal 4 segments, some black hairs intermixed between the yellow ones, 5th and 6th segment blackbrown, black haired at base, segmentations yellow haired. Seventh segment wholly black haired.

GROUP XVII.

The species belonging to this Group are greyish, brown or black, the eyes in the ♀ sex in life adorned with a transverse green M-shaped marking. Forehead narrow. Callus cylindrical, with a distinct linear extension or shield-shaped, resp. triangular, with a fine, not seldom broken linear extension. Subcallus bare, shining black or brown. Antennae usually redyellow, tooth blunt. Thorax greybrown or black, usually dark, covered with fine white, yellow or black pubescence. Breast black or white haired. Legs with all tibiae largely white, white haired. Abdomen uniformly grey, brown or black, mainly black haired, with paler pubescence on the segmentations in several species.

KEY 27.

- 1a. Species greyish 2
- b. Species brown or brownblack 3
2. Callus shield-shaped. Cheeks greywhite, white haired. Beard white. Palpi greyish, white and black haired. Thorax bluishgrey on foreborder, elsewhere brownish, fine white haired. Abdomen greyblack, with fine white fringed segmentations and low median triangles **minimus** VAN DER WULP.
- 3a. Callus triangular or square, linear extension fine. Cheeks dull brown, black haired. Thorax blackbrown or black, yellow or black haired. Abdomen yellowish-redbrown or black, mainly black haired
ceylonicus SCHINER.
- aa. Thorax brownblack, yellow haired, abdomen yellowishredbrown
var. **nitidulus** BIGOT.

- aaa. Thorax black, black haired, abdomen black var. *ceylonicus* SCHINER.
 b. Callus club-shaped, linear extension thick. Cheeks and face bluishgrey, yellowwhite haired. Beard yellowwhite. Palpi brown, brown and black haired. Thorax brownblack, yellowbrown haired. Abdomen olivebrown at base, darker to the apex, black haired, segmentations yellow fringed *simplicissimus* WALKER.

193. *Tabanus minimus* VAN DER WULP. (♀) Pl. 14, Fig. 3; Textfig. 210.

References:

- VAN DER WULP, Sumatra Exped. Diptera, 18, pl. 1, fig. 11 (1892).
 „ Notes Leyden Mus. VII, p. 71 (1885).
 RICARDO, Records Ind. Mus. IV, p. 221 (1911).
 DE MEYERE, Tijdschr. v. Ent. LIV, p. 275 (1911).
 FRASER, Jl. of Trop. Vet. Sc. IV, p. 573 (1909).

Habitat:

Sumatra

Gvt. East Coast Sumatra

- | | | |
|--------------------|---|----------------|
| 1 ♀ ♀ | from Tandjong Morawa, Serdang, HAGEN. | Coll. L.M.N.H. |
| 1 ♀ | „ on the road Pangkalan Brandan- Bindjei, EYKMAN, 8.5.'22 | Coll. V.S.L. |
| 1 ♀ | „ Belawan on board S.S. „MELCHIOR TREUB”, 3.'23 | |
| 1 ♀ | „ Medan, DE BUSSY | Coll. N.A.M. |
| 4 ♀ ♀ | „ East Coast Sumatra, J. B. CORPORAAL, 10.5.'20 | „ |
| Type ♀ | from Soeroelangoen 8.'78, Res. Djambi | Coll. L.M.N.H. |
| 27 ♀ ♀ | from Djambi, MARSIDI leg. | Coll. V.S.L. |
| respectively 2 ♀ ♀ | on horse on | 25.9.'22 |
| 2 ♀ ♀ | „ „ „ | 1.'23 |
| 6 ♀ ♀ | „ „ and cattle | 4.'22 |
| 5 ♀ ♀ | „ cattle on | 25.9.'22 |
| 2 ♀ ♀ | „ „ „ | 1.'23 |
| 5 ♀ ♀ | „ buffalo on | 25.9.'22 |
| 5 ♀ ♀ | „ „ „ | 4.'22 |

Gvt. Atjeh

- | | | |
|--------|--------------------------------|--------------|
| 62 ♀ ♀ | from Langsar, DIEBEN, 26.2.'23 | Coll. V.S.L. |
|--------|--------------------------------|--------------|

Residency Tapanoeli:

Ressort Padang Sidempoean, Mantrie Ressort, Padang Sidempoean.

- | | | |
|--------------------|--|----------|
| 5 ♀ ♀ | from Moeara Tais, Padang Sidempoean, coll. by LOBEL and BAKKER | |
| respectively 3 ♀ ♀ | on buffalo on | 16.1.'22 |
| 1 ♀ | „ „ „ | 12.'22 |
| 1 ♀ | „ „ „ | 2.11.'24 |

11 ♀ ♀ from Hoeta Tongga, Moeara Tais, LOBEL and BAKKER Coll. V.S.L.

respectively 1 ♀ on buffalo on 16.1.'22

3 ♀ ♀ „ „ „ 30.6.'23

4 ♀ ♀ „ horse on 12.'22

3 ♀ ♀ „ „ „ 1.'23

17 ♀ ♀ from Bintodjoe, Moeara Tais, LOBEL and BAKKER (Textfig. 210 b.)

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1922												3	3
	„	1923		1	2										3
	cattle	1923	1												1
	buffalo	1923		1	1										2
	„	1924					1	2		4	1				8
			1	2	3		1	2		4	1			3	17

4 ♀ ♀ from Hoeta Olboeng, Moeara Tais, LOBEL

Coll. V.S.L.

respectively 3 ♀ ♀ on buffalo 12.'22

1 ♀ „ „ 30.6.'23

5 ♀ ♀ from Si Balapak, Moeara Tais, LOBEL and BAKKER Coll. V.S.L.

respectively 2 ♀ ♀ on buffalo 12.'22

1 ♀ „ horse 12.'22

1 ♀ „ „ 5.8.'24

1 ♀ „ „ 7.9.'24

2 ♀ ♀ from Si Pakko, Moeara Tais, LOBEL

Coll. V.S.L.

respectively 1 ♀ on horse 12.'22 (Textfig 210 c)

1 ♀ „ buffalo 12.'22

3 ♀ ♀ from Hoeta Padang, Pidjor Koling, on buffalo, LOBEL 12.'22

6 ♀ ♀ from Pidjor Koling, LOBEL and BAKKER „

respectively 1 ♀ on horse 6.6.'23

1 ♀ „ buffalo 30.6.'23

2 ♀ ♀ „ „ 8.6.'24

2 ♀ ♀ „ „ 7.9.'24

1 ♀ from Sidoea doea, Pidjor Koling, on buffalo, BAKKER 26.9.'23

1 ♀ „ Angoli Simanossor, Sibolga on cattle 27.'10.'22, LOBEL „

1 ♀ „ Si Babangoen, Angoli Simanossor, on buffalo 11.'22, LOBEL
(Textfig. 210 a, d) Coll. V.S.L.

- 8 ♀ ♀ from Manegon, Angkola, on cattle 16.1.'22, TARIP Coll. V.S.L.
 18 ♀ ♀ „ Pidjang Bolang, on buffalo 13.3.'22, TARIP „
 1 ♀ „ Si Gala Gala, Marantjar, on cattle 3.8.'23, BAKKER „
 10 ♀ ♀ „ Hapesong Lama, Marantjar, LOBEL and BAKKER „

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	cattle	1923		1							1				2
	„	1924								1	1				2
	horse	1923		1		1		1		1					4
	buffalo	1924							1				1		2
				2		1		1	1	2	2		1		10

- 9 ♀ ♀ from Si Hitang, Batoe na Doea, LOBEL and BAKKER Coll. V.S.L.
 respectively 2 ♀ ♀ on buffalo 1.'23

2 ♀ ♀ „ „ 25.9.'23

1 ♀ „ „ 7.9.'24

1 ♀ „ „ 2.11.'24

3 ♀ ♀ „ cattle 2.5.'24

- 1 ♀ from Si Dadi, Si Galangan, on buffalo, 1.'23, LOBEL Coll. V.S.L.

- 2 ♀ ♀ „ Si Galangan, LOBEL

respectively 1 ♀ on horse 1.'23

1 ♀ „ buffalo 1.'23

Ressort Padang Si Dempoean, Mantrie Ressort Goenoeng Toea

- 2 ♀ ♀ from Pasar Goenoeng Toea, TARIP and BAKKER Coll. V.S.L.

respectively 1 ♀ on 17.4.'23

1 ♀ „ cattle on 9.4.'24

- 12 ♀ ♀ from Si Paho, Oedjoeng Padang, LOBEL and BAKKER „

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	horse	1922												5	5
	„	1923			1				1				2		4
	buffalo	1922												2	2
	„	1923			1										1
Total.					2				1				2	7	12

Ressort Padang Si Dempoean, Mantrie Ressort Kota Nopan

- 4 ♀ ♀ from Kota Siantar, LOBEL

Coll. V.S.L.

respectively 1 ♀ on buffalo 10.'22

- 1 ♀ „ „ 3.'23
 2 ♀ ♀ „ „ 29.4.'23
 1 ♀ from Kajoe Djati, Kota Siantar, on buffalo, BAKKER 4.'6.24
 1 ♀ „ Si Gengoe, on cattle 1.10.'23, BAKKER „
 2 ♀ ♀ „ Salemboe, Pidoli Boekit, on horse 13.3.'24, BAKKER
 3 ♀ ♀ „ Moeara Tagor, Tamiang, BAKKER „
 respectively 1 ♀ on buffalo 14.5.'24
 1 ♀ „ horse 30.9.'23
 1 ♀ „ cattle 30.9.'23
 1 ♀ from Kota Nopan without further locality 5.'24, BAKKER Coll. V.S.L.
 Ressort Padang Si Dempoean, Mantrie Ressort Sibolga
 33 ♀ ♀ from Si Boeni boeni, Si Boeloean, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov	Dec.	Total.
Number	horse	1924			6	1	1								8
	buffalo	1923					1						2	1	4
	„	1924									2				2
	cattle	1923								1					1
	„	1924			3	8		4	1				2		18
Total.					9	9	2	4	1	1	2		4	1	33

- Ressort Padang Si Dempoean, Mantrie Ressort Binanga
 3 ♀ ♀ from Si Oendol, Paringgonan, LOBEL and BAKKER Coll. V.S.L. .
 respectively 1 ♀ on horse 18.7.'23
 1 ♀ „ „ 29.10.'24
 1 ♀ „ buffalo 26.11.'24
 1 ♀ from Si Boehoean, Djandi Lobi on horse 15.7.'23, LOBEL Coll. V.S.L.
 2 ♀ ♀ from Hoeta Nopan, BAKKER „
 respectively 1 ♀ on horse 3.12.'23
 1 ♀ „ „ 25.11.'24
 3 ♀ ♀ from Pargaroetan, Balige, TARIP, on buffalo 16.1.'22
 Java
 2 ♀ ♀ from Ambarawa, LUDEKING Coll. L.M.N.H.
 Borneo
 1 ♀ from Djongkong, LORENTZ Coll. N.A.M.
 22 ♀ ♀ from Tanah Intan, Martapoera, on buffalo 8.'23, TARIP Coll. V.S.L.

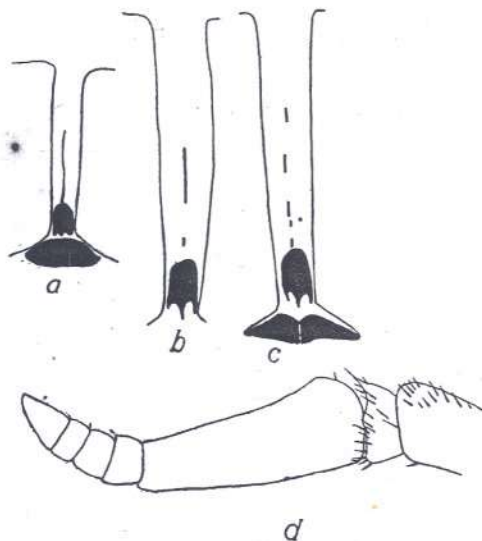
Federated Malay States

♀ ♀ without further locality, FRASER.

Tabanus minimus VAN DER WULP is a small greyish-black species, whose eyes are adorned with a transverse green, M-shaped marking. Frons narrow, brownish. Callus irregular, square, linear extension fine, filiform. Subcallus shining black, prominent. Cheeks greywhite, white haired. Beard white. Face sootygrey. Palpi greyblack to greybrown, white and black haired. Antennae reddishyellow, with darker apex and inconspicuous tooth. Thorax covered with fine whitish pubescence. Wings clear, with or without an appendix. Halteres, club white. Abdomen greyblack, with fine, white fringed segmentations and low median, white haired triangles. Legs, fore tibiae for more than the basal $\frac{2}{3}$ white, white haired, middle and hind tibiae almost wholly white.

Table of dimensions.

Bodylength	varying from	9,5 m.M.	—	11,8 m.M.
Width of thorax	„ „	2,8	„ —	4,2 „
Width of abdomen	„ „	3	„ —	4,2 „
Wingexpanse	„ „	18,4	„ —	23,8 „
Length of head	„ „	1,8	„ —	2,5 „
Length of thorax	„ „	3,8	„ —	5,2 „
Length of abdomen	„ „	5	„ —	7 „
Length of wing	„ „	7,8	„ —	9,8 „
Breadth of wing	„ „	3	„ —	4,5 „
Foreheadindex	„ „	6,33	„ —	10



Textfig. 210.

T. minimus v. D. WULP ♀.

a, b, c. forehead, d. antenna.

The Head. (Textfig. 210). Forehead narrow, a third narrower anteriorly than it is at vertex. Just above the callus it is bluishgrey tomentose, then redbrown. Callus irregularly square, indented at base, shining black, as is the filiform linear extension. In some specimens the linear extension is broken into pieces. Callus almost reaching to the eyes. Vertex spot brown, oval. Between the callus and the subcallus a narrow space remains open. Cheeks and face brownishgrey. Cheeks greyishwhite haired as is the beard. Face covered with brownishyellow and black hairs. Palpi greybrown, grey tomentose, first joint covered with long, loose, white pubescence, second joint broad at base, halfway strongly attenuated, ending in a sharp point, grey and black haired. Antennae reddishbrown-yellow. Third joint almost without a tooth, dorsal outline of basal annulation angular, slender, 2,3 times as long as its

widest part and 1.6 times as long as the blackish stylus. Postocular rim white haired. Eyes with the characteristic marking only visible in fresh specimens.

Thorax bluish grey at base. Scutum elsewhere brownish with bluegrey streaks, black and brownishyellowwhite haired. Lateral borders whitish, yellowwhite haired. Hindborder same pubescence. Pteropleuron bluegrey, with bright bismarckbrown areas, pubescence black and grey. Scutellum same colour as the scutum, hindborder yellowwhite haired. Sides and breast greywhite haired. Wings hyaline, veins yellowbrown, stigma pale brownishyellow. In rare cases an appendix is present, either on both wings or on a single wing only. Among 207 specimens 1 female presented short appendices on both wings, 1 specimen had an appendix on the left, a third a similar veinlet on the right wing. Legs first leg. Coxa greyblue, brownish at apex with long greywhite haircovering, femur blackredbrown, black haired on dorsum and on lateral borders, Tibia, extreme base reddishbrown, basal $\frac{2}{3}$ white, white haired, apex black, black haired. Tarsalia brownblack. Second leg, Coxa greyblue, black haired, trochanter reddishbrown, femur black, knee yellowbrown, dorsum black haired, distal lateral border fringed with long, greywhite hairs. Tibia yellowish brown, black haired at extreme apex, elsewhere white, white haired, ventral spurs reddishbrown, apex black. First tarsale white, white haired at base, apex reddishbrown, black haired. Other tarsalia reddishbrown, black haired. Third leg, Coxa trochanter and femur as in second leg. On the femur some silvergrey hairs are scattered between the black pubescence on the dorsum and on the ventral surface. Tibia identical, extreme base and apical ring yellowbrown. Tarsalia identical, second tarsale whitish at base.

Abdomen dull olivebrown, bluegrey tomentose, groundcolour greyblack, brown-black haired with paler segmentations, haircovering as mentioned above. On the first segment the median tuft is separated from the lateral fringes by a short space, devoid of white hairs. Seventh segment wholly black haired. Ventral surface brown with a bluegrey hue. Segmentations white fringed. Rest black haired, some white hairs being scattered between the black ones.

I compared my specimens with VAN DER WULF's type, so I am quite sure about the identity of the studied specimens. VAN DER WULF however does not mention the eyemarkings since he did observe old specimens only. From *T. simplissimus* WLK. the forelaying species differs in the colouring and pubescence of the abdomen, the shape of the callus and the colour and pubescence of the palpi. From *T. ceylonicus* SCHINER it may be distinguished i.a. by the white beard, the pubescence of the abdomen, especially in respect with the white haired segmentations and median triangles.

FRASER did obtain a transmission of surra with this species experimentally. Regarding the described confusion in the names, one is not quite sure, that he really experimented with this species or with *T. ceylonicus* SCHINER. The specimens brought to *T. minimus* v. d. WULF by DE MEYERE apparently belong to *T. ceylonicus* SCHINER, see there, page 439.

194. *Tabanus ceylonicus* SCHINER. (♀) Pl. 14, Fig. 1, 2, Textfig. 211.

Syn.: *T. nitidulus* BIGOT.

References:

- SCHINER, Reise Novara, Diptera, p. 93 (1868).
 BIGOT, Mem. Soc. Zool. France V, p. 679 (1892).
 RICARDO, Nova Guinea VI, p. 275.
 „ Nova Guinea IX, p. 401.
 „ Tijdschr. v. Ent. Vol. LV, p. 108. (1913).
 „ Rec. Ind. Mus. IV, p. 223 (1911).

DE MEYERE, Tijdschr. v. Ent. Suppl. LXVII, p. 56 (1924).

„ Tijdschr. v. Ent. LIV, p. 275 (1911).

SCHUURMANS STEKHOVEN JR., Buru publications, Vol. 2, p. 32 (1924).

„ „ Treubia. V, p. 330 (1924).

NIESCHULZ, Ned. Ind. Bladen v. Diergeneesk. XXXVII, p. 535 (1925, Dec.) .

Habitat:

Isle Ceylon

1. ♂ from Trincomalee, Hot Wells, YERBURY „rare” 23.8.'90 Coll. BR.M.

Siam

Dinding, RIDLEY Coll. BR.M.

Federated Malay States

Singapore, bites cattle and horses, found in town and jungle, very rarely seen,
FALSHAW Coll. BR.M.

from Tapah Road Perak

A long series from Bidor, S. Perak, ROBINSON and ANNANDALE Coll. BR.M.

1 ♀ from Mouth of Pahang River V.K. coll. 7.'15 Coll. R.M.S.

♀ ♀ from Kuala Lumpur, STANTON Coll. BR.M.

Sumatra

Gouvernement Atjeh

14 ♀ ♀ from Langsar, DIEBEN, 1923 Coll. V.S.L.

29 ♀ ♀ „ Meulaboh W. Coast, DIEBEN „

Gouvernement Sumatra's East Coast

1 ♀ from Tandjong Morawa, Serdang, HAGEN Coll. L.M.N.H.

8 ♀ ♀ „ Road Pangkalan Brandan—Bindjei 8.5.'22, EYKMAN
Coll. V.S.L.

1 ♀ „ Kepala Roessa, Bindjei, VIII/IX. '22, 120 M. TOXOPAEUS
Coll. N.A.M.

Residency Tapanoeli

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

4 ♀ ♀ from Hoeta Tongga, Moeara Tais, LOBEL Coll. V.S.L.

respectively 2 ♀ ♀ on horse 12.'22

2 ♀ ♀ „ „ 1.'23

4 ♀ ♀ from Si Balapak, Moeara Tais, LOBEL and BAKKER „

respectively 1 ♀ on horse 12.'22

1 ♀ „ buffalo 7.9.'23

1 ♀ „ „ 3.6.'24

1 ♀ „ „ 2.4.'24

20 ♀ ♀ from Moeara Tais, on buffalo 12.'21, TARIP „

12 ♀ ♀ „ Bintodjoe, Moeara Tais, LOBEL and BAKKER „

respectively 3 ♀♀ on horse 20.2.'23
 2 ♀♀ „ „ 28.4.'23
 1 ♀ „ buffalo 30.6.'23
 3 ♀♀ „ „ 2.5.'24
 1 ♀ „ „ 6.7.'24
 2 ♀♀ „ „ 5.8.'24

3 ♀♀ from Hoeta Olboeng, Moeara Tais, on buffalo 30.6.'23, LOBEL
 Coll. V.S.L.

1 ♀ „ Angkola 12.'21, TARIP „

5 ♀♀ „ Pargaroetan, Balige, on buffalo 12.'21, TARIP „

11 ♀♀ „ Pidjor Koling, LOBEL and BAKKER „

respectively 1 ♀ on cattle 6.6.'23

1 ♀ „ buffalo 7.9.'23

2 ♀♀ „ „ 26.9.'23

4 ♀♀ „ „ 2.5.'24

1 ♀ „ „ 3.6.'24

2 ♀♀ „ „ 5.8.'24

8 ♀♀ from Manegon, Pidjor Koling, TARIP and LOBEL „

respectively 5 ♀♀ on cattle 12.'21

3 ♀♀ „ buffalo 6.6.'23

3 ♀♀ from Hoeta Lombang, Pidjor Koling, on horse 12.'21, LOBEL

Coll. V.S.L.

1 ♀ „ Hoeta Padang, Pidjor Koling, on buffalo 12.'22, LOBEL (Textfig.
 211 b) Coll. V.S.L.

3 ♀♀ „ Si Doea doea, Pidjor Koling, LOBEL „

respectively 1 ♀ on buffalo 30.6.'23

1 ♀ „ „ 6.8.'23

1 ♀ „ „ 26.9.'23

36 ♀♀ from Hapesong Lama, Marantjar, LOBEL and BAKKER

Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	horse	1923		4	9	2		5		2					22
	cattle	1923			5	1		2							8
	„	1924								3					3
	buffalo	1923									2				2
	„	1924											1		1
Total				4	14	3		7		5	2		1		36

11 ♀ ♀ from Si Hitang, Batoe na Doea, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Number	buffalo	1923		1	1					1	1				4
	cattle	1923		1	3										4
	"	1924					1		1						2
	horse	1923	1												1
Total			1	2	4		1		1	1	1				11

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

50 ♀ ♀ from Si Boeni boeni, Siboeleean, LOBEL and BAKKER Coll. V.S.L.

	Host	Year	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number	buffalo	1923					1	2	2		3		1		9
	"	1924	1							1			1		3
	cattle	1922										15	4		19
	"	1923				2			2			3	1	1	9
	"	1924	1		1			2					1		5
	horse	1922										1			1
	"	1923									1	4			5
	"	1924			4	2			1	2			1		10
Total			2		5	4	1	4	5	3	4	23	9	1	61

37 ♀ ♀ from Batoe Harimo, LOBEL

Coll. V.S.L.

respectively 18 ♀ ♀ on cattle 19.10.'22

3 ♀ ♀ " " 11.'22

17 ♀ ♀ " buffalo 21.10.'22 (Textfig. 211 a, c)

4 ♀ ♀ " " 11.'22

11 ♀ ♀ from Mela, Sibolga, LOBEL

Coll. V.S.L.

respectively 6 ♀ ♀ on cattle 21.12.'22

5 ♀ ♀ " buffalo 26.12.'22

21 ♀ ♀ from Si Babangoen, Anggoli Simanossor, LOBEL

respectively 16 ♀ ♀ on buffalo 27.10.'22

1 ♀ " " 11.'22

3 ♀ ♀ " cattle 27.10.'22

1 ♀ " " 11.'22

Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea

- 1 ♀ from Si Paho, Oedjoeng Padang, on horse 15.6.'23, LOBEL Coll. V.S.L.
 1 ♀ „ Pasar Goenoeng Toea, on cattle 22.5.'23, LOBEL „
 Residency Djambi
 22 ♀ ♀ from Djambi, MARSIDI „
 respectively 2 ♀ ♀ on horse 1.'23
 10 ♀ ♀ „ „ and cattle 6.'22
 1 ♀ „ cattle 25.9.'22
 2 ♀ ♀ „ „ 1.'23
 6 ♀ ♀ „ buffalo 25.9.'22
 1 ♀ „ „ 1.'23
 1 ♀ from Muara Kiawi 6.'15, JACOBSON Coll. N.A.M.
 1 ♂ „ Fort de Kock, 920 M., 12.'21, JACOBSON „
 Isle Nias (Mentawai isles)
 6 ♀ ♀ from Lahewa, on horse 4.'22, TARIP Coll. V.S.L.
 Borneo
 7 ♀ ♀ from Karang Intam, Riam Kanan, on horse 8.'23, TARIP
 Coll. „
 6 ♀ ♀ „ Martapoera, on cattle 8.'23, TARIP „
 Isle Java
 BIGOT type ♀ from Java Coll. BR.M.
 1 ♀ from Semarang, 1.'06, JACOBSON Coll. N.A.M.
 3 ♀ ♀ „ Java, DAMMERMAN „
 1 ♀ „ Soemedang, DAMMERMAN „
 1 ♂ „ Semarang 1.'06, JACOBSON „
 1 ♂ „ Krawang '19—'20, DU PUY „
 33 ♀ ♀ from Tjitaroem Delta, Res. Batavia in stomach contents from *Bu-*
bulculus coromandus, BARTELS leg. 4.'23 Coll. V.S.L.
 Isle Buru
 1 ♀ from Buru, without further locality Coll. B.Z.M.
 Nova Guinea
 2 ♀ ♀ from Dutch Nova Guinea, LORENTZ Coll. N.A.M.
 4 ♀ ♀ „ Etna Bay, Dr. KOCH '04/'05 „
 2 ♀ ♀ „ Etna Bay, Dr. KOCH '04/'05 Coll. L.M.N.H.
 1 ♀ „ Etna Bay, Dr. KOCH '04/'05 Coll. BR.M.
 1 ♀ „ Prauwen Bivak, VAN HEURN 9.'20 Coll. N.A.M.
 2 ♂ ♂ „ Merauke, Dr. KOCH '04—'05 Coll. BR.M.
 1 ♀ „ Hollandia, V. A. 19.5.'10 Coll. B.Z.M.
 1 ♀ „ Idenburg River, TERPOORTEN 1911 „
 British Solomon Isles
 1 ♀ from Guadalcanar, Hookoom, Dr. A. G. CARMENT, on cows legs 18.6.'23
 Coll. BR.M.

- 1 ♀ from Hookoom, Dr. A. G. CARMENT, on cows legs 18.6.'23
Coll. BR.M.
3 ♀ ♀ from Hookoom, Dr. A. G. CARMENT, on horses fetlock 18.6.'23
Coll. BR.M.
3 ♀ ♀ from Aola, Dr. A. G. CARMENT, on cow 18.6.'23 ,,
1 ♀ from Mauronia, Dr. A. G. CARMENT, in bedroom '23 ,,

Dr. CARMENT wrote „This species is extremely common, feeding on cattle near the hoofs, and on horses, attacking the fetlocks”.

When examining a long series of females of the forelaying species, as I have done, one gets the conviction that there exist 2 varieties of the same species, originally described as distinct species: *T. nitidulus* BIGOT and *T. ceylonicus* SCHINER, mostly occurring in the same localities side by side, although the dark black, black haired variety is more frequent in the East of our Archipelago, whereas the other variety occurs in the West of our Archipelago in larger numbers.

The variety *nitidulus* has a yellowish redbrown to blackbrown abdomen, thorax covered with short butteryellow and black hairs; the variety *ceylonicus* seniori strictu is wholly black and possesses a black haircovering on the scutum.

***Tabanus ceylonicus* SCHINER var. *nitidulus* BIGOT. (♀)**

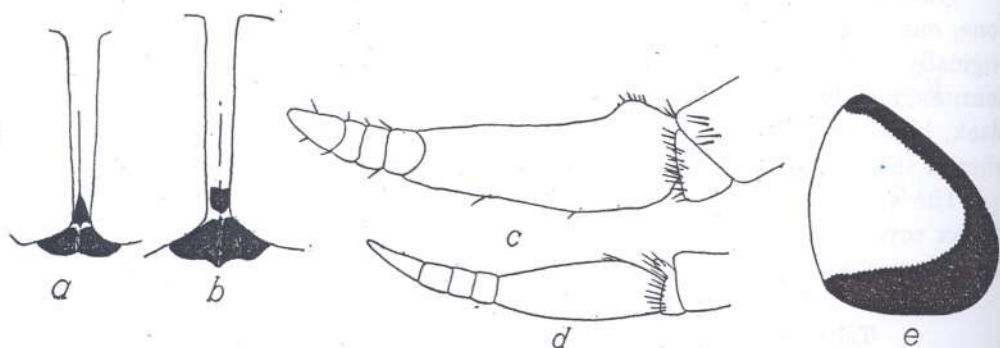
Pl. 14, Fig. 2; Textfig. 211 a, b, c.

Tabanus ceylonicus var. *nitidulus* as well as *T. ceylonicus ceylonicus* have eyes with the transverse M-shaped green marking. Callus in the first variety black, square or triangular, almost or wholly reaching to the eyes, linear extension long. Frons narrow, partly grey, partly brown. Subcallus shining, piceous, bare. Cheeks and face dull brown, black haired, as is the beard. Palpi darkbrown, black haired. Antennae reddish yellow, tooth inconspicuous, apex darker. Thorax dullbrownblack, yellow haired. Wings hyaline, yellowish. Legs with fore tibiae widely and middle and hind tibiae wholly white. Abdomen shining yellowishredbrown, darker at apex, mainly black haired.

Table of dimensions.

Bodylength	varying from 10,2 m.M. — 14 m.M.
Width of thorax	„ „ 2,5 „ — 5 „
Width of abdomen	„ „ 3,5 „ — 5 „
Wingexpanse	„ „ 19,6 „ — 27,4 „
Length of head	„ „ 2 „ — 3 „
Length of thorax	„ „ 4 „ — 5,8 „
Length of abdomen	„ „ 5,2 „ — 8 „
Length of wing	„ „ 8 „ — 11,2 „
Breadth of wing	„ „ 3 „ — 4,5 „
Foreheadindex	„ „ 6,57 — 14,5

The Head. (Textfig. 211 a, b, c). Forehead from a third to a half narrower anteriorly than it is at vertex, greywhite just in front of the callus, then dull dark goldenbrown to black-brown at vertex, black haired. Callus black, quadrangular, elongate, sometimes grooved in the middle, tridentate at base, pointed at apex and prolonged into a filiform or pistilliform, black, rather long linear extension, latter broken into pieces in some specimens. Callus reaching to the eyes or not. Subcallus shining, bare, piceous or nutbrown to olivebrown with black areas, grooved in the middle. A narrow space divides callus and subcallus. Cheeks dull brown, duskier on the lateral borders. Face dull brown with more or less chocolatebrown borders, running from the subcallus to the mouth, yellowwhite haired. Beard blackbrown to black, in a female from Nias and in some other females from Djambi pale brownyellow. Palpi dark brown, first joint yellow haired, second joint thick black haired, ending in a rather



Textfig. 211.

T. ceylonicus SCHINER, ♀ ♂. ♀ a, b. forehead, c, ♀ antenna, d, ♂ antenna, e. eye.

sharp point. Proboscis black, black haired. Antennae, first joint cinnamonbrown, black haired, second joint a grade paler, black fringed, provided with a dorsal spine, third joint slender, basal annulation cinnamonbrown with inconspicuous blunt tooth, 2,35 times as long as its widest part and about 1,8 times as long as the redbrown stylus.

Thorax dull brownblack, short butteryellow and black haired, with a longitudinal narrow median black stripe, not reaching to the scutellum. Laterally traces of 2 other slightly broader brownish stripes are found. Pteropleuron coffeebrown, yellow haired at apex, black haired below. Tufts at base of wings and behind as also the hindborders of scutum and scutellum yellow haired. Lateral borders of the scutum paler than the disc. Breast and sides slate-blueblack, brownish tomentose, yellow haired. Wings almost hyaline, brownish shades accompanying the veins in some specimens; foreborder yellow — yellowbrown or redbrown; stigma reddishbrown; veins yellowbrown; upper branch of the cubital vein always with an acute angle. Anal cell yellowish, closed with a short petiole. Among 237 specimens, 224 did not present any appendix; 13 specimens had one or 2 appendices, that means 5 specimens possessed an appendix on both wings, 5 on the right wing only, 3 on the left wing only. Halteres, stalk brown, club orangeous or yellowbrown. Legs. First leg. Coxa black, brownish tomentose, black haired, with some yellowbrown hairs on the distal lateral border. Femur shining black redbrown, knee olivebrown, black haired on dorsum, on distal lateral border black and brown-yellow hairs are intermixed. Tibia, basal $\frac{3}{4}$ white, white haired, extreme base redbrown apex brownblack, black haired. Tarsalia black, black haired. Second leg. Coxa and trochanter black, femur almost identical, brownblack with yellowbrown knee and similar pubescence as in first leg. Tibia wholly white, white haired, except a narrow shadow at extreme apex and base, ventrally some yellowish pubescence, spurs redbrown with black apex. First tarsale white, white haired, except the apical olivebrown, black haired $\frac{1}{8}$. Other tarsalia olivebrown,

black haired. Third leg. Trochanter and coxa blackbrown, black haired, femur as in second leg, with broader knee. Tibia with narrow, black haired, apical ring, yellowish hairs on distal lateral border. Tarsalia identical.

Abdomen shining yellowish reddbrown, darker to the apex, conical, mainly black haired a few yellow hairs being found on the first segment, just under the scutellum. Lateral borders of the tergites black haired, intermixed with some yellow hairs. In several instances the second segment presented a median roundish or lentiform blackish shadow. In rare cases some yellow hairs are to be found in the middle of the third and second segment. Ventral surface mainly black haired, on first and second segment a rather great number of yellow hairs is intermixed. Segmentations yellow haired.

RICARDO found some specimens of *T. ceylonicus* SCHINER with the abdomen reddishbrown, with yellowish beards and the palpi dark; or blackish beards and the palpi rather reddish. As one may see, I found also specimens with a yellowish beard. Surra transmission-experiments, started by NIESCHULZ with this fly, obtained a positive result, number of flies used: 25; incubation period 11 days,

***Tabanus ceylonicus* SCHINER. var. *ceylonicus* SCHINER (♀, ♂)**

Pl. 14, Fig. 1; Textfig. 211 d, e.

The true relation between both varieties can only be elucidated by breeding experiments, but so far I consider them as 2 varieties of one and the same species. In *T. ceylonicus ceylonicus* scutum, scutellum, sides, shoulders and breast are black haired. Callus square or rectangular, not tridentate, nearly or wholly reaching to the eyes.

The Female.

Table of dimensions.

Bodylength	varying from	10	m.M.	—	14,2	m.M.
Width of thorax	„	„	3,5	„	—	4,6 „
Width of abdomen	„	„	3,5	„	—	5 „
Wingexpanse	„	„	20,2	„	—	25,5 „
Length of head	„	„	2	„	—	3 „
Length of thorax	„	„	4,5	„	—	5,8 „
Length of abdomen	„	„	5	„	—	8,5 „
Length of wing	„	„	8,5	„	—	11 „
Baerth of wing	„	„	3	„	—	4,2 „
Foreheadindex	„	„	6,57	„	—	13,5

The Head. Forehead somewhat broader on the average than in the brown bodied variety, bluishgrey at base, cinnamonbrown at apex, black haired. Callus as in *nitidulus*. Antennae mostly darker on first and second joint than in *nitidulus*. Beard black.

Thorax and abdomen wholly shining black, black haired. Sides of thorax brownish, a small round brown spot being found just underneath the wings. Pteropleuron darkbrown, black haired, occasionally an appendix was noticed (in 3 out of 44 specimens on the right wing). Legs as in var. *nitidulus*.

Abdomen with scanty brown pubescence on the lateral borders of the 2d and 3d segment. On the venter the 1st and the upper border of the second segment are reddish brown, other segments black.

The Male. Textfig. 211 d, e.

The male is almost wholly identical to the female. Eyes with rather narrow, black-faceted area, prolonged to the vertex. Subcallus shining blackish brown, prominent. Cheeks and face blackish brown, black haired. Beard black. Palpi as in the female type, black haired. Antennae yellowish brown, hardly with any tooth, first 2 joints olive brown, black haired; third joint yellowish brown, basal annulation 2.8 times as long as its widest part, 1.2 times as long as the stylus. At the same level as the tooth some black hairs are to be found. Thorax brown haired. In other respects identical with the female type. About its relation with *T. simplissimus* WALKER see under the latter species.

DE MEYERE's description of *T. minimus* VAN DER WULF fits for *T. ceylonicus* SCHINER only.

195. *Tabanus simplissimus* WALKER. (♀, ♂) Textfig. 212, 213.

References:

WALKER, Proc. Linn. Soc. I, p. 111 (1857).

RICARDO, Rec. Ind. Mus. IV, p. 221 (1911).

SURCOUF, Bull. Soc. Ent. Fr., p. 14 (1922).

Habitat:

Type ♀ from Sarawak, Borneo, ex coll. SAUNDERS '68 (Textfig. 212 a c.)
Coll. BR.M.

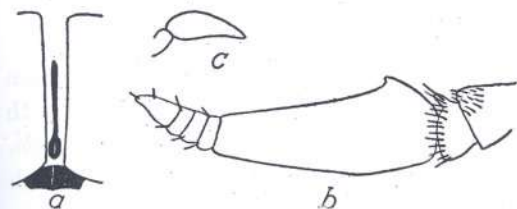
Type ♂ from Sarawak, Borneo '68

Federated Malay States

- | | | |
|------|---|---|
| 4 ♀♀ | from Batu Tiga, STANTON (Textfig. 212 b) | " |
| 2 ♀♀ | " Kuala Lumpur 27.4.'10, resp. 21.2.'10, STANTON | " |
| 1 ♀ | " Selangor, Kuala Lumpur 22.2.'08, DURHAM | " |
| 1 ♀ | " Railway Sungei Besi to Selangor, DURHAM 4.7.'07 | " |
| 1 ♀ | " Singapore, RIDLEY '98 | " |
| 1 ♀ | " Perak, PRATT '07 | " |
| 1 ♂ | " Singapore '98, RIDLEY (Textfig. 213) | " |

Apud SURCOUF *T. simplissimus* Wlk. is nothing but a variety of *T. pusillus* MACQ. It differs however with RICARDO's description of the same species in the shape of the forehead, which is much broader in *pusillus*, and the shape of the callus. For the rest RICARDO's description is too short to allow comparison. The following description was taken after the specimens seen by me in the British Museum. It is a brown species, forehead narrow as in *T. ceylonicus* var. *nitidulus*. Callus club-shaped, dark brown, with slender linear extension. Subcallus bare, shining chestnut brown. Cheeks and face bluish grey. Beard yellowish white. Palpi, brown, swollen at base. Antennae olive brown, third joint red yellow, with distinct tooth. Thorax brown black. Wings brownish, appendix present in the type female, absent in most other specimens. Legs brown. Abdomen olive brown with yellow haired segmentations. It is distinguished from *T. ceylonicus nitidulus* to

which it shows much resemblance by the colour of cheeks, face and beard and the pubescence on the segmentations. Length 9–12 m.m.



Textfig. 212.

T. simplissimus Wlk. ♀

a. forehead, b. antenna, c. palpe.

second joint broad and short, swollen at base, with rather sharp point, black haired. Antennae. First joint olivebrown, black haired on dorsum at apex, second joint reddish, short, with short dorsal spur, black fringed. Third joint reddishyellow, without a distinct tooth, soon growing brownblack, basal annulation 2.4 times as long as its widest part, 2.5 times as long as the stylus.

Thorax mainly denuded, brownblack, with yellowbrown pubescence, foreborder grey tomentose. Breast bluishbrown, yellowwhite haired. Pteropleuron yellowbrown, black haired. Wings brownish, foreborder yellowbrown, stigma pale havannabrown. Apical shadow faintly indicated. On the left wing a rudimental appendix is found, absent in all other specimens, except in a female from Batu Tiga, which shows a similar appendix on the right wing. Halteres, stalk yellowbrown, club ivoryyellow. Legs. First leg. Coxa greybrown, yellowwhite haired, femur blackbrown, knee yellowbrown, black haired. Tibia white to yellowwhite, yellowwhite haired on basal $\frac{2}{3}$, apex brownblack, black haired, extreme base brownish. Tarsalia black. Second leg. Femur more olivebrown, mainly yellowwhite haired, black haired on dorsum at apex only. Tibia yellowbrownish on extreme base, then yellowwhite, white haired, with narrow, black haired, reddishbrown apical band. First tarsale white haired at base, elsewhere black, other tarsalia black. Third leg, femur blackbrown, knee olivebrown, pubescence as on the middle femora, tibia identical, first tarsale yellowbrown, black haired, other tarsalia wholly black.

Abdomen olivebrown, black haired, with some yellow hairs on the segmentations, last segments darker, almost black. Sternites yellow haired, except those of the last 2 segments which are more black, black haired. Abdominal segments varying in colour according to the different specimens. Sometimes an oval, black median spot is found on the 2d segment, a median triangle on the 3d segment, or both at the same time.

The Male.

Eyes (Textfig. 213) with rather broad, black-facetted area, not extending to the vertex. Subcallus as in the female. Palpi olivebrown, club-shaped, yellowwhite haired. Antennae finer than in the female, same shape. Thorax and abdomen more yellowbrown, segmentations yellow haired, 6th and 7th segment dark olivebrown. Legs as in the female type. The male type is headless, so described the head of another male. It differs from the male of *T. ceylonicus* in the extension of the black-facetted part, which difference I con-

The Female.

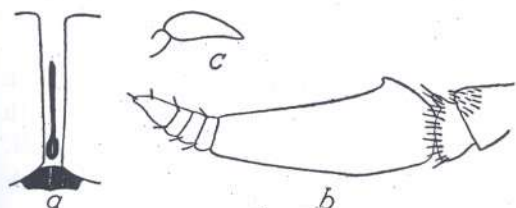
The Head. (Textfig. 212). Forehead rather narrow, white at base, brown at apex, about 8 times as long as it is wide anteriorly, 0.28 narrower anteriorly than it is at vertex. Callus darkbrown, grooved in the middle, with black linear extension. Subcallus shining chestnutbrown. Cheeks and face bluish-grey, brownish to the mouth, yellowwhite haired. Beard same colour. Palpi brown, first joint with long brownish pubescence,



Textfig. 213.

T. simplissimus Wlk. ♂ eye.

which it shows much resemblance by the colour of cheeks, face and beard and the pubescence on the segmentations. Length 9—12 m.M.



Textfig. 212.

T. simplissimus Wlk. ♀

a. forehead, b. antenna, c. palpe.

second joint broad and short, swollen at base, with rather sharp point, black haired. Antennae. First joint olivebrown, black haired on dorsum at apex, second joint redbrown, short, with short dorsal spur, black fringed. Third joint reddishyellow, without a distinct tooth, soon growing brownblack, basal annulation 2,4 times as long as its widest part, 2,5 times as long as the stylus.

Thorax mainly denuded, brownblack, with yellowbrown pubescence, foreborder grey tomentose. Breast bluishbrown, yellowwhite haired. Pteropleuron yellowbrown, black haired. Wings brownish, foreborder yellowbrown, stigma pale havannabrown. Apical shadow faintly indicated. On the left wing a rudimental appendix is found, absent in all other specimens, except in a female from Batu Tiga, which shows a similar appendix on the right wing. Halteres, stalk yellowbrown, club ivoryyellow. Legs. First leg. Coxa greybrown, yellowwhite haired, femur blackbrown, knee yellowbrown, black haired. Tibia white to yellowwhite, yellowwhite haired on basal $\frac{2}{3}$, apex brownblack, black haired, extreme base brownish. Tarsalia black. Second leg. Femur more olivebrown, mainly yellowwhite haired, black haired on dorsum at apex only. Tibia yellowbrownish on extreme base, then yellowwhite, white haired, with narrow, black haired, reddishbrown apical band. First tarsale white haired at base, elsewhere black, other tarsalia black. Third leg, femur blackbrown, knee olivebrown, pubescence as on the middle femora, tibia identical, first tarsale yellowbrown, black haired, other tarsalia wholly black.

Abdomen olivebrown, black haired, with some yellow hairs on the segmentations, last segments darker, almost black. Sternites yellow haired, except those of the last 2 segments which are more black, black haired. Abdominal segments varying in colour according to the different specimens. Sometimes an oval, black median spot is found on the 2d segment, a median triangle on the 3d segment, or both at the same time.

The Male.

Eyes (Textfig. 213) with rather broad, black-faceted area, not extending to the vertex. Subcallus as in the female. Palpi olivebrown, club-shaped, yellowwhite haired. Antennae finer than in the female, same shape. Thorax and abdomen more yellowbrown, segmentations yellow haired, 6th and 7th segment dark olivebrown. Legs as in the female type. The male type is headless, so described the head of another male. It differs from the male of *T. ceylonicus* in the extension of the black-faceted part, which difference I con-

The Female.

