

FURTHER NOTES ON CRUSTACEA DECAPODA IN THE INDIAN MUSEUM.

IX. ON THREE COLLECTIONS OF CRABS FROM TAVOY AND MERGUI ARCHIPELAGO.

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(Plate VI.)

The present report deals with three collections of crabs, two made by Prof. F. J. Meggitt of the University College, Rangoon, mostly at Maungmagan on the Tavoy Coast of Burma and the third by Drs. B. Prashad and B. N. Chopra of the Zoological Survey of India in the Mergui Archipelago. In the first collection of Prof. Meggitt, made in October 1933, there are also some specimens labelled "Mergui"; these were presumably collected in the neighbourhood of the town of Mergui. The second collection of Prof. Meggitt was made entirely at Maungmagan in October 1935, while the Mergui collection of Drs. Prashad and Chopra was made in January this year.

Maungmagan is a small village on the Tavoy Coast in Lower Burma, north-west of the town of Tavoy ($14^{\circ} 15' N.$, $97^{\circ} 50' E.$), and is, on account of its fine sandy beach, a popular sea-bathing resort. A sketch-map of the sea coast at Maungmagan, supplied by Prof. Meggitt, showing the exact location of the rock pools, sandy pools, etc., has already been published by Hora and Mukerji¹ with their account of the fishes of Prof. Meggitt's collection.

The collection from the Mergui Archipelago is chiefly from the group of small islands on the south-west and west of King Island, mostly between it and the large, more or less unsurveyed, Doung Island (or Ross Island, as it is also called). For the most part the collection was made from submerged coral reefs, but several specimens were collected on the beach at low tide also.

A list of the species found in all the three collections is given below and the species found in each collection are separately indicated. The species collected either only at Mergui or both at Mergui and Maungmagan and included in Prof. Meggitt's first collection are marked "M". An asterisk before the name of a species indicates that this was not represented in Dr. J. Anderson's collection from the Mergui Archipelago (*vide infra* p. 380).

¹ Hora and Mukerji, *Rec. Ind. Mus.* XXXVIII, p. 16 (1936).

			Prof. Meggitt's first collection from Mergui and Maungmagan.	Prof. Meggitt's second collection from Maungmagan.	Drs. Prashad and Chopra's collection from Mergui Archipelago.
Oxystomata.					
Calappidae.					
Calappinae.					
	* <i>Calappa hepatica</i> (Linn.)	...	+M	—	—
Matutinae.					
	* <i>Matuta lunaris</i> (Forskäl)	...	+M	+	—
	* <i>Matuta planipes</i> Fabricius	...	—	+	—
Leucoiidae.					
Leucoisiinae.					
	* <i>Heteronucia mesanensis</i> Rathbun	...	—	—	+
	<i>Philyra scabriuscula</i> (Fabricius)	...	+	—	—
Brachygnatha.					
Oxyrhyncha.					
Maiidae.					
Pisinae.					
	<i>Hyastenus hilgendorfi</i> de Man	...	—	—	+
	<i>Hyastenus</i> sp.	...	—	—	+
Maiinae.					
	<i>Schizophrys asper</i> (M.-Edw.)	...	+M	—	+
Parthenopidae.					
Parthenopinae.					
	* <i>Oethra scruposa</i> (Linn.)	...	+M	—	—
Brachyrhyncha.					
Portunidae.					
Carcininae.					
	* <i>Carcinus maenas</i> (Linn.)	...	+	—	—
Lupinae.					
	* <i>Scylla serrata</i> (Forskäl)	...	+M	+	—
	* <i>Neptunus (Neptunus) sanguinolentus</i> (Herbst)	...	—	+	—
	<i>Charybdis (Goniosoma) cruciata</i> (Herbst)	...	—	+	—
	* <i>Charybdis (Goniosoma) lucifera</i> (Fabricius)	...	+M	—	—
	* <i>Charybdis (Goniosoma) annulata</i> (Fabricius)	...	—	+	—
	<i>Charybdis (Goniosoma) merguiensis</i> (de Man)	...	+	+	—
	* <i>Charybdis (Goniosoma) ? callianassa</i> (Herbst)	...	+	—	—
	<i>Thalamita prymna</i> (Herbst)	...	—	+	—
Xanthidae.					
Xanthinae.					
	* <i>Carpilodes margaritatus</i> A. M.-Edw.	...	—	—	+
	<i>Atergatis integerrimus</i> (Lamarck)	...	+M	—	—
	* <i>Xantho neglectus</i> Balss	...	+M	+	—
	<i>Leptodius exaratus</i> (M.-Edw.)	...	+	+	+
	<i>Leptodius cavipes</i> (Dana)	...	+	—	—
Actaeinae.					
	<i>Actaea areolata</i> Dana	...	—	—	+
	* <i>Actaea calculosa</i> (M.-Edw.)	...	—	—	+
Chlorodinae.					
	<i>Chlorodiella niger</i> (Forskäl)	...	—	—	+
	* <i>Cymo melanodactylus</i> de Haan	...	—	—	+
Menippinae.					
	<i>Menippe rumphii</i> (Fabricius)	...	+	+	—
	<i>Myomenippe hardwickii</i> (Gray)	...	—	—	+

			Prof. Meggitt's first collection from Mergui and Maungmagan.	Prof. Meggitt's second collection from Maungmagan.	Drs. Prashad and Chopra's collection from Mergui Archipelago.
Ozinae.					
<i>Epixanthus frontalis</i> (M.-Edw.)	—	—	+
Pilumninae.					
<i>Pilumnus longicornis</i> Hilgendorf	—	—	+
* <i>Pilumnus hirsutus</i> Stimpson	—	—	+
<i>Actumnus elegans</i> de Man.	—	—	+
Eriphinae.					
<i>Trapezia cymodoce</i> (Herbst)	—	—	+
* <i>Trapezia ferruginea</i> , var. <i>areolata</i> Dana	—	—	+
* <i>Tetralia glaberrima</i> (Herbst)	—	—	+
Gonoplacidae.					
Pseudorhombilinae.					
* <i>Litocheira angustifrons</i> Alcock	—	—	+
Potamonidae.					
Potamoninae.					
* <i>Potamon (Acanthotelphusa) dayanum</i> (W.-M.)	+	—	—
<i>Potamon</i> sp.	+	—	—
Gecarcinucinae.					
<i>Paratelphusa (Phricotelphusa) callianaria</i> (de Man)	—	—	+
Ocypodidae.					
Ocypodinae.					
<i>Ocypoda ceratophthalma</i> (Pallas)	—	+	—
* <i>Ocypoda macrocera</i> M.-Edw.	+	+	—
<i>Ocypoda cordimana</i> Desmarest	—	+	—
<i>Gelasimus triangularis</i> A. M.-Edw.	—	—	+
* <i>Gelasimus marionis</i> (Desmarest)	—	—	+
<i>Gelasimus manii</i> (Rathbun)	+	—	+
Scopimerinae.					
<i>Dotilla intermedia</i> de Man	+	—	—
Macrophthalminae.					
* <i>Macrophthalmus telescopicus</i> (Owen)	—	—	+
* <i>Macrophthalmus convexus</i> Stimpson	+	—	—
<i>Macrophthalmus erato</i> de Man	—	—	+
Grapsidae.					
Grapsinae.					
<i>Grapsus strigosus</i> (Herbst)	+	+	+
Varuninae.					
* <i>Varuna litterata</i> (Fabricius)	+	—	—
Sesarminae.					
<i>Sesarma (Sesarma) taeniolata</i> White...	+	—	—
* <i>Sesarma (Parasesarma) prashadi</i> , sp. nov.	—	—	+
<i>Sesarma (Chiromantes) bidens</i> (de Haan)	+	—	+
<i>Clistocoeloma merguiense</i> de Man	—	—	+
<i>Metaplax dentipes</i> (Heller)	+	—	+

It will be seen from this list that of the total number of 57 species in all the three collections there are 26 in the first collection (of which 8 are from Mergui), 15 in the second and 30 in the third. These 57 species

belong to 10 families and are distributed in the three collections as shown below :—

Family.	Number of species in each collection.			TOTAL.
	I	II	III	
Calappidae ...	2	2	..	3
Leucosiidae ...	1	..	1	2
Maiidae ...	1	..	3	3
Parthenopidae ...	1	..	..	1
Portunidae ...	5	6	..	9
Xanthidae ...	5	3	14	18
Gonoplacidae ...	..	..	1	1
Potamonidae ...	2	..	1	3
Ocypodidae ...	4	3	5	10
Grapsidae ...	5	1	5	7
	—	—	—	—
TOTAL	26	15	30	57
	—	—	—	—

Of the 57 species dealt with by us there are only eight that occur both on the Tavoy Coast and in the Mergui Archipelago ; these are listed below. The apparent difference in the composition of the crab-fauna of these two, more or less adjacent areas can perhaps be easily explained by the fact that the collections in the two localities were made in different types of habitats. At Maungmagan Prof. Meggitt obtained most of his material from pools near shore, from under rocks near shore, or from the sandy beach ; this would no doubt account for large numbers, at least of individuals, if not of species, of Portunids, Oxystomes, Grapsids, etc., being collected. The collections from the Mergui Archipelago, on the other hand, were made, to a large extent, in coral reefs where certain types of Xanthids are abundant.

List of species found both at Maungmagan and Mergui.

Calappidae.

Matuta lunaris (Forskäl).

Portunidae.

Scylla serrata (Forskäl).

Xanthidae.

Xantho neglectus Balss.

Leptodius exaratus (M.-Edw.)

Ocypodidae.

Gelasimus manii (Rathbun).

Grapsidae.

Grapsus strigosus (Herbst).

Sesarma bidens (de Haan).

Metaplox dentipes (Heller).

The Decapod fauna of the Mergui Archipelago is already very well known, for, besides the work of earlier naturalists, de Man's monograph on¹ the Decapods of this area, based on the very extensive collections of Dr. J. Anderson, the first Superintendent of the Indian Museum, is a very comprehensive and masterly treatise on the subject.

¹ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, pp. 1-312, pls. i-xix (1887, 1888).

Dr. Anderson's collections were so extensive that in crabs alone de Man found as many as 115 species, compared with the 57 that we have before us. Another proof of the extensiveness of Dr. Anderson's collection is the fact that out of our 57 species only one is described as new. The species that were not represented in the collection that de Man examined, but are present in our collection are indicated in the list on pp.378,379 by an asterisk. Most of these species have been collected in the Mergui Archipelago or from closely adjoining areas since de Man's time, but so far as we have been able to ascertain the following five species are being recorded from this area for the first time :—

Leucosiidae.

Heteronucia mesanensis Rathbun.

Portunidae.

Carcinus maenas (Linn.).

Xanthidae.

Carpilodes margaritatus A. M.-Edw.

Gonoplacidae.

Litocheira angustifrons Alcock.

Grapsidae.

Sesarma (*Parasesarma*) *prashadi*, sp. nov.

The occurrence of these species in the Mergui Archipelago does not call for any special comments, for most of them have also been collected from other parts of the Indo-Pacific region. The case of *Carcinus maenas*, however, deserves special consideration. Alcock¹ described the distribution of this crab as : " The species has been found at various places on the Atlantic Coast of the Northern United States and off the coast of Pernambuco (Brazil) : it is the common shore-crab of the British Islands, and occurs in the North Sea almost up to the Arctic limits, in the Baltic, and on the Atlantic coasts of the European continent : it is common in all parts of the Mediterranean, and has been found in the Black Sea and the Red Sea : it is an Indian species, though evidently a very rare one, and has been reported from the Hawaiian Islands, from the Bay of Panama, and—though there is doubt about this locality—from Australia." In the Indian waters the species has been recorded from Ceylon only. Some of the records of this cosmopolitan species from the Indo-Pacific region have been doubted by some carcinologists ; its occurrence on the Tavoy coast definitely establishes the species as an inhabitant of at least the eastern part of this area. Hora and Mukerji² have recently recorded from Tavoy some species of fishes that were so far supposed to live in the European Atlantic only ; the distribution of *Carcinus maenas*, as indeed of a large number of other species of marine animals enumerated by Alcock,³ suggests that the occurrence of some Atlantic fishes in the Indian waters is not so very singular as has been supposed by some Zoologists.

In working out the present collections several interesting points concerning either the taxonomy of certain species or their distribution,

¹ Alcock, *Journ. As. Soc. Bengal* LXVIII, p. 14, (1899).

² Hora and Mukerji, *Rec. Ind. Mus.* XXXVIII, pp. 15-39 (1936).

³ Alcock, *Investigator Deep-Sea Madreporaria, Calcutta* (1898) ; *Investigator Deep-Sea Brachyura, Calcutta* (1899).

etc., have arisen; these are dealt with in their appropriate places in the following pages, and need not be referred to here. In the classification and arrangement of species we have closely followed Alcock's system as given in his masterly treatment of the Indian crabs in the series of papers entitled "Materials for a Carcinological Fauna of India" and published in the *Journal of the Asiatic Society of Bengal* between 1895 and 1900. In the Xanthidae Dr. Heinrich Balss and some other carcinologists have considerably altered Alcock's classification, but for the present at least we have preferred to follow Alcock's arrangement of subfamilies, etc. We have not given anything like complete synonymies of species, but have given a reference to Alcock's work and in some cases a few later important references only.

We have paid special attention to a study of the abdominal appendages of the male as these structures sometimes afford good characters for distinguishing males of closely allied species, and for this reason we have given figures of these appendages in a large number of species dealt with by us.

The illustrations accompanying this paper have been prepared, under our supervision, by Babu D. N. Bagchi and Babu Subodh Mondul, two of the talented artists attached to the Zoological Survey of India; both of them are jointly responsible for the text-figures, while the photographs are the work of Babu Subodh Mondul alone. We are very thankful to them for the skill and accuracy with which they have done the work. We would also like to express our special indebtedness to Dr. Bains Prashad, Director, Zoological Survey of India, for constant help and valuable suggestions received throughout the course of our work and for going through the manuscript with us. And lastly we have to express our thanks to Prof. F. J. Meggitt for giving us the opportunity to study his valuable collections.

Tribe OXYSTOMATA.

Family CALAPPIDAE.

Subfamily CALAPPINAE.

Calappa hepatica (Linn.).

1896. *Calappa hepatica*, Alcock, *Journ. As. Soc. Bengal* LXV, pp. 142-144.
 1918. *Calappa hepatica*, Ihle, *Siboga Exped. Rep.* XXXIXb², pp. 183, 184.
 1922. *Calappa hepatica*, Balss, *Arch. Naturgesch.* LXXXVIII, p. 123.
 1936. *Calappa hepatica*, Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) II, No. 37, p. 157.

One young specimen referable to the present species is in Prof. Meggitt's first collection from Mergui. The specimen is typical in every respect.

Calappa hepatica has a very wide range of distribution. Ihle gives its range as the Red Sea and the East African Coast to Japan, Australia and Sandwich Islands. In the Indian Museum there are numerous specimens both from the Bay of Bengal and the Arabian Sea.

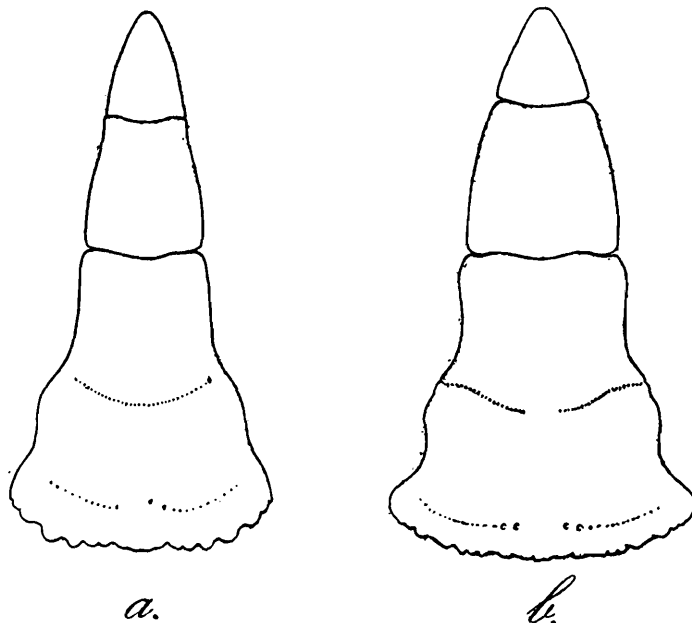
Subfamily MATUTINAE.

Matuta lunaris (Forskäl).1896. *Matuta victor*, Alcock, *Journ. As. Soc. Bengal* LXV, pp. 160, 161.1933. *Matuta lunaris*, Chopra, *Rec. Ind. Mus.* XXXV, pp. 31, 32.

There is a large number of specimens of the present species in the two collections of Prof. Meggitt. Only one of these specimens is from Mergui, while all the rest are from Maungmagan; of the latter some were collected from rock pools near shore, some from fisher-boat nets, and the others at Cat's Eye Rocks. The specimens are for the most part typical.

Two of the most important characters mentioned by Alcock for the separation of this species from the closely allied *M. planipes* (= *M. lunaris* of Alcock) are the presence in large males, of a spine at the angle where the hand comes in contact with the distal lobule of the arm and the presence, in females and young males, of two enlarged spines (counting from the proximal end, the second and the fourth) on the median longitudinal ridge on the outer surface of the hand. In *M. planipes* the spine at the angle of the hand is replaced by a tubercle, and the fourth lobe of the median longitudinal ridge of the hand is never enlarged into a spine. In all the specimens that we have examined in the present collection the spine near the junction of the arm is well developed; the fourth spine on the median longitudinal ridge is present in all the females and in most of the very young males; while in all medium-sized and large males this spine is invariably missing.

In addition to the characters mentioned by Alcock, the males of the two species can be generally recognised by the shape of the abdomen.



TEXT FIG. 1.—Terminal part of male abdomen of *a. M. lunaris*: \times ca. 3
b. M. planipes: \times 3½.

The abdomen in the males of *Matuta* consists of five pieces only, segments 3-5 being completely fused. In *M. lunaris* the length of the composite segment 3-5 is always greater than its breadth at the base,

and the terminal segment is always considerably longer than its posterior breadth. In *M. planipes*, on the other hand, the length of the composite segment is at most equal to, but generally less than, its breadth at the base and the last segment is almost as long as, or only slightly longer than, its posterior breadth. The sixth segment is also proportionately longer in *M. lunaris* than in *M. planipes*. These points are brought out clearly in text-figure 1 and the table of measurements.

			<i>M. lunaris.</i>	<i>M. planipes.</i>
Posterior breadth of composite segment 3-5	...	...	9.5	9.0
Median length of composite segment 3-5	...	...	10.8	9.0
Posterior breadth of segment 6	...	...	4.2	4.2
Median length of segment 6	...	...	5.0	4.4
Posterior breadth of segment 7	...	...	2.7	2.7
Median length of segment 7	...	...	4.0	2.9

The colour pattern of the species, mentioned by Alcock, is clearly seen only in some specimens.

Matuta lunaris has a very wide range of distribution having been recorded from several localities from Polynesia in the east to as far as the Red Sea and the Cape region on the west. In India it has been collected both in the Bay of Bengal and the Arabian Sea.

Matuta planipes Fabricius.

1896. *Matuta lunaris*, Alcock, *Journ. As. Soc. Bengal* LXV, pp. 161, 162.
 1933. *Matuta planipes*, Chopra, *Rec. Ind. Mus.* XXXV, p. 32.
 1936. *Matuta flagra*, Shen, *Chinese Journ. Zool.* II, pp. 64-66.

The species is represented in the present collection by five examples, two females and three young males, obtained by Prof. Meggitt from fisher-boat nets at Maungmagan.

Alcock has described a distinctive colour pattern in this species, which can sometimes be seen in very old specimens also. In the present collection this colour pattern is distinctly seen in one female example only; in the second female and the three males there is practically no colour pattern at all.

The male specimens are for the most part without claws, but in the claws that are present the typical *planipes* characters can be seen—at the angle near the arm there is only a somewhat low tubercle, and not a spine, as in the preceding species, and there is only one enlarged spine, the second from the proximal end, on the median longitudinal ridge on the outer surface of the hand. One of the females, with the distinct *planipes* colouration, also shows these characters clearly, but the second female has the typical *planipes* claw only on one side; in the other claw there is a sharp tubercle on the hand near its junction with the arm, and the fourth tubercle on the median ridge is also spiniform. This seems to be a rare abnormality, for a condition like this is not present in any of the large number of specimens of this species in the Indian Museum collection.

