



The new record of *Heteropilumnus sasekumari* (Serène, 1971) and *Aniptumnus quadridentatus* (De Man, 1895) (Crustacea, Decapoda, Brachyura, Pilumnidae) from mangrove habitat in Papua, Indonesia

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Abstract

Based on morphological evidence, we report a new record of *Heteropilumnus sasekumari* (Serène, 1971) for the first time in Indonesian water, and the third record of *Aniptumnus quadridentatus* (De Man, 1895) after its description from Pontianak and record from Singapore. These two species were collected from mangrove habitat in Timika, Papua, Indonesia. The female gonopore of these two species are described and illustrated for the first time in this paper.

Keywords: *Heteropilumnus sasekumari*, *Aniptumnus quadridentatus*, new record, mangrove, Papua

Abstrak

Catatan baru *Heteropilumnus sasekumari* (Serène, 1971) dan *Aniptumnus quadridentatus* (De Man, 1895) (Crustacea, Decapoda, Brachyura, Pilumnidae) dari habitat mangrove di Papua, Indonesia. Berdasarkan morfologi, kami melaporkan catatan pertama dari *Heteropilumnus sasekumari* (Serène, 1971) dari perairan Indonesia dan catatan ketiga dari *Aniptumnus quadridentatus* (De Man, 1895) setelah deskripsi pertamanya dari Pontianak dan catatan dari Singapura. Dua spesies ini telah dikoleksi dari ekosistem mangrove di Papua, Indonesia. Gonopor keping betina dari kedua spesies ini dideskripsikan dan diilustrasikan untuk pertama kalinya pada tulisan ini.

Kata Kunci: *Heteropilumnus sasekumari*, *Aniptumnus quadridentatus*, catatan baru, mangrove, Papua

Introduction

The mangrove forest in Mimika reGENCY, Western Papua, Indonesia is estimated at 186,291 ha (Aslan et al., 2018) and extends up to 20 km inland. The brachyuran mangrove crabs in this area have been relatively well studied with 64 species reported, but only three species of

pilumnid crabs have been recorded, namely *Heteropanope longipedes* Davie, 1989; *Heteropanope glabra* Stimpson, 1858, and *Benthopanope estuaria* Davie, 1989 (Rahayu & Setyadi, 2009; Rahayu & Ng, 2020). Recent collections from mangrove area around Timika, Papua, reveal the presence of two other pilumnid crabs: *Heteropilumnus sasekumari* (Serène, 1971)

and *Aniptumnus quadridentatus* (De Man, 1895). Crabs of the family Pilumnidae are usually inhabitant of rocky beaches or coral reefs, and are rarely found in mangrove environment.

The genus *Heteropilumnus* contains 20 species (Ng et al., 2008; 2018), distributed in the Indo-West Pacific, which are mostly found in littoral and sub-tidal area of sandy and rocky shores. *Heteropilumnus sasekumari* was previously reported from the mangrove ecosystem in Eastern Australia, Singapore and Malaysia (Ng & Davie, 1991; Lee & Ng, 2012). The genus *Aniptumnus* Ng, 2002 has only three species: *Aniptumnus quadridentatus* was originally described from Pontianak, Indonesia, and later on recorded from Singapore (Ng, 2002); the second and third species are *A. nefissurus* (Garth & Kim, 1983) from Sulu, the Philippines and *A. vietnamicus* Ng & Clark, 2008 from NhaTrang Bay, Vietnam, respectively (Ng & Clark, 2008).

An ensemble of characters is needed to determine a species. In brachyuran crab, the male specimen is the most important, since the male G1 very often is the key character to identify a species. However, female gonopore is more and more used to determine species when male specimens were not available (Rahayu & Widyastuti, 2014; Ng et al., 2016). This study aims to record the living environment and the new geographical distribution in the Southeast Asia of *H. sasekumari* and *A. quadridentatus*. The presence of female specimens allows us to provide illustrations and descriptions of the gonopore that has never been reported previously.

