PELAGIC AMPHIPODS IN THE COLLECTIONS OF THE CENTRAL MARINE FISHERIES RESEARCH INSTITUTE, INDIA: PART I. FAMILY OXYCEPHALIDAE

N. KRISHNA PILLAI

Marine Biological Laboratory, University of Kerala, Trivandrum, India

ABSTRACT

Since Bovallius published his monograph on the Oxycephalidae, this family has not been studied in detail. Page reviewed the family and added substantially to our knowledge of the synonymy, distribution and biology of the species, but only briefly dealt with the taxonomy. The present collection, made in the Arabian Sea, includes all except two species, considered valid by Page. Hence this opportunity is availed of to giving full illustrated descriptions of all the species which number fifteen.

Though oxycephalids are very common in the offshore plankton of tropical and subtropical waters they have not been studied in detail since Bovallius (1890) published his monograph. Apart from Stebbing (1888) and Bovallius no other worker seems to have studied them in detail. This is to be regretted since most of the species are highly variable and specific identification is difficult, except for the specialist. However, the recent work of Page (1960) has added considerably to our knowledge of the biology and distribution of the members of this family.

Though a large number of genera have been referred to this family Page (1960) recognised only ten as valid. Of these, all, except Metalycaea Stephensen (1925), are represented in the present collection. Metalycaea has not been recorded from anywhere since its discovery and hence the present collection can be considered as quite representative of the family. Surprisingly all, except two species of Rhabdosoma Adams and White, recognised as valid by Page, are present in this collection. I have, therefore, taken this opportunity to make a detailed study of all the species.

The collection was confined to a restricted part of the Indian Ocean (Figs. 17 and 18) and some of the species are represented by only a small number of individuals. There is hence very little scope for a discussion of the intraspecific variation or distribution of the species. In the present paper the taxonomic part alone is hence attended to. It is earnestly hoped that this would be of some help, especially to non-specialists who may also have to deal with tropical plankton in general. With this end in view detailed illustrations, together with an enumeration of the salient characters of each species, are included.

Family OXYCEPHALIDAE Spence Bate

Spence Bate, 1861; Claus, 1887; Stebbing, 1888; Bovallius, 1890; Stephensen, 1925; Spandl, 1927; Page, 1960.

Members of this family, except Metalycaea and Simorhynchotus, are rather elongated, with the cephalon produced into a prominent rostrum. The first antenna is articulated on the ventral side of the rostrum and in the male the basal flagellar segment is swollen and curved, with a close matting of long aesthetasks, the rest of the flagellum consists of three or rarely four small segments, subterminal in position. The second antenna in the male is very much elongated and kept folded like a carpenter's rule underneath the cephalon. The mandibular palp is long and three-segmented.
(A) Simorhynchotus antennarius, male; (B) Oxycephalus clausi, cephalon; (C) Oxycephalus clausi, abdomen;
(D) Oxycephalus latirostris; (E) Tullbergella cuspidata; (F) Leptocotis tenrostria, male; (G) Leptocotis tenrostria, female;
(H) Calamorhynchus pellucidus; (I) Cranocephalus scleroticus; (J) Glossocephalus milne-edwardsi, small form;
(K) Streetsia porcella; (L) Streetsia challengeri; (M) Streetsia steenstrupi; (N) Streetsia mindanaonis.
Second segment of peraeopods five to seven is elytra-like. Seventh peraeopod, though reduced in size, has the full complement of segments, except in *Tullbergella* and *Rhabdosoma*.

Based on the absence of maxillae *Simorhynchotus* was transferred from Lycaeidae to Oxycephalidae. It is doubtful whether this character alone is of such crucial importance. *Simorhynchotus* so closely resembles members of the family Lycaeidae and markedly differs from members of the family Oxycephalidae that it would be more appropriate to place it in Lycaeidae. As the consensus of expert opinion is otherwise I do not propose any change in the existing arrangement.

After Bovallius (1890) only Spandl (1927) provided a key for the identification of the oxycephalid genera. Both keys are out of date since some of the genera included in their key ceased to be valid. I, therefore, give a key for the identification of the genera treated here.

