# On the Crabs of the Family Ocypodidae in the Collection of the Raffles Museum

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The material described in this paper has been collected for the most part during the last four years, mainly in mangrove swamps around Singapore Island and at a few localities on the east and west coasts of the Malay Peninsula.

The greater part of the paper and most of the figures were prepared at the British Museum (Natural History) during August and September, 1936, and my grateful acknowledgments are due to the Director for permission to work there and for facilities provided, and particularly to Dr. Isabella Gordon for her unfailing help and encouragement.

I wish also to express my thanks to the Directorates of the Zoological Museums at Leiden and Amsterdam for permission to examine types, and for the helpfulness and courtesy with which I was received by the members of the staffs of these museums.

Finally acknowledgments are due to Prof. Dr. H. Balss, Dr. B. N. Chopra and Dr. C. J. Shen for their kindness in comparing specimens with types and authentic specimens in their respective institutions.

The mode adopted for collecting the material may be of interest to collectors of crustacea, and possibly other invertebrate groups, in the tropics. It was found that if crabs, especially Grapsidæ and Ocypodidæ, are put straight into alcohol, they tend to die slowly and in their struggles to shed their limbs and damage each other, so that often less than 10% of the collection survive as perfect specimens. This difficulty is met by collecting with large vacuum flasks containing ice and water. Small animals accustomed to living in water at about 80°F. are instantly paralysed on immersion in the iced water and die very quickly. They may be kept in the flasks so long as any ice remains, without fear of decomposition setting in. It is obvious that this method is suitable only for collecting in the tropics, and would be useless in a temperate climate.

*Systematic.*—

*Gelasimus roseus* sp. n.

*Scopimera intermedia* Balss=*Sc. tuberculata* Stimpson.

*Ilyoplax serrata* Shen (syn. *I. delsmani yuhana* Rathbun) = *I. delsmani* de Man, subsp. *serrata* Shen.

*Ilyoplax longicarpa* sp. n. (=*I. gangetica* Tweedie nec. Kemp.).
*Pseudogelasimus plectodactylus* gen. et sp. nov. (sub-fam. Scopimerinæ).
*Paracleistostoma longimanum* sp. n.
*Paracleistostoma microcheirum* sp. n.
*Macrophthalmus dilatatus carens* Lanchester=*M. brevis* (Herbst).
*Macrophthalmus malayensis* sp. n.
*Macrophthalmus malaccensis* sp. n.

The types of the new species will be deposited in the British Museum.

## Sub-family OCYPODINÆ

### Genus OCYPODA Fabr.

**Ocypoda ceratophthalma** (Pallas) Ortmann.

ORTMANN, 1897, pp. 261, 264.
ALCOCK, 1900, p. 345.
TESCH, 1918, p. 36.

*Material.*—Specimens from Singapore, the east and west coasts of the Malay Peninsula (Kuantan, Pahang; Port Swettenham, Selangor) and from Tioman Island.

**Ocypoda cordimana** Desm.

ORTMANN, 1897, pp. 259, 262.
ALCOCK, 1900, p. 349.
TESCH, 1918, p. 35.

*Material.*—A single male from Panjang Island, South Natuna Islands, 1931, coll. P. M. de Fontaine.

### Genus GELASIMUS Latr.

**Gelasimus annulipes** Latr. Fig. 1, a.

DE MAN, 1887–1888, p. 118; 1891, pp. 23, 39.
ALCOCK, 1900, p. 353.
GORDON, 1934, p. 10.

*Material.*—Specimens from Singapore and neighbouring islands and from the east and west coasts of the Malay Peninsula (Kuantan, Pahang; Port Swettenham, Selangor).

*Remarks.*—The right abdominal pleopod of the male is figured.[1]

**Gelasimus dussumieri** H. Milne Edwards. Fig. 2, b.

DE MAN, 1887–1888, p. 108, 1891, pp. 20, 26.
STIMPSON, 1907, p. 105 (*G. acutus*).
ALCOCK, 1900, p. 361.
GORDON, 1934, p. 12.

1. The abdominal pleopods of the males of *G. coarctatus* H. M. Edw., *G. dussumieri* H. M. Edw., *G. signatus* Hess, and *G. signatus* var. *angustifrons* de Man have been figured by Gordon, 1934, pp. 12–14.

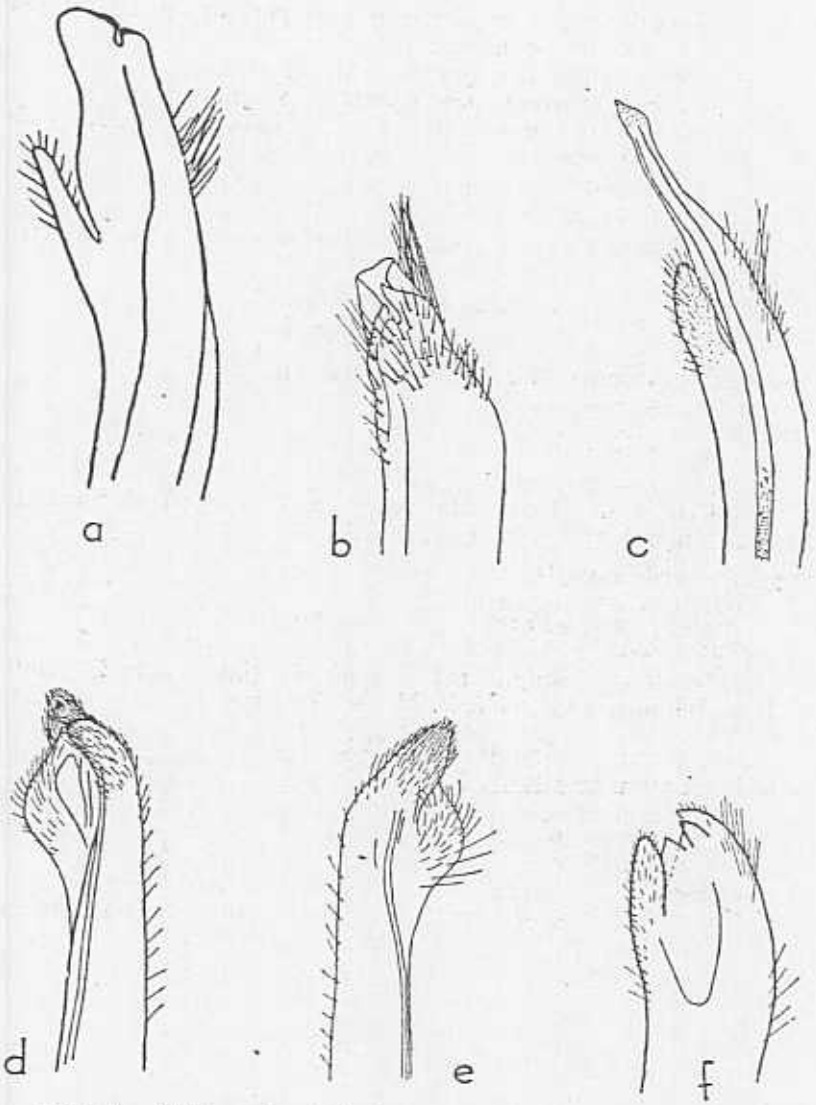


Fig. 1. Right male abdominal pleopods of *Gelasimus* spp. *a*, *G. annulipes*; *b*, *G. manii*; *c*, *G. triangularis*; *d*, *e*, *G. marionis* var. *nitidus*; *f*, *G. roseus* sp.n.

*Material.*—Specimens from Singapore and neighbouring islands, from the east and west coasts of the Malay Peninsula (Kuantan, Pahang, and Port Swettenham, Selangor), and from the Kabili river, Sandakan, British North Borneo, coll. H. G. Keith.

**Gelasimus manii** (Rathbun). Fig. 1, b; 2, a.

RATHBUN, 1909, p. 114; 1910, p. 22. (*Uca manii*).
DE MAN, 1887–1888, p. 113; 1891, p. 21, 30 (*G. acutus*).
ALCOCK, 1900, p. 360 (*G. acutus*).

