

ON THE NEW RECORD OF *Lithoselatum kusu* Schubart, Liu and Ng, 2009 FROM INDONESIA (CRUSTACEA: BRACHYURA: SESARMIDAE)

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ABSTRACT

Lithoselatum kusu Schubart, Liu and Ng, 2009 previously known from Singapore and surrounding areas, is reported in this paper for the first time from Indonesia. The specimens for this study were collected from under rocks and coral rubble around mangrove areas in Lingga, Indonesia. The morphological characteristics and differences of the three known species of the genus of *Lithoselatum* are presented.

Keywords: *Lithoselatum kusu*, new record, taxonomy, Indonesia

INTRODUCTION

The mangrove environment in Indonesia comprises approximately 3 million ha, extending from Sumatra, Java, eastward to Papua (Giri *et al.*, 2011). Crabs of the family Sesarmidae are the most conspicuous group of organism in the mangrove area. So far about a hundred species of sesarmids have been reported from Indonesia (De Man, 1895; 1902; Tesch, 1917; 1918; Serène and Moosa, 1971; Ng and Whitten, 1995; Rahayu and Takeda, 2000; Ng, 2002; Rahayu and Davie, 2002; 2006; Yeo *et al.*, 2004; Rahayu and Ng, 2005; 2009; 2010; Rahayu and Setyadi, 2009; Ng and Davie, 2007; Ng and Wowor, 2009). However, only few articles reported crab from the mangrove areas in the Riau Archipelago (Hamidy, 2010; Widyastuti, 2016).

The sesarmid genus *Lithoselatum* was established by Schubart *et al.*, (2009) describing two species: *Lithoselatum pulchrum* from Taiwan and *L. kusu* from Singapore and surrounding areas.

Following the genus establishment, Promdan and Ng (2009) described the third species, *L. tantichodoki*, from the Gulf of Thailand.

Recently several specimens of *Lithoselatum kusu* were collected during the Health Monitoring of coral reef project in the North Lingga and adjacent areas in Lingga District, Riau Archipelago, eastern Sumatra, Indonesia. This species is herein reported for the first time in Indonesian waters and represents the second record after its description.

The genus *Lithoselathium* is easily recognized by its slightly trapezoidal shape of the carapace which is diverging towards the posterior margin, the dactylus of the ambulatory legs distinctly longer than half of the propodi, the presence of prominent tufts of setae between coxae of the ambulatory legs 2 and 3, and part of the sternite 8 being exposed when the male abdomen is fully closed (Schubart *et al.*, 2009).

MATERIALS AND METHODS

The first author collected specimens from under rocks and coral rubble around mangrove area of Pulau Bakau Kecil, Pulau Buluh, Pulau Kongka and Pulau Kentar in Lingga, Riau Archipelago, Indonesia (Figure 1). We deposited the specimens in the Reference Collection of Research Center of Oceanography (RCO) - Indonesian Institute of Sciences (LIPI), Jakarta, Indonesia. The holotype of *L. kusu* Schubart,

Liu and Ng, 2009, *L. pulchrum* Schubart, Liu and Ng, 2009, and *L. tantichodoki* Promdan and Ng, 2009, housed in the Lee Kong Chian Natural History Museum (ZRC), National University of Singapore, was examined by the second author. The carapace breadth at the widest point followed by the length was measured in millimeters (mm). The abbreviation G1 is used for the male first gonopod.

