

Reprint from *Bulletin of the Raffles Museum, Singapore,*  
*Straits Settlements, No. 13, August 1937*

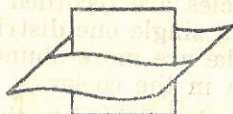
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Instituut voor Zeewetenschappelijk onderzoek  
Institute for Marine Scientific Research  
Prinses Elisabethlaan 69  
8401 Bredene - Belgium - Tel. 059 / 80 37 15

**Notes on a Collection of Swimming Crabs  
(Portunidae) from Singapore**

by

**CHIA-JUI SHEN**



Vlaams Instituut voor de Zee  
Flanders Marine Institute

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**Notes on a Collection of Swimming Crabs  
(Portunidae) from Singapore<sup>1</sup>**

By CHIA-JUI SHEN, PH.D.

*Department of Biology, National Peking University,  
Peiping, China*

(Text-figures 1-20)

The collection of swimming crabs (Portunidae) from Singapore and its vicinity is quite large, but it seems not so difficult as other groups to deal with as a whole. All the species belong to the sub-family Lupinæ, the groups Lupocycloida and Podophthalmoida each being represented by one species and the group Lupoida by twenty-six species. The majority of the Lupoida species are recorded also in the South China Sea but there is not a single one distributed to the North, showing that the Portunidae are more abundantly represented in the warmer regions than in the cooler.

I am much indebted to the Director of the Raffles Museum, Singapore, for giving me the opportunity of studying this collection.

LIST OF SPECIES

Family PORTUNIDÆ.  
Sub-family LUPINÆ.

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1. Contributions from the Zoological Laboratory, National Peking University, No. 15.

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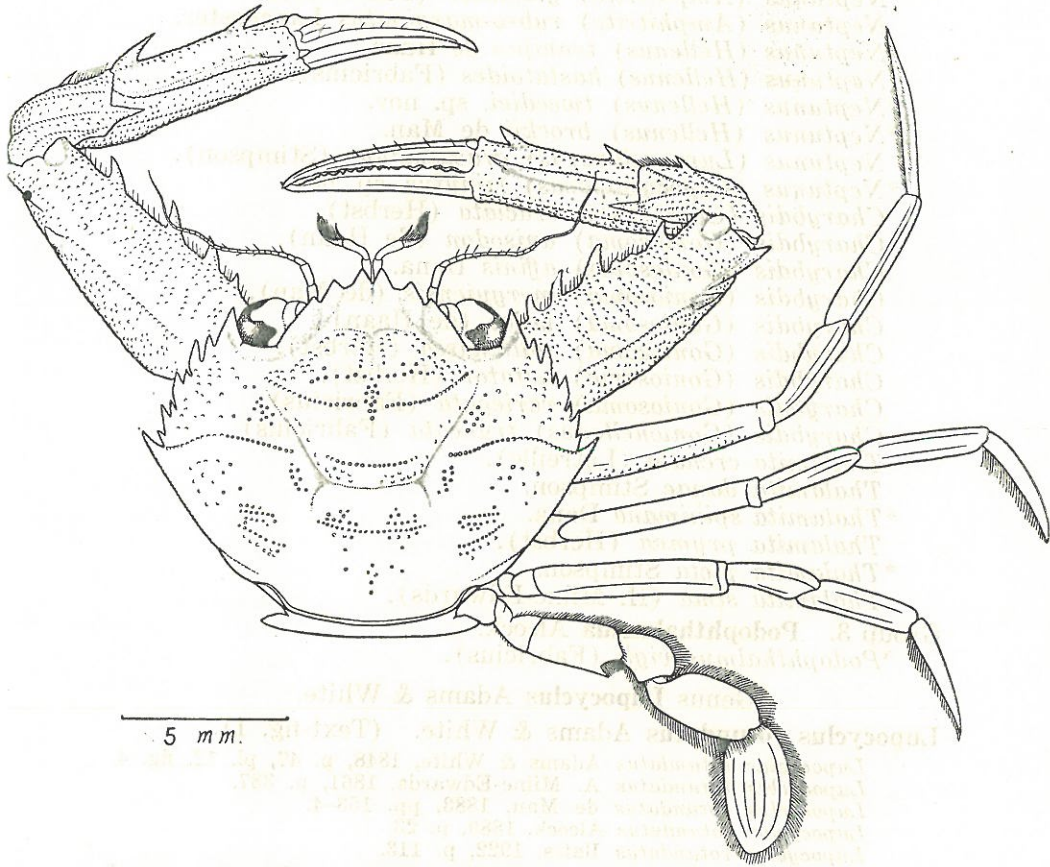


Fig. 1. *Lapocyclus rotundatus* Adams and White, ♂.

Group 1. **Lupocycloida** Alcock.

\**Lupocyclus rotundatus* Adams & White.

Group 2. **Lupoida** Alcock.

*Scylla serrata* (Forsk.)

*Neptunus* (*Neptunus*) *sanguinolentus* (Herbst).

*Neptunus* (*Neptunus*) *pelagicus* (Linnæus).

*Neptunus* (*Amphitrite*) *gladiator* (Fabricius).

*Neptunus* (*Amphitrite*) *rubro-marginatus* Lanchester.

\**Neptunus* (*Hellenus*) *tenuipes* de Haan.

*Neptunus* (*Hellenus*) *hastatoides* (Fabricius).

\**Neptunus* (*Hellenus*) *tweediei*, sp. nov.

\**Neptunus* (*Hellenus*) *brockii* de Man.

*Neptunus* (*Lupocycloporus*) *gracilimanus* (Stimpson).

\**Neptunus* (*Lupocycloporus*) *minutus*, sp. nov.

*Charybdis* (*Goniosoma*) *cruciata* (Herbst).

*Charybdis* (*Goniosoma*) *anisodon* (de Haan).

*Charybdis* (*Goniosoma*) *affinis* Dana.

*Charybdis* (*Goniosoma*) *merguiensis* (de Man).

*Charybdis* (*Goniosoma*) *miles* (de Haan).

*Charybdis* (*Goniosoma*) *callianassa* (Herbst).

*Charybdis* (*Goniosoma*) *natator* (Herbst).

*Charybdis* (*Goniosoma*) *variegata* (Fabricius).

*Charybdis* (*Goniohellenus*) *truncata* (Fabricius).

*Thalamita crenata* (Latreille).

*Thalamita danae* Stimpson.

\**Thalamita spinimana* Dana.

*Thalamita prymna* (Herbst).

\**Thalamita picta* Stimpson.

*Thalamita sima* (H. Milne-Edwards).

Group 3. **Podophthalmoida** Alcock.

\**Podophthalmus vigil* (Fabricius).

Genus **Lupocyclus** Adams & White.

**Lupocyclus rotundatus** Adams & White. (Text-fig. 1).

*Lupocyclus rotundatus* Adams & White, 1848, p. 47, pl. 12, fig. 4.

*Lupocyclus rotundatus* A. Milne-Edwards, 1861, p. 387.

*Lupocyclus rotundatus* de Man, 1883, pp. 153-4.

*Lupocyclus rotundatus* Alcock, 1889, p. 23.

*Lupocyclus rotundatus* Balss, 1922, p. 113.

*Characters*.—Carapace roundish, convex, with the usual transverse and granulated ridges and patches.

Front produced much beyond the inner supra orbital angle, and cut into four acute teeth of which the median pair is more prominent.

Antero-lateral border of carapace cut into nine unequal teeth, "five larger teeth, between which occur the four inter-

The species marked \* have not been recorded in Chinese Seas.

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mediate smaller ones. Of the five larger teeth, the first, *viz.* the external orbital angle is the largest, the four remaining are nearly similar to one another; the four intermediate teeth gradually decrease in size, the first, which is found immediately behind the external orbital angle, having the same size as the third of the five principal teeth, the fourth intermediate being scarcely perceptible."

Arm elongate bearing five spines on the anterior border, gradually decreasing in size posteriorly, and two on the posterior border, one is at the terminal and the other is in the distal third. Wrist with only two spines, the larger one at the inner angle and the smaller on the outer surface. Hand with three spines on the upper surface, two of them at the distal third, the outer one slightly beyond the inner, and the third in front of the apex of the wrist.

Merus of last leg elongate, with a spine on the posterior border.

Male abdomen pointed. Third segment with a short, transverse, smooth ridge.

*Material.*—1 ♂, 1 ♀ (juv.); Siglap, Singapore. Length of carapace 11 mm., breadth 15 mm. (♂).

*Distribution.*—Japan; North and North-east Australia; Malay Archipelago; Indian Ocean.

### Genus *Scylla* de Haan.

#### *Scylla serrata* (Forsk.)

*Scylla serrata* Lanchester, 1900, p. 748.

*Scylla serrata* Shen, 1932, pp. 36-38, pl. 7, b; text figs. 4-5.

*Materials.*—1 ♀ (juv.), Singapore. Length of carapace 42 mm., breadth 65 mm.

*Distribution.*—Japan; Liu-Kiu Islands; New Caledonia; Australia; China (Fukien, Kwangtung); Hong Kong, Macao; Malay Archipelago; Indian Ocean; Red Sea; South Africa.

### Genus *Neptunus* de Haan.

Key to the species of the genus *Neptunus*.

I. Hand either more, or but little less, massive than arm.

Merus of last leg bears no spine.

A. Posterior angles of carapace rounded (*Neptunus*).

1. Outer distal angle of merus of third maxilliped rounded.

(a) No spine on posterior border of arm. Carapace with three pinkish spots.

*Nep.* (*Neptunus*) *sanguinolentus*

(b) A spine at far end of posterior border of arm. Carapace without three pinkish spots.

*Nep.* (*Neptunus*) *pelagicus*

2. Outer distal angle of merus of third maxilliped strongly produced in a lateral direction (*Amphitrite*).
- (a) Arm with two spines on posterior border and hand with one spine near inner distal angle.  
*Nep. (Amphitrite) gladiator*
- (b) Arm with one spine on posterior border and hand with one spine at inner distal angle.  
*Nep. (Amphitrite) rubro-marginatus*
- B. Posterior angles of carapace square or spiniform (*Hellenus*).
1. Posterior angles square. Front cut into three teeth.  
*Nep. (Hellenus) tenuipes*
2. Posterior angles spiniform.
- (a) Merus of last leg serrulate distally. Two spines on hand.
- (i) Front cut into four teeth. Dactylus of last leg with a black spot distally.  
*Nep. (Hellenus) hastatoides*
- (ii) Front cut into three teeth. Dactylus of last leg without a black spot distally.  
*Nep. (Hellenus) tweediei*, sp.n.
- (b) Merus of last leg not serrulate distally. No spine on hand. Frontal teeth obsolescent.  
*Nep. (Hellenus) brockii*
- II. Hand slender, much less massive than arm. Merus of last leg bears a spine (*Lupocycloporus*).
1. Frontal teeth prominent. Mesogastric region with a transverse granulated ridge.  
*Nep. (Lupocycloporus) whitei*
2. Frontal teeth low. Mesogastric region with two granulated patches.  
*Nep. (Lupocycloporus) gracilimanus*

**Neptunus (Neptunus) sanguinolentus** (Herbst).

*Neptunus sanguinolentus* Lanchester, 1900, p. 745.

*Neptunus (Neptunus) sanguinolentus* Balss, 1922, pp. 106-7.

*Neptunus (Neptunus) sanguinolentus* Chopra, 1935, pp. 474-476, fig. 2.

*Portunus (Portunus) sanguinolentus* Shen, 1932, pp. 34-6, Pl. 7, a.

*Material*.—1 ♂, Siglap, Singapore, 4/35. Length of carapace 40 mm., breadth 94 mm.

*Distribution*.—Hawaiian Islands; East and South Australia; Japan; China (Fukien, Kwangtung); Formosa; Hong Kong; Philippine Islands; Malay Archipelago; Indian Ocean; Red Sea; South Africa.

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**Neptunus (Neptunus) pelagicus (Linnæus).**

- Neptunus pelagicus* Lanchester, 1900, p. 745.  
*Neptunus pelagicus* Yokoya, 1933, p. 177.  
*Neptunus (Neptunus) pelagicus* Balss, 1922, p. 107.  
*Neptunus (Neptunus) pelagicus* Chopra, 1935, pp. 476-477, fig. 3.  
*Portunus (Portunus) pelagicus* Shen, 1934, pp. 37-38, fig. 1.