*Material.*—Specimens from Singapore and neighbouring islands, from the east and west coasts of the Malay Peninsula (Kuantan, Pahang, and Port Swettenham, Selangor) and from the Kabili River, Sandakan, British North Borneo coll. H. G. Keith.

*Remarks.*—The right abdominal pleopod of the male is figured.

**Gelasimus coarctatus** H. Milne-Edwards.

DE MAN, 1891, pp. 21, 31.
GORDON, 1934, p. 11.

*Material.*—Three males and six females from Simalur Island off the west coast of Sumatra, coll. Abbott and Kloss, 1902.

*Remarks.*—The males of this series were compared with specimens in the British Museum from the Aru Islands identified by Dr. Gordon (1934, p. 11), and found to be identical. The Simalur specimens are very faded, but traces of the characteristic red patch on the lower half of the palm are still visible.

**Gelasimus marionis** Desm.

DE MAN, 1902, p. 487.
ALCOCK, 1900, p. 359.

*Material.*—Five specimens from Great Natuna Island, 1912.

**Gelasimus marionis** var **nitidus** Dana. Fig. 1, d, e.

DE MAN, 1891, p. 23 (*G. vocans*); 1902, p. 487.
ALCOCK, 1900, p. 360.

*Material.*—Specimens from Singapore and neighbouring islands and from Great Natuna Island, 1912.

*Remarks.*—I can do no more than previous authors in elucidating the relation of the variety to the *forma typica*. The male abdominal pleopods of both have been examined and show no significant differences; that of var. *nitidus* is figured (fig. 1, d, e). The two forms cannot be regarded as geographical races of which the females are inseparable, as we have both the variety and the typical form from the Natuna Islands, and Alcock records both from the Andamans. The evidence seems to suggest that it is a case of geographically local dimorphism

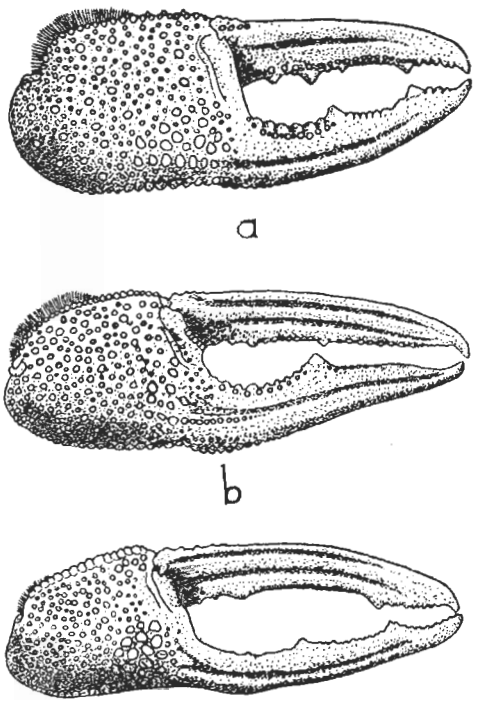


Fig. 2. Large chelæ of *Gelasimus* spp. *a, G. manii; b, G. dussumieri; c, G. roseus* sp.n.

confined to the male. It seems to be developed chiefly in islands fairly remote from large land masses and is not found in the neighbourhood of Singapore.

**Gelasimus triangularis** A. Milne-Edwards. Fig. 1, c.

DE MAN, 1887–1888, p. 119; 1891, p. 22.
ALCOCK, 1900, p. 356.

*Material.*—A series of specimens from Port Swettenham, Selangor, on the west coast of the Malay Peninsula.

*Remarks.*—In life the carapace is dark brown marbled with blue and the large chela of the male is orange-yellow.

The right abdominal pleopod of the male is figured.

**Gelasimus triangularis variabilis** de Man.

DE MAN, 1891, p. 47.

*Material.*—Three males from Simalur Island, west coast of Sumatra, coll. Abbott and Kloss, 1902.

*Remarks.*—These specimens show all the characters described by de Man, and the abdominal pleopods of the male do not appear to differ from those of the typical form. De Man described the variety from Amboina.

**Gelasimus roseus** sp. n. Fig. 1, f; 2, c.

*Types.*—An adult male and a smaller, but probably adult, female (a still smaller specimen is ovigerous) from Port Swettenham, Selangor, on the west coast of the Malay Peninsula, December, 1934.

*Material.*—A series of specimens from Port Swettenham and two small males from the river Jurong, Singapore.

*Characters.*—A species of *Gelasimus* closely allied to *G. manii* Rathbun and *G. dussumieri* H. M.-Edw., but distinguished by the colour of the carapace and male chela, which are rose pink in life, the broader, posteriorly more convergent carapace, the sculpture and dentition of the male chela and the form of the male abdominal pleopods.

*Description.*—In the form of the carapace this species most closely resembles *G. manii*, but its anterior breadth is greater in relation to its length, the ratio being about 1.70: 1 as against 1.55: 1 in *manii*. In addition the postero-lateral margins[1] are very much more convergent posteriorly in *roseus*. When the distance between their posterior terminations on the surface of the carapace is compared with that between the external orbital angles, the ratio is found to be 1:2.8–3.0. In *manii* it is 1:2.0–2.25, and in *dussumieri* 1:1.7–1.9. As a result of this condition the external orbital angles in *roseus* appear sharp and strongly directed outwards. There is no angulation of the lateral margins at the epibranchial angles[1]. The median frontal furrow is even broader than that of *manii*, and a little wider at its base than at its tip. In both sexes the surface of the carapace is distinctly granular, more coarsely in the female. In the two allied species this granulation is absent or scarcely perceptible in the male and very fine in the female. There is never any trace of an accessory line of granules inside the lower orbital margin.

The right abdominal pleopod of the male is figured (fig. 1, f). It is quite distinct from that of *manii* and differs from that of *dussumieri* in being expanded at the tip and in the very small and inconspicuous nature of the terminal tube and chitinous projection.

In the large chela of the male the dentition of the inner margins of the fingers is similar to that of *manii*, and varies in much the same way. On both fingers there is a tooth placed close to the tips, which are hooked, but these teeth are usually a

1. As defined by de Man, 1887–1888, p. 110.

little further from the tips than in *manii*. In addition there is usually another tooth about half way along each finger, but either or both of these may be absent. On the other hand the chela resembles that of *dussumieri* in having two parallel grooves on the outer surface of the dactylus, one running close to the upper margin and the other a little below the centre. The latter is only distinct in fully adult specimens. In *manii* only one such groove is present, running along the centre.

*Remarks.* At Port Swettenham the species is abundant in mangrove swamp, associated with *G. manii* and *G. dussumieri*. The colonies of *G. roseus* are rather higher above low water mark than those of the other two species, being always inside the growing mangrove. At Muar in Johore, also on the west coast of the peninsula, the species was observed in the banks of small drainage ditches liable to flooding by water of varying salinity.

Measurements of male type.

| | |
|---|---|
| *Carapace.*— | |
| Anterior breadth .. .. .. | 25.6 mm. |
| Posterior breadth .. .. .. | 9.5 „ |
| Median length .. .. .. | 15.0 „ |
| Distance between posterior terminations of postero-lateral margins .. .. | 9.2 „ |
| *Large Chela.*— | |
| Total length of chela .. .. | 45.0 „ |
| Length of dactylus .. .. .. | 29.0 „ |
| Height of palm .. .. .. | 13.6 „ |
| *Penultimate walking leg.*— | |
| Length of merus .. .. .. | 12.0 „ |
| Breadth of merus .. .. .. | 5.5 „ |
| Combined length of carpus and propodus .. | 13.8 „ |
| Length of dactylus .. .. .. | 5.1 „ |

## Sub-family SCOPIMERINÆ

## Genus SCOPIMERA de Haan

**Scopimera tuberculata** Stimpson.

STIMPSON, 1907, p. 102.
BALSS, 1934, p. 233 (*S. intermedia*).
SHEN, 1935, p. 36.

*Material.*—Numerous specimens from Singapore and islands in the Johore Strait.