The species recently described by Shen under the name of *M. flagra* seems to be based on young specimens of the present species. The characters of the hand mentioned by him agree almost exactly with those of young examples of *M. planipes* that we have examined. Shen

has also mentioned that the epibranchial spines in his species are directed straight outwards, instead of curving forwards as in *M. lunaris* (= *M. victor* of Alcock). We have examined a large number of specimens of both the allied species, *M. lunaris* and *M. planipes* and find that this character is far from constant. The spines are sometimes curved forwards, sometimes they point straight outwards, while in some cases they are directed distinctly backwards even. The smoothness of the outer surface of the movable finger of the hand is, as pointed out by Alcock for his *M. victor*, a character of the young; this is equally applicable to the young of the present species also. The colour pattern of the species, as already pointed out, is variable. From all these considerations we are of the opinion that Shen's *M. flagra* cannot be maintained as a distinct species, but must be sunk in the synonymy of *M. planipes* Fabricius.

Like the preceding species, *M. planipes* has a very wide range of distribution, having been met with from North-West of Australia in the east to the Cape of Good Hope in the west.

Family LEUCOSIIDAE.

Subfamily LEUCOSIINAE.

Heteronucia mesanensis Rathbun.

(Plate VI, fig. 1).

1910. *Heteronucia mesanensis*, Rathbun, *Skrift. K. Dansk. Vidensk. Selsk. Copenhagen* (7) V, pp. 306, 307.

1918. *Heteronucia mesanensis*, Ihle, *Siboga Exped. Rep.* XXXIXb², p. 309 (reference only).

One small female specimen from Mergui is referred to Miss Rathbun's species with some hesitation. In a general way our specimen agrees closely with the brief description published by Miss Rathbun, but in view of some important differences between the two, as pointed out below, we have thought it worth while giving a full description of our specimen.

The carapace (Plate VI, fig. 1) is subcircular in outline, it is strongly convex and its surface is markedly uneven on account of the prominent convexities of the different regions. The entire surface of the carapace, chelipeds and legs is covered with vesiculous granules closely studded together. The regions of the carapace are clearly demarcated by convexities, separated from one another by broad shallow grooves. The narrow triangular area embracing the mesogastric and the anterior part of the cardiac regions, mentioned by Miss Rathbun, is clearly seen, but is bordered by only shallow grooves. The convexities of the gastric, cardiac and branchial regions are very distinct, there being two on the last-named region, the anterior of which is the larger of the two. There is only an inconspicuous, low tubercle on each hepatic region.

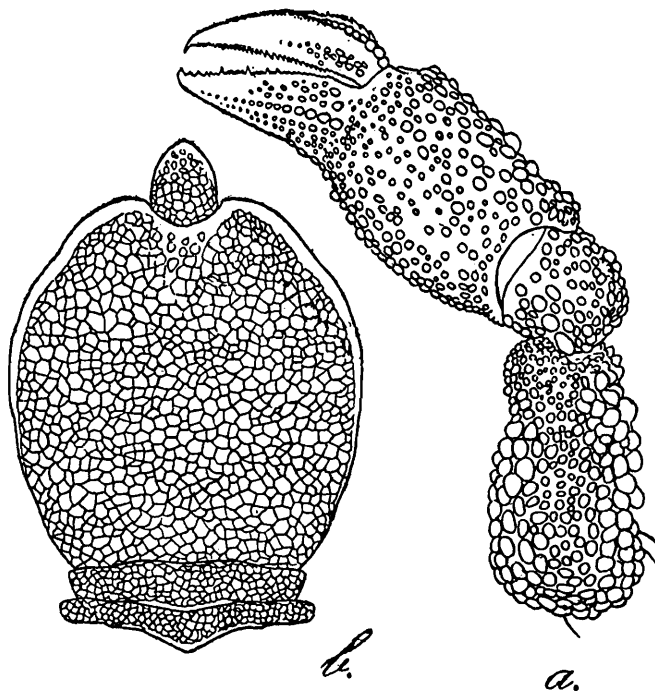
The carapace is distinctly broader than long and its lateral margins are slightly expanded. The front is broad and a narrow fissure in the middle makes it bilobed; the margin of each lobe is truncate or even slightly rounded. The pterygostomian regions are puffed out, but their anterior margin, which is almost transverse, is on a level with the eye, and when viewed from above does not extend beyond or even up to the

front. The tips of the external maxillipeds are just visible beyond the front in a dorsal view. The antero-lateral margins are divided into two subequal lobes by a rather broad and shallow notch. The postero-lateral margins are spinate, the granules near the lateral margins on the convexities of the branchial regions being sharply pointed and taking the form of short spines. The spines decrease in size distally, but extend almost up to the posterior margin of the carapace in the shape of sharply-pointed tubercles. The posterior margin of the carapace is on a lower level than the rest of the surface, and is somewhat convex posteriorly.

The orbits are shallow and do not conceal the rather large eye, even when fully retracted. Except for a narrow fissure the lower border of the orbit is practically complete, on account of the fusion of the basal antennal joint with it. The antennal flagellum has not been seen; it is either altogether missing or is very extremely reduced.

There is a remarkably broad space between the lower orbital border and the free edge of the buccal cavern. The maxillipeds completely close the buccal cavity, which is triangular in shape. Each maxilliped is strongly bent about its middle, so that the merus is nearly at right angle to ischium. Measured along the inner border the merus is only slightly more than half the length of the ischium. The exognath is quite stout, being only a little narrower than the endognath, and is straight along the outer edge.

The chelipeds are considerably stouter and longer than the walking legs and are densely covered with vesiculous granules. The arm is sub-cylindrical and is only slightly broader distally than at the proximal



TEXT FIG. 2.—*Heteronucia mesanensis* Rathbun.

a. Cheliped of female, outer view : \times ca. 8. b. Abdomen of female : \times ca. 8.

end. The wrist is globular. The palm is massive and swollen, the greatest diameter being about the middle, and the granules near its margins are sharp and pointed. The fingers are arched and taper

towards their tips, the immobile finger being distinctly more massive than the dactylus. The latter opens in a vertical plane. The fingers are shorter than the palm, their cutting edges are finely and evenly denticulated and they are hollowed and concave on the inner side. There is no gap left when the fingers meet. The tips are pointed and are apposed when the fingers meet. The fingers are also minutely granular and elegantly grooved. The lower border of the distal part of the palm and the proximal part of the fixed finger is concave.

The basal part of the walking legs is only slightly concealed beneath the lateral expansions of the carapace. The legs are also thickly covered with granules and even the dactyli are minutely granular. The merus is cylindrical, the carpus is nodular and the lanceolate dactylus is almost as long as the propodus. The granules on the margins of the different segments are sharp. The dactyli end in corneous tips.

The abdomen of the female (text-fig. 2 *b*) is large and oval and occupies practically the entire space between the legs. The exposed surface is covered with flattened granules. The two basal segments are short, the next four are completely fused and form a large broad plate. The seventh segment is a small, more or less, pear-shaped structure, somewhat deeply sunk in the distal margin of the preceding segment; its tip is rounded and reaches almost to the posterior end of the buccal cavern.

The specimen in spirit is of a pale-whitish colour, with an indistinct diffusion of light brownish tint on the carapace and a few small pale-orange spots on the ventral surface. There is a small triangular patch of a light brownish colour on the mesogastric region of the carapace.

The measurements of the specimen in millimetres (taken under a microscope) are given below.

Length of carapace	...	...	...	...	3.75
Breadth of carapace	...	...	...	...	4.50
Proto-orbital border	...	...	...	...	1.91
Length of upper border of palm	...	...	...	...	1.33
Length of dactylus	...	...	...	...	1.17

The specimen is registered in the collection of the Zoological Survey of India under the number C2283/1. It was collected by Drs. B. Prashad and B. N. Chopra from amongst corals in a submerged reef near shore, off Palaïow on the east coast of Doung Island in the Mergui Archipelago on 20th January, 1937. Miss Rathbun based the species on two female specimens collected between two islands in the Gulf of Siam at depths of 15 and 30 fathoms. As at present known the species seems to have a very restricted distribution.

Though the present specimen agrees very closely with Miss Rathbun's description of *Heteronucia mesanensis* in a large number of characters, there are some important differences between the two. The fronto-orbital border of the carapace is stated to be about half the carapace width in the Siam specimen, whereas in our example it is only about two-fifths of the breadth of the carapace. The frontal margin is faintly bidentate in Miss Rathbun's species; in the Mergui example this margin is obscurely bilobed by a narrow median fissure, the borders of each lobe being somewhat rounded. The hand in our example also differs materially from Miss Rathbun's description. The palm is thickest

about the middle and not at the proximal end, the fingers are shorter than the upper border of the palm and the dactylus is distinctly less massive than the immobile finger. The points of similarity between our specimen and Miss Rathbun's species are, however, so striking that it must, at least for the present, be referred to this species.

Heteronucia as defined by Alcock¹ is characterised, among other features, by having fingers longer than the palm, and this character is clearly seen in his figure, as also in the type-specimen of *H. vesiculosa* preserved in the Indian Museum. In *H. venusta* Nobili² the fingers are slightly longer than the palm.³ Besides, both these species have a peculiar type of front. In *H. mesanensis*, on the other hand, the fingers, according to Miss Rathbun, are not longer than the palm, though in her figure the palm actually appears to be somewhat longer than the fingers. In our specimen also the fingers are shorter than the palm. The front also in Miss Rathbun's species, or at least in the specimen that we are referring to it, has not the characteristic *Heteronucia* shape. It seems quite possible, therefore, that *H. masanensis* Rathbun, or at least the Mergui specimen that we have provisionally referred to this species, may have to be accommodated in a new genus.

Philyra scabriuscula (Fabricius).

1896. *Philyra scabriuscula*, Alcock, *Journ. As. Soc. Bengal* LXV, pp. 239, 240.

There are two male specimens from Maungmagan that we have referred to the present species. They bear the label "crabs on beach, sluggish: Maungmagan, 1933" The specimens agree with typical examples in the Museum collection. The dull brown and greenish mottling of the carapace, mentioned by Alcock, is not, however, visible.

The species has a very wide range of distribution. According to Ihle⁴ it is met with from Amboina to the Red Sea and East Coast of Africa. In the Indian Museum there are numerous specimens from Tavoy to the Persian Gulf.

Tribe BRACHYGNATHA.

Subtribe OXYRHYNCHA.

Family MAIIDAE.

Subfamily PISINAE.

Hyastenus hilgendorfi de Man.

1895. *Hyastenus hilgendorfi*, Alcock, *Journ. As. Soc. Bengal* LXIV, pp. 209, 210.

The species is represented in the present collection by seven specimens collected in the Mergui Archipelago. Three of these are males, three

¹ Alcock, *Journ. As. Soc. Bengal* LXV, p. 177 (1896).

² Nobili, *Bull. Mus. Hist. Nat. Paris* XII, p. 261 (1906); *Mem. Acad. Sci. Torino* (2) LVII, pp. 379, 380, pl. i, fig. 14 (1907).

³ Ihle in *Siboga Exped. Rep.* XXXIXb², p. 320 (1918) states that the upper border of the palm in *H. venusta* is almost as long as the upper border of the dactylus, but in his figure (text-fig. 123, p. 219) the fingers are seen to be slightly longer than the upper border of the palm.

⁴ Ihle, *Siboga Exped. Rep.* XXXIXb², p. 275 (1918).

ovigerous females and one young female. The largest male has a total length (carapace and rostrum) of over 26 mm., while the smallest ovigerous female is only 15 mm. in total length.

All the specimens agree very closely with de Man's¹ and Alcock's detailed and accurate descriptions of the species, as also with named specimens, including de Man's types from Mergui, in the Indian Museum collection. In the large male example, however, the spines are a little shorter than in the type-specimens and the fingers also gape, perhaps, a little more near the base. The proportions of the different parts of the hand are also very slightly different. As pointed out by Laurie² the rostral spines are longer and diverge distally more in the males than in the females. The measurements, in millimetres, of the largest male example in our collection are given below.

Total length of carapace and rostrum	...	...	26.2
Length of carapace	...	...	15.8
Distance between external orbital angles	...	...	6.5
Distance between internal orbital angles	...	...	4.5
Breadth of carapace	...	...	13.2
Length of cheliped	...	...	33.5
Length of hand and fingers	...	...	14.5
Median length of palm	...	...	10.0
Length of fingers	...	...	5.0
Height of palm	...	...	4.2
Length of first walking leg	...	...	38.0

The present specimens are registered as under :—

C2284/1. From corals in a submerged reef near shore off Palauiow, on the east coast of Doung Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 20th Jan., 1937.	3♂♂, 4♀♀ (3 ovig.).
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The species is represented in the Indian Museum collection by examples from the Straits of Malacca, Mergui, Nicobar Islands, the Ganjam coast and from Ceylon.

For reasons given by one of us in an earlier paper³ we have retained the name of *Hyastenus* White in preference to *Halimus* Latrielle.

Hyastenus sp.

There is one young male specimen in Drs. Prashad and Chopra's collection from the Mergui Archipelago that we are unable to put in any of the known species of *Hyastenus* with any degree of certainty. The carapace is practically smooth. The gastric and the intestinal tubercles are hardly developed, while the epibranchial and the sub-hepatic tubercles are fully formed. The rostral spines are a little more than half the length of the carapace and are distinctly divergent. The dactyli of the walking legs are strongly toothed.

The specimen was collected from a submerged reef off Cantor Island in the Mergui Archipelago on 19th January, 1937.

¹ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, pp. 14-19, pl. i, figs. 3, 4 (1887).

² Laurie, *Ceylon Pearl Oyster Fish. Rep.* V, p. 376, (1906).

³ Chopra, *Rec. Ind. Mus.* XXXVII, p. 467, (1935).

Subfamily *MAIINAE*.**Schizophrys asper** (M.-Edwards).

1895. *Schizophrys asper*, Alcock, *Journ. As. Soc. Bengal* LXIV, pp. 243, 244; *Ill. Zool. Investigator, Crust.*, pl. xxxv, fig. 1 (1899).
 1924. *Schizophrys asper*, Balss, *Arch. Naturgesch.* XC, Heft 5, p. 35.

There are three specimens of *S. asper* from Mergui in the collection. Two of these, a large male and a young female, are from Prof. Meggitt's first collection and are labelled only "Mergui," while the third, a small male, was collected by Drs. Prashad and Chopra from amongst corals in a submerged reef at Palaiow on the east coast of Doung Island in the Mergui Archipelago on January 20th, 1937. The large male from Prof. Meggitt's collection has a carapace length of 42.5 mm., while the smaller male from Doung Island is only 10 mm. long. The measurements of the larger male are given below in millimetres.

Length of carapace	...	...	...	...	42.5
Length of carapace and rostrum	...	...	...	...	50.0
Maximum breadth of carapace (excluding spines)	...	...	...	...	36.0
Length of chelepeda	...	...	...	...	74.0
Length of palm (including fixed finger) along lower border	...	...	...	...	35.0
Median length of palm	...	...	...	...	23.0
Height of palm	...	...	...	...	12.0
Length of dactylus	...	...	...	...	16.5
Length of 1st walking leg	...	...	...	...	57.0

In large male examples the fingers are considerably more than half the length of the palm, and meet only at the tips, which, along with a distal part of the fingers, are channelled. In the female the chelipeds are distinctly thinner and shorter than the legs, the fingers are hardly channelled and meet throughout.

The female specimen has entangled between the legs strings of eggs of some sort arranged like bunches of grapes. The eggs are too young to be identified, only yolk granules being visible through the semi-transparent shell.

Schizophrys asper is quite a common species in the Indian coastal waters, there being specimens of it from several localities both from the Bay of Bengal and the Arabian Sea. Balss gives the distribution of the species as: "Im warmen Indopacific von der Ostküste Afrikas u. dem roten Meere bis Neu-Caledonien, Samoa u. Funafuti."

Family PARTHENOPIDAE.

Subfamily PARTHENOPINAE.

Oethra scruposa (Linn.).

1895. *Oethra scruposa*, Alcock, *Journ. As. Soc. Bengal* LXIV, pp. 285, 286.
 1930. *Oethra scruposa*, Flipse, *Siboga Exped. Rep.* XXXIXc², p. 89.

One male specimen of this apparently somewhat uncommon species is in the present collection. It agrees closely with named examples in the Museum collection, as also with Alcock's description of it. The specimen is labelled "Mergui" and is from Prof. Meggitt's first collection.

There are only two examples of this species in the collection of the Indian Museum, a male from the Andamans and a female from Ceylon. The species has a fairly wide range over the Indo-Pacific area, being known from the Indian Archipelago to the east coast of Africa,

Subtribe *BRACHYRHYNCHA*.

Family PORTUNIDAE.

Subfamily *CARCININAE*.***Carcinus maenas* (Linn.).**

1899. *Carcinus maenas*, Alcock, *Journ. As. Soc. Bengal* LXVIII, pp. 13, 14.

Four large examples of this rare Indian species were collected by Prof. Meggitt at Maungmagan in October, 1933. All the specimens agree closely with the numerous published descriptions of the species, as also with our named material from Galle in Ceylon and from a number of other localities in the Mediterranean Sea and the North Atlantic; the specimens are typical in every respect. All the four of them are infested with *Rhizocephala*.

The geographical distribution of *Carcinus maenas* has already been referred to on p. 381. As stated by Alcock, it is evidently a very rare Indian species, there being only one Indian example of it (from Galle) in the Museum collection so far. The species is, however, very common in the Atlantic Ocean and the Mediterranean Sea. Alcock has discussed the distribution of this species in the work cited above, and of several other species of Crustacea and other groups in his account of the "Investigator" *Madreporaria*¹ and *Brachyura*²). The distribution of *Carcinus maenas* is, however, especially remarkable on account of its being a shore crab.

Subfamily *LUPINAE*.***Scylla serrata* (Forskäl).**

1899. *Scylla serrata*, Alcock, *Journ. As. Soc. Bengal* LXVIII, pp. 27, 28.

1922. *Scylla serrata*, Balss, *Arch. Naturgesch.* LXVIII, Heft 11, p. 110.

There are seven specimens of this common Indo-Pacific species in the present collection; three of these are in Prof. Meggitt's first collection from Mergui and four from Maungmagan in the second. All the specimens are typical.

Scylla serrata is the common edible crab of India and many other countries. In India it is met with extensively in backwaters and estuaries all along the coast. Hora³ has described an ingenious method of its capture for market purposes in the creeks in the Gangetic Delta. The species has a very wide range of distribution all over the Indo-Pacific region; Balss gives its distribution as: "Rein indopazifisch vom Rotten Meere, der Ostküste Afrikas und dem Kap bis Japan, Australien, Tahiti und Aucklandinseln"

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

1934. *Neptunus sanguinolentus*, Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) I, No. 25, p. 303.

1935. *Neptunus (Neptunus) sanguinolentus*, Chopra, *Rec. Ind. Mus.* XXXVII, pp. 474-476.

One young female example of this species is in Prof. Meggitt's second collection; it was obtained from fisher-boat nets at Maungmagan. The

¹ Alcock, *Investigator Deep-Sea Madreporaria*, Calcutta (1898).

² Alcock, *Investigator Deep-Sea Brachyura*, Calcutta (1899).

³ Hora, *Current Sci.* III, pp. 543-546 (1935).

specimen is very badly mutilated and its identification is, therefore, somewhat doubtful.

As mentioned by Chopra, *N. sanguinolentus* has a very wide range of distribution. Sakai gives Simoda as the northernmost limit of the range of the species in Japan.

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

1935. *Charybdis (Goniosoma) cruciatus*, Chopra, *Rec. Ind. Mus.* XXXVII, pp. 482, 483.

There are two very young specimens referable to the present species in Prof. Meggitt's second collection; these were collected from fisher-boat nets at Maungmagan. No colour markings are present on the specimens.