*Material.*—1 ♂, Singapore. Length of carapace 41 mm., breadth 93 mm.

*Distribution.*—Japan; China (Fukien, Kwangtung, Hainan); Hong Kong; Philippine Islands; Australia; Malay Archipelago; Indian Ocean; East Africa; Red Sea and Mediterranean Sea.

*Remarks.*—It differs from *Neptunus (Neptunus) trituberculatus* (Miers)<sup>1</sup> by the following features:

<i>N. (N.) trituberculatus</i>	<i>N. (N.) pelagicus</i>
1. Carapace roundish posteriorly	Squarish posteriorly.
2. Surface of carapace covered with finer granules	With coarser granules.
3. Outer angle of middle lobe on the supra orbital margin indistinct	Very acute.
4. Gastric region with one and cardiac region with two prominent tubercles	Without any prominent tubercles.
5. Arm with four spines on anterior border	Three spines on anterior border.
6. Median pair of frontal teeth indistinct above the base of the prolonged epistome	Distinct.
7. Sixth segment of male abdomen proportionately longer	Shorter.

**Neptunus (Amphitrite) gladiator (Fabr.).**

(Text-fig. 2)

- Portunus gladiator* Fabr. 1798, p. 368.  
*Lupea gladiator* H. Milne-Edwards, 1834, p. 456.  
*Amphitrite gladiator* de Haan, 1835, p. 39, pl. 1, fig. 5.  
*Neptunus gladiator* de Man, 1888, p. 69.  
*Neptunus (Neptunus) gladiator* Alcock, 1899, pp. 35-6.

*Characters.*—Carapace depressed, finely tomentose. Surface marked by low subregional elevations which are symmetrically disposed and finely granulated.

Front cut into four acute teeth, of which the median two are smaller and less prominent, and between them the dentiform process of the epistome can be seen.

Antero-lateral border of carapace cut into nine teeth, the last one directed slightly postero-laterally.

Outer distal angle of merus of third maxilliped strongly produced in a lateral direction.

1. De Haan, Crustacea in Fauna Japonica, p. 37, pls. 9, 10, 1835.

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Median lobe on the supra-orbital margin acutely produced at its outer angle.

Arm with four spines on the anterior border and two on the posterior border. Wrist with two spines, one at the inner angle, the other at the outer. Hand with two spines, one in front of the apex of the wrist, the other being a short distance behind the movable finger joint.

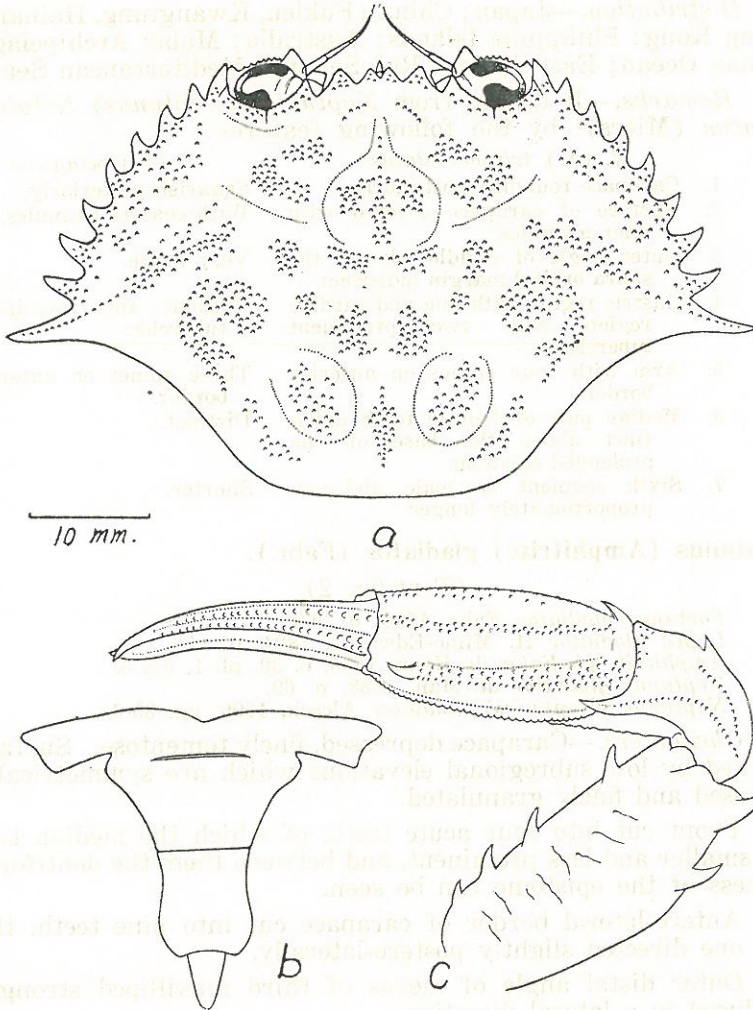


Fig. 2. *Neptunus (Amphitrite) gladiator* (Fabr.), ♂. a, carapace; b, abdomen; c, cheliped.

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Sixth segment, of male abdomen longer than broad, sides concave at basal half and convex at distal half.

*Material*.—1 ♂, 1 ♀, Siglap, Singapore, May, 1935. Length of carapace 40 mm., breadth 70 mm. (♂).

*Distribution*.—China (Fukien, Kwangtung); Hong Kong; Malay Archipelago; Indian Ocean.

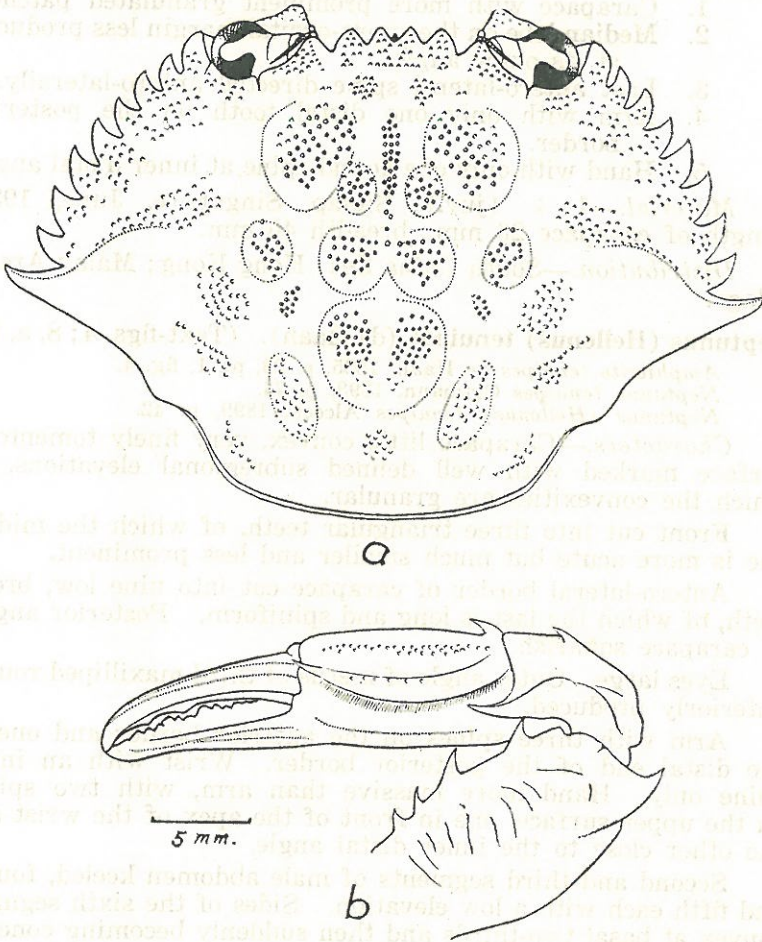


Fig. 3. *Neptunus* (*Amphitrite*) *rubro-marginatus* Lanchester, ♀. a, carapace; b, cheliped.

**Neptunus (Amphitrite) rubro-marginatus (Lanchester).**  
(Text-fig. 3)

*Achelous rubro-marginatus* Lanchester, 1900, pp. 746-7, pl. 46, fig. 8.

*Characters.*—It closely resembles *Neptunus (Amphitrite) gladiator* but differs as follows:

1. Carapace with more prominent granulated patches.
2. Median lobe on the supra-orbital margin less produced at its outer angle.
3. Last antero-lateral spine directed antero-laterally.
4. Arm with only one distal tooth on the posterior border.
5. Hand with only one dorsal spine at inner distal angle.

*Material.*—1 ♀ (juv.), Siglap, Singapore, June, 1934. Length of carapace 26 mm., breadth 40 mm.

*Distribution.*—South China Sea; Hong Kong; Malay Archipelago.

**Neptunus (Hellenus) tenuipes (de Haan).** (Text-figs. 4; 8, a, b).

*Amphitrite tenuipes* de Haan, 1835, p. 39, pl. 1, fig. 4.

*Neptunus tenuipes* Ortmann, 1893, p. 74.

*Neptunus (Hellenus) tenuipes* Alcock, 1899, p. 42.

*Characters.*—Carapace little convex, very finely tomentose, surface marked with well defined subregional elevations, of which the convexities are granular.

Front cut into three triangular teeth, of which the middle one is more acute but much smaller and less prominent.

Antero-lateral border of carapace cut into nine low, broad teeth, of which the last is long and spiniform. Posterior angles of carapace squarish.

Eyes large. Outer angle of merus of third maxilliped round, anteriorly produced.

Arm with three spines on the anterior border and one at the distal end of the posterior border. Wrist with an inner spine only. Hand more massive than arm, with two spines on the upper surface, one in front of the apex of the wrist and the other close to the inner distal angle.

Second and third segments of male abdomen keeled, fourth and fifth each with a low elevation. Sides of the sixth segment convex at basal two-thirds and then suddenly becoming concave at distal third.

*Material.*—3 ♂♂, 1 ♀, Siglap, Singapore, June, 1934. Length of carapace 17 mm., breadth including lateral spines 35 mm., excluding lateral spines 26.5 mm. (♂).

*Distribution.*—Malay Archipelago, Indian Ocean.

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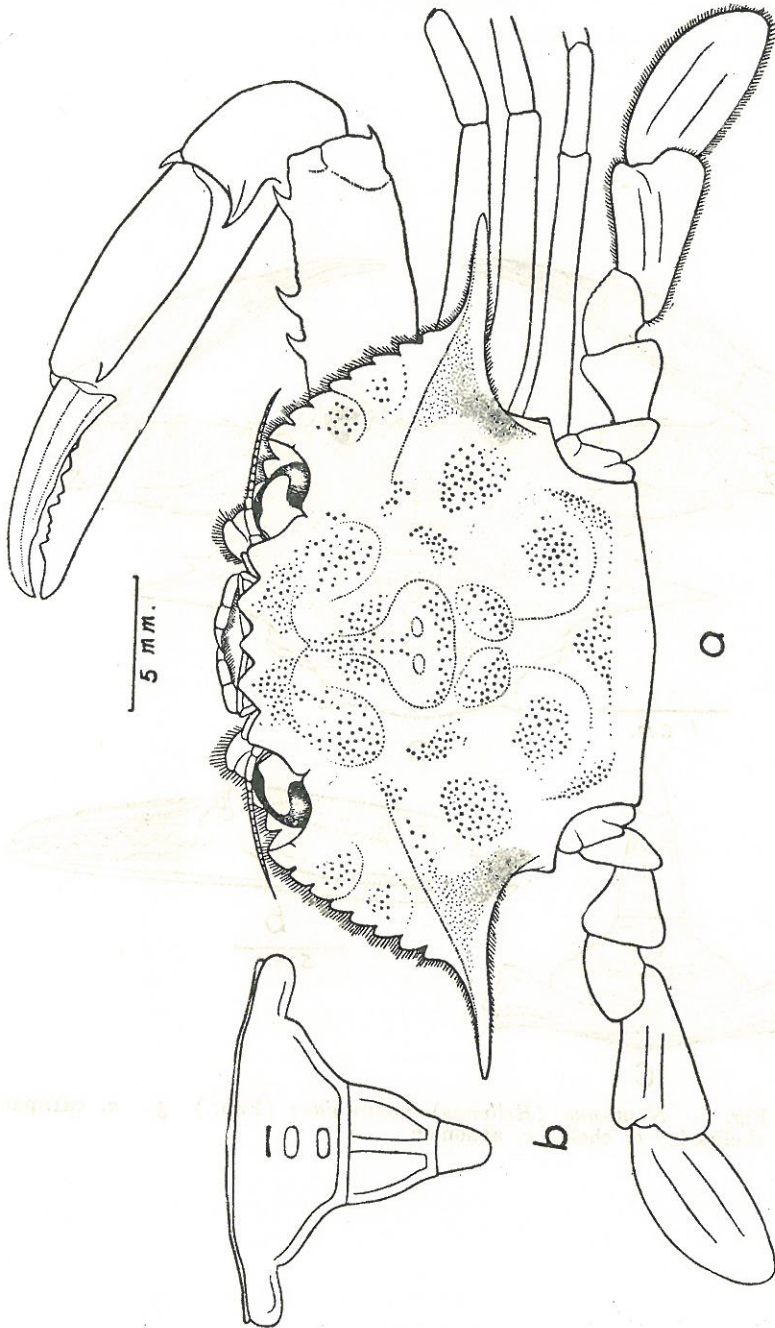


Fig. 4. *Neptunus (Hellemus) tenuipes* de Haan, ♂. a, carapace and legs; b, abdomen.