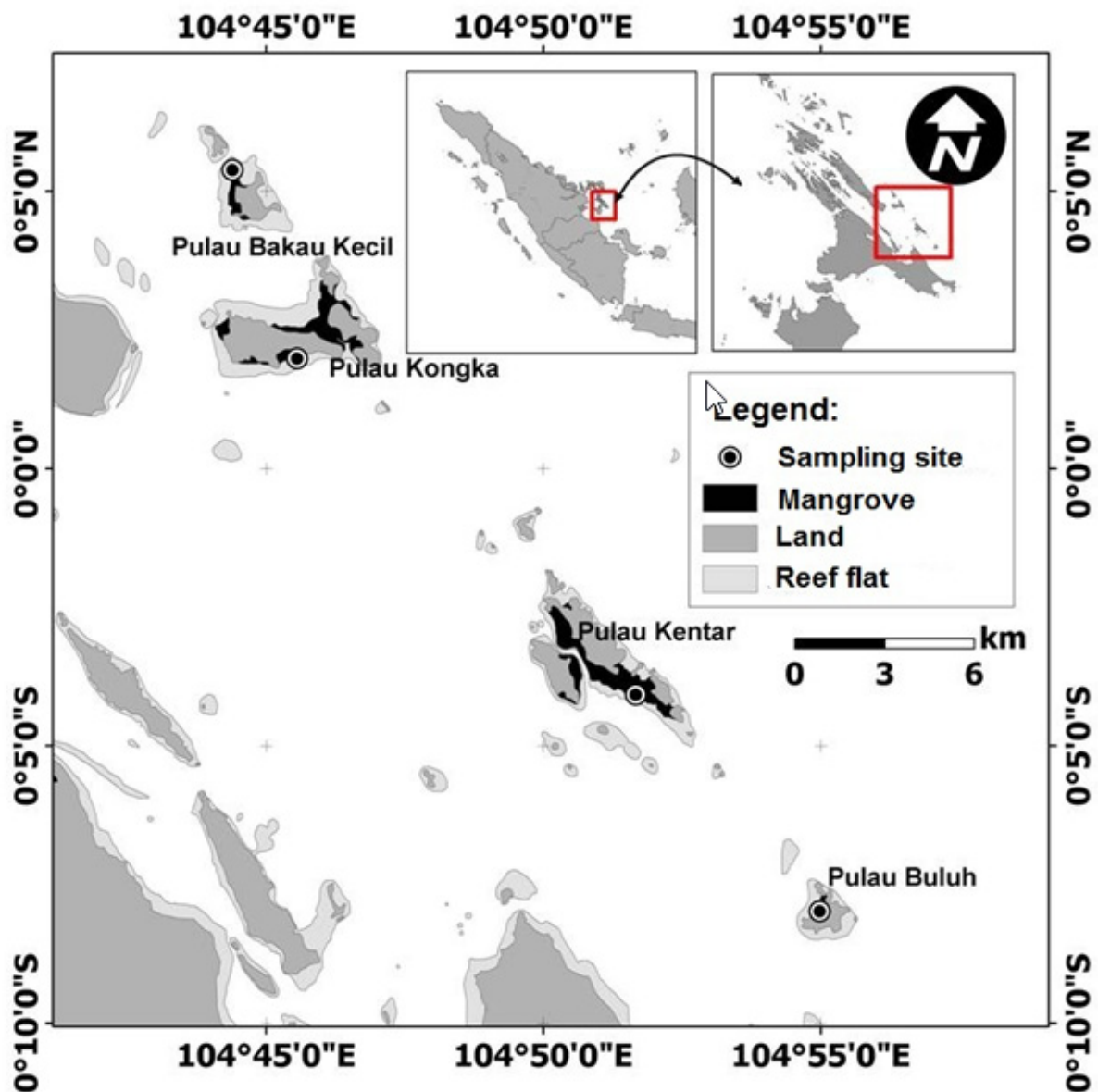


Figure 1. Sampling area in Lingga District, Riau Archipelago, Indonesia.

RESULTS

Family SESARMIDAE Dana, 1851

Genus *Lithoselatium* Schubart, Liu and Ng, 2009

Lithoselatium kusu Schubart, Liu and Ng, 2009

Lithoselatium kusu Schubart, Liu and Ng, 2009:
21, figs. 13–16.

Material examined: RCO CRU 2265, 1 male (17.4×15.6 mm), Pulau Bakau Kecil, 0°5'23.028"N 104°44'23.856"E, 7 October 2014; RCO CRU 2266, 2 males (16.8×14.6 mm, 19.4×17.5 mm), 1 female (13.2×11.0 mm), Pulau Buluh, 0°7'58.944"S 104°54'58.896"E, 6 October 2014; RCO CRU 2267, 1 female (12.3×10.2 mm), 2 female juveniles (5.8 × 5.0 mm, 6.8×6.4 mm), Pulau Kongka, 0°4'39.216"N 104°44'27.024"E, 7 October 2014; RCO CRU 2268, 1 male (20.1×17.7 mm), Pulau Buluh, 0°7'58.944"S 104°54'58.896"E, 6 October 2014; RCO CRU 2269, 1 male (17.4×15.6 mm), 2 females (12.8×11.0 mm, 14.2×12.5 mm), 1 female juvenile (7.6×6.0 mm), Pulau Bakau Kecil, 0°5'23.028"N 104°44'23.856"E, 7 October 2014; RCO CRU 2270, 1 male (17.0×16.0 mm),

Pulau Kentar, 0°4'04.728"S - 104°51'39.924"E, 8 October 2014.