*Remarks.*—Specimens from this collection were compared by Dr. Shen with his material from China, and by Prof. Balss with his types of *S. intermedia*. The latter species, described from Johore, was apparently founded on young specimens, in which the carapace is smooth and free from granules. The characteristic enlargement of the female abdomen is noticed for the first time by Prof. Balss in his description of *S. intermedia*.

The types of *S. tuberculata* are no longer extant and Stimpson's description is somewhat lacking in detail. For this reason the species has been confused with *S. globosa* de Haan, both species having been described from Japan. Dr. Shen (1935) has carefully compared and contrasted the two and leaves no room for doubt that they are distinct. There is little doubt that the species under consideration is really that described by Stimpson; so far as it goes his description is in agreement and Dr. Shen has compared his material with a male in the British Museum collected in Japan.

**Scopimera proxima** Kemp.

KEMP, 1919, p. 317.

*Material.*—A series of specimens from Morib, Selangor on the west coast of the Malay Peninsula.

*Remarks.*—Dr. B. N. Chopra was kind enough to compare specimens from this collection with the types in the Indian Museum.

Genus DOTILLA Stimpson

**Dotilla myctiroides** (H. Milne-Edwards).

ALCOCK, 1900, p. 368.
KEMP, 1919, p. 326.

*Material.*—Numerous specimens from Singapore and neighbouring islands. Observed also at Morib, Selangor, on the west coast of the Malay Peninsula.

**Dotilla wichmanni** de Man.

DE MAN, 1892, p. 308; 1895, p. 577.
KEMP, 1919, p. 329.

*Material.*—Specimens from Singapore and from Kuantan, Pahang, on the east coast of the Malay Peninsula.

Genus DOTILLOPSIS Kemp.

**Dotillopsis brevitarsis** (de Man).

DE MAN, 1887–1888, p. 130 (*Dotilla brevitarsis*).
KEMP, 1919, p. 335.

*Material.*—Series of specimens from Port Swettenham, Selangor; and Muar, Johore, localities on the west coast of the Malay Peninsula.

*Remarks.*—Small oval, orange coloured bodies are often present on the legs of individuals of these species. They are easily detached, and when crushed can be seen to contain jointed structures, suggestive of an arthropod embryo.

Genus ILYOPLAX Stimpson

This genus (synonyms: *Dioxippe* de Man, *Tympanomerus* Rathbun and *Cleistostoma* de Haan (part)) has not been treated comprehensively since Kemp gave a key to eleven species in

1919 (Kemp, 1919, p. 337). Since then eight more species and a subspecies have been described and *"Tympanomerus" ceratophora* Kœlbal has been made the type of a separate genus, *Tmethypocoelis* Kœlbal, by C. J. Shen (Shen, 1935, p. 33).

A single new species, *I. longicarpa*, is described in the present paper.

The following key, based on that given by Kemp, comprises the nineteen species and single subspecies now included in the genus.

KEY TO THE SPECIES OF *ILYOPLAX* WITH THEIR GEOGRAPHICAL DISTRIBUTION.

| | | |
|---|---|---|
| 1. | A tooth on the inner surface of the carpus of the male cheliped .. .. | 2. |
| | Carpus of male cheliped unarmed .. | 10. |
| 2. | Upper surface of carpus of male cheliped elongate, at least twice as long as broad | 3. |
| | Upper surface of carpus rounded or rhomboidal, never twice as long as broad .. .. .. | 5. |
| 3. | Lower orbital margin with a large projecting lobe near its outer end; lateral margins of carapace sinuous—*I. orientalis* (de Man). Malaysia; S. China. | |
| | Lower orbital margin without a projecting lobe; lateral margins of carapace regularly convex .. .. | 4. |
| 4. | Ratio of length to anterior breadth of carapace 0.75: 1; chelipeds of male moderately elongated—*I. gangetica* (Kemp). Gangetic delta. | |
| | Ratio of length to anterior breadth of carapace 0.8: 1; chelipeds of male greatly elongated—*I. longicarpa* sp.n. West coast Malay Peninsula. | |
| 5. | Orbits very oblique, eyes rather long .. | 6. |
| | Orbits nearly transverse, eyes short and thick .. .. .. | 7. |
| 6. | Surface of carapace smooth, not areolated, and ornamented on the branchial regions with a series of fine, oblique beaded lines—*I. obliqua* Tweedie. Singapore and west coast Malay Peninsula. | |
| | Surface of carapace smooth and conspicuously areolated—*I. dentata* M. Ward. Queensland, Australia. | |
| 7. | Surface of carapace with furry patches; an oval depression on each side of the surface of the front—*I. lingulata* (Rathbun). Gulf of Siam; Singapore and Malayan Coasts. | |
| | Surface of carapace without furry patches | 8. |

8. Surface of carapace coarsely punctate with irregular lines of granules on the branchial regions. [Epibranchial angle salient and dentate; male chelæ small and weak, fingers unarmed]—*I. punctata* Tweedie. Singapore and Malayan Coasts.

Surface of carapace granular, not coarsely punctate .. .. .. 9.

9. Inner part of the infra-orbital ridge in the male armed with 8–9 conspicuous teeth—*I. delsmani* de Man. Bay of Batavia; west coast Malay Peninsula.

Inner part of the infra-orbital ridge in the male armed with 4 conspicuous teeth. [Female indistinguishable from the *forma typica*]—*I. delsmani serrata* Shen. S. China; east coast Malay Peninsula.

10. Abdomen of male not or only slightly constricted at the 5th segment .. 11.

Abdomen of male abruptly narrowed or constricted at the 5th segment .. 16.

11. Carapace pentagonal, the orbits being decidedly oblique .. .. 12.

Carapace quadrilateral, the orbits being almost or quite transverse .. 13.

12. Granules on outer surface of palm arranged in a reticulate manner; a strong crenulate carina on the outer side of both fingers; fixed finger horizontal in relation to palm; meri of walking legs with large tympana on under side—*I. pusilla* (de Haan). Japan.

Granules on outer surface of palm not arranged in a reticulate manner; no carinæ on outer sides of fingers; fixed finger deflexed; meri of walking legs without tympana—*I. philippinensis* (Rathbun). Philippine Islands.

13. Meri of walking legs naked. [Posterior margins of those of first three pairs serrulate]—*I. dentimerosa* Shen. North China.

Meri of at least first and second walking legs tomentose .. .. 14.

14. Cutting edge of dactylus of male chela with two or more denticulated prominences, the proximal one the broadest. [First three walking legs tomentose, the tympana on the meri indistinct]—*I. pingi* Shen. North China.

Cutting edge of dactylus of male chela with a single tooth .. .. 15.

15. Carapace soft and ill calcified; tympana on meri of walking legs occupying the whole of their surfaces—*I. tenella* Stimpson. Canton River, China.
Carapace hard and well calcified; tympana only present on meri of first three walking legs and only occupying whole surface on the second—*I. formosensis* (Rathbun). Formosa.

16. 3–4 longitudinal carinæ on the lower surface of the palm and immovable finger of the male chela ... .. 17.
Lower surface of palm and immovable finger of male chela without longitudinal carinæ .. .. .. 19.

17. Surface of carapace beset with short, setiferous, rugose lines; a small tympanum (sometimes indistinct) on the upper surface of the merus of the fourth walking leg—*I. deschampsi* Rathbun. China.
Surface of carapace smooth except for some oblique rows of tubercles on the branchial regions; no tympanum on the upper surface of the merus of the fourth walking leg .. .. 18.

18. Front not more than 1/11 of anterior breadth of carapace; upper surface of carapace not wider at the middle than anteriorly; chela of adult male weak, similar to that of female; male with a patch of tomentum on carpus and propodus of second walking legs—*I. stevensi* (Kemp). Karachi, India.
Front not less than 1/7 of anterior breadth of carapace; upper surface of carapace wider at the middle than anteriorly; chela of adult male strong; male without tomentum on second walking legs—*I. frater*, (Kemp). Karachi, India.