1. Inner ramus of second and third uropods coalesced with the peduncle..............2
2. Inner ramus of third uropod coalesced with the peduncle
   1. Inner ramus of all the uropods free..................................................6
2. Rostrum hardly present, peraeopods one and two not cheliform..............*Simorhynchotus*
3. Rostrum prominent, peraeopods one and two cheliform...............................3
3. Cephalon produced into a very long rostrum, seventh peraeopod reduced to a flat small segment..........................................................*Rhabdosoma*
4. Cephalon produced into a short rostrum, seventh peraeopod seven-segmented...*Oxycephalus*
4. Seventh peraeopod five-segmented...............................................................*Tullbergella*
5. Seventh peraeopod seven-segmented............................................................5
5. Cephalon with lateral wings.................................................................*Calamorhynchus*
6. Cephalon without lateral wings...............................................................*Leptocotis*
6. Rostrum short and blunt, peraeopods five and six long and paddle-like.....*Glossoccephalus*
7. Rostrum long and pointed, peraeopods five and six not paddle-like...........7
7. Hind part of cephalon constricted, coxal plates fused with the peraeon segments..........................................................*Cranocephalus*
8. Hind part of cephalon not constricted, coxal plates not fused with the peraeon segments..........................................................*Streetsia*

*Simorhynchotus*, *Tullbergella*, *Leptocotis*, *Calamorhynchus*, *Glossoccephalus* and *Cranocephalus* are monotypic. *Rhabdosoma* includes four species, two of which are represented here. *Oxycephalus* includes three species and *Streetsia* four, all are contained in the present collection.

Genus *Simorhynchotus* Stebbing

*Simorhynchotus antennarius* Claus

(Plate I—A; Figs. 1–2)

*Simorhynchotus antennarius* Stebbing, 1888, p. 1772, pl. 200; Bovallius, 1890, p. 49; Stephensen, 1925, p. 185, f. 72; Spandl, 1927, p. 211, f. 32; Barnard, 1930, p. 433; 1931, p. 120; 1937, p. 191; Pirlot, 1938, p. 366; Fuge, 1960, p. 11, figs. 1–3.
**Simorhynchotus lilljeborgi** Bovallius, 1890, p. 52, pl. 1, figs. 1-7, t. figs.; Spandl, 1927, p. 212, f. 33.

**Simorhynchotus stebbingi** Bovallius, 1890, p. 50.

Material.—St. 742, 1 female; St. 749, 2 males; St. 759, 1 male; St. 1044, 2 females; St. 1157, 1 male; St. 1233, 1 female; St. 1256, 1 female; St. 1300, 1 female; St. 1329, 1 female; St. 1337, 2 females; St. 1344, 4 males; St. 1344, 1 male; St. 1344, 2 males; St. 1344, 3 males; St. 1344, 1 male; St. 1351, 1 male; St. 1370, 1 male; St. 1377, 2 males; St. 1385, 1 male; 1 female; St. 1385, 1 female; St. 1393, 1 male; St. 1395, 1 male; St. 1397, 3 males; St. 1411, 6 females, 6 males; St. 1688, 2 females; St. 1703, 1 female; St. 1721, 1 male; St. 1723, 1 female; St. 1732, 1 female; St. 1737, 2 males; St. 1738, 1 male; St. 1739, 1 male; St. 1739, 2 females; St. 1740, 3 females; St. 1749, 1 male; St. 1750, 1 female; St. 1761, 3 females; St. 1773, 2 females; St. 1774, 1 female; St. 1779, 1 male; St. 1805, 3 males; St. 1809, 3 males, 1 female; St. 1811, 1 male; St. 1813, 3 females, 1 male.

Specific characters.—Body is short and subcylindrical. A distinct rostral prolongation is absent. Basal flagellar segment of the first antenna of the male is produced at its distal corners, upper projection is acute. First antenna of female is slender and five-segmented. Second antenna of male as usual in the family.

![Figure 1](image-url)

**Fig. 1. Simorhynchotus antennarius** Claus. Male: (A) Antenna 1; (B) pereopod 1; (C) pereopod 2; (D) pereopod 4; (E) pereopod 5; (F) pereopod 6; (G) pereopod 7; (H) uropods and telson; (I-K) uropods 1-3.

Pereopods one and two are almost similar in both sexes, second pereopod is longer and stouter than the first, fifth segment of first pereopod is only slightly expanded but that of the second pereopod is well produced, with its distal border transverse, thus producing a subchela. Pereopods three
and four are slender and subsimilar, with the inner border of segments four to six spiny. Second segment of fifth pereaeopod is expanded and oblong, with scattered spine-setae along the upper border, inner border of segments four to six is spiny. Second segment of sixth pereaeopod is more flattened than that of the fifth and the inner border of segments five and six is spiny. Second segment of seventh pereaeopod is very large and leaf-like, sixth segment is distally produced into a conical process against which the seventh segment closes.

In the female pereaeopods three to seven are of the same pattern as in the male, but are comparatively very stout and the fifth pereaeopod, unlike as in the male, is not spiny.

In the male the telson is slightly longer than the last abdominal segment and is elongate triangular in shape. Peduncle of the first uropod is as long as the outer ramus and its outer border is serrated; inner ramus is longer and stouter than the outer and the borders of both rami are serrated. Peduncle of the second uropod is short and fused with the broad inner ramus, outer ramus is narrow and its outer border is smooth. Peduncle of the third uropod is short, about half the length of the inner ramus, the latter is narrowed at its middle and further on characteristically curved outwards, outer ramus is similar to that of the second uropod but slightly broader.