Comparative material:

Lithoselatium kusu: ZRC 2002.0149, holotype, male (16.0×14.35 mm), Kusu Island, Singapore.

Lithoselatium pulchrum: ZRC 2002.0152, Holotype, male (23.5×20.8 mm), Yakoulu, Manchou, Pingtung County, Taiwan.

Lithoselatium tantichodoki: ZRC 2009.1140, holotype, male (25.0×22.9 mm), Ko Wang Nok, south of Ko Samui, Ko Samui District, Gulf of Thailand.

Diagnosis: Carapace slightly trapezoidal, diverging toward posterior margin; lateral margin entire, without trace of epibranchial tooth (Figure 2A). Carapace surface smooth, regions well defined; frontal margin deflexed, sparsely granulated, anterior lobes prominent (Figure 2A); dorsal margin of palm with one continuous longitudinal crest of proximal tubercles, followed by pectinated crest consisting of 35 or 36 teeth, and approximately 5 or 6 fused distal tubercles

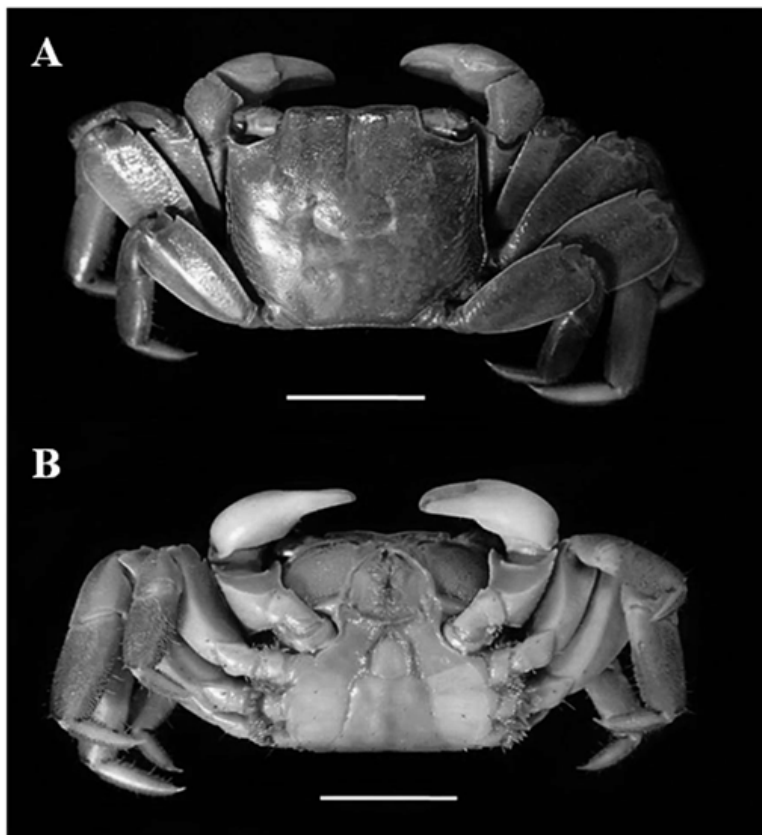


Figure 2. *Lithoselatium kusu* Schubart, Liu and Ng, 2009, RCO CRU. 2265, male (17.4×15.6 mm), Lingga, Indonesia. A. Dorsal view of carapace; B. Anterior thoracic sternum and abdomen.