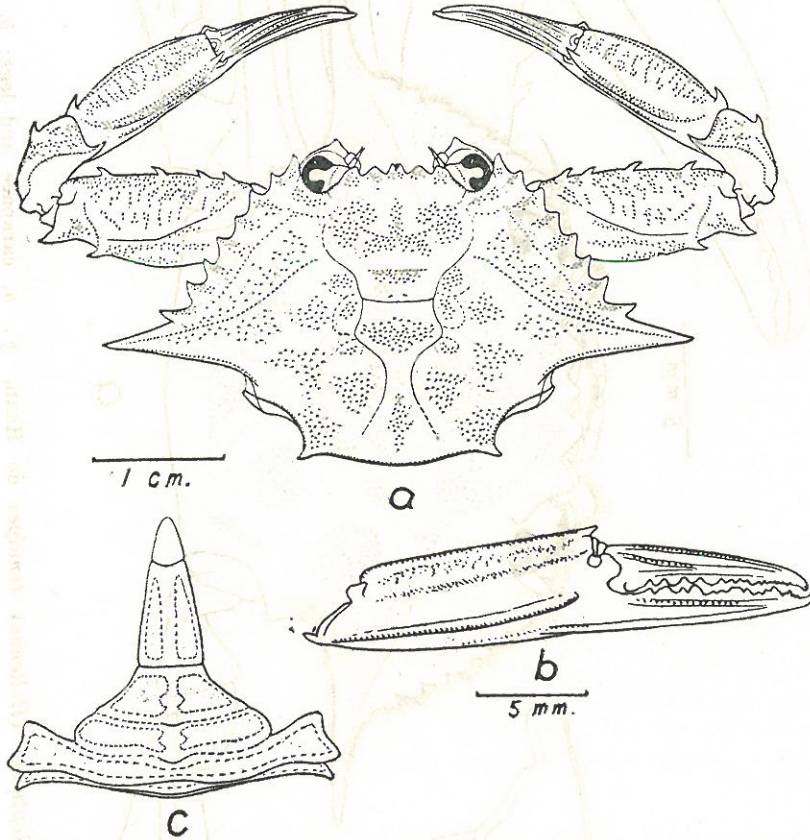


Fig. 5. *Neptunus (Hellenus) hastatoides* (Fabr.) ♂. a, carapace and chelipeds; b, chela; c, abdomen.

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**Neptunus (Hellenus) hastatoides (Fabr.).** (Text-figs. 5; 8, g, h).

- Portunus hastatoides* Fabricius, 1798, p. 368.  
*Amphitrite hastatoides* de Haan, 1835, p.39, pl. 1, fig. 3.  
*Amphitrite hastatoides*, Stimpson, 1907, p. 78.  
*Lupa hastatoides* de Man, 1907, p. 391.  
*Neptunus hastatoides* A. Milne-Edwards, 1861, pp. 332-338.  
*Neptunus (Amphitrite) hastatoides* Lanchester, 1900, pp. 745-6,  
pl. 45, fig. 7.  
*Neptunus (Hellenus) hastatoides* Alcock, 1899, pp. 38-9.  
*Neptunus (Hellenus) hastatoides* Balss, 1922, p. 108.  
*Neptunus (Hellenus) hastatoides* Yokoya, 1933, p. 178.  
*Neptunus (Hellenus) hastatoides* Chopra, 1935, pp. 477-8, fig. 4.

*Characters*.—Carapace flat, surface symmetrically broken up into low subregional convexities, of which the summits are granulated.

Front cut into four teeth, the median two much smaller and more acute than the others. The prolongation of the epistome can be seen between the middle teeth from the dorsal view.

Antero-lateral border of carapace cut into nine acute teeth, the last one much longer than the others. Posterior angles of carapace spiniform.

Outer angle of merus of third maxilliped acutely produced in a lateral direction, the anterior border of this segment and the outer surface of the palp have a pearly sheen.

Arm with four spines on the anterior border and two on the posterior border, of the latter, one is at the distal end, the other at the distal one-fourth. Wrist with inner and outer spines. Hand with two spines, one in front of the apex of the wrist and the other near the inner distal angle. Merus of last leg serrulate distally, the larger serræ situated at the ventral distal angle. Dactylus of the same leg with a black spot on the distal portion.

Sixth segment of male abdomen longer than broad, about twice as long as the seventh segment.

*Material*.—Specimens from Siglap, Singapore, June, 1934.

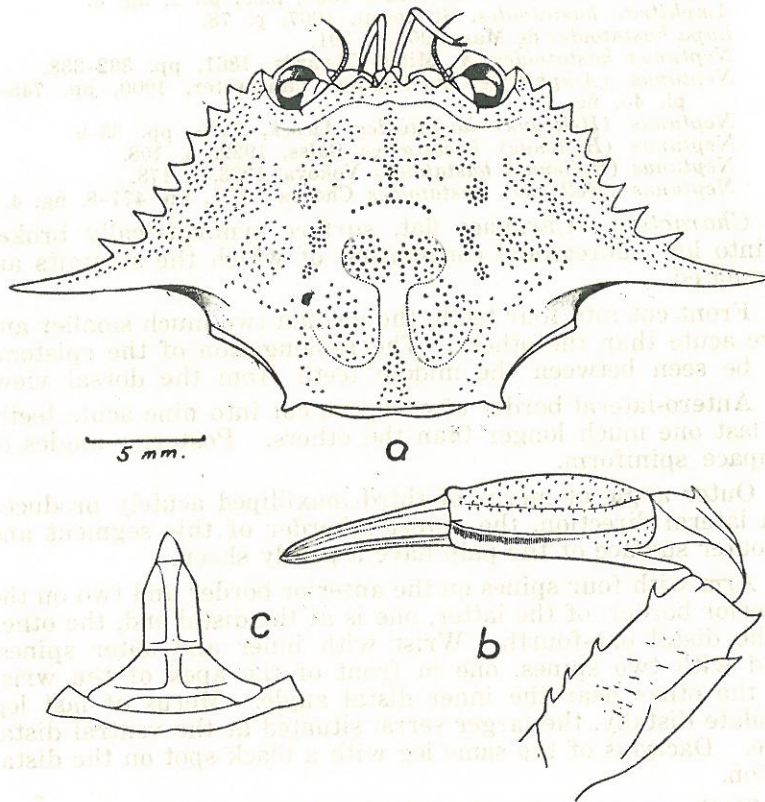


Fig. 6. *Neptunus (Hellemus) tweediei* sp. nov., ♂. a, carapuce; b, cheliped; c, abdomen.

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*Neptunus (Hellenus) tweediei* sp. nov.<sup>1</sup> (Text-figs. 6; 8, c, d).

*Characters.*—Carapace flat, subregional elevations well defined and granulated.

Front cut into three blunt triangular teeth, of which the middle one is smaller than the laterals. The prolongation of the epistome can be seen in front of the middle tooth.

Antero-lateral border of carapace cut into nine acute teeth, widely separated from each other, the last one is very long, directed slightly postero-laterally. Posterior angles of carapace spiniform, spines directed postero-laterally.

Arm with three or four spines on the anterior border and two on the posterior border. Wrist with two spines. Hand also with two spines, one in front of the apex of the wrist and the other at the inner distal angle.

Merus of last leg serrulate distally, serræ at ventro-distal angle larger than the rest.

Sixth segment of male abdomen longer than broad, sides parallel at basal two-thirds and convergent at distal third, so that the basal breadth is about twice the distal.

*Material.*—3 ♂♂, 1 ♀, Siglap, Singapore, Dec., 1933. Length of carapace 15 mm., breadth 31.5 mm. (♂). Type (♂) in the Raffles Museum, Singapore<sup>2</sup>.

*Distribution.*—Malay Archipelago.

*Remarks.*—This new species is most closely related to *Neptunus (Hellenus) hastatoides*, but it is distinguished by the following characters:

<i>N. (H.) tweediei</i>	<i>N. (H.) hastatoides</i>
1. Front cut into three teeth	Four teeth.
2. Last antero-lateral tooth longer and pointed postero-laterally	Shorter, pointed laterally.
3. Dactylus of last leg without a black spot	With a black spot.
4. Sixth segment of male abdomen relatively shorter and broader	Relatively longer and narrower.
5. First male appendage more curved (fig. 8, c, d)	Less curved (fig. 8, g, h).

1. Named after Mr. M. W. F. Tweedie, Curator of the Raffles Museum, who collected most of the material described in this paper.

2. The types of the new species described in this paper will be deposited in the British Museum. Ed.

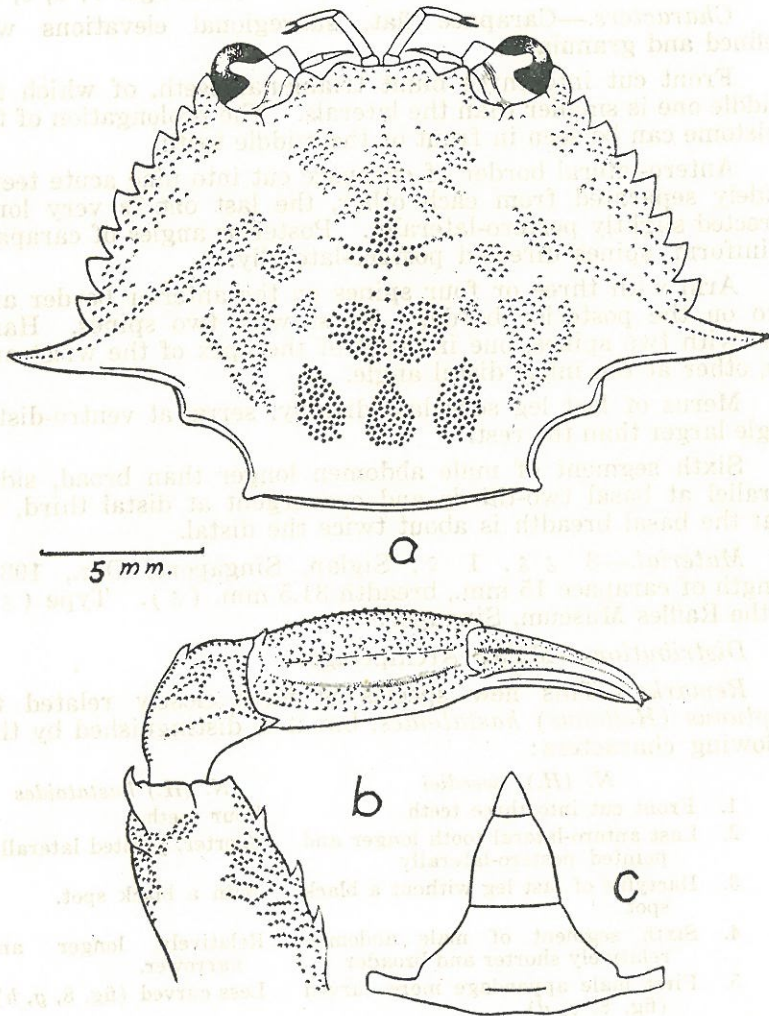


Fig. 7. *Neptunus (Hellenus) brockii* de Man, ♂. *a*, carapace; *b*, cheliped; *c*, abdomen.