In the female the uropods are generally like those of the male but the outer border of the peduncle of the first uropod is not serrated. The rami of the uropods are more conspicuously narrowed towards the tip and their borders are not closely serrated as in the male. Telson is much different from that of the male, roughly triangular with rounded apex. In the male the telson suddenly narrows in the middle and tapers to form an acute apex.

Length 6.7 mm.

Remarks.—As Stephensen (1925) has shown this species shows very pronounced sexual dimorphism in the pereaeopods, uropods and telson. The description given by Stebbing applies very well to the males in the present collection except with regard to the size of the fifth segment of the first pereaeopod and the shape of the inner ramus of the third uropod. Barnard (1930) pointed out that the inner ramus of the third uropod shows all degrees of variation between the figures of Stebbing (1888) and of Spandl (1927).

Distribution.—This widely distributed species has been previously recorded from the Mediterranean, Indian Ocean, Atlantic Ocean and the Pacific Ocean. In the present locality it is the most widely distributed species.

Genus Oxycephalus Milne Edwards

Boullioux, 1890; Stephensen, 1925; Spandl, 1927; Fage, 1960.

Fage (1960) recognised only three species in this genus. They can be distinguished by the following key.

1. Lateral borders of the first three abdominal segments with a sharp spine........ clausi
2. Lateral borders of the first three abdominal segments without a spine........ 2
3. Lateral borders of first three abdominal segments with the distal half sinuous, cutting edge of chela of pereaeopods one and two feebly toothed........ piscator
4. Lateral borders of first three abdominal segments evenly rounded, cutting edge of chela of pereaeopods one and two with conspicuous comb of spines........ latirostris
Oxycephahts clausi Bovallius

(Plate I, B & C; Fig. 3)

Oxycephahts clausi Bovallius, 1890, p. 60, pl. 1, figs. 19–24, pl. 2, fig. 1, t.-figs.; Stephensen, 1925, p. 188; Spandl, 1927, p. 189; [Barnard, 1930, p. 433; 1932, p. 130; 1937, p. 192; Pirlot, 1938, p. 192; Shoemaker, 1945, p. 251; Fage, 1960, p. 20, figs. 11–14.

Material.—St. 976, 1 female; St. 1164, 1 female; St. 1245, 1 female; St. 1278, 6 females, 1 male; St. 1278, 4 males, 9 females; St. 1278, 1 male, 9 females; St. 1278, 10 females, 6 males; St. 1292, 1 female; St. 1300, 1 male; St. 1351, 1 male; St. 1385, 3 males; St. 1385, 1 female; St. 1397, 1 male; St. 1415, 1 male; St. 1417, 1 female; St. 1719, 1 female; St. 1737, 1 male; St. 1737, 1 male; St. 1738, 1 male; St. 1739, 1 female; St. 1748, 1 female; St. 1749, 1 female; St. 1749, 1 male; St. 1749, 1 female; St. 1750, 2 males; St. 1750, 1 male, 1 female; St. 1750, 2 males; St. 1763, 1 male; St. 1788, 1 female; St. 1802, 1 female; St. 1807, 1 male.

Specific characters.—Cephalon is rather deep with the rostrum nearly half the length of the cephalon. In full grown individuals the peraeon segments are fairly deep. Pleura of the first three abdominal segments have a median lateral and a postero-lateral conical spine with the intervening border deeply concave. Telson is nearly as long as the last abdominal segment and the distal two-thirds of its lateral borders is serrated.

Peraeopod one is fairly stout, its fifth segment has a prominent outer distal tooth-like projection, inner distal part is produced into a conical process with irregularly serrated border, clearly over-reaching the tip of the sixth segment, inner border of the sixth segment is nearly straight and finely
serrated, inner surface of both fifth and sixth segments carries a large number of setae. Fifth segment of the second pereopod has an outer distal tooth as in the first pereopod, its inner distal process is a stout thumb with the cutting edge armed with about ten blunt teeth, sixth segment is slightly shorter than the prolongation of the fifth segment and its cutting edge is finely crenulate. Second segment of fifth pereopod is oblong and its upper border is serrated, segments four to six carry well-spaced spines. Second segment of sixth pereopod is nearly rounded and the distal half of its inner border is serrate, inner border of segments four to seven is armed with a closely packed row of strong short teeth mixed with long spines. Second segment of seventh pereopod conspicuously narrows distally, the succeeding segments are unarmed.

**Fig. 3. Oxycephalus clausi** Bovallius. (A) Peraeopod 1; (B) pereopod 2; (C) pereopod 4; (D) pereopod 5; (E) pereopod 6; (F) pereopod 7; (G) uropods and telson.