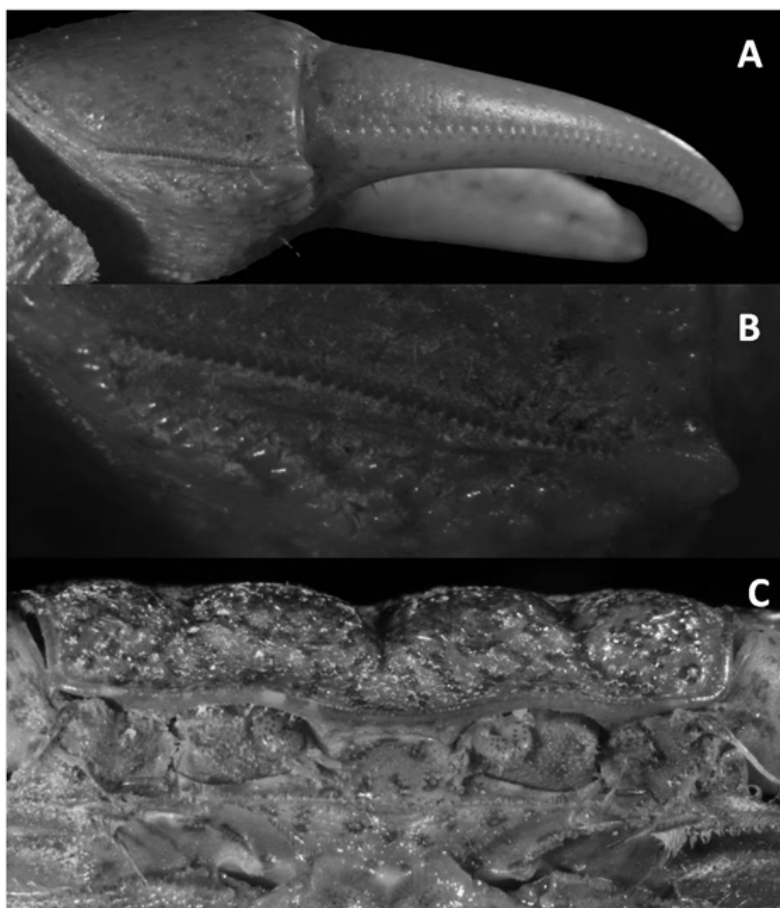


Figure 3. *Lithoselatium kusu* Schubart, Liu and Ng, 2009, RCO CRU 2265, male (17.4×15.6 mm), Lingga, Indonesia. A. Dactylus; B. Pectinated crest of dactylus; and C. Frontal view of carapace showing epistome, frontal margin, antennae and antennules.

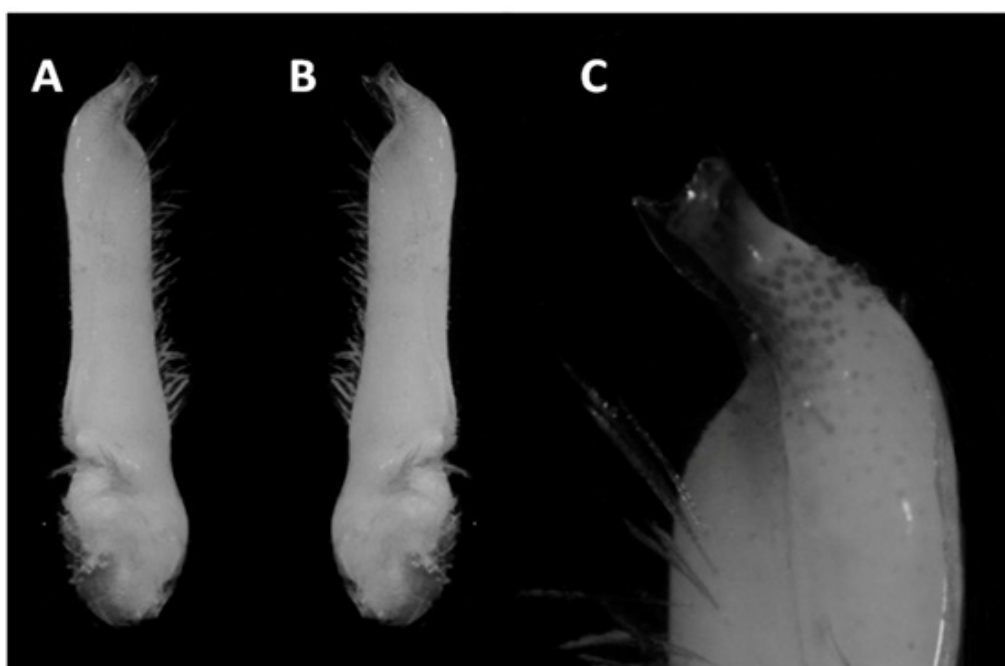


Figure 4. *Lithoselatium kusu* Schubart, Liu and Ng, 2009, RCO CRU 2265, male (17.4×15.6mm) A. Right G1, ventral view; B. Right G1, dorsal view; C. Tip of right G1, dorsal view.