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**Neptunus (Hellenus) brockii** de Man. (Text-figs. 7; 8, e, f).

*Neptunus brockii* de Man, 1887, p. 328, pl. 13, fig. 4.

*Neptunus (Hellenus) brockii* Alcock, 1899, pp. 43-44.

*Characters.*—Carapace flat, subregional elevations very prominent and granulate.

Front undulating, not cut into teeth, the lateral angle slightly produced beyond the middle portion.

Antero-lateral border of carapace cut into nine broad triangular teeth, of which the fifth is as large as the first and slightly larger than the anterior three and the posterior three. The last one is the longest and spiniform. Posterior angles of carapace angular.

Arm with two or three spines on the anterior border and one at the distal end of the posterior border. Wrist with two spinules. Hand with two spines on the upper surface, one of which is in front of the apex of wrist and the other is at the inner distal angle. Upper surface of hand unusually broad, inner border with granular ridges.

Sixth segment of male abdomen as long as broad, distal breadth about half the basal.

*Material.*—1 ♂, Siglap, Singapore, July, 1934. Length of carapace 15 mm., breadth 24 mm.

*Distribution.*—Malay Archipelago, Indian Ocean.

*Remarks.*—This species closely resembles *Neptunus (Hellenus) tuberculosus* A. Milne-Edwards<sup>1</sup> but differs in the following particulars:

<i>N. (H.) brockii</i>	<i>N. (H.) tuberculosus</i>
1. Front without four distinct lobes	With four distinct lobes.
2. Antero-lateral teeth sub-equal in size	Unequal in size.
3. Arm with three spines on anterior border	With two spines on anterior border.
4. Hand with acute spines on dorsal surface	With blunt spines on dorsal surface.
5. Telson of male abdomen triangular in shape	Oblong in shape.

<sup>1</sup>. A. Milne-Edwards: Arch. Mus. d'hist. nat. Paris, Vol. X, pp. 333, 339, pl. 31, fig. 5.

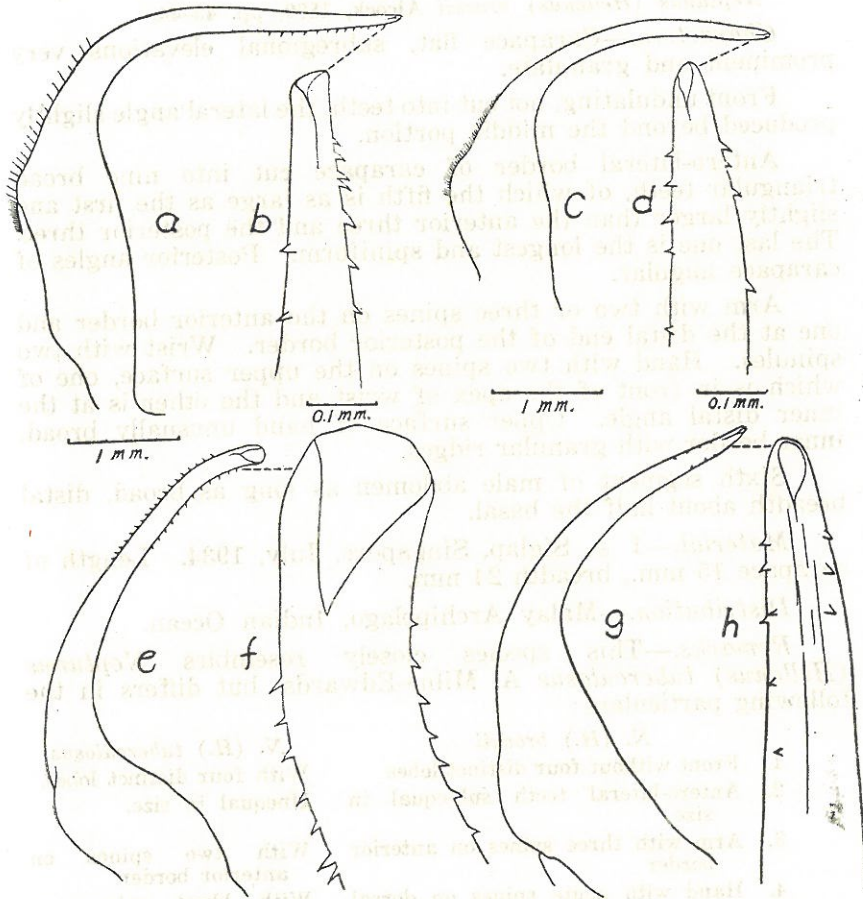


Fig. 8. First male appendages of:—*a, b*, *Neptunus* (*Hellenus*) *tenuipes* de Haan; *c, d*, *N. (H.) tweediei* sp. nov.; *e, f*, *N. (H.) brockii* de Man; *g, h*, *N. (H.) hastatoides* (Fabr.).

**Neptunus (Lupocycloporus) gracilimanus (Stimpson).**

(Text-figs. 9; 10, c)

*Amphitrite gracilimanus* Stimpson, 1858, p. 38; 1907, p. 77, pl. 10, fig. 3.

*Achelous whitei* A. Milne-Edwards, 1861, p. 343, pl. 31, fig. 6.

*Achelous whitei* Lanchester, 1900, p. 746.

*Neptunus (Lupocycloporus) whitei* Alcock, 1899, pp. 44-45.

*Portunus (Lupocycloporus) innominatus* Rathbun, 1909, p. 114.

*Neptunus (Lupocycloporus) gracilimanus* Alcock, 1899, p. 45.

*Neptunus (Lupocycloporus) gracilimanus* Balss, 1922, p. 108.

*Neptunus (Lupocycloporus) gracilimanus* Chopra, 1935, pp. 481-2, fig. 6.

*Characters.*—Carapace fairly convex and finely pubescent. Transverse ridges very distinct, one on each protogastric region, one on mesogastric region, another one on metagastric region, two on cardiac region and three on branchial region.

Front cut into four subacute teeth of nearly equal size, the middle two slightly the more prominent.

Antero-lateral border of carapace cut into nine teeth, the last one slightly the largest and pointing antero-laterally.

Merus of third maxilliped anteriorly pronounced.

Chelipeds more or less covered with squamiform granules. Arm with four or five spines on the anterior border, two on the posterior border. Hand with three spines on the upper surface, one in front of the apex of the wrist and the other two set side by side at the anterior one-fourth, the inner of these is much larger than the outer; the inner distal angle is produced further forwards than the outer. Fingers slender and compressed, tips slightly bent outwards, the movable finger straight and the immovable finger gently upcurved, when viewed laterally.

Merus of last leg with a spine on the posterior margin, propodus of the same smooth.

Male abdomen pointed, sixth segment with the lateral sides straight, the distal and posterior margins are in the proportion 3: 5. Second and third segments transversely carinated.

*Material.*—1 ♂, 1 ♀; Siglap, Singapore, June, 1934. Length of carapace 25 mm., breadth 41 mm. (♂).

*Distribution.*—New Guinea; Hong Kong; Malay Archipelago; Indian Ocean.

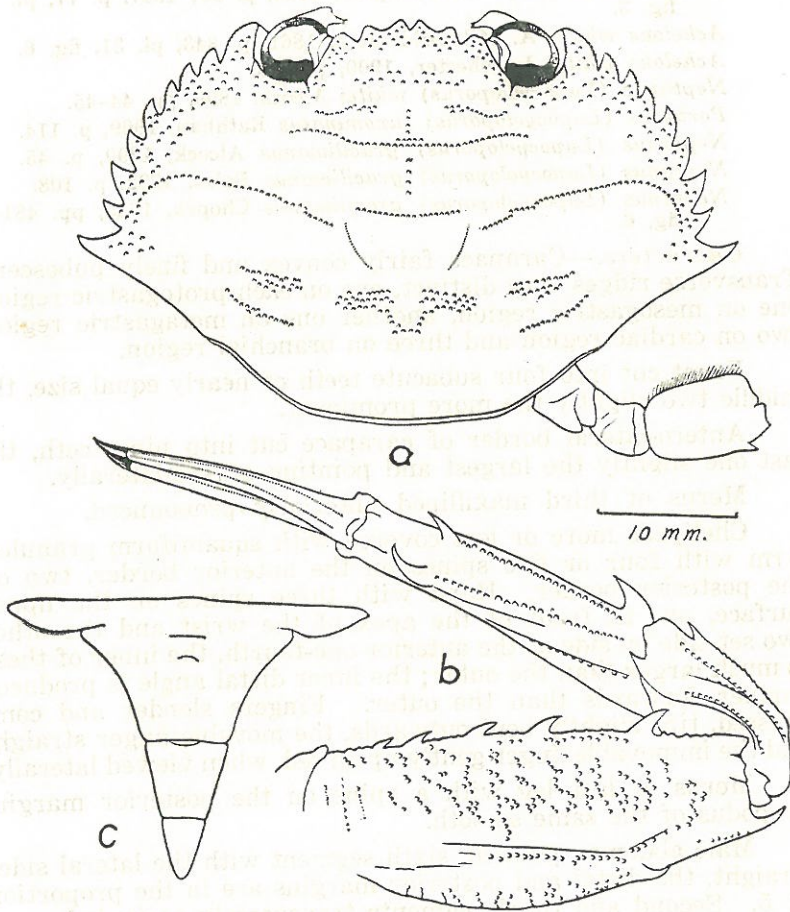


Fig. 9. *Neptunus (Lupocycloporus) gracilimanus* (Stimpson), ♂.  
a, carapace; b, cheliped; c, abdomen.

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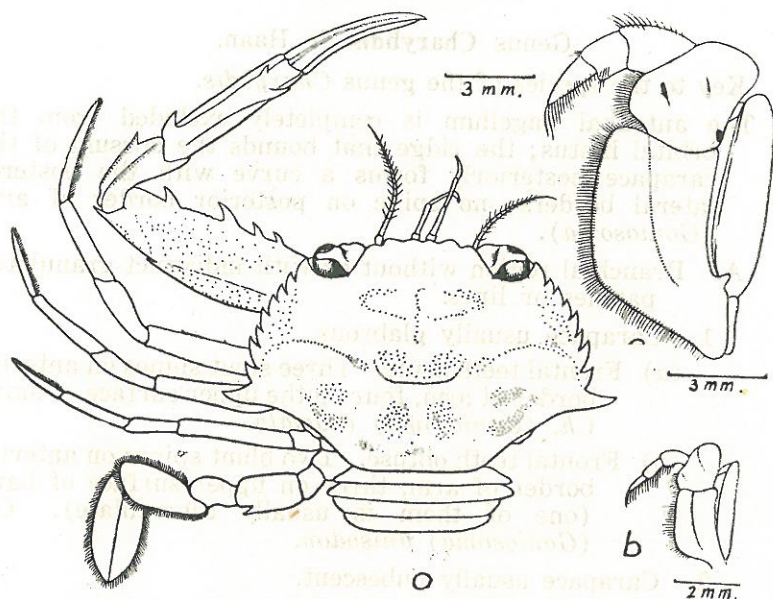


Fig. 10. *Neptunus (Lupocycloporus) minutus* sp. nov., ♀. *a*, carapace and legs; *b*, third maxilliped. *N. (L.) gracilimanus* (Stimpson). *c*, third maxilliped.

***Neptunus (Lupocycloporus) minutus*, sp. nov.** (Text-fig. 10).

*Characters*.—Closely resembling *Neptunus (Lupocycloporus) gracilimanus*, but distinguished from it as follows:

Protogastric regions each with a granulated line and some scattered granules in front of it. Metogastric region with two granulated patches. Branchial region with a granulated line and two patches behind it. Cardiac region with two granulated patches.

Front cut into four shallow lobes, of which the outer ones are broad and shallow while the middle two are narrow and dentiform. Inner supra-orbital angle also very low. The last antero-lateral teeth pointed laterally.