The Head. (Textfig. 212). Forehead rather narrow, white at base, brown at apex, about 8 times as long as it is wide anteriorly, 0,28 narrower anteriorly than it is at vertex. Callus darkbrown, grooved in the middle, with black linear extension. Subcallus shining chestnutbrown. Cheeks and face bluish-grey, brownish to the mouth, yellowwhite haired. Beard same colour. Palpi brown, first joint with long brownish pubescence,



Textfig. 213.

T. simplissimus Wlk. ♂ eye.

sider as very essential. For the rest identical with female. Contra RICARDO I maintain the difference of *T. ceylonicus* and *T. simplissimus* Wlk. on the given grounds.

GROUP XVIII.

Uniformly yellow-, yellowbrown-, olivaceousbrown-bodied species, abdomen usually yellow haired. In other species the yellow hairs are intermixed with black ones, whereas a few species possess a wholly black haired abdomen. Antennae ochraceousyellow, redyellow or redbrown. Palpi brown or yellowish yellow or black haired. Beard redbrown, yellowbrown, yellow or white.

KEY 28.

Synopsis of species.

- | | | |
|-----|--|---|
| 1a. | Beard yellowbrown, redyellowbrown or redbrown | 2 |
| b. | Beard paler, ochraceousyellow, citroneyellow, yellowwhite or white | 5 |
| 2a. | Body small-sized, shorter than 10 m.M. | 3 |
| b. | Body larger, 11,5 m.M. or longer | 4 |
| 3. | Beard redyellowbrown. Palpi ochraceousbrown. Antennae yellowbrown, redbrown haired. Scutum ochraceous. Legs with strawyellow femora and darker tibiae. Abdomen ochraceousyellow on basal 3 segments, then redbrown. Wings clear. Eyes in the male sex with the small-facetted area not prolonged to the vertex | |
| | ochrothorax SCHUURMANS STEKHOVEN. | |
| 4a. | Beard yellowbrown. Palpi yellowishgrey. Antennae orangeous, yellow haired, tooth small. Scutum yellowbrown. Legs yellowbrown. Abdomen redyellowbrown. Wings with distinct apical shadow. Eyes with small-facetted area large, small and large facets not differing much in size | |
| | insurgens WALKER ♂. | |
| b. | Beard redbrown. Palpi darkbrown. Antennae redbrown, black haired, tooth distinct. Scutum coffeenutbrown with 3 pale, yellow haired stripes. Wings clear. Legs tawny. Abdomen reddishyellowbrown | |
| | lorentzi RICARDO. | |
| 5a. | Beard pale ochraceousyellow | 6 |
| b. | Beard citroneyellow, yellowwhite or white | 7 |
| 6. | Palpi ochraceousyellow, yellow and black haired. Antennae ochraceous to ferrugineous, black haired. Scutum dull brown, gold lacquerbrown haired. Wings brownish. Tibiae ochraceous, black tipped. Abdomen conical, havannabrown, black haired, lateral borders of tergites pale yellow haired | |
| | aroeënsis SCHUURMANS STEKHOVEN. | |
| 7a. | Beard citroneyellow | 8 |
| b. | Beard white or yellowwhite | 9 |

8. Palpi reddishyellowbrown, mainly yellow haired. Antennae wholly orangeous, golden yellow haired, tooth prominent. Tibiae brownish-yellow, yellow haired. Abdomen orangeousyellow, yellow haired
sol SCHUURMANS STEKHOVEN.
- 9a. Species very small, shorter than 10 m.M. 10
b. Larger species 11
10. Bodylength 8 m.M. Eyes, with the small-faceted part not prolonged to the vertex. Palpi yellowbrown, redbrown haired. Thorax tawny, mainly redbrown haired. Wings clear, without appendix. Abdomen dark olivebrown, redyellowbrown haired on basal 4 segments, then blackbrown
breviusculus WALKER ♂.
- 11a. Wings, with distinct apical shadow..... 12
b. Wings clear, without apical shadow (shadows along the veins may be present) 15
- 12a. Legs with all tibiae largely yellowwhite white haired..... 13
b. Legs darker 14
13. Antennae, basal annulation of third joint orangeous. Upper cheeks pale yellowbrown, brownblack haired. Scutum dark olivebrown, brownyellow haired. Abdomen, basal 2 segments orangeous-brickred, remainder of dorsum with blackbrown, black haired bases of segments, hindborders brownred, orangeous haired
ochros SCHUURMANS STEKHOVEN.
- 14a. Upper cheeks redbrown, redbrown haired. Third antennal joint yellowbrown. Scutum olivaceous havannabrown, on foreborder grey tomentose, yellow and black haired. Wings yellowish. Legs dark. Abdomen olivaceousyellowbrown on basal segments, then blackbrown, black haired, lateral borders of the first 5 tergites yellowbrown haired
olivaceus SCHUURMANS STEKHOVEN.
- b. Cheeks white, white haired. Basal annulation of third antennal joint redyellow. Scutum reddishyellowbrown. Legs dark brown, tibiae yellowishbrown at bases only. Abdomen yellowbrown, yellow haired
flavipilosus SCHUURMANS STEKHOVEN.
- 15a. Wings appendiculate or with the appendix rudimental, palpi mainly yellow haired 16
b. Wings without appendix 19
- 16a. Tarsalia yellow haired..... 17
b. Tarsalia black haired 18
- 17a. Species closely allied to *T. flavipilosus* S.S. Abdomen yellowbrown at base, redbrown at apex, black haired, intermixed with yellow hairs
flavipus SCHUURMANS STEKHOVEN.
- b. Appendix not always present. Foreheadindex 5—6. Callus square, yellow-

brown. Antennae yellow to redyellow. Scutum yellowgrey, yellow haired. Abdomen orangeous, yellow haired

griseifacies SCHUURMANS STEKHOVEN.

- 19a. Subcallus goldenbrown. Cheeks yellowish haired. Antennae yellowbrown, tooth indistinct. Eyes with black-facettled part not extending to the vertex. Thorax pale havannabrown, yellow haired. Appendix long. Abdomen chromyellow, yellow haired

longicornis SCHUURMANS STEKHOVEN ♂.

- b. Subcallus brownishyellowwhite. Cheeks brown haired. Antennae dull olivebrown to redyellow, black tipped, tooth distinct. Eyes with black facettled part prolonged to the vertex. Appendix rudimental. Scutum leatherbrown, redbrown haired. Abdomen leatherbrown, darker to the apex, black haired

intempestivus SCHUURMANS STEKHOVEN ♂.

- 19a. Foreheadindex 20

- b. Forehead broader, index smaller 21

20. Abdomen yellowish olivebrown, black haired. Scutum blackish. Upper cheeks yellowish brown, black haired. Antennae, third joint redyellow, tooth distinct. Wings clear, veins yellowbrown. Legs with white haired femora and yellowwhite, yellow and black haired tibiae

formosiensis RICARDO.

- 21.a Abdomen yellow haired 22

- b. Abdomen black and white haired 23

- 22a. Abdomen conical, ochraceousyellow. Cheeks and face yellowbrown, yellowwhite haired. Palpi bright strawyellow, yellow haired. Antennae ferrugineous, tooth prominent. Legs with tibiae mainly yellowredbrown haired. Wings with brownish shadows along the veins

madoerensis SCHUURMANS STEKHOVEN.

- b. Abdomen uniformly reddishbrown. Upper cheeks ferrugineous, black haired. Palpi olivaceous, black haired. Antennae, third antennal joint redyellow, tooth indistinct. Scutum yellowwhite and black haired. Legs yellowbrown

uniformis RICARDO.

23. Forehead reddishyellowbrown, callus square, without linear extension. Upper cheeks yellowbrown. Palpi yellowbrown, silverywhite haired. Antennae, third joint broad. Scutum olivaceousbrown, foreborder grey tomentose, white haired

humillimus WALKER.

196. *Tabanus ochrothorax* nov. spec. (♀, ♂). Pl. 18, Fig. 1; Textfig. 214, 215.

References:

RICARDO, Nova Guinea IX, p. 401 (1914).

Habitat:

Nova Guinea

Type ♀ from S. Nova Guinea, Heubelbivak 7/15.11.'09

Coll. N.A.M.

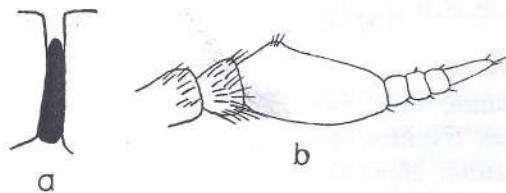
2 ♀ ♀ from same locality, 800 M.	Coll. BR.M.
Type ♂ from Alkmaar 2.2.'10	"
1 ♂ from Bivakisland 12.'09	"
1 ♂ „ Zoutbron 6.'10, VAN HEURN	Coll. N.A.M.
1 ♀ „ Zoutbron 30.6.'10	Coll. B.Z.M.
1 ♀ „ Dutch Nova Guinea	Coll. N.A.M.
1 ♀ „ Dutch Nova Guinea, VERSTEEG 26.12.'12	"
1 ♀ „ Bougainville Mountains, 525 M. 1.6.'10	"
1 ♀ „ Bougainville Mountains, 525 M. 1.6.'10	Coll. B.Z.M.
1 ♀ „ S. N. Guinea, VERSTEEG	Coll. L.M.N.H.

A small species near *T. breviusculus* Wlk. differing from this species in the colour of beard, thorax, abdomen, legs, especially the femora. Forehead, almost filled up with the broad shining tawnyredbrown, elongate callus, not differentiated in callus and linear extension. Subcallus and face goldenyellow. Cheeks sooty-grey, redyellowbrown haired. Beard redyellowbrown, some redbrown hairs on the face just underneath the antennae. Palpi ochraceousbrown, ochraceousyellow haired on first joint, black haired on second joint. Antennae yellowbrown, redbrown haired, stylus redbrown. Thorax ochraceousyellow, yellow haired. Wings clear, veins yellow. Legs with strawyellow femora and yellowbrown to darkbrown tibiae. Male similar, basal 1/3 small faceted, black, not extending to the vertex.

The Female.

Table of dimensions.

Bodylength	7	m.M.
Width of thorax	2,5	"
Width of abdomen	3,5	"
Wingexpanse	20,9	"
Length of head	1,2	"
Length of thorax	3,5	"
Length of abdomen	4,5	"
Length of wing	9,2	"
Breadth of wing	2,8	"
Foreheadindex	5,33	



Textfig. 214.
T. ochrothorax s. s. ♀
a. forehead, b. antenna,

The Head. (Textfig. 214). Forehead almost the same width throughout. Postocular rim blackbrown, or yellowbrown haired. Palpi, first joint ochraceousyellow haired, intermixed with some yellow hairs, second joint long, slender, acuminate, ochraceous, yellow haired at base, violetbrownish, black haired at apex. Proboscis yellowbrown, yellow haired on stalk, sugarflaps redbrown with darker pubescence. Antennae, first joint cylindrical, yellowbrown, redbrown haired, second joint halfmoon-shaped, without dorsal spur, yellow and redbrown fringed. Third joint, basal annulation elongate, curved, 1,85 times as long as its widest part, 1,3 times as long as the redbrown stylus, tooth indistinct, crowned with some redbrown hairs.

Thorax ochraceousyellow, scutum and scutellum same colour. Wings clear, pale brownish yellow at base, apex slightly darker. Stigma coffeenutbrown. Halteres, stalk yellow-brown, club redyellowbrown. Legs. First leg. Coxa butteryellow, femur darker, brownish strawyellow, dorsum black haired, lateral borders and ventral surface, knee brownish. Tibia yellowbrown at base, then blackbrown, black haired. Tarsalia brownish. Second leg. Coxa, trochanter and femur butteryellow, goldenyellow haired, apex femoris brownish. Tibia pale olivebrown, black haired. Tarsalia redbrown, black haired. Third leg identical, tibia reddish-yellowbrown, black haired. First tarsale paler at base, rest redbrown, black haired.

Abdomen ochraceousyellow, yellow haired on basal 3 segments. Following segments redbrown, anal hill sulfurousyellow, ventral surface similar, some yellow hairs on the first tergite at segmentation, abdomen elsewhere black haired.

The Male.

The Head. (Textfig. 215). Face reddishbrown tomentose. Cheeks greybrownish, black haired. Beard redbrown. Palpi olivaceousyellowbrown, black haired. Antennae, basal joints yellowbrown, redbrown haired, intermixed with yellow hairs third, joint as in the female.



Textfig. 215.
T. ochrothorax
s. s. ♂
eye.

Thorax reddishyellowbrown, clothed with rather long, blackbrown pubescence. Hindborder of scutellum paler, yellowbrownish. Pteropleuron yellow, yellow haired. Breast orangeousyellow, goldenyellow haired. Wings clear, foreborder yellowbrown, stigma brownish, well developed. Halteres, stalk bright reddishbrown, club blackish. Legs. First leg. Coxa brownish yellow, goldenyellow haired, trochanter yellowbrown. Femur yellowbrown at base, then blackbrown, black haired, knee yellowbrown. Tibia blackbrown, black haired. Tarsalia black. Second leg. Coxa, trochanter and femur brownish yellow, goldenyellow haired. Tibia olivebrown to blackbrown, black haired, first tarsale olivebrown at base, then blackbrown, black haired, other tarsalia blackbrown, black haired. Thrd leg identical.

Abdomen bright yellowbrown on basal 3 segments, then blackbrown, black haired, ventrally the same.

197. *Tabanus insurgens* WALKER (♂). Textfig. 216.

References:

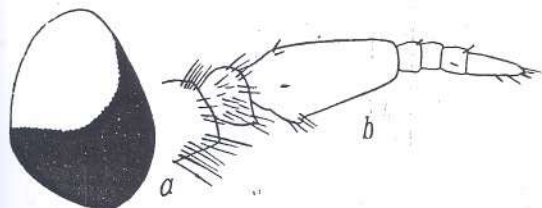
- WALKER, Proc. Linn. Soc. London. V, p. 276 (1861).
OSTEN SACKEN, Ann. Mus. Civ. Genova XVI, p. 116 (1882).
RICARDO, Nova Guinea IX, p. 400 (1914).

Habitat:

- Type ♂ from Isle Batchian (Batjan), A. R. WALLACE Coll. BR.M.

A small yellowbrown species. Eyes with a large, small-facettled portion, the large facets not differing much in size with the small facets. Subcallus yellowbrown. Face and upper cheeks brownish yellow, lower cheeks with whitish streaks, blackbrown haired. Beard yellowbrown. Palpi small, yellowishgrey, black haired. Antennae orangeyellow, mainly yellow haired, third joint brownish. Thorax yellowbrown, yellow haired. Wings brownish, with distinct apical shadow. Legs yellowbrown, with slightly darker tibiae. Abdomen redyellowbrown, yellow haired. Length 11,5 m.M.

The H e a d. (Textfig. 216). Antennae, first joint orangeousyellow, yellow haired, intermixed with a small number of black hairs, second joint with a short dorsal spine, third joint with a small, black haired tooth, basal annulation 1,9 times as long as its widest part, 1,6 times as long as the stylus.



Textfig. 216.

T. insurgens Wlk. ♂. a. eye, b. antenna.

yellowbrown, dorsum yellow haired at base, apex yellow haired. Tibia olivebrown, black haired on dorsum, yellow haired below. Tarsalia black. Second leg identical, femur and tibia wholly yellow haired, first tarsale blackbrown, black haired. Other tarsalia wholly black. Third leg, tibia dark olivebrown, dorsum black haired, ventral surface yellow haired.

A b d o m e n reddishyellowbrown, yellow haired, ventral surface similar.

T h o r a x, pteropleuron yellow, yellow haired, breast yellowbrown yellow haired. Wings with dark brown apical shadow, foreborder yellowbrown, stigma havannabrownyellow, veins brown. Halteres greybrown. Legs. First leg. Coxa pale yellowbrown, slightly darker at apex, yellow haired, some black hairs being visible at apex, trochanter reddishyellowbrown, black haired, femur

198. *Tabanus lorentzi* RICARDO (♀). Textfig. 217.

References:

RICARDO, Nova Guinea IX, p. 400 (1914).

Habitat:

Type ♀ from Alkmaar, Nova Guinea 10.'09

Coll. N.A.M.

Paratype ♀ from Alkmaar, Nova Guinea

Coll. BR.M.

1 ♀ from Kloofbivak 18.10.'12 S. N. Guinea, VERSTEEG

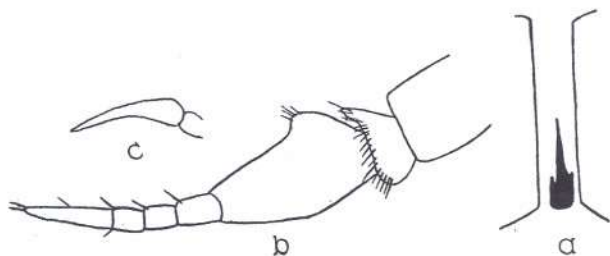
Coll. L.M.N.H.

A median-sized reddishyellowbrown species. Forehead parallel-sided, yellowbrown. Callus reddishyellowbrown, irregularly cylindrical, linear extension sharply pointed. Subcallus ferrugineous, cheeks and face yellowbrown, redbrown haired. Beard redbrown. Palpi acuminate, darkbrown, black haired. Antennae redbrown, black haired on basal joints, third joint redyellow, tooth blunt. Thorax coffeenutbrown, with 3 pale, yellow haired longitudinal stripes. Breast yellow haired. Wings clear without appendix. Legs tawnyredbrown. Abdomen reddishyellowbrown, yellow haired, apex slightly darker. Length 14 m.M.

The H e a d. (Textfig. 217). Forehead almost the same width throughout, index 4,5. Palpi, swollen at base of second joint, ending with a long fine point. Antennae, second joint with a short dorsal spine, third joint, basal annulation redyellow 1,6 times as long as its widest part, 0,8 times as long as the slender black stylus.

T h o r a x denuded, colour as mentioned. Breast reddishbrown, yellow haired. Wings clear, veins brown, stigma and foreborder yellow. Legs. First leg. Coxa reddishyellowbrown,

white haired on dorsum, ventrally redbrown haired, trochanter blackbrown, femur tawny-redbrown, black haired. Tibia tawnyredbrown, slightly darker than the femur. Tarsalia blackbrown. Second leg, femur redbrown, redbrown haired, tibia dark redbrown, first tarsale same colour, other tarsalia black. Third leg identical.



Textfig. 217.

T. lorentzi Ric ♀. a. forehead, b, antenna, c. palpe.

Abdomen reddish-yellowbrown, yellowbrown on basal 2 segments, apex darker, yellow haired, ventral surface reddishbrown, dark reddish-yellow haired.

199. *Tabanus aroeënsis* nov. spec. (♀). Pl. 14, Fig. 4; Textfig. 218.

Habitat:

Type ♀ from Dobo, Aroe Islands on horse 25.11.'22

Coll. V.S.L.

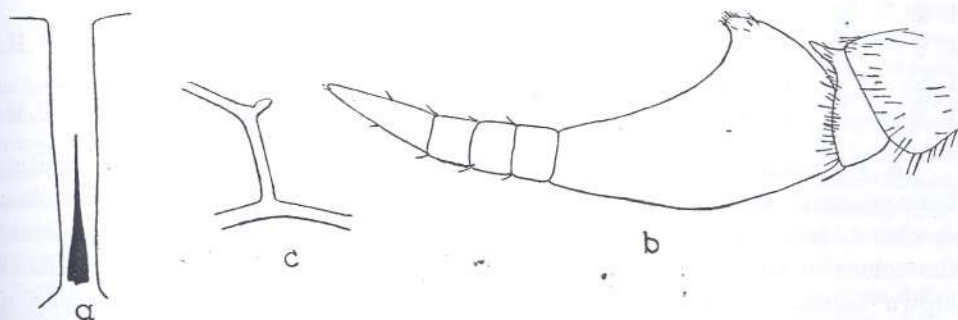
T. aroeënsis is a medium-sized brownishyellow species, closely allied to *T. lorentzi* Ric. but distinguishable inter alia by the forehead, which is narrower, the colour of the beard, and the palpi, which are blunt at apex, the pubescence of thorax and abdomen and the presence of an appendix on the wings. Forehead yellowbrown, brownyellow and black haired. Callus redbrown at base, black at apex, elongate triangular, effilated into a fine filiform linear extension, extending on the lower half of the forehead. Subcallus and upper cheeks redbrown, brown haired, lower cheeks canary-yellow, pale yellow haired. Beard pale ochraceous yellow. Face brownishyellow, yellow haired. Palpi ochraceousyellow, ochraceousyellow haired at base, black haired at apex. Antennae ochraceous-ferrugineous, black haired on basal joints, third joint darker, tooth distinct. Thorax without distinct longitudinal stripes, dull brown, clothed with gold-laquerbrown pubescence, intermixed with black hairs. Wings brownish. Legs brownish, tibiae ochraceous yellow, dark tipped. Abdomen conical, havanna-brown, black haired. Lateral borders of tergites pale yellow haired, ventral surface with a median longitudinal dull redbrown, black haired stripe, sides and segmentations orangeousbrown, yellowwhite haired.

Table of dimensions.

Bodylength	17,8 m.M.
Width of thorax	5,8 „
Width of abdomen	6,2 „
Wingexpanse	35,8 „
Length of head	3,2 „

Length of thorax	7,2	„
Length of abdomen	9,6	„
Length of wing	15	„
Breadth of wing	5,2	„
Foreheadindex	6,6	

The Head (Textfig. 218). Forehead almost the same width throughout, black haired along the lateral borders and on vertex, elsewhere brownyellow haired. Callus keeled. Face brownishyellow, with clearer streaks along the lateral borders. Postocular rim brownyellow fringed. Palpi, first joint ochraceousyellow, yellow haired, second joint as described, black hairsd at apex, intermixed with yellow hairs. Antennae, first joint, black haired on dorsum, especially at apex, distal lateral border yellowbrown haired, intermixed with some black hairs, second joint black fringed, dorsal hump short, third joint curved, basal annulation 1,5 times as long as its widest part, 1,1 times as long as the black stylus.



Textfig. 218.

T. aroeënsis s. s. ♀. a. forehead, b. antenna, c. palpe.

Thorax with a trace of a median longitudinal stripe, dull brown, pubescence as mentioned, pteropleura same colour as scutum and scutellum. Latter goldenyellowbrown haired. Tufts at base of wings and behind dirty brownishwhite. Breast and sides brownyellow tomentose, brownyellow or brownishwhite haired, mesosternumlobus black haired. Wings brownish by the brownish shadows which accompany the yellowbrown to redbrown veins, foreborder yellowish caramelbrown, stigma blackbrown. Both wings with short appendices. Halteres orangeous-ochre-yellow. Legs. First leg. Coxa greyishbrown, sootyblack at apex. Femur black, black haired on dorsum, distal lateral border long yellowbrown haired, knee ochraceous yellowbrown. Tibia ochraceous yellow, black and brown-yellow haired on basal half, apex redbrown passing over to black, black haired, the apical third is wholly black, extreme base redbrown. Ventral surface orangeous haired, black haired on apical third. Tarsalia black. Second leg. Coxa greybrown, trochanter brownblack, yellowbrown haired, femur sooty-browngrey with ochraceousyellow apical 1/4, mainly ochraceousyellow and yellowbrown haired, some black hairs being intermixed at apex on dorsum and at base on the ventral surface. Tibia orangeous ochraceousyellow, redbrown on apical ring, mainly ochreyellow haired, some black hairs being scattered over the dorsum. First tarsale redbrown, black haired, other tarsalia wholly black. Third leg. Femur as in second leg, mainly yellowbrown haired, except a few black hairs on dorsum near the apex and a median stripe of black hairs on ventral surface. Tibia yellowbrown, redbrown at apex, dorsum yellow haired in the middle, black haired on lateral borders, some yellow hairs being intermixed on distal lateral border,

ventral surface ochraceousyellow haired. First tarsale redbrown, black haired, other tarsalia wholly black.

Abdomen uniformly havannabrown, black haired, first segment with a grey tomentose, yellow haired median spot, a similar yellow haired spot being found at each side of the scutellum. Ventral surface as indicated above. Seventh segment wholly black haired.

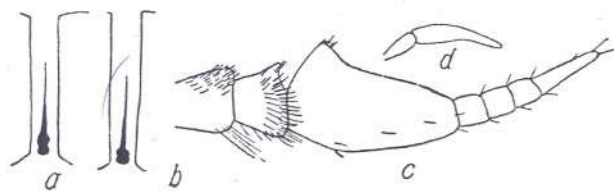
200. *Tabanus sol* nov. spec. (♀). Textfig. 219, 220.

Habitat:

Nova Guinea

Type ♀	from Bivak Island, LORENTZ 25.2.'10 (Textfig. 219 a, c, d)	Coll. BR.M.
1 ♀ ♀	from Bivak Island, LORENTZ 25.2.'10	Coll. L.M.N.H.
2 ♀ ♀	„ Rivierkamp, LORENTZ 2.'10	Coll. BR.M.
5 ♀ ♀	„ Rivierkamp, LORENTZ 2.'10 (Textfig. 219 b)	Coll. N.A.M.
2 ♀ ♀	„ Dutch Nova Guinea, LORENTZ 2.'10	„
1 ♀	„ Alkmaar, LORENTZ 10.'09	„
1 ♀	„ Alkmaar, LORENTZ 10.'09	Coll. L.M.N.H.
1 ♀	„ Heuvelbivak, 800. M., LORENTZ 7/15.11.'09	Coll. N.A.M.
1 ♀	„ Upper Segmowai river, 400 M. 28.3.'11 (Textfig. 220)	Coll. B.Z.M.

A yellowish species, placed by Miss RICARDO under *T. insurgens* Ric. but apparently distinct, distinguishable inter alia by the colour of the subcallus, cheeks and face, which are citronyellow, citronyellow haired, the broader antennae, the colour of the wings and of the tibiae. Forehead ochraceousbrown, black-brown haired. Callus yellow, small, pear-shaped or oblong, linear extension thick. Beard citronyellow. Palpi reddishyellowbrown, mainly yellow haired, some black hairs at apex. Antennae wholly orangeousyellow, goldenyellow haired, third joint broad, with a prominent tooth. Thorax brownyellow, with 3 yellow, yellow haired, longitudinal stripes, intermixed with some black hairs. Wings faintly brownishyellow, neither apical shadow nor appendix, veins yellowbrown. Legs brownish yellow. Abdomen orangeousyellow, yellow haired. Length 10—12 m.M.



Textfig. 219.

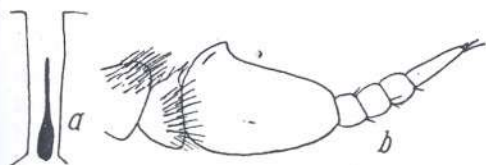
T. sol s.s. ♀. a, b. forehead, c. antenna, d. palpe.

haired, intermixed with a few redbrown hairs, no black hairs whatever, second joint with a double fringe of goldenyellow hairs, dorsal spine short. Third joint, basal annulation 1,6 times as long as its widest part, 1,1 times as long as the narrow stylus, tooth prominent, crowned with redbrown hairs.

The Head. (Textfig. 219). Forehead slightly narrower anteriorly than it is at vertex, index 5,3—5,7. Callus narrow, not reaching to the eyes, linear extension ending with a fine point. Palpi, second joint slightly swollen at base, ending with a narrow point. Antennae, first joint goldenyellow

Thorax, longitudinal stripes faintly indicated. Wings faintly brownishyellow, foreborder yellow, stigma yellowishbrown. Halteres, stalk yellowbrown, club ivoryyellow. Legs ochraceous-brownishyellow, yellow haired, middle tibiae brownishyellow, faintly darker at apex, yellow haired, hind tibiae identical, first tarsale of the middle legs yellowbrown, other tarsalia blackbrown, black haired, tarsalia of hind legs more olivebrown.

Abdomen orangeousyellow, yellow haired, in some specimens the 3 apical segments are blackish, ventral surface similar, on sixth and seventh segment black hairs are intermixed, between the yellow hairs, other sternites wholly yellow haired.



Textfig. 220.

T. sol s. s. ♀. aberrant form
a. forehead, b. antenna.

The female from the Upper Segmowairiver (Textfig. 220) differs slightly with the foregoing description, although it belongs to the same species, as I could conclude by comparing it with the females in the BR.M. Coll. Bodylength 10,5 m.M. Width of thorax 3,2 m.M., wingexpanse 22,2 m.M. Length of wing 9,5 m.M. Breadth of wing 3 m.M. Foreheadindex 4,5. Subcallus, face and cheeks

goldenyellowbrown, citronyellow haired. Callus olivebrown, Vertexspot blackish grey. Palpi with a greater number of black hairs at apex of second joint. Proboscis stalk goldenbrown, brownyellow haired, sugarflaps blackbrown, blackbrown haired. Antennae, first joint with some black hairs at apex on dorsum, second joint black fringed, third joint with black hairs on tooth, stylus brownish. Thorax pollinose yellowbrown, yellow haired, scutellum bismarckyellow haired. Sides and breast yellow, brownishyellow haired. Tibiae with some black hairs at apices, intermixed between the goldenyellow hairs, hind tibiae partly black haired on dorsum, i. e. on proximal lateral border and in the middle, elsewhere yellow haired. The given differences are rather small and do not suffice to separate the specimens, the more, as most of the indications about this specimen are completing the description of the type.

201. *Tabanus brevisculus* WALKER (♂). Textfig. 221.

References:

- WALKER, Proc. Linn. Soc. London VIII, p. 109 (1865).
RICARDO, Nova Guinea IX, P. 401 (1914).

Habitat:

- Type ♂ from Nova Guinea

The other males and females placed by RICARDO under this heading are distinct and belong to quite another species confer *T. ochrothorax* s.s.

A small species. Eyes, black, small-faceted on their lower third, this area not extending to the vertex, remainder small-faceted, yellowbrown. Subcallus redbrown, cheeks greywhite, scanty redbrown haired. Beard whitish. Face reddishbrown. Palpi yellowbrown, blackbrown haired. Antennae incomplete, second joint without a dorsal spine, basal joints redbrown haired. Thorax denuded, tawny, remainder of pubescence redbrown. Wings clear, veins olivebrown. Legs havanna-tawnybrown, tibiae olivebrown. Abdomen dark olive-

brown, redyellowbrown haired, last 3 segments darker, blackbrown, ventral surface redbrown haired. Length 8 m.M.



Textfig. 221.

T. breviusculus WLK. ♂
eye.

The Head. (Textfig. 221). Antennae, first joint cylindrical.

Thorax. Tufts at base of wings and behind white. Pteropleuron white tomentose, redbrown and white haired. Breast tawnybrown, redbrown haired. Wings clear, stigma yellowbrown. Legs brownish. First leg. Coxa redbrown, redbrown haired in the middle on dorsum, white haired on lateral borders, rest of the leg broken off. Second leg, femur havanna-tawnybrown, dorsum black haired, distal lateral border whitishyellow haired; tibia dark olivebrown, first tarsale same colour, other tarsalia blackbrown, pubescence on dorsum black, ventral surface yellowredbrown haired. Third leg. Coxa dark oliveredbrown, blackbrown haired, femur reddisholivebrown, blackbrown haired. Tibia dark olivebrown as also the first tarsale, other tarsalia black, black haired.

Abdomen darkolivebrown, and for the rest as mentioned above.

202. *Tabanus ochros* nov. spec. (♀) Textfig. 222.

Habitat:

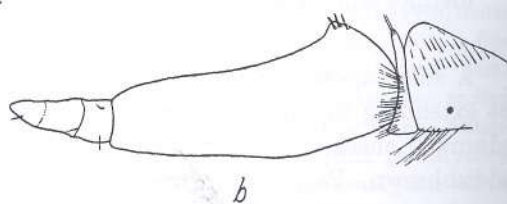
Type ♀ from Siam, Rompibun 8.3.'22

Coll. R.M.S.

A beautiful ochraceousyellow to orangeousbrickred species with dark olivebrown, brownyellow haired thorax. Forehead pale yellowbrown, black haired. Callus olivaceousyellowbrown, egg-shaped, grooved in the middle, linear extension broad, short. Subcallus and upper cheeks pale yellowbrown, brownblack haired. Lower cheeks and face silverywhite, white haired. Beard white. Palpi pale coffeenutbrown, black haired on second joint. Antennae tawny buff to orange, black haired on basal joints, third joint orangeredbrown. Wings with smokybrown apical shadow, elsewhere yellowish. Legs with tibiae largely yellowwhite, white haired with darker, black haired apices. Abdomen orangebrickred on basal 2 segments, following ones with blackbrown, black haired bases and orangeousbrownred, orange haired hindborders. Lateral borders of tergites yellowwhite haired.

Table of dimensions.

Bodylength	14 m.M.
Width of thorax	5 "
Width of abdomen	5 "
Wingexpanse	30 "
Length of head	2,5 "
Length of thorax	5,2 "
Length of abdomen	7,5 "
Length of wing	12,5 "
Breadth of wing	4,8 "
Foreheadindex	5,75



Textfig. 222

T. ochros s.s. ♀. a. forehead, b. antenna.

The Head. (Textfig. 222). Forehead $1/3$ narrower anteriorly than it is at vertex. Palpi first joint white haired, intermixed with some black hairs, second joint, stout, darker at apex, black haired. Proboscis brownblack, black haired. Antennae, first joint tawny buff, black haired, second joint orangeous, dorsal hump blunt, black fringed Third joint rather broad, basal annulation 2,4 times as long as its widest part, 2,7 times as long as the darker yellow-brown stylus. Tooth indistinct, blunt.

Thorax dirty, denuded, dark olivebrown, brownyellow haired. Scutellum same colour as scutum. Pteropleuron black haired. Sides and breast grey, greywhite haired, brownish along the mesosternumlobus brownish haired along the borders. Wings, foreborder yellow-brown, stigma narrow, dark redbrown, apical shadow smokybrown, veins pale havannabrown. Halteres, stalk dark redbrown, club yellowbrown. Legs. First leg. Coxa pale isabellabrown, darker at apex, silverywhite haired. Trochanter blackbrown. Femur blackbrown, black haired, knee narrowly yellowbrown. Tibia, basal half yellowwhite, white haired, apex dull havannabrown, black haired. Tarsalia black, black haired. Second leg. Coxa greywhite tomentose, white haired. Femur as in first leg, dark olivebrown on ventral surface, distal lateral border with a number of yellowish hairs, elsewhere black haired. Tibia strawyellow, white haired at base, intermixed with some black hairs, apical ring narrow, dark reddish havannabrown, black haired. Ventral surface similar. Tarsalia redbrown, black haired. Third leg. Trochanter reddishblackbrown. Femur as in second leg, white haired on the lateral borders and on the yellowbrown knee. Tibia yellowbrown, white haired on the basal $7/8$, intermixed with a median row of black hairs on dorsum. Apex darkredbrown, black haired. Tarsalia dark redbrown, black haired.

Abdomen denuded as mentioned, ventral surface uniformly whitish orange on the basal 2 segments, 3d and following segments darker, black haired at base, segmentations paler whitish, white haired. Seventh segment wholly black, black haired.

203. *Tabanus olivaceus* nov. spec. (♀) Textfig. 223.

Habitat:

Type ♀ from S. Nova Guinea, VERSTEEG 25.9.'12

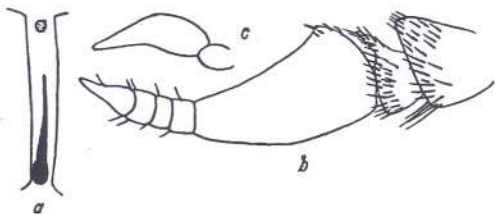
Coll. N.A.M.

A species distinguishable by the absence of a median abdominal stripe, the absence of brown shadows along the veins, the shape of forehead and palpi, the colour of the antennae, etc. Forehead dull havannabrown, black haired. Callus deep redbrown, gradually tapering to the black linear extension. Subcallus and upper cheeks redbrown, redbrown haired, lower cheeks greywhite, white haired. Beard white. Palpi havannabrown, white tomentose, yellowbrown haired on first joint, second joint black haired, acuminate. Antennae yellowbrown, black haired on basal joints, third joint yellowbrown, broad at base. Thorax olivaceous havannabrown, grey tomentose on foreborder of scutum, yellow and black haired. Wings yellowish, with brown apical shadow. Legs dark. Abdomen olivaceousyellowbrown on the basal 2 segments, then darker, blackbrown at the apex, black haired, lateral borders of tergites 1—5 paler yellow, yellowbrown haired. Bodylength 11.2 m.M.

The Head. (Textfig. 223). Forehead slightly narrower anteriorly than it is at vertex, index 7,5. Palpi, first joint yellowbrown haired, some black hairs at apex, second joint strongly swollen at base, suddenly attenuated in the middle to a narrow rather acute point

Antennae, first joint protruding caplike over the second joint, black haired, second joint with dorsalspur, black fringed, third joint yellowbrown on basal annulation, which is 1,7 times as long as its widest part, 1,5 times as long as the blackbrown stylus. Tooth triangular.

Thorax. Scutum denuded, only some yellow and black hairs are visible. Pteropleuron



Textfig. 223.

T. olivaceus s.s. ♀. a. forehead, b. antenna, c. palpe

dull yellowbrown, black haired. Sides and breast greybrown, yellowwhite haired with a number of black hairs on mesosternumlobus. Tufts at base of wings and behind yellowwhite haired. Wings, foreborder brownyellow, apical shadow brown, stigma dark havannabrown. Veins same colour. No appendix. Halteres yellowbrown, apex of club blackish. Legs incomplete. First pair. Coxae bluishgreybrown, white haired, trochanter tawnybrown as are the femora, black haired. Tibiae, blackbrown at extreme base, then yellowbrown, apical half havannabrown, wholly black haired. On basal half some yellow hairs are intermixed. Tarsalia blackbrown, black haired. Other legs wanting.

Abdomen. Ventral surface tawny yellowbrown on first 4 segments, black haired, segmentations 1-6 narrowly white, yellowwhite haired. Segments 5-7 blackbrown, black haired.

204. *Tabanus flavipilosus* nov. spec. (♀) Textfig. 224.

Syn. *T. borniensis* Ric. in parte

References:

RICARDO, Rec. Ind. Mus. IV, p. 216 (1911).

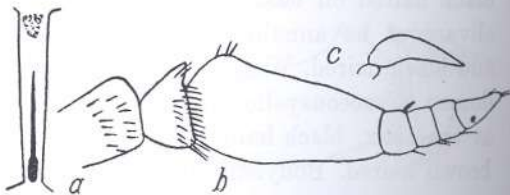
Habitat:

Type ♀ from Sarawak, Borneo, STEVENS 1857

Coll. BR.M.

Forehead pale yellowbrown, black haired. Callus cylindrical, redbrown, prolonged into a long linear extension. Vertexspot winered. Subcallus pale reddishbrown, cheeks and face white, white haired. Beard white. Palpi brown, acuminate, black haired. Antennae olivebrown on basal joints, black haired, third joint redyellow, tooth indistinct. Thorax reddishyellowbrown, denuded. Wings with pale reddishbrown apical shadow. Legs darkbrown, tibiae yellowishbrown at base. Abdomen yellowbrown, yellow haired. Length 12 m.M.

The Head. (Textfig. 224). Forehead 0,37 narrower anteriorly than it is at vertex, index 9,2. Callus elongate, not reaching the eyes, linear extension filiform. Antennae, first joint olivebrown haired, second joint black fringed, dorsal spur short. Third joint, basal annulation 2 times as long as its widest part, 1,34 times as long as the black-tipped stylus, hardly any tooth.



Textfig. 224.

T. flavipilosus s.s. ♀. a. forehead, b. antenna, c. palpe.

Thorax pale reddishyellowbrown, denuded. Breast greyyellowbrown, white haired. Wings, foreborder reddishyellow, veins yellowbrown, apical shadow redbrown, with clear centres in radial and cubital cells. Halteres yellow. Legs. First leg. Coxa greyyellowbrown, white haired. Femur blackbrown, black haired, knee yellowbrown. Tibia swollen, basal $1/3$ yellowishbrown, rest blackbrown, black haired. Tarsalia black. Second leg paler, femur more yellowbrown, dorsum black haired, pale yellowbrown haired at base along the distal lateral border. Tibia yellowbrown, black haired. Tarsalia redbrown, black haired. Third leg. Femur redbrown black haired on dorsum, yellowish haired at distal lateral border. Tibia reddishbrown, black haired. Tarsalia identical.

Abdomen yellowbrown, darker at apex, yellow haired on dorsum and venter.

RICARDO placed this specimen under *T. borniensis* RIC. which is a synonym of *T. apicalis* RONDANI, which name was preoccupied by a species from Brazil, described by WIEDEMANN in 1828. RICARDO redescribed *T. borniensis* RIC. and gives a record of the characters of the SARAWAK female. From this descriptions and from the given data elucidates that both specimens belong to different species, confer inter alia shape of forehead, length of linear extension, vertexspot, etc.

205. *Tabanus flavipus* nov. spec. (♀).

References:

RICARDO, Rec. Ind. Mus. IV, p. 216 (1911).

Habitat:

Type ♀ from India, SAUNDERS

Coll. BR.M.

The forenamed specimen was placed under the heading *T. borniensis* RIC. To all probability however it does not belong to this species. So I separate it provisionally from *T. borniensis* RIC. which is apparently present in the Genova Museum only.

Wings, clear, appendiculate, without apical shadow. Second leg wholly yellowbrown. Third leg, femur yellowbrown, tibia yellow, yellow haired, with a dorsal row of black hairs. Tarsalia yellow, yellow haired. Abdomen pale yellowbrown at base, darker, redbrown to the apex, black haired, intermixed with yellow hairs, lateral borders of tergites yellow, yellow haired.

206. *Tabanus griseifacies* nov. spec. (♀) Textfig. 225.

Type ♀ and 2 other females from Sibagsar, Assam, India (Textfig. 225 a, b, c, f, g)

Coll. BR.M.

Isle Ceylon

1 ♀ from Tangleam 21.10.'90 (Textfig. 225 d)

1 ♀ „ Kanthalla 15.10.'90 (Textfig. 225 e)

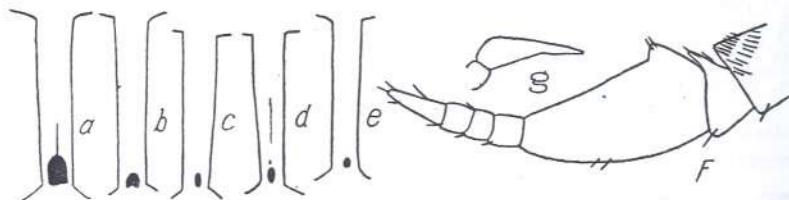
1 ♂ „ Trincomalee, Sober Island 10.8.'90, YERBURY

1 ♂ „ Ceylon 29.3.91, MACHAVELLI

A yellowish species. Wings clear, appendiculate, veins yellowbrown. Fore-

head yellowbrown. Callus square, yellowbrown, with an inconspicuous fine prolongation, in the type, wholly wanting in other females. Subcallus yellowbrown. Cheeks yellowishgrey. Face greywhite, white haired. Beard white. Palpi yellowbrown, acuminate, orangeousyellow haired. Antennae yellow to redyellow. Thorax yellowgrey, yellow haired. Legs brownish, yellow haired. Abdomen orangeousyellow, yellow haired.

The H e a d. (Textfig. 225). Forehead 0,16—0,27 narrower anteriorly than it is at vertex, index 5,6—6,0. Callus, square, roundish, elongate or absent. Palpi, second joint swollen at base, tapering to a fine point, orangeous haired, intermixed with some black hairs. Antennae, first joint yellow haired, third joint redyellow, basal annulation 1,6 times as long as its widest part, 1,8 times as long as the dark redbrown stylus, tooth small triangular.



Textfig. 225.

T. griseifacies s.s. ♀. a—e. forehead, f. antenna, g. palpe.

Thorax yellowgrey, mainly denuded, some yellow hairs remaining. Pteropleuron yellowbrown. Breast grey. Wings clear, stigma yellowbrown. Under the four females observed the type had distinct appendices on both wings, 1 ♀ had no appendices whatever, the 3d had an appendix on the right wing, and the last a similar structure on the left wing only. Halteres yellow. Legs yellowbrown. First leg. Coxa yellowbrown, yellow haired, femur tibia and tarsalia similar, yellow haired, tibia with some black hairs on dorsum. Middle and hind legs identical, tibiae with a great number of black hairs on dorsum.

Abdomen denuded, orangeous yellow, yellow haired, intermixed with black hairs. Ventral surface identical, yellow haired.

207. *Tabanus longicornis* nov. spec. (♀) Pl. 18, Fig. 2, Textfig. 226.

Habitat:

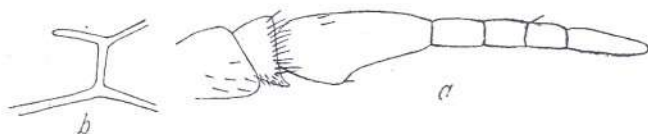
Type ♂ from Java, Rembang 1.10.'22 on 10 h.a.m. near the shore, DE WILDE
Coll. V.S.L.