19. Orbits transverse; lateral margins of carapace with a notch behind the outer orbital angle; all male abdominal segments separate and distinct; meri of walking legs without tympana—*I. stapletoni* (de Man) Gangetic delta.
Orbits oblique; lateral margins of carapace entire; 4th and 5th segments of male abdomen fused, distal angles of 4th segment produced and acute; meri of walking legs with conspicuous tympana—*I. integer* (Tesch) Kur Island, west of Kei Island.

The species of this genus in the collection of the Raffles Museum formed the subject of a recent paper by myself.

**Ilyoplax longicarpa** sp. n.

TWEEDIE, 1935, p. 55 (*Ilyoplax gangetica*).

*Types.*—An adult male and female collected at Muar, Johore on the west coast of the Malay Peninsula in February, 1936.

*Material.*—Two males and a female, including the types, from Muar and a series of specimens from Port Swettenham, also on the west coast of the Peninsula.

*Characters.*—A species very closely allied to *I. gangetica* (Kemp), but distinguished by the following features:

1. The carapace is rather narrower, the ratio of the length to the anterior breadth being more than 0.8:1 as against 0.75:1 in *gangetica*.

2. The shape of the male abdomen differs, the emargination of the fifth segment being more marked in *longicarpa* (*see* Kemp, 1919, text-fig. 21 and Tweedie, 1935, pl. III, e). The female abdomen is broader than that of any other species that I have seen.

3. The chelipeds of the male, especially the carpus, are greatly elongated in the adult. Kemp says of *gangetica* that the chelipeds are a little shorter than in *I. orientalis* (de Man), whereas in *longicarpa* they are longer. This character should, however, be used with caution, as both in *longicarpa* and *orientalis* it is only well developed in fully adult specimens.

4. The walking legs of *longicarpa* are more slender than those of *orientalis*, whereas in *gangetica* they are described as being shorter and stouter than in de Man's species.

*Remarks.*—After referring this species to *I. gangetica* I received a letter from Dr. B. N. Chopra who had compared specimens from Port Swettenham with the types of that species. He pronounced them to be different, and the above characterization is based on information kindly supplied by him.

Measurements of the male type.

| | |
|---|---|
| *Carapace.*— | |
| Anterior breadth .. .. .. | 5.7 mm. |
| Greatest breadth .. .. .. | 6.3 „ |
| Length .. .. .. .. | 4.75 „ |
| Breadth of front .. .. .. | 1.5 „ |
| Posterior border .. .. .. | 3.7 „ |
| *Cheliped.*— | |
| Length of merus .. .. .. | 3.7 „ |
| Length of carpus .. .. .. | 4.0 „ |
| Length of chela .. .. .. | 6.75 „ |
| Height of chela .. .. .. | 2.4 „ |
| *Penultimate walking leg.*— | |
| Length of merus .. .. .. | 4.4 „ |
| Breadth of merus .. .. .. | 1.3 „ |
| Combined length of carpus and propodus .. | 4.25 „ |
| Length of dactylus .. .. .. | 1.8 „ |

Genus PSEUDOGELASIMUS gen. nov.

This genus has its nearest ally in *Ilyoplax* Stimpson. A single species has been discovered and of that only the male. The most conspicuous features distinguishing this from any of the species of *Ilyoplax* are the very marked inequality of the male chelæ and the greater length of the eyes and associated broadening of the front of the carapace. Pending the eventual discovery of additional species, in which possibly other features, which will be dealt with at present under the specific description, may prove to be of value in defining the genus, these two characters, in combination with all those indicating inclusion in the subfamily *Scopimerinae* and close affinity with *Ilyoplax*, are to be regarded as diagnostic of the genus. The most important of the Scopimerine features are: The form of the antennæ, antennules, second and third maxillipeds and associated structures, which are described and figured under the specific description; the constriction of the abdomen at the fifth segment, and the presence of "tympana" on the meri of the walking legs.

The two diagnostic characters tend to produce a marked superficial resemblance to the genus *Gelasimus*, and the generic name has been chosen to indicate this.

**Pseudogelasimus plectodactylus** sp. n. Fig. 3, a–h.

*Type.*—A male, assumed to be adult, from tidal mud-flats backed by mangrove swamp near the mouth of the river Muar at Muar in Johore on the west coast of the Malay Peninsula, February 1936. Female unknown.

*Material.*—The type and two smaller males from the type locality.

*Description.*—The carapace (Fig 3, a) differs from that of any of the species of the allied genus *Ilyoplax* in the relatively greater width of the fronto-orbital margin and the narrowness of the front, features connected with the enlargement of the eyes. It is almost flat from side to side and slightly convex from front to back. The front is narrow and considerably deflexed. Its lateral margins are convergent and it is truncate at the tip. On each side it has on its upper surface a low prominence of triangular shape, these prominences being separated by a shallow furrow. The upper orbital margin is sinuous and very finely beaded in its outer two-thirds. The antero-lateral angle is rounded and is separated from the small and obtuse epibranchial angle by a shallow notch. Behind the epibranchial angles the lateral borders are sinuous and slightly convergent. The posterior margin is short and straight and in front of it there is a raised transverse ridge just as in most

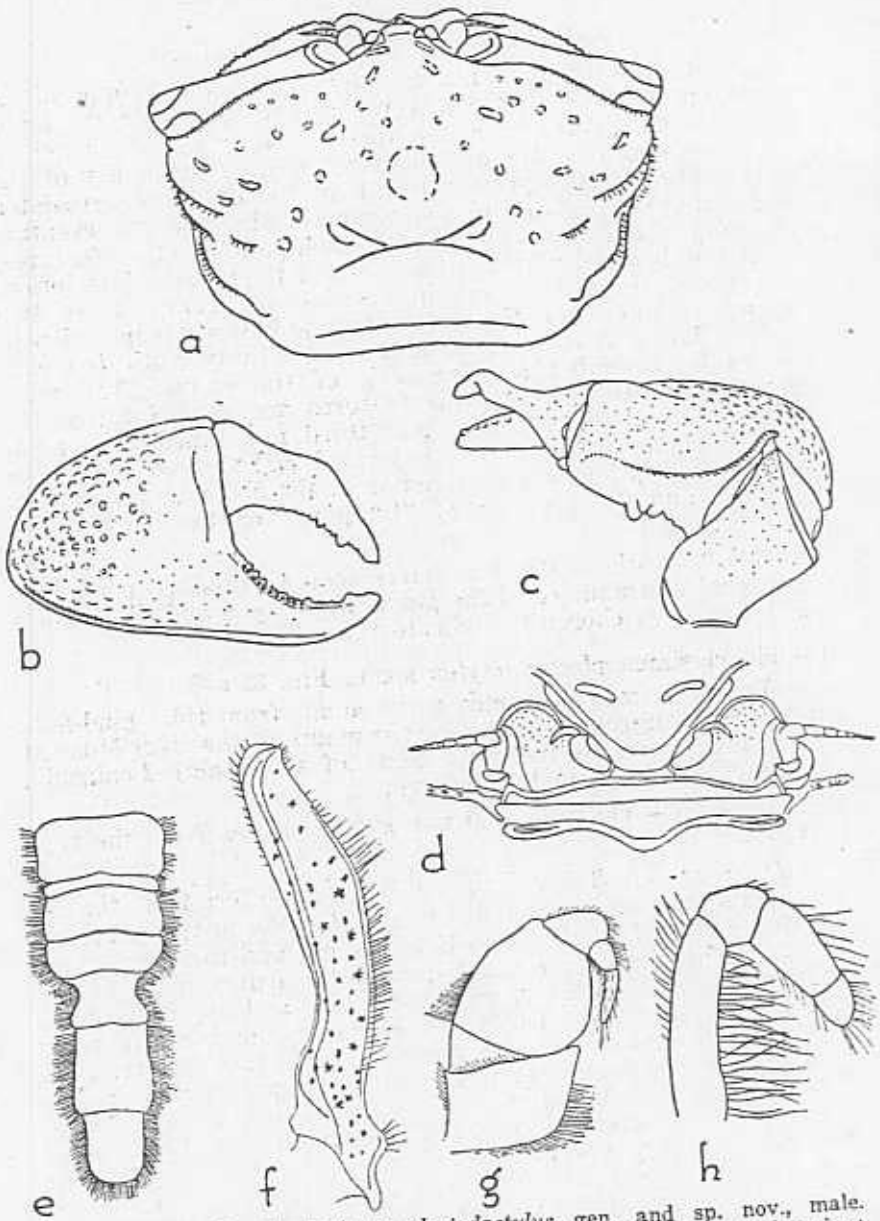


Fig. 3. *Pseudogelasimus plectodactylus* gen. and sp. nov., male. *a*, carapace; *b*, *c*, right cheliped; *d*, detail of frontal and epistomial region; *e*, abdomen; *f*, right abdominal pleopod; *g*, third maxilliped; *h*, second maxilliped.