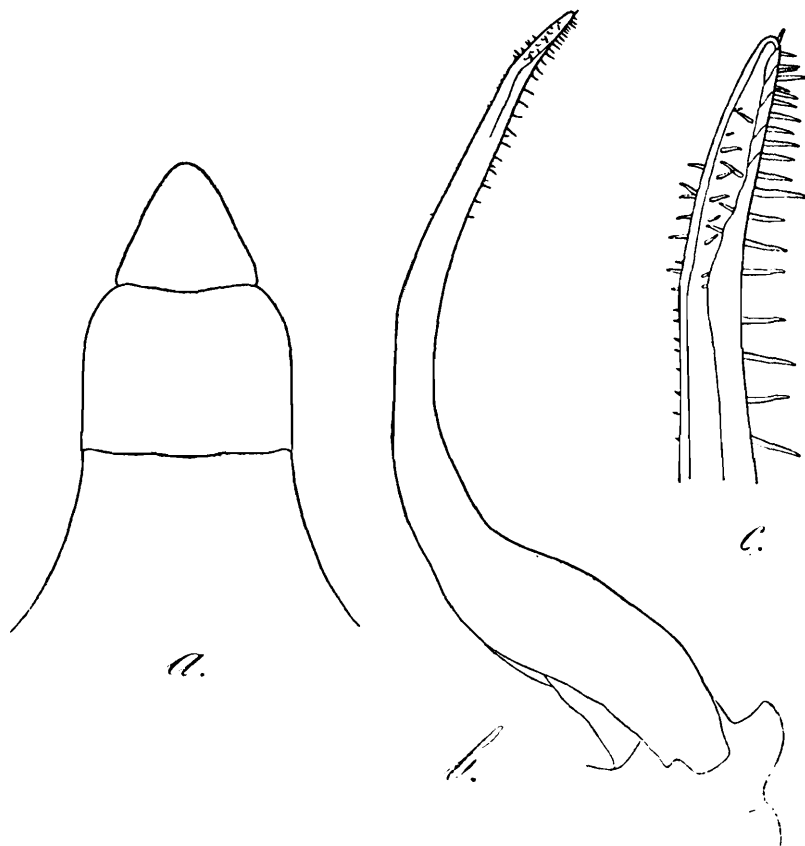
This species also, as described by Chopra, has a very wide range of distribution.

***Charybdis (Goniosoma) lucifera* (Fabricius).**

1899. *Charybdis (Goniosoma) quadrimaculata*, Alcock, *Journ. As. Soc. Bengal* LXVIII, p. 54.

1922. *Charybdis lucifer*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 106.

A single ovigerous female, collected at Mergui, is in Prof. Meggitt's first collection. It agrees closely with named specimens in the Indian Museum collection. In some specimens from the Coromandel coast in



TEXT-FIG. 3.—*Charybdis (Goniosoma) lucifera* (Fabr.).

a. Terminal part of male abdomen: $\times 5$. b. Left anterior male appendage: $\times 11$.
c. Tip of the same enlarged: $\times 34$.

the Museum collection the carapace is somewhat thickly furred; the present example does not show any trace of the fur.

The sixth segment of the male abdomen has a characteristic shape.

The anterior abdominal appendages of the male are as shown in the accompanying text-figure. They are of the type usual in the genus *Charybdis*. There is no bend near the tip, and except for the fact that the small lobe on the inner border a little behind the tip is absent, the appendages are very much like those of *C. merguensis* as figured by Chopra.¹

C. lucifera is met with on both the coasts of the Indian Peninsula. Balss gives its distribution as: "Ceylon, Küsten von Vorderindien, Java, Malabarenküste, Siam"

***Charybdis (Goniosoma) annulata* (Fabricius).**

1899. *Charybdis (Goniosoma) annulata*, Alcock, *Journ. As. Soc. Bengal* LXVIII, pp. 54, 55.

1922. *Charybdis annulata*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 106.

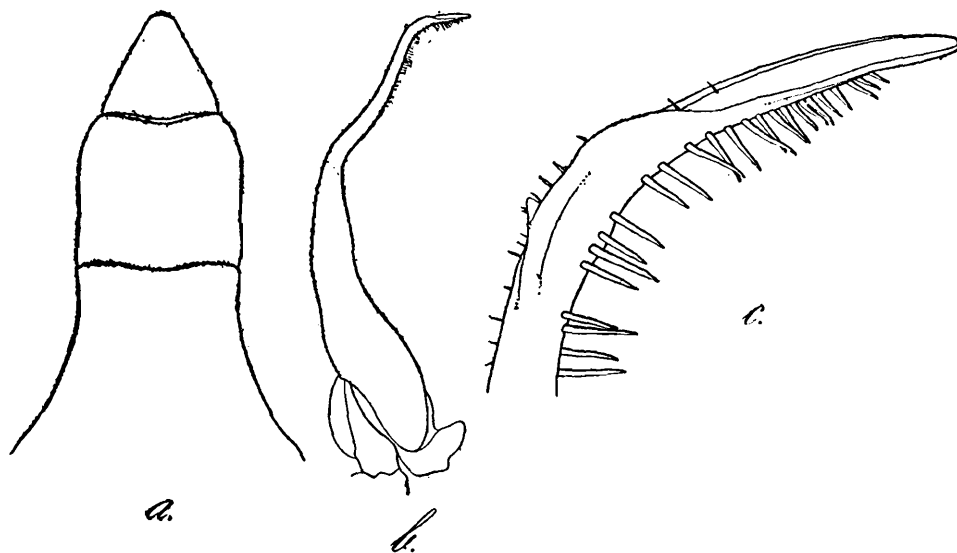
1937. *Charybdis (Goniosoma) annulata*, Leene, *Zool. Meded. Leiden* XIX, pp. 167-168.

The following specimens referable to the present species are in Prof. Meggitt's second collection:—

C 2285/1	Maungmagan, Cat's Eye Rocks	Prof. F. J. Meggitt	1 large ♂
C 2286/1	Maungmagan Rocks: low tide	Prof. F. J. Meggitt	1 ♀, 1 small ♂

The large male has a carapace length of about 47 mm. and a breadth of 68 mm. The female is about 38 mm. long and 55 mm. broad.

C. annulata closely resembles the preceding species, but the carapace is narrower and more convex, the orbits are shorter, being about one-third of the distance between the inner supra-orbital angles, and the



TEXT-FIG. 4.—*Charybdis (Goniosoma) annulata* (Fabr.).

a. Terminal part of male abdomen: $\times 2\frac{1}{2}$. b. Left anterior male appendage: $\times ca. 3$.
c. Tip of the same enlarged: $\times 24$.

lobule at the outer end of the lower orbital border is not dentiform. The sixth tergum of the male abdomen, as seen in text-fig. 4, is also longer

¹ Chopra, *Rec. Ind. Mus.* XXXVII, p. 485, text-fig. 8 (1935).

and has parallel sides. The acute spine on the posterior border of the carpus of the last leg, so characteristic of *C. merguiensis*, is absent in this species.

The anterior male appendages are of the usual type and are as shown in the accompanying text-figure. They are somewhat sharply bent near the tip. The inner margin has a small lobe-like process a little behind the tip, as in *C. merguiensis*.¹

Most of the specimens examined have no characteristic colour-markings, but the female specimen from Maungmagan has three rather prominent purplish patches on the carapace, one on each hepatic region and a larger one on the gastric.

A few measurements in millimetres of the large male from Maungmagan are given below :—

Length of carapace	...	...	...	...	...	...	46.9
Greatest breadth of carapace	...	...	...	...	...	...	68.2
Distance between outer and inner supra-orbital angles of one side	...	...	...	...	...	...	7.3
Distance between inner supra-orbital angles	...	...	...	...	...	...	24.0

Miss Leene has shown that *Cancer fasciatus* of Herbst is not a synonym of the present species as Alcock had suggested.

C. annulata is represented in the Indian Museum collection by specimens from Penang, Bimlipatam and Karachi. The species has a fairly wide range of distribution, being known from Tahiti, Siam, Mergui Archipelago, Ceylon and the Indian coasts.

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

1934. *Charybdis merguiensis*, Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) I, No. 25, p. 303.
 1935. *Charybdis (Goniosoma) merguiensis*, Chopra, *Rec. Ind. Mus.* XXXVII, pp. 484-486.
 1937. *Charybdis (Goniosoma) merguiensis*, Leene, *Zool. Meded. Leiden* XIX, pp. 165-167.

This species appears to be very common at Maungmagan and is represented by 10 specimens, eight males and two females in the two collections of Prof. Meggitt. Some of the specimens are very young.

The strongly arched "Querlinie" of Monod and Steinitz is faintly indicated in all the specimens, but the fringe of pile is practically absent in all the examples. The three dark red spots also are not seen on the carapace of any of the specimens.

The tips of the lateral spines of the carapace and the chelipeds and the distal parts of the fingers are brownish in colour.

Chopra mentioned the range of distribution of *C. merguiensis* from Hongkong in the east to the coast of Palestine in the Mediterranean Sea on the west. Sakai has given a record of occurrence of the species from Japan also and has thus extended the range considerably.

¹ Chopra, *Rec. Ind. Mus.*, XXXVII, p. 485, text-fig: 8 (1935).

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

1935. *Charybdis (Goniosoma) callianassa*, Chopra, *Rec. Ind. Mus.* XXXVII, pp. 489-491, pl. ix, fig. 1.

A single small female specimen in Prof. Meggitt's first collection from Maungmagan is referred to the present species with some doubt. The specimen is very immature and is badly damaged.

C. callianassa, as mentioned by Chopra, is known to occur from the Gulf of Siam to Karachi.

***Thalamita prymna* (Herbst).**

1899. *Thalamita prymna*, Alcock, *Journ. As. Soc. Bengal* LXVIII, pp. 78, 79.

1922. *Thalamita prymna*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 112.

There is one ovigerous female belonging to the present species in Prof. Meggitt's first collection; this was collected at Cat's Eye Rocks, Maungmagan.

The specimen agrees closely with Alcock's description, as also with named specimens in the Museum collection.

The species is represented in the collection of the Indian Museum by several specimens collected in the Bay of Bengal from Mergui to Madras. Balss gives its distribution as: "Natal, Rotes Meer, Indische Küsten und Inseln, Malayischer Archipel, Liu-Kiu-Inseln, Japan (Tokio-bai), Australien, Neu-Caledonien, Tongatabu, Samoainseln"

Family XANTHIDAE.

Subfamily XANTHINAE.

***Carpilodes margaritatus* A. M.-Edw.**

1898. *Carpilodes margaritatus*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 85, 86.

1925. *Carpilodes margaritatus*, Odhner, *Handl. Kungl. Vetensk. Vitterh. Göteborg* XXIX, No. 1, pp. 24, 25, pl. ii, fig. 4.

A single specimen from Drs. Prashad and Chopra's collection from Mergui is referred to the present species.

C2287/1	A submerged coral reef, off Jounjounja, a small rocky Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 20th Jan. 1937.	1 ♂
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The specimen has the following measurements (in millimetres) :—

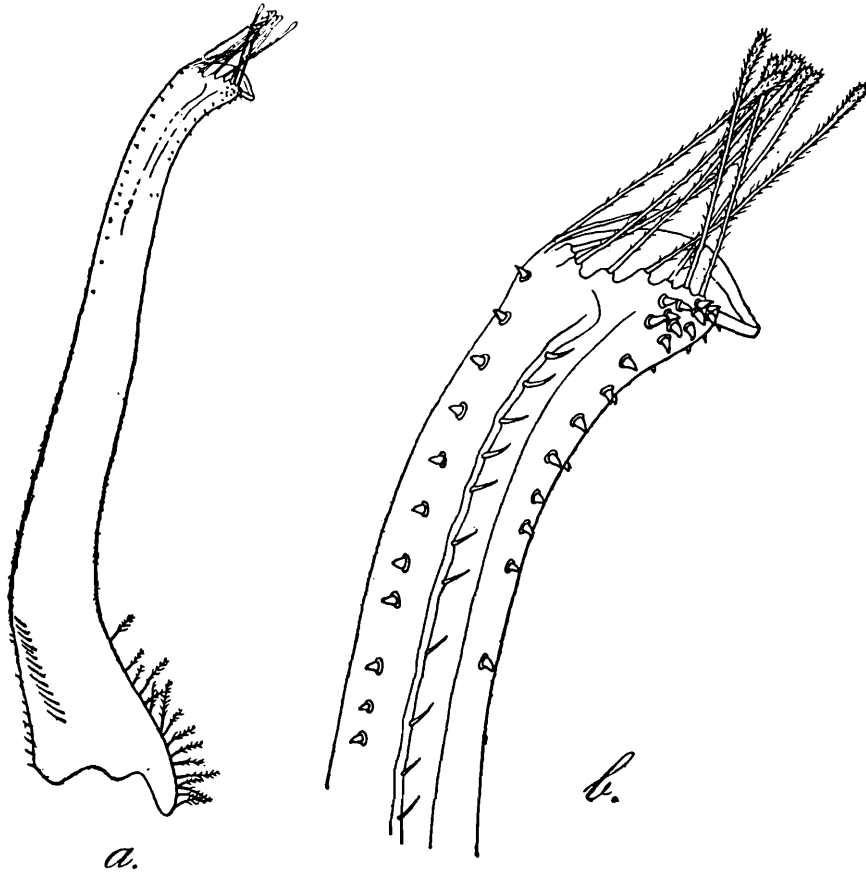
Length of carapace	5.8
Greatest breadth of carapace	...	...	...	...	...	...	9.4
Breadth of front	...	...	...	...	...	...	3.3

The specimen agrees exactly with the figure given by Odhner, as also with the figure and brief description of A. Milne-Edwards.¹ The breadth of the front does not appear to be a constant character of the species. In our example it is slightly more than one-third of the carapace breadth, as is the case in Odhner's figure also. In a specimen of

¹ A. Milne-Edwards, *Nouv. Arch. Mus. Paris* IX, p. 182, pl. v, fig. 2 (1873).

C. dioderus, which according to Odhner is only a synonym of the present species, the front is stated to be sometimes very much narrower.

The anterior male appendages of *C. margaritatus* are illustrated in the accompanying text-figure. Each appendage is practically straight



TEXT-FIG. 5.—*Carpilodes margaritatus*, A. M.-Edw.

a. Anterior left pleopod of male : $\times 40$. b. Tip of the same enlarged : $\times 113$.

and has a short claw-like tip. There are some long club-shaped, feathery hairs just below the tip on the exposed surface of the appendage, and some more or less similar, but shorter hairs near the base on the outside. Along both the margins behind the tip there are some very minute spinules, and a number of these bunched together just close to the tip on the outer side. The characteristic "scroll-like projection" shown in the figure given by Miss Gordon¹ for *C. lippus* (Nobili) is not present in this species.

C. margaritatus seems to be rare in Indian waters. There is no example of this species in the collection of the Indian Museum and Alcock included it in the Indian fauna on the authority of Henderson.² The species according to Odhner, however, has a wide range of distribution, having been recorded from a number of places from Samoa on the east to Madagascar and the Red Sea on the west.

¹ Gordon, *Mem. Mus. Roy. Hist. Nat. Belgique* III, Fasc. 15, pp. 24, 25, text fig. 13 (1934).

² Henderson, *Trans. Linn. Soc. London* (2) V, p. 353 (1893).

Atergatis integerrimus (Lamarck).

1898. *Atergatis integerrimus*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 95, 96.
 1922. *Atergatis integerrimus typicus*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 124.

There is one young female of this somewhat common species in Prof. Meggitt's first collection from Mergui. The carapace breadth of the specimens is about 35 mm.

The present specimen agrees closely with named examples in the Museum collection. The surface of the external maxillipeds has, however, a scanty growth of short hairs, and the walking legs, in addition to the usual little tuft of hairs near the far end of lower border of the propodus, have a few stiff hairs in a similar position on the ischium and merus also. In the allied species *A. dilatatus* de Haan (see Alcock, *op. cit.*, p. 97) the external maxillipeds are closely covered with long thick bristles and the lower border of ischium and merus of the walking legs has remarkable comb-like tufts of long stiff bristles.

A. integerrimus has a wide range of distribution, having been recorded from several localities from Japan to Zanzibar on the east African coast. In the Indian Museum there are examples from the Bay of Bengal only.

Xantho neglectus Balss.

1898. *Xantho distinguendus*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 113, 114 (*nec* 1835. *Xantho distinguendus*, de Haan, *Faun. Japon. Crust.*, p. 48, pl. xiii, fig. 7; 1922. *Xanthodius distinguendus*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, pp. 127, 128).
 1922. *Xantho neglectus*, Balss, *Zool. Anz.* LIV, p. 6 (name only).

On account of the fact that de Haan (*op. cit.*, p. 66) described the tips of the fingers in his *Xantho distinguendus* as "obtusus", Balss is of the opinion that de Haan's species cannot be retained in the genus *Xantho*, and further as in Alcock's (and several other authors') *Xantho distinguendus*, among other characters, the fingers are sharp-pointed, this crab, though rightly placed in the genus *Xantho*, cannot be considered the same form as de Haan had described under the name of *distinguendus*. Balss has, therefore, given the new name *neglectus* to the form that Alcock and several other writers had identified and described as *Xantho distinguendus* of de Haan. We have not gone deeply into this matter, but as the specimens¹ in the Indian Museum collection identified by Alcock as *Xantho distinguendus* differ considerably from the detailed description of *Xanthodius distinguendus* given by Balss in *Archiv für Naturgeschichte* (*loc. cit.*), we have preferred to adopt Balss' name for the Indian form.

There are six specimens of this species, one from Mergui and five from Maungmagan Rocks, low tide, in the two collections of Prof. Meggitt. They are all small and both the sexes are represented. The specimens agree closely with named examples in our collection, as also with Alcock's excellent description of the species.

¹ The specimens from Hongkong differ from all the other specimens in the collection in having the tips of their figures blunt and hollowed out, in having the carapace and chelipeds more profusely granulated and in a number of other characters. They agree fairly closely with the description of *Xanthodius distinguendus* given by Balss, and are probably referable to this species.

X. neglectus is represented in the Indian Museum collection by several specimens both from the Bay of Bengal and the Arabian Sea. The species seems to have a wide range over the Indo-Pacific area.

Leptodius exaratus (M.-Edwards).

1898. *Xantho* (*Leptodius*) *exaratus*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 118, 119.
 1922. *Leptodius exaratus*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 127.
 1934. *Xantho* (= *Leptodius*) *exaratus*, Gordon, *Mem. Mus. Roy. Hist. Nat. Belgique* III, Fasc. 15, pp. 29, 30.

A large number of specimens referable to this common Indo-Pacific species are represented in both the collections of Prof. Meggitt as also in that of Drs. Prashad and Chopra from Mergui. Both the sexes are represented and some of the females are ovigerous. The largest male specimen has a carapace length of 14.5 mm. and carapace breadth of 22.5 mm. Some of the very small specimens have the claws and most of the walking legs missing. Three or four specimens are infested with *Rhizocephala*.

There seems to be a great deal of variation in the shape and acuteness of the lateral lobes and teeth of the carapace; in younger individuals generally, though not always, the lobes are less distinct and the teeth are blunter. The carapace is non-granular in practically all the specimens.

In the Indian Museum there are numerous examples of this species from both the Bay of Bengal and the Arabian Sea, including the Persian Gulf. The species has a very wide range of distribution over the Indo-Pacific area having been recorded from a larger number of localities from Polynesia to the east coast of Africa.

Leptodius cavipes (Dana).

1898. *Xantho* (*Leptodius*) *cavipes*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 122, 123.
 1906. *Leptodius cavipes*, Nobili, *Ann. Sci. Nat. Paris* (9) IV, p. 243.

Two male examples of this somewhat rare species were collected by Prof. Meggitt from under stones in rock pools, between tide-marks at Maungmagan in October, 1933, along with a large number of specimens of the preceding species.

The species is easily recognised, among other characters, by the presence of a trough-like concavity on the upper surface of the carpopodites of the walking legs. Both our specimens agree in every respect with named specimens in the Museum collection.

L. cavipes is represented in the collection of the Indian Museum by specimens from Mergui, Andaman Islands and the Palk Strait between India and Ceylon. The species has a wide range of distribution, having been recorded from Bonin Island in the North Pacific in the east to the Red Sea and the east African coast on the west. Sakai¹ has recorded it from the Japanese coast.