Methods

The specimens were collected randomly by hand during low tide in the mangrove area of Papua, Indonesia and preserved in 70% alcohol. Specimen examined are deposited in the Museum Zoology Bogor (MZB) Research and Innovation Agency (BRIN). Crab size was measured using the width and length of the carapace (width \times length). Carapace width (mm) is measured on the widest point of the carapace, and the carapace length (mm) is measured from the tip of the frontal margin to the posterior margin of the carapace. The abbreviation used is G1 for the first male gonopod. The synonyms, material examined, and diagnosis were given for each species. Diagnosis is presented in telegraphic format.

Result

Four individuals of *Heteropilumnus sasekumari* and seven individuals of *Aniptumnus quadridentatus* were collected from mangrove habitat in Timika, Papua. Systematic accounts for these two species were presented below.

Heteropilumnus sasekumari (Serene, 1971)

Synonym: *Rhizopa? Sasekumari* Serene, 1971: 915, pl. VA

Rhizopa sasekumari Ng, 1985: 631, fig. 2A

Heteropilumnus sasekumari Ng, 1987: 83; Ng & Davie, 1991: 517, figs. 1, 2; Lee & Ng, 2012: 57, fig. 1.

Material examined. 2 males, 12.2 \times 8.7 mm, 19.6 \times 13.6 mm (MZB Cru 5382), Kamora, Timika, Papua, 6 November 2002; 1 female, 17.1 \times 11.8 mm (MZB Cru 5383), Ajkwa Island, Timika, Papua, 21 April 2009; 1 male, 17.5 \times 11.5 mm (MZB Cru 5384), Ajkwa river, Timika, Papua, 19 June 2014.

Diagnosis. Carapace quadrilateral (Figs. 1A, 2A), covered with short tomentum; regions not well defined, external orbital angle low; anterolateral margin with 3 blunt, broad teeth, and long, stiff setae; first tooth broader than second and third. Front bilobed with shallow median cleft (Fig. 1B). Orbit short, ocular peduncle bulbous filling orbit, movable, cornea distinct, pigmented (Fig. 1B). Epistome relatively broad, median lobe broadly triangular. Third maxilliped covering buccal cavity (Fig. 1D). Chelipeds (Fig. 1C) stout, right usually larger than left; outer surface covered with dense pubescence and scattered long setae, median part of larger chela glabrous. Fingers with low longitudinal ridge on outer surface. Pereopod 2–5 setose, unarmed. Male pleon narrow, 7 segments free (Fig. 1E); telson subtriangular, longer than sixth segment (Fig. 1D, E). G1 slender, sinuous, distal part curved downward, tapering to pointed tip. Female cheliped subequal, covered with dense pubescence, pleon relatively broad, longitudinally subovate, 7 segments free (Fig. 2B); telson rounded; vulvae (Fig. 2C) subovate, positioned on anterior edge of sternite 6, margin with operculum.