species of *Ilyoplax*. The surface of the carapace is uneven; the mesogastric area is raised into a low, rounded prominence and a shallow furrow runs inwards a little way from each epibranchial notch. The whole of the anterior two thirds of the carapace is ornamented with small, symmetrically arranged tubercles, and the branchial regions carry a number of beaded and setose ridges. The most conspicuous of these runs obliquely inwards from the epibranchial angle. A little behind and interior to it is another short isolated ridge and a third runs parallel to and a little behind it from the lateral margin. Behind this again is a fourth ridge running backwards and ending in a sharp sigmoid curve just over the articulation of the last walking leg.

The infra-orbital ridge is sufficiently prominent to be visible in dorsal view and is beaded in about its interior half. The antennules are larger than is usual in *Ilyoplax* and less concealed by the front, and they also lie more obliquely when folded. The median process of the epistome is only a slight prominence and is not lingulate or dentiform as in species of the allied genus. In the external maxillipeds (fig. 3, g) the merus is broad and rounded and of about the same size as the ischium; it is not longitudinally grooved. A wide space is left between the maxillipeds and posteriorly they are not closely in contact with the sides of the buccal cavern. The usual Scopimerine oblique hairy ridge is present on the ischium. The exopodite is small and completely concealed.

The second maxilliped (Fig. 3, h) has the two distal segments slender as in *Ilyoplax* and *Dotillopsis*, not expanded as in *Scopimera* (see Kemp, 1919, pp. 318, 334, 336).

The abdomen (fig. 3, e) differs from that of any of the species of *Ilyoplax* in the very strong constriction of the fifth segment and the shape of the sixth, which is considerably longer than broad.

The chelipeds of the male are very unequal in size and different in structure. In all the three males collected the right one is enlarged (fig. 3, b, c.).

The palm of the large cheliped of the type is as high as long, and its length, together with that of the immobile finger is about equal to the anterior breadth of the carapace. The outer surface is granular, more so on the lower half, and a low ridge runs along the lower margin onto the immobile finger. The upper surface of the palm carries a curved milled crest, and there is a small tubercle near the carpal articulation. On the inner surface there is a group of four conspicuous tubercles below which is a curved line of about eight smaller granules, the convex side of the curve being upwards. The fingers are

peculiarly twisted, the immobile curving inwards and the dactylus being directed outwards and then sharply inwards at the tip. As a result of this the fingers can never meet at the tip, and pressure applied to the dactylus from above seems to indicate that it will not close beyond the position shown in fig. 3, b. The inner margins of both fingers are irregularly denticulate.

In the two immature specimens the cheliped is relatively less enlarged, the palm is smooth exteriorly and the granules on the inner surface form an irregular group. Also the twisting of the fingers is far less emphasized and the tips can be made to meet.

The left cheliped is very small and slender and the fingers setose and spooned at the tip. It closely resembles the smaller cheliped of *Gelasimus* and those of the females of most mangrove dwelling Ocypodidæ, and evidently conforms to a type associated with the feeding habits of these crabs.

The walking legs have the meri considerably expanded and on those of all but the last there is a distinct "tympanum", a feature highly characteristic of the subfamily. The legs are practically naked except for a tomentose patch on the carpus and propodus of the first.

The right male abdominal pleopod is figured (fig. 3, f.).

The colour of the upper surface of the carapace is dark bluish grey, the under surface being lighter and everywhere marked with conspicuous chromatophores. The large chela is yellowish white.

Measurements of the type.

| | |
|---|---|
| *Carapace.*— | |
| Anterior breadth .. .. .. | 6.7 mm. |
| Posterior breadth .. .. .. | 3.3 „ |
| Length .. .. .. .. | 4.75 „ |
| *Abdomen.*— | |
| Length .. .. .. .. | 6.2 „ |
| Breadth at third segment .. .. | 2.1 „ |
| Length of penultimate segment .. | 1.6 „ |
| Breadth of penultimate segment .. | 1.0 „ |
| *Large Chela.*— | |
| Total length of chela .. .. | 6.5 „ |
| Height of palm .. .. .. | 3.8 „ |
| Length of dactylus .. .. .. | 3.1 „ |
| *Penultimate walking leg.*— | |
| Length of merus .. .. .. | 4.0 „ |
| Breadth of merus .. .. .. | 1.6 „ |
| Combined length of carpus and propodus .. | 3.6 „ |
| Length of dactylus .. .. .. | 1.75 „ |

## Sub-family MACROPHTHALMINÆ

### Genus PARACLEISTOSTOMA de Man

Since the publication of Tesch's key to the genus (Tesch 1918, p. 62) *P. japonicum* has been described by T. Sakai from Kyusyu, Japan and two new species are described in the present paper.

**Paracleistostoma depressum** de Man. Fig. 4, a, b.

DE MAN, 1895, p. 581; 1897, pl. 14, fig. 13.
TESCH, 1918, p. 63.
GORDON, 1931, p. 550.

*Material.*—Specimens from Singapore and from Port Swettenham and Muar, localities on the west coast of the Malay Peninsula.

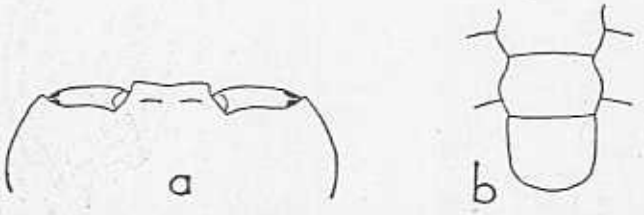


Fig. 4. *Paracleistostoma depressum* de Man, male. *a*, anterior part of carapace; *b*, distal abdominal segments and sternal sutures.

**Paracleistostoma longimanum** sp. n. Fig. 5, a–e.

*Type.*—An adult male from mangrove swamp in the river Kranji, Singapore, June, 1935.

*Material.*—The unique type; female unknown.

*Characters.*—A form closely resembling *P. depressum* de Man, but distinguished by the form of the male chelipeds, which are greatly enlarged and elongated, the more slender walking legs, the shape of the penultimate abdominal segment and of the abdominal pleopod, and other minor characters.

*Description.*—The proportions of the carapace are very similar to those of *P. depressum*, but the lateral margins are less convex and the upper orbital margins are straighter and less deeply notched at their junction with the front (fig. 4, a; 5, a). The epigastric lobes are a little broader. The surface of the front is more concave, its free edge appearing deeply emarginate when viewed from above. The carapace is tomentose posteriorly and on the branchial regions.

The form of the external maxillipeds (fig. 5, b) is similar in the two species but the outline of the merus is noticeably less sinuous and indented in *longimanum* than in *depressum*.