A small yellow species. Eyes yellowbrown on the large-facettted area, lower portion black, the small facets not extending to the vertex. Subcallus goldenbrown, bearing at its upper border an oval redbrown rudimental callosity. Cheeks greywhite, yellowish haired. Beard pale yellowwhite. Palpi short honeyyellow, long yellow haired. Antennae yellowbrown, mainly yellow haired on basal joints, third joint brownyellow, very slender, tooth indistinct. Thorax pale dull havannabrown, yellow haired. Wings clear, veins brown, appendix long. Legs yellowbrown. Abdomen chromyellow, pale yellow haired.

Table of dimensions.

Bodylength	9,5 m.M. till the end of the 3d abdominal segment.
Width of thorax	4,5 „
Width of abdomen	5 „
Wingexpanse	24,1 „
Length of head	2,5 „
Length of thorax	4,5 „
Length of wing	9,8 „
Breadth of wing	4 „

The Head. (Textfig. 226). Palpi slightly redbrown on basal joint. Proboscis darkbrown,



Textfig. 226.

T. longicornis. s.s. ♀. a antenna, b. wingstructure

stalk yellowbrown haired, sugarflaps blackbrown haired. Antennae, first joint yellow haired, intermixed with some black hairs on dorsum, second joint black fringed, dorsal spine short, third joint brownyellow, basal annulation 2,2 times

as long as its widest part, 0,72 times as long as the narrow, long, dark redbrown stylus. Tooth indistinct, blunt. Postocular rim yellowbrown haired.

Thorax uniformly dull pale havanna^brown, with indications of longitudinal yellowbrown stripes, yellow haired on scutum and scutellum. Pteropleuron chromy^aellow, yellow haired. Hairtufts at base of wings and behind whitish. Hindborder of scutellum long yellow haired. Breast and sides blackish, pale coffeenutbrown tomentose, pale brown haired. Wings clear, stigma yellowbrown. Halteres, stalk redbrown, club yellowbrown. Legs. First leg. Coxa yellowbrown, pale yellowwhite haired, femur yellowish brown, yellowwhite haired, very long on distal lateral border, some black hairs intermixed at apex on dorsum, tibia redbrown, black haired, orangeous chromy^aellow on basal ring, tarsalia redbrown, black haired. Middle pair of legs wanting. Third leg. Coxa yellowbrown, grey tomentose, trochanter redbrown, femur orange, goldenyellow haired, tibia oranyeous^aredbrown, dorsum black haired, intermixed with some yellow hairs in the middle, ventral surface orange haired, first tarsale redbrown, black haired on dorsum, orange haired on venter. Other tarsalia identical.

Abdomen as far as present chromy^aellow, pale yellow haired as well on dorsum as on venter.

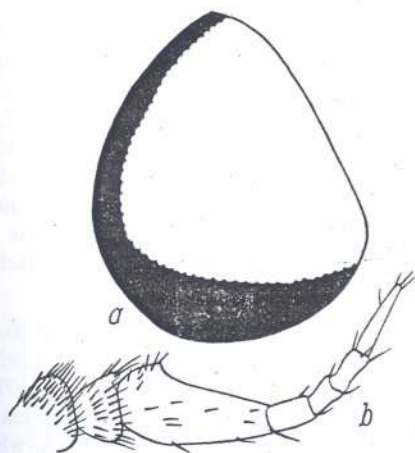
208. *Tabanus intempestivus* nov. spec. (♂), Textfig. 227.**Habitat:**

Type ♂ from S. N. Guinea Kloof Bivak 30.10.'12, VERSTEEGH Coll. N.A.M.

A brown species. Eyes dull yellowbrown on the large-facett^aed part, black-facett^aed part covering less than 1/3 of the eyesurface, prolonged to the vertex as a narrow border. Subcallus brownishyellowwhite. Upper cheeks faintly brownish. Lower cheeks sootygreywhite, brown haired. Beard yellowwhite, Palpi pale olivebrown, yellowbrown haired, some black hairs being

found at apex. Antennae dull olivebrown to redyellow, black tipped, black haired. Thorax leatherbrown, redbrown haired. Wings clear, appendix rudimental. Legs yellowbrown. Abdomen as thorax, darker to the apex, black haired. Body-length 12,5 m.m.

The Head. (Textfig. 227). Antennae dull olivebrown, black haired on basal 2 joints, third joint ochraceousyellow, with a distinct tooth, basal annulation 1,85 times as long as its widest part, 0,73 times as long as the black stylus.



Textfig. 227.

T. intempestivus. s.s. ♂. a. eye,
b. antenna.

Thorax as mentioned. Pteropleuron olivebrown, blackbrown haired. Sides and breast olivaceousyellowbrown, redyellow haired. Scutellum slightly brighter than the scutum. Wings with chineseyellow foreborder, pale havannabrown stigma, veins yellowbrown, hind border paler. Halteres, stalk yellowbrown, club olivebrown. Legs. First leg. Coxa olivaceousyellowbrown, yellow haired, trochanter leatherybrown, femur idem, dorsum blackbrown haired, distal lateral border yellow haired. Tibia olivebrown, black haired. Tarsalia reddishyellowbrown, black haired. Second leg, femur yellowbrown, yellow haired, rest identical. Third leg. Coxa yellowbrown, yellow haired, intermixed with some black hairs, trochanter idem, femur tawnyyellowbrown, yellow haired. Tibia and tarsalia olivebrown, black haired.

Abdomen as mentioned. Ventral surface as dorsum, black haired as also the lateral borders of the tergites.

This species probably also can be reckoned to Group XVI, confer the long and narrow stylus.

209. *Tabanus formosiensis* RICARDO (♀). Textfig. 228.

References:

- RICARDO, Rec. Ind. Mus. IV, p. 220 (1911).
SHIRAKI, Tabanidae of Formosa, p. 429 (1918).
RICARDO, Ann. Hist. Nat. Mus. Nat. Hung. XI, p. 172 (1913).

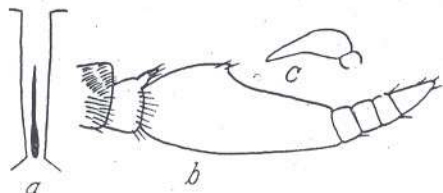
Habitat:

Type ♀ from Formosa
1 ♀ from Formosa
1 ♀ „ Takao 195/7

Coll. B.R.M.
Coll. KERTÉSZ
Coll. SHIRAKI

A small greyish species, with olivebrown abdomen and blackish thorax. Forehead narrow, yellowishbrown, black haired. Callus narrow, black, hardly broader than the linear extension, which ends in a fine point. Subcallus and

upper cheeks yellowishbrown tomentose, black haired, lower cheeks and face white, white haired. Beard white. Palpi pale yellowishbrown, white haired, black haired at apex. Antennae, first joint olivebrown, following joints reddishyellow, third joint with distinct tooth. Wings clear, veins yellowbrown, no appendix. Legs yellow. Abdomen olivebrown, yellowbrown tomentose, black haired, intermixed with yellow hairs. Length 11 m.M.



Textfig. 228.

T. formosiensis Ric. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 228). Forehead 0.43 narrower anteriorly than it is at vertex, index 10. Palpi, first joint white haired with some black hairs at apex, second joint swollen at base, white haired, terminating in a fine, black haired point. Antennae, first joint olivebrown, black haired on dorsum, third joint, basal annulation 2 times as long as its widest part. 1.66 times as long as the blackish stylus.

Thorax. Scutum blackish, grey tomentose on foreborder, short yellow hairs being scattered over the dorsum. Shoulders reddish, black haired. Sides and breast ashygrey, white haired. Scutellum same colour as scutum. Wings clear, stigma pale yellow. Legs yellow. First leg, femur violet-olivebrown, black haired, tibia yellowbrown, yellow haired at base, black-brown, black haired at apex. Tarsalia black. Second leg. Femur pinkish-olivebrown, white haired, some black hairs being visible on apex, tibia paler yellowwhite, olivebrown at apex, dorsum black haired, yellow haired below. First tarsal reddishbrown, black haired. Other tarsalia black. Third leg. Femur darker violet-olivebrown, white haired, tibia as in second leg.

Abdomen olivebrown, yellow brown tomentose, black haired, intermixed with yellow hairs. Ventral surface black, ashy grey tomentose.

210. *Tabanus madoerensis* nov. spec. (♀). Pl. 14, Fig. 5, Textfig. 229.

Habitat:

Type ♀ and another ♀ from Pasar Galis on horse 22.7.'22, SCHUURMANS
STEKHOVEN Coll. V.S.L.

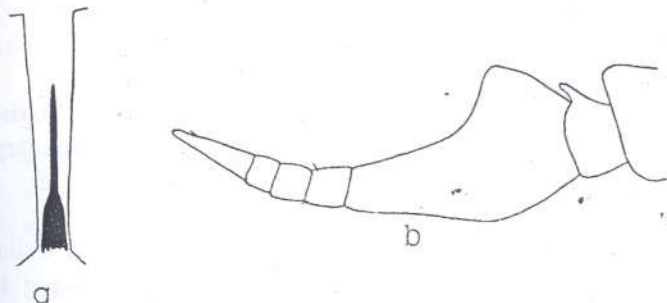
T. madoerensis has a conical ochraceousyellow, uniformly yellow haired abdomen. Forehead narrow, yellowwhite, yellowbrown haired, intermixed with some black hairs. Callus black, oval, pear-shaped, linear extension long. Subcallus, cheeks and face yellowbrown, yellowwhite haired. Beard yellowwhite. Palpi bright strawyellow, yellow haired, intermixed with a few black hairs. Antennae, ferrugineous, mainly yellow haired on basal joints, third joint reddishyellow at base, then darker, tooth blunt, distinct. Thorax denuded, blackish brown with yellowbrown longitudinal stripes, black haired on scutum, intermixed with some yellow hairs. Scutellum with redyellowbrown hindborder. Wings normal, with brownish shadows along the veins. Legs brown.

Table of dimensions.

	♀ 1	♀ 2
Bodylength	16,6 m.M.	15,5 m.M.
Width of thorax	5,8 „	5 „
Width of abdomen	5,8 „	5,8 „
Wingexpanse	35,4 „	33 „
Length of head	3 „	2,8 „
Length of thorax	6,4 „	6,2 „
Length of abdomen	9,2 „	8,8 „
Length of wing	14,8 „	14 „
Breadth of wing	5 „	4,2 „
Foreheadindex	7,25	7,14

The Head. (Textfig. 229.) Forehead $\frac{1}{3}$ narrower anteriorly, with a black stripe

at vertex. Postocular rim blackbrown haired. Callus almost reaching to the vertex, linear extension extending on two thirds of the frontal stripe. The lower part of the frontal stripe is yellow haired, vertex mainly blackbrown haired. Palpi, second joint stout at base, gradually tapering to a long blunt point, yellow haired, intermixed with a few black hairs at apex.



Textfig. 229.

T. madoerensis s.s. ♀. a. forehaed, b. antenna.

Proboscis black, brownyellow haired. Antennae, first joint yellowwhite haired on dorsum, intermixed with some black hairs at apex, distal lateral border long white yellow haired, second joint black fringed. Third joint slender, broad at base, reddishyellow till a little in front of the broad, blunt tooth, which is crowned with yellow hairs, then darker; basal annulation 1,66 times as long as its widest part, 1,25 times as long as the black stylus.

Thorax denuded, blackishbrown with yellowbrown to deep velvetybrown longitudinal stripes. Pteropleuron violetred, black haired. Tufts at base of wings and more behind half redbrown, half white. A white tomentose spot is visible just behind the pteropleuron. Breast and sides yellowishbrown, yellowwhite haired, darker brownyellow hairs occurring after the mesternumlobus, which is yellowish and bears a black hairtuft. Wings, stigma yellowbrown, foreborder yellowbrown. Halteres with yellowbrown-yellowwhite stalk, club darker brown. Legs. First leg. Coxa brown, whitishbrown haired, femur black, black haired, redbrown haired on the lateral borders, knee redbrown. Tibia yellowish redbrown, yellowredbrown haired on basal $\frac{3}{4}$, apex dark, deepredbrown, black haired, intermixed with some paler hairs on the proximal lateral border, tarsalia dark redbrown, black haired. Second leg. Coxa yellowishgrey, yellowbrown haired, trochanter dark mahoganybrown, yellow haired, femur black haired on dorsum, thick yellowredbrown haired on distal lateral border, ventral surface sootygrey tomentose in the median line, clothed with some hairs. Tibia reddish-strawyellowbrown, yellowredbrown haired, intermixed with some longer black

hairs, ventral surface same pubescence, spurs brownred. First tarsale yellowredbrown, black haired, other tarsalia black haired. Third leg, trochanter redbrown, femur yellowbrown, black haired in the middle, yellowredbrown haired on lateral borders, ventral surface yellow tomentose, scanty yellowbrown haired, tibia yellowredbrown, black haired, with a row of short yellow hairs along the distal lateral border, ventral surface reddishrustybrown, intermixed with some black hairs. Tarsalia ferrugineous, black haired.

A b d o m e n uniformly yellowbrown, conical, apex rounded, yellow and black haired. Ventral surface wholly brownyellow, with same colour of pubescence as on dorsum.

From *T. flaviventris* BIGOT to which it shows some resemblance, *T. madoerensis* is distinguishable by its larger size, darker legs, shape of forehead and callus, and the absence of an appendix.

From *T. uniformis* RIC. it is distinguishable by the segmentations of the abdomen, the colour of the beard, the pubescence of the palpi and of the forehead and the shape of the callus.

211. *Tabanus uniformis* RICARDO. (♀) Textfig. 230.

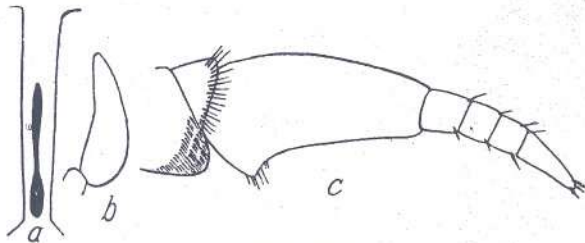
References:

RICARDO, Rec. Ind. Mus. IV, p. 218 (1911).

Habitat:

Type ♀ and a long series of females from the Federated Malay States, Darien
Typus, Negri Sembilan on a new road, running through the jungle country,
STANTON Coll. BR.M.

A redbrown species with reddishrustybrown, black haired forehead. Callus yellowbrown, cylindrical, linear extension narrow at the base, broadening to the apex. Subcallus and upper cheeks ferrugineous, black haired. Lower cheeks greywhite, white haired. Beard white. Face brownishgrey at sides, black haired, just under the antennae, yellow haired in the middle. Palpi stout, swollen, olive-brown, black haired. Antennae dark olivebrown to dark redbrown, black haired on basal joints, third joint reddish yellow, tooth indistinct. Thorax dark brown with 3 indistinct longitudinal stripes on scutum which is yellowwhite and black haired. Wings clear. Legs yellowbrown. Abdomen uniformly redbrown, reddishyellow haired. Length of type 16 m.M., other females 14—16 m.M.



Textfig. 230.

T. uniformis Ric. ♀ a. forehaed, b. palpi, c. antenna.

The H e a d. (Textfig. 230). Forehead 0.3 narrower anteriorly than it is at vertex, index 8. Callus not reaching to the eyes. Palpi first joint yellowish haired, black haired at apex, second joint swollen at base, ending with a blunt point, black haired. Antennae, first joint dark olivebrown, black haired, some red hairs being visible at apex, second

joint dark redbrown, third joint reddishyellow, basal annulation 1,7 times as long as its widest part, 1,2 times as long as the darker stylus. Tooth inconspicuous, black haired.

Thorax slightly reddish dark brown, with traces of 3 longitudinal stripes. Scutum yellowwhite haired, intermixed with a great number of black hairs in the middle on disc. Wings, foreborder and veins yellowbrown. Halteres reddishyellow. Legs with olivebrown femora, tibiae yellowbrown, redbrown tipped. Fore tibiae reddishyellow haired with a median row of black hairs and a black haired apical ring, middle tibiae black haired at apex only, hind tibiae black haired on dorsum, yellow haired below.

Abdomen uniformly redbrown, reddishyellow haired, ventral surface redbrown, black haired, segmentations reddishyellow haired till upon the 6th segment.

212. *Tabanus humillimus* WALKER (♀) Textfig. 231

References:

WALKER, Trans. Ent. Soc. London IV, p. 124 (1857).

Habitat:

Isle Celebes

Type ♀ from Celebes, A. R. WALLAOE

Coll. BR.M.

Another ♀ from Celebes, A. R. WALLACE

„

Isle Java

1 ♀ from Java

1 ♀ „ Nongkodjadjar 2.'11, JACOBSON

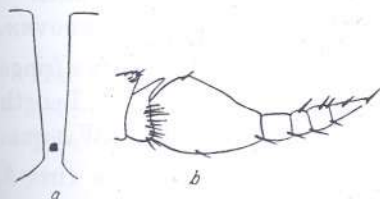
1 ♀ „ Java, JACOBSON

Coll. N.A.M.

2 ♀ ♀ „ Java Noesa Kambangan 3.'11, JACOBSON

„

A rather small brownish white species. Forehead reddish yellowbrown, black haired, intermixed with some yellow hairs. Callus small, square, black, without linear extension. Subcallus and upper cheeks yellowbrown, the latter with golden reddishyellow streaks, lower cheeks and face white, white haired. Palpi yellowbrown, swollen at base of second joint, acuminate, silverywhite haired, intermixed with some black hairs at apex. Antennae yellowbrown, yellow haired on first joint, third joint reddishyellow, broad. Thorax olivaceous-brown, grey tomentose on foreborder, white haired. Wings clear, veins yellowbrown, no appendix. Legs yellowbrown. Abdomen tawnybrown on dorsum, black and white haired, lateral borders of tergites white haired.

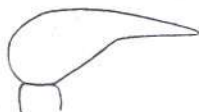


Textfig. 231. a, b.

T. humillimus Wlk. ♀. a. forehead,
b. antenna.

The Head. (Textfig. 231). Forehead, barely half as wide anteriorly than it is at vertex, index 8,2. Palpi ending with a long fine point. Antennae, first joint, mainly yellow haired, some black hairs at apex of dorsum and a couple of them at distal lateral border, intermixed between the white ones, second joint black fringed, dorsal spur distinct, third joint broad at base, basal annulation 1,4 times as long as its widest part, 0,96 times as long as the narrow stylus.

Thorax, scutellum same colour as scutum, white haired, intermixed with a few black hairs. Pteropleuron darker reddishbrown, black haired, with some white hairs at apex. Breast brownishgrey, white haired. Wings clear, foreborder pale brownish. Halteres reddishbrown.



Textfig. 231 c.
T. humillimus Wlk.
palpe.

Legs. First leg. Coxa brownishgrey, white haired, trochanter reddishbrown, femur grey-olivebrown, white haired, some black hairs on dorsum at apex. Tibia yellowbrownish at base, black brown at apex, black haired. Tarsalia blackbrown, black haired. Second leg. Coxa, trochanter, femur yellowbrown, white haired. Tibia olivebrownyellow, apex darker, dorsum black haired, intermixed with some white hairs, ventral surface white haired. First tarsale yellowbrown, white haired at base, rest yellowbrown, black haired. Third leg identical, tibia with thicker pubescence on dorsum.

Abdomen as mentioned. Ventral surface pale pinkishbrown, white haired, sixth segment with some black hairs. Seventh segment wholly black haired.

GROUP XIX.

The species belonging to this group are dark, black or blackbrown, with the abdomen unicolorous or at the utmost whitish tomentose on some segments, never showing *longitudinal* whitish *stripes*, or *series* of *spots* or *bands* diverging largely in colour from the surrounding pubescence, although the pubescence on the lateral borders of the tergites and on the ventral surface may be coloured differently. Wings strongly infuscated, black, brownblack or redbrown, this colour allways extending over the whole wing, although some of the cells may show paler centres. Veins blackbrown. Appendix present or absent, first posterior cell open, closed or narrower at opening. Legs in most species dark, black haired, in other species with paler tibiae.

KEY. 29.

Synopsis of species.

- 1a. Wings with first posterior cell very narrow at opening or only slightly narrowed 2
- b. All posterior cells widely open 3
- 2a. Wings with first posterior cell almost closed 2
- b. Wings with first posterior cell only slightly narrower at opening 5
3. Abdomen bluish white tomentose on basal 4 segments, thorax redblack, legs black, fore tibiae narrowly white at base Bodylength 27 m.M.
ingens SCHUURMANS STEKHOVEN.
- 4a. Abdomen white tomentose on first segment only, which presents a fringe of white hairs. Thorax dark redbrown. Legs wholly brownblack, Length 18 m.M.
tenebrosus WALKER.
- b. Wings redbrown. Abdomen with the lateral borders of the first 3 tergites hoary white haired and a tuft of white hairs at the segmentation of the 4th segment. Antennae with blunt indistinct tooth Length: 14 m.M.
noctuinus SCHUURMANS STEKHOVEN.

- 5a. Abdomen wholly or almost wholly black haired on ventral surface as well as on dorsum, without white or yellow haired lateral borders or segmentations 6
- b. Abdomen, dorsum black or blackbrown, black haired on the disc of the segments, white or yellow haired on lateral borders of tergites or (and) at the segmentations on the ventral surface 11
- c. Abdomen redbrown, mainly black haired, the pubescence if eventually differing, not contrasting very much with the surrounding hair-covering 16
- 6a. Thorax black, wholly black haired or almost so 8
- b. Colour of thorax or its pubescence contrasting with that of the abdomen 7
- 7a. Thorax yellow, reddishyellow haired. Abdomen conical. Antennae black. Body voluminous 26 m.M. *atriventer* SCHUURMANS STEKHOVEN.
- b. Thorax velvety-brown, black and yellowbrown haired, scutum showing 3 indistinct redbrown stripes. Abdomen velvety-brown to blackbrown, black haired, some white hairs being found on the middle of the first segment. Body medium-sized 15—18 m.M. *obscuratus* WALKER.
- 8a. Antennae wholly bright redbrown or with reddishyellow third joint 10
- b. Antennae wholly darkbrown to black 9
- 9a. Forehead narrow. Callus egg-shaped linear extension long. Palpi black-brown. Appendix usually present. *inobservatus* RICARDO.
- b. Palpi dark redbrown, black haired. No appendix. Forehead broad, Callus square, linear extension short
latifrons SCHUURMANS STEKHOVEN.
- 10a. Antennae wholly bright redbrown with prominent tooth. Palpi brown-black. Thorax black on dorsum, bluishgrey on breast. Coxae bluishgrey tomentose. Abdomen black, a brown spot occurring on the middle of the first segment. Foreheadindex 8 *ruficornis* SCHUURMANS STEKHOVEN.
- b. Third antennal joint reddishyellowbrown only. Palpi redbrown, acuminate. Thorax wholly blackbrown. Legs wholly blackbrown to black. Abdomen wholly black. Foreheadindex 7
angustipalpis SCHUURMANS STEKHOVEN.
- c. Foreheadindex 10. Palpi stout, blunt, redbrown. Scutum slateblue-black, mainly black haired, intermixed with some white hairs. Abdomen blackbrown, black haired *elegans* SCHUURMANS STEKHOVEN.
- 11a. Thorax yellow haired on scutum 12
- b. Thorax black haired on scutum 13
12. Thorax yellow haired on scutum and on breast, lateral borders of abdominal tergites yellow haired as also the segmentations on the ventral surface. Antennae reddishyellowbrown. Legs blackbrown with paler tibiae, partly black, partly yellow haired
ventriflavimarginatus SCHUURMANS STEKHOVEN.

13. Breast white haired 14
 b. Breast black haired 15
- 14a. Body bluishblack, abdomen greyblue tomentose on basal 2 segments, with similar segmentations to the following segments, no white hairs at the lateral borders of the tergites, ventral surface white haired on the first 5 segmentations, palpi bluishbrown, antennae black. Wings appendiculate or not *fumipennis* VAN DER WULP.
- b. Body dull black, abdomen with a small white median hairgroup on the first segment, some white hairs at segmentations and broadly white haired lateral borders to the first 4 tergites, palpi yellowbrown, antennae dull brown to black, wings not appendiculate *perakiensis* RICARDO.
- 15a. Breast bluishgrey tomentose, black haired. Abdomen grey tomentose on basal 2 segments, abdomen elsewhere brownblack, lateral borders of the first 3 tergites white haired, white hairfringes being found to the 2d till 4th segmentation on the ventral surface *caerulescens* MACQUART.
16. Abdomen conical, redbrown, black haired, except a square blotch of reddishyellow hairs on the first segment on dorsum, thorax dark brown, clothed with copper red pubescence. Cheeks black and redbrown haired *atrohirtus* RICARDO.

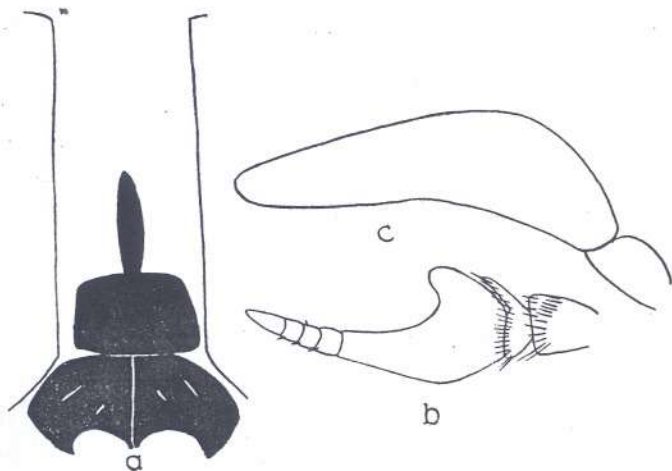
213. *Tabanus ingens* nov. spec. (♀) Textfig. 232

Habitat:

Type ♀ from Bindjei, Gvt. Sumatra's East Coast 1916, WITPEN Coll. N.A.M.

A big, black species with redblack thorax, bluishblack abdomen, white tomentose on first 4 segments and black haired body. All bodyparts black. Fore tibiae white at base. Halteres with whitish club. Wings brownblack, first posterior cell almost closed, appendix rudimental. Bodylength 27 m.M.; width of thorax 8 m.M.; length of wing 24 m.M.; wingexpanse 56 m.M.

The Head. (Textfig. 232). Head broad. Forehead broad, black, almost the same width throughout, black haired, index 2,3. Callus broad, reddishblack, with narrow linear extension. Subcallus prominent, shining black, bare, with a deep groove in the middle, postocular rim black haired. Cheeks and face black, black haired. Beard black. Palpi long, black, black haired, with a rather broad point. Antennae black, black haired, third joint dull black, basal annulation 1,35 times as long as its widest part, 1,5 times as long as the stylus. Tooth prominent.



Textfig. 232.

T. ingens s.s. ♀. a. forehead, b. antenna, c. palpi.

Thorax deep redblack, black haired. Breast black. Wings brownblack, first posterior cell almost closed at opening. Halteres as described. Legs. All legs black, black haired, except the fore tibiae, which are narrowly white at base.

Abdomen bluish-black, black haired, bluish white tomentose over the first 4 segments, ventral surface whitish.

214. *Tabanus tenebrosus* WALKER (♀) Textfig. 233.

References:

WALKER, List Dipt. V, Suppl. I, p. 242, 389 (1854).

RICARDO, Rec. Ind. Mus. IV, p. 203 (1911).

Habitat:

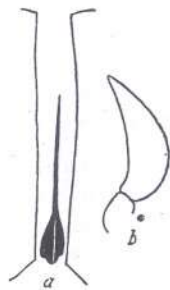
Type ♀ from Kanara, Malabar, S.-N. WARD.

Coll. BR.M.

A reddishbrown species. Forehead dark velvetybrown. Callus black, irregularly egg-shaped, with fine, filiform linear extension. Subcallus, cheeks and face velvetybrown, blackbrown to black haired. Beard same colour. Palpi falciform, reddishbrown, black haired. Antennae incomplete, redbrown on first 2 joints. Thorax dark redbrown, with 3 longitudinal stripes, breast black haired. Wings brown, first posterior cell slightly narrower at border. Legs brownblack, black haired. Abdomen brownblack, redbrown, black haired on ventral surface. Length 18 m.M.

The Head. (Textfig. 233). Forehead dark velvetybrown (black by wetting?) slightly narrower anteriorly, index 8. Callus as mentioned, not reaching to the eyes. Face and cheeks as described. Palpi reddishbrown, falciform, ending with a slender acute point, both joints thick black haired. Antennae redbrown, black haired on basal 2 joints, second joint with short dorsal spur.

Thorax in bad condition, wholly denuded, dark redbrown, with 3 brown longitudinal stripes, remainder of pubescence reddish-blackbrown. Breast almost wholly devastated by parasites, bluishblack, black haired. Wings tinged brown, submarginal cell slightly paler, first posterior cell narrower at opening. No appendix. Halteres, stalk and club redbrown. Legs incomplete, both forelegs missing. Second leg. Coxa, trochanter and femur brownblack, thick black haired, tibia redbrown, black haired, tarsalia similar. Third leg identical.



Textfig. 233.

T. tenebrosus Wlk ♀ a. forehead, b. palpi.

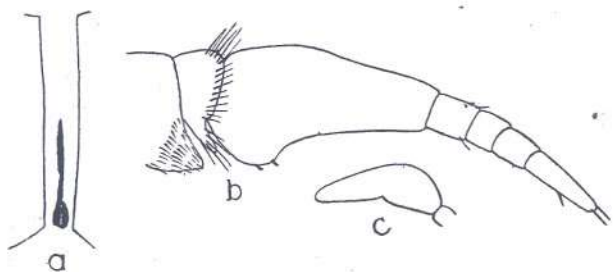
Abdomen in bad condition, rather narrow, ending broad, brownblack, first segment with bluish shadow, due to white tomentum, white haired at hindborder. Ventral surface redbrown, black haired.

215. *Tabanus noctuinus* nov. spec. (♀) Textfig. 234.

Habitat:

Type ♀ and another female from S. India, Madras Presidency, near Kodakanal,
PATTON '20 Coll. BR.M.

A redbrown-winged species. Forehead broader than in the foregoing species of the same group, almost the same width throughout, reddishbrown. Callus club-shaped, brownblack. Subcallus and cheeks deep redbrown, black haired. Face greyishbrown, black haired. Beard blackbrown. Palpi darkbrown, antennae blackbrown, both black haired. Thorax black. Legs blackbrown. Abdomen same colour. Length 14—14,5 m.M.



Textfig. 234.

T. noctuinus s.s. ♀. a. forehead, b. antenna, c. palpe.

ring a blunt dorsal hump, third joint blackbrown at base, then black, basal annulation with indistinct tooth, 1,6 times as long as its widest part, 1,1 times as long as the black stylus. Pubescence black.

Thorax bluishblack on foreborder, elsewhere deep brownblack, black haired. Breast same colour. Wings deep redbrown, apex clearer, submarginal cell, 4th and 5th posterior cells, upper basal cell and hindborder of ala near the alula, clearer. First posterior cell slightly narrower at opening. No appendix. Halteres deep redbrown. Legs blackbrown, black haired, knees paler, yellowbrown.

Abdomen black, denuded in the middle on the first 3 segments of the type, black haired, lateral borders of the same tergites covered with a hoary cloth of white hairs, fourth segment showing some white hairs at segmentation. Remainder of dorsum black haired. Ventral surface blackbrown, black haired, first 4 segmentations white fringed.

The second female, with her better preserved abdomen, possesses white hairfringes to the first 3 segmentations on dorsum. Lateral borders of first 4 tergites white haired. Rest identical.

The Head. (Textfig. 234). Forehead reddishbrown, grey at base, 0,2 narrower anteriorly than it is wide at vertex, index 8. Callus club-shaped, brownblack, the black linear extension not reaching to the vertex. Subcallus, cheeks, etc. as mentioned. Palpi darkbrown, curved, ending with a blunt tooth, black haired, Antennae, first joint black. protruding caplike over the second joint, the latter bearing

216. *Tabanus atriventer* nov. spec. (♂) Textfig. 235.

Habitat:

♂ Type from N. Borneo, Mt. Kinabalu, 2800 Feet, 22.9.'13 Coll. BR.M.

A very peculiar species with yellowbrown, reddishyellow haired thorax, black abdomen, smokybrown wings with clearer centres in most cells. Subcallus cheeks and face blackbrown, black haired. Beard black. Palpi blackbrown, antennae black, both black haired. Legs black haired. Bodylength 26 m.M., Wingexpanse 25 m.M.



Textfig. 235.

T. atriventer s.s. ♂ eye.

The Head. (Textfig. 235). Eyes, lower $\frac{2}{3}$ black, small-faceted, this area prolonged to the vertex. Subcallus, etc as described. Antennae incomplete, third joint broken off, basal 2 joints black, black haired.

Thorax yellow, reddishyellow haired. Breast black, black haired. Wings without appendices, fore border dark blackbrown, all posterior cells widely open. Halteres blackbrown. Legs black, black haired.

Abdomen conical, black, black haired.

217. *Tabanus obscuratus* WALKER (♀) Pl. 16, Fig. 3; Textfig. 236.

References:

RICARDO, Nova Guinea IX (1912).

WALKER, Proc. Linn. Soc. London 8, p. 232 (1864).

RICARDO, Bijdragen tot de Dierkunde Afl. 19 (1913).

Habitat:

Type ♀ from Isle Ceram, A. R. WALLACE (Textfig. 236 b, c, d)

Coll. BR.M.

3 ♀ ♀ from Isle Ceram, A. R. WALLACE

1 ♀ „ Isle Ceram, Mrs. DE BEAUFORT '10

4 ♀ ♀ „ Isle Ceram 19.2.'10, DE BEAUFORT

Coll. N.A.M.

1 ♀ „ W. Ceram 4/6.'10, VAN DEDEM

„

1 ♀ „ Ceram, DE BEAUFORT 1910

Coll. L.M.N.H.

Nova Guinea

5 ♀ ♀ from N.N. Guinea Pioniersbivak 6/7.'20, VAN HEURN (Textfig. 236 a)

Coll. B.Z.M.

1 ♀ „ N.N. Guinea Pioniersbivak 7/8.'20, VAN HEURN

„

3 ♀ ♀ „ N.N. Guinea Pionierbivak 8.'20, VAN HEURN Coll. N.A.M.

1 ♀ „ N.N. Guinea Prauwenbivak 9.'20, VAN HEURN

„

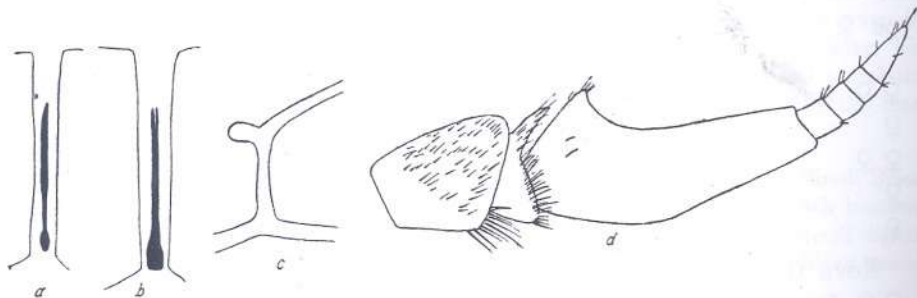
Tabanus obscuratus Wlk is a rather dark median-sized species. Forehead

narrow, dull velvetybrown, black haired. Callus cylindrical, dark redbrown, linear extension forked at apex. Subcallus velvetybrown, upper cheeks and face yellow- to redbrown haired. Lower cheeks brownish grey. Beard brownblack. Palpi pale yellowbrown on inner side, outer border thick black haired. Antennae yellowbrown, darker at apex, tooth distinct. Thorax velvetybrown, black and yellowbrown haired, showing 3 indistinct deep redbrown, longitudinal stripes. Wings brownish, appendix present or absent. Legs brownish, black haired. Abdomen velvetybrown to blackbrown, mainly black haired, some white hairs being found on the middle of the first segment.

Table of dimensions.

Bodylength	varying from 15,8 m.M. to 17,8 m.M.			
Width of thorax	„	„	5,2	„ — 6,2 „
Width of abdomen	„	„	5,6	„ — 5,5 „
Wingexpanse	„	„	31,2	„ — 35,2 „
Length of head	„	„	2,2	„ — 3 „
Length of thorax	„	„	6,5	„ — 7 „
Length of abdomen	„	„	8,2	„ — 10,2 „
Length of wing	„	„	13	„ — 14,8 „
Breadth of wing	„	„	5,2	„ — 5,5 „
Foreheadindex	„	„	6,4	„ — 8

The Head. (Textfig. 265). Forehead dull velvetybrown, almost the same width throughout, 0,1 tot 0,2 narrower anteriorly than it is at vertex. Callus not reaching the eyes, dark redbrown. Subcallus, etc. as described. Face greyishyellowbrown, yellowbrown haired on the middle portion, lateral borders and a space below the antennae redbrown



Textfig. 236.

T. obscuratus WLK. ♀. a. b, forehead, c. wingstructure, d. antenna.

haired, blackbrown haired to the mouth. Palpi pale yellowbrown on inner border, whitish tomentose on outer border, thick black haired, first joint brownblack haired, second joint stout, rather long, tapering to a long point. Antennae, first joint comparatively long, pale yellowbrown, whitish tomentose, thick black haired, second joint redyellowbrown, black fringed, dorsal hump acute; third joint yellowbrown at base till the tooth, then

darker, blackbrown, basal annulation slender, curved, 2.1 times as long as its widest part, 1.91 times as long as the dark havannabrown stylus. Proboscis blackishredbrown, black haired. Postocular rim brownblack haired.

T h o r a x dark velvetybrown, black haired, intermixed with some paler yellowbrown pubescence, presenting 3 indistinct longitudinal redbrown stripes, of which the middle one is the narrowest. Scutum paler on foreborder. Scutellum same colour as scutum. Lateral borders of scutum, especially at the level of the suture white and yellowbrown haired. Tufts at base of wings and behind white, hindborder of scutellum fringed with yellowbrown hairs. Pteropleuron black haired. Sides clothed with long whitish pubescence. Breast velvetybrown, brownblack haired, mesosternumlobus redbrown haired. Wings tinged brownish, clearer centres in some of the cells, posterior border paler. Foreborder reddishbrown, stigma havannabrown. In 2 out of 6 females a rudimental appendix was present on one of the wings only. Halteres redbrown. Legs blackish. First leg. Coxa bluishgrey tomentose, brownblack haired, trochanter bluishgreybrown tomentose, apex black, brownblack haired, femur dark blackredbrown on ventral surface, dorsum black, black haired, knee narrowly yellowbrown. Tibia dull redbrown on basal half, then black, wholly black haired. Tarsalia black. Second leg identical, femur shining black on ventral surface, dorsum darkredbrown, black haired, knee yellowbrown, tibia yellowbrown at extreme base, then redbrown, apex black, black haired. Tarsalia brownish, black haired. Third leg. Femur velvetybrown on ventral surface, elsewhere black, black haired, knee yellowbrown. Tibia yellowbrown at base, then dark redbrown, thick black haired. Tarsalia blackbrown, black haired.

A b d o m e n dark velvetybrown on first 2 segments, rest blackbrown, black haired, except at the mentioned spot on the first segment. Apex rounded. Lateral borders of tergites black haired. Ventral surface blackbrown, black haired. The Ceram females in the N.A.M. collection deviate from the type in that the wings are dark yellowbrown at base, duller brown, more fuscous to the apex. In these instances one must always be mindful of changing of colour or fading during the stay in the collections.

218. *Tabanus inobservatus* RICARDO (♀) Pl. 15, Fig. 6, Textfig. 237.

References:

RICARDO, Rec. Ind. Mus. IV, p. 205 (1911).

Habitat:

Type ♀ and another female from Kajoe Tanan, Sumatra, HAGEN (Textfig. 237 b)
Coll. BR.M.

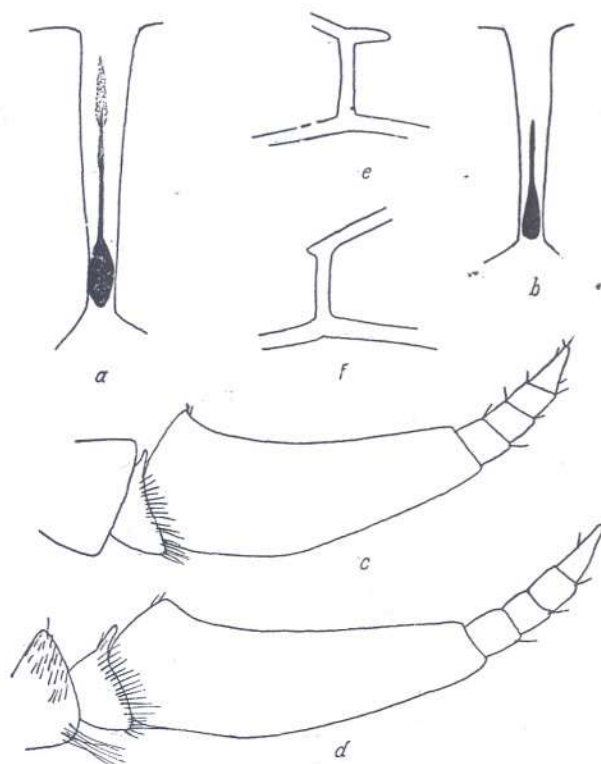
2 ♀ ♀ from Si Boeni-boeni, Siboloean, Sibolga, Tapanoeli on cattle 28.6.'23,
LOBEL (Textfig. 237 a, d, e) Coll. V.S.L.

1 ♀ from Si Boehoean, Djandi Lobi, Binanga, Tapanoeli on horse 4.6.'23,
LOBEL (Textfig. 237 c, f) Coll. V.S.L.

T. inobservatus Ric. is a dull chocolatebrown species with conical abdomen. Wings blackbrown with appendix, and clearer centres in most of the cells. Forehead brownblack, narrow. Callus black, egg-shaped, almost reaching the eyes. Subcallus, face and cheeks dark havannabrown to blackbrown, black haired. Beard black. Palpi blackbrown, black haired. Antennae similar, slender, tooth inconspicuous. Legs blackbrown to black, black haired.

Table of dimensions.

Bodylength	varying from 16,5 m.M. to 19,2 m.M.				
Width of thorax	"	"	5,2	"	— 6,5
Width of abdomen	"	"	5,2	"	— 6,5
Wingexpanse	"	"	34,2	"	— 34,5
Length of head	"	"	3	"	— 3,5
Length of thorax	"	"	6	"	— 6,5
Length of abdomen	"	"	9	"	— 10,6
Length of wing	"	"	14,5	"	— 14,5
Breadth of wing	"	"	5,2	"	— 5,6
Foreheadindex	"	"	8,66		— 11,66



Textfig. 237.

T. inobservatus RIC, ♀. a, b, forehead, c, d, antenna, e, f, wingstructure.

The Head. (Textfig. 237). Forehead narrow, from 0,23—0,4 narrower anteriorly than is at vertex, brown-black. Callus broad egg-shaped, black or dark brown, almost reaching the eyes, prolonged into a fine linear extension, reaching till half-way the frontal stripe. Subcallus darkhavannabrown, black haired. Cheeks, etc. as described. Palpi grey tomentose on base of first joint, the latter therefore appearing bluish, black haired, second joint blackbrown, black haired. Antennae darkbrown on first 2 joints, black haired, second joint with small dorsal spur, third joint black, basal annulation 2,3—2,8 times as long as its widest part, 2,06—2,3 times as long as the stylus. Proboscis black. Postocular rim black, black haired.

Thorax dull chocolatebrown tomentose, with traces of 3 indistinct, black, longitudinal stripes. Scutum rather denuded on places,

black haired, tufts at base of wings blackbrown. Sides and breast chocolatebrown, black haired all over. Wings blackbrown, foreborder chocolatebrown, apex and hindborder slightly paler. Appendix present in 2 females on both wings. In another female it is present on the right wing as a rudiment. In one of the Kajoe Tanan females it is wholly

absent. First posterior cell open. Antesquama sooty black, squama brown. Legs dark. First leg. Coxa dark havannabrown, trochanter and femur blackbrown, the latter with a narrow yellowbrown knee, tibia brownish at extreme base, then black, tarsalia black, all joints black haired. Second leg identical, tibia black. Hind legs, tibiae blackbrown, all legs black haired.

A b d o m e n blackbrown, rather long, conical, black haired on dorsum and on ventral surface.

219. *Tabanus latifrons* nov. spec. (♀, ♂). Textfig. 238.

Habitat:

Type ♀ and ♂ from Nilgiris India 4.4.'88, THOMPSON Coll. BR.M.

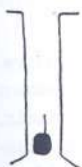
A brownish species.

The Male.

The Head. Eyes with a large area of big, brown facets, smallfacetted region narrow, reaching to the vertex as a narrow border. Subcallus dark redbrown. Face and cheeks black brown, black haired. Beard black. Palpi darkbrown, black haired. Antennae incomplete, blackbrown.

Thorax blackbrown, black haired. Wings tinged dark brown with a paler spot in the upper basal cell, near the alula and in the submarginal cell. Halteres, stalk dark brown, club dark yellowbrown. Legs dark blackbrown, black haired, tibiae slightly paler.

A b d o m e n blackbrown, black haired. Bodylength 13 m.M.



Textfig.
238.

The Female.