Peduncle of the first uropod overreaches the base of the third uropod, its borders are serrated, rami are subsimilar and the inner ramus is slightly longer than the outer, both borders of the rami are serrated. Peduncle of the second and third uropods is fused with the inner ramus and the place of fusion is indicated by a strong tooth on the inner border, outer ramus of both uropods is considerably smaller than the inner and their outer border is not serrated.

Length 21.4 mm.

Remarks.—*O. clausi* can be easily distinguished by the apically acute rostrum, the presence of a sharp spine-like process at the middle of the lateral borders of the first three abdominal pleura and the presence of a tooth-like process at the outer distal part of the fifth segment of the first and
second pereopods. Stebbing has shown the apex of the telson as drawn out and pointed but in the present specimens it is less produced and in this respect resembles the specimens of Bovallius. Both Stebbing and Bovallius have shown the lower border of the second segment of the sixth pereopod as serrated. In the present specimens they may be serrated or not irrespective of the size of the specimens. As observed by Fage the present collection includes dimorphic forms.

The pereopods of *O. longipes* Spandl (1927, p. 181) are peculiar in that they are somewhat different from those of all the other species, particularly in the extreme elongation of the end segment of the seventh pereopod. But the dentition of the second pereopod is very much like that of *O. clausi*.

**Distribution.**—This is a very widely distributed species which has been previously recorded from the North and South Atlantic, Mediterranean, Tropical and South Pacific and the Indian Ocean. In the present locality this is the most abundant member of the genus.

**Oxycephalus piscator** Milne Edwards

(Fig. 4)

Oxycephalus piscator Milne Edwards, 1840, p. 100; Bovallius, 1890, p. 56, pl. 1, figs. 8–16, t.-figs; Spandl, 1927, p. 180, fig. 13; Barnard, 1930, p. 433; Shoemaker, 1945, p. 246, figs. 42–43; Fage, 1960, p. 14, figs. 5–10.

**Material.**—St. 1278, 1 male, 1 female; St. 1278, 4 males; St. 1278, 1 male; St. 1278, 1 male; St. 1278, 1 male; St. 1312, 1 female; St. 1356, 1 male; St. 1356, 1 female; St. 1375, 2 males; St. 1389, 1 female; St. 1722, 1 female; St. 1735, 1 male; St. 1750, 1 female; St. 1763, 1 female.

**Specific characters.**—The cephalon is only moderately deep and the rostrum proper is comparatively short, in adult specimens the basal part of the cephalon is constricted to form a neck followed by a dorsal hump. The pleura of the first three abdominal segments are posterolaterally produced but there is no lateral spine, posterior half of the lateral border is concave. Telson is roughly triangular but the proximal one-third of its lateral borders is plain and nearly parallel.

Fifth segment of the first pereopod is produced at its inner distal part but this process does not quite reach the distal border of the sixth segment, its outer distal angle is rounded. Pereopod two is comparatively weak, its second segment is as long as the rest of the limb, fifth segment has parallel sides and its inner distal border is feebly crenate, outer distal part of the segment is not produced. Inner border of fourth and fifth segments of the fourth pereopod carries well-spaced spine-setae, that of the sixth segment is spiny. Outer border of second segment of the fifth pereopod is denticate, that of the sixth segment is feebly spiny. Distal half of outer border of the second segment of the sixth pereopod is denticate, that of segments four to six is armed with closely packed spines. Second segment of seventh pereopod narrows towards the tip, the rest of the limb is subequal to the second segment in length.

Peduncle of the first uropod overreaches the base of the third uropod, distal half of both borders is serrate, inner ramus is more than half the length of the peduncle. Inner ramus of second uropod is less than half the length of the peduncle. Inner ramus of the third uropod is as long as the peduncle and slightly overreaches the telson.

Length 15.6 mm.

**Remarks.**—*O. piscator* closely resembles *O. clausi* but judging from the present collection it can be distinguished by the following characters. The outer distal part of the fifth segment of the first and second pereopods does not form a tooth-like process; Spandl (1927, p. 180, fig. 13 a, b), has shown a tooth and this probably shows that he based his illustrations on a specimen of *O. clausi*. 
Neither Shoemaker (1945) nor Page (1960) has shown this tooth. The cutting edge of the prolongation of the fifth segment of the second pereopod is only feebly crenulate whereas in *O. clausi* this edge is armed with a row of strong blunt teeth. In this character Spandl's figures are in agreement with mine. The lateral border of the first three abdominal segments has no spine-like process; each segment has a prominent tooth in *O. clausi*. The telson is proximally parallel sided whereas in *O. clausi* the telson steadily narrows towards the tip.

![Diagram](image_url)

**Fig. 4.** *Oxycephalus piscator* M. Edwards. (A) Cephalon of male; (B) abdominal segments 1-4; (C) pereopod 1; (D) pereopod 2; (E) pereopod 4; (F) pereopod 5; (G) pereopod 6; (H) pereopod 7; (I) uropods and telson.