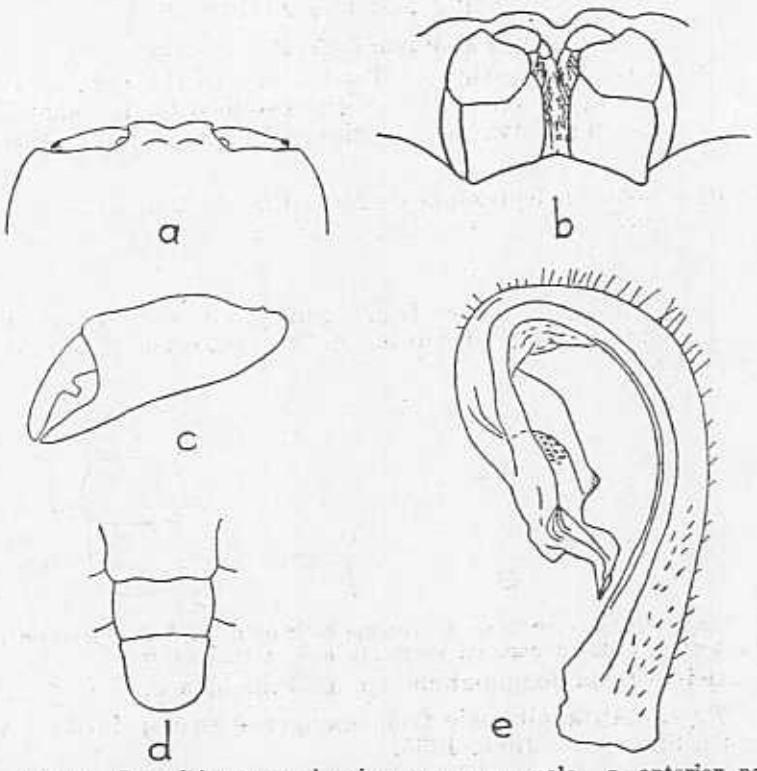


Fig. 5. *Paracleistostoma longimanum* sp.n., male. *a*, anterior part of carapace; *b*, third maxillipeds; *c*, chela; *d*, distal abdominal segments and sternal sutures; *e*, right abdominal pleopod.

The outline of the sixth abdominal segment (fig. 5, d) is uniformly convex, whereas in *depressum* (fig. 4, b) it is sinuous. In both species the first to fifth segments are fused.

The male abdominal pleopod (fig. 5, e) is similar to that of *depressum*, (*see* Gordon, 1931, fig. 26) but it is more completely bent back on itself and the Y shaped projection at the tip is less prominent.

The chelipeds are equal and are relatively larger than in *depressum*. The palm in *longimanum* is much elongated, giving the animal a superficial resemblance to some species of the genus *Macrophthalmus*. The length of the palm together with the immobile finger is more than two and a half times its height and is equal to the anterior breadth of the carapace. The fingers are short and are spooned and slightly setose at the tips. There is a large truncated tooth on the inner margin of the dactylus,

a little nearer to the base than to the tip. In *depressum* a similar tooth is present, but it is smaller and is situated nearer to the base of the finger. The merus and carpus are also elongated; the borders of these two joints and the upper border of the palm are granular. The colours of the chelæ are distinctive, the palm being pale brown and the fingers orange-red.

The walking legs of *longimanum* are much more slender than those of *depressum*, and less thickly tomentose.

Measurements of the type.

| | |
|---|---|
| *Carapace.*— | |
| Anterior breadth .. .. .. | 8.0 mm. |
| Greatest breadth .. .. .. | 9.6 „ |
| Posterior breadth .. .. .. | 5.7 „ |
| Length .. .. .. .. | 7.8 „ |
| *Cheliped.*— | |
| Length of carpus .. .. .. | 3.1 „ |
| Total length of chela .. .. | 8.0 „ |
| Height of chela .. .. .. | 3.0 „ |
| Length of dactylus .. .. | 3.4 „ |
| *Penultimate walking leg.*— | |
| Length of merus .. .. .. | 6.0 „ |
| Breadth of merus .. .. .. | 2.2 „ |
| Combined length of carpus and propodus .. | 5.4 „ |
| Length of dactylus .. .. .. | 2.8 „ |

**Paracleistostoma microcheirum** sp. n. Fig. 6, a–d.

*Types.*—A male and female from the River Kranji, Singapore.

*Material.*—Two males and five females, in addition to the types, from the type locality.

*Characters.*—A species of *Paracleistostoma* characterized by the small size and lack of sexual modification in the male chelipeds and by the shape and proportions of the carapace and abdominal segments.

*Description.*—The carapace is relatively narrow, the ratio, of its length to its breadth being 1:1.15 as against 1:1.4 in the common *P. depressum*. The fronto-orbital margin (fig. 6, a) is narrow relative to the greatest breadth of the carapace which lies rather far back; the orbits are small and short. The epigastric lobes are broad and meet in the middle line. On the strongly convex lateral margins there are traces of two blunt teeth behind the antero-lateral angle. The beaded line that runs obliquely backward onto the carapace from the lateral margin has its origin rather far back and the "hepatic facet" that it cuts off is very small and narrow. The surface of the carapace is everywhere tomentose and must usually be cleaned to reveal the regions, which can then be seen to be fairly well marked.

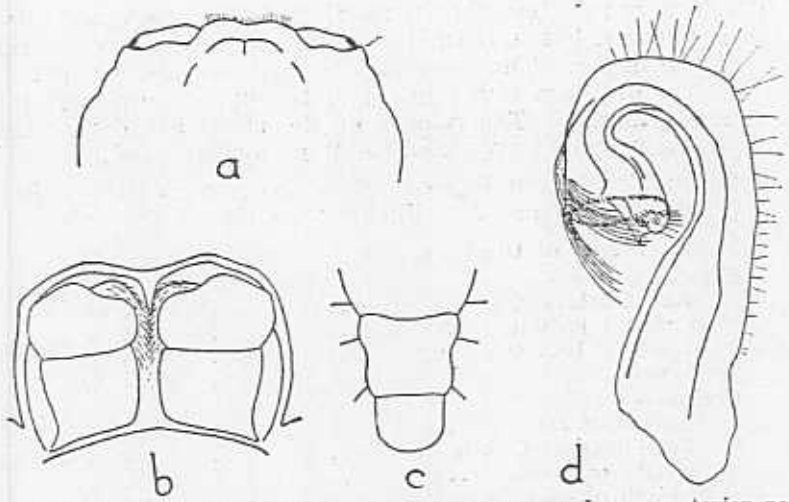


Fig. 6. *Paracleistostoma microcheirum* sp.n., male. *a*, anterior part of carapace; *b*, third maxillipeds; *c*, distal abdominal segments and sternal sutures; *d*, right abdominal pleopod.

The buccal cavern (fig. 6, c) is short and broad and both the ischium and merus of the third maxillipeds are distinctly broader than long. The palp is conspicuously broadened at the base. The median process of the epistome is long and dentiform.

The abdomen of the male (fig. 6, b) is peculiar in that the penultimate segment is very much larger and longer than is usual in the species, so that it overlaps both the first and second sternal sutures. In *depressum* and *longimanum* the second sternal suture is covered by the fifth abdominal segment. The male abdominal pleopod (fig. 6, d) has the usual complicated form characteristic of the genus (*see* Gordon, 1931, fig. 26–28) but differs markedly from that of any other species in which it has been figured.

The chelipeds of the male are remarkable in that they are of the type usual for the females of the genus and identical in form with those of the female of the species. They are much smaller and more slender than any of the walking legs and the fingers are setose and widely spooned at the tips and there is no tooth on the dactylus. This condition might be regarded as due to immaturity, but the type and another male appear to be mature in all other respects. In this connection it should be noted that the modification of the chelipeds is perceptible in quite small males of *P. depressum*. *P. japonicum* Sakai (Sakai 1934, p. 320) also exhibits this peculiarity.

The walking legs are more slender than those of *depressum* and are all tomentose.

The female resembles the male in all except the primary sexual characteristics.

Measurements of the male type.

| | | |
|---|---|---|
| *Carapace.*— | | |
| Anterior breadth | 5.25 | mm. |
| Greatest breadth | 6.9 | " |
| Posterior breadth | 3.8 | " |
| Length | 6.0 | " |
| *Cheliped.*— | | |
| Length of chela | 2.25 | " |
| Height of palm | 0.5 | " |
| *Penultimate walking leg.*— | | |
| Length of merus | 3.75 | " |
| Breadth of merus | 1.7 | " |
| Combined length of carpus and propodus | 4.5 | " |
| Length of dactylus | 2.25 | " |

## Genus CAMPTANDRIUM Stimpson

Shen (1935, p. 30) has given a key to all the known species of this genus.