Arm with four spines on the anterior border and two on the posterior.

Merus of third maxilliped strongly produced anteriorly.

Fingers curved inwards, the bending outwards of the tip of movable finger perceptible.

*Material*.—1 ♀ (ovig.), Siglap, Singapore, June, 1933. Length of carapace 8 mm., breadth 13 mm. Type in the Raffles Museum.

*Distribution*.—Singapore.

Genus *Charybdis* de Haan.

Key to the species of the genus *Charybdis*.

- f. The antennal flagellum is completely excluded from the orbital hiatus; the ridge that bounds the dorsum of the carapace posteriorly forms a curve with the postero-lateral borders; no spine on posterior border of arm (*Goniosoma*).
  - A. Branchial region without or with indistinct granulated patches or lines.
    1. Carapace usually glabrous.
      - (a) Frontal teeth acute. Three stout spines on anterior border of arm, four on the upper surface of hand. *Ch. (Goniosoma) cruciata*.
      - (b) Frontal teeth obtuse. Two blunt spines on anterior border of arm, three on upper surface of hand (one of them is usually tuberculate). *Ch. (Goniosoma) anisodon*.
    2. Carapace usually pubescent.
      - (a) Three spines on anterior border of arm, five on upper surface of hand.
        - (i) Median pair of frontal teeth triangular at apex. First antero-lateral tooth concave on the outer margin. Merus of last leg as long as broad, propodus smooth on the posterior border. *Ch. (Goniosoma) affinis*.
        - (ii) Median pair of frontal teeth round at apex. First antero-lateral tooth convex on the outer margin. Merus of last leg twice as broad as long, propodus serrate on the posterior border. *Ch. (Goniosoma) merquiensis*.
      - (b) Four spines on anterior border of arm, four on upper surface of hand.
 

Median pair of frontal teeth triangular at apex. First antero-lateral tooth concave on the outer margin. Merus of last leg almost as long as broad, propodus with few serræ on the posterior border. *Ch. (Goniosoma) miles*.
- B. Branchial region with granulated patches or lines.
  1. Branchial region with two granulated patches. Two or three spines on anterior border of arm, three

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on upper surface of hand. Propodus of last leg smooth on the posterior border. *Ch. (Goniosoma) callianassa*.

2. Branchial region with two granulated lines.

(a) Frontal teeth long. Four spines on anterior border of arm, three on upper surface of hand which has tuberculated costæ. Propodus of last leg with a row of serræ on the posterior border. *Ch. (Goniosoma) natator*.

(b) Frontal teeth low. Three spines on anterior border of arm, four on upper surface of hand which has no tuberculated costæ. Propodus of last leg with only few serræ on the posterior border. *Ch. (Goniosoma) variegata*.

II. Antennal flagellum completely excluded from the orbital hiatus. Posterior border of dorsum of carapace straight and forming a dog's eared angular junction with the postero-lateral borders. Posterior border of arm ends in a spine (*Goniohellenus*).

Last spine of antero-lateral border not prominent and smaller than any of the others. *Ch. (Goniohellenus) truncata*.

***Charybdis (Goniosoma) cruciata* (Herbst).**

*Charybdis cruciata* Rathbun, 1910, pp. 363-4.

*Charybdis (Goniosoma) cruciatus* Chopra, 1935, pp. 482-3, fig. 7.

*Charybdis (Goniosoma) cruciata* Shen, 1932, pp. 38-40, text fig. 6, pl. 8.

*Material*.—1 ♂, Siglap, Singapore. Length of carapace 46 mm., breadth 69 mm.

*Distribution*.—Japan; China (Fukien, Kwangtung); Formosa; Hong Kong; Australia; Malay Archipelago; Indian Ocean; South Africa.

***Charybdis (Goniosoma) anisodon* (de Haan).**

*Portunus anisodon* de Haan, 1835, p. 42.

*Goniosoma anisodon* A. Milne-Edwards, 1873, p. 147.

*Charybdis (Goniosoma) anisodon* Nobili, 1906, p. 198.

*Charybdis (Goniosoma) anisodon* Shen, 1932, pp. 43-45, text fig. 9, pl. 9, fig. b.

*Material*.—1 ♂, 1 ♀; Siglap, Singapore. Length of carapace 29 mm., breadth 50.5 mm. (♂).

*Distribution*.—China; Formosa; Philippine Islands; Malay Archipelago; Indian Ocean; Red Sea.

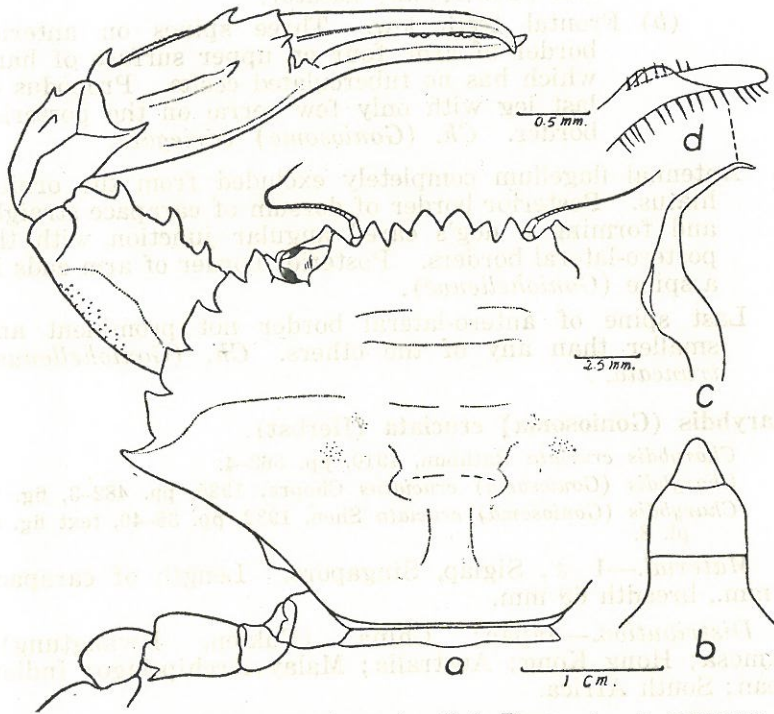


Fig. 11. *Charybdis (Goniosoma) affinis* Dana, ♂. a, carapace and legs; b, abdomen; c, first male appendage; d, distal part of first male appendage, much enlarged.

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***Charybdis (Goniosoma) affinis* Dana. (Text-fig. 11).**

*Charybdis affinis* Dana, 1852, p. 286, pl. 17, fig. 12.

*Charybdis (Goniosoma) affinis* Alcock, 1899, pp. 56-7.

*Goniosoma affinis* Lanchester, 1900, p. 747.

*Characters*.—Carapace slightly convex, pubescent. The granulated ridges on the cardiac region and the granulated patches on the branchial region are distinguishable.

Front cut into six teeth, the median pair is the most prominent, the next outer one, on either side, is triangular in shape, the outermost one, on either side, is the narrowest.

Antero-lateral border of carapace cut into six teeth, all pointed anteriorly with the exception of the last one which is the longest and directed antero-laterally. The first antero-lateral tooth is concave on the outer margin.

Arm with three spines, and five on the upper surface of hand (the outer distal one usually very small).

Propodus of last leg smooth on the posterior border.

Sides of sixth segment of male abdomen straight at the basal two-thirds and becoming convergent at the anterior third.

*Material*.—1 ♂, 1 ♀, Siglap, Singapore. Length of carapace 29.6 mm., breadth 45 mm. (♂).

*Distribution*.—China; Malay Archipelago; Indian Ocean.

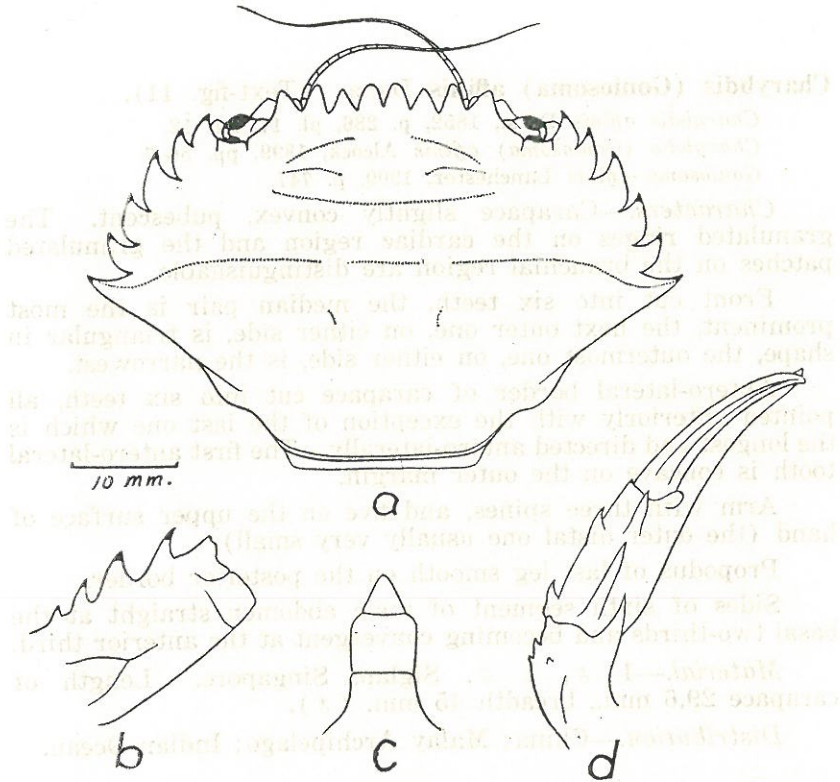


Fig. 12. *Charybdis* (*Goniosoma*) *merguensis* (de Man), ♂.  
a, carapace; b, arm of cheliped; c, abdomen; d, wrist and hand of cheliped.

***Charybdis (Goniosoma) merguensis* (de Man). (Text-fig. 12).**

*Charybdis merguensis* Monod, 1930, p. 140, fig. 7.

*Charybdis (Goniosoma) merguensis* Alcock, 1899, pp. 55-6.

*Charybdis (Goniosoma) merguensis* Nobili, 1903, p. 31.

*Charybdis (Goniosoma) merguensis* Chopra, 1935, pp. 484-6, fig. 8.

*Characters.*—Carapace tomentose and bearing the usual number of transverse lines.

The two median frontal teeth have rounded apices, the next lateral ones are triangular and are deeply and widely separated from the outermost ones which are narrowly triangular. The orbit is large and has two fissures on the dorsal border. The antero-lateral teeth all pointed anteriorly with the exception of the last one which is directed antero-laterally.

The arm of the cheliped is armed with three or four strong spines on the anterior border and another small one is usually present at the distal end of the same border. The wrist has a large pointed spine at the inner angle and three small ones on the outer surface. The hand bears five spines on the dorsal surface, the two largest along the inner border, two small ones at the anterior half of the outer border and another near the articulation of this segment and the wrist.

The merus of the fourth leg is nearly twice as broad as long, propodus with a number of serræ on the posterior border (7-8 in female and 8-11 in male).

Sides of sixth segment of male abdomen parallel at basal two-thirds and then convergent distally.

*Material.*—1 ♂, 1 ♀, Siglap, Singapore. Length of carapace 36 mm., breadth 55.6 mm. (♂).

*Distribution.*—China (Amoy); Hong Kong; Malay Archipelago; Indian Ocean; Red Sea; Mediterranean Sea.