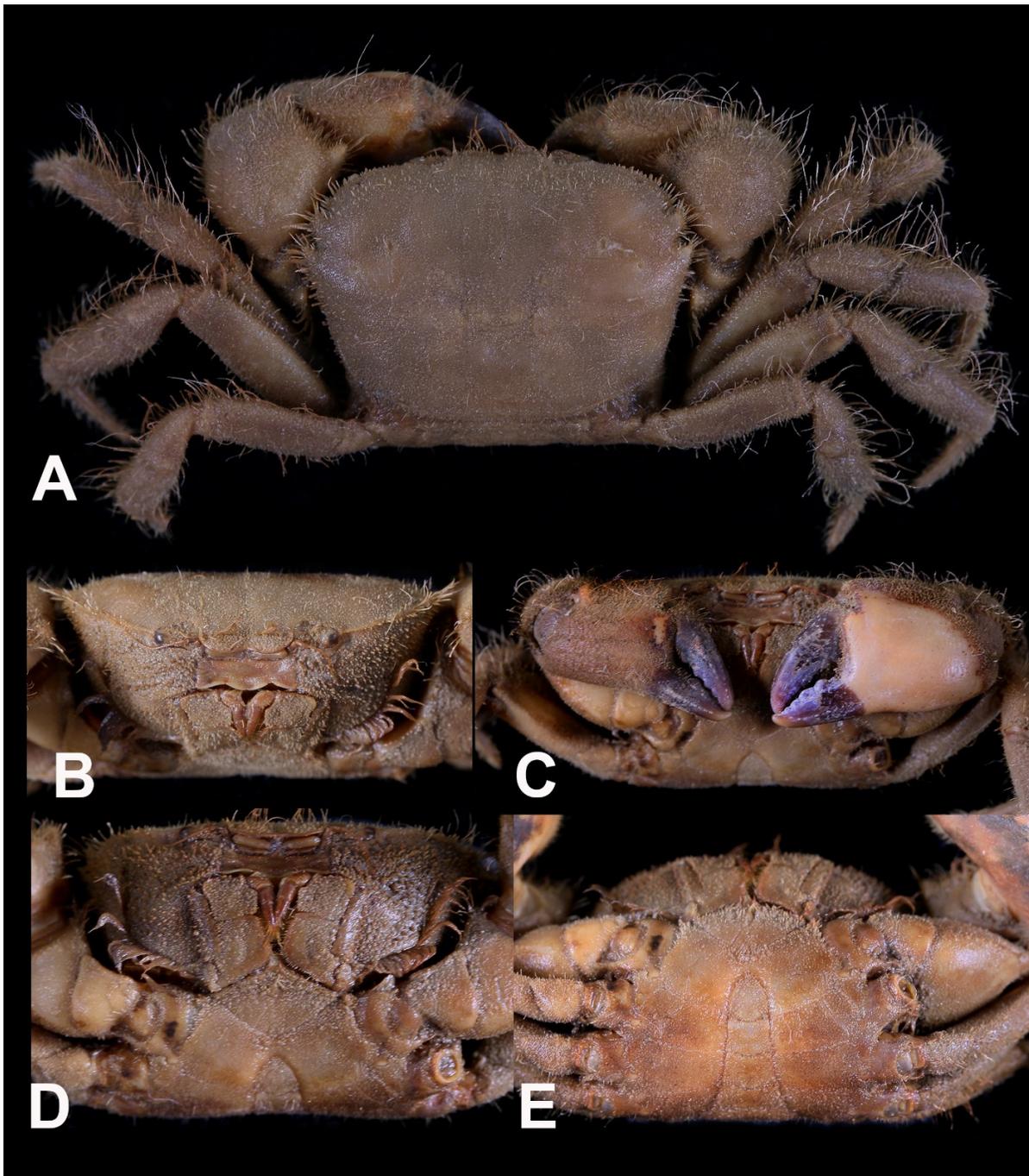


Figure 1. *Heteropilumnus sasekumari* (Serène, 1971), male, 19.6 × 13.6 mm (MZB Cru 5382): A) overall dorsal view; B) frontal view of carapace, orbit and ocular peduncle; C) cheliped; D) third maxilliped; E) anterior thoracic sternum and pleon.

Gambar 1. *Heteropilumnus sasekumari* (Serène, 1971), jantan, 19.6 × 13.6 mm (MZB Cru 5382): A) keseluruhan penampakan dorsal; B) bagian depan karapas, orbit dan tangkai mata; C) cheliped; D) maxilliped ketiga; E) sternum dan pleon.