The Head. (Textfig. 238). Forehead rather broad, almost the same width throughout, index 4. Callus square, not reaching to the eyes, linear extension short, faintly indicated. Palpi redbrown, ending in a fine point, black haired.

s.s. ♀. Thorax and abdomen as in the ♂ sex. Wings similar, with clearer forehead centres in most cells. Bodylength 13 m.M.

220. *T. ruficornis* nov. spec. (♀) Textfig. 239.

References:

WALKER, List Dipt. V, Suppl. I, p. 242, 389 (1854).
RICARDO, Rec. Ind. Mus. IV, p. 203 (1911).

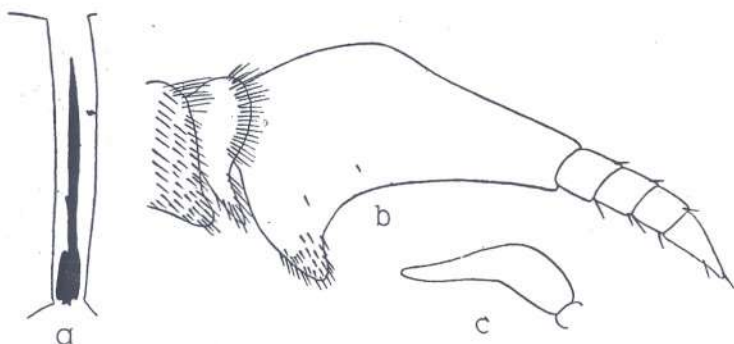
Habitat:

Type ♀ collected by DAMMERMAN, without locality (Java?) Coll. N.A.M.

A blackish species closely allied to *T. tenebrosus* Wlk. Forehead pale brownish. Callus blackbrown, cylindrical, with long linear extension. Subcallus and cheeks ferrugineous, redbrown haired. Face brownish, black haired. Beard black. Palpi brownblack, antennae bright redbrown, with prominent tooth,

both black haired. Thorax brownblack. Wings reddishbrown. Legs black. Abdomen black. Length 17,5 m.M.; wingexpanse 37,1 m.M.; width of thorax 5,5 m.M.

The H e a d. (Textfig. 239). Forehead narrow, slightly narrower anteriorly only, covered,



Textfig. 239.

T. ruficornis s.s. ♀. a. forehead, b. antenna, c. palpi.

with a pale brownish down, vertex blackish, index 8,5. Callus blackbrown, reddish at base, cylindrical, with long linear extension. Subcallus, etc. as described. Palpi brownblack, black haired, second joint bluish tomentose, rather broad at base, ending with a long, fine point. Antennae bright

reddbrown, black haired, third joint with a prominent tooth, basal annulation 1,34 times as long as its broadest part, 1,6 as long as the blackbrown stylus.

T h o r a x denuded, brownblack, black haired, with no traces of longitudinal stripes. Pteropleuron reddish, black haired. Breast greyishblue, black haired. Wings reddishbrown with redbrown foreborder, dark redbrown stigma and paler posterior border. No appendix. Halteres redbrown. Legs. First leg. Coxa bluishgrey tomentose, black haired. Femur blue-black, knee yellowish, black haired all over. Tibia reddish at base, then blueblack, black haired. Tarsalia black. Middle and hind legs similar, tibiae more reddish.

A b d o m e n black, brownish on 3d and following segments, black haired all over. In the middle of the first segment one finds a brown spot. Ventral surface black, black-haired, with dull brown segmentations.

T. ruficornis is closely allied to *T. tenebrosus* Wlk., which name was written on the label attached to it, in the handwriting of Miss RICARDO. It may be distinguished inter alia by the colour of the forehead, which is also narrower than in the latter species, the shape of the palpi, the pubescence on the first abdominal segment and by the colouring of the ventral surface of the last bodypart.

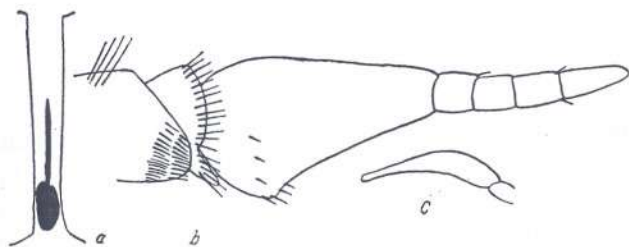
221. *Tabanus angustipalpis* nov. spec. (♀) Textfig. 240.

Habitat:

Type ♀ without locality, named *T. tenebrosus* Wlk. by RICARDO Coll. BR.M.

This species is distinguished at once from *T. tenebrosus* Wlk. by the shape of palpi, the club-shaped callus, the blackish thorax, the clearer wings and the blackishreddbrown abdomen, bearing no white hairs. From *T. ruficornis* SCHUUR-

MANS STEKHOVEN it may be divided i.a. by the shape of the antennae. Same size as *T. tenebrosus* Wlk.



Textfig. 240.

T. angustipalpis s.s. ♀. a. forehead, b. antenna, c. palpi.

Antennae dull brown on first 2 joints, black haired, third joint reddishyellowbrown, basal annulation broad, 1,6 times as long as its widest part, 1,2 times as long as the blackbrown stylus, tooth not prominent, crowned with black hairs.

Thorax blackbrown, black haired. Wings clearer than in *T. tenebrosus* Wlk., with clearer centres in several cells. Halteres reddbrown. Legs. First leg. Coxa, trochanter and femur blackbrown, black haired, tibia reddishbrown on basal half, apex blackbrown, black-haired all over. Tarsalia black. Middle and hind legs identical, tibiae dark reddishbrown, black haired.

Abdomen dark blackish reddbrown, elongate, ending rather broad, black haired all over. Ventral surface same colour, black-haired, no white tomentum, nor white pubescence.

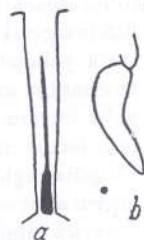
222. *Tabanus elegans* nov. spec. (♀) Textfig. 241.

Habitat:

Type ♀ from Borneo, W. Serawak 2/3.'14, BRYANT

Coll. BR.M.

A darkbrown-winged species of medium size, length 13 m.M. Forehead narrow, blackish blue. Callus cylindrical, black, linear extension slender. Subcallus, face and cheeks reddbrown, black haired. Beard black. Palpi dark reddbrown, blunt at apex, black haired. Antennae reddbrown on basal joints, black haired, 3d joint broken off. Thorax brownish slateblue, denuded, remainder of pubescence black, intermixed with some white hairs. Legs incomplete, all tibiae missing, blackbrown, black haired. Abdomen blackbrown, black haired.



Textfig. 241.

T. elegans s.s. ♀

The Head. (Textfig. 241). Forehead 0,44 narrower anteriorly than it is at vertex, index 10,6. Callus not reaching to the eyes.

Thorax as mentioned, breast blackbrown, black haired. Wings darkbrown, all posterior cells widely open, no appendix. Halteres blackbrown. Legs with femora blackbrown, paler at apex, black haired.

a. forehead,
b. antenna.

223. *Tabanus ventriflavimarginatus* nov. spec. (♀) Textfig. 242.

Habitat:

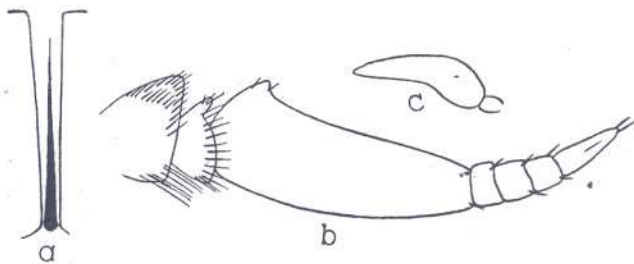
Type ♀ from Borneo, Boengan River, Dr. NIEUWENHUYNS 7.'94

Coll. L.M.N.H.

1 ♀ from Sumatra, without locality

,,

A comparatively small, dull blackbrown species with infuscated wings. Forehead sootygrey, black haired. Subcallus, cheeks and face dark havannabrown, blackbrown haired. Beard same colour. Palpi dull havannabrown, black haired. Antennae reddishyellowbrown, stylus blackbrown. Thorax sootybrown, yellow haired. Legs blackbrown, with paler tibiae. Abdomen dark havannabrown, black haired, distal lateral borders of tergites yellow haired, segmentations on ventral surface yellow fringed. Length 13 m.M.; Width of thorax 4 m.M.; Length of wing 11,5 m.M.; Wingexpanse 26 m.M..



Textfig. 242.

T. ventriflavimarginatus s.s. ♀. a. forehead,
b. antenna, c. palpi.

The Head. (Textfig. 242). Forehead narrow, sootygrey, black haired. Linear extension black, reaching to the vertex and gradually broadened at its lower end to an indistinct cylindrical callus, nearly reaching the eyes. Subcallus, etc. as described. Palpi dull havannabrown, black haired, second joint swollen at base, suddenly attenuated in the middle and ending in a fine point. An-

tennae, first 2 joints reddishyellowbrown, black haired, third joint same colour, slender, basal annulation 2,25 times as long as its widest part, 1,6 times as long as the blackbrown stylus.

Thorax sootybrown, yellow haired on the few spots, which are not rubbed. Pteropleuron black haired. Sides and breast sootybrown to redbrown, yellow haired, mesosternum-lobus black haired. Wings strongly infuscated, apical shadow reddish havannabrown. Submarginal cell and hindborder slightly paler. Stigma dark havannabrown. Halteres, stalk yellowbrown, club blackbrown. Legs. First leg. Coxa havannabrown, black haired, trochanter and femur blackbrown, black haired, tibia blackbrown, black haired at apex, paler havannabrown to yellowbrown on basal half, black and reddishyellow haired. Second leg, femur more reddish havannabrown, black haired, tibia yellowbrown, black haired. Tarsalia slightly darker, black haired. Third leg, femur bluishhavannabrown at base, yellowbrown at apex, black haired. Tibia olivebrown, black haired on dorsum, yellow haired below. Tarsalia similar.

Abdomen dark havannabrown, mainly rubbed, black haired, lateral borders of tergites yellow haired. Ventral surface identical, segmentations slightly paler, yellow haired.

Tabanus fumipennis VAN DER WULP (♀) Pl. 15, Fig. 5; Textfig. 243.

References:

VAN DER WULP, Sumatra Exped. Dipt., p. 18,6 pl. I (1881).

RICARDO, Rec. Ind. Mus. IV, p. 225 (1911).

Habitat:

Isle Sumatra

Type ♀ from Alahan Pandjang 10.'77

Coll. L.M.N.H.

2 ♀ ♀ from Siboehoean, Djandi Lobi, Binanga, Tapanoeli, LOBEL

Coll. V.S.L.

respectively 1 ♀ on buffalo 4.6.'23 (Textfig. 243 f, g)

1 ♀ „ horse 4.6.'23 (Textfig. 243 c)

2 ♀ ♀ from Si Boeni boeni, Siboeoean, Sibolga, Tapanoeli, on cattle 25.6.'23,

LOBEL (Textfig. 243 b, d)

Coll. V.S.L.

1 ♀ from Kota Nopan, K. Siantar, 3.'23, LOBEL (Textfig. 243 a, e).

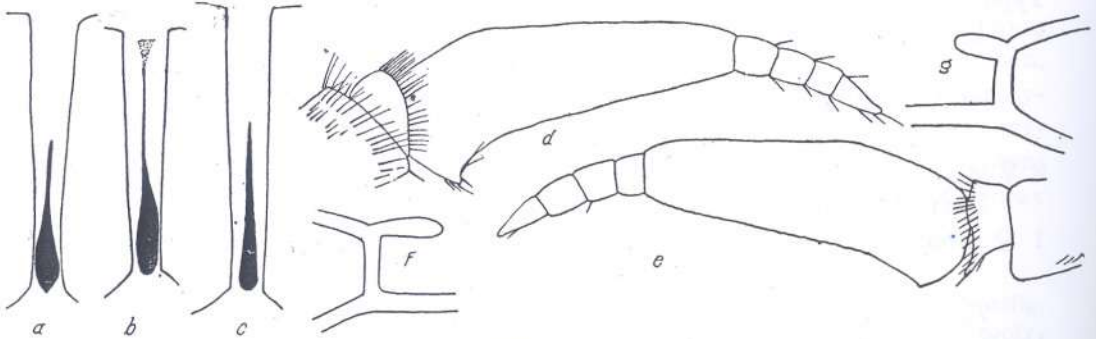
T. fumipennis VAN DER WULP is a bluishblack species, with dark brown-black wings, most cells showing clearer centres, appendix present or wanting. Forehead rather narrow, dark brown. Callus brownblack, almost reaching the eyes, with a long linear extension. Subcallus and upper cheeks dull brown, lower cheeks blackish sooty-grey, black haired. Beard black and white. Face browngrey, black haired. Palpi bluishbrown, black haired. Antennae black, tooth inconspicuous. Thorax bluishblack, black haired, breast white haired. Legs blackish. Abdomen greyblue tomentose on basal 2 segments, following segments darker, segmentations bluegrey tomentose, pubescence black. Ventral surface white haired on first 5 segmentations, elsewhere black haired.

Table of dimensions.

Bodylength	varying from 16 m.M. to 18,2 m.M.			
Width of thorax	„	„	5	„ — 6,5 „
Width of abdomen	„	„	5	„ — 6,5 „
Wingexpanse	„	„	31	„ — 35,5 „
Length of head	„	„	2,8	„ — 3 „
Length of thorax	„	„	5,8	„ — 7,2 „
Length of abdomen	„	„	9,8	„ — 10 „
Length of wing	„	„	13	„ — 15 „
Breadth of wing	„	„	5,2	„ — 6,5 „
Foreheadindex	„	„	7,75	— 9

The Head. (Textfig. 243). Forehead 0,2 to $\frac{1}{3}$ narrower anteriorly than it is at vertex, dark brown, whitish round the callus. Latter brownblack, almost reaching to the eyes,

upper part flattened, prolonged into a linear extension, which almost reaches the vertex. Subcallus, etc. as mentioned. Face brown-grey, covered with white tomentum, black haired. Palpi reddishbrown, first joint clothed with long loose white pubescence, intermixed with some black hairs at apex. Second joint same colour, white tomentose on outer border, black haired. Antennae, first joint cylindrical, darkvelvetybrown to redbrown, grey tomentose, therefore appearing bluishgrey, black haired; second joint darkbrown, bluishgrey tomentose, with a distinct short dorsal hump, black fringed; third joint blackishbrown at base, then black, basal annulation 2.83 times as long as its widest part, 2 times as long as the stylus, tooth rather indistinct. Proboscis black, black and brown haired.



Textfig. 243.

T. fumipennis WULP. ♀. a—c. forehead, d, e. antennae, f, g. wingstructures.

Thorax denuded on some spots, bluishblack, appearing brown at hindborder of scutum by the cocoapowder-coloured tomentum. Shoulders black, black haired. Pteropleuron with a violetred hue, black haired also. Lateral borders of scutum whitish. Tufts at base of wings white. Sides and breast greyblue to slateblue, white haired, mesosternum-lobus black haired. Wings very dark, havannabrown, paler on extreme apex and along the hindborder, centres of most cells paler. Out of 5 specimens, 2 had appendices on both wings, 1 presented a rudimental appendix on the right wing only, the remainder lacked the recurrent veinlet. Halteres, stalk black, club brownblack. Legs. First leg. Coxa bluegrey, apex brown, grey haired, trochanter havannabrown, femur piceous, greyblue tomentose on dorsum, knee yellowbrown, pubescence black, distal lateral border black haired, intermixed with some white ones; tibia reddishbrown, white tomentose at extreme base, the redbrown colour gradually passing into a dirty white, extending till half way the joint, then becoming brownblack, black haired; on the basal half some white hairs are intermixed, distal lateral border black haired, intermixed with some white hairs. Tarsalia black. Second leg. Coxa slateblue, trochanter black, femur bluishblack, white and black haired, distal lateral border as in first leg, knee brown. Tibia dark shining brownish, whitish tomentose on basal half, then black, black haired all over. Tarsalia black. Third leg identical, tibia brownish at base.

Abdomen conform the description, somewhat denuded. Ventral surface shining black, with paler silvery-white fringed segmentations to the first 5 segments, elsewhere black haired.

225. *Tabanus perakiensis* RICARDO (♀) Pl. 16, Fig. 1; Textfig. 244.

References:

RICARDO, Rec. Ind. Mus. IV, p. 204 (1911).

SHIRAKI, Tabanidae of Formosa, p. 425 (1918).

Habitat:

Federated Malay States

Type ♀ from Kuala Lumpur, F.M.S., STANTON 1909 (Textfig. 244 d, f, g)

Coll. BR.M.

1 ♀ from Perak, PRATT

London School Trop. Med. Coll.

Isle Sumatra

1 ♀ from Serapai Kur 7.'15, JACOBSON

Coll. N.A.M.

3 ♀ ♀ „ Siboeni, boeni, Siboeleean, Sibolga, Tapanoei, BAKKER

Coll. V.S.L.

respectively 1 ♀ on horse 6.9.'23

1 ♀ „ „ 7.9.'23

1 ♀ „ cattle 11.11.'23

1 ♀ from Siboeleean, Djandi Lobi, Binanga, Tapanoei on buffalo 4.6.'23,
LOBEL (Textfig. 244 b) Coll. V.S.L.

7 ♀ ♀ from Moeara Tagor, Tamiang, Kota Nopan, LOBEL and BAKKER

respectively 5 ♀ ♀ on horse 20.4.'23 (Textfig. 244 c, a, e)

1 ♀ „ „ 30.9.'23

1 ♀ „ cattle 27.4.'23

1 ♀ from Kota Siantar, Kota Nopan on horse 29.4.'23, LOBEL

4 ♀ ♀ „ Kota Nopan, Kota Nopan, Tapanoei on horse 27.4.'23; LOBEL
Isle Formosa

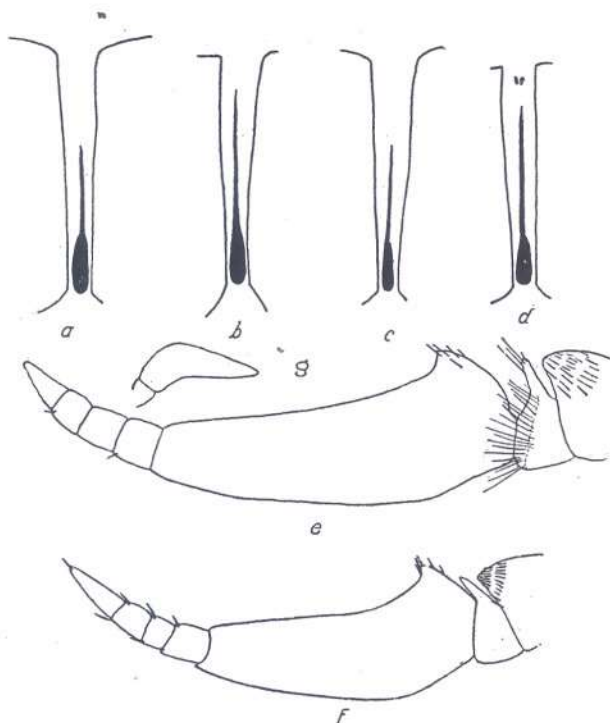
1 ♀ from Kosempo July. Further recorded from Fuhosho (July)

Coll. SHIRAKI

Tabanus perakiensis RIC. is a dull black species. Forehead dull havanna-brown. Callus black, narrow, prolonged into a fine linear extension. Subcallus dull goldenbrown. Upper cheeks brown, lower cheeks grey, black haired. Face greybrown, black haired. Beard black and white. Palpi yellowbrown, black haired. Antennae dull brown, stylus black. Thorax and abdomen havannabrown to blackbrown, latter darker at apex, white haired on the lateral borders of first 4 tergites, elsewhere mainly black haired. Breast white haired. Wings fumigated, presenting 3 clear spots. Appendix absent.

Table of dimensions.

Bodylength	varying from 14,8 m.M. to 17 m.M.				
Width of thorax	„	„	4,5	„	— 6 „
Width of abdomen	„	„	4,5	„	— 6 „
Wingexpanse	„	„	29,5	„	— 33,5 „
Length of head	„	„	2	„	— 3,2 „
Length of thorax	„	„	5	„	— 6,8 „
Length of abdomen	„	„	8,5	„	— 10 „
Length of wing	„	„	12,5	„	— 14 „
Breadth of wing	„	„	4,6	„	— 5,5 „
Foreheadindex	„	„	7,66	„	— 12,8



Textfig. 244.

T. perakiensis RIC. ♀. a—d. forehead, e, f. antennae, g. palpe.

The Head. (Textfig. 244). Forehead 0,4—0,55 narrower anteriorly than it is at vertex, dull havannabrown, black haired. In SHIRARI's female it was greyish at base. When nothing is mentioned about the pubescence it was found black on the different bodyparts. Callus long, cylindrical, narrow, reaching the eyes in some specimens, narrowly separated from them, in others, black, with similar fine linear extension, the last ending at $\frac{1}{3}$ from the vertex. Subcallus and cheeks as mentioned. Face grey-brown, black haired. Beard white and black. Palpi yellow-caramelbrown on inner border, bluishgrey tomentose on outer border of the black haired second joint, first joint greyblue, mainly white haired, intermixed with some black hairs. Antennae, first joint redbrown, thick black haired, second joint same colour, provided with a dorsal spur, third joint brownish at base, then black, tooth obtuse, blunt,

basal annulation slender, 2,5 times as long as its widest part, 2,3 times as long as the black stylus. Proboscis brownblack.

Thorax, groundcolour black, havannabrownblack tomentose, mainly black haired, intermixed with some white hairs. Foreborder of scutum bluishgrey tomentose. A median longitudinal black stripe runs from foreborder till scutellum. Tufts at base of wings and behind white. Pteropleuron slateblue. Scutellum same colour as scutum. Sides and breast bluishgrey, white haired, mesosternumlobus black haired. Wings blackbrown, apex and hindborder paler, clear spots in centres of subcostal and upper basis cell. Foreborder dark rusty havannabrown, stigma deep blackbrown, veins blackbrown. Halteres, stalk blackbrown, club darkbrown. Legs. First leg. Coxa bluishgrey tomentose, olivebrown at apex, silverygrey haired, trochanter black, femur black, knee pale brown, black haired, distal lateral border black haired, intermixed with a few white hairs. Tibia black at extreme base, then pale dull brown on basal half, black haired, intermixed with some white hairs, apex blackbrown, black haired, ventral surface, white haired on basal half, elsewhere black haired. Tarsalia black. Second leg. Coxa bluishgrey, white haired, trochanter dull blackbrown, femur dark, dorsally it is black haired at base, intermixed with some white hairs, apical half white haired, knee yellowbrown, black haired, distal lateral border with a thick white hairfringe. Tibia, basal $\frac{2}{3}$ oliveyellowbrown, apical $\frac{1}{3}$ blackbrown, dorsum black haired, ventral surface white haired on basal paler area, apex black haired; 2 black spurs are visible. Tarsalia black. Third leg, femur brownishbluegrey on dorsum, white haired, knee yellowbrown, presenting some black hairs, ventral surface bluishgrey tomentose, white haired. Tibia, black at extreme base, then yellowbrown, passing into redbrown and

blackbrown, black haired on dorsum, venter white haired on basal half, then black haired. Tarsalia black.

A b d o m e n blackbrown to black, first segment with a small median white hairgroup and a sootygrey spot at each side of the scutellum, some white hairs are intermixed between the black ones at the segmentations. Lateral borders of first 4 tergites broadly white haired, other tergites black haired at lateral borders, abdomen rounded at apex. Ventral surface bluishblackbrown with paler greywhite, white haired segmentations on the first 5 segments, 6th segment with some white hairs at sides on the segmentation, ventral surface elsewhere black haired.

226. *Tabanus caerulescens* MACQUART (♀) Pl. 15, Fig. 4; Textfig 245.

References:

MACQUART, Dipt. Exot. I, p. 132 (1838).
RICARDO, Rec. Ind. Mus. IV, p. 203 (1911).

Habitat:

MACQUART's type from Java

Coll. Paris Mus.

3 ♀♀ from Gamboeng, Tea Estate on Goenoeng Tiloe, Preanger Regencies
1400 M. on horse 5.23, KERKHOVEN

Coll. V.S.L.

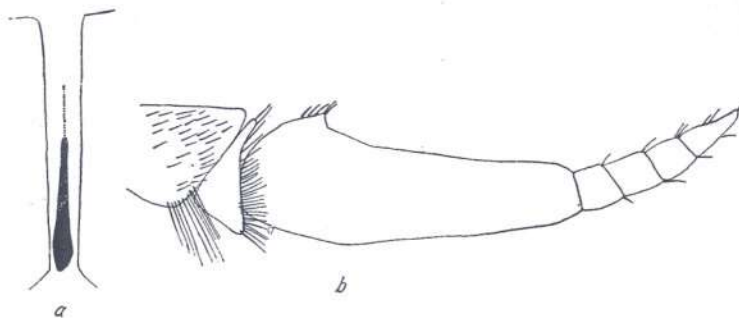
T. caerulescens MACQUART is a medium-sized, dark black to blackbrown species with dark brownblack wings, with paler centres in most cells. The basal 2 abdominal segments are covered with grey tomentum. Forehead dark brown, black haired, rather narrow. Callus black, pear-shaped, lineal extension broad. Subcallus whitish in the middle, brown at sides, black haired. Palpi dullbrown, black haired. Antennae brown to brownblack, tooth small, distinct. Thorax greyish tomentose on foreborder and on breast, latter black haired. Legs black with dark havannabrown tibiae.

Table of dimensions.

Bodylength	varying from 16,5 m.M. to 18 m.M.			
Width of thorax	"	"	5,5	" — 6 "
Width of abdomen	"	"	5,8	" — 6,8 "
Wingexpanse	"	"	33,6	" — 36 "
Length of head	"	"	2,5	" — 2,8 "
Length of thorax	"	"	6,5	" — 7 "
Length of abdomen	"	"	9	" — 10 "
Length of wing	"	"	13,8	" — 15 "
Breadth of wing	"	"	5,2	" — 5,8 "
Foreheadindex	"	"	9,1	— 10,33

The Head. (Textfig. 245). Forehead 0,3—0,4 narrower anteriorly than it is at vertex, beautiful dull dark brown, black haired. Vertexspot shining, triangular. Callus shining black

ovate to cylindrical, gradually tapering to the paler, broad linear extension, which is cleft at its end. Postocular rim whitish, black haired. Eyes bronze-coloured to brownblack. Sub-



Textfig. 245.

T. caeruleus MACQ. ♀. a. forehead. antenna.

callus paler than the forehead, dull dark-brown. Cheeks and face as described. Palpi, first joint white haired, second joint, stout at base, ending in a rather acute point, inner border yellowish dull brown, outer border whitish tomentose, thick black haired, therefore appearing bluishblack

with a violetbrown hue. Antennae, first joint brown, white tomentose, black haired second joint brown, black fringed, third joint dull brown, then almost black, basal annulation showing some grey tomentum, 2,7 times as long as its widest part, about 1,9 times as long as the stylus, tooth rather distinct.

T h o r a x brownblack, scutum bluishgrey tomentose on fore- and hindborder, latter more dull brown as also the 3 indistinct longitudinal stripes. Pubescence mainly black, intermixed with some white hairs, especially at the hindborders of scutum and scutellum and in the tufts at base of wings. Breast black, bluishgrey tomentose, black haired. Hindborder of mesosternum lobus, metasternum and episternum metathoracis white haired. Wings brown-black, very dark on foreborder and on apical shadow, with paler centres in most cells. Halteres, stalk brownblack, club dull reddish. Legs dark. First leg. Coxa bluishgrey tomentose, apex black, black haired. Trochanter black, femur piceous, black haired, tibia dull, dark velvety-brown at base, then wholly black, black haired. Tarsalia black. Second leg similar, femur bluishblack on ventral surface, knee yellowbrown, some white hairs visible on proximal lateral border, elsewhere black haired. Tibia dull reddish with black apical ring, proximal lateral border white tomentose, some white hairs being found at base, elsewhere black haired. First tarsale brownblack, black haired, other tarsalia black. Third leg identical, femur slate-blueblack, knee yellowbrown, black haired. Tibia dull dark havannabrown, bluish white tomentose, black haired. Tarsalia black.

A b d o m e n black. First segment bluish white tomentose, with a whitish hairtuft at each side of the scutellum, second segment white tomentose in the middle, abdomen elsewhere brownblack, lateral borders of first 3 tergites white haired, remainder of dorsum black haired. Ventral surface black, black haired, except on the 2d till 4th segmentation, which are white fringed.

227. *Tabanus atrohirtus* RICARDO (♀) Pl. 16, Fig. 5; Textfig. 246.

References:

RICARDO, Rec. Ind. Mus. IV, p. 209 (1911).

Habitat:

Type ♀ and 3 other females from Ceylon, YERBURY (Textfig 246 c, d)
Coll. BR.M.

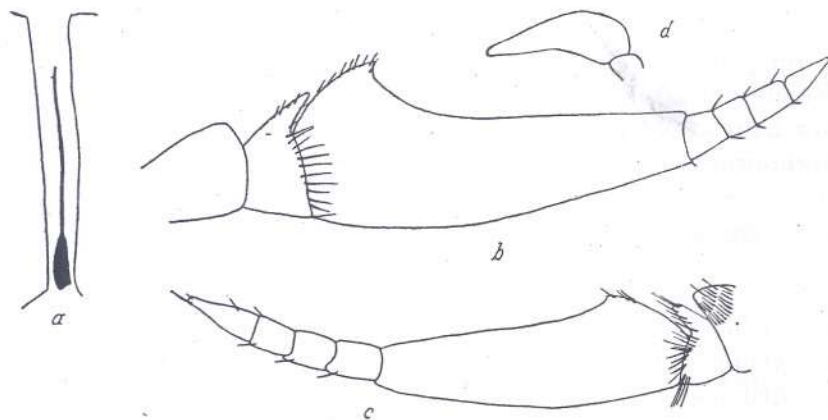
Isle Sumatra

- 1 ♀ from Moeara Tagor, Tamiang, Kota Nopan, Tapanoeli on horse 3.'23,
LOBEL (Textfig. 246 a, b) Coll. V.S.L.
1 ♀ from Kajoe Djati, Kota Siantar, K. Nopan, Tapanoeli on buffalo 16.5.'24,
BAKKER
1 ♀ from Siboloean, Sibolga, Tapanoeli on buffalo 9.7.'24, BAKKER

T. atrohirtus RIC. is characterised by the typical redbrown, black haired conical abdomen, thorax dark brown, with copper-red pubescence, wings fumigate. Legs black- to redbrown, black haired. Forehead narrow, dark. Callus narrow, redbrown, not reaching the eyes, linear extension long, filiform. Subcallus, cheeks and face reddishbrown, black and redbrown haired. Beard black. Antennae reddish-blackbrown, slender, with distinct acute tooth. Palpi dark redbrown, black haired.

Table of dimensions.

Bodylength	18—29	m.M.
Width of thorax	6,2	„
Width of abdomen	6,5	„
Length of head	3,5	„
Length of thorax	6,8	„
Length of abdomen	10,5	„
Foreheadindex	9,42—10	



Textfig. 246.

T. atrohirtus RIC. ♀. a. forehead, b, c. antennae, d. palpe.

The Head. (Textfig. 246). Forehead greyishblack, black haired in type, reddish dull brown in the Sumatra females, $\frac{1}{3}$ narrower anteriorly than it is at vertex. Callus redbrown, pear-shaped, with filiform, black linear extension, extending beyond $\frac{3}{4}$ of frontal stripe.

Postocular rim yellowbrown, black haired. Subcallus, upper cheeks and face redbrown, lower cheeks greyblack, blueblack haired in type, intermixed with redbrown hairs in the Sumatra-females. Beard black, thick. Palpi dark redbrown, thick black haired, second joint stout, with long obtuse point. Antennae, basal 2 joints redbrown, black haired, third joint reddish-brown at base, then blackbrown, basal annulation 2,8 times as long as its widest part, 1,4 times as long as the stylus in the type, 2,27 times as long as its widest part and as much times as long as the stylus in one of the Sumatra-females. Tooth small, distinct, acute.

T h o r a x dark brown, grey tomentose on foreborder, clothed with short copper-coloured hairs, intermixed with some black hairs. Scutellum same colour as scutum, yellowbrown haired, intermixed with some black hairs. Lateral borders of scutum paler redbrown, yellowbrown haired, disc provided with 3 blackbrown longitudinal stripes. Pteropleuron dull velvetyredbrown, black haired, intermixed with some reddishyellow short hairs in the type female. Breast blackbrown, black haired, slateblue on mesosternumlobus. Wings blackbrown, with clearer centres in most cells, foreborder dark redbrown, stigma blackbrown, veins same colour. Apex of wing broken off. Halteres redbrown. Legs. Coxa dull redbrown, black haired, trochanter piceous, femur similar, brownish on ventral surface, black haired, knee yellowbrown. Tibia dark redbrown, apex darker, black haired. Tarsalia black, black haired. Second leg. Coxa black, black haired. Trochanter reddish black. Femur dull black-havannabrown with paler knee, black haired. Tibia redbrown, black haired, with 2 ventral black spines. First tarsale redbrown, black haired, other tarsalia black. Third leg. Coxa dull velvetybrown, black haired, trochanter dull havannabrown, black haired, femur as in second leg, blackbrown in type. Tibia as in second leg. Tarsalia redbrown, black haired.

A b d o m e n blackbrown in type, more deep redbrown to blackbrown in the Sumatra females, black haired, conical, ventral surface tawny redbrown, black haired. The type presents a square blotch of reddishyellow hairs on the middle of the first segment on dorsum.

Thus the type differs from the Sumatra females almost exclusively in the shape of the antennae with their longer stylus, the other differences are unimportant and so I don't hesitate to bring the Sumatra females to the same species as the type. By a fault of the printing-block-maker the abdominal pubescence which was black, became yellow on the coloured plate.

GROUP XX.

Group XX embraces a number of dark black, yellow or orangeous species with uniformly black, yellow or orangeous abdomen, which is uniformly black or yellow haired, seldom with paler fringes on dorsum abdominis. Wings yellow, yellowbrown, seldom redbrown.

KEY 30

Synopsis of species.

- | | | |
|-----|---|---|
| 1a. | Abdomen orangeousyellow, yellowbrown or redbrown | 2 |
| b. | Abdomen black or blackbrown | 5 |
| 2a. | Abdomen mainly black haired | 3 |
| b. | Abdomen orangeousyellow haired | 4 |
| 3a. | Abdomen yellowbrown, darker to the apex, lateral borders of tergites yellowwhite haired as also the basal 4 ventral scutes. Beard brownish-yellowwhite. Legs with reddish blackbrown, black haired tibiae | |

fuscifrons SCHUURMANS STEKHOVEN.

- b. Abdomen redbrown, black haired on dorsum, second segment with a median tuft of yellow hairs, lateral borders of tergites redyellow haired, ventral surface black haired, segmentations yellow haired. Legs with mainly yellow haired tibiae **rubriscutatus** SCHUURMANS STEKHOVEN.
- 4a. Forehead broad. Callus reversed heart-shaped, linear extension stout. Palpi slender. Antennae darkbrown, basal annulation of third joint broad, tooth distinct. Palpi yellow haired. Wings without appendix. Legs reddishbrown, black haired **fulvissimus** RONDANI.
- b. Forehead narrow. Callus cylindrical, narrow, linear extension fine. Palpi stout. Antennae nutbrown, slender, basal annulation narrow, tooth inconspicuous. Palpi blackbrown haired. Wings appendiculate. Legs reddishyellowbrown, tibiae yellow haired **flavissimus** RICARDO.
- 5a. Antennal tooth very long, thus giving the antennae a bicornous appearance 6
- b. Antennal tooth shorter 7
6. Callus hardly broader than the linear extension. Body black haired, except on the yellowwhite hairtufts at bases of wings and on the yellow-red hairtufts at the lateral borders of the 5th and 6th abdominal tergites **denticulatus** RICARDO.
- 7a. Thorax purplishred, redbrown or yellowish tomentose, therefore contrasting more or less with the dark black abdomen..... 8
- b. Thorax and abdomen same colour 13
- 8a. Scutum and scutellum reddish. Wings yellow at base, hindborder and apical shadow smoky black. Dorsum abdominis black haired with groups of redbrown hairs at the segmentations of the first 2 tergites. Ventral surface white fringed on basal 5 segments **tinctothorax** RICARDO.
- b. Scutum redbrown or yellowish 9
- 9a. Wings redbrown. First posterior cell distinctly narrower at opening. Scutum yellowish tomentose. Callus black. Beard redbrown. Abdomen black, black haired **wollastoni** RICARDO.
- b. All posterior cells widely open 10
- 10a. Thorax mainly redbrown haired..... 12
- b. Thorax mainly black haired 11
11. Callus reddishyellow, linear extension fine. Beard black. Antennae redbrown, tooth distinct, stylus black. Legs wholly black **pollinosus** RICARDO.
- 12a. Forehead redbrown. Callus redbrown. Wings redbrown, with clearer centres in several cells. Halteres dark redbrown. Abdomen, lateral borders of first 2 tergites redbrown, elsewhere black **angusticallosus** SCHUURMANS STEKHOVEN.

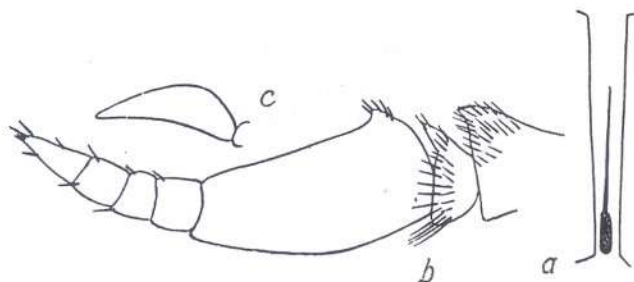
- b. Forehead grey. Callus black. Wings without clearer centres in the cells. Halteres with the club luteous. Abdomen wholly black, black haired
doreicus WALKER.
- 13a. Body wholly black haired 14
- b. Apart from the black pubescence some tufts of white or yellowish hairs occur 15
14. Callus egg-shaped, broad, linear extension stout, ending blunt. Hind tibiae incrassate. Wings yellowbrown
nigerrimus SCHUURMANS STEKHOVEN.
- 15a. Wings appendiculate 16
- b. Not so 17
16. Upper cheeks blackbrown, lower cheeks bluishgrey, both black haired. Third antennal joint redyellow. Breast white haired. Abdomen blackbrown, black haired, except on the second segment at segmentation, which is white fringed, the white haired lateral borders of the tergites and the white fringed segmentations of the first 5 ventral scutes
obtusipalis SCHUURMANS STEKHOVEN.
- 17a. Wings saffranyellow. Forehead barely half as wide at base, than it is at vertex Callus tapering gradually to the linear extension. Antennae blackbrown. Thorax paler on foreborder, white hairtufts at the wingbases
crocitinctipennis SCHUURMANS STEKHOVEN.
- b. Wings yellowbrown. Forehead slightly narrower at base only. Callus suddenly narrowed to the linear extension. Scutum wholly black haired except a yellow hairtuft at the wingbases *flavipennis* RICARDO.

228. *Tabanus fuscifrons* nov. spec. (♀) Textfig. 247.**Habitat:**

Type ♀ from Borneo, Sintang 8/9'94, GOEDHUIS

Coll. L.M.N.H.

A female resembling *T. flavitibiatus* SCHUURMANS STEKHOVEN but distinguished at once by the colour of the tibiae, shape of callus, etc. Forehead dull havannabrown, black haired. Callus cylindrical, blackbrown, prolonged into a long linear extension. Subcallus and upper cheeks rustybrown, goldenyellow haired. Lower cheeks bright brownyellow, brownyellowwhite haired. Face greyish. Beard brownyellowwhite. Palpi yellowbrown, yellow and black haired. Antennae olivebrownyellow, black haired. Thorax havannabrown, yellow haired. Wings yellowbrown, with smoky-brown apical shadow. Legs, with reddish blackbrown tibiae. Abdomen yellowbrown, darker to the apex, black haired, lateral borders of tergites yellowwhite haired. Length 13,5 m.M.; Wingexpanse 29 m.M.



Textfig. 247.

T. fuscifrons s.s. ♀. a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 247). Forehead dull pale havannabrown, black haired at base and at vertex on the reddish vertexspot, goldenyellow haired on the lateral borders. Callus not reaching the eyes, linear extension fine, pointed. Subcallus, etc. as described, face greyish brown-yellow, yellow haired, presenting some black hairs to the mouth. Palpi, first joint

yellowbrown, pubescence as on cheeks, second joint olivebrown to dull havannabrown, broad at base, gradually tapering to the rather acute point, yellow haired at base and below, black haired at apex. Antennae, olivebrownyellow, black haired on first 2 joints, second joint narrow, with short dorsal spur, third joint broad, basal annulation redyellow, 1.75 times as long as its widest part, 1.2 times as long as the tawny stylus, tooth distinct, short, acute.

Thorax havannabrown, rubbed, remainder of pubescence yellow. Pteropleuron reddishyellow brown, black haired, intermixed with some yellow hairs. Sides and breast greyishyellowbrown, yellowwhite haired. Wings as mentioned, foreborder deep yellowbrown, stigma burnt siennabrown. Halteres bright yellowbrown. Legs. First leg. Coxa greyish yellowbrown, yellowwhite haired, trochanter reddishbrown, femur havannabrown, dorsum black haired; distal lateral border yellowwhite haired, tibia blackbrown, slightly paler at base, black haired. Tarsalia blackbrown, black haired. Second leg similar, femur black haired above, yellowwhite haired below, tibia reddishblackbrown, black haired, third leg identical, femur with a considerable number of yellowwhite hairs on dorsum at base, black hairs being found at extreme apex only.

Abdomen yellowbrown, blackbrown on the last 2 segments, dorsum almost wholly rubbed. Remainder of pubescence on dorsum black. Second tergite, with a blackish median shadow. Lateral borders of tergites yellowwhite haired. Ventral surface yellowbrown on first 4 segments, then blackbrown, first 4 segments mainly yellowwhite haired, intermixed with some black hairs on the middle of the disc, these hairs being found in greater number on the 5th segment. Sixth segment with a yellowwhite hairfringe only, seventh segment wholly black haired.

229. *Tabanus rubriscutatus* nov. spec. (♀). Textfig. 248

Habitat:

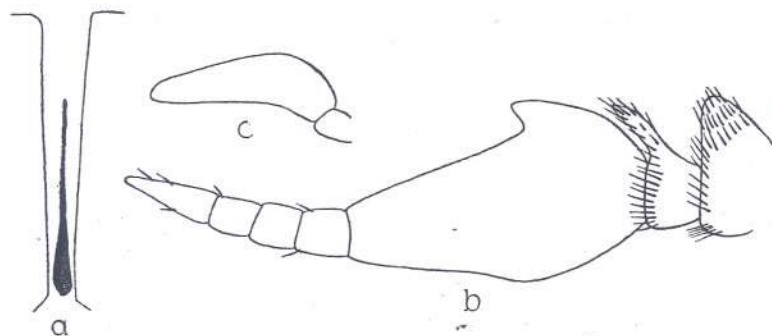
Type ♀ from Borneo, Sibau River 6.'94, BUTTIKOEFER Coll. L.M.N.H.

A medium-sized species labelled *T. univentris* WALKER affinis, to which it does not show any point of resemblance. It is probably allied to *T. tinctothorax* Ric. but may be distinguished inter alia by the colouring and pubescence of the abdomen, legs, etc. Forehead yellowbrown. Callus reddishyellow, triangular. Subcallus, cheeks and face yellowbrown to ochraceous yellow, yellow haired. Beard yellow. Palpi ochraceousyellow, black haired on second joint. Antennae

same colour, third joint darker. Thorax brownish red, ochraceousyellow haired.

Wings brownishyellow, with reddish yellowbrown veins. Legs redyellow, mainly ochraceous yellow haired. Abdomen red to redbrown, black haired, with a median tuft of yellow hairs on the first segment and redyellow haired lateral borders of tergites, ventral surface tawnyred, black haired, yellowhaired at segmentations. Length 18,5 m.M.; Width of thorax 5,6 m.M.; Wingexpanse 37,6 m.M. Length of wing 16 m.M.; Length of abdomen 10,6 m.M.

The Head. (Textfig. 248). Forehead yellowbrown, distinctly narrower anteriorly than it is at vertex, wholly rubbed. Callus elongate, triangular, redyellow. Subcallus, etc. as described. Palpi ochraceousyellow, first joint yellow haired, intermixed with some black



Textfig. 248.

T. rubriscutatus s.s. ♀. a. forehead, b. antenna, c. palpe.

hairs at apex, second joints swollen at base, yellow haired, then tapering to the slightly darker, brownish, black haired blunt apex. Antennae ochraceousyellow on the first 2 joints, the first protruding caplike over the second, both black haired,

third joint more redyellow, basal annulation broad, 2 times as long as its widest part, 1,6 times as long as the brownish stylus, tooth acute.