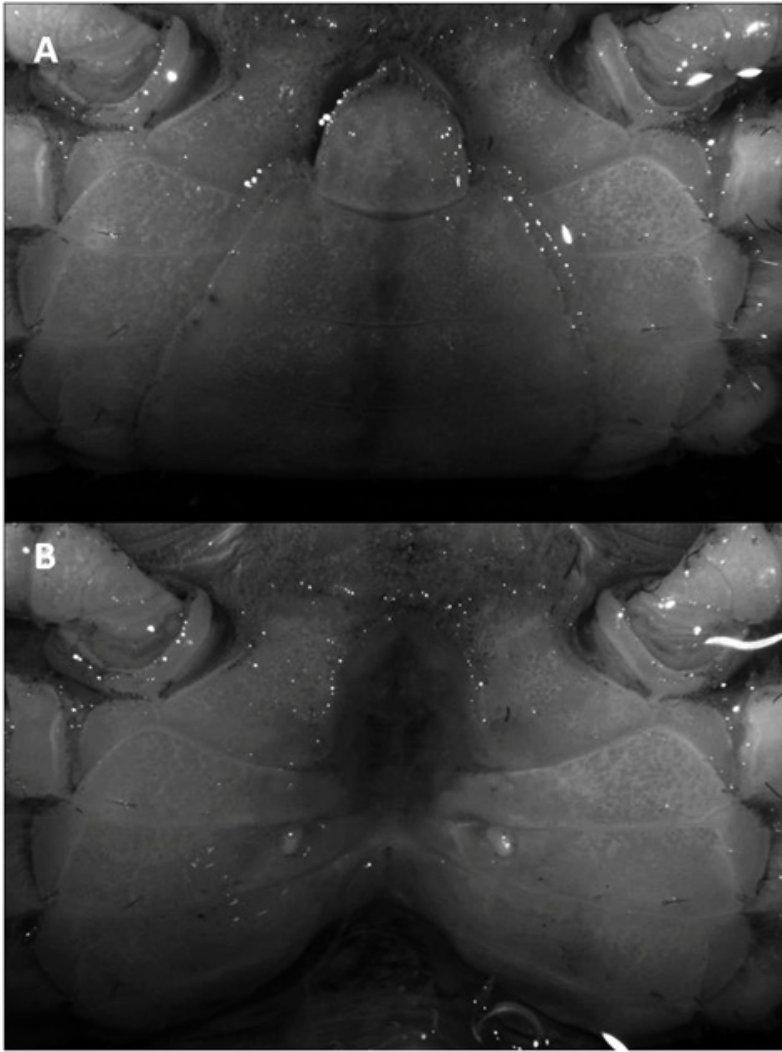


Figure 5. *Lithoselatium kusu* Schubart, Liu and Ng, 2009, RCO CRU 2266, female (13.2×11.0 mm). A. Abdomen ; B. Gonopore.

(Figure 3A, 3B); dorsal margin of dactylar finger with row of 33–35 tubercles (Figure 3A); G1 slender, straight; apical process bent at 60° from vertical, chitinous distal part subtruncate (Figure 4A), tip with slight fissure, (Figure 4A, 4B). Female abdomen broad, all abdominal somites in contact with bases of ambulatory legs; gonopores elevated, bilobed (Figure 5A, 5B).

Colour: In life, carapace and legs purplish; carapace with yellowish green mottling; chelae orangish-red (Schubart *et al.*, 2009).

DISCUSSION

The specimens in this study agree with the description of the holotype of *L. kusu* from Singapore. Variation was noted on the number of pectinated crest on the palm, and dactylar tubercles of the chelipeds, which have 35 or 36 teeth versus 33–35 tubercles respectively. In the holotype, the pectinated crest on the palm of chelipeds consists of 33 or 34 teeth, and the dorsal surface of the dactylus of the chelipeds has a row of 30–32 tubercles. Morphological differences and geographical distribution of *L. pulchrum*, *L. kusu*, and *L. tantichodoki* are presented in Table 1.