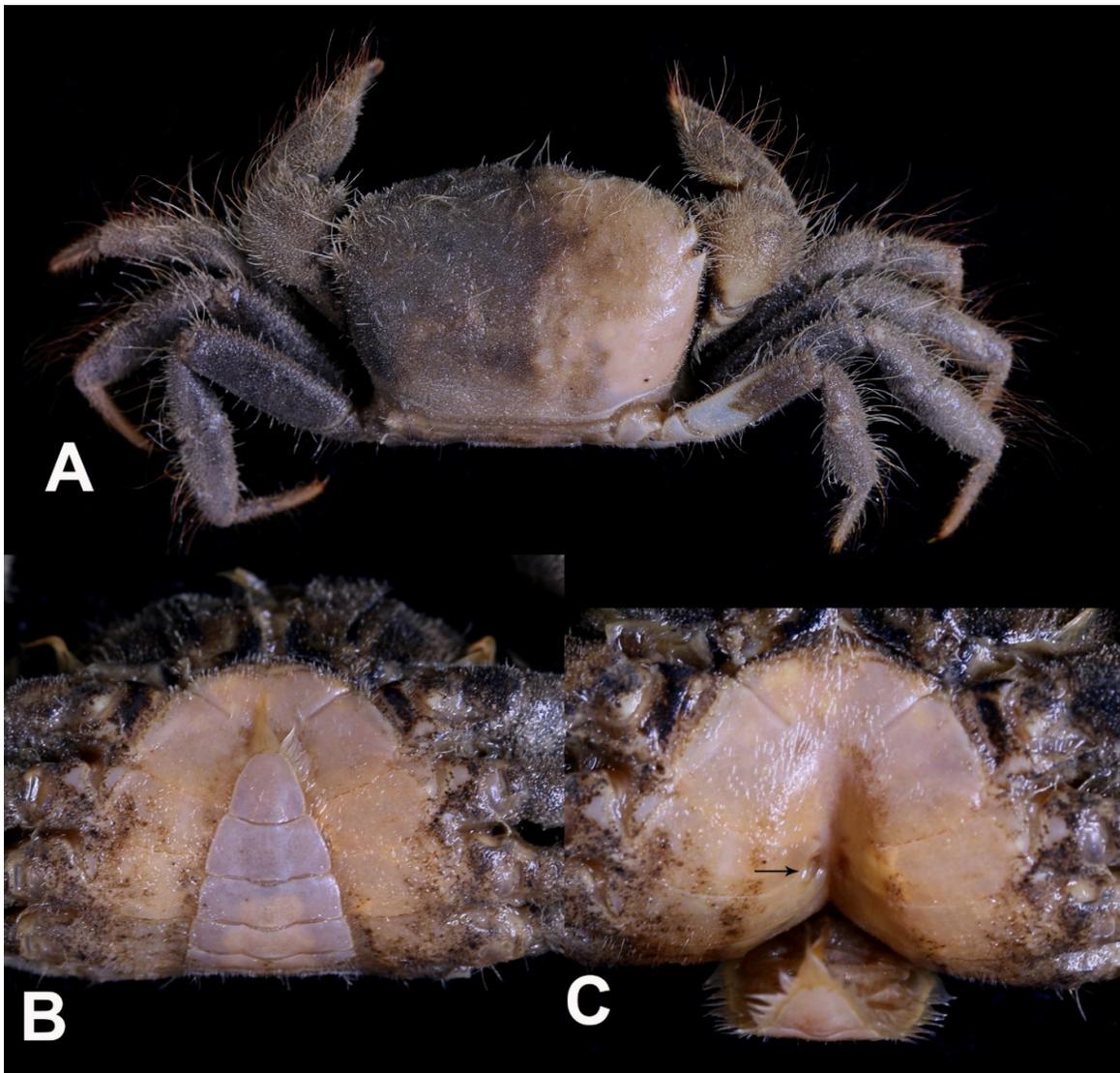


Figure 2. *Heteropilumnus sasekumari* (Serène, 1971), female, 17.1 × 11.8 mm (MZB Cru 5383): A) overall dorsal view; B) anterior thoracic sternum and pleon; C) sterno-abdominal cavity and vulvae.
 Gambar 2. *Heteropilumnus sasekumari* (Serène, 1971), betina, 17.1 × 11.8 mm (MZB Cru 5383): A) keseluruhan penampakan dorsal; B) sternum dan pleon; C) rongga abdomen dan vulva.

Aniptumnus quadridentatus (De Man, 1895)

Synonym: *Pilumnus quadridentatus* De Man, 1985:

Aniptumnus quadridentatus Ng, 2002: 213, figs. 1, 2; Ng & Clark, 2008:

Material examined. 2 males, 4.8 × 7.1 mm, 6.9 × 10.7 mm, 1 female, 5.5 × 8.0 mm (MZB Cru 5385), Lanal Base, Tipoeke River, Papua, Timika, 13 June 2000; 2 males, 6.4 × 9.5 mm; 5.8 × 9.1 mm, 2 females, 4.4 × 6.7 mm; 4.7 × 6.5 mm (MZB Cru 5386), same locality, 13 May 2000.