Thorax brownish red, ochraceousyellow haired, where it is not rubbed, intermixed with some black hairs. Pteropleuron mainly black haired. Sides and breast same colour as scutum, ochraceousyellow haired. Wings as described, with sienna-coloured stigma. All posterior cells widely open. Halteres yellowbrown. Legs redyellow, darker, brownish on the apices of the tibiae and on the tarsalia. Pubescence on all legs ochraceousyellow, except on dorsum of fore femora, on dorsum of middle femora at apices only and on dorsum of the hind femora at extreme apices, further on the apical havannabrown-yellow half of the fore tibiae, on the extreme apex of the middle tibiae, where the hairs are black. Hind tibiae and tarsalia broken off.

Abdomen red on basal 2 segments, then redbrown, black haired on dorsum, except on first segment in the middle, where one finds some yellow hairs, a similar hairtuft is found on the first segment at each side of the scutellum. Remainder as described.

230. *Tabanus fulvissimus* RONDANI (♀) Pl. 16, Fig. 6; Textfig. 249

References:

- RONDANI, Ann. Mus. Civ. Genova VII, p. 458 (1875).
RICARDO, Rec. Ind. Mus. IV, p. 205 (1911).

Habitat:

Isle Borneo		
Type ♀	from Borneo (Textfig. 249)	Coll. M. Genova
1 ♀	from Borneo, Upper Sibau River 26.6.—1.7.'94, BUTTIKOEFER	Coll. N.A.M.
5 ♀ ♀	„ Borneo, Upper Sibau River 26.6.—1.7.'94, BUTTIKOEFER	Coll. L.M.N.H.
2 ♀ ♀	„ Poetoos, Sibau 28/30.6.'09, LORENTZ	Coll. N.A.M.
1 ♀	„ Poetoos 6.'94, BUTTIKOEFER	Coll. L.M.N.H.
3 ♀ ♀	„ Boenoet 26.6.'09, LORENTZ	Coll. N.A.M.
1 ♀	„ Boenoet 26.6.'09, LORENTZ	Coll. L.M.N.H.
4 ♀ ♀	„ Sintang 25.6.'09, LORENTZ	Coll. N.A.M.
3 ♀ ♀	„ Djongkong 1.7.'09, LORENTZ	„
1 ♀	„ South Slope of G. Kenapai 21—31.12.'93	Coll. L.M.N.H.
1 ♀	„ Sambas 5.'07, BODEN CLOSS	Coll. R.M.S.
1 ♀	„ Borneo, without further locality, XANTUS	Coll. BR.M.
1 ♀	„ Borneo, without further locality	Coll. L.M.N.H.
4 ♀ ♀	„ Borneo and Sumatra	Coll. KERTESZ
1 ♀	„ Java, JACOBSON	Coll. N.A.M.

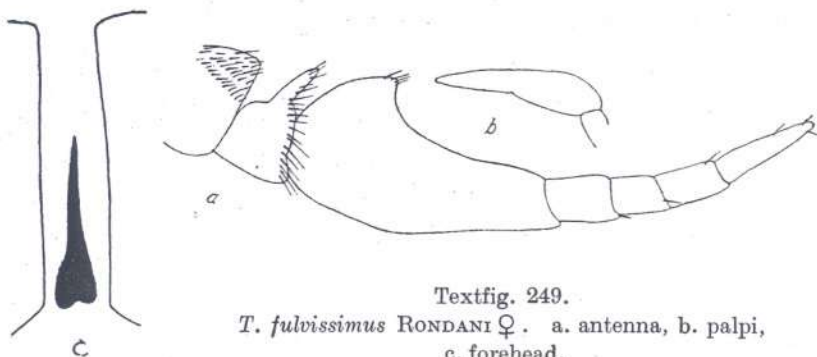
This is a reddishyellow species, covered with redbrown to orangeous pubescence. Wings yellowbrown. Legs reddishbrown, black haired. Forehead rather broad, with a heart-shaped redbrown callus, linear extension broad, pointed. Subcallus, cheeks and face yellowbrown, orangeousyellow haired. Beard pale yellow. Palpi long and slender, tawny-ochraceousyellow, mainly yellow haired. Antennae darkbrown, black haired.

Table of dimensions.

Bodylength	22	m.M.
Width of thorax	7,5	„
Width of abdomen	7,8	„
Wingexpanse	45,9	„
Length of head	4	„
Wength of thorax	8,2	„
Length of wing	19,2	„
Breadth of wing	7,6	„
Foreheadindex	4,5—6	

The Head. (Textfig. 249). Forehead brown, slightly narrower at apex, callus redbrown, heart-shaped, linear extension broad, redbrown, pointed, extending on $\frac{3}{5}$ of the frontal stripe. Subcallus, etc. as mentioned. Palpi, long and slender, orangeousyellowbrown, first joint with similar pubescence, second joint yellow haired at base, some black hairs being intermixed at apex, which ends acute. Antennae redbrown, black haired on basal 2 joints, second joint

with a distinct dorsal hump, third joint dark redbrown, long, slender, basal annulation 1,75 times as long as its widest part, 0,92 times as long as the black slender stylus, tooth distinct, crowned with black hairs.



Textfig. 249.

T. fulvissimus RONDANI ♀. a. antenna, b. palpi,
c. forehead.

Thorax reddishyellowbrown, with 3 longitudinal dark reddishbrown stripes, redbrown haired. Tufts at base of wings and behind orangeousyellowbrown. Pteropleuron red haired. Scutellum same colour as scutum. Breast and sides orangeousyellowbrown, yellow haired. Wings yellowbrown, with slightly darker shadows along some of the veins, which are yellowbrown. Halteres, stalk redbrown, club orangeous. Legs. First leg. Coxa violetyellowbrown, darker to the apex, yellow haired at base, apex black haired, trochanter pale havannabrown, femur similar, black haired, tibia dull dark redbrown, black haired, tarsalia identical, black haired. Second leg. Coxa yellowbrown, yellow and black haired, femur dark havanna- to redbrown, black haired, tibia redbrown, black haired, tarsalia similar. Third leg identical.

Abdomen broad, orangeous, orangeous haired; in one of the Sintang females one finds a lot of black hairs at the foreborders of the abdominal segments. Ventral surface, first 2 segments obscurely red, following segments dark redbrown, with paler, orangeous haired, segmentations pubescence, elsewhere black.

231. *Tabanus flavissimus* RICARDO (♀). Textfig. 250.

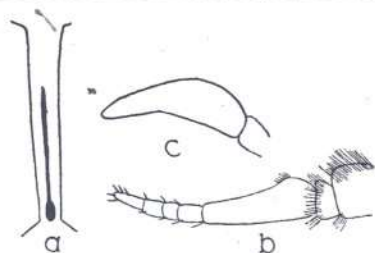
References:

RICARDO, Rec. Ind. Mus. IV, p. 207 (1911).

Habitat:

Type ♀ and another female from Pundaluoya, Ceylon, (GREEN) Coll. BR.M.

A large species, closely allied to *T. fulvissimus* RONDANI, but distinguished inter alia by the shape of the forehead, which is narrower, shape of callus, palpi and antennae, colouring of thorax, legs, etc. Forehead redbrown. Callus yellowbrown, egg-shaped. Subcallus, face and cheeks blackbrown, black haired. Beard black. Palpi blunt, dark redbrown, blackbrown haired. Antennae nutbrown to yellowbrown, mainly yellow haired. Thorax reddishyellowbrown, yellow haired. Wings yellowbrown, appendiculate. Legs reddishyellowbrown as is the abdomen, latter yellow haired. Bodylength 24 m.M.



Textfig. 250.

T. flavissimus RIC. ♀. a. forehead
b. antenna, c. palpi.

The Head. (Textfig. 250). Forehead reddishbrown, 0,45 narrower anteriorly than it is at vertex, index 9,4. Callus narrow, not reaching the eyes, prolonged into a fine linear extension. Subcallus, etc. as described. Palpi ending blunt, swollen at base, dark reddishbrown, blackbrown haired, yellowred haired at apex. Antennae nutbrown, yellow haired on basal 2 joints, 2d joint with blunt, indistinct dorsal spur, third joint yellowbrown, basal annulation 2,7 times as long as its widest part, 1,25 times as long as the darker stylus, tooth indistinct.

Thorax reddishyellowbrown, clothed with rather long yellow hairs, intermixed with some black hairs. Wings yellowbrown, veins similar, appendix present. Legs. First leg. Coxa reddish copperbrown, reddishyellow and blackbrown haired, trochanter yellowbrown, femur reddishyellowbrown, copper-red haired on dorsum, blackbrown haired on distal lateral border. Tibia as femur, copperredyellow haired. Tarsalia the same. Second leg identical, dorsum of tibia wholly covered with copperred hairs, intermixed with some blackbrown ones. Third leg similar.

Abdomen reddishyellowbrown, yellow haired, ventral surface wholly orangeousyellow.

232. *Tabanus denticulatus* RICARDO (♀) Textfig. 251.

References:

RICARDO Nova Guinea IX, p. 397 (1912).

Habitat:

Nova Guinea

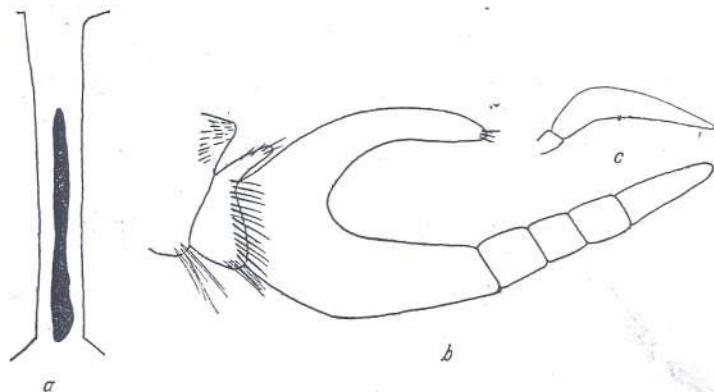
Type ♀	from Hellwig Mountains	2000 M.	10.12.'09	Coll. N.A.M.
1 ♀	from Hellwig Mountains		10.12.'09	"
4 ♀♀	" Hellwig Mountains	1800 M.	10.'09	"
4 ♀♀	paratypes from Hellwig Mountains	1800 M.	10.09, LORENTZ	Coll. BR.M.
1 ♀	from "	Hellwig Mountains	1800 M. 10.'09, LORENTZ	Coll. BR.M.
2 ♀♀	" "	Nova Guinea		Coll. B.Z.M.
2 ♀♀	" "	WICHMANN Mountains	3000 M. 11.'09	Coll. N.A.M.
2 ♀♀	" "	Dutch New Guinea,	LORENTZ	"
1 ♀	" "	S. N. Guinea,	VERSTEEG 1912/'13	"
1 ♀	" "	S. N. Guinea,	VERSTEEG 8.12.'12	"
1 ♀	" "	S. N. Guinea,	VERSTEEG 8.12.'12	Coll. L.M.N.H.
2 ♀♀	" "	S. N. Guinea,	VERSTEEG 13.13.'12	Coll. N.A.M.
1 ♀	" "	N. Guinea?		Coll. N.A.M.
1 ♀	" "	S. N. Guinea,	TREUB 3.'13	"
5 ♀♀	" "	Doorman Path, N. N. Guinea	10.'20, VAN HEURN	

A large, broad-bodied reddishbrown species, basal annulation of third antennal joint, with a very long tooth. Forehead dull greybrown. Callus reddishbrown, with broad linear extension. Subcallus, cheeks and face dull brown, black haired.

Beard black. Palpi redbrown, black haired Thorax redbrown, black haired. Tufts at base of wings yellowwhite haired. Wings reddishbrown to yellowbrown. Legs brownred, black haired. Abdomen blackish, black haired, with yellowred hair-tufts on 5th and 6th segmentations at sides.

Table of dimensions.

Bodylength	19—21	m.M.
Width of thorax	7	"
Width of abdomen	8,5	"
Wingexpanse	49	"
Length of head	3,5	"
Length of thorax	7,8	"
Length of abdomen	15	"
Length of wing	21	"
Breadth of wing	7	"
Foreheadindex	8	



Textfig. 251.

T. denticulatus Ric. ♀. a. forehead, b. antenna, c. palpe.

apex. Antennae black, black haired, second joint with dorsal spine, third joint violetbrown-black, tooth long, reaching to the level of the upper border of the 2d annulation.

Thorax black, black haired, pteropleuron brownblack, scutellum same colour as scutum. Breast redbrown, black haired. Wings reddishbrown to yellow, with clearer areas in the centres of most cells. Halteres, stalk redbrown, club yellowbrown. Legs black, black haired. First leg. Femur blackish redbrown, tibia shining brownred, tarsalia black. Second leg similar. Third leg tibia more blackish red, black haired. Tarsalia black.

Abdomen blackbrown, black haired, bristly yellowred or yellowbrown tufts being found at the lateral borders of the 5th and 6th tergites.

One of the females present in the Amsterdam Collection deviates from the type in the following characters. Wings more yellow, instead of yellowbrown, veins yellowbrown. The

The Head.
(Textfig. 251). Forehead almost the same width throughout. Callus shining redbrown with linear extension extending over $\frac{3}{4}$ of frontal stripe, hardly narrower than the callus. Postocular rim black haired. Eyes dark green in fresh specimens. Subcallus, etc. as described. Palpi with a long point at

mentioned hairtufts on the 5th and 6th abdominal tergites goldenyellow. Abdomen elsewhere reddish brown haired. Legs brownred, brown haired. Palpi brownyellow, black haired. Beard yellow. The differences although rather obvious do not suffice to separate this specimen from the described species.

233. *Tabanus tinctothorax* RICARDO (♀). Pl. 8, Fig. 6; Textfig. 252.

References:

RICARDO, Rec. Ind. Mus. IV, p. 202 (1911).

Federated Malay States

Type ♀ from Bukit Koetoe, Selangor 3500 Feet. ROBINSON Coll. BR.M.

1 ♀ from Kinta Valley, South Perak, Sept. Oct., RIDLEY „

2 ♀ ♀ „ Maxwell Hills, 3600 Feet 22 Aug. '08 Coll. R.M.S.

1 ♀ „ Tor Batang Padang, Perak, 6.'23

1 ♀ „ Bukit Lansai, S. Ujong 7.'10

1 ♀ „ Summit Mt. Ophir, Johore 11.8.'05

1 ♀ „ Camerons Highland, Pahang 4800 Feet, 6.'23 CHASEN

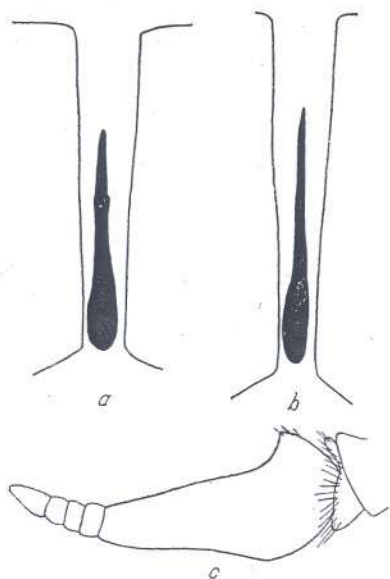
2 ♀ ♀ „ Lubok Tamang, Pahang 3500 Feet 6.'23, CHASEN

A dark species, with bright reddish thorax and scutellum, brownblack abdomen, black legs and wings, tinged yellowish at base, apex and hindborder smokyblack. Forehead dark velvetybrown. Callus stout, club-shaped, mahogany-reddish brown, linear extension long. Subcallus and upper cheeks velvetybrown, lower cheeks and face black, black haired. Beard black. Palpi brownish, thick black haired. Antennae rather long, black, tooth distinct. Ventral surface of abdomen, black, first 5 segmentations white fringed.

Table of dimensions.

Bodylength	varying from 20 m.M. to 24,2 m.M.			
Width of abdomen	„	7	„	— 8 „
Width of thorax	„	6	„	— 7,5 „
Wingexpanse	„	39,5	„	— 45,5 „
Length of head	„	3	„	— 4,5 „
Length of thorax	„	7,8	„	— 9 „
Length of abdomen	„	10,8	„	— 14 „
Length of wing	„	16,5	„	— 19 „
Breadth of wing	„	6	„	— 8 „
Foreheadindex	„	7,8	„	— 10,5

The Head. (Textfig. 252). Forehead, brown, black haired, almost or wholly half as wide anteriorly as it is at vertex. Callus mahoganyreddish brown, club-shaped, not reaching the eyes, linear extension long, broad, extending on $\frac{2}{3}$ of the frontal stripe. Cheeks, etc. as descri-



Textfig. 252.

T. tinctothorax RIC. ♀. a, b. forehead,
c. antenna.

bed. Palpi redbrown, thick back haired. Antennae rather long, blackish, first 2 joints black haired, third joint, rather broad at base, curved at ventral border, basal annulation almost 2 times as long as its widest part, 2,3 times as long as the narrow stylus. Tooth conspicuous, black haired. Proboscis black.

Thorax red, purple, scutellum same colour, both rather denuded in type and other females, scanty yellowred haired. Shoulders and sides black haired. Breast dull velvetyredbrown, black haired. Wings as described, clearer centres in most cells, veins yellowish brown, stigma reddish yellow. Halteres, stalk redbrown, club yellowbrown. Legs black, black haired. Trochanters of fore legs brownish, middle femora brownish tomentose, hind femora dull velvetybrown tomentose. A few reddish hairs are visible on the ventral surface of the tarsalia and at apex of the middle tibiae. Hind tarsalia dullbrown tomentose, black haired.

Abdomen conical, black, black haired, some redbrown pubescence is found in groups on the middle of the first 2 segments at segmentations. Ventral surface as mentioned above.

234. *Tabanus wollastoni* RICARDO (♀) Textfig. 253.

References:

RICARDO, Nova Guinea IX, p. 395 (1912).

Habitat:

Type ♀ from Dutch N. Guinea, Mimica River 8.'10, WOLLASTON (Textfig. 253)
Coll. BR.M.

2 ♀♀ same locality

11 ♀♀ from Bivakisland N. Guinea

respectively	1 ♀	on 25.2.'10	Coll. BR.M.
	1 ♀	„ 25.2.'10	Coll. L.M.N.H.
	1 ♀	„ 25.2.'10	Coll. N.A.M.
	1 ♀	„ 1.'10	Coll. BR.M.
	1 ♀	„ 1.'10	Coll. L.M.N.H.
	7 ♀♀	„ 1.'10	Coll. N.A.M.
	1 ♀	„ 12.'09	Coll. N.A.M.

2 ♀♀ from Dutch N. Guinea, LORENTZ

Coll. N.A.M.

3 ♀♀ „ Regen Island

„

respectively 1 ♀ on 16.2.'10

2 ♀♀ „ 20.12.'09

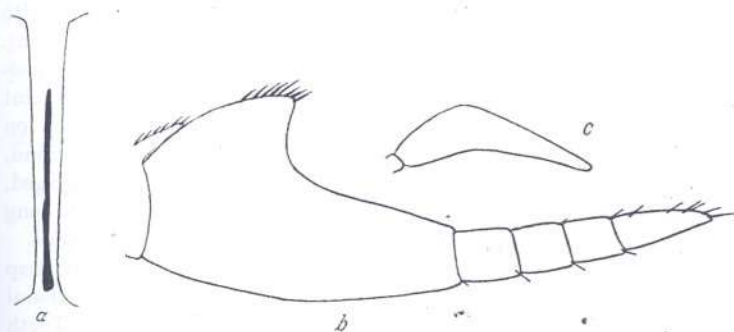
- 8 ♀ ♀ from Etnabay '04/'05
 1 ♀ „ Alkmaar 10.'09, LORENTZ
 1 ♀ „ Kloofbivak, VERSTEEG 18.19.'12

Aroe Islands

- 1 ♀ FROGGAT Coll.

Coll. BR.M.

A large black, broad-bodied species, thorax yellowish tomentose. Forehead redbrown, black haired. Callus black. Subcallus, cheeks and face rustybrown, black haired. Beard reddishbrown. Palpi darkbrown, black haired. Antennae blackbrown, black haired, stylus long. Wings redbrown. Legs black, black haired. Abdomen black, black haired. Bodylength 16,5—17 m.M.



Textfig. 253.

T. wollastoni RIC. ♀. a. forehead, b. antenna, c. palpe.

The H e a d.
 (Textfig. 253). Forehead, 0,4 narrower anteriorly than it is at vertex. Index 10,3. Callus narrow, black, hardly broader than the linear extension. Subcallus, etc. as described. Antennae blackbrown, black haired on the first 2 joints, third joint black, basal annu-

lation 1,5 times as long as its widest part, 1,3 times as long as the stylus; second joint with long dorsal spine.

T h o r a x blackish, reddish tomentose, often degenerating into a greyishyellow colour, black haired. Type female velvetybrown on scutum, pteropleuron reddish. Sides and breast rustybrown, black haired. Wings tinged redbrown, with paler centres in some cells, first posterior cell distinctly narrower at opening. Halteres reddishbrown. Hairtufts at base of wings and behind reddishyellow. Legs black, black haired.

A b d o m e n black, black haired.

RICARDO described the beard as goldenyellow, which I could not affirmate.

235. *Tabanus pollinosus* RICARDO (♀). Textfig. 254.

References:

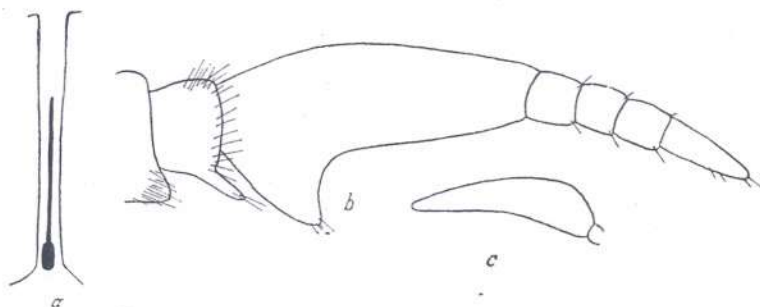
RICARDO, Nova Guinea IX, p. 395 (1912).

Habitat:

- 1 ♀ from Simbang, near Finch Harbour, Huon Gulf, N. Guinea, KERTESZ 1898
 paratype in Coll. BR.M.

A large black species, with denuded black abdomen, reddishbrown, black haired thorax and reddishbrown wings, without appendices, all posterior cells being widely open. Forehead narrow, brown. Callus oval reddishyellow, linear extension long. Subcallus, cheeks and face dark rustybrown, black haired. Beard black. Palpi darkbrown, black haired. Antennae redbrown, stylus black. Legs wholly black. Bodylength 16—20 m.M.

The H e a d. (Textfig. 254). Forehead brown, almost the same width throughout, index 9,4. Callus not reaching the eyes, linear extension bright redbrown. Subcallus, etc. as mentioned.



Textfig. 254

T. pollinosus Ric. ♀. a. forehead, b. antenna, c. palpi.

annulation 1,7 times as long as its widest part, 1,3 times as long, as the black stylus. Tooth prominent, black haired.

T h o r a x reddishbrown, denuded, remainder of pubescence black. Breast dark velvety-brown, black haired. Wings and legs as described. Halteres, stalk yellowbrown, club luteous.

A b d o m e n denuded, with a bluish tomentose shadow on the basal segments, just as in *T. caeruleus* MACQUART. black, black haired. Ventral surface black, black haired.

Palpi dark brown, black haired, second joint swollen at base ending with a blunt point. Antennae redbrown, first joint black haired on dorsum, second, black fringed, joint with long dorsal spine, third joint deep redbrown, basal

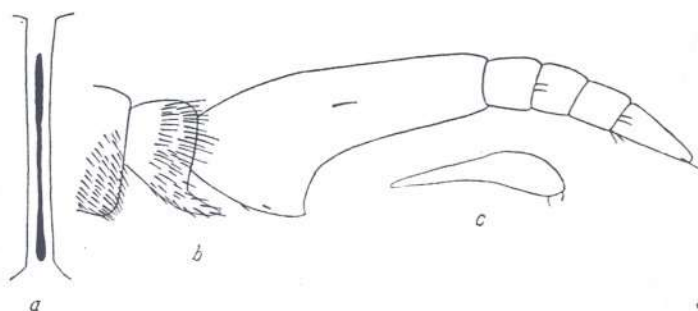
236. *Tabanus angusticallosus* nov. spec. (♀) Textfig. 255.

Habitat:

Type ♀ from Milne Bay, KERTESZ coll. (Textfig. 255) N. Guinea, Coll. BR.M.

This female, labelled by RICARDO as *T. pollinosus* Ric., though closely allied to this species, is evidently distinct, differing inter alia in the shape of the callus, which is hardly broader than its linear extension, in the shape of the palpi, which are slender and present a long acute point. Antennal tooth less distinct, second antennal joint with a double fringe of black hairs. Body of the same size as in *T. wollastoni* Ric.

The H e a d. (Textfig. 255). Forehead redbrown, index 9,1. Callus redbrown, linear extension filiform, reaching the vertex. Subcallus, cheeks and face bright redbrown, cheeks black haired, face redbrown haired. Palpi deep redbrown to blackbrown, black haired. Antennae



Textfig. 255.

T. angusticallosus s.s. ♀ a. forehead, b. antenna. c. palpe.

redbrown haired. Wings redbrown, clearer centres in the disc cell, upper basal cell, cubital and submarginal cell, all posterior cells widely open. Halteres dark redbrown. Legs black, black haired.

A b d o m e n much denuded on dorsum with whitish shade, first 2 segments redbrown on lateral borders of tergites. Abdomen elsewhere black, black haired.

dark olivebrown on first 2 joints, black haired, third joint reddishyellow, basal annulation 1,5 times as long as its widest part, 1,3 times as long as the dark brown stylus, tooth inconspicuous.

T h o r a x redbrown, very denuded, remainder of pubescence redbrown. Sides and breast redbrown,

237. *Tabanus doreicus* WALKER (♀). Textfig. 256.

Syn. *Atylotus sonnerati* BIGOT.

References:

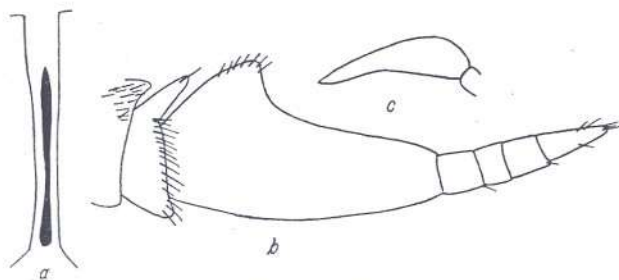
- WALKER, Proc. Linn. Soc. V, p. 233 (1861).
 BIGOT, Mem. Soc. Zool. France V, p. 772 (1892).
 RICARDO, Nova Guinea IX, p. 396 (1912).

Habitat:

Type ♀ from Doré, N. Guinea, A. R. WALLACE	Coll. BR.M.
1 ♀ from Keepaun, Dutch N. Guinea, FRUEHSTORFER	"
1 ♀ „ Finch Harbour, Australian N. Guinea	Coll. KERTESZ
1 ♀ „ N. Guinea, <i>Atylotus sonnerati</i> , BIGOT	Coll. BR.M.
1 ♀ „ N. Guinea	Coll. N.A.M.

A dark redbrown species. Forehead narrow, grey. Callus black, filiform. Subcallus, face and cheeks dull velvetybrown, black haired. Beard redbrown. Palpi redbrown, black haired. Antennae redbrown, reddishyellow on third joint. Thorax redbrown, dull redbrown haired. Wings redbrown. Legs black, black haired. Abdomen dark redbrown, black haired, first 2 segments slightly paler. Length 14—18 m.m.

The H e a d. (Textfig. 256). Forehead grey, narrow, only slightly broader at vertex than it is at base, index 7. Callus black, narrow, pear-shaped, linear extension spear-shaped. Subcallus, etc. as mentioned. Palpi redbrown, black haired, second joint slightly swollen at base,



Textfig. 256.

T. doreicus Wlk. ♀. a. forehead, b. antenna, c. palpe.

and breast reddishbrown, same pubescence, mesosternum lobus black haired. Wings reddishbrown, no clear centres in the cells. Halteres with luteous club. Legs black.

Abdomen black, black haired.

The forelaying species differs from *T. wollastoni* inter alia by the brighter colour of thorax and abdomen, the broader callus, the broader forehead, the shorter and more attenuated palpi, the narrower third antennal joint, etc. Therefore I don't agree with RICARD where she says. „Forehead very narrow, about ten times as long as it is wide anteriorly, whereas it is a little more than half as wide as it is at vertex.”

238. *Tabanus nigerrimus* nov. spec. (♀) Pl. 15, Fig. 3; Textfig. 257.

Habitat:

Isle Borneo

Type ♀ from Baram River, Long Majam, Sarawak, MOULTON 5.10.'20

Coll. R.M.S.

Isle Sumatra

1 ♀ from Siboloean, Sibolga, Tapanoeli on cattle 10.7.'24, BAKKER

Coll. V.S.L.

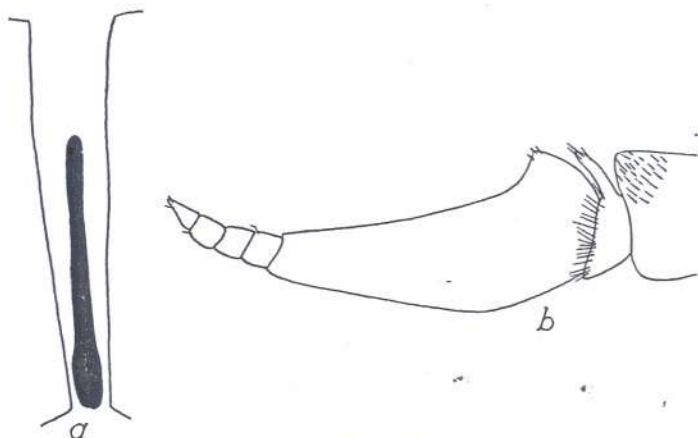
This is a broad-bodied, big-sized, almost wholly black species. Scutellum and some denuded places on thorax reddishbrown. Legs black, tibiae thickly fringed by black hairs, hind tibiae incrassate. Wings yellow. Forehead dark velvetybrown. Cheeks and face brownblack black haired. Callus oval, black-brown to black, linear extension broad, black. Beard black. Palpi long, black haired. Antennae black, black haired.

Table of dimensions.

Bodylength	25,5—25	m.M.
Width of thorax	7,2—8	„
Width of abdomen	8,5—9	„

Wingexpanse	48,8	„
Length of head	5,2	„
Length of thorax	9	„
Length of abdomen	13,5	„
Length of wing	20,8	„
Breadth of wing	8	„
Foreheadindex	9,8	„

The Head. (Textfig. 257). Forehead comparatively narrow, $\frac{1}{2}$ narrower anteriorly than it is at vertex, dark velvetybrown, black haired. Callus oval, blackbrown to black, not reaching



Textfig. 257.

T. nigerrimus s. s. ♀. a. forehead. b. antenna.

to the eyes, prolonged into a broad, black linear extension, ending in a blunt point and extending over $\frac{1}{2}$ of the frontal stripe. Subcallus dark velvetybrown. Cheeks, etc. as mentioned. Palpi long, ending with a blunt point, bluishgrey tomentose, thick black haired. Antennae black, black haired, second joint, with a long acute dorsal hump, third joint slender, broader at base, basal annulation almost 2,2 times as long as its

widest part, 2,6 times as long as the short stylus, ending with an acute point, tooth distinct triangular.

Thorax chocolatebrown, black haired, sides and breast blackbrown, black haired. Legs wholly black, black haired, hind tibiae incrassate. Hindborder paler; Halteres dark to blackbrown. Wings yellowbrown, veins similar.

Abdomen black, black haired, broad at apex. Ventral surface similar.

239. *Tabanus obtusipalpis* nov. spec. (♀) Textfig. 258.

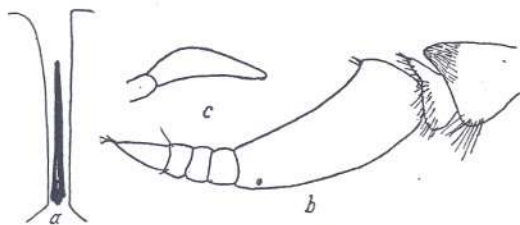
Habitat:

Type ♀ from Isle of Mysol, A. R. WALLACE

Coll. BR.M.

A dark blackish species. Forehead blackbrown. Callus black, furrowed, linear extension long. Subcallus dull velvetybrown, upper cheeks blackbrown, black haired, lower cheeks and middle portion of face bluishgrey, black haired. Lateral borders of face velvetybrown. Beard black. Palpi blackbrown, black haired. Antennae dark brown on basal joint, third joint redyellow. Thorax blackbrown, denuded. Breast white haired. Wings brownish with appendix.

Legs redbrown to blackbrown. Abdomen blackbrown, segmentations slightly paler. Lateral borders of tergites white haired, white hairfringes being found on ventral surface on the first 5 segmentations.



Textfig. 258.

T. obtusipalpis s.s. ♀ a. forehead, b. antenna, c. palpe.

nulation 2,2 times as long as its widest part, 1,7 times as long as the blackbrown stylus. Tooth indistinct, situated near the base.

T h o r a x blackbrown, wholly denuded, breast blackbrown, white haired, mesosternum-lobus black haired. Wings as mentioned, stigma pale havannabrown. Halteres stalk reddish-brown, club yellowbrown. Legs dark. First leg. Coxa dark redbrown, black haired, intermixed with some yellowish hairs, femur warm blackbrown, black haired, knee yellowbrown. Tibia yellowish at base, then dark olivebrown. Tarsalia blackbrown. Second leg identical, femur white haired on distal lateral border. Tibia reddishbrown as are the tarsalia. Third leg similar, tibia with some white hairs.

A b d o m e n blackbrown, with slightly-paler segmentations, second segment white fringed, rest as described, mainly black haired.

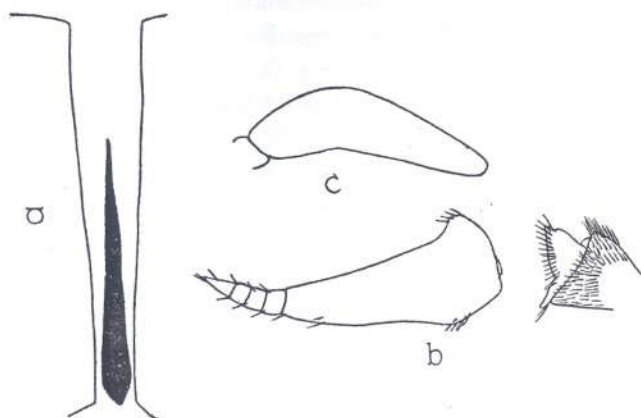
240. *Tabanus crocitinctipennis* nov. spec. (♀). Textfig. 259.

Habitat:

Type ♀ from Borneo, Bloee 25.9.'94, Dr. NIEUWENHUYSEN Coll. L.M.N.H.

A large-sized species, closely allied to *T. tinctothorax* RICARDO with saffran-yellow wings, with yellowbrown veins, a broad blackbrown, black haired abdomen, mahoganybrown, black haired thorax, with 2 white hairtufts at sides, and blackbrown black haired legs. Forehead blackbrown, black haired. Callus brownred, fine, with long linear extension. Subcallus, cheeks and face deep redbrown to blackbrown, black haired. Beard black. Palpi blackbrown, black haired. Antennae same colour, black haired. Bodylength 33,6 m.M.; Width of thorax 8 m.M.; Wingexpanse 48 m.M.; Length of wing 20 m.M.; Length of abdomen 13,5 m.M.

The Head. (Textfig. 259). Forehead barely half as wide at base than it is at vertex, redbrown* at base, blackbrown to the apex, black haired, index 8,3. Callus brownred, elongate oval, hardly more than a widening of the brownred linear extension, almost reaching to the eyes. Linear extension ending acute. Subcallus, etc. as described. Palpi, second joint almost the same width throughout, ending blunt. Antennae, with very narrow second joint, bearing



Textfig. 259.

T. crocitinctipennis s.s. ♀. a. forehead, b. antenna, c. palpe.

an acute dorsal spur, third joint broad at base, with a prominent blunt tooth, basal annulation 2 times as long as its widest part, 2,3 times as long as the narrow stylus.

Thorax redbrown to mahoganybrown, paler on foreborder, where it presents 3 indistinct dull, dark havanna-brown longitudinal stripes. Scutellum same colour as scutum, both black haired. Breast deep reddish black-brown, this colour being hardly visible by the thick black-brown to black haircovering. Sides black haired, except 2 white hairtufts, one at base

of wings and another underneath. Wings as described, brownish shadows being visible in the apices of the cubital and radical cells. Extreme apex of wing, centre of disc cell and hind-border of wing slightly paler. All posterior cells widely open. Halteres blackbrown. Legs blackbrown, black haired, hind tarsalia red haired underneath.

Abdomen as mentioned.

241. *Tabanus flavipennis* RICARDO. (♀) Pl. 15, Fig. 2; Textfig. 260.

References:

RICARDO, Nova Guinea XIII.

SCHUURMANS STEKHOVEN, Buru publications Vol. II, p. 1 (1921).

„ „ Treubia V, p. 299 (1924).

Habitat:

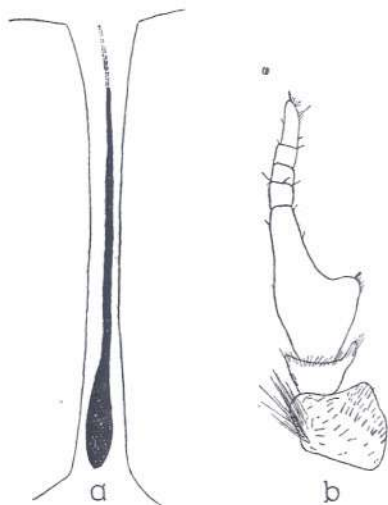
Isle Buru, for further particulars about the localities see my publications.

T. flavipennis Ric., allied to *T. denticulatus* Ric. is a large black species with deep yellowbrown tinged wings, with clearer areas in most of the cells. Forehead narrow, black haired. Callus egg-shaped, black, linear extension long. Subcallus sootygrey, yellowbrown at upper border. Upper cheeks pale yellowbrown, yellowbrown haired. Lower cheeks sooty black, black haired. Beard black. Palpi sootyblack to reddishbrown, black haired. Antennae black, black haired on first joint, second joint reddishbrown, black fringed, third joint reddishbrown at base, then black. Thorax sooty black, black haired. Legs blackbrown, black haired, Abdomen broad, black, black haired.

Table of dimensions.

Bodylength	varying from 17,8 m.M. to 23,2 m.M.				
Width of thorax	„	„	5,8	„	— 7,1
Width of abdomen	„	„	7,8	„	— 9,2

Wingexpanse	"	"	44	"	— 52,8	"
Length of head	"	"	2,1	"	— 3	"
Length of thorax	"	"	7	"	— 9	"
Length of abdomen	"	"	10,6	"	— 14,8	"
Length of wing	"	"	19	"	— 23	"
Breadth of wing	"	"	6,8	"	— 8	"
Foreheadindex	"	"	7,6	"	— 10	"



Textfig. 260.

T. flavipennis Ric. ♀. a. forehead,
b. antenna.

The Head. (Textfig. 260). Forehead 0,2—0,33 narrower anteriorly than it is at vertex. Callus black. Palpi long, ending with a long point, sootyblack at base, apex more reddish brown, black haired, some yellowish hairs are to be found at base.

Thorax sootyblack, black haired on dorsum. Breast yellowish brown tomentose as is the pteropleuron, black haired. On the scutum just after the wings one finds a small yellow hairtuft. Wings as mentioned. Halteres, stalk brown, club yellowishwhite and reddishbrown. Legs blackbrown, black haired, fore coxae yellow-brown tomentose, fore femora reddishbrown on the knees.

Abdomen uniformly black, black haired all over.

GROUP XXI.

To Group XXI I brought the species with black, blackbrown, dark brown, reddishbrown or bluegreen, mainly black haired abdomen. Wings clear or almost so, appendiculate or not, bearing an apical shadow in some species. Antennae usually dark.

KEY 31.

Synopsis of species.

- 1a. Abdomen shining metallic green 2
- b. Abdomen not so 3
- 2a. Palpi black haired. Antennal stylus brown. Hairtufts, just under wings black. Abdomen uniformly green, wholly black haired

metallicus RICARDO.

- b. Palpi white haired. Antennal stylus blackbrown. Hairtufts under the wings white. Abdomen, mainly black haired with a yellowwhite, white haired band at the base of the second segment

luciliaeformis SCHUURMANS STEKHOVEN.

- 3a. Thorax red, contrasting with the abdomen 4
 b. Thorax and abdomen same colour or almost so 5
- 4a. Forehead almost same width throughout. Beard black. Breast black haired. Wings with short appendix. Abdomen wholly black haired
illustris RICARDO.
 b. Forehead almost 0,5 narrower anteriorly than it is at vertex. Beard white. Breast white haired. Appendix long. Abdomen black haired, except on the white haired lateral borders of the first tergite
flammeus SCHUURMANS STEKHOVEN.
- 5a. Abdomen wholly black haired 6
 b. Abdomen mainly black haired apart from small groups of yellow, yellow-white, white or yellowbrown hairs, occurring either at the segmentations or the lateral borders on dorsum or ventral surface 11
- 6a. Abdomen with a median lentiform blackspot on the second segment 7
 b. Not so 8
7. Eyes with large, small-faceted area. Third antennal joint reddbrown on basal annulation. Scutum chocolatebrown, black and copperred-brown haired, legs with havannabrown tibiae
lentsignatus SCHUURMANS STEKHOVEN. ♂
- 8a. Abdomen bluishblack 9
 b. Abdomen reddishbrown or dark brown 10
9. Subcallus, cheeks and face velvetybrown, black haired. Palpi dark brown. Third antennal joint reddishyellow. Scutum bluishblack, with 2 brown longitudinal stripes. Legs with yellowredbrown tibiae
recusans WALKER.
- 10a. Abdomen reddishbrown. Subcallus and upper cheeks yellowbrown. lower cheeks and face black haired. Palpi reddishbrown. Antennae dark-brown with sootyblack third joint. Wings with first posterior cell slightly narrower at opening
atripilosus SCHUURMANS STEKHOVEN.
 b. Abdomen mahoganybrown. Subcallus dull goldenbrown. Upper cheeks dull brown. Lower cheeks yellowishbrown, blackbrown haired. Palpi brownblack. Antennae yellowbrown, third joint blackbrown. Wings with all posterior cells widely open *oviventris* SCHUURMANS STEKHOVEN.
- 11a. Abdomen black or blackbrown 12
 b. Abdomen brown or reddbrown 15
- 12a. Abdomen with white hairfringes to the first 5 or 6 ventral scutes, combined or not with similar hairfringes to the dorsal scutes..... 13
 b. No white hairfringes to a series of dorsal or ventral srutes..... 14
- 13a. Abdomen wholly black haired on dorsum, ventral surface with white hairfringes to the first 5 sternites. Beard white or black. Third antennal joint redyellow on the whole basal annulation. Breast white haired. Wings with faint brown apical shadow, no appendix
tristis VAN DER WULP.

- b. Abdomen bluishblack, dorsum with white hairfringes to the first 5 tergites, ventral surface with white hairfringes to the first 6 tergites. Beard white. Third antennal joint redyellow on the basal annulation at extreme base only. Breast black haired. Wings brownish, appendiculate
opalescens SCHUURMANS STEKHOVEN
14. Abdomen blackbrown, wholly black haired or with a few whiteyellow hairs on the dorsum on the first tergite. Wings with apical shadow. No appendix
macfarlanei RICARDO.
- 15a. Abdomen yellowbrown, almost wholly yellow haired on ventral surface, except on the 6th segment at base and on the 7th segment. Eyes with the black-faceted area prolonged to the vertex. Cheeks reddishbrown haired. Beard same colour. Breast yellow haired
fuscibarbus SCHUURMANS STEKHOVEN.
- b. Abdomen redbrown, wholly black haired on ventral surface with a darker longitudinal median band. Dorsum with a dot of copperredyellow hairs in the middle of the first segment and yellowbrown haired lateral borders to the 3d—5th tergites. Cheeks black, black haired. Beard black. Breast black haired
geniculatus VAN DER WULP.

242. *Tabanus metallicus* RICARDO. (♀) Textfig. 261.

References:

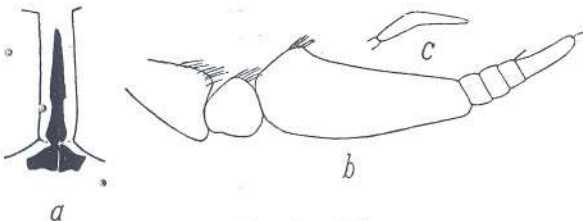
RICARDO, Nova Guinea IX, p. 393. (1914)

Habitat:

Type ♀ from Iwaka River, WOLLASTON

Coll. BR.M.

A shining metallic bluegreen species, resembling to *Lucilius caesar*, the blue-green lustre covering thorax and abdomen. Forehead almost the same width throughout, snowwhite, white haired with a triangular blackbrown vertexspot. Callus dark blackbrown, club-shaped, linear extension broad, extending to the vertexspot. Subcallus bare, shining olivebrown. Cheeks and face white, white haired. Beard pale reddishbrown. Palpi fine, ending blunt, awl-shaped, dull brown, black haired. Antennae, reddishbrown, brown haired on basal joints, third joint reddishyellow, second joint without dorsal spine. Legs blackbrown shining, tibiae white at base. Length 8 m.M.