¹ Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) I, No. 25, p. 310 (1934).

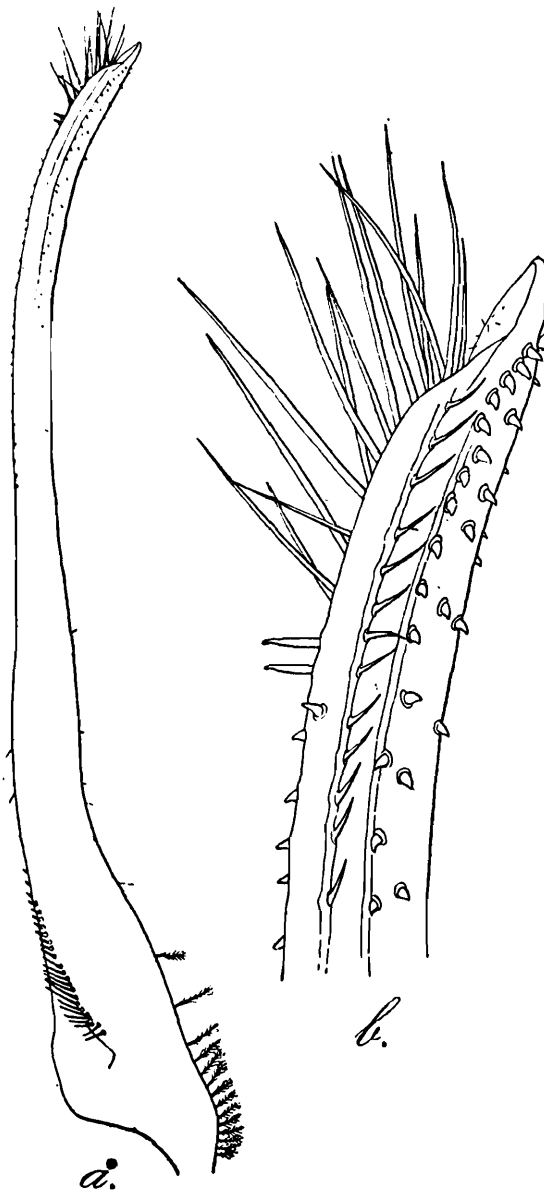
Subfamily *ACTAEINAE.*

Actaea areolata Dana.

1898. *Actaea areolata*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 141.

1925. *Actaea areolata*, Odhner, *Handl. Kungl. Vetensk. Vitterh. Göteborg* XXIX, No. 1, pp. 65, 66, pl. iv, fig. 12.

On account of the fact that Alcock described a dense covering of fur on the carapace of the single specimen from Mergui that he had examined, Odhner has expressed the opinion that Alcock's (and de Man's¹) *A. areolata* is not the same form as that described by Dana² under this name. Unfortunately this specimen from Mergui cannot be



TEXT-FIG. 6.—*Actaea areolata* Dana.

a. Left anterior pleopod of male : $\times 28$. b. Tip of the same enlarged : $\times 113$.

traced in the Museum collection and we are, therefore, unable to compare it with Odhner's description of the species. There are, however,

¹ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, pp. 25, 26 (1887).

² Dana, *U. S. Explor. Exped. Crust.* I, pp. 162, 163, pl. viii, figs. 1a, b (1852).

three examples from Mergui in the present collection that are clearly referable to Dana's *A. areolata*. Two of these are males (the larger one having a carapace length of 9.5 mm. and carapace breadth of 12.5 mm.) and the third, a young female. These specimens agree almost exactly with the descriptions and figures of Dana and Odhner. The hairs on the carapace are short and do not conceal the granulation and much less the areolae. The arrangement of the granules and the hairs is exactly as described and figured by Dana. The basal antennal joint reaches little beyond the front and the orbital border, therefore, does not form a complete ring as is shown by Odhner (*op. cit.*, pl. iv, fig. 11a) in his figure of *A. semoni* (Ortmann). The areolae of the carapace are almost exactly as in Odhner's figure of *A. areolata*, the only difference from Dana's figure being in the fact that the innermost areola on the proto-gastric lobe (2 M) is hardly broader than the areola on the mesogastric lobe (3 M). This difference was noticed by de Man in the case of his specimen from Mergui also. The mesogastric areola is in the form of an inverted T. The claws are densely hairy as described by Alcock.

We give here a figure of the anterior abdominal appendage of one of our male specimens. These are long and slender and are more or less of the type usual in the genus *Actaea*. The tips are as shown in the figure.

In the absence of the specimen on which de Man and Alcock based their descriptions of *A. areolata* it is difficult to express any opinion on Odhner's observations, referred to above, regarding the correct identification of this specimen. Our specimens are from more or less the same locality as de Man's and agree with it in practically every character, including the comparatively narrow innermost branch of the areola 2 M. de Man made no mention of the dense growth of hair on the carapace concealing the granulation, though Alcock seems to have considered this point of special importance. Except for a denser growth of hair on the carapace there does not seem to be any other difference between de Man's Mergui specimen and typical examples of *A. areolata* and it seems to us likely, therefore, that this specimen is referable to Dana's species.

The three specimens in the present collection are registered as under :—

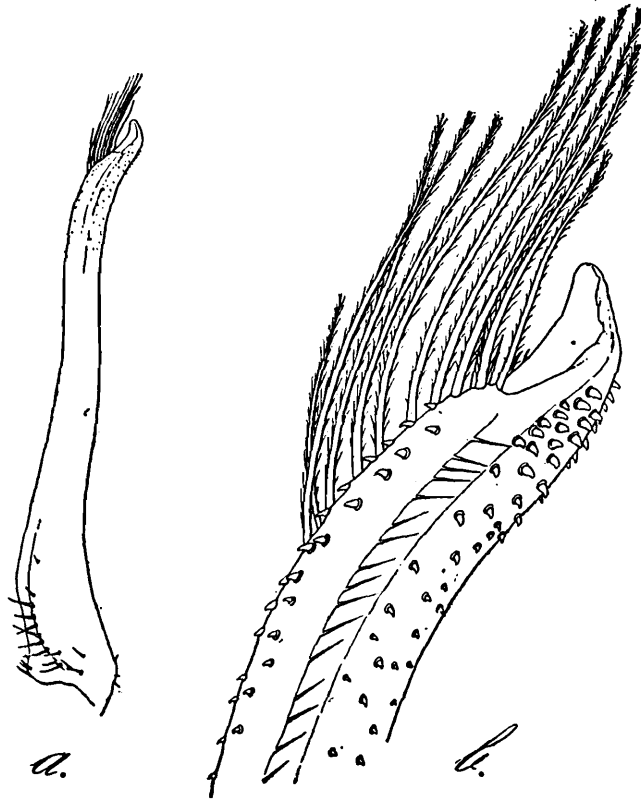
C2288/1	A submerged coral reef, off Joun-jounja, a small rocky island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 20th Jan., 1937.	1 ♂
C2289/1	A submerged coral reef near shore, off Palaïow on the east coast of Doung Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 20th Jan., 1937.	1 ♂, 1 ♀

The only record of *A. areolata* from Indian waters is from the Mergui Archipelago. Odhner has given several records of the species from the east coast of Queensland, Japan, N. W. Australia, Gulf of Siam and Singapore. The species seem to be restricted to the eastern part of the Indo-Pacific area only.

***Actaea calculosa* (M.-Edwards).**

1898. *Actaea calculosa*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 152, 153.
 1922. *Actaea calculosa*, Balss., *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 122.
 1925. *Actaea calculosa*, Odhner, *Handl. Kungl. Vetensk. Vitterh. Göteborg* XXIX, pp. 52, 53.

The present species resembles very closely *Actaea granulata* (Audoin), which according to Odhner and some other writers should be known



TEXT-FIG. 7.—*Actaea calculosa* (Milne-Edwards).

a. Left anterior pleopod of male : $\times 20$. b. Tip of the same enlarged : $\times 83$.

under H. Milne-Edwards' name of *savignyi*. The differences between *A. calculosa* and *A. savignyi* have been fully described by Alcock and Odhner. The male appendages also show some differences.

A. calculosa is represented in our collection by one male specimen (carapace length 7.7 mm., carapace breadth 10.5 mm.), collected by Drs. Prashad and Chopra from amongst corals in a submerged reef near shore, off Palaiow on the east shore of Doung Island in the Mergui Archipelago on 20th Jan., 1937. It agrees very closely with named examples of this species in the Museum collection.

The anterior male appendages are as shown in the accompanying text-figure. They are shorter and stouter than those of the preceding species, and the tip is blunter and somewhat more upturned. The hairs on the inner margin just behind the tip are also longer and have minute secondary hairs on them.

A. calculosa is represented in the Indian Museum collection by specimens from Mergui, Karachi and the Persian Gulf. Balss gives the distribution of the species from Torres Strait and Japan to the Red Sea. Odhner has extended the known range considerably by giving records of occurrence of the species from Adelaide, South Australia, and Tahiti in the Pacific.

Subfamily CHLORODINAE.

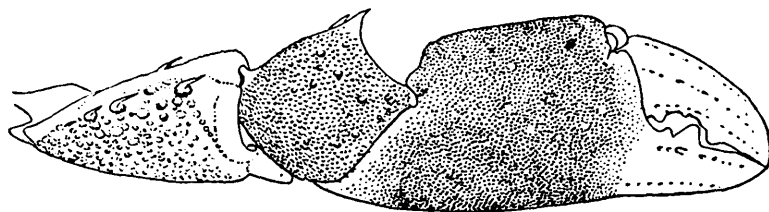
Chlorodiella niger (Forskäl).

(Plate VI, fig. 2.)

1898. *Chlorodius niger*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 160, 161.1936. *Chlorodiella niger*, Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) II, p. 166.

This common Indo-Pacific species was collected from a number of localities in the Mergui Archipelago by Drs. Prashad and Chopra and is represented in our collection by several specimens. Most of the specimens are small, the largest male having a carapace length of 7.8 mm. and carapace breadth of 11.5 mm. The species does not grow to a large size, as some of the females with a carapace length of between seven and eight millimetres are ovigerous.

An examination of some of the very young examples in our collection has shown that in a number of characters young individuals show considerable difference from adults. In one female specimen (plate VI, fig. 2) with a carapace length of about 4 mm. the external orbital tooth is sharper than is usually the case, the first spine on the anterolateral border is very small, blunt and almost like a tubercle, the next two spines are sharp and prominent and the fourth is smaller and blunter than the two preceding ones. There are a few stiff hairs scattered on the carapace, especially in the anterior part and along the edge of the front. The cheliped also shows some differences. There is a sharp spine on the anterior border of the arm, and the posterior border also has a spine and some crenulations. The inner angle of the wrist has

TEXT-FIG. 8.—*Chlorodiella niger* (Forskäl).

Right cheliped of a small female specimen, with a carapace length of about 4 mm., outer and upper view: $\times 13$.

two sharp and unequal spines. Further in the walking legs the anterior border of the merus is crenulate, or even sometimes spiny.

Some very young examples from the named collection of the Indian Museum that we have examined show all these characters clearly. In specimens even a little over 5 mm. in carapace length these characters can be seen. In slightly larger examples the fourth spine of the lateral margin of the carapace becomes increasingly acute; the second spine on the wrist becomes smaller and the other becomes a little blunter. In examples with a carapace length of 6 mm. all the characters of the adult can generally be seen.

Chlorodiella niger is represented in the Museum collection by a large number of specimens mostly from the Bay of Bengal. The species has a wide range of distribution, being known to occur from Hawaii on the east to the Red Sea and the African coast on the west. Sakai has given the records of its occurrence from Japan.

***Cymo melanodactylus* de Haan.**

1898. *Cymo melanodactylus*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 174.

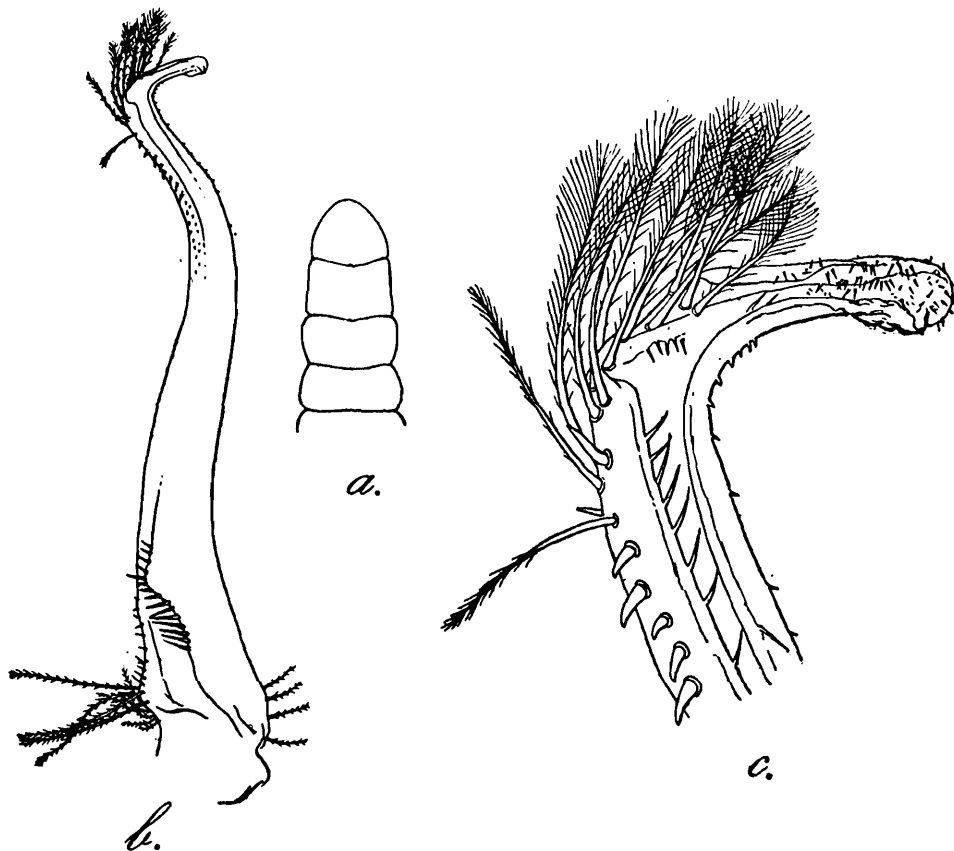
There are two male examples of the present species from Drs. Prashad and Chopra's collection from Mergui.

C2290/1	Submerged coral reef, off Cantor Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 19th Jan., 1937.	1 ♂
C2291/1	Submerged coral reef near shore, off Palaiow on the east coast of Doung Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 20th Jan., 1937.	1 ♂

The specimens have the following measurements, in millimetres :—

Length of carapace	..	..	..	10.0	7.2
Greatest breadth of carapace	..	..	..	11.0	8.0
Breadth of front	..	..	..	4.7	3.5

C. melanodactylus seems to be variable in the amount of granulation and lumps on the carapace, some specimens in the Museum collection having the carapace even more or less smooth. Similarly the tubercles on the chelipeds show considerable variation. In our examples the rows



TEXT-FIG. 9.—*Cymo melanodactylus* de Haan.

a. Terminal part of male abdomen of one of our specimens : $\times 4\frac{3}{4}$. b. Left anterior male pleopod : $\times 23$. c. Tip of the same enlarged : $\times 93$.

of tubercles on the upper surface and also on the outer surface near the upper border of the hand are in the form of broad-based, curved spines.

Some of the tubercles on the outer surface of the hand, unlike what is mentioned by Stimpson¹, are also reddish in colour. The basal parts of the fingers are strongly granulated, and are black. The dactyli of the walking legs are also tipped black.

The penultimate segment of the male abdomen in both our specimens has practically straight sides, whereas in some of the named examples in the Museum collection the sides are distinctly concave. The last segment also appears to be somewhat longer.

The anterior abdominal appendages of the male are sharply bent upwards (as seen in a specimen lying on its back) near the tip. Their form is shown in the accompanying text-figure. The tips are bluntly pointed and are beset with numerous minute spines. On the inner side just behind the tip there is a bunch of long plumose hairs, and the outer border behind the tip is a little serrate. In specimens in the Museum collection with sixth segment of the male abdomen having concave sides the anterior abdominal appendage does not show any material differences from what has been described above.

In the Indian Museum there are specimens of *C. melanodactylus* from Mergui, Andamans and Ceylon. According to Balss² the species is known from Tahiti to east coast of Africa.

Subfamily *MENIPPINAE*.

Menippe rumphii (Fabricius).

1898. *Menippe rumphii*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 178, 179.
1936. *Menippe rumphii*, Shen, *Chinese Journ. Zool.* II, p. 67.

There are several specimens of this species from Maungmagan in both the collections of Prof. Meggitt. Some of the specimens are light orange in colour on the upper side of the carapace, chelipeds and legs, with the lower side dirty whitish yellow.

The species is very common in Indian waters both in the Bay of Bengal and the Arabian Sea. Its range of distribution in the Indo-Pacific area is very wide.

Myomenippe hardwickii (Gray).

1898. *Menippe*, (*Myomennippe*) *granulosa*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 179, 180.
1899. *Myomenippe hardwickii*, de Man, *Notes Leyden Mus.* XXI, p. 56.
1934. *Myomenippe hardwickii*, Balss, *Faune des Colonies Francaises* V, Faso. 8, pp. 516, 517.

The correct synonymy of this species has been given by de Man and Balss.

Two specimens of *M. hardwickii* are in our collection.

C2292/1	Submerged coral reef, off Cantor Island, Mergui Archipelago.	Drs. B. Prashad and B. N. Chopra, 19th Jan., 1937.	2 ♂♂
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The specimens agree very closely with de Man's³ detailed description of the species given under the name of *Myomennippe granulosa*, as also

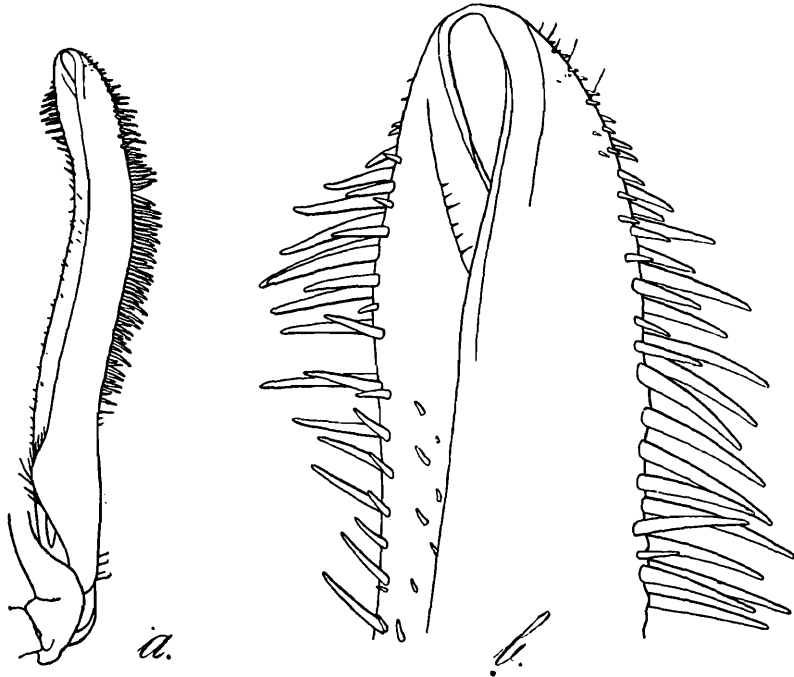
¹ Stimpson (Rathbun), *Smithsonian Misc. Coll.* XLIX, p. 59 (1907).

² Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 128 (1922).

³ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, pp. 40-43, pl. ii, fig. 1 (1887).

with examples named by him and by Alcock preserved in the Museum collection.

The anterior male appendages are as shown in the text-figure ; they are short and stout and are rounded at the tip. The usual ciliated



TEXT-FIG. 10.—*Myomenippe hardwickii* (Gray).

a. First left pleopod of male : $\times 4$. b. Tip of the same enlarged : $\times 20$.

channel is entirely closed leaving only an ovalish aperture near the distal end. The sides are beset with long stout hairs. The second pleopods are whip-like, as is usual in the subfamily.