The description and figures given by Shoemaker clearly apply to the present specimens except for the shape of the second segment of the seventh pereopod. In the single specimen Shoemaker had, the second segment strongly narrows towards the tip so that the distal one-third of the segment is no more wider than the third segment. In the present specimens the second segment is considerably less narrowed, even less than in *O. clausi*. Shoemaker’s specimen was abnormal or as remarked by him the seventh pereopod is undergoing reduction in the suborder Hyperiidea and hence cannot have much specific importance.

**Distribution.**—North, Tropical and South Atlantic, Subtropical and Tropical Pacific, New Zealand, Indian Ocean and the Mediterranean.
**Oxycephalus latirostris** Claus

*(Pl. I–D; Fig. 5)*

*Oxycephalus latirostris* Claus, 1879, p. 71, pl. 24, fig. 1; Bovallius, 1890, p. 66, pl. 2, figs. 7–12, t.-figs.; Pinlot, 1938, p. 367; Fuge, 1960, p. 26.

*Oxycephalus pectinatus* Bovallius, 1890, p. 64, pl. 2, figs. 4–6, t.-figs.

*Oxycephalus notabilis* Spendl, 1927, p. 182, figs. 15–16.

**Material.**—St. 1256, 1 male; St. 1278, 1 male; St. 1278, 2 males; St. 1278, 1 male, 1 female; St. 1278, 3 males, 1 female; St. 1762, 1 female; St. 1808, 1 female.

**Specific characters.**—Body is slender. Rostral part of the cephalon is short and apically rather blunt. The lateral borders of the first three abdominal segments are rounded, without lateral and postero-lateral processes. Telson is triangular and steadily narrows towards the tip with the proximal one-third of the border smooth.

Peraeopods one and two are very characteristic. Second segment of the first peraeopod is comparatively slender and long, fifth segment steadily broadens distally so that together with the sixth segment it forms a stout club, the inner distal prolongation of the fifth segment is stout and as long as the segment itself. The cutting edge of the fifth and sixth segments carries a closely packed

![Fig. 5. Oxycephalus latirostris Claus. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.](image-url)
row of sharp spines and several long submarginal setae. Second peraeopod is similar to the first but is longer and stouter, its sixth segment is nearly parallel sided and as long as the prolongation of the fifth segment, the armature of the chela is similar to that of the first peraeopod. Third and fourth peraeopods are similar to those of *O. clausi* and *O. piscator*. Second segment of the fifth peraeopod is somewhat elongated, with non-serrate border. The second segment of the sixth peraeopod is also rather elongated, with irregularly serrated inner border; seventh peraeopod is similar to that of other species, but its second segment is less narrowed distally.

Peduncle of the first uropod slightly overreaches that of the second, distal two-thirds of its inner border is serrated, outer ramus is shorter than the inner and its outer border is not serrated. Peduncle of the second uropod is one and a half times the length of the inner ramus, outer border of the outer ramus is not serrated. Peduncle of the third uropod is almost as long as the inner ramus, outer ramus is broader than that of the second uropod.

Length 13.9 mm.

Remarks.—The long slender body and the shape and armature of the first two peraeopods easily distinguish *O. latirostris* from *O. clausi* and *O. piscator*. In *O. latirostris* the inner border of the peduncle of the first uropod, unlike as in the other two species, is unarmed.


Genus *Tullbergella* Bovallius

*Tullbergella cuspidata* Bovallius

(Pl. I—E, Fig. 6)

*Tullbergella cuspidata* Bovallius, 1887, p. 38; 1890, p. 69, pl. 2, fig. 13, t.-figs.; Spandl, 1927, p. 191, fig. 22; Fage, 1960, p. 30.

Material.—St. 1799, 2 females.

Specific characters.—Body is somewhat tumid, quite unlike that of other oxycephalids, except *Simerhynchotus*. Cephalon is rather small and produced into a short rostrum, triangular in dorsal view and narrow in lateral view. Telson is as long as the last abdominal segment but completely fused with it and apically drawn out and acute.

First antenna is fairly stout and five-segmented, with long setae, fifth segment is slender and long. Mandible has no palp and the maxilliped is provided with foliaceous palps.