### Camptandrium paludicola Rathbun.

RATHBUN, 1909, p. 109; 1910, p. 326.
TESCH, 1918, p. 68 (*Cyrtograpsus paludicola*).

*Material.*—One ovigerous female, measuring five mm. in greatest carapace breadth, from mangrove swamp near the River Jurong, Singapore.

This specimen agrees with Dr. Rathbun's description and figure except for the following minor points:

(1) The tubercles and irregularities on the surface of the carapace are more pronounced and the front more deeply bilobed.

(2) The sides of the carapace are less convergent backwards.

(3) The antennal flagellum is longer, surpassing the eye.

Tesch, (l.c.) referred this species to the genus *Cyrtograpsus* of the Grapsidæ. I am inclined to regard it as a true *Camptandrium*, but its systematic position must remain in doubt until the male is discovered.

### Camptandrium elongatum Rathbun.

RATHBUN, 1929 (published July 1931), p. 95.
SHEN, 1935, p. 33.

*Material.*—Specimens from the River Jurong, Singapore; localities in the Johore Straits; Kuantan, Pahang on the east coast of the Malay Peninsula.

**Camptandrium anomalum** Shen.

SHEN, 1935, p. 31.

*Material.*—Specimens from the River Kranji, Singapore; and Muar, Johore on the west coast of the Malay Peninsula.

*Remarks.*—The specimens collected in the River Kranji were found inhabiting burrows in soft mud, a number of individuals of various sizes inhabiting one relatively large burrow, just as described for *Ilyoplax delsmani* de Man (Tweedie, 1935, p. 54).

Genus LEIPOCTEN Kemp.

**Leipocten sordidulum** Kemp. Fig. 7.

KEMP, 1915, p. 243.
BALSS, 1935, p. 47.

*Material.*—Specimens from the River Jurong, Singapore, localities in the Johore Strait and Kuantan, Pahang, on the east coast of the Malay Peninsula.

*Remarks.*—I am in full agreement with Balss that this genus should be included in the subfamily Macrophthalminæ The form of the male pleopod (fig. 7) indicates affinity with that section of the subfamily which includes the genera *Paracleistostoma* and *Camptandrium* rather than with the genus *Macrophthalmus*.

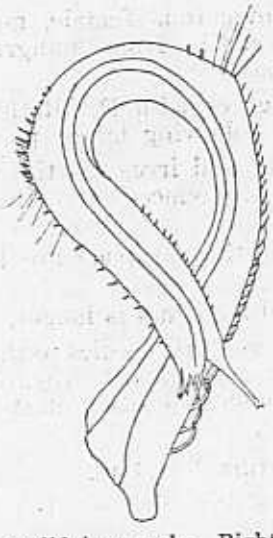

Fig. 7. *Leipocten sordidulum*, male. Right abdominal pleopod.

The habits of this crab are very similar to those of *Camptandrium elongatum*. Both species are found among the

roots of mangrove, are very sluggish in their movements and do not appear to inhabit burrows.

Specimens from Singapore were compared with the types in the Indian Museum by Dr. B. N. Chopra.

### Genus MACROPHTHALMUS Latreille

The numerous species of this genus are notoriously difficult to identify with certainty, partly because the characters separating them are often vague and difficult to define and perhaps even more because in their post-larval development many species change their proportions in respect of both the carapace and chelipeds. These proportions have been largely used in defining and describing the species and such descriptions are not always made from fully adult specimens, or if they are, no account of developmental changes is given.

In the present collection five forms can be referred with certainty to described species, two are tentatively so referred but are probably varietally or subspecifically distinct, and two cannot be reconciled with any of the published descriptions which I have seen and are described as new.

References to literature are confined for the most part to Tesch's monographic paper on the genus (Tesch, 1915), where complete synonymies are to be found.

**Macrophthalmus convexus** Stimpson.

TESCH, 1915, p. 175.

*Material.*—Specimens from islands in the neighbourhood of Singapore.

**Macrophthalmus latreillei** (Desmarest).

TESCH, 1915, p. 181.

*Material.*—Specimens from the Singapore fishmarket. Their presence in the market was exceptional; they are not regularly sold as food.

**Macrophthalmus tomentosus** Eyd. and Soul.

TESCH, 1915, p. 193.

*Material.*—Specimens from Port Swettenham, Selangor; and Muar, Johore, localities on the west coast of the Malay Peninsula.

*Remarks.*—Comparison was made with material in the British Museum from the Mergui Archipelago, identified by de Man.

**Macrophthalmus erato** de Man.

TESCH, 1915, p. 179.

*Material.*—A series of specimens from Muar, Johore, on the west coast of the Malay Peninsula.

*Remarks.*—At Muar the crabs were found on the foreshore in the mouth of the river between low water mark and the lower limit of growing mangrove. Almost all were found in tubular burrows consisting of the bark of a buried mangrove twig from which the wood had rotted away.

**Macrophthalmus brevis** (Herbst).

LANCHESTER, 1900, p. 759 (*M. dilatatus carens*).
TESCH, 1915, p. 169.

*Material.*—An adult male from Pisang Island, in the south part of Malacca Strait; sub-adult specimens from this locality and Senang Island, near Singapore.

*Remarks.*—The single adult male has the very elongate palm characteristic of the species and the sub-adult series is so graded as to leave no doubt of its identity. I examined Lanchester's series of *M. dilatatus carens* in the British Museum and found it to consist entirely of sub-adult specimens of *brevis*.

**Macrophthalmus c.f. crassipes** H.M.-E.

TESCH, 1915, p. 174.

*Material.*—Specimens from Singapore and Pisang Island, Malacca Strait.

*Remarks.*—The specimens are identical with those recorded by Lanchester (1900 p. 759) from Singapore, which I examined in the British Museum. They differ, however, from an adult male in the Leiden Museum from the Caroline Islands, identified by de Man (1890, p. 76), in the following points:—The carapace in the specimen from the Carolines is relatively broader; the immovable finger is more deflexed (but de Man states that this feature is more marked in his specimen than in the type, (l.c., p. 77, footnote) ; the carapace is more granular.

These are all characters, however, which may vary with age, and as none of the present series nor of Lanchester's specimens appears to be fully adult, I regard the Singapore form as best referred to *crassipes* with the reservation that it may prove to be at least subspecifically distinct.

**Macrophthalmus c.f. telescopicus** (Owen).

LANCHESTER, 1900, p. 760 (*M. podophthalmus*).

*Material.*—One female from Telok Paku, Singapore.

*Remarks.*—I am in agreement with Kemp's remarks (1919 A, p. 387) concerning this species, and consider it probable that two or more forms have been included under the names in Tesch's synonymy (1915, p. 161).

The present specimen is conspecific with a male recorded by Lanchester (l.c.s.) from Singapore, which I examined in the

British Museum, but differs from specimens at the Leiden Museum from Jeddah in having the extra-orbital angle and lateral teeth less prominent.

**Macrophthalmus malayensis** sp.n. Fig. 8, a, b.

*Type.*—An adult male collected at Morib, Selangor, by N. Smedley.

*Material.*—The type and a sub-adult male and female from Muar, Johore; both localities are on the west coast of the Malay Peninsula.

*Characters.*—This species comes under division 9 in Tesch's key to the genus (Tesch, 1915, p. 153). It is distinguished from the four species in that division by the characteristic dentition of the fingers, and also in the following particulars:

From *M. dilatatus.*—The outer surface of the palm of the male cheliped (in *malayensis*) is everywhere finely granular; the immobile finger is armed with a tooth.

From *M. brevis.*—The merus and carpus are each armed with several spines; the submarginal rim on the outer surface of the palm is not well defined.

From *M. hilgendorfi.*—As from *M. brevis;* also the carapace is granular and the "verrucose tubercles" on the branchial regions are distinct.