Table 1. Morphological differences between *L. pulchrum* Schubart, Liu and Ng, 2009, *L. kusu* Schubart, Liu and Ng, 2009, and *L. tantichodoki* Promdan and Ng, 2009, and their geographical distribution

Morphology	<i>Lithoselatum pulchrum</i>	<i>Lithoselatum kusu</i>	<i>Lithoselatum tantichodoki</i>
Carapace	Trapezoidal; lateral margin entire, occasionally with 1 or 2 granules, distinctly diverging posteriorly	Slightly trapezoidal, lateral margin entire, without trace of epibranchial tooth, diverging posteriorly	Nearly quadrate; lateral margins entire, but with shallow concavity adjacent to exorbital angle, diverging slightly posteriorly
Front	Strongly deflexed downward; margin with 2 low gently convex lobes not produced anteriorly	Deflexed, anterior lobe prominent, margin sinuous	Deflexed, anterior lobe prominent, margin sinuous
Third maxillipeds	Slender, internal margin of merus slightly sinuous proximally	Stout, internal margin of merus straight	Slender, internal margin of merus rounded
Cheliped: Dorsal margin of palm	With continuous longitudinal crest of proximal tubercles, followed by 36 or 37 pectinated teeth and 5 distal tubercles	With continuous longitudinal crest of proximal tubercles, followed by 33 or 34 pectinated teeth and 5 or 6 distal tubercles, partially fused	With distinct continuous longitudinal crest of proximal small, rounded granules, followed by 34 small peg like, pectinated teeth, and 2 or 3 shallow, rounded, uneven ridges distally
Cheliped: Dactylar tubercles	34 or 35 tubercles, broad, dome shape, transversely striated; more widely spaced toward distal part	30-32 tubercles with circular ring and central conical apex, more widely spaced toward distal part	30 tubercles, with conical apex surrounded by circular rings, tubercles relatively larger, more closely spaced along proximal part
Ambulatory legs	Dactylus distinctly longer than half length of propodus	Dactylus slightly shorter than propodus	Dactylus subequal to propodus
Male telson	Subcircular, length and width subequal	Subcircular, length and width subequal	Subcircular, longer than broad
G1	Stout, pectinated distal part short, broad, prominently bifurcate	Slender, pectinated distal part long, subtruncate, tip gently clefted	Stout, pectinated distal part short, subtruncate, tip clefted
Female telson	Sunken into anterior margin of somite 6	Sunken into anterior margin of somite 6	NA
Distribution	Taiwan	Singapore, Malaysia, Indonesia	The Gulf of Thailand

The carapace width of the female specimens in this study is between 5.8–13.2 mm, and the abdomen is not fully developed (Figure 5), therefore it is not reaching the coxae of the ambulatory legs. It is possibly because they are still not sexually mature. The adult female paratype has a carapace width of 21.2 mm (*cf.* Schubart *et al.*, 2009, Figure 13B, 13C).

As mentioned by Schubart *et al.*, (2009), species of *Lithoselathium* inhabit the supralittoral zone, under rock and boulders. However, unlike *L. kusu* from Singapore that was recorded in coarse rock and coral rubbles well above the water line (Schubart *et al.*, 2009), the *L. kusu* studied here were collected in mangrove environments, under rock and dead coral rubbles in the littoral zone in Riau archipelago.