First two peraeopods are subsimilar but the second is much longer than the first, fifth segment of both is flattened and triangular, with several stiff spine-setae, inner distal angle is drawn out into a long slender spine, the inner border of the sixth segment is armed with a row of sharp spines, that of the first peraeopod is comparatively broader and more spiny. Second segment of second peraeopod is as long as the rest of the limb. Third and fourth peraeopods are subsimilar, inner border of segments five and six is armed with small spines arranged in series, seventh segment is long. Second segment of the fifth peraeopod is flattened and oblong, its inner border carries a row of stiff setules and fine spines, fourth and fifth segments are fairly broad with their inner border spiny, sixth segment is equal to the combined lengths of the two previous segments. Sixth peraeopod is very characteristic, its second segment carries only very few setae along the inner border, its distal outer part is drawn out into an outwardly curved process and the distal border is obliquely truncate, fourth and fifth segments are spiny, sixth segment, compared to that of the fifth peraeopod, is short,
Seventh peraeopod is also very characteristic, its second segment is nearly twice as long as broad, with nearly straight inner border and convex outer border, this segment is followed by three small segments.

Peduncle of the first uropod is curved outwards and reaches the base of the third uropod, distal part of its outer border is serrated, rami are subequal in length and width, and as long as the peduncle, their borders are serrated, the teeth being irregularly long and short. The peduncle of the second uropod is only half as long as that of the first, but the rami are nearly as long as those of the first. The third uropod is subequal to the peduncle of the first uropod in length, inner ramus is fused with the peduncle and the outer border of the outer ramus is not spiny.

![Fig. 6. Tullbergella cuspidata Bovallius.](image)

Length 8·0 mm.

**Remarks.**—Compared to Spandl’s figures the telson of the present specimens is apically drawn out and acute and the inner ramus of the third uropod is narrower. Spandl has shown the latter as very broad. It may be pointed out that Bovallius (1890) has also shown the telson apically rather blunt. Compared to the figure given by Bovallius the apex of the rostrum in my specimens is also more blunt. The illustrations of both these authors were those of a male while mine are of a female. This may perhaps account for the differences.

**Distribution.**—This species has been previously recorded from Malay Archipelago, Batavia, Gulf of Siam, Indian Ocean and Great Barrier Reef. This is one of the rare species.
Genus *Leptocotis* Streets

*Leptocotis tenuirostris* (Claus)

(Pl. I—F and G; Fig. 7)

*Leptocotis tenuirostris* Stephensen, 1925, p. 191, fig. 74; Spandl, 1927, p. 206, fig. 30; Barnard, 1930, p. 435; 1931, p. 132; 1937, p. 194; Piriot, 1938, p. 371; Shoemaker, 1945, p. 253; Fage, 1960, p. 37, figs. 21-24.

*Leptocotis spinifera* Streets, 1877, p. 137; 1878, p. 283, pl. 2, fig. 4.

*Leptocotis ambobus* Stebbing, 1888, p. 1594, pl. 205.

*Leptocotis lindstroemi* Bovallius, 1890, p. 76, pl. 2, figs. 16-18, pl. 3, fig. 1, t.-figs.

*Leptocotis similis* Spandl, 1927, p. 204, fig. 29.

Material.—St. 1157, 1 male; St. 1245, 1 female; St. 1254, 1 male; St. 1256, 1 male; St. 1278, 1 female; St. 1302, 1 male; St. 1329, 1 male; St. 1337, 6 males, 11 females; St. 1337, 1 male; St. 1340, 4 males; St. 1344, 2 males; St. 1351, 1 female; St. 1373, 2 females, 1 male; St. 1381, 1 male, 3 females; St. 1383, 2 females; St. 1385, 1 male; St. 1385, 2 males; St. 1385, 1 male; St. 1389, 1 male, 1 female; St. 1391, 2 females, 1 male; St. 1393, 1 male, 1 female; St. 1411, 1 female; St. 1413, 1 female; St. 1413, 1 male; St. 1415, 22 males; St. 1415, 1 male; St. 1415, 2 males, 1 female; St. 1415, 3 females; St. 1417, 1 male; St. 1750, 1 male; St. 1808, 1 female.

![Fig. 7. *Leptocotis tenuirostris* (Claus). (A) Cephalon of male; (B) antenna 1; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson; (J-L) uropods 1-3.](image-url)
Specific characters.—Cephalon is comparatively long and produced into a long rostrum which is slightly curved downwards near the tip; the ventral border of the cephalon and the rostrum carries scattered fine hairs but no serrations. In the female the cephalon has an indistinct neck constriction but in the male the neck constriction is made more conspicuous by a sudden elevation of the dorsal side of the cephalon. The first two abdominal segments are postero-laterally rounded but the third is drawn out into sharp spines reaching clearly beyond the middle of the fourth abdominal segment. The fifth abdominal segment is fused with the sixth and this composite segment is about two and a half times as long as the telson and subequal to the peduncle of the first two uropods in length.

Basal flagellar segment of the first antenna of the male is produced at its outer distal angle and the succeeding four-segmented part originates from the middle of the distal border. Second antenna of the male is only sparsely setose.