The measurements, in millimetres, of the two examples from Mergui are given below :—

Length of carapace	..	..	..	40.0	23.0
Breadth of carapace	..	..	..	55.0	33.0
Distance between external orbital angles			..	27.5	18.0
Length of larger hand and fixed finger along lower border	..	..	..	40.0	23.0

In the Museum collection there are specimens of the present species from several localities in the Bay of Bengal. The only record outside the Bay is that of Balss from Dar-es-Salaam on the east coast of Africa.

Subfamily OZIINAE.

Epixanthus frontalis (Milne-Edwards).

1898. *Epixanthus frontalis*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 185.

1922. *Epixanthus frontalis*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, pp. 132, 133.

Two male examples referable to the present species are in the collection of Drs. Prashad and Chopra from Mergui. They are typical in every respect. The suture below the outer orbital angle is somewhat indistinct.

In the Museum collection there are specimens both from the Bay of Bengal and the Arabian Sea. The species is known from Tasmania to the east coast of Africa and the Red Sea.

Subfamily *PILUMNINAE*.

Pilumnus longicornis Hilgendorf.

(Plate VI, fig. 3.)

1898. *Pilumnus longicornis*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 193, 194.

1898. *Pilumnus andersoni*, Alcock, *op. cit.*, p. 194.

1933. *Pilumnus longicornis*, Balss, *Capita Zool.* IV, Af. 3, pp. 15, 16.

One specimen of this species, collected by Drs. Prashad and Chopra at Mergui, is in the present collection. We give below its measurements in millimetres.

Length of carapace	..	..	..	..	10·5
Breadth of carapace	..	..	..	..	14·0
Breadth of front (distance between internal orbital angles)					4·6
Length of larger hand along lower border			..	..	9·2
Height of larger hand	..	..		..	5·0
Length of smaller hand along lower border			..	..	8·0
Height of smaller hand	..	..	..	..	3·5

The specimen has some features which might be mentioned here :—

1. The inner orbital angles are acute.
2. The external margin of the second tooth on the lateral margin of the carapace is distinctly spiniform, that of the third is obscurely so.
3. The subhepatic granule is sharp.
4. The postero-lateral margins of the carapace are slightly more arched than is usually the case.
5. There are two spines on the inner angle of the wrist.
6. Meropodites of the walking legs are spiny on the upper margin.

Most of these characters are seen in our named examples also, though Alcock and some other authors have not mentioned these. The only noteworthy difference between our example and the older specimens that we have examined is in the sharpness of the subhepatic granule and in the postero-lateral margin of the carapace being somewhat more arched. So far as the latter character is concerned it seems, however, that in the males the postero-lateral borders of the carapace are generally arched a little more than in females of the same size.

P. longicornis is represented in the collection of the Indian Museum by specimens from both the coasts, as also from more eastern parts of the Bay. Balss gives the range of the species as : “ von Ostafrika bis Hawaii und Ponape.”

Pilumnus hirsutus Stimpson.

1898. *Pilumnus hirsutus*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 197.

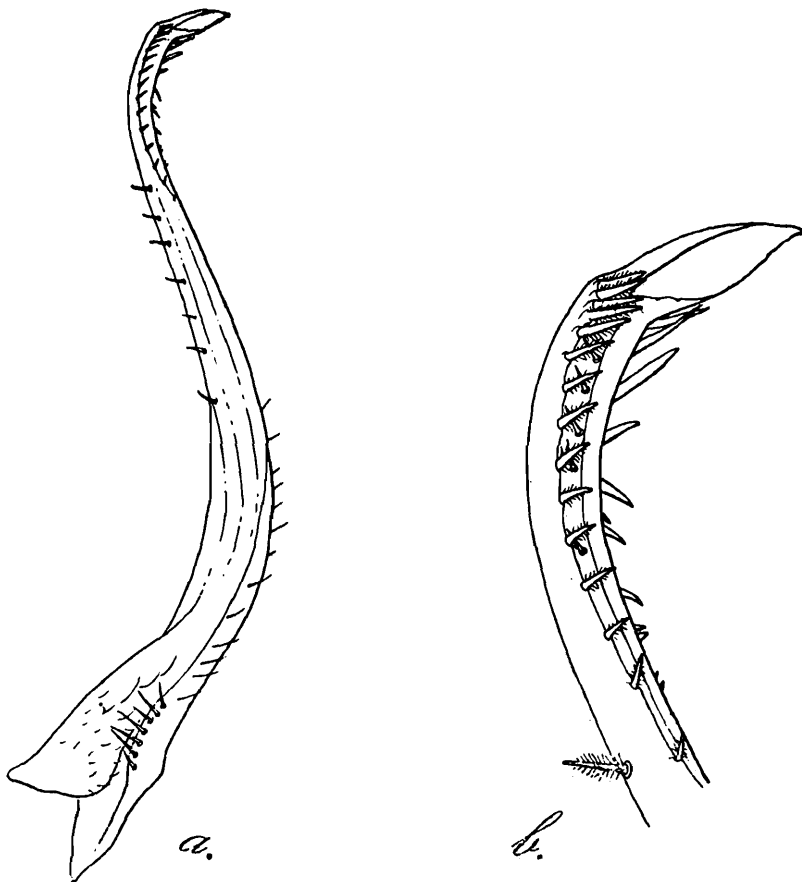
1922. *Pilumnus hirsutus*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, pp. 117, 118.

1933. *Pilumnus hirsutus*, Balss, *Capita Zool.* IV, Af. 3, p. 20.

There are three examples of *P. hirsutus* in the present collection. They were collected by Drs. Prashad and Chopra in different localities in the Mergui Archipelago; two of these are young males and the third, a young female. The specimens are typical.

The amount of granulation on the large claw varies considerably in our named examples.

The anterior abdominal appendages of the male from Mergui are as shown in the accompanying text-figure. In their general appearance



TEXT-FIG. 11.—*Pilumnus hirsutus* Stimpson.

a. Left anterior pleopod of male : $\times 34$. b. Tip of the same enlarged : $\times 113$.

they more or less conform to the type figured by Balss (1933, *op. cit.*, p. 10, fig. 2) as characteristic of the subfamily Pilumninae, but they seem to show a closer resemblance to the appendages figured by Miss Gordon¹ as of *P. seminudus* Miers, which species Balss (1933, *op. cit.*, pp. 13 and 39) has transferred to his new genus *Glabropilumnus*.

In the Museum collection there are specimens of the present species from the eastern part of the Bay of Bengal only. Balss (1922, *loc. cit.*) gives the range of distribution of the species as New Caledonia to the Red Sea, extending as far north as Korea on the coast of China.

¹ Gordon, *Journ. Linn. Soc. London (Zool.)* XXXVII, p. 541, text-fig. 17a, b (1931).

Actumnus elegans de Man.1898. *Actumnus elegans*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 206.1933. *Globopilumnus globosus*, Balss, *Capita Zool.* IV, Af. 3, p. 7, pl. i, figs. 1 and 2 (*partim*).

Balss is of the opinion that the form described by de Man and Alcock as *Actumnus elegans* is only a young stage of Dana's¹ *Pilumnus globosus*, which species he has transferred to his new genus *Globopilumnus* in the subfamily Menippinae. He was led to this opinion on a comparison of de Man's paratype of *A. elegans* with young specimens of, what he identified as, *Pilumnus globosus* of Dana. We are unable to subscribe to this view. We have before us one of the original specimens of de Man from Mergui (labelled co-type), two specimens from Kyuk Phyu Harbour and four examples from Mergui recently collected by Drs. Prashad and Chopra. All these seven specimens agree very closely with the descriptions of de Man and Alcock, and are no doubt conspecific. One of these specimens, from Kyuk Phyu, is an ovigerous female and, shows unmistakably all the characters on which de Man based his species. This specimen, which is the largest in our collection, has the following measurements (in millimetres):—

Length of carapace	..	..	..	..	7.2
Greatest breadth of carapace	..	..	..	..	9.2
Breadth of front	..	..	..	..	3.0
Breadth of fronto-orbital border	..	..	..	..	6.2

It would thus appear that *Actumnus elegans* is normally a small species, and what Balss believed to be the characters of the young only persist up to the adult stage also. The co-type from Mergui is a young male with a carapace length 3.9 mm. and there are hardly any characters to distinguish this specimen from the ovigerous female referred to above.

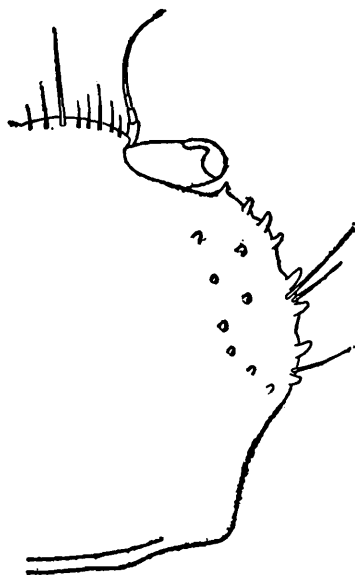
Actumnus elegans is easily recognised, among other characters, by the paired arrangement of the spinuliform granules on the antero-lateral margins of the carapace. Typically there are eight of these granules on each margin; six of these are arranged in three pairs, the seventh is between the granules of the first pair and the outer orbital angle and the eighth is at the outer orbital angle itself. We give here an outline-figure of the carapace of the ovigerous female from Kyuk Phyu and the disposition of the granules will be clearly seen from it. In one of the recently collected specimens from Mergui, however, there are two or three additional minute granules in between the larger paired granules. In all the other examples the number and arrangement of the granules is quite typical. In Dana's *Pilumnus globosus*, as described both by Dana and de Man,² there are only three or four isolated granules on the antero-lateral border of the carapace. The upper orbital border in *Actumnus elegans*, as described by de Man³ has a characteristic shape. In de Man's words "the frontal or inner part of the upper margin of the orbits makes nearly right angles both with the frontal and the external, somewhat granular portion of the upper orbital margin"; this is

¹ Dana, *U. S. Explor. Exped. Crust* I, pp. 236-237, pl. xiii, fig. 10 (1852).

² de Man, *Notes Leyden Mus.* XII, pp. 59-61, pl. xiii, fig. 10 (1890).

³ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, 1 p. 47-49 (1887).

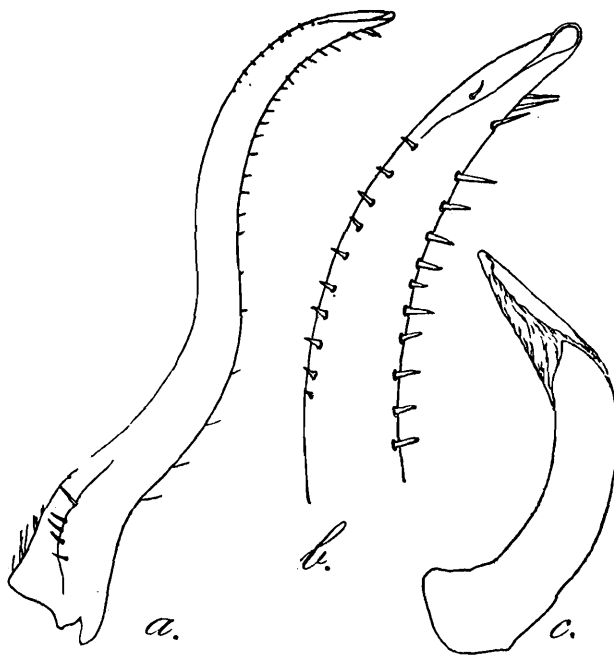
clearly seen in the text-figure. In *P. globosus*, as seen in Dana's figure, the upper margin of the orbit. is regularly rounded.



TEXT-FIG. 12.—*Actumnus elegans* de Man.

Upper view of carapace of ovigerous female specimen from Kyuk Phyu : \times ca. 9.

The abdominal appendages of the male, that we have been able to examine in the single male specimen (co-type from Mergui) in our collection are unmistakably of the *Pilumnus* type.¹ They are as illustrated



TEXT-FIG. 13.—*Actumnus elegans* de Man.

a. First left pleopod of male : \times 41. b. Tip of the same enlarged : \times 107. c. Second left pleopod of male : \times 107.

in the accompanying text-figure. The second pleopod is very much shorter than the first and is not whip-like. The species, therefore, cannot be included in the subfamily Menippinae as proposed by Balss.

¹ We have also examined these appendages in a specimen of *A. setifer* (de Haan) that has been seen by Dr. Balss ; they are more or less like those of *A. elegans* in their general form and structure.

The species is represented in the present collection by four examples collected by Drs. Prashad and Chopra in the Mergui Archipelago.

- | | | | |
|---------|---|---|--------------------|
| C2293/1 | Submerged coral reef off Cantor Island, Mergui Archipelago. | Drs. B. Prashad and B. N. Chopra, 19th January, 1937. | 1♀ from an oyster. |
| C2294/1 | Submerged coral reef off Palaïow on the east coast of Doung Island, Mergui Archipelago. | Drs. B. Prashad and B. N. Chopra, 20th January, 1937. | 3 ♀♀ from corals. |

One of the specimens from Palaïow is infested with a Rhizocephalon. *A. elegans* is so far known from Mergui only.

Subfamily *ERIPHINAE*.

Trapezia cymodoce (Herbst).

1898. *Trapezia cymodoce*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 219, 220.
 1922. *Trapezia cymodoce*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 134.
 1936. *Trapezia, cymodoce*, Sakai. *Sci. Rep. Tokyo Bunrika Daigaku* (B) II, pp. 169, 170.

This common coral crab is represented in the collection of Drs. Prashad and Chopra by 19 specimens from a number of localities in the Mergui Archipelago. There are examples of both the sexes and some of the females are ovigerous. The largest specimen, a female, has a carapace length of 15 mm., carapace breadth 19 mm. and the fronto-orbital border 16 mm. One female has two Bopyrids under the carapace, forming lumps one on each side near the junction of the antero- and postero-lateral borders; this specimen has a little pubescence on the carapace, especially in the anterior half. All the specimens are typical.

The species is represented in the collection of the Indian Museum by specimens both from the Bay of Bengal and the Arabian Sea. According to Balss it is distributed from Polynesia to the east coast of Africa.

Trapezia ferruginea, var. *areolata* Dana.

1898. *Trapezia ferruginea*, var. *areolata*, Alcock, *Journ. As. Soc. Bengal* LXVII, p. 221.
 1907. *Trapezia cymodoce areolata*, Rathbun, *Mem. Mus. Comp. Zool. Harvard* XXXV, p. 59.

Miss Rathbun is of the opinion that a large number of forms that have been described as *T. cymodoce*, *T. ferruginea* and its varieties or as *T. maculata* are all referable to the first-named species.

We have before us six female examples (three ovigerous) that are referable to Dana's *Trapezia areolata*. These were collected by Drs. Prashad and Chopra in the Mergui Archipelago.

The "elegant honeycomb network of fine brown" described by Alcock is very distinct and in most cases extends to the claws, sides and ventral surface of the carapace and even to the abdomen. The upper part of the outer surface of the hand is finely pubescent in most of the examples.

The largest female has a carapace length of 9 mm., carapace breadth 11.5 mm. and fronto-orbital border 10 mm. The range of distribution of the present form is more or less the same as that of *Trapezia cymodoce*,

Tetralia glaberrima (Herbst).

1898. *Tetralia glaberrima*, Alcock, *Journ. As. Soc. Bengal* LXVII, pp. 223—225.
 1922. *Tetralia glaberrima*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft. 11, p. 134.

Like the two preceding species *Tetralia glaberrima* is also very commonly met with living in corals; twelve examples of this species were collected by Drs. Prashad and Chopra from amongst corals in the Mergui Archipelago. Both the sexes are represented in the collection and some of the females are ovigerous. We give below some measurements, in millimetres, of two males and two ovigerous female specimens.

		Ovig. ♀	Ovig. ♀	♂	♂
Length of carapace ...	...	10.2	7.5	8.0	8.8
Breadth of carapace ...	...	12.2	9.0	9.2	10.0
Breadth of fronto-orbital border...		10.5	8.2	8.2	9.0

In the Indian Museum there are numerous examples of this species both from the Bay of Bengal and the Arabian Sea. The species has a very wide range of distribution over the Indo-Pacific area, being met with from Polynesia to the east coast of Africa.

Family GONOPLACIDAE.

Subfamily PSEUDORHOMBILINAE.

Litocheira angustifrons Alcock.

(Plate VI, fig. 4.)

1900. *Litocheira angustifrons*, Alcock, *Journ. As. Soc. Bengal* LXIX, p. 315.
 1918. *Litocheira angustifrons*, Tesch, *Siboga Exped. Rep.* XXXIX c¹, p. 163, foot-note.
 1933. *Heteropilumnus angustifrons*, Balss, *Capita Zool.* IV, Af. 3, pp. 41-44.

A single specimen of this apparently rare species is in the present collection :—

C2295/1 Palaiow, on the east coast of Doung Island, Mergui Archipelago, on beach at low tide. Drs. B. Prashad and B. N. Chopra, 20th January, 1937. 1♀

The specimen agrees very closely with Alcock's named examples in the collections of the Indian Museum, as also with his description. Alcock's description of the species is very brief and does not mention several important characters and as Tesch has expressed some doubts about the validity of the species we have thought it desirable to redescribe it in some detail.

The entire surface of the carapace (Plate VI, fig. 4), chelipeds (excepting the fingers) and the legs is covered with a short, dense fur and long silky hairs, the latter being most abundant on the lateral margins of the carapace and on the chelipeds and legs. There is a row of similar hairs

just behind the fronto-orbital margin surmounting a low and somewhat indistinct ridge. The length of the carapace is almost three-fourths of its breadth. It is more or less flat, especially in the posterior part, the anterior region being somewhat curved and markedly deflexed anteriorly. When denuded the surface of the carapace is smooth, with only a few small granules on and near the antero-lateral margins. The regions are very faintly distinguishable and the crecentic groove between the gastric and cardiac regions is deeply impressed.

The fronto-orbital border is distinctly shorter than the length of the carapace, and, as mentioned by Alcock, is about five-ninths of its greatest breadth. The front is strongly deflexed anteriorly and is distinctly bilobed, each lobe being somewhat convex anteriorly. It is a little less than one-third of the carapace breadth. The two lobes of the front are separated from one another by a small deep notch, followed by a shallow groove running longitudinally for some distance on the carapace. The front is not demarcated from the supra-orbital angles.

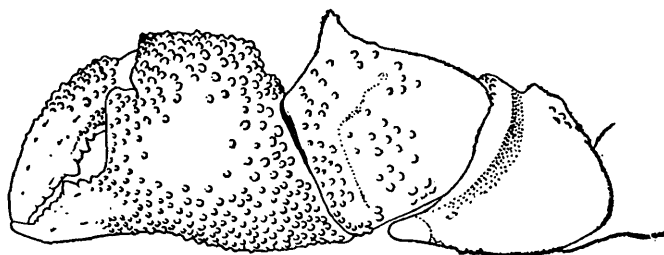
The antero-lateral borders of the carapace are shorter than the postero-lateral and are arched. On each side the antero-lateral margin is cut up by three deep notches into four lobes. The first lobe is confluent with the external orbital angle; its margin is truncate, with the anterior angle acute, and the posterior somewhat blunt. The second lobe is as large as, or even a little larger than the first; its margin is rounded, the anterior angle sharp and the posterior regularly rounded. The third lobe is considerably smaller than the first two and is sharply truncate, while the fourth is the smallest, is triangular and somewhat acutely pointed. The margins of all the lobes are crenulate as is also a small part of the postero-lateral margin of the carapace behind the fourth tooth. The postero-lateral margins are more or less straight and converge posteriorly. The posterior margin is slightly sinuous.

The upper border of the orbit is crenulate. There is a small triangular groove near the outer orbital angle and one in a similar position on the lower border. There is another small and indistinct notch on the middle of the upper border. The outer orbital angle is acute. The eye-stalks are cylindrical, fill up the orbits completely and the greatly reduced and pigmented corneas are somewhat ventrally placed at their tips.

The antennules fold transversely in their fossae and the antennal flagella, as usual, stand in the orbital hiatus. The epistome is quite distinct, and the buccal cavern is somewhat widened anteriorly. The external maxillipeds completely close the buccal cavern and the broad merus has its antero-external angle slightly produced.