Textfig. 261.

T. metallicus RIC. ♀. a. forehead, b. antenna, c. palpi.

The Head. (Textfig. 261). Forehead index 3.8. Antennae first joint reddishbrown, black haired on dorsum, distal lateral border and ventral surface brown haired. Second joint olivebrown black fringed, third joint oran

geously yellow, basal annulation 2,3 times as long as its widest part, 1,7 times as long as the brown stylus. Tooth indistinct, blunt.

Thorax metallic green, black haired. Pteropleuron yellowbrown, yellow haired, a black haired patch occurs just under the wings, sides and breast blackbrown, black haired. mesosternum lobus whitish tomentose, bearing some white hairs. Wings clear. Foreborder dark yellow, stigma redbrown, well developed. Upper basal cell wholly and lower basal cell partly redbrown. Halteres blackbrown. Legs. First leg shining blackbrown, tibia white, white haired on basal half. Other legs similar, middle tibiae white on basal 2/3, hind tibiae white on basal 1/4.

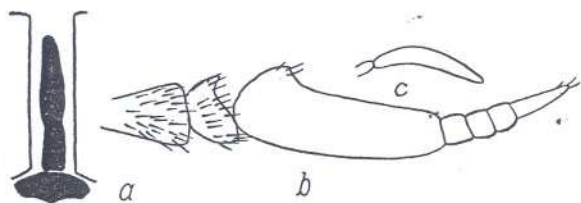
Abdomen shining metallic green, black haired, ventral surface same as dorsum.

243. *Tabanus luciliaeformis* nov. spec. (♀) Textfig. 262.

Habitat:

Type ♀ and another female from Alkmaar, Nova Guinea 10.09 Coll. N.A.M.

This species is closely allied to *T. metallicus* RICARDO, to which it shows much resemblance. I will mention the differences only, as it will be easy enough to determine the species. Length 9.8 m.M.; Wingexpanse 24 m.M.



Textfig. 262.

T. luciliaeformis s.s. ♀. a. forehead, b. antenna, c. palpi.

Thorax showing a white hairtuft just underneath the wings, pteropleuron pale brownish white, white haired. Breast black haired, except a white hairtuft along the metathorax-sternites and on the mesosternum lobus, which presents some white hairs. Wings, stigma yellowbrown. Legs with all tibiae white on basal 1/3.

Abdomen metallic green as the thorax, except a yellowwhite, white haired band on the second abdominal segment, letting the hindborder blue.

RICARDO regards these specimens as paratypes of her species *T. metallicus* Ric. but to my opinion the given differences suffice to separate the species.

244. *Tabanus illustris* RICARDO (♀) Textfig. 263.

References:

RICARDO, Nova Guinea IX, p. 398 (1914).

Habitat:

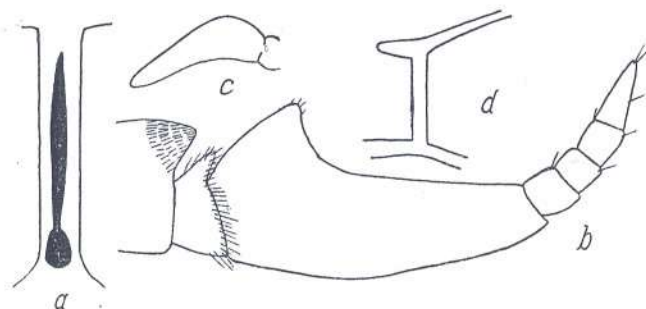
Type ♀ from Iwaka River, WOLLASTON 1911

1 ♀ Dutch Nova Guinea, LORENTZ

Coll. BR.M.

Coll. L.M.N.H.

A black species with peculiar reddish thorax. Forehead rather broad, dark greyblack, black haired. Callus oval, mahoganyredbrown, grooved in the middle, linear extension long. Subcallus rustybrown. Cheeks bluishgrey, black haired. Face reddishbrown, black haired. Beard black. Palpi darkbrown, whitish tomentose, ending blunt, black haired. Antennae black, black haired. Thorax winered, black haired. Wings clear, appendix short. Legs black, black haired. Abdomen black, black haired. Length 17 m.M.



Textfig. 263.

T. illustris RIC. ♀.

a. forehead, b. antenna, c. palpe, d. wingstructure.

The Head. (Textfig. 263). Forehead almost the same width throughout, index 5,7. Antennae, second joint black fringed, dorsal spine short, third joint with distinct tooth, basal annulation 1,72 times as long as its widest part, 1,72 times as long as the stylus.

Thorax as mentioned, dorsum partly denuded, black haired. Breast and sides black, black

haired, with redbrown streaks on several sclerites. Wings clear, veins brown, foreborder yellowbrown, stigma dark siennabrown. Halteres dark redbrown to havannabrown. Legs black, black haired. Coxae black haired. Middle and hind femora bluish tomentose on the lateral borders, middle and hind tibiae reddishbrown at base.

Distinguishable from *T. tinctothorax* to which it shows some resemblance at once by the clear wings.

245. *Tabanus flammeus* nov. spec. (♀) Textfig. 264.

References:

RICARDO, Nova Guinea IX, p. 398.

Habitat:

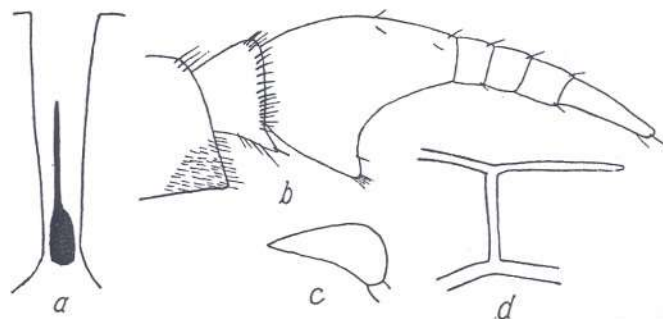
Type ♀ from N. Guinea, Heubelbivak, 7—15.11.'09, 800 M. Coll. N.A.M.

3 ♀ ♀ from S. N. Guinea, Heuvelbivak

Coll. BR.M.

RICARDO says in her description of the Nova Guinea females: of *T. illustris* RIC. „three of the females vary in the following particulars, which however hardly seem specific differences. The beard is whitish, the pubescence on the fore coxae same colour. Palpi appear somewhat stouter and shorter, with the point shorter. Forehead velvetyblack and the frontal callus blackish, pubescence on forehead blackish, pubescence on breast white. Wings brownish, with the apex and posterior border paler and pale streaks and centres in the

cells." According to my opinion the given differences suffice to create a new species, as likewise will follow from the description given underneath. Some size as *T. illustris*.



Textfig. 264.

T. flammeus s. s. ♀.

a. forehead, b. antenna, c. palpi, d. wingstructure.

The Head. (Textfig. 264). Forehead velvety-black, black haired, 0,42 narrower anteriorly than it is at vertex, index 6,5. Callus black, rather broad, cylindrical, linear extension distinctly shorter than in *T. illustris* Ric. Subcallus white tomentose. Upper cheeks blackish, lower cheeks white, both white haired. Beard white. Palpi short, stout, second joint strongly swollen at base, ending in a triangular

point. Antennae black, black haired, second joint with short dorsal spine, third joint, basal annulation shorter and broader than in *T. illustris* Ric., 1,1 times as long as its widest part, 0,92 times as long as the stylus.

Thorax red. Breast white haired on mesosternumlobus, white haired tufts at base of wings and behind. Wings darkbrown to the apex and similar streaks along the veins, posterior border paler. Appendix long. Halteres blackbrown. Legs almost identical to those in *T. illustris*, femora with a few white hairs on their distal lateral borders. Fore coxae sootygrey, white haired.

Abdomen black haired, with some white hairs on the lateral borders of the first tergite.

246. *Tabanus lentisignatus* nov. spec. (♀). Pl 17, Fig. 3; Textfig. 265.

Habitat:

Type ♀ from Sarawak, labelled *T. fumifer* WALKER, WALLACE Coll. BR.M.
1 ♀ from Tebing Tinggi, Kelantan, F.M.S., V. KNIGHT 7.20 Coll. R.M.S.

Both males were incomplete. The black, small-faceted area of the eyes occupies about 2/3 of the eyesurface. Palpi chocolatebrown, black haired. Antennae blackbrown, third joint redbrown. Thorax dark chocolatebrown, black haired, intermixed with some copperredbrown hairs. Wings tinged brownish, without appendices. Legs with havannabrown tibiae, darker than those of the female *T. fuscicauda* BIGOT. Abdomen brighter havannabrown, with a median black lentiform marking on the second segment, wholly black haired.

Table of dimensions.

Bodylength more than	10	m.M.
Width of thorax	5,2	„

Width of abdomen	5,2	„
Wingexpanse	31,2	„
Length of head	3,5	„
Length of thorax	6,2	„
Length of wing	18	„
Breadth of wing	4,8	„



Textfig. 265.

T. lentisignatus s. s. ♂. antenna.

The Head. (Textfig. 265).

Upper eyepart large-faceted, darkbrown, the small-faceted part extending to the vertex. Subcallus dark reddishbrown. Cheeks same colour, reddishbrown haired. Beard black. Face yellowishbrown. Antennae, first joint blackbrown, black haired, protruding caplike

over the second, black fringed joint, the latter bearing a distinct dorsal hump. Third joint dusky reddishbrown at base, then blackbrown to black, tooth distinct, blunt, basal annulation 2 times as long as its widest part.

Thorax as described. Breast and sides dark reddishbrown, black haired. Wings yellowishbrown with diffuse shadows along the olivebrown veins, foreborder yellowishbrown, stigma tawny. Halteres dull reddishbrown. Legs. Coxa, trochanter and femur blackbrown, black haired, tibia blackbrown, paler to the base, black haired. Tarsalia black. Second leg more reddish, femur dark chocolatebrown, yellowishbrown tomentose on the ventral surface, knee yellowishbrown, black haired, tibia yellowishbrown at extreme base, then blackbrown, black haired. Third leg identical, femur without a yellowishbrown knee.

Abdomen dull havannabrown, black haired, ventral surface reddishbrown, with a black longitudinal stripe in the median line.

From *T. fuscicauda* BIGOT it is distinguishable in the colour of the beard, the length of the stylus and the colouring of the tibiae.

247. *Tabanus recusans* WALKER (♀). Textfig. 266.

References:

WALKER, Proc. Linn. Soc. London III, p. 83 (1859).

RICARDO, Nova Guinea IX, p. ... (1914).

Habitat:

Type ♀ from Aroe Islands

Coll. BR.M.

1 ♀ from Nova Guinea, Noordrivier 15/19.5.'07, LORENTZ

Coll. N.A.M.

1 ♀ Salawati, BERNSTEIN

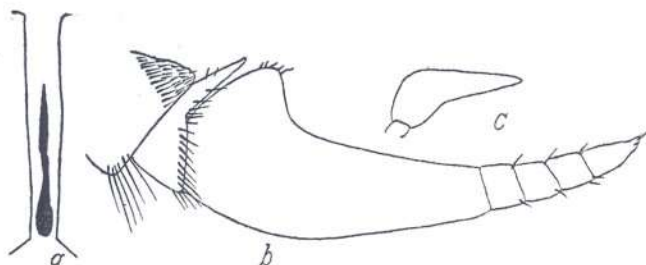
Coll. L.M.N.H.

1 ♀ Haroeke, HOEDT

Coll. L.M.N.H.

A bluishblack species not unlike *T. caerulescens* MACQ. Forehead rather narrow, greybrown. Callus pear-shaped, black in type, reddishbrown at base in the Nova Guinea ♀, linear extension filiform. Subcallus, cheeks and face velvetybrown, black haired. Beard black. Palpi long, dark brown, black haired.

Antennae, dark olivebrown, black haired on basal joints, third joint reddish-yellow, redbrown in the Nova Guinea ♀, stylus black. Thorax bluishblack, with 2 brown longitudinal stripes, black haired. Wings rather clear, Legs blackish, tibiae yellowredbrown, dark tipped. Abdomen bluishblack, black haired. Length 16,5—17 m.M.



Textfig. 266.

T. recusans WLK. ♀

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 266). Forehead slightly narrower at base than it is at vertex index 9. Palpi rather long, second joint swollen at base, tapering to a rather acute point. Antennae, second joint with long spur, third joint with distinct blunt tooth, basal annulation 1,95 times as long as its widest part, 1,9 times as long as the black stylus.

Thorax as mentioned, pteropleuron redbrown, breast and sides bluishgreybrown, black haired. Wings, foreborder reddishbrown, hindborder paler, stigma long, redbrown. Halteres redbrown. Legs blackish, all femora black or tawnybrown, black haired, fore tibiae yellowredbrown on basal half, apex blackbrown, wholly black haired, middle tibiae almost wholly dark yellowredbrown, hind tibiae darker on apical half, black haired. In the Nova Guinea ♀, the tibiae are brownred at base.

Abdomen bluishblack, denuded, remainder of pubescence black, ventral surface bluish on basal 2 segments, black haired.

248. *Tabanus atripilosus* nov. spec. (♀) Textfig. 267.

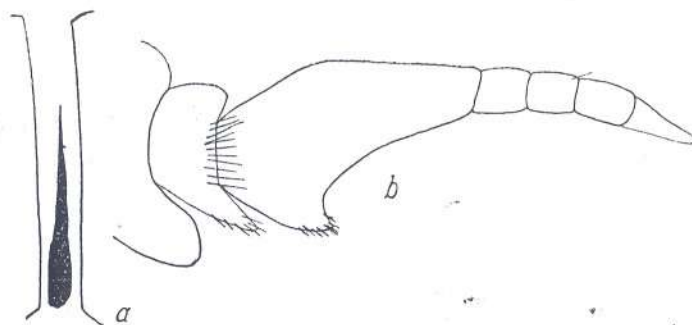
Habitat:

Type ♀ from Sumatra, Kaban Djahe, near Toba Lake on buffalo, VAN DER REEST Coll. V.S.L.

A dark velvetybrown species. Forehead pale havannabrown, black haired. Callus black, club-shaped, linear extension long, ending in a fine point. Subcallus and upper cheeks yellow brown, lower cheeks and face black haired. Beard black. Palpi reddish brown, dull, ending blunt, thick black haired. Antennae dark brown, black haired on basal joints, third joint sootyblack, with distinct tooth. Thorax velvetybrown, black haired, with 3 indistinct, dark brown, longitudinal stripes. Tufts at base of wings yellowbrown. Wings, first posterior cell slightly narrower at opening. Legs dark blackishbrown, tibiae reddish. Abdomen uniformly reddishbrown, black haired.

Table of dimensions.

Bodylength	19,5 m.M.
Width of thorax	7 „
Width of abdomen	7 „
Wingexpanse	40 „
Length of head	3 „
Length of thorax	8 „
Length of abdomen	10 „
Length of wing	16,5 „
Breadth of wing	6 „
Foreheadindex	7,4 „



Textfig. 267.

T. atripilosus s.s. ♀. a. forehead, b. antenna

The Head. (Textfig. 267). Forehead slightly darker near the callus. Callus not reaching the eyes. Palpi stout. Postocular rim pale brown, black haired. Antennae, first joint dark brown, black haired, second joint blackbrown, black haired, dorsal hump blunt, third joint, basal annulation 1,65 times as long as its widest part,

1,2 times as long as the stylus, tooth prominent, crowned with black hairs.

Thorax. Pteropleuron yellowbrown, black haired. Scutellum same colour as scutum. Shoulders black haired. Breast and sides dark velvetybrown, black haired, mesosternum lobus grey tomentose. Wings, foreborder yellowbrown, stigma dark yellowbrown. Veins accompanied by brown shadows. Halteres, club yellowbrown, stalk redbrown. A hairtuft just underneath the wings is orangebrown. Legs. First leg. Coxa dark velvetybrown, trochanter black, femur similar, knee yellowbrown, tibia slightly redbrown at base, elsewhere black, tarsalia black, whole leg black haired. Second leg similar, tibia reddishblackbrown, tarsalia darkbrown, black haired. Third leg tibia blackbrown, tarsalia black, whole leg black haired.

Abdomen uniformly reddishbrown, slightly paler at segmentations, black haired.

249. *Tabanus oviventris* nov. spec. (♀), Pl. 16, Fig. 2; Textfig. 268.

Habitat:

Type ♀ from Moeara Tagor, Tamiang, Kota Nopan, Tapanoei, Sumatra on buffalo 11.7.'23, LOBEL

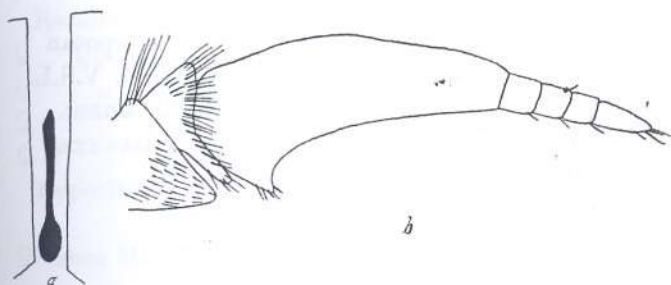
Coll. V.S.L.

A dark blackbrown species, allied to *T. tristis* WULF and *T. macfarlanei* Rrc., distinguished inter alia by the darker brown antennae, the brownish black

legs, the brownish wings, the redbrown, egg-shaped abdomen, being darker at apex, without any white pubescence. Thorax darkbrown, black and reddish-yellow haired. Frons narrow, velvety-redbrown. Callus egg-shaped, with sword-blade-shaped linear extension. Palpi brownblack, black haired. Beard black.

Table of dimensions.

Bodylength	16	m.M.
Width of thorax	5,2	,,
Width of abdomen	6	,,
Wingexpanse	31,6	,,
Length of head	3	,,
Length of thorax	7,2	,,
Length of abdomen	8,5	,,
Length of wing	13,2	,,
Breadth of wing	5	,,
Foreheadindex	8	



Textfig. 268.

T. oviventris s.s. ♀. a. forehead, b. antenna.

The Head. (Textfig. 268). Forehead $\frac{1}{3}$ narrower anteriorly than it is at vertex, deep velvety-redbrown, black haired. Callus black, bottle-shaped, not reaching the eyes, with broad linear extension. Subcallus dull, goldenbrown, yellowish tomentose near the feet of the antennae. upper border, just

under the eyes, darker. Upper cheeks dark dullbrown, lower cheeks yellowish brown, black-brown haired. Beard black. Face pale velvetybrown, black haired. Palpi black, black haired, second joint bluishgrey tomentose on outer border, inner border dark redbrown, apex blunt. Antennae. First joint yellowbrown, darker olivebrown on dorsum, black haired, second joint olive-redbrown with broad dorsal hump, black fringed, third joint slender, blackbrown at base, dusky to the apex, basal annulation 2,27 times as long as its widest part, 2 times as long as the black stylus. Proboscis black, yellowbrown and black haired. Postocular rim black haired.

Thorax dark havannabrown, more redbrown on foreborder, rubbed on the middle of the disc. Scutum black haired, intermixed with rather long, copper-redyellow hairs, especially at the hindborders of scutum and scutellum. Tufts at base of wings and behind yellowbrown. Pteropleuron reddish havannabrown, black haired. In fresh, unrubbed specimens the number of copper-redyellow hairs on disc of scutum will probably be much greater. Shoulders black haired. Breast and sides sooty velvetybrown, black haired. Wings without appendices, foreborder caramelbrown, stigma dark havannabrown, remainder of wing uniformly pale brownish,

with some darker shadows along several veins. Halteres stalk reddish-brown, club dull yellowish-brown. Legs. First leg. Coxa dark velvetybrown, black haired, trochanter shining brown-black, femur similar, paler yellowbrown tomentose, black haired. Tibia basal half yellowwhite to olivebrown, gradually darkening to the black apex, wholly black haired. Tarsalia black. Second leg. Coxa sootybrown, femur as in first leg, dull brown tomentose, knee yellowbrown, black haired. Tibia yellowbrown to dark olivebrown on basal $\frac{2}{3}$, apex black, thick black haired all over. First tarsale dark olivebrown at base, then black, black haired, other tarsalia black. Third leg identical, tibia darker, dark olivebrown, black at apex, black haired, tarsalia black.

A b d o m e n broad egg-shaped mahoganybrown, black haired, with an indistinct black spot on the first segment in the middle and a paler haired spot at each side of the scutellum. Ventral surface black haired, with a black median longitudinal band, more reddish brown sides and yellowbrown segmentations.

250. *Tabanus tristis* VAN DER WULP (♀) Pl. 16, Fig. 4; Textfig 269.

VAN DER WULP, Sumatra Exped. Dipt. 17,5, pl. I, fig. 9 (1881).

RICARDO, Rec. Ind. Mus. IV, p. 163.

Isle Sumatra

Type ♀ from Datar, 5.'77

Coll. L.M.N.H.

Residency Tapanoeli

Ressort Padang Sidempoean, Mantrie Ressort Padang Sidempoean

Coll. V.S.L.

2 ♀ ♀ from Hoeta Olboeng, Moeara Tais, on buffalo 30.6.'23, LOBEL

6 ♀ ♀ „ Bintoedjoe, Moeara Tais on buffalo, LOBEL and BAKKER
respectively 3 ♀ ♀ on 30.6.'23

1 ♀ „ 7.9.'23

1 ♀ „ 2.5.'24

1 ♀ „ 6.7.'24

4 ♀ ♀ from Si Balapak, Moeara Tais on buffalo, BAKKER

respectively 1 ♀ on 7.9.'23

1 ♀ „ 6.7.'24

2 ♀ ♀ „ 5.8.'24

5 ♀ ♀ from Pidjor Koling, Pidjor Koling on buffalo, LOBEL and BAKKER

respectively 2 ♀ ♀ on 30.6.'23

2 ♀ ♀ „ 7.9.'23

1 ♀ „ 6.8.'23

5 ♀ ♀ from Si Doea doea, Pidjor Koling on buffalo, LOBEL and BAKKER

respectively 3 ♀ ♀ on 30.6.'23

1 ♀ „ 6.8.'23

1 ♀ „ 5.6.'24

1 ♀ from Si Gala Gala, Marantjar, on cattle 3.8.'23, BAKKER

2 ♀ ♀ „ Hapesong, Marantjar, on cattle 6.8.'24, BAKKER

3 ♀ ♀ „ Si Hitang, Batoe na Doea, BAKKER

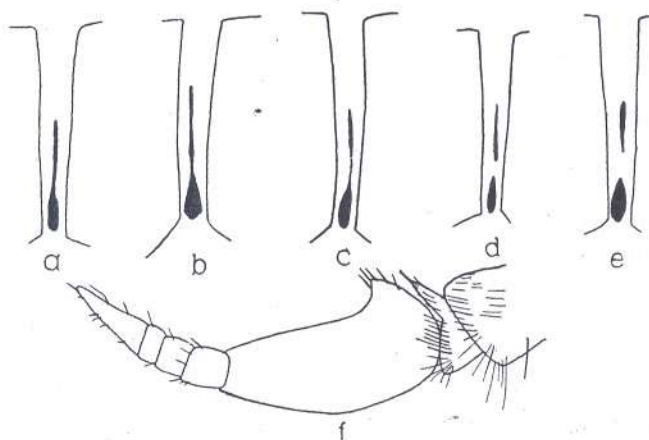
- respectively 2 ♀ ♀ on horse on 6.8.'23
 1 ♀ „ buffalo „ 6.8.'23
 Ressort Padang Sidempoean, Mantrie Ressort Binanga
 14 ♀ ♀ from Si Oendol, Paringgonan, LOBEL and BAKKER
 respectively 2 ♀ ♀ on buffalo 18.7.'23
 2 ♀ ♀ „ „ 26.8.'23
 8 ♀ ♀ „ „ 1.7.'24
 2 ♀ ♀ „ horse 1.7.'24
 18 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, BAKKER
 respectively 4 ♀ ♀ on buffalo 27.8.'23
 6 ♀ ♀ „ „ 2.7.'24
 8 ♀ ♀ „ horse 2.7.'24
 7 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, BAKKER
 respectively 2 ♀ ♀ on buffalo 28.8.'23
 1 ♀ „ „ 3.7.'24
 2 ♀ ♀ „ horse 28.8.'23
 2 ♀ ♀ „ „ 3.7.'24
 Ressort Padang Sidempoean, Mantrie Ressort Sibolga
 1 ♀ from Siboeleean, Siboeleean, Sibolga on cattle 9.6.'24, BAKKER
 Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
 1 ♀ from Sigengoe, Kota Nopan on buffalo 11.7.'23, LOBEL
 1 ♀ „ Kota Nopan on buffalo 26.5.'24, BAKKER
 1 ♀ „ Kajoe Djati, Kota Siantar on buffalo 4.6.'24, BAKKER
 2 ♀ ♀ „ Kota Siantar, Kltta Nopan, LOBEL
 respectively 1 ♀ on horse 27.6.'23
 1 ♀ „ buffalo 27.6.'23
 1 ♀ from Moeara Tagor, Tamiang on buffalo 14.5.'24, BAKKER

A dark blackbrown, mainly black haired species. Breast and segmentations to the ventral scutes of the abdomen white haired. Forehead narrow, black-brown as also cheeks, subcallus and face. Callus blackbrown, egg-shaped or cylindrical. Beard white in VAN DER WULP's type, black in the other specimens. Palpi blackbrown, black haired. Antennae dull brown, third joint reddish-yellowbrown, black tipped, tooth distinct. Scutum blackbrown, black and brownyellow haired. Wings sootygrey, with indistinct apical shadow. Legs brownblack, mainly black haired.

Table of dimensions.

Bodylength	varying from 11,2 m.M. to 12,6 m.M.				
Width of thorax	„	„	3,8	„	— 4,5 „
Width of abdomen	„	„	4	„	— 5 „
Wingexpanse	„	„	23,8	„	— 26,5 „

Length of head	„	„	2	„	—	2,5	„
Length of thorax	„	„	4	„	—	5,5	„
Length of abdomen	„	„	6	„	—	8,4	„
Length of wing	„	„	10	„	—	11	„
Breadth of wing	„	„	3,5	„	—	4,8	„
Foreheadindex	„	„	6,25		—	8,66	



Textfig. 269.

T. tristis v.d. WULF. ♀. a—e. forehead, f. antenna.

The Head. Eyes wholly green. Forehead 0,25—0,34 narrower anteriorly than it is at vertex, black haired. Callus with staminiform linear extension, sometimes callus and linear extension are separated. Lower cheeks whitish tomentose, black haired as is the face. Proboscis black. Palpi, first joint black-brown, bluishgrey tomentose, black haired, second joint bluishgrey tomentose at base only, black haired. Antennae, first joint dull yellowbrown, black haired, second joint more red-

brown, black fringed, dorsal spine blunt, third joint reddishyellowbrown on the basal annulation, which is 1,7 times as long as its widest part, 1,25 times as long as the black stylus.

Thorax blackbrown, foreborder dark havannabrown, grey tomentose, black haired. Disc of scutum black haired, sides of scutum and scutellum prevailing brownyellow haired, hairtufts at base of wings white, intermixed with black hairs. Sides and breast sootybrown, brownishwhite haired, mesosternumlobus bluish tomentose, black haired. Wings as mentioned with brownish shadows along several veins, no appendix. Halteres brownblack. Legs, first leg, coxa brownblack, white haired at base, apex black haired, trochanter blackbrown, femur black, black haired, distal lateral border white and black haired, knee yellowbrown, tibia bluishblack, brownish at base, black haired. Tarsalia black. Second leg identical, femur white haired at base. Third leg similar.

Abdomen brownishblack, egg-shaped, segmentations slightly paler, first segment with a dull brown spot at each side of the scutellum, and a group of yellowbrown hairs in the middle. Lateral borders of the first 4 tergites brickredbrown, white haired, other white hairs tufts are to be found in the lateral angles of the 5th and 6th segment. Ventral surface grey-black, black haired with paler white haired segmentations to the first four segments, 5th segment with a few white hairs at sides only.

As the type and the other females differ only in the colour of the beard I feel not excused to make two distinct species.

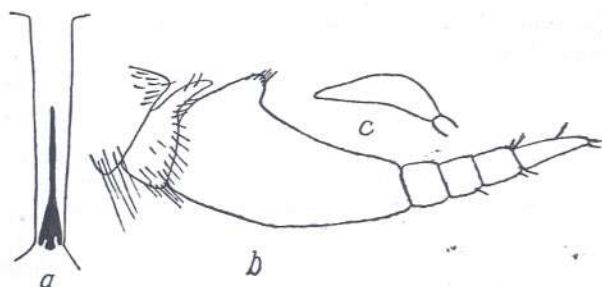
251. *Tabanus opalescens* nov. spec. (♀). Textfig. 270.

Habitat: *

Type ♀ from S. N. Guinea, Heuvel Bivak 800 M. 7/15.11.'09, LORENTZ
Coll. N.A.M.

2 ♀♀ from Kloof Bivak, VERSTEEG 31/10.'13

A species allied to *T. obtusipalpis* SCHUURMANS STEKHOVEN, but quite certainly distinct, confer the more acuminate palpi, the shape of forehead and callus, and the shape of the third antennal joint. Forehead narrow, black haired. Callus black, egg-shaped, linear extension fine. Subcallus and upper cheeks pale redbrown, black haired, lower cheeks bluishgrey, white haired. Beard white. Face white, black and white haired. Palpi redbrown, black haired. Antennae dark redbrown, black haired on basal joints, third joint black, tooth distinct. Thorax black, white tomentose, black haired. Wings brownish, appendiculate. Legs darkbrown, mainly black haired. Abdomen black, white tomentose on the basal 2 segments, white fringed at the segmentations, black haired elsewhere. Length 13,5 m.M., Wingexpanse 27.2 m.M.



Textfig. 270.

T. opalescens s. s. ♀. a. forehead, b. antenna, c. palpe.

joint with a reddishyellow spot at base, then black, basal annulation 1,54 times as long as its widest part, 1,2 times as long as the stylus.

Thorax bluishbrownblack, white tomentose, black haired, intermixed with white hairs, the latter being especially numerous at hindborder of scutum and in the tufts at base of wings and behind and along the border of the scutellum. Lateral borders of scutum brownish, white tomentose, pteropleuron bluishblack, black haired. Sides and breast sootygrey, white haired, mesosternumlobus black haired. Wings brownish, foreborder yellowbrown, stigma paler havannabrown, reddishbrown shadows accompanying the veins, appendix long, curved. Halteres stalk redbrown, club dull blackbrown. Legs. First leg. Coxa brownblack, grey tomentose, black and white haired, trochanter blackish, femur blackbrown, black haired, distal lateral border grey tomentose, white haired, knee yellowbrown. Tibia reddishbrown on basal half, apex blackbrown, black haired, tarsalia black. Second leg identical, tibia dark yellowbrown, redbrown at apex, black haired, first tarsale redbrown at base, then blackbrown, black haired. Third leg similar.

Abdomen as mentioned, bluishblack, black haired, segmentations slightly paler, white fringed on dorsum and venter on the first 5 segments in the middle, lateral borders of the first 4 tergites brownishblack, white haired, fifth segment with a white hairtuft only, first segment with a small, white haired spot at each side of the scutellum. Ventral surface bluishgrey in some lights, darker in the middle, in other lights brownblack, black haired, except on the 1st—6th segmentation, which are white fringed.

The Head. (Textfig. 270). Forehead bluishwhite at base, black at apex, 0.3 narrower anteriorly than it is at vertex, index 8.1. Callus almost reaching the eyes. Palpi, first joint pale redbrown, black haired, second joint same colour, whitish tomentose on outer border, inner border yellowbrown, ending with a rather long acute point, black haired. Antennae, first joint protruding caplike over the second joint, which bears a dorsal spur, third

From *T. recusans* Wlk. to which it resembles in many respects *T. opalescens* is distinguishable inter alia in that the antennae are darker, the abdomen is bluishblack and not brown, and that the wings are paler.

252. *Tabanus macfarlanei* RICARDO (♀) Textfig. 271.

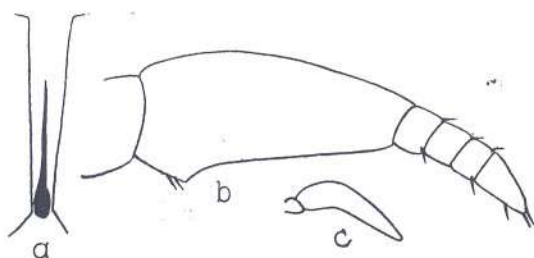
References:

RICARDO, Bull of Ent. Res. VI, p. 406 (1916).

Habitat:

Type ♀ and another female from Hongkong, MACFARLANE Coll. BR.M.

A blackish species. Forehead narrow, greyishbrown, black haired. Callus black, cylindrical, with a fine linear extension. Subcallus blackbrown. Cheeks and face dark velvetybrown, black haired. Beard black. Palpi blackbrown, antennae redbrown, both black haired. Thorax black, tufts at base of wings white, elsewhere black haired. Wings grey, with redbrown foreborder and apical shadow. Appendix absent. Legs blackbrown, black haired. Abdomen blackbrown, black haired.



Textfig. 271.

T. macfarlanei Ric. ♀.

a. forehead, b. antenna, c. palpe.

The Head. (Textfig. 271). Forehead greyishbrown, black haired, 0,6 narrower anteriorly than it is at vertex, index 10,6. Callus black, cylindrical, almost reaching to the eyes, with a fine pointed linear extension. Subcallus, face, etc. as mentioned. Palpi blackbrown, curved, with a long point. Antennae redbrown on first 2 joints, third joint reddishyellow, with hardly any tooth, basal annulation about 2 times as long as its widest part, 1,67 times as long as the reddishyellow stylus with its darker, blackish apex.

Thorax black, slateblue on foreborder, black haired, intermixed with a number of white hairs, present especially at hindborder of scutum and in the tufts at base of wings and behind. Scutellum same colour as scutum. Breast blackbrown, black haired. Wings grey with redbrown foreborder, similar apical shadow, covering radial and cubital cells, no appendix. Legs blackbrown, black haired. Middle and hind tibiae paler than the conformable femora, colour more reddishbrown.

Abdomen blackbrown, apex blunt, black haired. The second female presents some whiteyellow hairs on the first tergite in the middle.

253. *Tabanus fuscibarbus* nov. spec. (♂). Textfig. 272

References:

MACQUART, Dipt. Exot. Suppl. V, p. 47 (1855).

„ Dipt. Exot. Suppl. III, p. 170 (1847).

MACQUART, Mem. Soc. des Sc. de l'Agric. et des Arts de Lille 2e Partie, p. 170 (1848).

RICARDO, Rec. Ind. Mus. IV, p. 173 (1911).

Habitat:

Type ♂ from Java, PAYEN

Coll. BR.M.

AUSTEN wrote on the label attached to this ♂ „N.B. This is the specimen referred to by MACQUART as *T. rubicundis* ♂." To me however it appears doubtful, whether the specimen really belongs to this species. Note colour of front tibiae, E. E. AUSTEN 3.11.'22.



Textfig. 272.

T. fuscibarbus s.s. ♂
eye.

The Head. (Textfig. 272). Eyes with curved, small-faceted black area, prolonged to the vertex by a distinct border. The area of large facets extends much further downwards than in *T. mentitus*. Subcallus reddishbrown. Pubescence on cheeks and beard reddish brown, intermixed with some black hairs. Palpi dark yellowbrown, first joint yellow haired, second joint rather long, club-shaped, yellow haired at base, black haired at apex. Antennae reddish-brown, first joint black haired on dorsum, yellow haired elsewhere, second joint black fringed, with a long spur, third joint broken off.

Thorax darkbrown, denuded. Pteropleuron reddishbrown, black haired, Breast dull redbrown, yellow haired. First leg. Coxa pale coffeenutbrown, pale yellowbrown haired. Femur dark redbrown, distal lateral border dirty isabellabrown haired. Tibia pale havanna-brown, black haired. Tarsalia black. Second leg missing. Third leg. Coxa greyish brown, trochanter redbrown, femur leatherbrown, dorsum black haired at base, then golden-reddishyellow haired, lateral borders yellow haired.

Abdomen reddish leatherbrown, darker at apex, black haired. Ventral surface yellowbrown, yellow haired, sixth segment yellow haired at segmentation only, black haired elsewhere, seventh segment wholly black haired.

254. *Tabanus geniculatus* VAN DER WULP (♀) Textfig. 273.

References:

VAN DER WULP, Sumatra Exped. Dipt. 16,2 pl. 1, figs. 7, 7a (1881).

RICARDO, Rec. Ind. Mus. IV, p. 200 (1911).

Habitat:

Isle Sumatra

Type ♀ from Lebong 5.'78

Coll. L.M.N.H.

Residency Tapanoeli

Ressort Balige

9 ♀ ♀ from Hoendoelan Parmaksian, Balige on buffalo 21.12.'21, VAN DER REEST (Textfig. 273 a, b, d).

Coll. V.S.L.

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

7 ♀ ♀ from Si Boeni boeni, Siboeleean, Sibolga, LOBEL and BAKKER

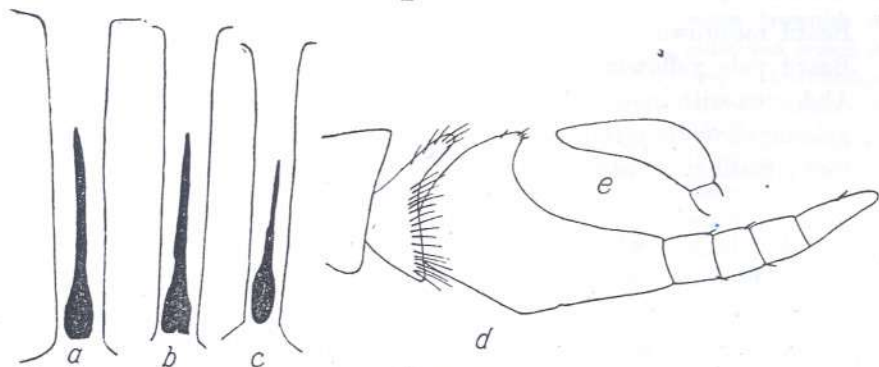
respectively	1 ♀	on horse	23.5.'23	
	1 ♀	„ „	23.7.'23	
	1 ♀	„ buffalo	14.12.'23	
	1 ♀	„ „	10.4.'24	
	1 ♀	„ „	8.5.'24	
	1 ♀	„ cattle	4.3.'24	
	1 ♀	„ „	17.11.'24	
1 ♀	from Sungei Kumbang,	Korinchi 4500 Feet	4.'14,	JACOBSON
				Coll. BR.M.
1 ♀	„ Sandaran Agong,	Korinchi Lake 2500 Feet	5/6.'14,	JACOBSON
1 ♀	„ Muara Sako	10'15,	JACOBSON	(Textfig. 273 c, e).
1 ♀	„ Suban Ajam	1.'16,	Bengkoelen	JACOBSON,
3 ♀ ♀	„ Tanang Talu	5.'15,	JACOBSON	Coll. N.A.M.
1 ♀	„ Ait Njuruk,	Dempu 1400 M.	8.'16,	JACOBSON
1 ♀	„ Lubuk Selasih	1000 M.	9.'20,	JACOBSON
1 ♀	„ Padang Highlands,	Solok 1889,	MAX WEBER	
2 ♀ ♀	„ Padang Highlands,	Solok	STOLZ	Coll. L.M.N.H.
2 ♀ ♀	„ Fort de Kock	11.'23	MEERENS	Coll. V.S.L.

T. geniculatus WULF is a dark redbrown species. In general appearance it resembles *T. fumifer* WLK., there are however no median abdominal triangles and the species is larger. Forehead black, black haired, rather broad, parallel-sided. Callus club-shaped, redbrown to black, grooved in the middle, linear extension stout, black. Subcallus, cheeks and face velvetybrown, black haired. Beard black. Palpi stout, blackish redbrown, ending with an obtuse point, black haired. Antennae redbrown, black haired on basal joints, third joint reddish blackbrown with very prominent tooth. Thorax brown, yellowbrown and black haired. Wings with brown shadows along the veins. Legs black or blackbrown, black haired. Abdomen broad with broad apex, black haired.

Table of dimensions.

Bodylength	varying between 19,2 m.M. to 21,6 m.M.				
Width of thorax	„	„	6,2	„	— 7,6 „
Width of abdomen	„	„	7	„	— 9 „
Wingexpanse	„	„	40,2	„	— 43,2 „
Length of head	„	„	3	„	— 3,5 „
Length of thorax	„	„	7,2	„	— 9 „
Length of abdomen	„	„	10,2	„	— 11,5 „
Length of wing	„	„	16,8	„	— 18,2 „
Breadth of wing	„	„	6	„	— 6,5 „
Foreheadindex	„	„	7	„	— 8 „

The Head. (Textfig. 273). Forehead yellowish tomentose at base, greybrown or greyish in other specimens, blackbrown haired, almost the same width in several specimens, in other specimens 0.16–0.25 narrower anteriorly than it is at vertex. Callus gradually tapering to the stout linear extension; base of callus redbrown, then darkening becoming blackbrown, linear extension black. Postocellar rim black haired. Palpi, first joint blackish, bluegrey tomentose, black haired, second joint stout, redbrown, black haired. Antennae, second joint with long dorsal spur, third joint reddishblackbrown, basal annulation curved, 1.4 times as long as its widest part, 0.94 times as long as the stylus, tooth black, black haired. Proboscis black, stalk black haired, sugarflaps dull dirtybrown haired.



Textfig. 273.

T. geniculatus RIC. ♀. a–c. forehead, d. antenna, e. palpe.

Thorax dull reddish yellowbrown, black haired; intermixed with some yellowbrown hairs. Scutum, with a faint median and 2 indistinct redbrown longitudinal stripes, lateral borders of scutum grey white, hindborder of scutum goldenbrown, yellowbrown haired. Tufts at base of wings and behind yellowbrown or reddishbrown. Pteropleuron hazelnutbrown, black haired, intermixed with some yellow hairs, shoulders black haired. Breast black, black haired, epimeron prothoracis redbrown, redbrown haired; mesosternumlobus blackishbrown, bluegrey at hindborder. Wings tinged yellowbrown, with bright yellowbrown shadows along the veins. Anal cell yellowbrown, stigma siennabrown, foreborder bright yellowbrown, no appendix. Halteres reddishbrown. Legs. First leg. Coxa velvetyreddishbrown with bluish cinereous tomentose spot, black haired, trochanter darkbrown, yellowish tomentose, blackbrown haired, femur black, black haired, knee yellowbrown. Tibia dull redbrown on basal half, apex black, black haired. Second leg. Coxa brownblack, with shining apical rim, black haired, trochanter shining blackbrown, femur black, yellowbrown tomentose, knee ochraceous yellow, tibia narrowly ochraceous at base, elsewhere black, redblack haired, tarsalia black, black haired as the other legparts. Third leg. Coxa reddishvelvetybrown, tibia deep reddishbrown at base, apex black, extreme apex narrowly ochraceous, tarsalia black, all parts black haired.

Abdomen redbrown, black haired, apex broad, first 2 segments blueblack, with a black spot in the middle of the second segment, first segment, with a median patch of copperredyellow hairs, lateral borders of tergites black haired, except on the segments 3–5, where one finds some yellowbrown hairs. Ventral surface redbrown with black or blackbrown, black haired median longitudinal band, pubescence elsewhere black.

GROUP XXII.

The species belonging to this Group have brownish wings. Abdomen havanna-

brown, with one or more black spots on the tergites. Moreover small inconspicuous yellow or white hairgroups may be found on one or more segments. Legs with yellow-brown or redbrown tibiae. This Group is allied with the 5th and 18th Group.

KEY 32.

Synopsis of species.

- 1a. Beard redbrown 2
 b. Beard pale yellowbrown, yellowwhite, or white 3
 2. Abdomen with median black spots on the first 2 dorsal scutes and median goldenyellow hairgroups on the same segments. Antennae reddishyellow tooth distinct. Scutum grey tomentose on foreborder

bipunctatus SCHUURMANS STEKHOVEN.

- 3a. Beard pale yellowbrown or yellowwhite. Antennae, basal annulation of third antennal joint redyellow at base, tooth distinct. Wings appendiculate or not. Legs darkbrown with all tibiae largely yellowbrown. Abdomen with a median black lentiform spot and small inconspicuous median groups of yellow hairs on the segments 2—5. lateral borders of the first 5 tergites wholly or partly yellow haired

brunnipes SCHUURMANS STEKHOVEN.

- b. Beard white. Antennae redbrown, tooth inconspicuous. Legs dark brown, tibiae olivebrown to redbrown at base. Abdomen with a longitudinal black spot on the second segment and a median dot of white hairs on the 1st segment lateral borders of the first 4 tergites white haired

brunniventer SCHUURMANS STEKHOVEN.

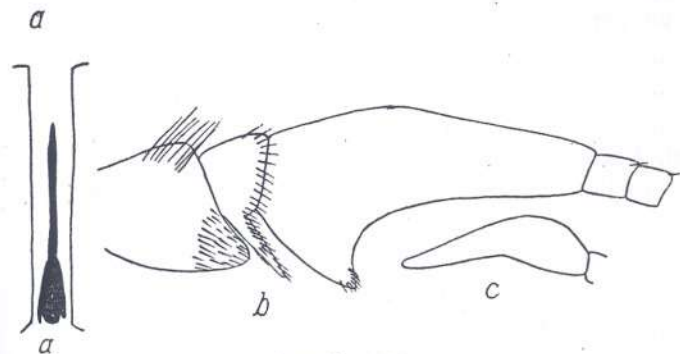
255. *Tabanus bipunctatus* nov. spec. (♀) Textfig. 274.