Fifth and sixth segments of the first peraeopod are internally expanded and their inner border is cut into a large number of strong acute teeth. In the second peraeopod the fifth and sixth segments are similarly armed, but the fifth segment is broader than that of the first peraeopod and the sixth segment is narrower. Third and fourth peraeopods are slender and weakly armed. Segments four to six of peraeopods five and six are internally armed with spines, the spines on the fourth segment of the sixth peraeopod are very strong and bent basalwards, those on the sixth segment are arranged in series of small spines alternating with long ones. The coxal plate of the seventh peraeopod is subequal to the second segment in size and is produced backwards. Though this appendage is reduced in size all the segments are distinct.

The peduncle of the first uropod is longer than that of the second and both margins of the first and the inner margin of the second are serrated. In the first uropod the endopod is very small and the exopod is long and closely serrated on the inner side and sparsely serrated on the outer margin. The endopod of the second uropod is slightly longer than the exopod and armed with widely spaced teeth, each tooth having a frilled border, inner border of the exopod carries large curved spines armed with a row of subsidiary spines. The peduncle of the third uropod is fused with the endopod, exopod is small and less than half the length of the endopod. Telson strongly tapers to the apex. Dorso-median part of the abdomen and the telson is keeled.

Length 10.1 mm.

Remarks.—The consensus of expert opinion is that genus *Leptocotis* is monotypic. The present study has shown that *L. ambobus* Stebbing (1888) was created on the males of *L. tenuirostris*. The present collection is very rich in specimens of both sexes and all the males show the "ambobus" shape of the cephalon. The two sexes show conspicuous difference in the shape and size of the cephalon.

As pointed out by Barnard (1930) the lower margins of the abdominal segments are not serrated and the peduncle of the third uropod is coalesced with the inner ramus.

Distribution.—This is a very widely distributed species which has been previously recorded from North and South Atlantic, Pacific, East Indies and Indian Ocean. In the present locality this is the most abundant oxycephalid. The males always outnumber the females.

Genus *Calamorhynchus* Streets

*Calamorhynchus pellucidus* Streets

(Pl. I—H; Fig. 8)

*Calamorhynchus pellucidus* Streets, 1878, p. 285, pl. 2, fig. 5; Bovallius, 1890, p. 73, pl. 2, figs. 14–15, t.-figs.; Spandl, 1927, p. 198, figs. 25–26; Barnard, 1930, p. 434; Pirlot, 1938, p. 371; Shoemaker, 1945, p. 251; Fage, 1960, p. 31, figs. 19–20.
Calamorhynchus rigidus Stebbing, 1888, p. 1600, pl. 206; Bovallius, 1890, p. 74; Stephensen, 1925, p. 189, fig. 73; Spandl, 1927, p. 203, fig. 27.

Material.—St. 1730, 1 female; St. 1749, 1 male.

Specific characters.—The cephalon is about a third of the total length of the animal and is divisible into a short but distinct neck, an oblong cephalon proper occupied by the eyes and a long rostrum expanded into broad wings with feebly serrated border. The cephalon has a prominent dorso-median longitudinal keel. Each pereon segment has an indistinct transverse furrow. The postero-lateral angles of the first three abdominal pleura are produced and apically acute. Telson is about two-thirds the length of the previous segment and is apically drawn out and acute.

![Figure 8. Calamorhynchus pellucidus Streets.](image)

First pereopod has a highly swollen fifth segment armed with a row of teeth at the broadly produced inner distal part, inner border of the sixth segment is also toothed. Fifth segment of the second pereopod is swollen and its inner distal corner is produced, distal border is armed with a row of small blunt teeth, inner border of the sixth segment has the same armature. Pereopods three and four are subsimilar, slender and weakly armed. Second segment of fifth pereopod has a nearly straight and feebly serrated upper border and a convex lower border, the segment slightly narrows towards the tip, the sixth segment has its inner border spiny. Second segment of the sixth pereopod is shorter but broader than that of the fifth pereopod, segments four to six have their inner border strongly spiny. Second segment of the seventh pereopod is nearly as long as the rest of the limb and conspicuously narrows towards its distal end so that the distal border is only slightly broader than the third segment.

Peduncle of the first uropod clearly overreaches that of the second and stops a little short of the base of the third uropod, its inner margin is strongly serrate, inner ramus is larger than the outer,
with closely serrate border, outer ramus has sparsely serrate border. Inner margin of the peduncle of the second uropod is very indistinctly serrate, rami are weakly serrate. Peduncle of the third uropod is completely fused with the inner ramus and is as long as the latter, outer ramus is comparatively small.

Length 10.1 mm.

Remarks.—Except in very minor characters the present specimens are exactly like those described by Stebbing. The margin of the rostrum is serrated and each peraeon segment has a faint transverse groove. I could not find the close spinulation of the third and fourth peraeopods illustrated by Stebbing, instead, there are long spine-setae. In Stebbing’s figures the spines arming the cutting edge of the chela of the second peraeopod are pointed. They are actually blunt as illustrated by Fage (1960). In the fifth peraeopod the dorsal border of the second segment is sparsely serrated and not smooth as shown by Stebbing and the fourth and fifth segments possess only a few spine-setae and are not closely spiny as shown by Stebbing. Similarly, the sixth peraeopod is much more strongly armed than shown by Stebbing.