Diagnosis. Carapace quadrilateral (Figs. 3A, 4A), smooth but with sparse setae; regions defined by broad, shallow groove; external orbital angle low, not prominently projecting; anterolateral margin with 3 well-defined teeth; first tooth broadest,

second and third teeth strong, pointed. Front bilobed with broad V-shaped median cleft (Fig. 3B). Orbit short, broad, ocular peduncle bulbous filling orbit, movable, cornea distinct, pigmented (Fig. 3B). Epistome relatively broad, median lobe broadly triangular. Third maxilliped covering buccal cavity (Fig. 3C). Chelipeds stout, right (Fig. 3D) usually larger than left (Fig. 3E); outer surface of larger cheliped covered with small tubercles on anterior half of palm, rest of palm and fingers smooth. Small cheliped palm covered with short tomentum, and with rows of spines or

tubercles; fingers with longitudinal ridge on surface. Pereopod 2–5 with sparse short and long setae, second, third and fourth pereopods unarmed, fifth pereopod merus with distinct outwardly-directed granules along proximal part of ventral margins, distal margin of basis-ischium with several prominent teeth. Male pleon narrow,

7 segments free (Fig. 3F); telson subtriangular, as long as sixth segment (Fig. 3F). G1 slender, sinuous, distal part slightly curved, tip broad. Female pleon relatively broad, 7 segments free (Fig. 4B); telson rounded; vulva rounded (Fig. 4C), positioned on anterior edge of sternite 6, margin with operculum.