Habitat:

Type ♀ from Idenburg River, Nova Guinea, TER POORTEN 1911 Coll. N.A.M.

A label, written by RICARDO and attached to this specimen, mentioned *T. fuscicauda* BIG.? subform. It is however distinct. Forehead redbrown, black haired. Callus cylindrical, blackbrown, linear extension thick. Subcallus and upper cheeks ferrugineous, black haired, lower cheeks and face greywhite, white haired. Beard redbrown. Palpi orangeousyellowbrown, ending with a rather acute point, black haired. Antennae reddishyellow, tooth distinct. Thorax dull dark havannabrown, foreborder grey tomentose, with redbrown longitudinal stripes, yellow and black haired. Wings brownish. Legs with yellowbrown tibiae. Abdomen dark havannabrown, black haired, with a median black spot on the first 2 segments and groups of goldenyellow hairs in the middle of same segments at the segmentations. Bodylength: 15,2 m.M.; Wingexpanse 33,5 m.M.

The Head. (Textfig. 274). Forehead almost the same width throughout, index 6.47. Palpi first joint orangeousbrown, black haired, second joint, swollen at base, orangeousyellowbrown, black haired. Antennae, first joint redbrown, protruding caplike over the second joint, black haired, the latter with a distinct dorsal hump, third joint reddishyellow on basal annulation, which is 2 times as long as its widest part, 2.26 times as long as the dark redbrown stylus.



Textfig. 274.

T. bipunctatus s. s. ♀. a. forehead, b. antenna, c. palpe.

Thorax havannabrown, with at least 2 redbrown longitudinal stripes. Tufts at base of wings brownish white. Sides and breast sootygrey, brownishyellow haired, mesosternumlobus black haired. Wings brownish, by the distinct brown shadows, which accompany the veins, foreborder reddishyellowbrown, stigma havannabrown. Halteres reddishyellowbrown. Legs. First leg. Coxa grey tomentose, yellowbrown haired, trochanter and femur blackbrown, knee narrowly yellowbrown. Tibia bright yellowbrown, on basal half, apex blackbrown, dorsum black haired, ventral surface reddishyellow haired on basal 1/2. Tarsalia black, black haired. Second leg, femur bluishgrey tomentose at base, darker, yellowbrown to the apex, dorsum black haired, distal lateral border redbrown haired, knee yellowbrown. Tibia reddishyellowbrown, dorsum black haired, ventral surface reddishyellow haired. Tarsalia dark redbrown, black haired. Third leg identical.

Abdomen incomplete, 4 segments being visible only, first segment with a median group of redyellow hairs and another similar group at each side of the scutellum, other segments yellow fringed at segmentations, black spots as mentioned. Ventral surface dark walnutbrown, black haired, segmentations reddish, yellow fringed.

256. *Tabanus brunnipes* nov. spec. (♀) Pl. 17, Fig. 2; Textfig. 275.

References:

BIGOT, Mém. Soc. Zool. France V, p. 658 (1892).

„ Mém. Soc. Zool. France V, p. 668 (1892).

RICARDO, Rec. Ind. Mus. IV, p. 217 (1911).

Habitat:

Isle Sumatra

Type ♀ from Penantin, Kaban Djahe on buffalo 4.'23, VAN DER REEST

(Textfig. 275 c)

Coll. V.S.L.

2 other females from same locality on buffalo 4.'23, VAN DER REEST

5 ♀♀ from Mangga Belawan, Kaban Djahe on buffalo 4.'23, VAN DER REEST

3 ♀♀ „ Boeloe Ajam, Kaban Djahe on buffalo 4.'23, VAN DER REEST

Residency Tapanoei

Ressort Padang Sidempoean, Mantrie Ressort Binanga

- 3 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, BAKKER
 respectively 1 ♀ on buffalo 23.8.'23
 1 ♀ „ „ 2.6.'24
 1 ♀ „ horse 1.6.'24
- 4 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, BAKKER
 respectively 1 ♀ on horse 16.7.'23
 1 ♀ „ „ 3.12.'23
 1 ♀ „ buffalo 3.12.'23
 1 ♀ „ „ 3.6.'24
- 6 ♀ ♀ from Si Oendol, Paringgonan, BAKKER
 respectively 1 ♀ on horse 18.7.'23
 1 ♀ „ „ 25.8.'23
 1 ♀ „ „ 1.5.'24
 1 ♀ „ „ 3.6.'24
 3 ♀ ♀ „ buffalo 25.8.'23
- Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
- 8 ♀ ♀ from Kota Nopan, Kota Nopan, LOBEL and BAKKER
 respectively 1 ♀ on horse 25.11.'22
 3 ♀ ♀ „ „ 24.4.'24 (Textfig. 275 b, e, g)
 3 ♀ ♀ „ „ 26.5.'24
 1 ♀ „ buffalo 4.1.'24
- 4 ♀ ♀ from Kota Siantar, Kota Siantar on buffalo 4.6.'24, BAKKER
 1 ♀ „ Kajoe Djatie, Kota Siantar, on buffalo 4.6.'24, BAKKER
 1 ♀ „ Moeara Tagor, Tamiang on horse 27.4.'23, LOBEL
 7 ♀ ♀ „ Kajoe Tanan Dr. HAGAN on cattle on 3.18.6.'07
 (Textfig. 275 a, d, f) Coll. BR.M.
- 2 ♀ ♀ „ Balun, Padang Highlands 6.'14, JACOBSON Coll. N.A.M.
 1 ♀ „ Gunung Teleman, Sumatra 6.'17, JACOBSON
 1 ♀ „ Tanang Talu 5.'15, JACOBSON
 1 ♀ „ Peak of Korinchi 8.'15, JACOBSON
 1 ♀ „ Suban Ajam, Bengkoelen 7.'16, JACOBSON

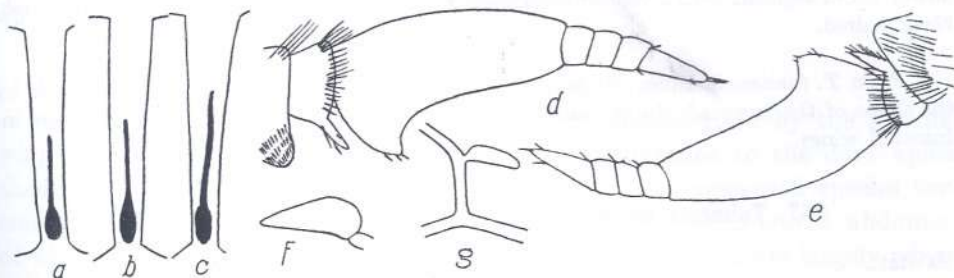
A species closely resembling *T. fuscicauda* BIGOT, thus giving Miss RICARDO an opportunity to bring the mentioned specimens from Kajoe Tanan to this species. It is however surely distinct. Forehead dull chocolatebrown, black haired, narrow. Callus lanceolate cylindrical, black, redbrown or yellowishredbrown, darker at apex, linear extension filiform. Subcallus and upper cheeks dull velvetybrown to dark havannabrown, blackbrown or black haired. Lower cheeks greywhite. Beard pale yellowbrown or yellowwhite. Face pale yellowbrown, black haired. Palpi yellowbrown, bluegrey tomentose, black haired on second joint, which ends blunt. Antennae redbrown, black haired on basal joints, third joint redyellow at base, then darker, tooth distinct. Thorax. Scutum dark chocolatebrown to blackbrown, black haired, foreborder yellowgrey tomentose, as

also the lateral borders of the scutum. Wings tinged yellowbrown to havanna-brown, appendix sometimes present. Legs darkbrown, with tibiae largely yellowbrown in all legs. Abdomen dull redbrown, black haired on the first 2 segments, blackbrown to the apex, segmentations narrowly paler. In well preserved specimens small inconspicuous groups of yellow hairs are found on the 2d—5th segment, hairfringes at the segmentations only. Second segment with a median black lentiform spot, lacking in some specimens.

Table of dimensions.

Bodylength	varying from 14,5 m.M. to 16,8 m.M.				
Width of thorax	"	"	4,8	"	5,5
Width of abdomen	"	"	5	"	6,5
Wingexpanse	"	"	29,4	"	35,1
Length of head	"	"	2	"	3,5
Length of thorax	"	"	5	"	7,2
Length of abdomen	"	"	7,2	"	10
Length of wing	"	"	12,2	"	14,8
Breadth of wing	"	"	4,2	"	5,8
Foreheadindex	"	"	8	"	11,33

The Head. (Textfig. 275). Forehead $1/3-1/2$ narrower anteriorly than it is at vertex, in type it is dull chocolatebrown, in other females from Kota Nopan it was dark redbrown to blackbrown, egg-shaped or cylindrical, grooved in the middle. Callus varying in colour from yellowishredbrown, darker blackbrown at apex to wholly black. In some specimens it almost reaches the eyes, in others it is separated from them by a larger space. Subcallus



Textfig. 275.

T. brunnipes s.s. ♀. a—c. forehead, d, e. antennae, f. palpe, g. wingstructure. . .

dull velvetybrown, dark havannabrown, redbrown or coffeebrown. Beard yellowishbrown to yellowbrownishwhite. On the face in rare instances some yellowwhite hairs were found to be intermixed between the black ones, in a single case black and redbrown hairs were observed on the upper border of the face. Postocular rim yellowbrown, black- or yellowbrown haired. Palpi, first joint yellowbrown, yellowbrown haired, second joint slender, with long obtuse point, redbrown, bluegrey tomentose, thick black haired, some yellowbrown hairs being visible at the base. Proboscis black or brownblack, black and brownblack haired. Antennae,

- 3 ♀ ♀ from Pasar Sibohoean, Djandi Lobi, BAKKER
 respectively 1 ♀ on buffalo 23.8.'23
 1 ♀ „ „ 2.6.'24
 1 ♀ „ horse 1.6.'24
- 4 ♀ ♀ from Hoeta Nopan, Hoeta Nopan, BAKKER
 respectively 1 ♀ on horse 16.7.'23
 1 ♀ „ „ 3.12.'23
 1 ♀ „ buffalo 3.12.'23
 1 ♀ „ „ 3.6.'24
- 6 ♀ ♀ from Si Oendol, Paringgonan, BAKKER
 respectively 1 ♀ on horse 18.7.'23
 1 ♀ „ „ 25.8.'23
 1 ♀ „ „ 1.5.'24
 1 ♀ „ „ 3.6.'24
 3 ♀ ♀ „ buffalo 25.8.'23
- Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
- 8 ♀ ♀ from Kota Nopan, Kota Nopan, LOBEL and BAKKER
 respectively 1 ♀ on horse 25.11.'22
 3 ♀ ♀ „ „ 24.4.'24 (Textfig. 275 b, e, g)
 3 ♀ ♀ „ „ 26.5.'24
 1 ♀ „ buffalo 4.1.'24
- 4 ♀ ♀ from Kota Siantar, Kota Siantar on buffalo 4.6.'24, BAKKER
 1 ♀ „ Kajoe Djatie, Kota Siantar, on buffalo 4.6.'24, BAKKER
 1 ♀ „ Moeara Tagor, Tamiang on horse 27.4.'23, LOBEL
- 7 ♀ ♀ „ Kajoe Tanan Dr. HAGAN on cattle on 3.18.6.'07
 (Textfig. 275 a, d, f) Coll. BR.M.
- 2 ♀ ♀ „ Balun, Padang Highlands 6.'14, JACOBSON Coll. N.A.M.
 1 ♀ „ Gunung Teleman, Sumatra 6.'17, JACOBSON
 1 ♀ „ Tanang Talu 5.'15, JACOBSON
 1 ♀ „ Peak of Korinchi 8.'15, JACOBSON
 1 ♀ „ Suban Ajam, Bengkoelen 7.'16, JACOBSON

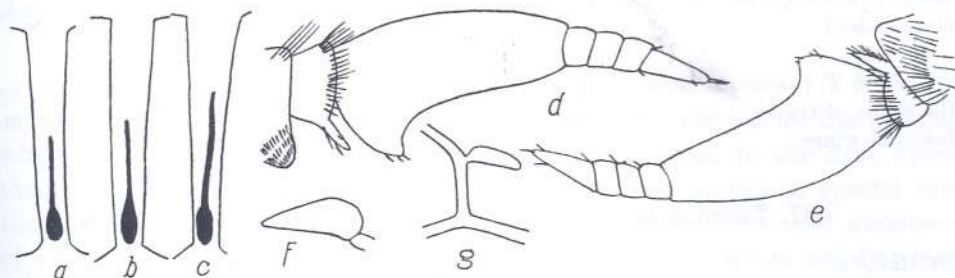
A species closely resembling *T. fuscicauda* BIGOT, thus giving Miss RICARDO an opportunity to bring the mentioned specimens from Kajoe Tanan to this species. It is however surely distinct. Forehead dull chocolatebrown, black haired, narrow. Callus lanceolate cylindrical, black, redblack or yellowishredbrown, darker at apex, linear extension filiform. Subcallus and upper cheeks dull velvetybrown to dark havannabrown, blackbrown or black haired. Lower cheeks greywhite. Beard pale yellowbrown or yellowwhite. Face pale yellowbrown, black haired. Palpi yellowbrown, bluegrey tomentose, black haired on second joint, which ends blunt. Antennae redbrown, black haired on basal joints, third joint redyellow at base, then darker, tooth distinct. Thorax. Scutum dark chocolatebrown to blackbrown, black haired, foreborder yellowgrey tomentose, as

also the lateral borders of the scutum. Wings tinged yellowbrown to havanna-brown, appendix sometimes present. Legs darkbrown, with tibiae largely yellow-brown in all legs. Abdomen dull redbrown, black haired on the first 2 segments, blackbrown to the apex, segmentations narrowly paler. In well preserved specimens small inconspicuous groups of yellow hairs are found on the 2d—5th segment, hairfringes at the segmentations only. Second segment with a median black lentiform spot, lacking in some specimens.

Table of dimensions.

Bodylength	varying from 14,5 m.M. to 16,8 m.M.				
Width of thorax	„	„	4,8	„	— 5,5
Width of abdomen	„	„	5	„	— 6,5
Wingexpanse	„	„	29,4	„	— 35,1
Length of head	„	„	2	„	— 3,5
Length of thorax	„	„	5	„	— 7,2
Length of abdomen	„	„	7,2	„	— 10
Length of wing	„	„	12,2	„	— 14,8
Breadth of wing	„	„	4,2	„	— 5,8
Foreheadindex	„	„	8	„	— 11,33

The Head. (Textfig. 275). Forehead $1/3$ — $1/2$ narrower anteriorly than it is at vertex, in type it is dull chocolatebrown, in other females from Kota Nopan it was dark redbrown to blackbrown, egg-shaped or cylindrical, grooved in the middle. Callus varying in colour from yellowishredbrown, darker blackbrown at apex to wholly black. In some specimens it almost reaches the eyes, in others it is separated from them by a larger space. Subcallus



Textfig. 275.

T. brunnipes s.s. ♀. a—c. forehead, d, e. antennae, f. palpe, g. wingstructure. • •

dull velvetybrown, dark havannabrown, redbrown or coffeebrown. Beard yellowishbrown to yellowbrownishwhite. On the face in rare instances some yellowwhite hairs were found to be intermixed between the black ones, in a single case black and redbrown hairs were observed on the upper border of the face. Postocular rim yellowbrown, black- or yellowbrown haired. Palpi, first joint yellowbrown, yellowbrown haired, second joint slender, with long obtuse point, redbrown, bluegrey tomentose, thick black haired. some yellowbrown hairs being visible at the base. Proboscis black or brownblack, black and brownblack haired. Antennae,

second joint with long, pointed dorsal spine, third joint redyellowbrown at base, soon growing dusker, basal annulation 2,1 times (in type) to 1,6 times (in Kajoe Tanan female) as long as its widest part, 1,7 times (in type) to 1,6 times (in Kajoe Tanan ♀) as long as the stylus.

Thorax as described. Pteropleuron pale brown, black haired. Hairtufts at base of wings pale yellowbrown. Sides yellowbrown. Breast bluishgrey tomentose, over which a yellowbrown hue is spread, pale yellowbrown haired, mesosternumlobus black haired. Scutellum same colour as scutum, with slightly paler hindborder. Wings tinged yellowbrown to havannabrown, foreborder caramelbrown, stigma havannabrown, brown streaks accompanying the veins. Apical shadow present in the Kajoe Tanan females, extreme apex slightly paler. Appendix present or absent, either in both wings or in one of the wings only. Out of 23 specimens, 3 had distinct appendices on both wings, 1 female presented an appendix on the right wing only, 1 a similar structure on the left wing, 2 others with rudimental appendices on the right wing. In total 7 or about 30% of the mentioned females presented more or less distinct appendices. Legs. First leg. Coxa greybrown, blackbrown at apex, pale brownwhite haired, trochanter dark redbrown, femur black to brownblack haired in dorsum, white haired or yellowbrown haired at distal lateral border, knee redbrown or yellowbrown. Tibia yellowishbrownwhite, yellowwhite haired, with a median row of black hairs on basal 2/3, apex havannabrown, black haired, extreme base blackbrown. Tarsalia black. Second leg. Coxa greybrown, yellow haired, trochanter blackbrown, femur violetgreybrown, yellowbrown haired at base on dorsum, then more redbrown, redbrown haired, intermixed with some black hairs at apex, knee yellowbrown. In the Kajoe Tanan females the pubescence is greywhite. Tibia pale brownyellow, white haired, intermixed with some black hairs, apical ring narrow, dark olivebrown to redbrown, black haired. First tarsale dullbrown at base, black haired. Other tarsalia black. Third leg similar, tibia almost wholly brownish yellow, except the narrow redbrown apexring, black haired. First tarsale redbrown, black haired, other tarsalia black, black haired.

Abdomen as described. Lateral borders of tergites till 5th segment yellowbrown, yellow haired. The first segment bears a whitishgrey haired spot at each side of the scutellum. In one of the Kota Nopan females the lateral borders of tergites were only partly yellowwhite, being reduced to the first and second tergite and the angles of the 3d and 4th tergites. Ventral surface with a median longitudinal blackbrown, black haired band, composed of square spots, segmentations and sides broadly yellowbrown, yellowbrown haired on the first 5 segments. Sixth segment with a yellowbrown segmentation only. Seventh segment wholly black, black haired.

From *T. fuscicauda* BIGOT, *T. brunnipes* SCHUURMANS STEKHOVEN is distinguishable by the shape of the forehead, the pubescence on the face and on the scutum, and the more infuscated wings.

257. *Tabanus brunniventer* nov. spec. (♀). (Textfig. 276.

Habitat:

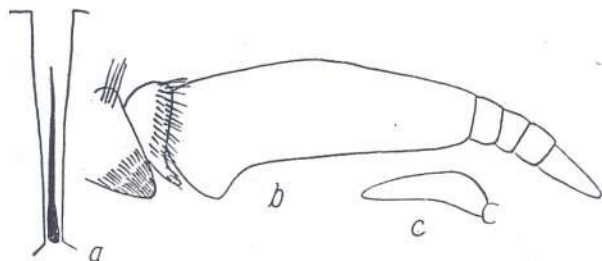
Isle Sumatra

Type ♀ from Sibolangit, LOERZING 1918

Coll. N.A.M.

A species allied to *T. brunnipes* SCHUURMANS STEKHOVEN but distinct. Forehead narrow, sooty grey, black haired. Callus yellowbrown, reaching the eyes, linear extension redbrown. Subcallus and upper cheeks brownishgrey, redbrown haired, lower cheeks bluishgrey, white haired. Beard white. Palpi olivebrown, black haired, apex blunt. Antennae redbrown, black haired. Thorax

brownblack, redbrown haired. Hindborder of scutum and scutellum white haired. Legs dark brown. Abdomen reddish havannabrown, black haired on basal 3 segments, second segment, with longitudinal black spot. Lateral borders of the first 4 tergites white haired. Length 14 m.M.; Wingexpanse 24.8 m.M.



Textfig. 276.

T. brunniventer s.s. ♀. a. forehead, b. antenna, c. palpe.

lation 2,46 times as long as is widest part, 1,97 times as long as the redbrown stylus.

Thorax brownblack, rubbed, redbrown haired on disc of scutum. Pteropleuron havannabrown haired. Breast and sides bluishgrey, white haired, mesosternumlobus black haired. Legs. First leg. Coxa browngrey, apex blackbrown, white haired. Femur blackbrown, black haired, knee yellowbrown, tibia yellowbrown at base, apical half blackbrown, wholly black haired, with some white hairs intermixed between the black ones on the basal portion. Tarsalia black, black haired. Second leg. Coxa greybrown, trochanter blackbrown, femur as in first leg, distal lateral border white haired, tibia olivebrown, black haired, with blackbrown apical ring. Tarsalia blackbrown, black haired. Third leg. Coxa slatebluebrown, trochanter blackbrown, both white haired. Femur tobaccobrown, black haired on dorsum in the middle only, elsewhere white haired. Tibia redbrown, black haired, intermixed with some white hairs on ventral surface. Tarsalia havannabrown, black haired.

Abdomen as mentioned. First segment with a median dot of white hairs. Ventral surface dull havannabrown, black haired, segmentations white haired, except the seventh, which is wholly black haired.

GROUP XXIII.

The species belonging to Group XXIII are characterised by the peculiar wingmarkings, consisting in a sort of crossband, attached to the dark apical shadow, letting the wingapex free. The scutum of the concerned species contrasts by its paler tomentum with the darker, uniformly coloured abdomen, of which the ventral surface usually is paler. Legs with all tibiae largely white, yellow or yellowbrown, yellow, white or yellowbrown haired. Antennae ochraceousyellow or bright redyellow on the basal annulation of the third joint. The species of this Group are allied with those of the 5th Group, confer i.a. *T. fuscithorax* SCHUURMANS STEKHOVEN.

KEY 33.

Synopsis of species.

- 1a. Abdomen, ventral surface with a median longitudinal dark, black haired

- band and paler, white haired sides and segmentations. Palpi black haired. Legs with tibiae yellow or yellowbrown 3
- b. Ventral surface wholly yellowwhite haired, except on the 7th segment, or almost wholly black haired, with paler, yellow haired segmentations. Palpi yellow or yellowbrown haired. Legs with the tibiae largely white 2
- 2a. Dorsum abdominis with small median, pale yellow haired triangles at the 4d—6th segmentations, ventral surface almost wholly yellowwhite haired. Scutum with longitudinal redbrown stripes. Cheeks yellow haired. Beard yellow **angustiventer** SCHUURMANS STEKHOVEN ♂
- b. Dorsum abdominis with groups of reddishyellow hairs at the 2d—4th segmentations, ventral surface yellow haired at the first 4 segmentations only. Scutum without longitudinal stripes. Cheeks reddishyellowbrown, black and redbrown haired. Beard redbrown **flavimarginatus** SCHUURMANS STEKHOVEN
- 3a. Dorsum abdominis redbrown, black haired. Callus with linear extension fine. Beard yellow. Palpi slender. Scutum yellow, without longitudinal stripes, mainly yellow haired **flavothorax** RICARDO.
- b. Dorsum abdominis blackbrown, black haired, with a faint median brownish-yellow, yellowbrown haired stripe. Callus with linear extension broad. Beard black. Palpi ending blunt. Scutum reddishbrown with 3 redbrown longitudinal stripes, mainly black haired, intermixed with yellowbrown hairs **fuscithorax** SCHUURMANS STEKHOVEN.

250. *Tabanus angustiventer* nov. spec. (♂) Pl. 9, Fig. 6; Textfig. 277.

Habitat:

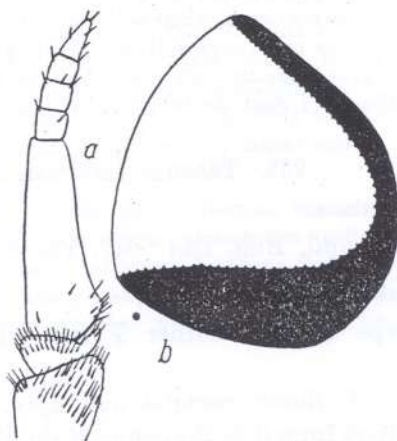
Type ♂ from Wai Lima, Lampong Districts
1 ♂ from Java 1.08 Semarang, JACOBSON

Coll. B.Z.M.
Coll. N.A.M.

A species closely allied to *T. flavothorax* Ric. but distinguished inter alia by the colour of the thorax, which shows 3 longitudinal redbrown stripes. Ventral surface of abdomen brownyellow haired. Eyes ochrebrown on the large-faceted part, lower portion black, prolonged to the vertex. Subcallus goldenyellow, olivebrown at apex. Cheeks and face pale yellow, pale yellow haired. Beard same colour. Palpi pale yellow, yellow haired, intermixed with some black hairs. Antennae butteryellow, whitish tomentose, black haired on the basal joints, third joint reddishyellow, tooth distinct, apex darker, redbrown. Thorax pale yellowish-velvetybrown, honey yellow haired. Wings with smokybrown crossband as in *T. flavothorax*. Legs with tibiae largely white, white haired, and black haired apices. Abdomen as mentioned, basal 3 segments yellowbrown, apical segments blackishredbrown, pale yellow haired triangles being visible on the segments 4—6.

Table of dimensions.

Bodylength	15	m.M.
Width of thorax	4	"
Width of abdomen	4	"
Wingexpanse	25,6	"
Length of head	3	"
Length of thorax	5	"
Length of abdomen	8	"
Length of wing	10,8	"
Breadth of wing	3,8	"



Textfig. 277.

T. angustiventer s. s. ♂

a. antenna, b. eye,

The Head. (Textfig. 277). Antennae, first joint blackish butteryellow, white tomentose, black haired in the middle on dorsum, elsewhere pale yellow, some black hairs being intermixed at distal lateral border, second joint same colour, black fringed, yellowwhite haired along the proximal lateral border. Third joint dotteryellow, basal annulation 2,4 times as long as its widest part, 1,5 times as long as the darker stylus, which is reddbrown on apical annulation. Tooth distinct blunt, black haired.

Thorax. Scutum as mentioned, some black hairs being intermixed between the honeyyellow ones. Scutellum same colour, long, pale brown yellow haired, intermixed with some black hairs. Hindborder of scutum black haired. Tufts at base of wings and behind whitish. Wings yellowish at base, foreborder reddbrown, stigma blackbrown, crossband smoky brown, letting free the extreme apex and reaching to the hindborder of the wing. Halteres, stalk yellowbrown, club darkbrown. Legs. First leg. Coxa brownishyellow, apex reddbrown, pale yellow haired. Femur reddbrown at base, then strawyellowbrown, thick black haired on dorsum, distal lateral border long yellow haired, intermixed with some black hairs. Tibia reddishbrown at extreme apex, then white, white haired, intermixed with some black hairs, apical half blackbrown, black haired. Tarsalia dark ochraceousbrown, thick black haired. Second leg. Coxa dull yellowbrown, blackreddbrown at apex, pale yellow haired. Trochanter violet red. Femur pale oakbrown, some black hairs being visible on dorsum at base, elsewhere yellowbrown haired. Tibia pale yellowwhite, apex butteryellowwhite, wholly white haired, except a median row of black hairs on dorsum. Tarsalia reddbrown, black haired. Third leg. Coxa olivebrown, rustyyellowbrown haired, trochanter blackisholivebrown, brownyellow haired. Femur yellowbrown, pale yellow and yellowbrown haired. Tibia strawyellow, clothed on dorsum with 2 rows of black hairs, intermixed with some pale yellowwhite hairs, distal lateral border pale yellowwhite haired, apex olivebrown. Tarsalia olivebrown, black haired.

Abdomen uniformly yellowbrown on basal 3 segments, rest as mentioned above. Lateral borders of tergites with some yellowwhite hairs, segments 4—6 with pale indistinct yellow median triangles, ventral surface brownishyellowwhite haired, except on seventh segment, which is black haired.

The Java female is identical but has a slightly darker abdomen, which is almost wholly black haired on dorsum with a fine median stripe, beginning at the hind border of the 2d segment and ending on the 6th segment. A median, yellow haired dot is present on the first segment, the yellow hairtufts on the dorsum of the male are thus probably rests of this longitudinal stripe, which was evidently partly rubbed.

WIEDEMANN's description of *T. ardens* WIED. has many points in common with this

species. The scutum of *T. angustiventer* is brighter, the antennae paler as also cheeks face and the beard, whereas the lateral borders of the abdominal tergites are not broadly yellow haired as in *T. ardens* WIED. Confer also *T. auribundus* SCHUURMANS STEKHOVEN. Having not seen WIEDEMANN's type I have no base for a more detailful discussion of the differences, although I don't doubt that the species are distinct.

259. *Tabanus flavimarginatus* nov. spec. (♀) Textfig. 278.

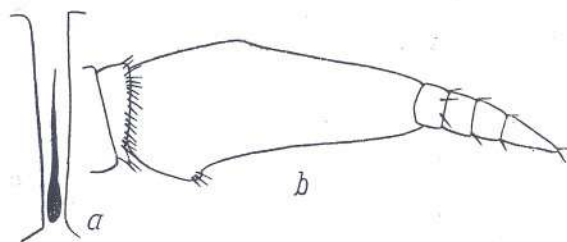
References:

RICARDO, Bull. Ent. Res. Vol. VI, p. 406 (1916).

Habitat:

Type ♀ and another ♀ from Hongkong, H. MACFARLANE Coll. BR.M.

T. flavimarginatus nov. spec. is closely allied to *T. flavothorax* Ric. but differs from it in the shape of the callus, the colour of the abdominal pubescence, the segmentations being yellow fringed, ventral surface quite different in pubescence as in *T. flavothorax*. Forehead reddishbrown, narrow, reddishbrown haired. Callus redbrown, elongate. Linear extension fine, black. Subcallus and cheeks reddishyellowbrown, black and redbrown haired. Face reddishbrown, yellow haired. Beard redbrown. Palpi redbrown, yellowbrown haired. Antennae yellowbrown, black haired on basal joints, third joint reddishyellow. Thorax sulfurousyellow, reddishyellowbrown haired. Tibiae widely white, with darker apices. Abdomen darkyellowbrown at base, yellow, fringed at segmentation, at lateral borders, following segments blackbrown, with groups of reddishyellow hairs at the 2d—4th segmentation. Dorsum elsewhere black haired. Lateral borders of the first 4 tergites yellow haired. Ventral surface, with yellow haired segmentations to the first 4 segments.



Textfig. 278.

T. flavimarginatus s.s. ♀. a. forehead, b. antenna.

yellow haired, second joint dark yellowbrown, black fringed; third joint almost wholly reddishyellow, basal annulation slender, 2.1 times as long as its widest part, 1.87 times as long as the stylus, which has a blackish tip; tooth indistinct.

Thorax denuded, sulfurousyellow to reddishbrown, remainder of pubescence reddishyellowbrown. Pteropleuron reddish, redbrown haired. Sides and breast reddishyellowbrown, reddishyellow haired. Wings yellowbrown on foreborder with brown apical shadow. Legs. First leg. Coxa goldenyellowbrown, yellow haired, trochanter dark redbrown, femur dark

The Head. (Textfig. 278).

Forehead 1/2 narrower anteriorly than it is at vertex, index 10. Callus not reaching the eyes, gradually narrowing to the fine black linear extension. Palpi broad at base of the redbrown second joint, which ends with a long narrow point, first joint yellowbrown, both joints yellowbrown haired. Antennae, first joint yellowbrown, dorsum black haired, lateral borders and ventral surface

blackbrown, black haired, knee yellowbrown. Tibia swollen, narrowly reddishbrown at extreme base, then white, white haired, apical 1/5 blackbrown, black haired. Tarsalia black, black haired. Second leg, trochanter blackbrown, femur blackbrown, black haired, distal lateral border yellowbrown haired, knee yellowbrown; tibia reddishyellow at extreme base, then white, white haired, except the reddishbrown, black haired, extreme apex. First tarsale redbrown, black haired, other tarsalia black. Third leg identical, tibia with a dorsal row of black hairs.

Abdomen ad described, mainly black haired on dorsum. As the dorsum is partly rubbed I am not able to discern if the yellow hairs at the segmentations are arranged in median triangles or if there exist yellow hairfringes to those segments, although I believe that the last supposition is right. Lateral borders of the basal 4 tergites yellow haired. Basal segments on ventral surface blackyellowbrown, black haired, segmentations yellow haired, venter elsewhere black haired.

260. *Tabanus flavothorax* RICARDO (♀,♂) Pl. 9, Fig. 4, 5; Textfig. 279.

References:

RICARDO, Rec. Ind. Mus. IV, p. 201 (1911).

Habitat:

Federated Malay States

Type ♀ and another female from Perak, F. M. S. PRATT Coll. Lond. Sc. Trop. Med

1 ♀ from Sungei Siput, Perak, PRATT Coll. BR.M.

1 ♀ „ Sungei Krudda, Perak? PRATT „

1 ♀ „ Singapore, RIDLEY „

1 ♀ „ Johore, FLOWER „

Several females from Batu Tiga, not seen by me „

Type ♂ from Kelantan, Tebing Tinggi, V. KNIGHT 7.'20 Coll. R.M.S.

Sumatra

Gvt. Sumatra's East Coast

1 ♀ from Tandjong Merah 22 M., CORPORAAL Coll. N.A.M.

Residency Tapanoei

Ressort Padang Sidempoean, Mantrie Ressort Pidang Sidempoean

2 ♀ ♀ from Pidjor Koling on horse 6.8.'23, BAKKER Coll. V.S.L.

1 ♀ „ Si Doea doea, Pidjorkoling on buffalo 6.8.'23, BAKKER

1 ♀ „ Si Hitang, Batoe na Doea on horse 6.8.'23, BAKKER

3 ♀ ♀ „ Hapesong, Marantjar on horse 3.8.'23, BAKKER. Textfig. 279 b.

Ressort Padang Sidempoean, Mantrie Ressort Sibolga

1 ♀ from Rimboe Sibolga 2.'22, BUBBERMAN

2 ♀ ♀ „ Si Boeni boeni, Siboeleean on buffalo, TARIP and BAKKER
respectively 1 ♀ on 2.'22

1 ♀ „ 7.10.'23

1 ♀ from Poring, Siboeleean, on buffalo 3.'23, LOBEL

Ressort Padang Sidempoean, Mantrie Ressort Binanga

3 ♀ ♀ from Pasar Siboeleean, Djandi Lobi, LOBEL and BAKKER

- respectively 1 ♀ on cattle on 11.12.'22 (Textfig. 279 d.)
 1 ♀ „ horse „ 12.12.'22
 1 ♀ „ buffalo „ 28.10.'24
 4 ♀♀ from Hoeta Nopan, H. Nopan, LOBEL and BAKKER
 respectively 1 ♀ on horse 10.'22 (Textfig. 279 a.)
 2 ♀♀ „ buffalo 25.11.'24
 1 ♀ „ „ 3.12.'23
 2 ♀♀ from Pangkal Dolok, Pangkal Dolok Lama on buffalo 14.12.'22, LOBEL
 1 ♀ „ Si Oendol, Paringgonan, on buffalo 29.10.'24, BAKKER
 Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan, BAKKER
 2 ♀♀ from Kota Nopan on horse 10.3.'24

A very peculiar species with yellowbrown, pollinose, yellowwhite haired thorax, contrasting sharply with the deep redbrown, black haired abdomen. Wings with redbrown foreborder and similar crossband. Eyes brown in death. Forehead narrow. Callus club-shaped, olivebrown, linear extension long. Subcallus and upper cheeks ferrugineous, black haired, lower cheeks and face strawyellow, butteryellow haired. Beard similar. Palpi pale yellowbrown, thick black haired. Antennae ochraceous yellow; black haired. Legs largely yellow with darker apices to the tibiae.

Table of dimensions.

Bodylength	varying from 14,2 m.M. to 15,3 m.M.				
Width of thorax	„	„	4	„	— 5,2 „
Width of abdomen	„	„	4,5	„	— 5,5 „
Wingexpanse	„	„	27	„	— 32,8 „
Length of head	„	„	2,2	„	— 2,6 „
Length of thorax	„	„	5,2	„	— 6,6 „
Length of abdomen	„	„	8	„	— 9,2 „
Length of wing	„	„	12	„	— 13,8 „
Breadth of wing	„	„	4,2	„	— 5 „
Foreheadindex	„	„	7,5	„	— 11,2

The Head. (Textfig. 279). Forehead velvetybrown to redbrown, brown haired, $\frac{1}{3}$ to almost $\frac{1}{2}$ narrower anteriorly than it is at vertex. Callus olivebrown to redbrown, rectangular to oval, not reaching the eyes. Linear extension broad. In one of the studied specimens the callus was hardly broader than the linear extension. Vertex not triangular, black. Subcallus, etc. as mentioned. Palpi slender. Antennae, basal 2 joints redbrown, ochraceousyellow tomentose, black haired, the distal lateral border of the first joint bearing a number of long redbrown hairs. Third joint redbrown, basal annulation 2,2 times as long as its widest part, 1,7 times as long as the black, acute stylus. Tooth distinct, blunt. Postocular rim brownred. Eyes in life greenish, probably wholly bright green, brown in death.

Thorax yellow pollinose, clothed with long yellowwhite pubescence, scutellum same

colour as scutum. Pteropleuron redbrown, black haired as are the shoulders. Sides and breast yellowwhite, same pubescence. Wings as mentioned. Stigma redbrown, the crossband issuing at the stigma, letting the apex and the disc cell free. To the hindborder this crossband grows fainter. Base of wing including both basal cells and the anal cell reddishbrown. Veins redbrown. Squama and antesquama redbrown. Halteres, stalk redbrown, club dark brown. Legs. First leg. Coxa yellowbrown, apex black, pale yellowbrown haired, femur reddish yellowbrown to reddish olivebrown, black haired on dorsum, distal lateral border yellowwhite haired. Tibia slightly incrassate, dorsum white, white haired on basal $\frac{2}{3}$ — $\frac{3}{4}$, intermixed with a median row of black hairs, apex black, black haired, ventral surface similar, groundcolour more yellowbrown, with a similar median row of black hairs. Tarsalia black. Second leg. Trochanter violetbrown, black haired. Femur strawyellow, with some black hairs on dorsum and white hairs along the distal lateral border, tibia almost wholly white, white haired, apical ring redbrown, black haired, further a median longitudinal row of black hairs on dorsum. Ventral surface yellow haired. Tarsalia redbrown, black haired. Third leg. Trochanter violetbrown, yellow haired. Femur reddish strawyellow, pale yellowbrown haired, with some black hairs at apex. Tibia oakbrown, redbrown at apex, dorsum black haired, ventral surface yellowwhite haired. Tarsalia identical.

Abdomen uniformly dull rustybrown, black haired, apex slightly darker, broad and rounded. Ventral surface redbrown, with a median series of black haired, halfmoon-shaped spots forming together a median longitudinal band. Sides and segmentations yellowwhite haired. Seventh segment wholly black, black haired.

The Male. Pl. 9, Fig. 4.

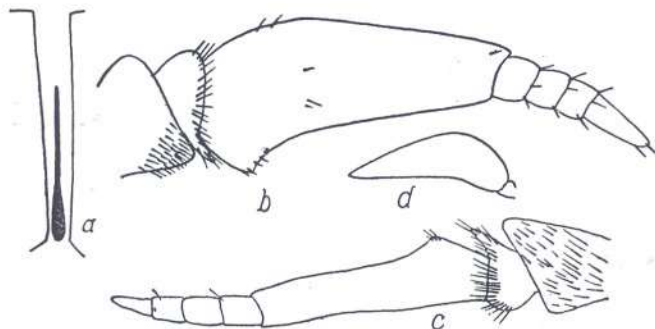
The male is almost wholly identical to the female. In the type from Kelantan the last 2 abdominal segments are missing.

Table of dimensions.

Bodylength		
Width of thorax	5	m.M.
Width of abdomen	4,5	„
Wingexpanse	30	„
Length of head	3	„
Length of thorax	6	„
Length of abdomen		
Length of wing	12,5	„
Breadth of wing	4,8	„

The Head. (Textfig. 279 c). Eyes black, small-faceted on lower third, this area being prolonged to the vertex as a rather broad stripe. Large-faceted area brown. Subcallus russet, black at apex. Cheeks and face goldenyellow haired. Beard pale yellow. Palpi club-shaped, honeyyellow, mainly pale yellow haired, intermixed with a few black hairs. Antennae long and slender, first joint cinnamonbrown, black haired, with some yellowbrown hairs on ventral surface, second joint dark nutbrown, black haired, dorsal hump distinct, blunt. Third joint cinnamonbrown on basal annulation, which is 3,3 times as long as its widest part, 1,5 times as long as the blackbrown stylus. Proboscis, stalk greyblue, white haired, sugarflapsbrown-black, black haired.

Thorax darker than in the female, brownish yellow, pollinose yellow haired. Sides and breast yellow haired. Wing, foreborder redbrown, stigma darkbrown, both basal cells and borders of anal cell reddishbrown. Crossband not reaching the hindborder. Legs. Coxa clothed with very dense, pale yellow pubescence. Femur redbrown, knee yellowbrown, black haired, some yellow hairs appearing at apex on ventral surface. Tibia yellowbrown at extreme



Textfig. 279.

T. flavothorax Ric. ♀.

♀, a. forehead, b. antenna, d. palpe, ♂ c. antenna,

base, then white, pubescence, etc. as in female. Second leg. Femur violet tomentose at base, more cinnamonbrown to the apex, yellow haired. Tibia, etc. as in the female. Third leg. Tibia pale yellowwhite, yellow haired, apex brownish, black haired, a few black hairs being intermixed also between the white ones. First tarsale redbrown, black haired, other tarsalia black.

Abdomen long and narrow, first segment with

a blackish shadow in the middle. Ventral surface yellowbrown, white haired, except on the median redbrown, black haired triangles, which form together a longitudinal band. Lateral borders of the first 4 tergites yellowbrown, pale yellow haired, on following segments the lateral yellowbrown borders are black haired.

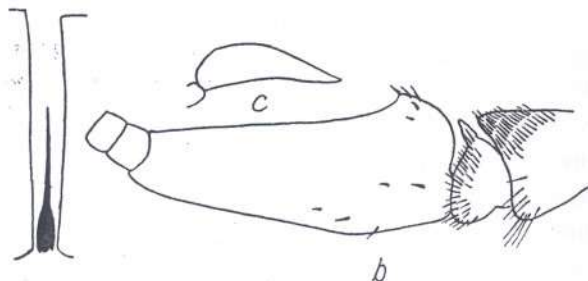
261. *Tabanus fuscithorax* nov. spec. (♀) Textfig. 280.

Habitat:

Type female from Sumatra, Pengadang 6.'16, JACOBSON Coll. N.A.N.

A female, labelled by RICARDO as *T. flavothorax* Ric., but quite certainly distinct, confer the colour of the wings, the thorax and its pubescence, the abdomen with its median yellowwhite longitudinal band, etc. Forehead yellowbrown. Callus redbrown, cylindrical, hardly broader than the linear extension. Subcallus and upper cheeks redbrown, blackbrown haired, lower cheeks and face yellowwhite, brownish yellow haired. Palpi yellowbrown, black haired. Antennae yellowbrown to reddishyellow, black haired. Beard same colour. Thorax reddish brown, with 3 indistinct redbrown longitudinal stripes, scutum mainly black haired, intermixed with a smaller number of yellowbrown hairs. Wings brownish, with distinct apical shadows, transverse band less distinct. Legs with yellowbrown to white tibiae, most femora yellowbrown, fore femora darker. Abdomen blackbrown, with faint median narrow, yellowbrown haired stripe. Lateral borders of tergites 1—5 yellow haired. Ventral surface with a median black haired longitudinal band. Length. 19,2 m.M.; Wingexpanse 30 m.M.

The Head. (Textfig. 239.) Forehead yellowbrown at base, ferrugineous at apex, much narrower anteriorly than it is at vertex. Index 10. Callus not reaching to the eyes. Subcallus, etc. as described. Palpi yellowbrown, first joint brownishyellow haired, second joint broad



Textfig. 280.

T. fuscithorax s.s. ♀. a. forehead, b. antenna, c. palpe.

at base, then curved, ending with a rather broad apex, black haired. Antennae, first joint yellowbrown, black haired, second joint reddishyellow, black haired, third joint reddishyellow on basal annulation, which is 2.25 times as long as its widest part, stylus, short, black, tooth near the base indistinct.

Thorax reddishbrown, mainly black haired, intermixed with a few yellowbrown hairs, tufts at base of wings and behind partly yellowbrown, partly black.