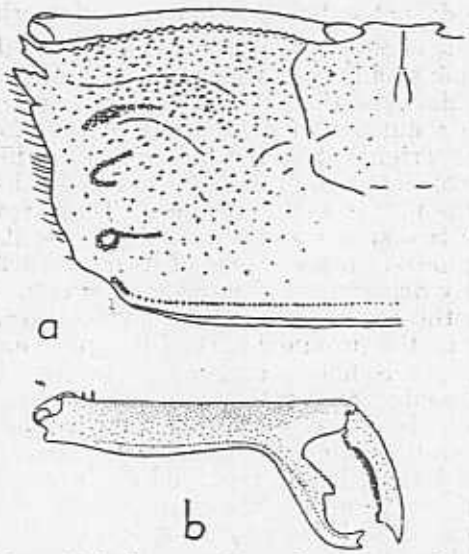


Fig. 8. *Macrophthalmus malayensis* sp.n., male. *a*, carapace; *b*, right chela.

From *M. crassipes*.—As from *M. brevis;* also the palm in the male is greatly elongated and the immobile finger is strongly deflexed.

*Description*.—The proportions and areolation of the carapace are similar to those of *M. brevis*. The extra-orbital angle is shorter and more directed forwards and the first lateral tooth is similar to it in size and direction, but rather broader. A third smaller tooth lies just behind it.

The surface of the carapace is rather coarsely granular and the "verrucose tubercles" on the branchial regions conspicuous. The anterior of these takes the form of a raised, slightly oblique transverse line of granules on the anterior branchial lobe. The next one consists of a semicircular or hook-shaped line of granules; the third (posterior) one is also hook-shaped or, as in the type, the curved portion of the hook may be replaced by a closed circle from which a short line of granules leads inwards.

In addition and anterior to the usual submarginal rim near the posterior margin there is a conspicuous raised granular line, more or less interrupted in the middle, and curved forwards at each end, where the granules are abruptly enlarged, so as to form, in effect, a fourth "verrucose tubercle" behind the anterior three. There is a trace of this fourth tubercle in *M. brevis*, but the granular line connecting the two across the carapace is wholly absent.

The eyes do not extend beyond the extra-orbital angle.

In the male chelipeds the merus is armed with one or more spines and some smaller denticles on the distal part of all three margins. In the type the anterior margin carries three spines in addition to a number of denticles, the posterior margin two (left) and one (right), and the inferior one spine and a diminishing series of denticles proximally to it. In the smaller male this dentition is not so well developed. The carpus of the type is armed with two spines and some spinules on its inner aspect and a single spine on the lower part of its inner surface. Its outer margin is finely denticulate. The palm is greatly elongated and in addition to the tooth on the inner surface carries two spines close together on the proximal part of its upper margin; distally the upper margin is finely serrulate. The palm is very finely granular externally and rather more coarsely on its inner surface, which is quite devoid of hair. The submarginal granular rim on the lower part of the outer surface of the palm is very low and faint in the type and slightly better developed in the smaller specimen. The immobile finger is strongly deflexed and carries a large assymmetrical tooth half way along its inner border. The presence of a large subdistal tooth makes the tip of the immobile finger appear forked like a fish's tail.

The dactylus has a strong inward curve and has a truncate tooth near its base. The rest of its inner margin is denticulate to within a short distance of the tip. In the type the distal denticles are coalesced to form a low, subdistal tooth. The inner surface of the dactylus, in contrast to the rest of the hand, is thickly tomentose.

The walking legs and the remainder of the external anatomy exhibit no diagnostic features.

Measurements of the type.

| | | |
|---|---|---|
| *Carapace.*— | | |
| Breadth between extra-orbital angles | .. | 24.5 mm. |
| Breadth between first lateral teeth | .. | 24.5 „ |
| Median length .. .. | .. | 10.6 „ |
| Greatest breadth of front .. | .. | 3.5 „ |
| Breadth of front at constriction | .. | 2.8 „ |
| *Right Chela.*— | | |
| Length of palm (upper margin) | .. | 17.5 „ |
| Median height of palm .. | .. | 4.3 „ |
| Length of dactylus .. .. | .. | 9.0 „ |
| *Penultimate walking leg.*— | | |
| Length of merus .. .. | .. | 13.5 „ |
| Breadth of merus .. .. | .. | 3.0 „ |
| Combined length of carpus and propodus | .. | 10.4 „ |
| Length of dactylus .. .. | .. | 5.7 „ |

**Macrophthalmus malaccensis** sp. n. Fig. 9, a, b.

*Types.*—A male (probably not quite adult) and a female from Morib, Selangor, on the west coast of the Malay Peninsula.

*Material.*—A series of specimens from the type locality.

*Characters.*—A species resembling the Japanese and North Chinese species *M. dilatatus*. It differs in having the first lateral tooth very much larger and more salient than the extra-orbital angle, and in the absence, on the outer surface of the palm of the male, of a longitudinal row of 5–6 large tubercles, a most characteristic feature of *dilatatus*.

*Description.*—The carapace is rather more than twice as broad as long and is coarsely, but rather sparsely, granular over most of its surface, only the frontal and intestinal regions being smooth. The "verrucose tubercles" on the branchial regions are represented by rather inconspicuous lines and groups of larger granules.

The extra-orbital angle is slender and sharp and directed outwards, sometimes curving slightly forwards. The first lateral tooth is large and broad and extends considerably beyond the extra-orbital angle and usually a trifle further forward. The incision between the two is narrow and sometimes nearly closed distally. The second lateral tooth is small and inconspicuous.

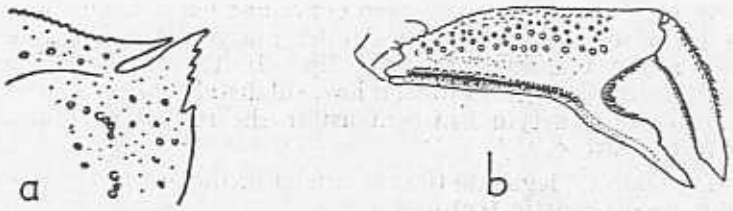


Fig. 9. *Macrophthalmus malaccensis* sp.n., male. *a*, antero-lateral region of carapace; *b*, chela.

The eye extends beyond the extra-orbital angle to about the level of the first lateral tooth, but not beyond the sides of the carapace.

In the external maxillipeds the central part of the surface of the merus is coarsely pitted.

In the male chelipeds the anterior border of the merus carries one or two spinules, which are often obscured by hair. The carpus has a small spine at its inner angle and another on the lower part of its inner surface. The palm has the tooth on its inner surface which defines Tesch's division 7 (Tesch, 1915, p. 153), and the inner surface of the palm and both fingers is tomentose. The outer and upper surface of the palm are coarsely granulate, some of the granules on the proximal part of the upper margin being replaced by short spines. About the middle of the surface of the palm the granules cease along a well defined line, below which the surface is smooth and polished. The granules along this line are not specially enlarged, as in *M. dilatatus*. The granular submarginal rim on the palm is sharp and salient, but becomes faint on the immobile finger. The immobile finger is moderately deflexed and its lower margin is sinuous, being convex proximally. Its cutting edge is denticulate and carries a single low tooth in the middle. The dactylus is curved and armed only with a very obscure, truncate tooth near the base.

In the walking legs the three distal joints, especially the dactyli, are long and slender.

Measurements of the male type.

*Carapace.*—

| | | |
|---|---|---|
| Breadth between extra-orbital angles | .. | 20.0 mm. |
| Breadth between first lateral teeth | .. | 21.4 „ |
| Median length .. .. | .. | 9.5 „ |
| Greatest breadth of front .. | .. | 3.0 „ |
| Breadth of front at constriction | .. | 2.4 „ |

*Right Chela.*—

| | | |
|---|---|---|
| Length of palm (upper margin) | .. | 9.2 „ |
| Median height of palm .. | .. | 3.5 „ |
| Length of dactylus .. .. | .. | 6.0 „ |

*Penultimate walking leg.*—

| | |
|---|---|
| Length of merus .. .. .. | 12.0 mm. |
| Breadth of merus .. .. .. | 3.0 „ |
| Combined length of carpus and propodus .. | 10.5 „ |
| Length of dactylus .. .. .. | 6.8 „ |

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