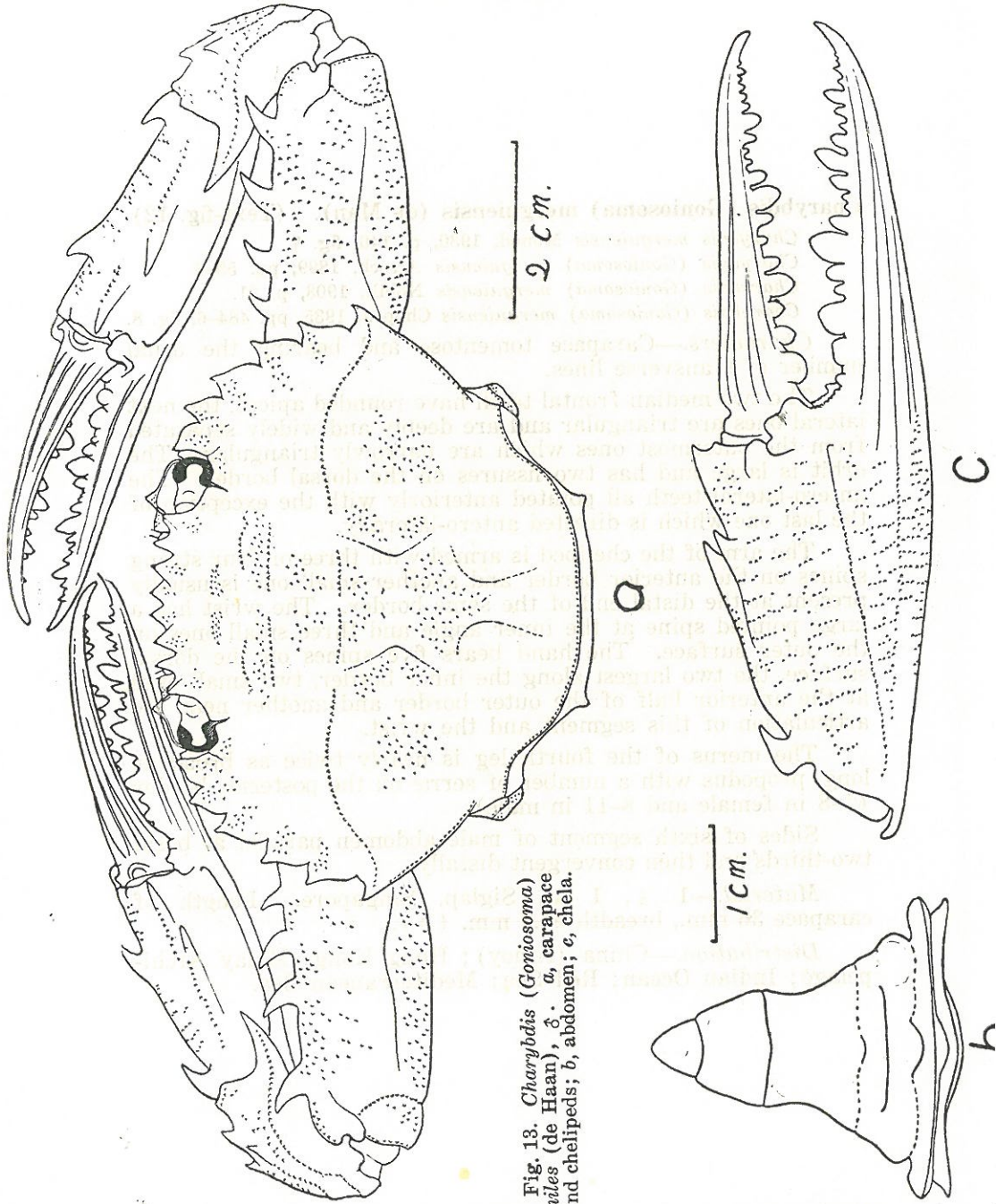


Fig. 13. *Charybatis* (*Gomiosoma*)  
*miles* (de Haan), ♂. a, carapace  
and chelipeds; b, abdomen; c, chela.

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**Charybdis (Goniosoma) miles (de Haan). (Text-fig. 13).**

*Portunus (Charybdis) miles* de Haan, 1835, p. 41, pl. 11, fig. 1.

*Charybdis miles* Rathbun, 1902, p. 27.

*Charybdis miles* Parisi, 1916, p. 175.

*Charybdis miles* Balss, 1922, p. 104.

*Charybdis miles* Yokoya, 1933, p. 175.

*Goniosoma miles* A. Milne-Edwards, 1861, p. 378.

*Goniosoma miles* Ortmann, 1893, p. 81.

*Goniosoma miles* Whitelegge, 1900, p. 157.

*Charybdis (Goniosoma) miles* Alcock, 1899, pp. 62-3.

*Characters*.—Carapace tomentose. Frontal teeth acute, triangulate, the outermost one narrowest. Orbit large, its dorsal inner angle small and acute.

First antero-lateral tooth excavated on the outer margin.

Chelipeds very long. Arm with four spines on the anterior border, hand with four on the upper surface. Propodus of last leg with two to three spinules on the posterior border.

Sides of sixth segment of male abdomen almost straight, the basal margin about twice as broad as the distal.

*Material*.—1 ♂, Off Tioman Island, South China Sea, September, 1926. Length of carapace 46 mm., breadth 68 mm.

*Distribution*.—Japan; China (Foochow, Amoy); Formosa; Hong Kong; Australia; Indian Ocean.

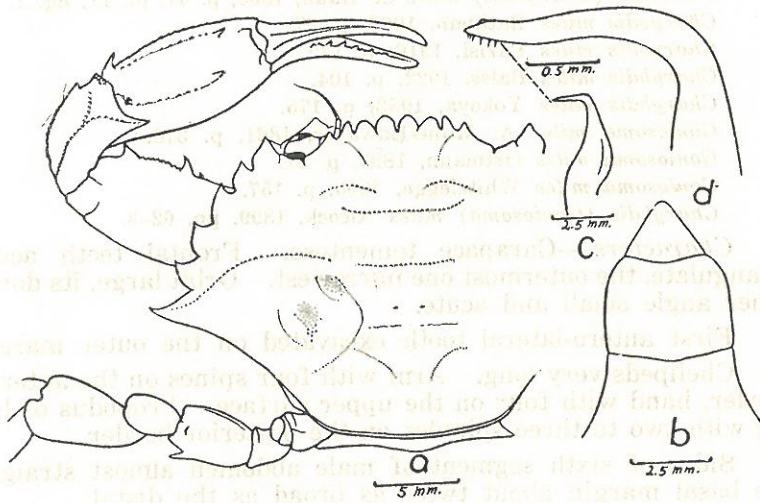


Fig. 14. *Charybdis (Goniosoma) callianassa* (Herbst), ♂.  
*a*, carapace and legs; *b*, abdomen; *c*, first male appendage; *d*, distal part  
of first male appendage, much enlarged.

**Charybdis (Goniosoma) callianassa** (Herbst). (Text-fig. 14).

*Charybdis callianassa* Rathbun, 1910, p. 364.

*Charybdis (Goniosoma) callianassa* Alcock, 1899, pp. 57-59.

*Charybdis (Goniosoma) callianassa* Chopra, 1935, pp. 489-491, pl. 9, fig. 1; text fig. 11.

*Characters.*—Carapace convex and pubescent. Besides the usual transverse ridges there are two prominent ones placed side by side on the cardiac region and two granulated patches on the branchial region.

Front cut into six teeth of which the median pair is the most prominent, apex rounded. The next outer one is very low, bluntly triangular, tending antero-laterally. The outermost one on either side is the narrowest and as high as its inner fellow.

Antero-lateral border of carapace cut into six teeth, their lateral borders all finely serrate. The last tooth is spiniform and longer than any of the preceding ones. The first one is slightly concave on the outer margin.

Arm with two spines and sometimes one or two small ones behind the second. The hand is provided with three spines on the upper surface (not including the two indistinct distal ones).

Propodus of last leg smooth on the posterior border.

Sixth segment of male abdomen broader than long, sides convex. Third segment with a smooth carina. Distal portion of first male appendage curved outwards almost at a right angle.

*Material.*—1 ♂, Siglap, Singapore, July, 1934. Length of carapace 19.5 mm. breadth 29 mm.

*Distribution.*—Japan; China; Malay Archipelago; Gulf of Siam; Indian Ocean.

**Charybdis (Goniosoma) natator** (Herbst).

*Charybdis (Goniosoma) natator* Alcock, 1899, p. 61-2.

*Charybdis (Goniosoma) natator* Shen, 1932, pp. 40-3, text fig. 7, 8; pl. 9, fig. 2.

*Material.*—1 ♂, Siglap, Singapore. Length of carapace 39 mm. breadth 58 mm.

*Distribution.*—China (Kwangtung); Hong Kong; Philippine Islands; Malay Archipelago; Indian Ocean; South Africa.

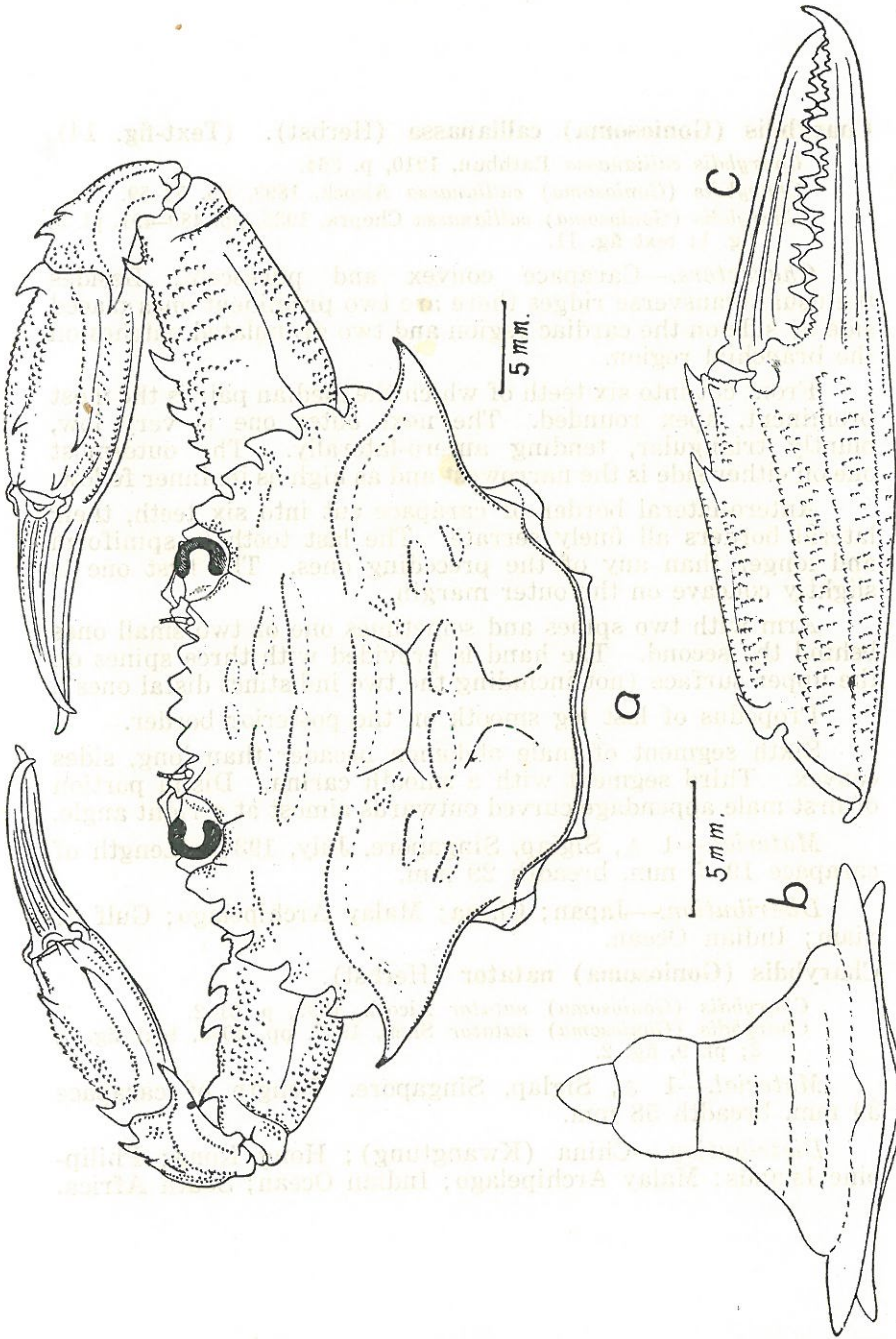


Fig. 15. *Charybdis (Goniosoma) variegata* (Fabr.), ♂. a, carapace and chelipeds; b, abdomen; c, chela.

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**Charybdis (Goniosoma) variegata (Fabr.).** (Text-fig. 15).