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REFERENCES

- de Man, J.G. (1902). Die von Herrn Professor Kükenthal in Indischen Archipel gesammelten Dekapoden und Stomatopoden. In: W. Kükenthal, Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo. *Abhandlungen Der Senckenbergischen Naturforschenden Gesellschaft*, 25: 467–929.
- de Man, J.G. (1895). Bericht über die von Herrn Schiffscapitän Storm zu Atjeh, an den westlichen Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Dekapoden und Stomatopoden. *Zweiter Theil. Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Thiere*, 9(1): 75–218, Plates 28–38 [vol. 10(6), 1898]
- Girri, C., Ochieng, E., Tieszen, L. L. Zhu, Z., Singh, A., Loveland, T., Masek, J. and Duke, N. (2011). Status and distribution of mangrove forests of the world using earth observation satellite data. *Global ecology and Biogeography*, 20: 154–159.
- Hamidy, R. (2010). Structure and diversity of crabs community in mangrove area, Marine Station of Riau University, Purnama Dumai. *Journal of Environmental Science*, 2(4): 81–91.
- Ng, P.K.L. (2002). New species of carvenicolous crabs of the genus *Sesarmoides* from the western Pacific with a key to the genus (Crustacea: Decapoda: Brachyura: Sesarmidae). *Raffles Bulletin of Zoology*, 50(2): 419–435.
- Ng, P. K. L. and Davie, P. J. F. (2007). A new genus for cave-dwelling crabs previously assigned to *Sesarmoides* (Crustacea: Decapoda: Brachyura: Sesarmidae). *Raffles Bulletin of Zoology, supplement*, 16: 227–231.
- Ng, P. K. L. and Whitten, A. J. (1995). On a new cave-dwelling *Sesarmoides* (Crustacea: Decapoda: Brachyura: Grapsidae) from Nusa Penida, Bali, Indonesia. *Tropical Biodiversity*, 2(3): 364–376
- Ng, P. K. L. and Wowor, D. (2009). Two new species of sesarmid crab (Crustacea: Decapoda: Brachyura) associated with limestone formations in West Papua, Indonesia. *Zootaxa*, 20125: 21–31
- Promdan, R. and Ng, P. K. L. (2009). *Lithoselathium tantichodoki*, a new species of intertidal crab (Crustacea: Brachyura: Sesarmidae) from southern Thailand. *Zootaxa*, 2291: 24 – 34.
- Rahayu, D. L. and Takeda, M. (2000). A new species of the genus *Clistocoeloma* (Crustacea: Decapoda: Grapsidae) from Irian Jaya, Indonesia. *Bulletin of the National Science Museum, Series A (Zoology)*, vol. 26, No. 2: 35–41.

- Rahayu D. L. and Davie, P. J. F. (2002). New species and new record of *Perisesarma* (Decapoda, Brachyura, Sesarminae) from Irian Jaya, Indonesia. *Crustaceana*, 75 (3-4): 597-607.
- Rahayu, D. L. and Davie, P. J. F. (2006). Two new species of the genus *Neosarmatium* Serène and Soh, 1970 (Decapoda, Brachyura, Sesarmidae) from Papua, Indonesia. *Zoosystema*, 28(2): 573-584.
- Rahayu, D. L. and Ng, P. K. L. (2005). On two new species of the genera *Haberma* and *Parasesarma* (Crustacea: Decapoda: Brachyura: Sesarmidae) from Papua, Indonesia. *Zoologische Mededelingen*, 79(8): 167-178.
- Rahayu, D. L. and Ng, P. K. L. (2009). Two new species of *Parasesarma* De Man, 1895, from Southeast Asia (Crustacea: Decapoda: Brachyura: Sesarmidae). *Zootaxa*, 1980: 29-40.
- Rahayu, D. L. and Ng, P. K. L. (2010). Revision of the *Parasesarma plicatum* (Latreille, 1803) species-group (Crustacea: Decapoda: Brachyura: Sesarmidae). *Zootaxa*, 2327: 1-22.
- Rahayu, D. L. and Setiadi, G. (2009). *Mangrove estuary crabs of the Mimika Region- Papua, Indonesia*. Timika, Papua : PT Feeport Indonesia ; [Jakarta] : Research Center for Oceanography, Indonesian Institute of Sciences. 154 pp.
- Schubart, C.D., Liu, H. and Ng, P. K. L. (2009). Revision of *Selatium* Serène and Soh, 1970 (Crustacea: Brachyura: Sesarmidae), with description of a new genus and two new species. *Zootaxa*, 2154: 1-29.
- Serène, R. and Moosa, M.K. (1971). New and few known species of Brachyura from Ambon. *Marine Research in Indonesia*, 11: 3-18, 6 pls.
- Tesch, J. J. (1917). Synopsis of the genera *Sesarma*, *Metasesarma*, *Sarmatium* and *Clistocoeloma*, with a key to the determination of the Indo-Pacific species. *Zoologische Mededelingen*, 3: 127-260, pls. 15-17.
- Tesch, J. J. (1918). The Decapoda Brachyura of the Siboga Expedition. Hymenosomatidae, Retropilumnidae, Ocypodidae, Grapsidae and Gecarcinidae. *Siboga Expeditie*, 39c (82): 1-148, 6 pls.
- Widyastuti, E. (2016). Crab diversity at mangrove ecosystem in Lingga waters and adjacent area, Riau Islands. *Zoo Indonesia*, 25(1): 22-32.
- Yeo, D. C. J., Rahayu, D. L. and Ng, P. K. L. (2004). Brachyura (Crustacea) of the Anambas Expedition 2002. *Raffles Bulletin of Zoology*, supplement, 11: 79-88.