Foreborder of scutum grey tomentose. Pteropleuron redbrown, black haired. Sides and breast brownishgrey, yellowbrownwhite haired. Wings brownish, foreborder caramelbrown, stigma redbrown, apical shadow, including radial and cubital cells smokybrown, hindborder of wing slightly brownish too, submarginal cell clear, a darker streak running along the cubital vein connects fore- and hindborder. Legs. First leg. Coxa brownishgrey, brownishyellow haired, trochanter brownblack, femur similar, dorsum black haired, distal lateral border browngrey tomentose, brownishyellow haired, knee yellowbrown. Tibia white, white haired on basal 2/3, extreme base reddishbrown, apex brownblack, black haired. Tarsalia black, black haired. Second leg. Coxa brownish yellow, yellowbrown haired. Trochanter blackbrown, femur sootygrey at base, then yellowbrown, yellowbrown haired, intermixed with a few black hairs at apex, knee bright yellowbrown. Tibia yellowbrown, yellowbrown haired, except on a median row of black hairs, apex redbrown, black haired. Tarsalia redbrown, black haired. Third leg identical, tibia black haired on dorsum.

Abdomen blackbrown, with a faint median brownishyellow tomentose, longitudinal, narrow, straight-sided, mainly yellowbrown haired stripe, some black hairs being intermixed. Pubescence elsewhere black, except on the narrowly yellowbrown, yellow haired lateral borders of tergites. Ventral surface, median band brown, black haired, sides grey, segmentations yellowbrown, both yellowwhite haired.

GROUP XXIV.

The species belonging to this group have without exception brown bodies, mostly showing paler segmentations to the abdominal segments, in others the abdomen is uniformly brown. All species however present banded wings, showing one or two crossbands, which never reach the hindborder of the wings. One or more of the cells situated in the crossbands may present clearer centres. No appendix present. Scutellum same colour as scutum or contrasting with it.

KEY 34.

Synopsis of species.

- 1a. Scutellum contrasting with the scutum, broadly white on hindborder. . . 2

- b. Scutellum same colour as scutum or narrowly greyish at hindborder... 3
2. Abdomen rustybrown to brownblack, black haired on the bases of the segments, segmentations yellowbrown, rustyyellowbrown haired on the 2d—6th segment, elevated in the middle to low white triangles. Forehead distinctly narrower at vertex. Beard yellowwhite. Antennae with black-brown third joint. Legs with all tibiae largely yellowbrown, yellow haired, with black, black haired apices. Eyes in the male with lower third small-faceted, prolonged to the vertex as a narrow border **optatus** WALKER.
- 3a. Abdomen wholly rufous, without distinct markings, thorax rufous.... 4
- b. Abdomen with broad, goldenyellow haired segmentations and all or not similar median triangles; thorax goldenyellow haired 5
- 4a. Thorax and scutellum wholly rufous, abdomen orangeous, copperred-brown haired. Beard, face and cheeks ochraceous, ochraceousyellow haired, tibiae tawny, mainly black haired, middle tibiae yellowbrown haired. Third antennal joint redyellow. Forehead broad **rufiscutellatus** S. S.
- b. Thorax brown with 2 or 3 longitudinal redbrown stripes, scutellum narrowly greyish at hindborder, abdomen bright brownyellow at base, black at apex, pubescence on bases of segments black, yellowwhite at segmentations, in some lights faint median, white triangles are visible. Foreheadindex 5. Tibiae yellowbrown at base, redbrown at apex, middle and hind tibiae yellow haired at base **melanognathus** BIGOT
- 5a. Palpi orangeous haired. Wings with 2 crossbands indicated, first posterior cell closed or very narrow at opening. Upper cheeks yellow haired. Abdomen uniformly chestnutbrown. Male, with eyes composed of equal facets over the whole surface **flexilis** WALKER.
- b. Palpi black haired. Wings with the apical crossband broader. Upper cheeks black haired. Abdomen chestnutbrown, with a median black spot on the 2d and 3d segment. **biatripunctatus** SCHUURMANS STEKHOVEN.

262. *Tabanus optatus* WALKER (♀, ♂) Pl. 17, Fig. 4, 5; Textfig. 281, 282.

Syn. *T. alboscutatus* RONDANI.

T. equestris VAN DER WULP,

References:

- WALKER, Proc. Linn. Soc. London I, p. 33 (1856).
 RONDANI, Ann. Mus. Civ. Genova VII, p. 456 (1875).
 VAN DER WULP, Notes Leyden Museum VII, p. 456 (1875).
 RICARDO, Rec. Ind. Mus. IV, p. 139 (1911).
 PRATT, Jl. Trop. Vet. Sci. IV, p. 390 (1909).

Habitat:

Isle Borneo

7 ♀♀ from Tanah Intan, Martapoera, 8. '23, TARIP (Textfig. 281 c) Coll. V.S.L.

- 1 (♀ or ♂?) from Borneo Coll. N.A.M.
 3 ♀ ♀ from Borneo, MULLER Coll. L.M.N.H.
 1 ♀ „ Borneo. RONDANI's type Coll. M. C. Genova
 Isle Java
 Residency Batavia
 1 ♀ from Djasinga, near Buitenzorg on horse 17.4.'22 Coll. V.S.L.
 1 ♂ „ Tandjong Priok 4.'08 Coll. N.A.M.
 1 ♂ „ Tjilatjap, DRESCHER 9.'10 Coll. N.A.M.
 1 ♂ „ Ambarawa, LUDEKING Coll. L.M.N.H.
 1 ♀ „ Java, BLUME Coll. L.M.N.H.
 Isle Sumatra
 1 ♀ from Kajoe Tanan, HAGEN Coll. BR.M.
 Gouvt. Atjeh
 7 ♀ ♀ from Langsar 25.2.'23, DIEBEN Coll. V.S.L.
 Residency Tapanoeli
 Ressorst Padang Sidempoean, Mantrie Ressorst Padang Sidempoean
 1 ♀ from Moeara Tais on buffalo 12.'21, TARIP Coll. V.S.L.
 3 ♀ ♀ „ Hoeta Tongga, Moeara Tais, TARIP and LOBEL
 respectively 2 ♀ ♀ on buffalo 12.'21
 1 ♀ „ „ horse 8.1.'23
 11 ♀ ♀ from Bintodjoe, Moeara Tais, LOBEL and BAKKER
 respectively 1 ♀ on cattle 8.1.'23
 1 ♀ „ „ horse 20.2.'23
 4 ♀ ♀ on horse 28.4.'23
 3 ♀ ♀ „ „ buffalo 28.4.'23
 2 ♀ ♀ „ „ 2.5.'24
 1 ♀ from Si Balapak, Moeara Tais on buffalo 2.5.'24, BAKKER
 1 ♀ „ „ Si Pogoe, Si Pirok on horse 22.12.'22, LOBEL
 1 ♀ „ „ Si Galangan, Si Galangan on buffalo 30.6.'23, LOBEL
 3 ♀ ♀ „ „ Pidjor Koling, Pidjor Koling on buffalo, LOBEL and BAKKER
 respectively 1 ♀ on 30.6.'23
 2 ♀ ♀ „ „ 2.5.'24
 2 ♀ ♀ from Si Doea doea, Pidjor Koling, on horse 2.5.'24, BAKKER
 2 ♀ ♀ „ „ Sorik, Pintoe Padang on buffalo 2.4.'24 BAKKER
 6 ♀ ♀ „ „ Si Hitang, Batoe na Doea, on buffalo, LOBEL and BAKKER
 respectively 5 ♀ ♀ on 28.4.'23
 1 ♀ „ „ 2.11.'24
 2 ♀ ♀ from Hapesong Lama, Marantjar, on cattle 30.4.'23, LOBEL
 Ressorst Padang Sidempoean, Mantrie Ressorst Sibolga
 32 ♀ ♀ from Si Boeni boeni, Si boeloan, TARIP, LOBEL and BAKKER
 respectively 6 ♀ ♀ on buffalo 1.'22
 1 ♀ „ „ 7.9.'23
 1 ♀ „ „ 7.11.'23

- 1 ♀ „ „ 21.11.'23
 4 ♀ ♀ „ „ 8.5.'24
 1 ♀ „ „ 9.7.'24
 2 ♀ ♀ „ „ 8.8.'24
 1 ♀ „ cattle 17.10.'22
 3 ♀ ♀ „ „ 3.'23
 1 ♀ „ „ 6.9.'23
 3 ♀ ♀ „ „ 4.3.'24
 2 ♀ ♀ „ „ 8.5.'24
 1 ♀ „ „ 8.8.'24
 1 ♀ „ horse 3.'23
 1 ♀ „ „ 7.9.'23
 1 ♀ „ „ 10.4.'24
 1 ♀ „ „ 8.5.'24
 1 ♀ „ 17.1.'24 without indication of host
 2 ♀ ♀ from Batoe Harimo, Siboloean, Sibolga, on buffalo 19/21.10.'22, LOBEL
 4 ♀ ♀ from Si Babangoen, Anggoli Simanossor, LOBEL
 respectively 2 ♀ ♀ on buffalo 27.10.'22
 1 ♀ „ „ 11.'22 (Textfig. 281 a)
 1 ♀ „ horse 11.'22 (Textfig. 281 b, d)
 Ressort Padang Sidempoean, Mantrie Ressort Binanga
 2 ♀ ♀ from Pasar Si Boehoean, Djandi Lobi, TARIP and LOBEL
 respectively 1 ♀ on buffalo 5.2.'22
 1 ♀ „ horse 10.'22
 1 ♀ from Hoeta Nopan, Hoeta Nopan on buffalo 3.5.'24, BAKKER
 Ressort Padang Sidempoean, Mantrie Ressort Goenoeng Toea
 6 ♀ ♀ from Pasar Goenoeng Toea, Goenoeng Toea, BAKKER
 respectively 1 ♀ on horse 22.9.'23
 1 ♀ „ „ 22.11.'24
 1 ♀ „ buffalo 20.7.'24
 1 ♀ „ „ 22.11.'24
 2 ♀ ♀ „ cattle 26.11.'24
 2 ♀ ♀ from Si Paho, Oedjoeng Padang, on horse, BAKKER
 respectively 1 ♀ on 30.9.'23
 1 ♀ „ 25.7.'24
 1 ♀ from Sawah Bangoenan, Portibi on horse 23.9.'23, BAKKER
 1 ♀ „ same locality on horse 17.4.'24
 Ressort Padang Sidempoean, Mantrie Ressort Kota Nopan
 3 ♀ ♀ from Manjabar, Panjaboengan on buffalo 15.5.'24, BAKKER
 3 ♀ ♀ „ Moeara Tagor, Tamiang, LOBEL and BAKKER
 respectively 1 ♀ on buffalo 21.2.'23
 1 ♀ „ „ 14.5.'24
 1 ♀ „ cattle 30.9.'23

- 6 ♀ ♀ from Kota Siantar, Kota Nopan, LOBEL
 respectively 1 ♀ on horse 29.4.'28
 1 ♀ „ buffalo 3.'28
 2 ♀ ♀ „ „ 29.4.'28
 2 ♀ ♀ „ „ 27.6.'28
- 1 ♀ from Kajoe Djati, Kota Siantar on buffalo 16.5.'24, BAKKER
 1 ♀ „ Pidjang Bolang on buffalo 13.3.'22, TARIP
 1 ♀ „ Ressort Kota Nopan without locality 2.'24, BAKKER
 Residency Sumatra's West Coast
- 2 ♀ from Fort de Kock, near Padang 11.'22
 Residency Djambi
- 26 ♀ ♀ from Djambi, MARSIDI
 respectively 11 ♀ ♀ on buffalo 25.9.'22
 1 ♀ „ „ 25.9.'22
 3 ♀ ♀ „ „ 22.1.'23
 2 ♀ ♀ „ horse 4.'22
 3 ♀ ♀ „ „ 25.9.'22
 1 ♀ „ „ 22.1.'23
 2 ♀ ♀ „ cattle 25.9.'22
 3 ♀ ♀ „ „ 22.1.'23
 Gvt. Sumatra's East Coast
- 5 ♀ ♀ from the Road Bindlji — Pangkalan Brandan 5.'22, EYKMAN
 1 ♂ „ Sandaran Agong, Korinchi Lake 2450 Feet 5/6.'14 Coll. BR.M.
 1 ♀ without locality Coll. L.M.N.H.
 Residency Palembang
- 2 ♀ ♀ from Moeara Enim on horse '22
 Federated Malay States
- 1 ♂ from Tebing Tinggi, Kelantan, V. KNIGHT 7.'20 (Textfig. 282)
 Coll. R.M.S.
 British India
- 1 ♂ from India, SAUNDERS Coll. BR.M.
 1 ♀ from Belgatchia, Bengal Coll. Ind. Mus.

T. optatus WALKER is a beautiful species, characterised at once by the banded wings, the white scutellum, contrasting with the brown scutum, the green eyes, etc. Forehead narrower at vertex, rufous, reddishbrown haired at base, black brown to black haired at vertex, intermixed with some yellow hairs. Callus reversed heart-shaped or pear-shaped, pale yellowbrown to redbrown, effiliated at its apex to a pointed linear extension. Subcallus brown. Cheeks and face pale yellowwhite, yellowwhite haired. Beard yellowwhite. Palpi brownish yellow, ending blunt, mainly yellow haired, intermixed with some black hairs at apex. Antennae brownyellow, black and yellow haired on basal joints, third joint blackbrown, tooth prominent. Thorax dullbrown, with 3 indistinct longi-

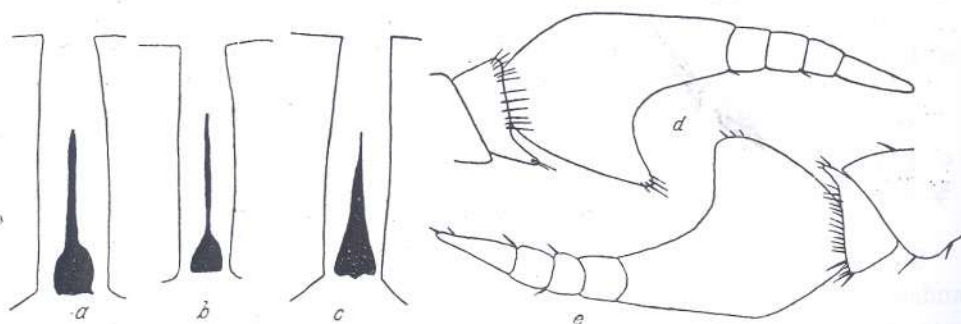
tudinal stripes on the scutum, yellowishbrown haired, scutellum broadly white at hindborder. Wings with brown crossband, not reaching the hindborder of the wing, base of wing reddishbrown. Tibiae largely yellowbrown with black, black haired apices. Abdomen rustybrown at base, then dull black, with yellowbrown, rustyyellowbrown haired segmentations to the 2d—6th segment, these segmentations elevated in the middle to low white triangles on the segments 2—5.

The Female.

Table of dimensions

Bodylength	varying from 13,2 m.M. to 18 m.M.			
Width of thorax	„	„	4,2	„ — 6,5
Width of abdomen	„	„	5	„ — 7
Wingexpanse	„	„	27,8	„ — 36,2
Length of head	„	„	2	„ — 3,2
Length of thorax	„	„	5	„ — 8
Length of abdomen	„	„	7	„ — 11,2
Length of wing	„	„	10,4	„ — 15
Breadth of wing	„	„	4	„ — 5,8
Foreheadindex	„	„	3,12	„ — 4,83

The Head. (Textfig. 281). Forehead from $\frac{1}{3}$ — $\frac{1}{4}$ narrower at vertex than it is at base. In a single case it showed almost the same width throughout. It is covered with rufous tomentum, in some instances the linear extension is accompanied by a darker tomentose shadow. The linear extension varies in shape and in length, sometimes it is broad at base and gradually narrows to a fine point, in other cases it starts from a knob-shaped incassation of the apex of the callus, whether extending on the basal $\frac{2}{3}$ of the frontal stripe or even reaching the vertexspot, which is oval reddishbrown, triangular or even may be absent. Eyes in life bright



Textfig. 281.

T. optatus Wlk. ♀. a—c. forehead, d, e. antennae.

coppergreen, in death this colour soon fades away. Proboscis yellowbrown, with dark pubescence. Antennae, first joint brownyellow, thick black haired on dorsum, distal lateral border yellowbrown haired; in other females the black pubescence on dorsum is reduced to a median row of black hairs, second joint black fringed, dorsal hump distinct, third joint blackbrown, basal annulation 1,3 times as long as its widest part, analogous index in other females 1,16), 1,1 times as long as the stylus. Tooth acute crowned with some black hairs.

Thorax. Scutum deep dullbrown, slightly paler on foreborder, rustybrown haired. Tufts at base of wings and more behind white. Scutellum havannabrown, havannabrown haired at base, hindborder white, rustybrown haired. Breast and sides yellowbrown, brown-yellow haired. In some females the hindborder of the scutum is more blackbrown. Wings with a brown crossband, starting from the redbrown to dark brown stigma, passing over the radial, cubital, disc cells and the apices of the first 3 posterior cells, not reaching the hindborder, although the veins enclosing the 4th and 5th posterior cells are accompanied by brownish shadows. Base of wing, including the foreborder of the wing, both basis cells and the anal cell pale reddishbrown. The disc cell may be uniformly brown or may show a paler centre, either in one or in both wings. Legs. First leg. Coxa yellowbrown, black at apex, yellowwhite to brownyellow haired. Femur reddishblack, black haired on dorsum, some redbrown hairs being intermixed at distal lateral border, knee paler. Tibia yellowbrown, yellowbrown and black haired at base, apical half black, black haired. Tarsalia black. The basal yellowbrown area of the front tibiae may vary to a certain extent. Second leg. Coxa as in first leg, yellowbrown haired, trochanter redbrown, black haired. Femur black haired on dorsum, distal lateral border brownyellow haired, proximal lateral border short, rustybrown haired, ventral surface bare, blackbrown, knee paler yellowbrown, black haired. Tibia yellowbrown, yellowbrown haired, distal lateral border long, black haired, apical ring narrow, black haired. First tarsale redbrown at base, then black, black haired. In other specimens the tibia bears a dorsal median row of black hairs. Third leg. Femur dull blackbrown, mainly yellowbrown haired, intermixed with some black hairs on dorsum and on venter at base, lateral borders reddish-yellowbrown haired, knee pale reddish yellow. Tibia yellowbrown, with black haired apical ring, mainly black on dorsum, with a median row of black hairs, distal lateral border black haired on apical half, yellow haired to the base, on the proximal lateral border yellow hairs are intermixed between the black ones. Ventral surface rustyyellow haired. Tarsalia redbrown, black haired.

Abdomen rustybrown on basal 2 segments, elsewhere brownblack, black haired, segmentations yellowbrown, rustyyellowbrown haired, the mentioned median white spots are triangular or halfmoon-shaped, the segmentations are broadened to the lateral borders. Lateral borders of the first and second tergite bearing a reddishbrown spot, those of the other tergites being rustybrown, rustybrown haired, intermixed with some white hairs. Apex of seventh segment white haired on ventral surface. Ventral surface blackbrown, rustyyellow haired, with broad white, white haired segmentations. In a single female I observed the trace of a median spot on the first abdominal tergite, whereas in other instances a white median spot was present on the sixth segmentation.

The Male.

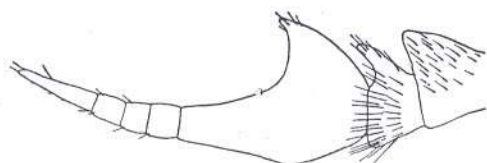
Table of dimensions.

Bodylength	15,2 m.M.
Width of thorax	6,2 "
Wingexpanse	33,8 "
Length of head	4,5 "
Length of thorax	6,5 "
Length of wing	13,8 "
Breadth of wing	5,5 "

The Head. (Textfig. 282), Eyes violetyellowbrown on large-facettèd part, lower third black, small-facettèd, this area being prolonged to the vertex as a narrow border,

finally becoming less distinct. Subcallus reddishbrown at apex, elsewhere goldenyellow tomentose. Cheeks and face same colour, honeyyellow haired. Beard yellowwhite. Proboscis blackbrown.

Thorax as in the female. Scutum dark brownred, with 3 faint longitudinal stripes, foreborder yellowbrown. Shoulders and pteropleura, long black haired. Breast and sides reddish velvety-yellowbrown, brown haired. Wings identical. Legs more or less reddishbrown. First leg, femur dark redbrown, black haired on dorsum, distal lateral border yellowbrown haired, basal half of fore tibiae coppered haired. Second leg almost wholly yellowbrown, coppered haired, extreme base blackish, apical ring narrow, black haired, distal lateral border long, black haired. Third leg. Femur reddishbrown, copperyellowbrown haired, some black hairs being intermixed at base on dorsum, knee yellowbrown. Tibia dark yellowbrown, black haired on dorsum,



Textfig. 282.

T. optatus Wlk. ♂. antenna.

ventral surface cinnamonbrown, coppered haired, apical ring reddishblackbrown, black haired. Tarsalia blackbrown, black haired.

Abdomen, wanting in type, complete in the Korinchi female, pale reddishbrown on basal 4 segments, following segments chestnutbrown to blackbrown, segmentations yellowbrown, yellow haired, lower in the middle, median triangles only faintly indicated on the 2d-4th segment, the triangles being not purely white. Ventral surface, with narrow, white haired segmentations and black, halfmoon-shaped median patches, forming together a longitudinal band, which is interrupted at the segmentations only.

SAUNDERS ♂ presents more distinct white segmentations and triangles on the 2d-5th segment, latter ones even higher than in the ♂ type. Bodylength 17 m.M., wingexpanse 33 m.M., width of thorax 5 m.M.

A female in the N.A.M. collection labelled as *T. equestris* WULF by VOLLENHOVEN does not belong to *T. optatus* WALKER, the type after which WULF has described his *T. equestris* is quite certainly identical with *T. optatus* Wlk., confer the description, therefore *T. equestris* WULF is a synonym of *T. optatus* Wlk. and the mentioned specimen from VOLLENHOVEN belongs to a new species, confer my *T. rufiscutellatus* nov. spec.

263. *Tabanus rufiscutellatus* nov. spec. (♀, ♂) Pl. 17, Fig. 6; Textfig. 283.

Habitat:

Isle Java

Type ♀ and 2 other females from Rangkas Dengklok, Krawang, Res. Batavia on buffalo 30.11.'21 Coll. V.S.L.

1 ♀ from Teloekdjambi, Krawang, Res. Batavia on buffalo 9.12.'21

1 ♀ „ Stomachcontents from *Bubulculus coromandus*, caught in Tjitaroem delta by BARTELS Coll. V.S.L.

1 ♀ from Mlangi, O. D. Widang, Toeban, Res. Rembang on buffalo 11.12.'22, DE WILDE (Textfig. 283) Coll. V.S.L.

1 ♂ from Java, JACOBSON

Coll. N.A.M.

1 ♀ „ Java, BLOEM, VOLLENHOVEN det. *T. equestris* WULF „

Isle Sumatra

8 ♀ ♀ from Djambi, MARSIDI

Coll. V.S.L.

respectively 4 ♀ ♀ on buffalo 4.'22

1 ♀ „ „ 22.1.'23

3 ♀ ♀ „ cattle 22.1.'23

T. rufiscutellatus is closely related to *T. optatus* Wlk., but differs inter alia in the shape of the callus, the colour of cheeks and face, the yellow beard, the colour of the antennae and the uniformly coloured thorax and abdomen. Eyes green. Forehead ochrebrown, yellow and blackbrown haired, the latter especially at vertex on the small dark vertexspot. Callus pale olive-yellowbrown to reddishbrown, irregular square to club-shaped, linear extension rather long. Subcallus rustyyellow. Face and cheeks ochraceous, ochraceousyellow haired. Beard same colour. Palpi reddish- ochraceousyellow, acuminate, mainly yellow haired, intermixed with a few black hairs on outer border. Antennae ochraceousyellow, black haired on basal joints, third joint redyellow to orangeous, tooth distinct. Thorax uniformly reddishbrown on scutum with indistinct paler stripes, black and rustybrown haired, lateral borders paler yellow tomentose. Scutellum same colour as scutum. Wings with brown crossband. Legs yellowbrown with tawny tibiae, darker at the apices. Abdomen wholly orangeousyellow, darker to the apex, copperedbrown haired, no paler segmentations or white median spots. Male identical.

The Female.

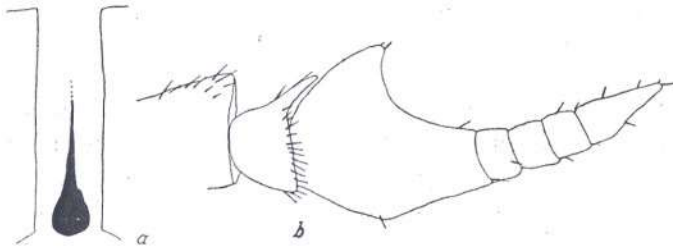
Table of dimensions

Bodylength	varying from 15,2 m.M. to 17,5 m.M.				
Width of thorax	„	„	4,2	„	— 6,2 „
Width of abdomen	„	„	5,5	„	— 7 „
Wingexpanse	„	„	30,2	„	— 35,8 „
Length of head	„	„	2,2	„	— 3 „
Length of thorax	„	„	6,2	„	— 7,8 „
Length of abdomen	„	„	8,2	„	— 10,5 „
Length of wing	„	„	13	„	— 14,8 „
Breadth of wing	„	„	4,8	„	— 5,5 „
Foreheadindex	„	„	3,29	„	— 4 „

The Head. (Textfig. 283). Forehead almost the same width throughout, either narrower anteriorly or narrower at vertex. The green eyes present some short hairs. Linear extension extending on the basal $\frac{2}{3}$ of the frontal stripe. Palpi, first joint rustyredbrown, long yellow haired, second joint ochraceousyellow, slender, ending acute. Proboscis black, black haired, with some yellowbrown hairs on the sugarflaps. Antennae, first joint dull yellowishbrown, coffee-coloured to ochraceousyellow, black haired, second joint black fringed, dorsal hump

distinct, third joint, broad at base, curved, basal annulation orangeousyellow, almost equal in size to its widest part, slightly shorter than the long blackishredbrown stylus. Tooth blunt distinct, black haired.

T h o r a x uniformly reddishvelvetybrown with indistinct paler stripes. Pteropleuron darker brown, with short black and yellowbrown pubescence. Tufts at base of wings and behind ochraceousyellow. Schutellum copperreddbrown, with long pubescence along the hindborder. Breast and sides rustyyellowbrown haired, mesosternumlobus black haired. Wings with similar crossband as in *T. optatus* Wlk., stigma darkbrownred. Foreborder and base of wings, including



Textfig. 283.

T. rufiscutellatus s. s. ♀. a. forehead, b. antenna.

basal cells and the anal cell, yellowbrown. Disc cell with clear centre in all specimens. Halteres, stalk deep rustybrown, club clearer yellowreddbrown. Legs. First leg. Coxa yellowbrown, loose yellowbrown haired, apex darker mahoganybrown, black haired. Femur reddishbrown, dorsum black haired, distal lateral border black haired, intermixed with some yellow-

brown ones. Tibia incrassated and curved, reddishbrown at baes, apical third black, almost the whole tibia black haired, intermixed with some yellowbrown hairs. Tarsalia black. Second leg. Coxa yellow, rustybrown tomentose at base, blackbrown at apex, black haired, intermixed with some yellowbrown hairs, femur violetreddbrown on ventral surface, dorsum yellowbrown, short black haired along the proximal lateral border, yellowbrown haired elsewhere. Tibia tawnyyellowbrown haired on dorsum, intermixed with black hairs, ventral surface black haired, intermixed with some yellowbrown hairs. First tarsale tawny reddbrown, following ones darker reddbrown, all black haired. Third leg. Coxa yellowbrown tomentose, yellowbrown haired, black haired at apex; trochanter redvioletbrown, black haired, femur reddishyellowbrown, dorsum mainly yellowrustybrown haired, distal lateral border covered with longer black pubescence, intermixed with some yellowbrown hairs, black haired on ventral surface. Tibia tawny, dorsum mainly black haired, with a row of yellowrustybrown hairs along the distal lateral border, ventral surface yellowbrown haired. Tarsalia reddbrown, black haired. In the Widang female the fore femora are more chromateyellow, black haired on dorsum, yellow haired on ventral surface, fore tibiae of the same female orangeous rustybrown at apex. Middle femora chromateyellow, yellow haired, intermixed with some black hairs on dorsum, middle tibiae orangeous, some black hairs being found on dorsum in the middle. Hind tibiae paler than the middle tibiae.

A b d o m e n uniformly ochraceous-orangeyellow, copperred haired, segmentations slightly darker, chocolatereddishbrown. Black hairs are intermixed between the coppercoloured hairs. Lateral borders of tergites yellowrustybrown. Ventral surface yellow, with redyellow segmentations, pubescence ferrugineous.

264. *Tabanus melanognathus* BIGOT (♀, ♂) Textfig. 284.

Syn. *T. non optatus* RICARDO.

References:

BIGOT, Nouv. Arch. Mus. Hist. Nat. Paris (3) II, p. 204 (1890).

RICARDO, Rec. Ind. Mus. IV, p. 226 (1911).

„ Rec. Ind. Mus. IV, p. 140 (1911).

Habitat:

Type ♀ of unknown locality. AUSTEN stated the synonymy of both species by comparison of the types.

♂ from Purnea District Ind. Mus. Coll.

♀ „ unknown locality, BR.M. Coll.

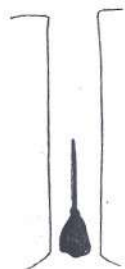
2 ♂♂ from unknown locality BR.M. Coll.

1 ♂ „ (BIGOT's type) from Laos

Tabanus melanognathus BIGOT is distinguishable from *T. rufiscutellatus* SCHUURMANS STEKHOFEN, to which it is closely allied, by the shape of the callus, the colour of the beard, the shape and pubescence of the palpi. Peculiar distinct abdominal markings wanting. Forehead brown. Callus pears-shaped to triangular, dark reddish brown, linear extension fine and short. Subcallus and cheeks greyish brown. Beard white. Face brownish, white haired. Palpi acuminate yellowish brown, white haired. Antennae reddish yellow, black haired on basal joints, third joint missing. Thorax denuded, brown, with 2 or 3 longitudinal brown stripes. Breast brownish white haired. Wings with brown crossband. Legs yellowish brown. Abdomen bright brownish yellow on the basal 3 segments, darker to the apex, yellowish white haired on disc of tergites, narrowly black haired at bases of the segments. In certain lights median whitish triangles are visible. Ventral surface with white haired segmentations, elsewhere reddish brown, with darker median, black haired patches. Length of female type 19 m.M. male type 14 m.M., other males 17—19 m.M.

The Female.

The Head. (Textfig. 284). Forehead almost the same width throughout, index 5. Palpi stout. Antennae incomplete, second joint with a distinct spine, third joint broken off.



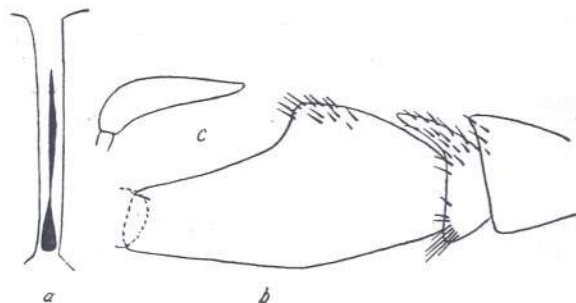
Textfig. 284.

T. melanognathus

BIGOT ♀
forehead.

Thorax denuded on scutum, which shows 2 distinct longitudinal stripes, whereas probably a third brown stripe is present. Lateral borders of scutum whitish. Tufts at base of wings and more behind white. Pteropleuron reddish yellowish brown, black haired. Hindborder of scutellum greyish. Sides and breast greyish brown, brownish white haired. The wings are brown banded, this crossband does not reach the hindborder, foreborder yellowish brown, stigma dark reddish havannabrown. Legs. First leg. Coxa greyish white, apex brown, white haired, trochanter yellowish brown, black haired. Femur reddish brown black, black haired, knee yellowish brown. Tibia swollen, yellowish brown on basal half, deep reddish brown at apex, black haired. Tarsalia black, black haired. Second leg. Coxa greyish brown, white haired, trochanter brown, femur darker than in first leg, mainly black haired. Tibia bright yellowish brown, golden yellow haired, apical ring reddish blackish brown, black haired. Tarsalia black. Third leg, femur blackish brown, yellow haired at apex and on distal lateral border, elsewhere black haired, knee yellowish brown. Tibia yellowish brown to dark olive brown, yellow haired with blackish, black haired apical ring. Tarsalia deep brown black, black haired.

segmentations on the segments 1—6 with broad yellowbrown, goldenyellow haired, elevated in the middle to distinct triangles, seventh segment wholly black haired. Lateral borders of the first 4 tergites brownish, yellow haired. Ventral surface, with basal 2 segments caramelbrown, yellow haired, following 4 segments redbrown, black haired at bases, yellowbrown, goldenyellow haired at segmentations and sides, 7th segment wholly black haired. Length 16—19 m.M. ♂ 16—19 m.M.



Textfig. 285

T. flexilis Wlk. ♀. a. forehead, b. antenna, c. palpe,

The Female.

The Head. (Textfig. 285). Forehead 0.3 narrower anteriorly than it is at vertex, index 10. Antennae, first joint orangeousyellow, some black hairs being visible at apex on dorsum, elsewhere yellow haired, second joint reddishyellow, black fringed, dorsal spur long, third joint redyellow, basal annulation 1.83 times as long as its widest part, tooth distinct, blunt, black haired.

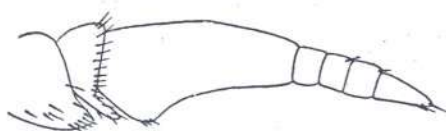
Thorax goldenyellow haired on shoulders and pteropleura, tufts at base of wings yellowwhite. Breast citroneyellowwhite, yellow and yellowwhite haired. Wings with peculiar markings and crossband, first posterior cell closed, foreborder reddishyellow, stigma dull pale havannabrown, a smokybrown apical shadow being present. The apical crossband is attached to it and surrounds with its brown colour the cubital veins and the veins running from the disc cell to near the hindborder of the wing but does not reach it. Centres of cells paler. One may hardly speak from a second crossband, but the veinlets, surrounding the apices of both basal cells are accompanied by brown shadows, thus giving the impression of a crossband. Halteres, stalk redbrown, club ochraceousyellow. Legs. First leg. Coxa yellowbrown, yellow and yellowwhite haired, trochanter yellowbrown, femur yellowish olivebrown, black haired on dorsum in the middle, lateral borders and knee yellow haired. Tibia, reddishbrown, reddishyellow haired at base, apex chestnutbrown, black haired. Tarsalia black, black haired. Second leg. Coxa and trochanter redbrown, femur dull pale buffbrown, yellow haired, some black hairs being visible at apex, tibia orangeousyellowbrown at base, apex blackbrown, dorsum black haired, ventral surface reddishyellow haired at base elsewhere black haired. Tarsalia dark redblackbrown, black haired. Third leg. Coxa brownishyellow, yellow haired, trochanter reddishbrown, femur as in second leg, tibia blackish tawny, black haired on dorsum, ventral surface orangeousredyellow haired, except on the apical, black haired band. Tarsalia blackbrown, black haired.

Abdomen as described. A female from Menado has the first posterior cell of the wings not wholly closed, but narrowly open at hindborder.

The Male.

The Head. (Textfig. 286). Eyes with equal facets over the whole surface. Subcallus orangeousyellowbrown. Face and cheeks yellow, yellow haired. Beard yellow. Palpi orangeousyellow, yellow haired. Antennae, first joint yellow, mainly yellow haired, a few black hairs present on dorsum, second joint olivebrown, third joint reddishyellow, basal annulation almost 2 times as long as its widest part, 1.34 times as long as the redbrown stylus.

Thorax. Scutum denuded, greyishyellow tomentose on foreborder, disc brownish yellow haired. Wings with yellowbrown foreborder, pale havannabrown stigma, the usual markings and the first posterior cell strongly narrowed at opening, but not wholly closed.



Textfig. 286.

T. flexilis Wlk. ♂. antenna.

Abdomen conical, first segmentation with a small, median yellow spot, the 2d—6th segments have yellow haired segmentations with median triangles, which are less elevated than in the female sex. Lateral borders of 1st and second tergite yellow haired, those of the 3d and following tergites are partly black, partly yellow haired. Sternites yellow haired at the segmentations only, elsewhere black haired.

266. *Tabanus biatripunctatus* nov. spec. (♀). Textfig. 287.

Habitat:

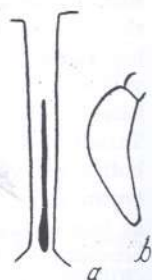
Locality unknown

A ♀, closely allied to *T. flexilis* Wlk. distinguishable inter alia by the velvetybrown, black haired forehead. Callus blackbrown, hardly broader than the linear extension. Subcallus and upper cheeks velvetybrown, black haired. Lower cheeks and face as in *T. flexilis*. Orangeousyellow, yellow haired. Beard yellow. Palpi blackbrown, black haired. Antennae tawny, black haired, third joint orangeousyellow. Thorax dark olivebrown, goldenyellow haired. Wings almost as in *T. flexilis*, apical crossband broader, reaching the hindborder, no clear centres in the cells. Legs blackbrown to black. Abdomen partly denuded, colour as in *T. flexilis*, with a median black spot on the 2d and 3d segment.

The Head. (Textfig. 287). Forehead $\frac{1}{3}$ narrower anteriorly than it is at vertex, index 10. Callus narrow. Palpi, second joint swollen at base, ending with a brown blunt tooth, black haired, with some yellow hairs at base. Antennae broad on basal annulation of the third joint, stylus short, blackbrown.

Thorax dark olivebrown, scutellum paler, yellowbrown, black haired at base, goldenyellow haired at borders, scutum without longitudinal stripes, goldenyellow haired. Pteropleuron yellowbrown, black haired. Breast grey-yellowbrown, yellow haired, intermixed with some long loose brownish hairs. Wings as in *T. flexilis*, apical crossband more continuous, concave at basal border, letting free the apex of the submarginal cell. Foreborder of wing reddishbrown, stigma reddish. Halteres, stalk redbrown, club yellowwhite. Legs. First leg. Coxa yellowbrown, yellow haired, apex blackishbrown, black haired, trochanter and femur brownblack, black haired, knee yellowbrown, tibia reddishblackbrown, black haired, tarsalia similar. Second leg identical, femur blackbrown, dorsum black haired, distal lateral border yellow haired on lower half. Third leg similar, tibia black, black haired.

Abdomen, first segment, with a black, black haired collar, embracing the scutellum, rest of 1st segment orangeousyellow, yellow haired, 2d and third segment orangeousyellow



Textfig. 287.

T. biatripunctatus

s.s. ♀

a. forehead

b. antenna.

with rectangular black, black haired spots at base of segmentations and sides, yellow haired. Segmentations 3—5 yellow haired, but not elevated to the huge triangles which *T. flexilis* shows, 5th segmentation narrower, yellowwhite. Segment 4—7 blackbrown, black haired. Ventral surface reddishyellowbrown, yellow haired on basal 2 segments, the 2d showing some black hairs in the middle. Third segment same colour, base black haired, segmentation yellow haired. Following 2 segments blackbrown, black haired at base, segmentations yellowbrown, yellow haired. Sixth and seventh segment wholly black haired.

GEOGRAPHICAL DISTRIBUTION OF THE SPECIES BELONGING TO THE GENUS TABANUS.

This list includes only those species, which are named in RICARDO's list and in my book and is therefore incomplete. The species which our Archipelago has in common with the neighbouring countries are printed in fat types

The Oriental Region

British India, including the Pundjab, Northern India, Nepal, Bengal, Assam (55 species.)

Tabanus albocostatus, *albofasciatus*, *andamanicus*, *auriflamma*, *auristriatus*, *avittatus*, *bicallosus*, *bicinctus*, *bombayensis*, ***brunnipennis***, *calidus*, *ditaeniatus*, *diversifrons*, *explicatus*, *flavicinctus*, *flavimediis*, *flavipus*, *flaviventris*, *hirtipalpis*, ***hybridus***, *imparicallosus*, *indianus*, *joidus*, *jucundus*, ***khasiensis***, *laotianus*, *laticinctus*, *latifrons*, *leucocnematus*, *leucohirtus*, *leucopogon*, *manipurensis*, *melanognathus*, *monilifer*, *monotaeniatus*, *nemocallosus*, *nephodes*, *nico-barensis*, *noctuinus*, *obconicus*, ***optatus***, *pallidiventer*, *palpalis*, *puteus*, *rectilineatus*, *rubicundus*, ***rubidus***, *rufiventris*, *speciosus*, ***striatus***, *subhirtus*, *tenebrosus*, *tenens*, *tuberculatus*, *virgo*.

Ceylon (13 species)

Tabanus atrohirtus, ***ceylonicus***, *discrepans*, *flavissimus*, *fuscicauda*, *griseifacies*, *inflatalpalpis*, *internus*, *jucundus*, *puteus*, ***rubidus***, *speciosus*, *tenens*.

Siam, including Burma, Annam, Cambodja (23 species.)

Tabanus abbreviatus, *abscondens*, *annamitus*, *birmanicus*, ***brunnipennis***, *burmanense*, *equicinctus*, *fuscomaculatus*, ***griseipalpis***, ***immanis***, *insidiator*, *leucosparsus*, *melanognathus*, ***multicinctus***, *nigrotectus*, *ochros*, *oxyceratus*, *pallidipectoratus*, ***rubidus***, *sexcinctus*, *siamensis*, ***striatus***, *subcinerascens*.

Federated Malay States (25 species.)

Tabanus albitriangularis, *bicinctus*, *brunneus*, *ceylonicus*, *dissimilis*, *effilatus*, ***flavothorax***, *fumifer*, *hirtistriatus*, ***hybridus***, ***immanis***, ***khasiensis***, ***lentsignatus***, *minimus*, ***optatus***, *perakiensis*, *pratti*, *rarus*, ***rubidus***, *rufiventris*, ***striatus***, ***significans***, ***simplissimus***, *tinctothorax*, *uniformis*.

Riouw Archipelago (4 species.)

Tabanus hirtistriatus, *immanis*, *malayensis*, *undulans*.

Sumatra (63 species.)

Tabanus albicinctus, *albitriangularis*, *angustistriatus*, *angustitriangularis*,

atripilosus, atrohirtus, angustiventer, auricingulatus, aurilineatus, bilateralis, brunneus, brunnipes, brunniventer, bubalophilus, canipus, ceylonicus, chrysater, citripilosus, dissimilis, effilatus, flavicornis, flaviscutellatus, flavistriatus, flavitriatus, flavitriangularis, flavothorax, fontinalis, fulvissimus, fumifer, fumipennis, fuscibarbus, fuscithorax, fusciventer, geniculatus, gilvus, griseipalpis, griseithorax, hirtistriatus, immanis, incultus, ingens, inobservatus, khasiensis, longirostris, malayensis, minimus, multicinctus, nexus, nigerrimus, ochroäter, optatus, ovi-ventris, parallelifrons, paralleliventer, perakiensis, pseudorufiventer, rubidus, rufiscutellatus, rufiventer, significans, striatus, tristis, ventriflavimarginatus.

Nias (6 species.)

Tabanus fumifer, *immanis*, *malayensis*, *rubidus*, *rufiventer*, *striatus*.

Street Soenda.

Isle Sebesi (2 species.)

Tabanus auriventer, *longirostris*.

Bay of Batavia

Isle Leyden (1 species.)

Tabanus platybasiannulatus.

Isle Java (38 species.)

Tabanus abbreviatus, *albicinctus*, *albivittatus*, *albopunctatus*, *angustiventer*, *ardens*, *atripunctatus*, *auribundus*, *aurisparsus*, *basalis*, *brunneus*, *brunnipennis*, *caeruleus*, *ceylonicus*, *chloropis*, *chrysater*, *flavistriatus*, *flavivittatus*, *fulvissimus*, *fumifer*, *griseipalpis*, *humillimus*, *immanis*, *javanus*, *longicornis*, *malayensis*, *minimus*, *monotaeniatus*, *multicinctus*, *optatus*, *rubidus*, *ruficornis*, *rufiscutellatus*, *rufiventer*, *servillei*, *striatus*, *subhirtus*, *tricoloratus*.

Isle Madoera (4 species.)

Tabanus effilatus, *madoerensis*, *rubidus*, *striatus*.

Isle Kangean (1 species.)

Tabanus rubidus.

Isle Borneo (28 species.)

Tabanus atriventer, *borniense*, *canipus*, *crocitinctipennis*, *cylindricallus*, *elegans*, *flavipilosus*, *fulvissimus*, *fumifer*, *fuscifrons*, *hybridus*, *ignobilis*, *immanis*, *jutorius*, *latifascies*, *lativenter*, *lentisignatus*, *minimus*, *nexus*, *nigerrimus*, *optatus*, *parallelifrons*, *pauper*, *pratti*, *rubriscutatus*, *simplissimus*, *varicolor*, *ventriflavimarginatus*.

Isle Soembawa (3 species.)

Tabanus rubidus, *soembawensis*, *striatus*.

Isle Soemba (2 species.)

Tabanus rubidus, *striatus*.

Isle Timor, (3 species.)

Tabanus argentisignatus, *aurifer*, *striatus*.

The Philippines 4 species (at the borders of the Oriental and the Australian Region).

Tabanus factiosus, *flexilis*, *reducens*, *striatus*.