*Portunus (Charybdis) variegata* de Haan, 1835, p. 42, pl. 1, fig. 2.

*Charybdis variegata* Rathbun, 1902, p. 27; 1910, p. 364.

*Charybdis variegata* Balss, 1922, p. 104.

*Charybdis variegata* Yokoya, 1933, p. 176.

*Charybdis (Goniosoma) variegata* Alcock, 1899, p. 60.

*Charybdis (Goniosoma) variegata* Nobili, 1906, p. 196.

*Charybdis (Goniosoma) variegata* Chopra, 1935, pp. 488-9, fig. 10.

*Characters.*—In addition to the usual transverse ridges, there are two on the cardiac region set side by side and also two short ones on the branchial region, the anterior of these is larger than the posterior and the latter is slightly oblique.

Front cut into six teeth, median pair larger, separated by a deep incision; the next outer one, on either side, is similar in shape to the middle ones but tending outwards; the third is very narrow and deeply separated from the second.

First antero-lateral tooth broadly triangular and the last slightly more prominent than the others.

Arm provided with three strong spines and some small ones on the anterior border, hand with five on the upper surface.

Sides of the sixth segment of the male abdomen smoothly convex, the distal margin about one-half as broad as the basal.

Merus of last leg longer than broad (7: 4.6). Propodus bears 1-2 denticles on the distal portion of the posterior border.

*Material.*—1 ♂, 1 ♀; Siglap, Singapore. Length of carapace 23 mm., breadth 37 mm. (♂).

*Distribution.*—Japan; China (Amoy); Hong Kong; Malay Archipelago; Indian Ocean; Red Sea.

*Remarks.*—I have not found this species occurring in North China. The species referred to by Yokoya (1933, p. 176) is perhaps *Charybdis (Gonioneptunus) bimaculata* Miers.

**Charybdis (Goniohellenus) truncata (Fabr.).**

*Portunus truncatus* Fabricius, 1798, p. 365.

*Charybdis ornata* Rathbun, 1910, p. 365.

*Goniosoma ornatum* Laurie, 1906, p. 418.

*Charybdis (Goniohellenus) ornata* Alcock, 1899, p. 64.

*Charybdis (Goniohellenus) truncatus* Balss, 1922, p. 103.

*Charybdis (Goniohellenus) truncatus* Yokoya, 1933, pp. 176-7.

*Charybdis (Goniohellenus) truncata* Shen, 1934, pp. 49-51, text figs. 13-14.

*Material.*—1 ♂, 1 ♀, Siglap, Singapore. Length of carapace 26 mm., breadth 38 mm. (♂).

*Distribution.*—Japan; China (Fukien, Kwangtung); Hong Kong; Philippine Islands; Siam; Malay Archipelago; Indian Ocean.

Genus *Thalamita* Latreille.

Key to the species of the genus *Thalamita*.

I. Front cut into six lobes.

A. Antero-lateral border of carapace cut into five spines of nearly equal size.

(a) Carapace glabrous. Transverse ridges faint. Outer surface of hand nearly smooth. *Th. crenata*.

(b) Carapace pubescent. Transverse ridges distinct. Outer surface of hand costate.

(i) Basal segment of antenna with a row of denticles. Arm with a spinule at the distal end of the anterior border. Hand with five spines on the upper surface. Sides of sixth segment of male abdomen converging distally. *Th. danae*.

(ii) Basal segment of antenna with 3-4 sharp spinules. Arm without a spinule at the distal end of the anterior border. Hand with 9-10 spines on the upper surface. Sides of sixth segment of male abdomen almost straight. *Th. spinimana*.

B. Antero-lateral border of carapace cut into five spines, of which the fourth is much the smallest.

(a) Fourth antero-lateral spine very rudimentary. Median pair of frontal lobes low and truncate. Arm with a minute spine at distal end of the anterior border. Basal segment of antenna with some spines. Sides of sixth segment of male abdomen straight. *Th. prymna*.

(b) Fourth antero-lateral spine small. Median pair of frontal lobes produced and round. Arm without a spine at distal end of the anterior border. Basal segment of antenna with a smooth lobe produced forwards. Sides of sixth segment of male abdomen convex. *Th. picta*.

II. Front cut into two lobes. *Th. sima*.

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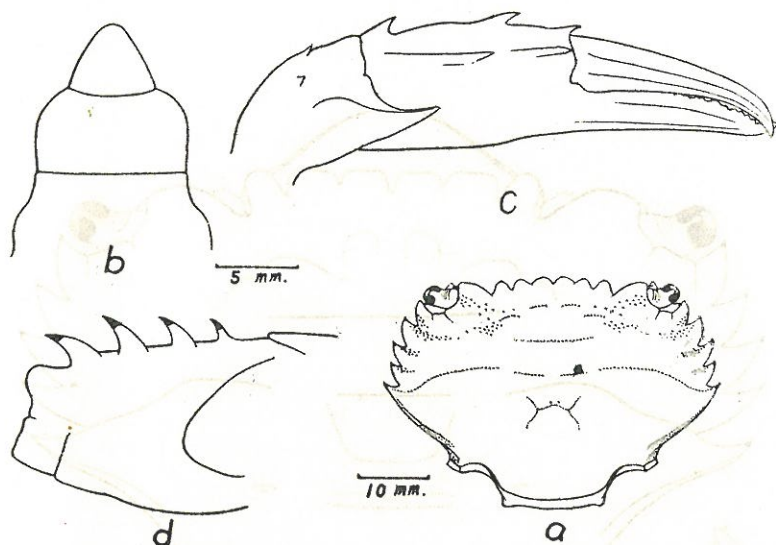


Fig. 16. *Thalamita crenata* (Latr.), ♂. *a*, carapace; *b*, abdomen; *c*, chela; *d*, arm of cheliped.

***Thalamita crenata* (Latreille). (Text-fig. 16).**

*Thalamita crenata* Alcock, 1899, p. 76.

*Thalamita crenata* Stimpson, 1907, p. 84, pl. 10, fig. 6.

*Thalamita crenata* Klunzinger, 1913, p. 351, pl. 7, fig. 19.

*Thalamita crenata* Balss, 1922, p. 111.

**Characters.**—Carapace smooth. Transverse ridges faint. Front cut into six lobes of nearly equal size. Antero-lateral border of carapace cut into five teeth, which gradually decrease in size from before backwards.

Basal segment of antenna with some tubercles.

Arm with four spines on the anterior border. Hand with five spines on the upper surface. Propodus of last leg serrate on the posterior border.

Sixth segment of male abdomen about twice as broad as long.

**Material.**—1 ♂, 1 ♀, Pisang Island, Malacca Strait, January, 1934. Length of carapace 29 mm., breadth 44.5 mm. (♂).

**Distribution.**—Liu Kiu Islands; Hong Kong; Malay Archipelago; Indian Ocean and Red Sea.

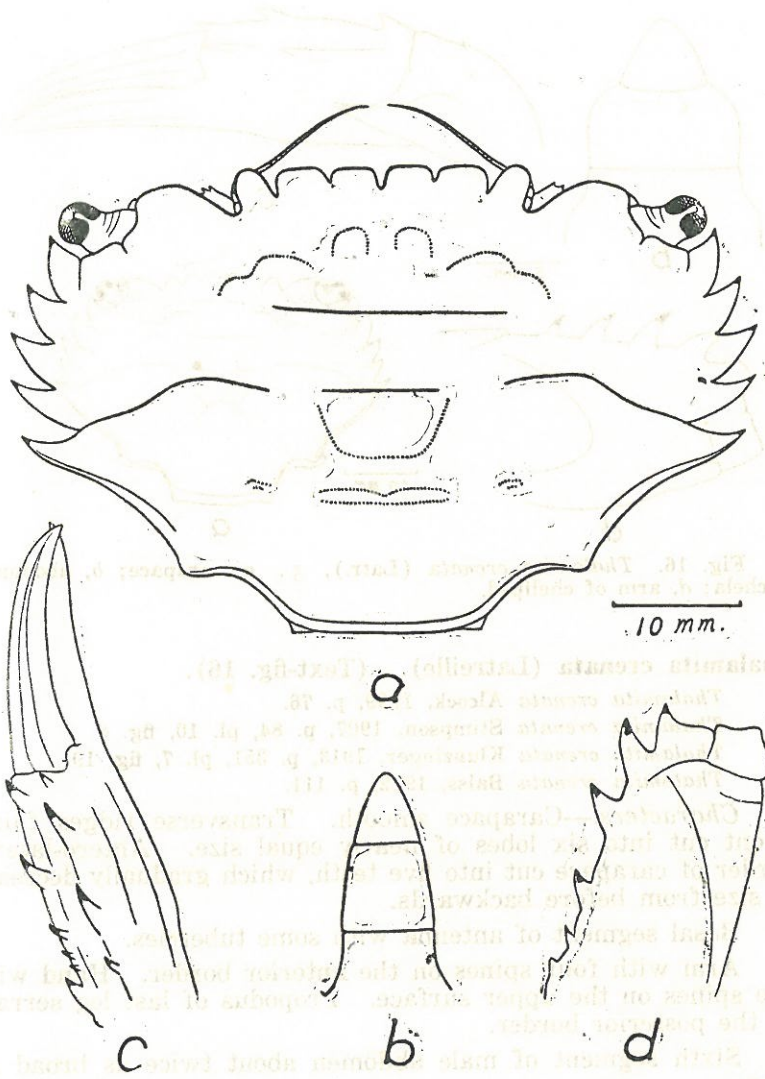


Fig. 17. *Thalamita spinimana* Dana, ♂. a, carapace; b, abdomen; c, chela; d, arm of cheliped.

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***Thalamita danae* Stimpson.**

*Thalamita danae* Lanchester, 1900, p. 749.

*Thalamita danae* Stimpson, 1907, p. 85.

*Thalamita danae* Shen, 1934, pp. 52-54 fig. 15-16.

*Material*.—1 ♂, Blakang Mati Island, Singapore, March, 1934. 1 ♀, Pisang Island, Malacca Strait, January, 1934. Length of carapace 43 mm., breadth 66 mm. (♂).

*Distribution*.—Hong Kong; New Zealand; Malay Archipelago; Indian Ocean.

***Thalamita spinimana* Dana. (Text-fig. 17).**

*Thalamita spinimana* Dana, 1852, p. 283, pl. 17, fig. 8.

*Thalamita spinimana* A. Milne-Edwards, 1873, p. 165, pl. 4, fig. 5.

*Thalamita spinimana* Lanchester, 1900, p. 749.

*Thalamita spinimana* Sakai, 1936, p. 162, pl. 12, fig. 1.

*Characters*.—Carapace usually pubescent. Front cut into six lobes, of which the median pair is truncate and separated by a narrow incision, the next outer pair much broader and also truncate anteriorly and the outermost the narrowest and rounded at the apex.

Antero-lateral border of carapace cut into five pointed spines which decrease in size from before backwards.

Basal segment of antenna armed with three to four spinules.

Arm with three or four spines on the anterior border and another small one at the distal end of the same border. Upper inner border of the hand armed with four to five (the distal and the basal ones are usually smaller) spines, upper outer border of the same with five spines, of which the basal second and third ones are usually much smaller than the others.

Propodus of last leg serrate on the posterior border.

Sides of sixth segment of male abdomen almost straight. Seventh segment elongate triangular.

*Material*.—2 ♂♂ 1 ♀; Pulau Pawai, near Singapore, November, 1933. Length of carapace 38 mm., breadth 60 mm. (♂).

*Distribution*.—Viti Archipelago; New Caledonia; Palao; Malay Archipelago.