The chelipeds are slightly unequal, especially in the male, in which they are about twice the length of the carapace and are almost as long as the penultimate pair of walking legs. In the female the chelipeds are less than twice the carapace length and are shorter than the legs. They are thickly covered with fur and long hairs, except on the fingers which are quite bare. In the Mergui specimen the larger claw has a part of the outer surface of the palm near the distal end also bare, but

in the smaller claw the whole of the outer surface of the palm is thickly covered with hairs. The inner surface of the palm is almost completely devoid of hairs. The upper border of the arm has a thin longitudinal crest on it, with a spine-like lobule near its distal end. There is also an indistinct transverse ridge on the outer face of the arm, a little from the distal end. The wrist has its inner angle acute, almost spiniform, and its upper surface granular, especially near its junction with the hand. The upper surface of the palm is densely covered with granules, and the



TEXT-FIG. 14.—*Litocheira angustifrons* Alcock. Outer view of the left cheliped of male from Karachi: $\times 3$.

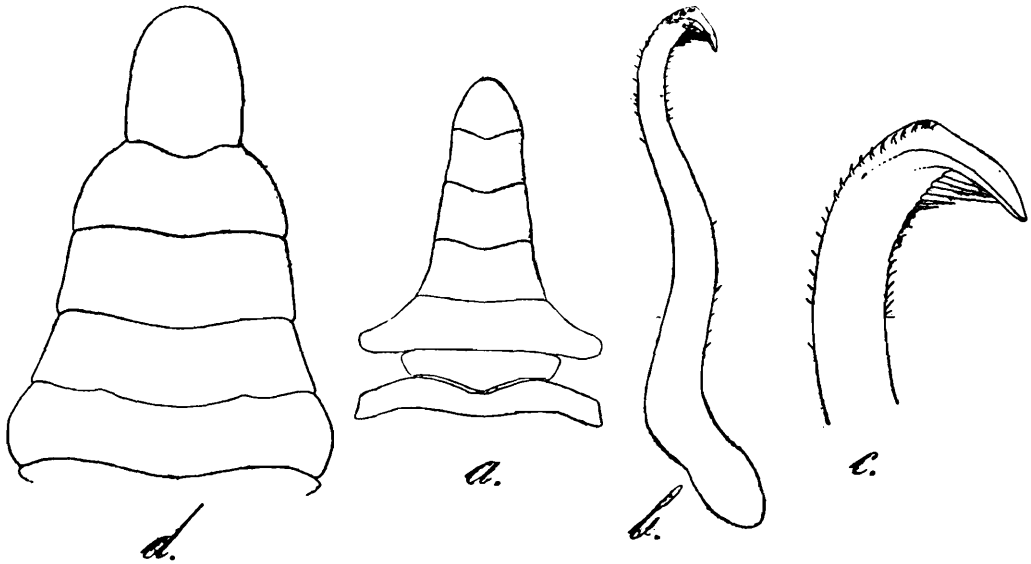
outer surface also is granular, except for a smooth patch in the middle. In the larger chela of the Mergui specimen the outer surface of the palm is quite smooth, as described by Stimpson¹ for *Pilumnoplax ciliata*. The inner surface of the palm is altogether devoid of granules. The upper margin of the palm is straight and is considerably shorter than its height. The fingers are long and stout and the dactylus is slightly arched. The proximal half of the upper surface of the dactylus and less than half of the lower surface of the fixed finger is granular. The cutting edges of the fingers are finely dentate, with one large tooth on each finger about the middle of the cutting edge. There is a small gap near the base when the fingers meet and the pointed tips cross one another slightly.

The third walking legs are the longest, while those of the last pair are the shortest. The merus in all the legs is without any crest, anterior or posterior. The dactyli of the first three pairs are long and straight with short, pointed horny tips, while those of the last pair are short and stout. In the large male specimen from Karachi the third leg of one side is shorter than the second, but it has possibly been regenerated, for it is shorter than the corresponding leg of the other side.

All the seven abdominal segments are distinct in both the sexes. The first segment of the male abdomen (text-figure 15 a) occupies all the space between the bases of the last pair of walking legs. The second is narrower, and the third at the base is almost as broad as the first. The sides of this segment converge strongly distally so that it is very much broader at the base than at its distal end. From the third segment the abdomen tapers gradually to the tip. The fourth, fifth and sixth segments are subequal in length and the basal breadth of the sixth is about one and a half times of its median length. The anterior abdominal appendages

¹ Stimpson (Bathbun), *Smithsonian Misc. Coll.* XLIX, pp. 92, 93 (1907).

of the male are somewhat like those of *L. subintegra* Lanchester, as figured by Miss Gordon.¹ The appendages of the two sides are not in any close contact distally and the apex of each is bent outwards and considerably upwards, perhaps not quite as sharply as shown in Miss Gordon's figure. Just behind the tip on the outside there is a tuft of long hairs decreasing in size distally and on the inner side there are a few minute spinules just at the place where the tip bends.



TEXT-FIG. 15.—*Litocheira angustifrons* Alcock. a. Abdomen of male specimen from Karachi: $\times 2\frac{2}{3}$. b. Anterior left abdominal appendage of same: $\times 7$. c. Tip of the abdominal appendage magnified: $\times 20$. d. Abdomen of male of *Clistocoeloma balanse*² A. M.-Edw.: $\times 4\frac{1}{2}$.

The older specimens are a dirty light brownish in colour, with the fingers white and the pearly granules on the palm also showing white through the long hairs. In the Mergui specimen the colour is dirty greyish, but on removal of the fur and hairs it is seen to be ivory white. The fingers in this specimen are light brownish in their entire length.

Alcock based the species on two specimens, a female from Bombay and a larger male from Karachi. In the Indian Museum collection the female specimen from Bombay is labelled as the type, and is numbered 6182/3. The species has since been recorded, without any comments, by Borradaile³ from Male Atoll in the Maldives and has now been obtained from the Mergui Archipelago.

We give below measurements in millimetres and the proportions of certain measurements of the carapace in the three specimens of *L. angustifrons* in the Museum collection. For purposes of comparison we have also included similar measurements and proportions of *L. cristata* Rathbun,⁴ so far as published by the author.

¹ Gordon, *Journ. Linn. Soc. London (Zool.)* XXXVII, p. 549, text-fig. 25b (1931).

² The figure of the male abdomen of *Clistocoeloma balansae* has been included in this block through a mistake; it should have formed a part of text-figure 21 on p. 432.

³ Borradaile, *Fauna Geog. Maldive Laccadive Arch.* I, p. 430 (1903).

⁴ Rathbun, *Skrift. K. Dansk. Vidensk. Selsk. Copenhagen* (7) V, pp. 340, 341 (1910).

	<i>L. angustifrons.</i>			<i>L. cristata.</i>
	Female Type- specimen from Bombay.	Male from Karachi.	Male from Mergui.	Female Type- specimen.
Length of carapace	11.0	13.2	9.4	5.5
Greatest breadth of carapace	14.8	18.4	12.2	7.7
Fronto-orbital breadth	8.2	10.0	7.0	5.0
Breadth of front	4.6	5.5	4.0	2.8
Length of hand along lower border (large claw)	8.9	13.2	9.0	..
Height of palm (large claw)	5.1	7.8	5.1	..
Length of hand along lower border (small claw)	8.7	12.8	8.4	..
Height of palm (small claw)	4.7	7.4	4.8	..
Penultimate walking leg—				
Length of merus	8.8	9.5	7.5	..
Length of carpus	4.5	} 11.5	4.2	..
Length of propodus	5.5		4.5	..
Length of dactylus	5.5	6.3	4.7	..
<u>Carapace length</u> ... ..	.74	.72	.77	.71
<u>Carapace breadth</u>				
<u>Fronto-orbital breadth</u> <u>Carapace breadth</u> ... ..	.55	.54	.57	.65
<u>Front</u> <u>Carapace breadth</u> ... ..	.31	.30	.33	.36

Litocheria angustifrons resembles *L. ciliata* (Stimpson) and *L. cristata* Rathbun so closely that Tesch has suggested that the three may have to be combined under Stimpson's name. Alcock's species, however, differs from Stimpson's in having a narrower carapace and from both the allied species in having the walking legs without any crest on the merus. In *L. cristata* the upper surface of the wrist is strongly eroded and has a blunt ridge along the inner edge; there is hardly any trace of the erosion or the ridge in Alcock's species, nor has their presence been mentioned by Stimpson. The front and the fronto-orbital border are also broader in Miss Rathbun's species than in *L. angustifrons*. The walking legs of the second pair are stated to be longer than those of the third in *L. cristata*, while, as is usually the case, the third legs are the longest in both Alcock's and Stimpson's species. The shape of the teeth on the antero-lateral margins of the carapace is also slightly different in Alcock's and Miss Rathbun's species. Stimpson's species is very inadequately known and it is therefore, impossible to enumerate any other differences that may possibly exist between his species on the one hand and Alcock's and Miss Rathbun's species on the other. The general resemblance between the three species is, however, very close and striking.

The position of a number of species grouped in the genus *Litocheira* appears to us to be far from satisfactory. According to Kinhan's¹ definition of the genus and the genotype, in addition to other characters, members of the genus *Litocheira* are characterised by having a front which is about half as broad as the carapace, and by the possession of an orbit the upper border of which is entire. A large number of species that are now included in the genus agree with the type-species, *L. bispinosa*, in these, as also in most other characters, but there are certain others in which the frontal breadth is markedly less than half the carapace breadth, or in which the upper border of the orbit has one or two distinct gaps. In *L. angustifrons*, *L. setosa* (A. M.-Edw.)² and *L. integra* (Miers),³ to mention only the species that we have ourselves examined, the front is either exactly or only a little more than one-third of the carapace breadth, while in *L. angustifrons*, *L. quadrispinosa* Zehntner² and perhaps in several others the upper border of the orbit has two more or less distinct gaps. In the matter of the anterior abdominal appendages of the male also there appears to be a great deal of difference between the genotype and several other species. We give here a figure of the anterior male appendage in *L. bispinosa* from a specimen



TEXT-FIG. 16.—*Litocheira bispinosa* Kinhan. a. Left anterior pleopod of male : $\times 12$.
b. Tip of the same magnified : $\times 35$.

from St. Vincent Gulf, South Australia, presented to the Indian Museum, and a comparison of this with the similar appendage of *L. angustifrons* as figured here, or of *L. subintegra* Lanchester, *L. subintegra*, var. *hirsutior* Lanchester and *L. amoyensis* Gordon, as figured by Miss Gordon⁴ will

¹ Kinhan, *Journ. Roy. Dublin Soc.* I, pp. 121-123, pl. iii, fig. 1 (1856).

² See Tesch, *Siboga Exped. Rep.* XXXIX c¹, pp. 165-167, pl. vii, fig. 1 and pp. 168-171, pl. vii, fig. 3 (1918).

³ Miers, *Zool. "Alert"*, p. 543, pl. xlvi, fig. c (1884).

⁴ Gordon, *Journ. Linn. Soc. London (Zool.)* XXXVII, p. 549, text-fig. 25 (1931).

show the great difference between the appendage of the type-species on one hand, and that of the species named here on the other. We have also examined this appendage in *L. setosa* (A. M.-Edw.) and *L. beaumontii* Alcock¹ and find that in these species also the anterior abdominal appendages of the male are more or less of the same type as in *L. angustifrons* and the other species named here. Miss Gordon² believes that in the genus *Litocheira* the anterior abdominal appendages of the male are of two kinds, both the kinds having a beak-like apex, but, differing from one another chiefly in the presence or absence of a very large spine just under the apex; all the species that we have examined, except *L. bispinosa*, or the figures of the male appendages of which have been published conform to one of these types. In the genotype, however, the appendage, besides being short and proportionately very stout, has no beak-like apex. The terminal portion is straight, blunt and truncate and is beset with a profuse growth of long hairs on both the margins. From all the differences enumerated above it seems to us likely, therefore, that the inclusion of some of the species now grouped in the genus *Litocheira* is only a matter of convenience, and does not represent their true natural relationship with the other members of the genus. An examination of the anterior abdominal appendages of the male in all the known species of the genus seems to us very desirable.³

Balss has recently suggested that *L. angustifrons* along with some other species that are now included in the genus *Litocheira* should be accommodated in de Man's genus *Heteropilumnus* in the family Xanthidae. From what has been stated above we are also of the opinion that certain species at present assigned to the genus *Litocheira* do not agree with the type-species of this genus in a number of important characters, and it may perhaps be advisable to put such species in another genus. We are not, however, convinced that these species could find a place in the genus *Heteropilumnus* or be included in the family Xanthidae. A considerable amount of further work on all the species included in *Litocheira* and *Heteropilumnus*, and specially on their male appendages, could only settle this point. We have included *L. angustifrons* in the genus *Litocheira* in the family Gonoplacidae chiefly as a matter of convenience.

Family POTAMONIDÆ.

Subfamily POTAMONINÆ.

Potamon (Acanthotelphusa) dayanum (Wood-Mason).

1910. *Potamon (Acanthotelphusa) dayanum*, Alcock, *Cat. Ind. Decapod Crust.* I, *Brachyura* Fasc. II, pp. 61-63, pl. xi, fig. 49.

One large female specimen of the present species is in Prof. Meggitt's first collection from Maungmagan. The exact locality from which it was obtained is not mentioned. The specimen is quite typical. A

¹ Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 315, 316 (1900).

² Gordon, *Journ. Linn. Soc. London (Zool.)* XXXVII, p. 526 (1931).

³ Of the seven species of the genus *Litocheira* in the Indian Museum collection, viz., *L. bispinosa* Kinhan, *L. setosa* (A. M.-Edw.), *L. beaumontii* Alcock, *L. angustifrons* Alcock, *L. integra* (Miers), *L. quadrispinosa* Zehntner, and *L. kingsleyi* Miers the last three are represented by female examples only.

large number of more or less fully-formed young ones are under the abdomen of the specimen and some are lying loose in the bottle in which it had been put.

There is a large number of specimens of this species in the Museum collection from various localities in Burma. So far as we are aware the species is not known outside the "Burma-Malay Territory" as defined by Alcock (*op. cit.*, p. 10).

Potamon sp.

Two female examples with the chelipeds missing and otherwise badly damaged are in Prof. Meggitt's first collection from Maungmagan. We have found it impossible to give them a specific name.

Subfamily GECARCINUCINAE.

Paratelphusa (Phricotelphusa) callianaria (de Man).

1910. *Paratelphusa (Phricotelphusa) callianaria*, Alcock, *Cat. Ind. Decapod Crust. I, Brachyura* Fasc. II, pp. 102, 103, pl. xiii, fig. 62.

One female specimen with a carapace length of 10.7 mm. and greatest carapace breadth of 12.5 mm. was collected by Drs. Prashad and Chopra in a small freshwater stream near shore at Kamachaung on the east coast of Doung Island in the Mergui Archipelago. The specimen agrees very closely with the original examples of de Man from Mergui.

The species is represented in the collection of the Indian Museum by specimens from Mergui only. So far as we know it has not been recorded from any other locality.

Family OCYPODIDAE.

Subfamily OCYPODINAE.

Ocypoda ceratophthalma (Pallas).

1900. *Ocypoda ceratophthalma*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 345-347.

1918. *Ocypoda ceratophthalma*, Tesch, *Siboga Exped. Rep.* XXXIX c, p. 36.

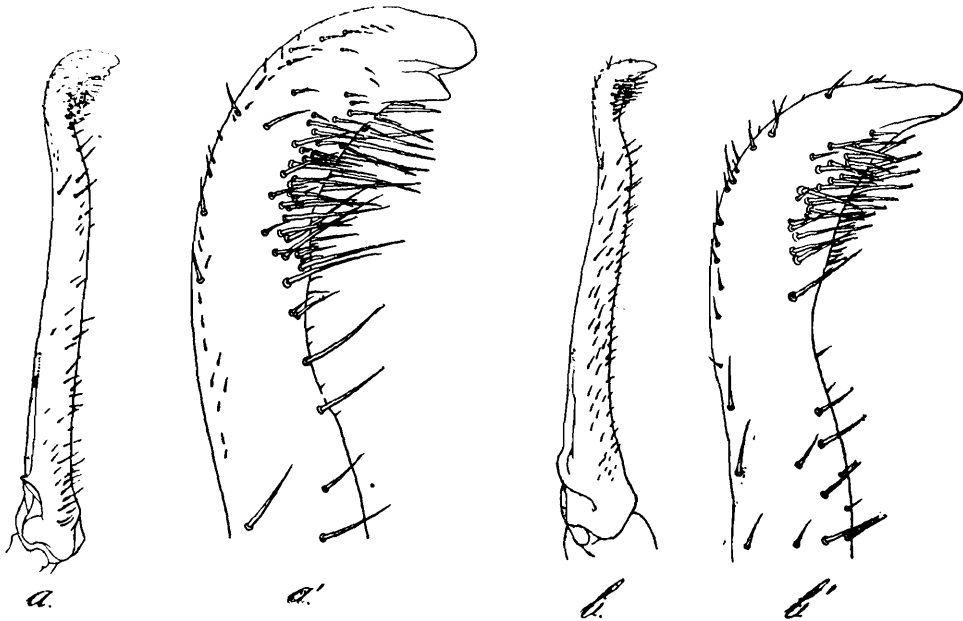
1922. *Ocypoda ceratophthalma*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, pp. 141, 142.

1937. *Ocypoda ceratophthalma*, Tweedie, *Bull. Raffles Mus. Singapore* XIII, p. 141.

A large number of examples of this common Ocypod are in the two collections of Prof. Meggitt from Maungmagan. They were collected on beach and in Rock Pools near shore.

Ocypoda ceratophthalma resembles *O. macrocera* M.-Edwards (*vide infra*) so closely that it is sometimes difficult to distinguish young examples, and especially young females of the two species. The fingers of the smaller chela, however, afford a useful character for separating the species; in *ceratophthalma* these are pointed at the tips, while in *macrocera* the fingers are lamellar right up to the tips, which are broad and blunt and not pointed. The stridulating organ on the inside of the palm is always much shorter and more hairy in the present species than in *O. macrocera*, and, as pointed out by Alcock, consists, in its upper

half, of tubercles gradually passing to striae, which in the lower half are short and generally very closely arranged ; in *macrocera* the stridulating ridge consists entirely of striae. The abdomen of the male in the two species is also different ; in the present species it is narrower than in *macrocera*. The sixth segment is narrower and longer, its median length being more than its greatest breadth while in *macrocera* the length of this segment more or less equals its greatest breadth. The fifth abdominal segment is also proportionately longer and narrower in the present species than in the allied form. The first pleopods of the male are somewhat



TEXT-FIG. 17.—*a.* First left pleopod of male in *Ocypoda ceratophthalma* (Pallas) : $\times 5^3$, *a'*. Tip of the same enlarged : $\times 21$. *b.* First left pleopod of male in *Ocypoda macrocera* Milne-Edwards : $\times 5^3$. *b'*. Tip of the same enlarged : $\times 22$.

different in the two species, as is seen in the accompanying text-figure. In the present species the appendage is a little more sharply bent near the tip, which is more rounded and consists of two somewhat flattened and distally rounded lobes, separated by a narrow incision between them. In *O. macrocera* there is just a suggestion of the incision, but the two lobes are not differentiated.

In young examples the horn at the end of the eye is generally very poorly developed.

O. ceratophthalma occurs very commonly in the Bay of Bengal. Balss gives the distribution of the species as Tahiti to the east coast of Africa.

***Ocypoda macrocera* Milne-Edwards.**

1900. *Ocypoda macrocera*, Alcock, *Journ. As. Soc. Bengal* LXIX, p. 347.

1915. *Ocypoda macrocera*, Kemp, *Mem. Ind. Mus.* V, pp. 219, 220.

A number of examples of this species were collected by Prof. Meggitt in Rock Pools near shore at Maungmagan in October 1933.

The species can be distinguished from the closely similar *O. ceratophthalma* by the characters enumerated above. The characters of the male abdomen appears to be constant even in young examples. The present species is of a smaller size than the preceding one.

Kemp has described the colour of the species and has given very interesting notes on the habits, etc., of the species, in its early stages.