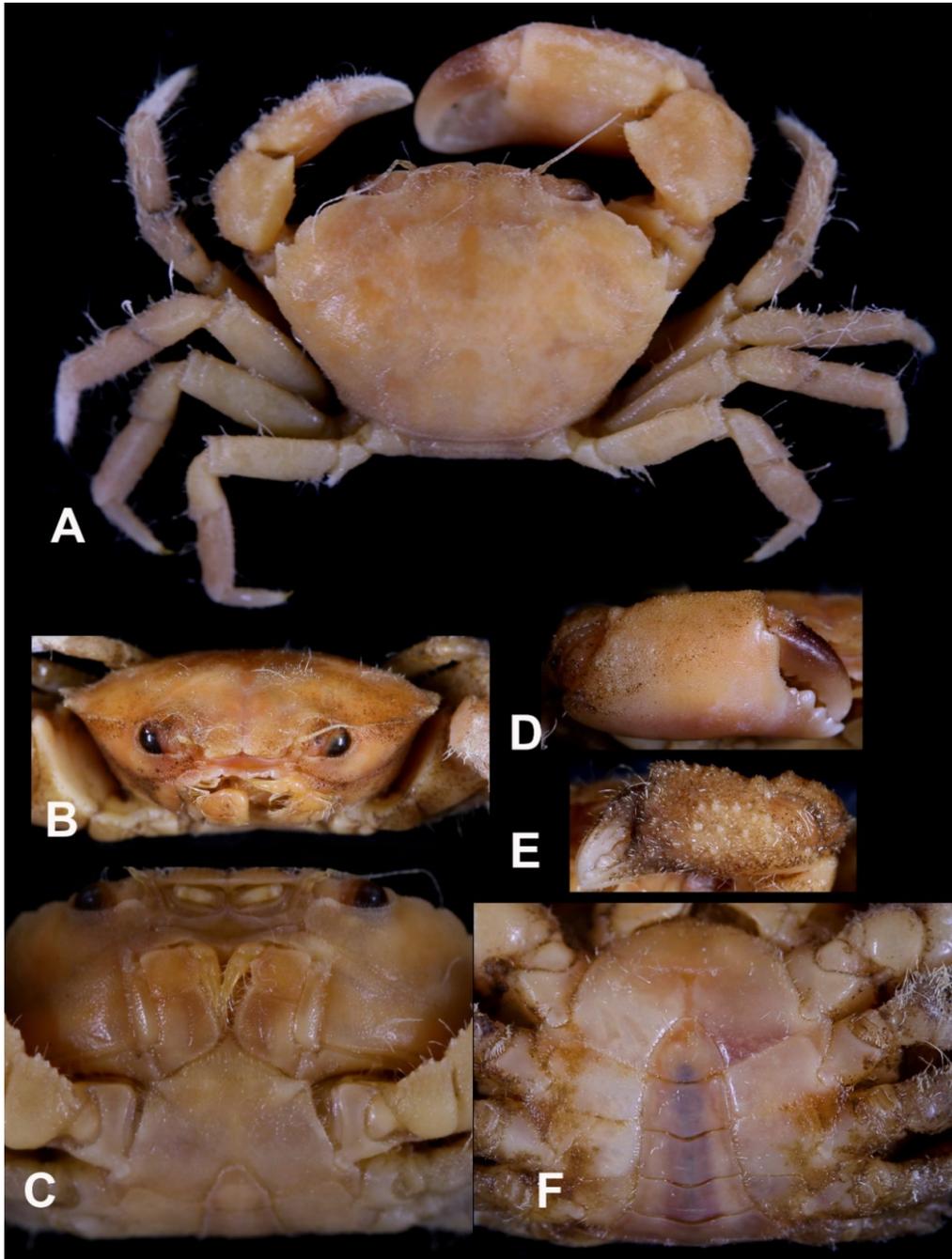


Figure 3. *Aniptumnus quadridentatus* (De Man, 1895), male, 6.9 × 10.7 mm (MZB Cru 5385): A) overall dorsal view; B) frontal view of carapace, orbit and ocular peduncle; C) third maxilliped; D) right cheliped; E) left cheliped; F) anterior thoracic sternum and pleon.

Gambar 3. *Aniptumnus quadridentatus* (De Man, 1895), jantan, 6.9 × 10.7 mm (MZB Cru 5385): A) keseluruhan penampakan dorsal; B) bagian frontal karapas, orbit dan tangkai mata; C) maxilliped ketiga; D) cheliped kanan; E) cheliped kiri; F) sternum dan pleon.