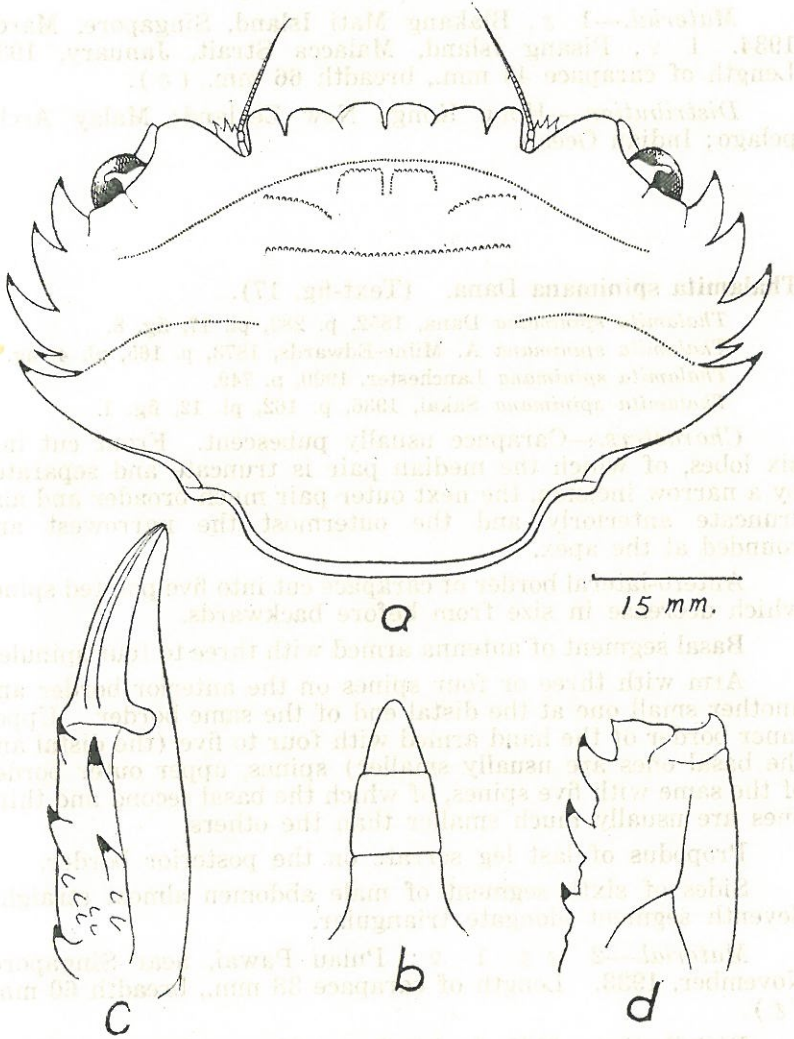


Fig. 18. *Thalamita prymna* (Herbst), ♂. a, carapace; b, abdomen; c, chela; d, arm of cheliped.

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***Thalamita prymna* (Herbst). (Text-fig. 18).**

*Thalamita prymna* de Man, 1888, p. 75, pl. 4, figs. 5-6.

*Thalamita prymna* Alcock, 1899, p. 78.

*Thalamita prymna* Klunzinger, 1913, p. 354, pl. 7, fig. 20.

*Thalamita prymna* Parisi, 1916, p. 176.

*Thalamita prymna* Balss, 1922, p. 112.

*Thalamita prymna* Yokoya, 1933, p. 178.

*Characters*.—Carapace glabrous but pubescent when young. Transverse ridges distinct. Post-frontal crests prominent, and truncate anteriorly. Protogastric region with an arched and granulated ridge. The other regions with the usual transverse ridges.

Front cut into six truncate lobes which are in close contact with one another.

Antero-lateral border of carapace cut into five spines, of which the fourth is very minute and scarcely perceptible.

Basal segment of antenna with two or three spines and some tubercles.

Arm with three spines on the anterior border and a tiny one at the distal end of the same (more distinct in the younger specimens than in the adult ones). The dorsal surface of the hand has five larger spines and two or three small ones near the basal end of the upper inner border.

Propodus of last leg serrate on the posterior border.

Sides of the sixth segment of the abdomen almost straight.

*Material*.—1 ♂, Horsburgh Lighthouse, South China Sea, April, 1934. Length of carapace 38 mm., breadth 60 mm.

1 ♂, Sultan Shoal, near Singapore, December, 1933.

1 ♀, Siglap, Singapore, July, 1933.

*Distribution*.—Japan; Liu-Kiu Islands; Australia; New Caledonia; Malay Archipelago; Indian Ocean; Red Sea; Natal.

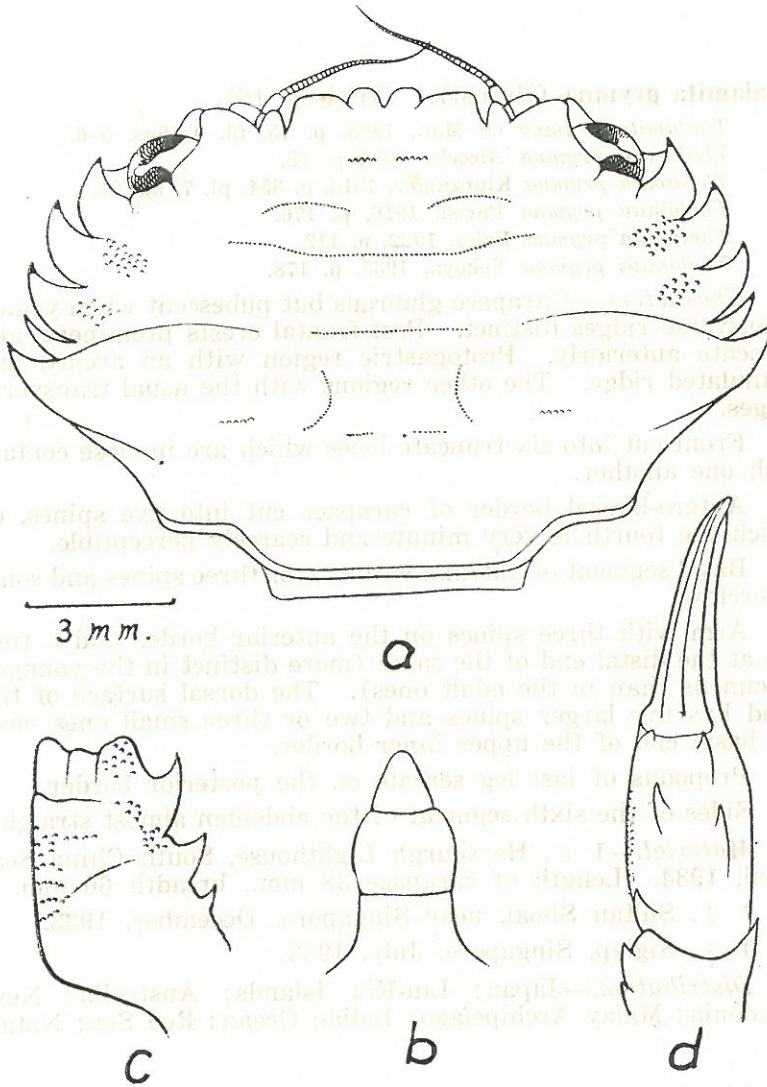


Fig. 19. *Thalamita picta* Stimpson, ♂. a, carapace; b, abdomen; c, arm of cheliped; d, chela.

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**Thalamita picta** Stimpson. (Text-fig. 19).

*Thalamita picta* Stimpson, 1858, p. 39.

*Thalamita picta* A. Milne-Edwards, 1873, p. 164, pl. 4, fig. 4.

*Thalamita picta* Alcock, 1899, p. 79.

*Characters*.—Size small. Carapace pubescent. Post-frontal crests conspicuously granulated. The transverse ridges are as usual, but there is a short transverse ridge on the branchial region and two patches of granules on the dorsal surface of the second and third antero-lateral spines.

Front cut into six lobes, of which the median pair is separated by a V-shaped sinus, apex rounded. The next outer one, on either side, is much broader and truncate, the outermost one is much the smallest and triangular in shape.

Antero-lateral border of carapace cut into five teeth, the fourth very small, the fifth spiniform.

Basal segment of antenna produced forwards into a rounded lobe.

Arm with three spines on the anterior border and four spines on the upper surface of the hand (the outer distal one is usually indistinct).

Propodus of last leg serrate on the posterior border.

Sides of sixth segment of male abdomen slightly convex.

*Material*.—1 ♂, 1 ♀, Christmas Island, Indian Ocean, August–September, 1932. Length of carapace 10.5 mm., breadth 16 mm. (♂).

*Distribution*.—Hawaiian Islands; Japan; Malay Archipelago; Indian Ocean; Red Sea.

**Thalamita sima** (H. Milne-Edwards).

*Thalamita sima* Alcock, 1899, p. 81.

*Thalamita sima* Shen, 1934, p. 54, textfig. 17–18.

*Material*.—1 ♂, 1 ♀, Siglap, Singapore, December, 1933. Length of carapace 32.5 mm., breadth 53 mm.

*Distribution*.—Japan; China (Amoy); Hong Kong; New Caledonia; Australia; Malay Archipelago; Indian Ocean; Red Sea.

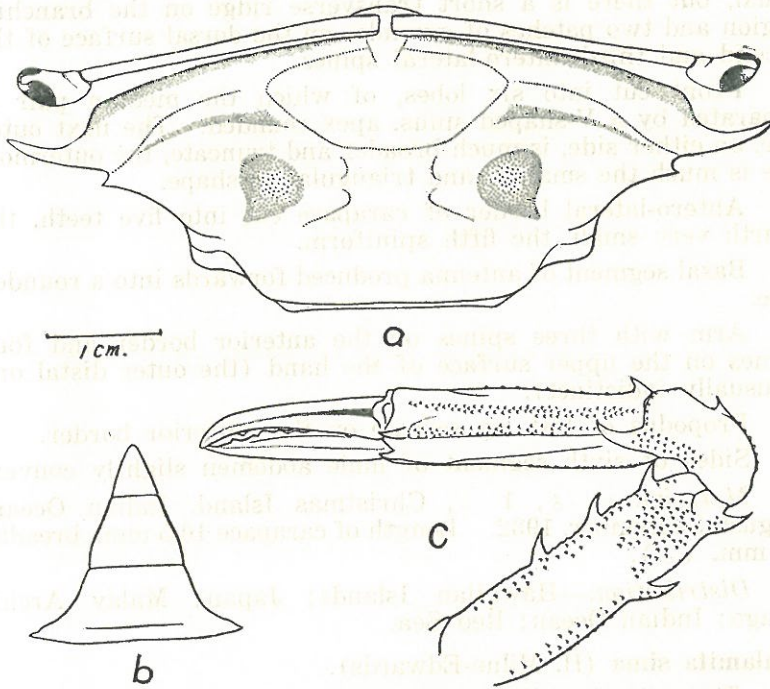


Fig. 20. *Podophthalmus vigil* (Fabr.), ♂. a, carapace; b, abdomen; c, cheliped.

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### Genus *Podophthalmus* Lamarck.

#### *Podophthalmus vigil* (Fabricius). (Text-fig. 20).

*Podophthalmus vigil* Alcock, 1899, p. 94.

*Podophthalmus vigil* Balss, 1922, p. 112.

*Characters.*—Carapace extremely broad, broadest between the outer orbital angles, from which the antero-lateral margin of the carapace runs obliquely backwards. Epibranchial spine very small, situated a short distance behind the large outer orbital angle. Length of carapace slightly less than one-half its breadth. Regions fairly well defined. Surface of carapace finely granulated along the supra-orbital margin, epibranchial crest and on the mesobranchial region.

Front T-shaped. Eye-stalk very long, eye jointed to the end of the stalk. Orbit very long, transversely grooved. Epistome projected. Antennulæ stout, placed on either side of the vertical bar of the front; antennæ standing in the orbital hiatus, very slender.

Merus of third maxilliped produced antero-laterally into a rounded lobe.

Arm with three spines on the distal half of the anterior border and two on the distal third of the posterior border. Wrist with a strong spine at the inner angle and another smaller one at the outer angle. Hand with granulated carinæ, one on the outer surface, two on the dorsal surface, the ventral surface entirely granulated. It is also armed with two spines, one in front of the apex of wrist, the other at inner distal angle. There is another spine on the inner surface, near the finger joint. Fingers shorter than hand.

Last leg paddle-shaped, merus with a spine on the posterior border.

Sixth segment of male abdomen broader than long, sides converging, slightly constricted at distal third.

*Material.*—1 ♂, Siglap, Singapore, July, 1934. Length of carapace 29 mm., breadth 70 mm.

*Distribution.*—Hawaiian Islands; Philippine Islands; Malay Archipelago; Indian Ocean; Red Sea.

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