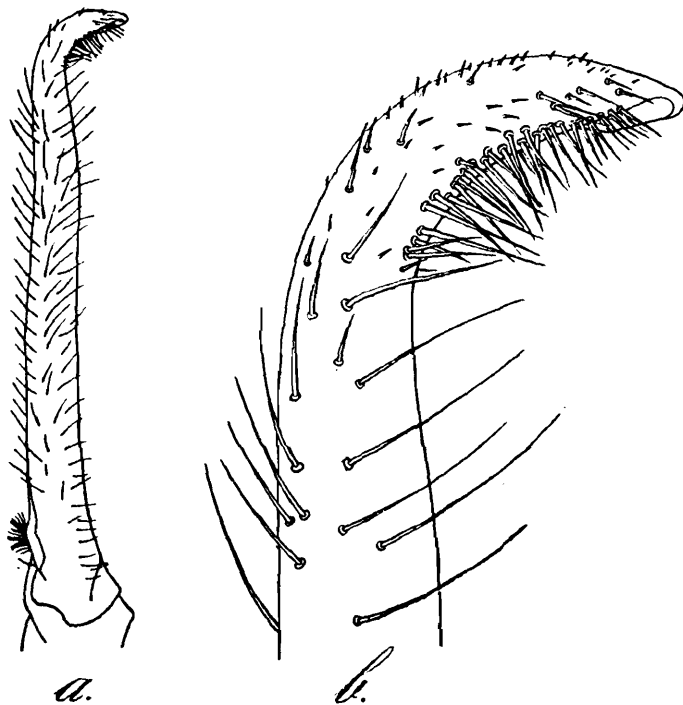
The species is mostly confined to the Bay of Bengal only, though it has been recorded from the Gulf of Siam also.

Ocypoda cordimana Desmarest.

1900. *Ocypoda cordimana*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 349, 350.
 1918. *Ocypoda cordimana*, Tesch, *Siboga Exped. Rep.* XXXIX c, pp. 35, 36.
 1922. *Ocypoda cordimana*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft. 11, p. 142.

Several large males and females of this species are in Prof. Meggitt's second collection from Maungmagan. The specimens are typical and agree very closely with named examples in our collection, as also with Alcock's description of the species.

The anterior abdominal appendages of the male are more or less like those of *O. macrocera* (*vide* p. 419 and text-figure 17 *b*, *b'*). There is no deep incision separating the two lobes at the tip, though the lobes



TEXT-FIG. 18.—*Ocypoda cordimana*. Desmarest. *a*. First left pleopod of male : $\times 5$.
b. Tip of the same enlarged : $\times 20$.

are better differentiated than in the other species. The condition is more or less intermediate between *O. ceratophthalma* and *O. macrocera*.

O. cordimana occurs very commonly in the eastern part of the Indo-Pacific area. There is a large number of specimens of the species in the collection of the Indian Museum from various localities in the Bay of Bengal, but none from the Arabian Sea. Balss gives the range of distribution as Tahiti to the Red Sea. The species is frequently met with in Japan also.

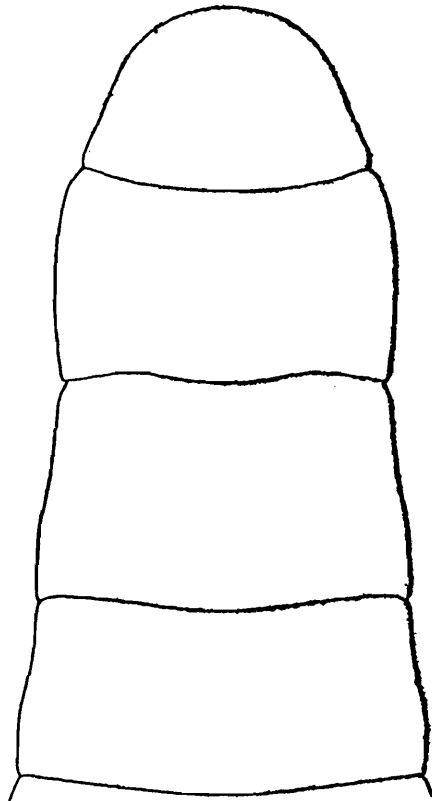
Gelasimus¹ triangularis A. Milne-Edwards.

1900. *Gelasimus triangularis*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 356, 357.

1937. *Gelasimus triangularis*, Tweedie, *Bull. Raffles Mus. Singapore* XIII, p. 144, fig. 1c.

A single male specimen of this species was collected by Drs. Prashad and Chopra in Bockachaung, a small freshwaters tream near Mergui. The specimen, which is quite typical, has a carapace length of 6.5 mm., carapace breadth of 11.5 mm. and the large hand is 13.2 mm. long.

The male abdomen in this species is as shown in text-figure 19. The fifth segment is somewhat broader than long, and is appreciably



TEXT-FIG. 19.—*Gelasimus triangularis* A. M.-Edw.

Terminal part of male abdomen : $\times 17$.

longer than the fourth and the sixth segments. The seventh segment is semicircular. The anterior pleopod of the male has been figured by Tweedie.

G. triangularis is a very common species in the Bay of Bengal and is known to extend up to New Caledonia in the east.

¹ We agree with Miss Gordon that the name *Galasimus* should be retained for the Fiddler-crab in preference to *Uca* Leach : see Gordon, *Mem. Mus. Roy. Hist. Nat., Belgique* III, Fasc. 15, p. 10, foot-note (1934).

Gelasimus marionis (Desmarest).

1900. *Gelasimus Marionis* and var. *nitidus*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 359, 360.
 1918. *Uca marionis*, Tesch, *Siboga Exped. Rep.* XXXIXc, pp. 38, 39.
 1922. *Uca marionis nitidus*, Balss, *Arch. Naturgesch.* LXXXVIII, p. 143.
 1937. *Gelasimus marionis* and var. *nitidus*, Tweedie, *Bull. Raffles Mus.* XIII, pp. 143, 144, fig. 1 d, e.

Tesch has shown that *Gelasimus nitidus* of Dana, or the variety *excisa* Nobili of the species *marionis*, as it should be called, is only a claw-variation of Desmarest's species and as such should not be recognised as distinct from the *forma typica*. This view is further confirmed by Tweedie who failed to find any significant differences between the abdominal appendages of the male in the two forms. According to Tweedie it is probably a case of "geographically local dimorphism confined to the males"; the females in the two forms are inseparable.

Five large males and a female of this species were collected by Drs. Prashad and Chopra on beach at low tide at Palaiow on the east coast of Doung Island in the Mergui Archipelago. The species is represented in the Museum collection by a large number of examples from the Bay of Bengal and some from the Arabian Sea. Balss gives the range of distribution of the species from Samoa and Fiji Island to the east coast of Africa and the Red Sea.

Gelasimus manii (Rathbun).

1900. *Gelasimus acutus*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 360, 361.
 1918. *Uca manii*, Tesch, *Siboga Exped. Rep.* XXXIXc, p. 38.
 1937. *Gelasimus manii*, Tweedie, *Bull. Raffles Mus. Singapore* XIII, p. 143, fig. 1 b.

Miss Rathbun has shown (see Tesch, *loc. cit.*) that *Gelasimus acutus* of de Man and Alcock is not the same form as *Gelasimus acutus* of Stimpson, which is synonymous with *G. dussumieri* Milne-Edwards. For de Man's form she has given the name of *Uca manii*.

G. manii is represented in our collection by a large number of specimens from Maungmagan and some from Bockachaung, a freshwater stream near Mergui. All the specimens are typical, agreeing very closely with the descriptions of de Man and Alcock, as also with examples named by them.

The front measured between the bases of the eye-stalks is about one-twelfth of the greatest breadth of the carapace, but rarely it is a little narrower than this even. Tweedie has figured an anterior pleopod of the male.

The species is known from both the coasts of India, but is most common in the Bay of Bengal.

Subfamily *SCOPIMERINAE*.**Dotilla intermedia** de Man.

1919. *Dotilla intermedia*, Kemp, *Rec. Ind. Mus.* XVI, pp. 331-333.

Three male examples referable to the present species were found mixed with specimens of *Ocypoda macrocera* collected by Prof. Meggitt at Maungmagan. Two of these are mutilated, but the third has most of the legs intact.

The specimens agree closely with the description of *D. clepsydrodactylus* Alcock¹ or with that of "high" males of *intermedia*, as described by Kemp. As Kemp has shown these species are synonymous. We have compared our examples with the named material, including types of the two species, in our collection.

D. intermedia is represented in the collection of the Indian Museum by a large number of specimens from the Mergui and Tavoy coasts of Burma and the Orissa coast of India. To our knowledge the species has not been recorded from any locality outside the Bay of Bengal.

Subfamily *MACROPHTHALMINAE*.

Macrophthalmus telescopicus (Owen).

1900. *Macrophthalmus Verrauxi*, Alcock, *Journ. As. Soc. Bengal* LXIX, p. 377.
 1915. *Macrophthalmus telescopicus*, Tesch, *Zool. Meded. Leiden Mus.* I, pp. 161-164, pl. v, fig. 2.
 1919. *Macrophthalmus telescopicus*, Kemp, *Rec. Ind. Mus.* XVI, pp. 387, 388, pl. xxiv, figs. 10, 11.
 1934. *Macrophthalmus telescopicus*, Sakai, *Sci. Rep. Tokyo Bunrika Daigaku* (B) I, p. 320, pl. xviii, fig. 2.
 1934. *Macrophthalmus telescopicus*, Balss, *Faune des Colonies Francaises V*, p. 522.

Two female specimens, one of which is ovigerous, collected by Drs. Prashad and Chopra on beach at low tide at Palaiow on the east coast of Doung Island, Mergui Archipelago are referable to the present species.

Kemp and Tweedie² have suggested that Tesch's *M. telescopicus* may possibly consist of more than one species. Both these authors have shown that in the characters of the male chela and in some other respects the species, as understood by Tesch, is not quite homogeneous.

M. telescopicus is represented in the Museum collection by examples from Mergui, Tavoy, Andamans, Gulf of Manaar and the Red Sea. The species has a very wide range of distribution extending from Hawaiian Islands in the Pacific to the east coast of Africa and the Red Sea. It has been met with in a number of localities in Japan also.

Macrophthalmus convexus Stimpson.

1900. *Macrophthalmus convexus*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 378, 379.
 1915. *Macrophthalmus convexus*, Tesch, *Zool. Meded. Leiden Mus.* I, pp. 175-178, pl. vii, fig. 8.
 1919. *Macrophthalmus convexus*, Kemp, *Rec. Ind. Mus.* XVI, pp. 389, 390, pl. xiv, fig. 2.

Two somewhat mutilated examples of the present species are in Prof. Meggitt's first collection from Maungmagan. They appear to be typical in every respect.

As stated by Tesch the carapace length in young individuals is distinctly more than half of the carapace breadth. Similarly the front appears to be somewhat broader in young specimens than in the adult forms.

¹ Alcock, *Journ. As. Soc. Bengal* LXIX, p. 367 (1900); *Ill. Zool. Investigator, Crust.*, pl. lxiii, figs. 2, 2a (1905).

² Tweedie, *Bull. Raffles Mus. Singapore* XIII, pp. 164, 165 (1937).

There are specimens of *M. convexus* in the Museum collection from Mergui, Andaman Islands and the Gulf of Manaar. The species is restricted to the eastern part of the Indo-Pacific area only, being known from the Hawaiian Islands and Tahiti on the east to the Gulf of Manaar between India and Ceylon on the west. It has been recorded from Japan also.

Macrophthalmus erato de Man.

1900. *Macrophthalmus erato*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 381, 382.
 1915. *Macrophthalmus erato*, Tesch, *Zool. Meded. Leiden Mus.* I, pp. 179-181, pl. viii, fig. 9.
 1919. *Macrophthalmus erato*, Kemp, *Rec. Ind. Mus.* XVI, p. 390.
 1936. *Macrophthalmus eratus*, Shen, *Contrib. Inst. Zool. Nat. Acad. Peiping* III, pp. 70, 71.

There are seven specimens of the present species in Drs. Prashad and Chopra's collection from Mergui. Six of these are females (two ovigerous) and one young male.

The lower margin of the orbit has a very characteristic shape in this species. The claw in the male, as described by de Man¹ in detail, differs considerably from that of the female, but in some young males that we have examined from the Museum collection the claw is more or less of the female type. In a young male example from Chandipur on the Orissa coast (carapace length 4.75 mm., carapace breadth 6.5 mm.) the fingers are almost as long as the palm and have no lobe-like teeth on the cutting edges, all the teeth being minute and more or less uniform and the spine on the inside of the palm is hardly noticeable. As in all the females, there is a strongly-marked ridge on the outer surface of the palm more or less parallel to the lower border and running almost up to the tip of the fixed finger; this ridge is faintly discernable on the fixed finger in large males even. In another male of about the same size from the same locality the claws are typically like those of the male. In a third male (carapace breadth 6.5 mm.) from Jack and Una Island in the Mergui Archipelago the claws are still more interesting, for they are intermediate between the male and the female types. The fingers are longer than is usually the case in the male, the lobes on the cutting edges are less well developed and the ridge on the palm, though fainter than it is usually in the female, is fairly well marked throughout. The inner surface of the palm is less hairy and the spine is altogether absent.

In two very small males from Chandipur (carapace breadth less than 5 mm.) the claws are definitely of the female type.

In the single male example in the present collection (carapace breadth 5.3 mm.) the fingers are as long as the palm and are not arched; the teeth are minute and uniform; the muscular crest, the spine on the inner surface of the palm and the usual pad of hairs are suppressed; and the ridge near the lower border of the palm is strongly marked up to the tip of the fixed finger. All these characters are typical of the female chela.

¹ de Man, *Journ. Linn. Soc. London (Zool.)* XXII, pp. 125-129, pl. viii, figs. 12-14 (1887-1888).

It is thus seen that in the young examples of *M. erato* the claws are of one type only and that whereas this type is retained by the females throughout life, in males after attaining a carapace breadth of 6 mm. or a little more, a differentiation into what ultimately becomes the "male type" starts appearing.

Tweedie¹ has recorded the occurrence of the species in "burrows consisting of the bark of a buried mangrove twig from which the wood had rotted away"

There is a large number of specimens of *M. erato* in the collection of the Indian Museum; all of these are from the Bay of Bengal. The species extends from Java and the Chinese coast on the east to the Orissa coast in India on the west.

Family GRAPSIDÆ.

Subfamily GRAPSINÆ.

Grapsus strigosus (Herbst).

1900. *Grapsus strigosus*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 393, 394.
 1918. *Grapsus strigosus*, Tesch, *Siboga Exped. Rep.* XXXIXc, pp. 71-74, pl. iv, figs. 1 and 4.
 1922. *Grapsus strigosus*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 147.

A large number of specimens of this species are in all the three collections under report.

Alcock and Tesch have enumerated the differences between this species and the closely allied *Grapsus grapsus* (Linn.). Our specimens are all typical examples of the present species.

In young individuals the length of carpus and propodus of the walking legs is more than the length of the merus; in older individuals, however, the two are generally equal.

Grapsus strigosus is a very common species in the Indian coastal waters, both in the Bay of Bengal and the Arabian Sea. It has a very wide range over the entire Indo-Pacific region, being met with from Polynesia to the east coast of Africa. The species possibly extends to the west coast of America² also.

Subfamily VARUNINÆ.

Varuna litterata (Fabricius).

1900. *Varuna litterata*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 401, 402.
 1922. *Varuna litterata*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, pp. 149, 150.

Only one female specimen of this widely-distributed species is in the first collection of Prof. Meggitt from Maungmagan. The species is met with in large numbers in estuaries and backwaters along the Indian coasts, and is frequently collected in places where the water is even quite fresh. Kemp³ has described the "modes of invasion" of this

¹ Tweedie, *Bull. Raffles Mus. Singapore* XIII, p. 164 (1937).

² Rathbun, *Bull. U. S. Nat. Mus.*, XCVII, p. 231 (1918).

³ Kemp, *Mem. Ind. Mus.* V, pp. 232, 233 (1915).

species in order to establish itself in fresh water in the neighbourhood of Calcutta. The species has been frequently collected in the open sea also.

V. litterata has a very wide range of distribution; Balss gives it as: "In See-und Süßwasser, von der Ostküste Africa (nicht im roten Meere) bis zur Südsee; im eigentlichen Pazifik seltener."

Subfamily *SESARMINAE*.

Sesarma (*Sesarma*) *taeniolata* White.

1900. *Sesarma taeniolatum*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 419, 420.
 1917. *Sesarma* (*Sesarma s. s.*) *taeniolata*, Tesch, *Zool. Meded. Mus. Leiden* III, pp. 201-203, pl. xvi, fig. 3.
 1936. *Sesarma* (*Sesarma*) *taeniolata*, Tweedie, *Bull. Raffles Mus. Singapore* XII, p. 53.

A single male specimen, perhaps not fully grown, of this species is in Prof. Meggitt's first collection from Maungmagan.

The specimen shows all the characters enumerated by Tesch. The upper border of the arm ends in a somewhat blunt tooth. The distance between the external orbital angles of the carapace equals the distance between the epibranchial teeth. The breadth of the meropodites of the walking legs is a half or a little more than half of their length. The "tympana" mentioned by Tesch can only be faintly made out in the usual position.

Sesarma taeniolata is represented in the Indian Museum collection by specimens from the Bay of Bengal only. The species seems to be restricted to the eastern part of the Indo-Pacific region only.

Sesarma (*Parasesarma*) *prashadi*, sp. nov.

(Plate VI, figs. 5-7.)

The carapace is for the most part flat, though it is slightly convex in a longitudinal direction in the anterior part. The branchial regions, as usual, slope strongly downwards towards the margins. The regions are fairly well demarcated; the mesogastric lobe forms an independent convexity, with the anterior narrow longitudinal projection running forward for a short distance. The intestinal region also forms a convexity. There are seven or eight prominent oblique ridges, rather than striations, on the epibranchial regions, each ridge being microscopically beaded. The surface of the carapace is smooth, there being only a few low and blunt tubercles, with short, stiff hairs on them, scattered on the surface. The four post-frontal lobes run in almost a straight line; the inner lobes are about twice as broad as the outer lobes. The two inner lobes are separated from one another by a deep longitudinal groove, which runs for a considerable distance backwards. The groove between the outer and the inner lobes on each side is broad and V-shaped and is much shorter than the groove between the median lobes. All the four lobes are anteriorly rounded and those of the median pair are minutely rugose on the anterior aspect.

The carapace is distinctly broader than long, the median length being about three-fourths of the distance between the outer orbital angles, where the carapace is the broadest. The sides are somewhat convergent posteriorly, the breadth of the carapace at the postero-lateral angles being less than that at the outer orbital angles. The sides are straight in the anterior part, somewhat concave about the middle and bulge outwards posteriorly. The margins are entire and there is no tooth behind the acute external orbital angle; the latter is directed outwards and somewhat forwards.

The front (Plate VI, fig. 6), as usual, is very much deflexed. Its sides are more or less parallel and the anterior angles are broadly rounded. In dorsal view the anterior margin of the front forms a broad and shallow depression in the middle, with an anteriorly convex lobe on either side. Just close to the margin of each lobe there is a transversely oval tubercle with a single short stiff hair on it. In frontal view the anterior margin of the front is straight or slightly convex.

The orbits are markedly slanting. From the inner supra-orbital angle the upper orbital border comes more or less directly backwards, but from about the level of the posterior limit of the thick eye-stalk it runs backwards and outwards, in its last part, near the lateral margin of the carapace the orbital border runs directly outwards. For the most part this border forms a broad regular curve, but a portion about the middle is somewhat convex. The lower orbital border is prominent, and a part of it is visible in dorsal view. The lower border is finely beaded.