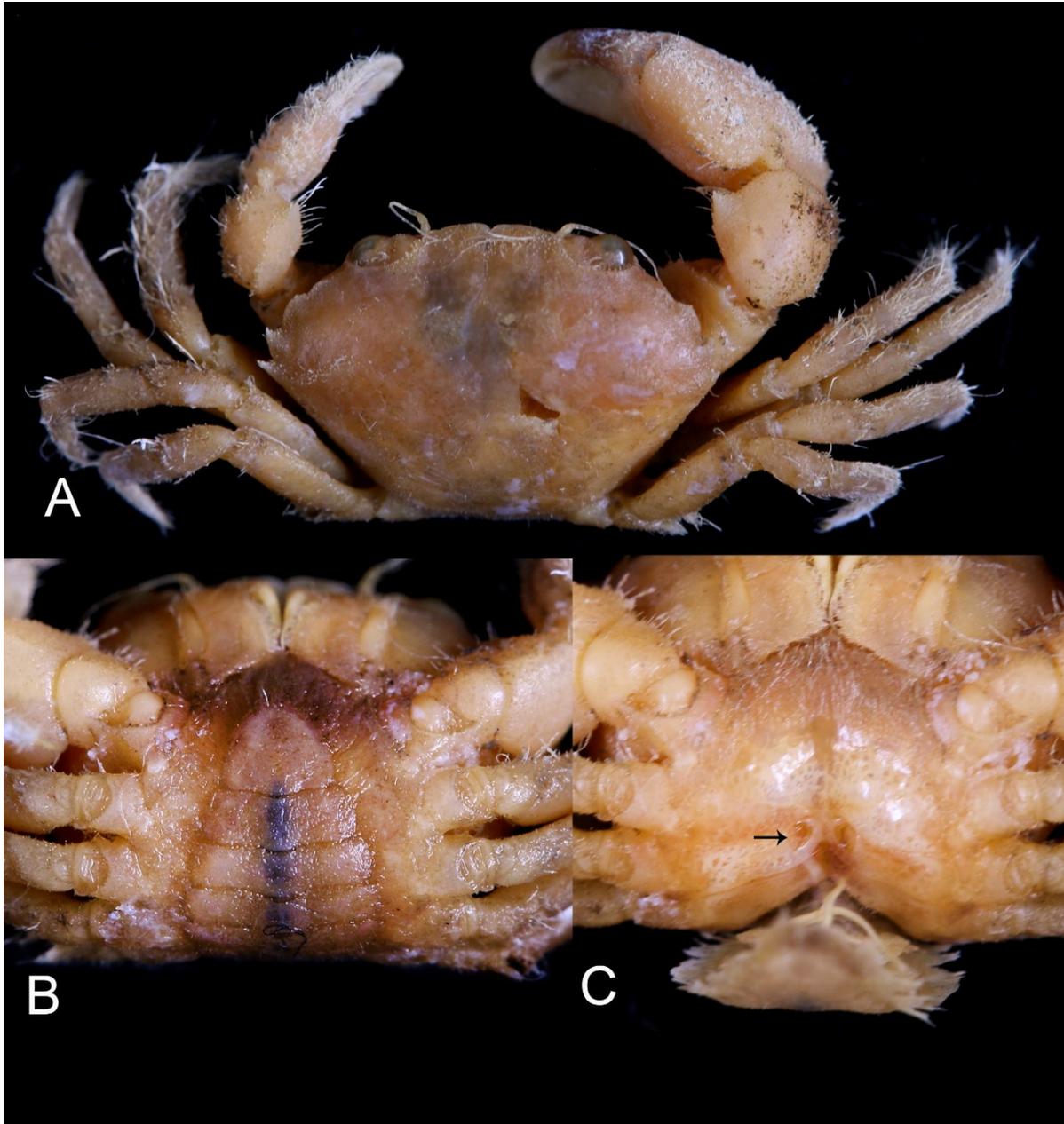


Figure 4. *Aniptumnus quadridentatus* (De Man, 1895), female, 5.5 × 8.0 mm (MZB Cru 5385). A) overall dorsal view; B) anterior thoracic sternum and pleon; C) sterno-abdominal cavity and vulvae.

Gambar 4. *Aniptumnus quadridentatus* (De Man, 1895), betina, 5.5 × 8.0 mm (MZB Cru 5385). A) keseluruhan penampakan dorsal; B) sternum dan pleon; C) rongga abdomen dan vulva.

Discussion

Heteropilumnus sasekumari was described as *Rhizopa sasekumari* by Serene in 197. Ng (1987) transferred this species to *Heteropilumnus* De Man, 1895. In all aspects *H. sasekumari* from Timika, Papua agree well with the redescription of the species by Ng & Davie, 1991. This species is uniformly dark brown in colour (Figs. 1, 2), the larger cheliped in male

specimen has a small area of white on the palm; the small cheliped of male, and both chelipeds of the female entirely covered by short tomentum. The short setae on the carapace, chelipeds, and pereopods 2–5 very often was covered with mud, consequently, the crab is difficult to spot in its habitat. Although Lee & Ng (2012) have illustrated a female specimen from Singapore, but the female gonopore was not shown. In Timika, Papua, this species inhabits muddy substrate in

mangrove forest dominated by *Rhizophora apiculata*. It was also found away from riverbank, buried in the mud during low tide. The record of *H. sasekumari* in Papua extends the geographic range eastwards and northward.

Aniptumnus quadridentatus in this study is the third report of this species since the description of this species as *Pilumnus quadridentatus* by De Man (1895) and the report by Ng (2002) and Ng & Clark (2008). The character of the fourth ambulatory merus, which has distinct outwardly directed granules along the proximal part of the ventral margins, and the distal margin of the basis-ischium that has several prominent teeth, led Ng (2002) to place this species into a new genus, *Aniptumnus*. Ng (2002) stated that the structure of granules on the merus of the fourth ambulatory legs is used by this crab to hold on the substrate such as barnacles, bryozoan colonies, or macroalgae. In Timika, this species was found clinging on a floating cage of bivalve culture that was placed in the estuarine area of mangrove environment.

Conclusion

The presence of *H. sasekumari* in the mangrove habitat of Papua is the first record for this species in Indonesia. It showed that the distribution of this species is broader than previously reported. The female gonopore is broad, subovate, and equipped with an operculum (Fig. 2C).

Aniptumnus quadridentatus was rediscovered after the report of Ng in 2002. Ng & Clark (2008) described the larval development of the same specimen reported by Ng in 2002. The female gonopore is rounded with an operculum on its margin (Fig. 4C). Although this species is rarely reported, the number of collected specimens were quite numerous.

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