The chelipeds are unequal, that on the right side being distinctly longer and stouter than that on the left. The arm is trigonous, with all the three border cristiform and beaded. The outer surface of the arm is covered with squamiform granules, while the inner and lower surfaces are smooth. The inner border is distally expanded and terminates in a large, broad-based and pointed spine. There is no subterminal spine on the upper border. The outer surface of the wrist is only faintly granular, though it has squamiform markings; the inner angle is broad and obtuse. The palm is swollen and is markedly high, the length of the propodus (palm and fixed finger) along the lower margin being only one and a half times of its height. The upper border is very short and finely beaded. The outer surface of the palm is quite smooth, though there are a few indistinct squamiform markings arranged in irregular lines near the carpal joint, and a few stiff hairs scattered about. The inner surface is more or less smooth with a few isolated granules scattered in the distal portion. The lower border of the palm is denticulate, the denticulation extending up to about the middle of the fixed finger. The usual chitinous pectinated ridges are arranged transversely near the upper border of the palm, and more or less parallel to its posterior border. The anterior or the distal-most ridge is quite straight, the second is somewhat sinuous, while the third, which is more or less obsolete, consists of only a few pectinations and some granules. The teeth in the first ridge are so closely arranged, more or less like the teeth of a very fine comb, that it is difficult to count them, but there appear to be at least 40 of these. In the second ridge the teeth are

less high and their number is also smaller. The fingers are stout and gape only slightly at the base. The lower border of the fixed finger is somewhat concave near the base. The dactylus is as long as the height of the palm and tapers gradually towards the tip. The cutting edge has seven or eight blunt teeth, the proximal-most of which is the largest. The fixed finger has only five teeth arranged on about the distal half of the cutting edge and, as in the dactylus, the most proximal tooth is the largest. The tips are broadly pointed, hollowed and almost spoon-shaped. The outer surface of the dactylus is profusely granular near the base. On the upper border of the dactylus (Plate VI, fig. 7), slightly on the outer aspect, there is the usual row of transverse tubercles extending from the base to almost the tip. Each tubercle, except in the distal part, is in the form of a narrow oval dome, with a median, somewhat smooth longitudinal ridge. The tubercles are quite symmetrical with respect to their long axes. Near the base of the finger they are small and crowded together, but the distance between them increases distally and near the tip they again become small, almost squarish and are widely separated from one another. The most distal ones, quite close to the tip, are indistinct, but 27 of them can be counted on the large claw. On the inside of this row of tubercles the basal half of the upper border of the dactylus is densely studded with largish granules. The smaller chela differs from the larger one only in size.

The merus of the walking legs is broad, that of the third pair being two and a half times as long as broad. The posterior margin of the merus is entire, but the anterior has a subterminal sharp spine. In the first three pairs the merus has prominent squamiform markings on the upper surface. The carpus has two, more or less, longitudinal ridges on its upper surface, one about the middle and the other close to the anterior margin. The propodus also has one ridge running obliquely from about the middle at the proximal end to the posterior margin at the distal end. The dactylus is large and sharply pointed; in the first three legs it is almost as long as the propodus, but in the last leg it is longer than the preceding segments. The last three segments are sparsely clothed with short stiff hairs on the margins.

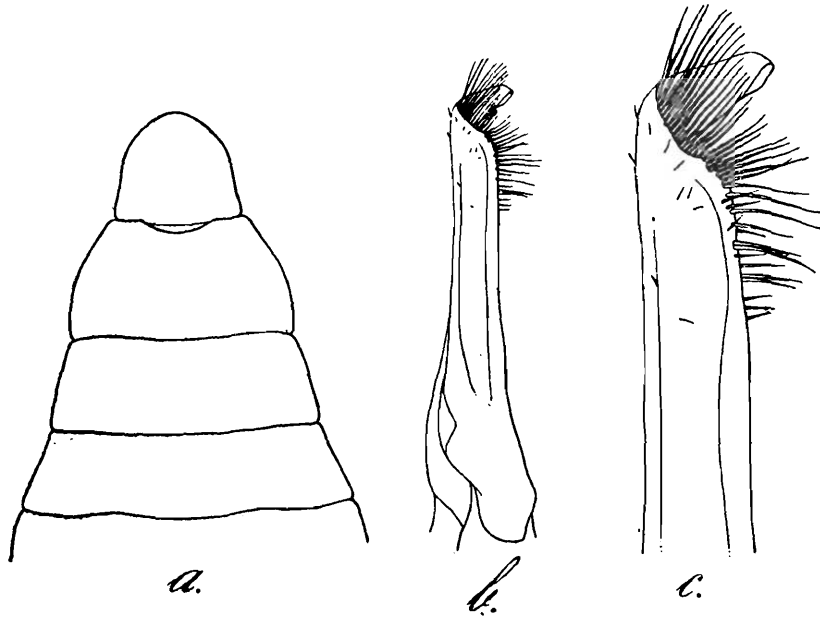
As usual in the genus the abdomen of the male (text-figure 20a) is somewhat broad and occupies the whole breadth of the sternum between the bases of the last legs. The terminal segment is short and broadly rounded; its basal breadth is a little more than its median length. The sixth segment is very slightly shorter than the seventh and is almost half as long as its breadth at the posterior margin. The fifth segment is shorter than the sixth and its posterior breadth is a little less than three times of its median length. The sides of the abdomen are somewhat concave.

The anterior abdominal appendages of the male are rather short and stout and the tip is sharply bent outwards. There is a dense growth of long hairs on the outer margin behind the tip.

The carapace and legs in the single specimen preserved in spirit that we have examined are of a dull mottled purplish colour; the chelipeds are pale and the fingers light orange. The sternum and the ventral surface of the legs are lighter than the dorsal surface.

Type-specimen.—C 2296/1, Zoological Survey of India (*Ind. Mus.*).

Locality.—The single specimen on which the present species is based was collected in a small freshwater stream, quite near the sea-shore, at Kamachaung, a small village on the east coast of Doung Island in the



TEXT-FIG. 20.—*Sesarma (Parasesarma) prashadi*, sp. nov.

a. Terminal part of male abdomen : $\times 7$. b. First left pleopod of male : $\times 13$, c. Tip of the same enlarged : $\times 30$.

Mergui Archipelago, by Drs. B. Prashad and B. N. Chopra on 19th January, 1937. The water at the place where the specimen was obtained tasted quite sweet, but may possibly have been subject to the influence of the tides.

The measurements, in millimetres, of the male specimen of *S. prashadi* are given below, and, for purposes of comparison, the corresponding measurements of a male specimen of *S. plicata* (Latreille) from Burma are included.

	<i>S. prashadi</i>	<i>S. plicata</i>
	♂	♂
Length of carapace	9.2	10.5
Distance between external orbital angles	12.2	13.2
Distance between postero-lateral angles of carapace	10.3	12.0
Breadth of front	6.3	7.5
Breadth of carapace at posterior margin	5.1	6.3
Length of palm and fixed finger (larger claw) along lower border	9.3	7.8
Height of palm (larger claw)	6.1	4.4
Length of dactylus (larger claw) along upper border	6.1	4.8
Length of upper border of palm (larger claw)	3.9	2.8
Length of merus of 3rd walking leg	7.8	8.5
Breadth of merus of 3rd walking leg	3.2	3.8
Median length of 5th abdominal somite of male	1.4	1.7
Posterior breadth of 5th abdominal somite of male	4.0	4.6
Median length of 6th abdominal somite of male	1.6	1.7
Posterior breadth of 6th abdominal somite of male	3.3	3.9
Median length of 7th abdominal somite of male	1.7	2.3
Posterior breadth of 7th abdominal somite of male	1.9	2.3

That *Sesarma prashadi* belongs to the subgenus *Parasesarma* of de Man is clearly seen by the fact that the lateral margins of the carapace are not dentate behind the external orbital angles, that the upper surface of the palm has two or three transversely arranged pectinated ridges, and that the upper border of the dactylus has a row of transverse tubercles. In the key given by Tesch¹ for the identification of the Indo-Pacific species of *Parasesarma* the present species—in so far as there are no spines on the posterior border of the meropodites of the walking legs, the sides of the carapace converge distally and the tubercles on the upper border of the dactylus are symmetrical with respect to their long axes—seems to come close to *Sesarma plicata* (Latreille), which name Tesch,² presumably on the authority of Miss Rathbun, has given to the species so far known to most carcinologists as *Sesarma quadratum* (Fabricius). There are, however, some noteworthy differences between these two species. In the new species the carapace is a little more convex, the regions are a little more distinct, the outer post-frontal lobes are considerably smaller than the inner and the front, as compared with the carapace breadth, is a little narrower. Further the upper margin of the arm does not end in a spine, the inner angle of the wrist is broader than in *plicata*, the palm is considerably higher, its outer surface is less granular and the inner less tuberculate. The number of teeth in the pectinated ridges on the palm is also very much larger in the new species. The number of tubercles on the upper border of the dactylus is about 27 in our species, whereas in *S. plicata* there are usually 12-14 tubercles, though the number may vary between 11 and 18 or even rarely 19. The proportions of the last three abdominal segments of the male are also different in the two species and the anterior male abdominal appendages are not quite similar. A comparison of the measurements of *S. prashadi* with those of *S. plicata* given on p. 429, and of the figures of the male abdomens and the male appendages of the two species will bring out most of these points.

In having 20 or more tubercles on the upper border of the movable finger the present species shows some resemblance to *S. erythroductyla* (Hesse)³ and *S. bataviana* de Man.⁴ In both these species, however, the tubercles are not symmetrical with respect to their long axes and are prominently striated longitudinally. There are several other differences also. *S. melissa* de Man⁵ has also a superficial resemblance with *S. prashadi*, but besides other differences, the number of tubercles on the dactylus in de Man's species, is smaller and the tubercles are asymmetrical. In *Sesarma (Parasesarma) obliquifrons* Rathbun⁶, described from Samoa, the general shape of the front and the hands is more or less like that in our new species, but the differences between the two species are far more numerous than these points of superficial similarity.

¹ Tesch, *Zool. Meded. Mus. Leiden* III, pp. 251-255 (1917).

² Tesch, *op. cit.*, pp. 187-190; see foot-note 3 on p. 187.

³ See Tesch, *op. cit.* p. 149 (1917).

⁴ See Tesch, *op. cit.*, p. 132.

⁵ See Tesch, *op. cit.*, p. 174.

⁶ Rathbun, *Proc. Biol. Soc. Washington* XXXVII, pp. 127, 128 (1924).

S. prashadi seems to show the closest resemblance to the species recently described by Tweedie¹ under the name *Sesarma* (*Parasesarma*) *rutilimana* from a small island near Singapore. The points of similarity are clearly seen by comparing our description of the new species with that given by Tweedie for his. There are, however, some noteworthy differences between the two. *S. prashadi* appears to be a somewhat broader form than the Singapore species and, unlike the latter, has unequal chelipeds. There are three (two distinct and one obsolete) pectinated ridges on the outer surface of the palm and the first of these has over 40 teeth; in Tweedie's species there is only one ridge having rather more than 20 teeth. Further the tubercles on the dorsal surface of the distal half of the movable finger, in *S. rutilimana*, become elongated, asymmetrical, with the longer proximal slopes striated; in our species they become squarish distally, but, are all symmetrical and are not striated. The colouration of the two species is also markedly different. The two species in our opinion, in spite of their very close similarity, must, therefore, be considered distinct.

***Sesarma* (*Chiromantes*) *bidens* (de Haan).**

1900. *Sesarma bidens*, Alcock, *Journ. As. Soc. Bengal* LXIX, p. 415.
 1917. *Sesarma* (*Chiromantes*) *bidens*, Tesch, *Zool. Meded. Mus. Leiden* III, pp. 132-135.
 1922. *Sesarma* (*Chiromantes*) *bidens*, Balss, *Arch. Naturgesch.* LXXXVIII, Heft 11, p. 156.

In our collection there are examples of the present species from Maungmagan (Prof. Meggitt's first collection) and from a fresh-water stream near Mergui (Drs. Prashad and Chopra). The specimens are quite typical.

In the Museum collection there are specimen of *S. bidens* from a number of localities in the Bay of Bengal. The species has a very wide range of distribution being known from Australia and New Guinea to the east coast of Africa. It is one of the commonest species of *Sesarma* in Japan.

***Clistocoeloma merguiense* de Man.**

1900. *Clistocoeloma merguiense*, Alcock, *Journ. As. Soc. Bengal* LXIX, p. 429.
 1917. *Clistocoeloma merguiense*, Tesch, *Zool. Meded. Mus. Leiden* III, p. 222.
 1936. *Clistocoeloma merguiense*, Tweedie, *Bull. Raffles Mus. Singapore* XII, p. 68.

A single specimen referable to de Man's species is in the present collection. It was collected in a small fresh-water stream on a small Island in the Mergui Archipelago. The place from which the specimen was obtained is probably subject to a certain extent to tidal influence.

C2297/1 A small fresh-water stream at Kama- Drs. B. Prashad and 1 ♂
 chaung on the east coast of Doung B. N. Chopra, 19th
 Island, Mergui Archipelago Jan., 1937

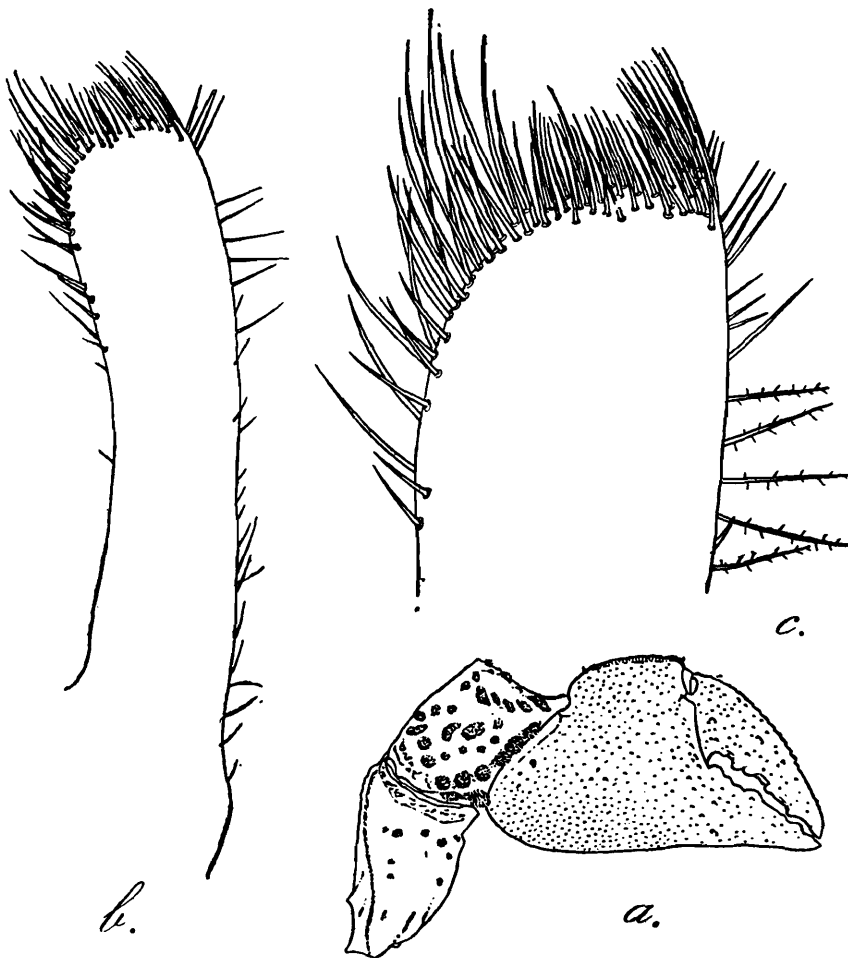
The specimen agrees very closely with the detailed description given by de Man,² as also with the named examples in the Museum collection

¹ Tweedie, *Bull. Raffles Mus. Singapore* XII, pp. 63-65, pl. xv, fig. 2 (1936).

² de Man, *Journ. Linn. Soc. London (Zool.)* XXII pp. 195, 196, pl. xiii, fig. 10 (1888).

identified by Alcock. The key given by Tesch (*op. cit.*, p. 259) for the recognition of this species is very helpful. The abdomen of the male, as mentioned by de Man, is very much like that of *C. balansae* A. M.-Edwards.¹ the genotype, and differs considerably from that *C. tectum* Rathbun, as described and figured by Tesch (*op. cit.*, pp. 224, 225, pl. xvii, fig. 3c). The chelipeds in our specimen are also as described by de Man.

The anterior male appendages are as shown in the accompanying text-figure. They are short and stumpy and are broadly truncate at the tip, which is densely hairy.



TEXT-FIG. 21.—*Clistocoeloma merguiense* de Man.

a. Cheliped of male : $\times 3\frac{3}{4}$. b. Anterior left pleopod of male : $\times 22$. c. Tip of the same enlarged : $\times 47$.

The measurements, in millimetres, of the Mergui specimen are as given below :—

Length of carapace	...	...	...	11.3
Distance between external orbital angles	...	...	...	12.8
Breadth of front	...	...	...	8.2
Length of claw (palm and fixed finger) along lower border	...	...	...	9.2
Height of palm	...	...	...	6.0
Length of dactylus along upper border	...	...	...	6.1
Median length of 4th abdominal somite of male	...	...	...	1.3
Median length of 5th abdominal somite of male	...	...	...	1.6
Median length of 6th abdominal somite of male	...	...	...	1.4
Posterior breadth of 6th abdominal somite of male	...	...	...	4.1
Median length of 7th abdominal somite of male	...	...	...	2.8
Posterior breadth of 7th abdominal somite of male	...	...	...	2.2

¹ A. Milne-Edwards, *Nouv. Arch. Mus. Paris IX*, p. 311, pl. xvii, fig. 1 (1873).

C. merguiense is known mostly from the Bay of Bengal only, having been recorded from Penang, Mergui Archipelago and Nicobar Islands; the only record outside the Bay is that of de Man from Amboina Island.

Owing to the carapace being "symmetrically and boldly lobulated" Tesch (*loc. cit.*, foot-note) is of the opinion that the specimens which Alcock referred to *C. balansae* really belong to Miss Rathbun's *C. tectum*. We have carefully re-examined these specimens and though we have no examples of *C. tectum* to compare them with, we have checked them with the published descriptions of the species and especially with the detailed account given by de Man.¹ We are of the opinion that Alcock's specimens cannot be referred to *C. tectum* and that they have been rightly identified as *C. balansae*. In the form of the upper orbital border and the proportion of the abdominal segments of the male, to mention only the two characters especially stressed by Tesch for the identification of the species of *Clistocoeloma*, the Indian Museum specimens show their close similarity with Milne-Edward's species. We give here a figure (text fig. 15*d*, p. 414) and measurements, in millimetres, of the male abdomen of one of Alcock's specimens of *C. balansae*, and a comparison of these with the similar figure and measurements of *C. tectum* given by Tesch will show that they are not referable to Miss Rathbun's species. The curvature in the upper orbital border is perhaps not so well pronounced as mentioned by de Man, but it can still be clearly seen.

Median length of 4th abdominal segment of male ...	...	1.6
Median length of 5th abdominal segment of male ...	...	1.9
Median length of 6th abdominal segment of male ...	...	1.7
Posterior breadth of 6th abdominal segment of male	...	4.5
Median length of 7th abdominal segment of male ...	...	3.2
Posterior breadth of 7th abdominal segment of male	...	2.4

In the character of the lobulation of the carapace, it must be admitted that Alcock's specimen of *C. balansae* comes very close to *C. tectum*. The number and arrangement of the tubercles on the dorsal surface of the carapace in the Indian Museum specimens is more or less identical with that described and figured by Tesch for *C. tectum*. The length of the carapace also equals the distance between the outer orbital angles and the outer post-frontal lobe is subdivided into two by a longitudinal fissure, but these characters, as mentioned by Tesch, are common to both the species.

Metaplax dentipes (Heller).

1900. *Metaplax dentipes*, Alcock, *Journ. As. Soc. Bengal* LXIX, pp. 433, 434.
 1918. *Metaplax dentipes*, Tesch, *Siboga Exped. Rep.* XXXIXc, p. 117, foot-note.

Two males of this species are in Prof. Meggitt's first collection from Maungmagan and four males were collected by Drs. Prashad and Chopra in Bockachaung, a freshwater stream near Mergui.

¹ de Man, *Zool. Jahrb. Syst.* IX, pp. 340-343 (1896).

The specimens agree very closely with our named examples. The dactylus of the chelipeds may sometimes be a little longer than the upper border of the palm. In one example from Maungmagan the chelae are unequal.

Metaplex dentipes is a common coastal form in the Bay of Bengal. Tesch gives its distribution as the Gulf of Siam, Mergui Archipelago, Ceylon and the Indian (eastern) coast.