Distribution.—North and South Atlantic, North Pacific, East Indies, Indian Ocean and the Mediterranean.

Genus Cranocephalus Bovallius

Cranocephalus scleroticus (Streets)

(Pl.I—I; Fig.9)

Oxycephalus scleroticus Streets, 1878, p. 281, pl. 2, fig. 3.

Oxycephalus typhoides Claus, 1879, p. 195; 1887, p. 72, pl. 24, figs. 11-14.

Cranocephalus goesi Bovallius, 1890, p. 95, pl. 4, figs. 7-9, t.-figs.

Stebbingella sclerotica Bovallius, 1890, p. 98, pl. 4, figs. 13-16.

Stebbingella typhoides Bovallius, 1890, p. 100, pl. 4, figs. 10-12, t.-figs.; Stephensen, 1925, p. 199, fig. 76; Spandl, 1927, p. 193, fig. 23.

Stebbingella theeli Bovallius, 1890, p. 101, pl. 5, figs. 1-4, t.-figs.

Cranocephalus scleroticus Shoemaker, 1945, p. 251, fig. 44; Fage, 1960, p. 72, figs. 44-53.

Material.—St. 1393, 1 female; St. 1723, 1 male.

Specific characters.—The proximal dorsal side of the cephalon is abruptly raised so that a deep neck constriction is evident. Each peraeon segment has a transverse furrow slightly behind its anterior border. Coxal plates, except the first, are fused with the peraeon segments, but a deep posterior incision demarcates them, the fifth coxal plate has a conspicuous median spine directed backwards. Inferior border of the first three abdominal segments is nearly straight. The telson is linguiform and only very slightly narrows towards the broadly rounded apex.

Lower distal corner of the basal segment of the flagellum of the first antenna of the male is bluntly produced. Peraeopods one and two are subequal in size and shape but the second segment of the second peraeopod is longer than that of the first and the anterior border of the fifth segment of the first peraeopod is more prominently serrated. Peraeopods three and four are long and slender and subsimilar, second segment is as long as the fourth and fifth segments combined. Peraeopods
five to seven have broad flattened second segment which is somewhat irregular in shape, that of the sixth peraeopod is the longest, the anterior border of the second segment of peraeopods five and six is feebly serrated, segments three to six of the fifth peraeopod carry scattered setae while those of the sixth are serrated as in other oxycephalids. Seventh peraeopod, though comparatively small, has all the segments.

**Fig. 9.** *Cranocephalus scleroticus* Bovallius. (A) Antenna 1; (B) same, tip enlarged; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson; (J) same, enlarged.

Peduncle of the first uropod is stout and reaches beyond the base of the telson, distal two-thirds of its inner border and distal half of its outer border are serrated, rami are strongly serrated on both borders, inner ramus is longer than the outer and slightly overreaches the telson. Borders of the inner ramus and inner border of the outer ramus of the second uropod are prominently serrated, outer border of the outer ramus is smooth. Peduncle of the third uropod is as long as the inner ramus, distal half of its inner border is serrated, outer border of the outer ramus is sparsely toothed.

Length 11.3 mm.

**Remarks.** Fage (1960) described the growth changes and sex difference this species exhibits. When compared with the illustrations published by Shoemaker (1945) the inner distal prolongation of the fifth segment of peraeopods one and two in the present specimens is more prominent. The specimen described above is an young male very well agreeing with the figures given by Fage (1960, p. 73, fig. 45 B and p. 77, fig. 51).

**Distribution.** North Pacific, Mediterranean, Tropical Atlantic, Indian Ocean, North Atlantic and South Atlantic.
Genus *Glossocephalus* Bovallius

*Glossocephalus milne-edwardsi* Bovallius

(Pl. I-J; Fig. 10)

*Glossocephalus milne-edwardsi* Bovallius, 1887, p. 35; 1890, p. 106, pl. 5, fig. 5, t.-figs.; Chevreux and Fage, 1925, p. 432, fig. 421; Spandl, 1927, p. 196, fig. 24; Pirlot, 1938, p. 371; Shoemaker, 1945, p. 253, fig. 45; Fage, 1960, p. 83, fig. 56.

*Glossocephalus spiniger* Bovallius, 1887, p. 35; 1890, p. 108, pl. 5, figs. 6-9; t.-figs.

*Elsia indica* Giles, 1888, p. 250, pl. 6, figs. 2-4.

*Glossocephalus adriaticus* Steuer, 1911, p. 682, pl. 3.

*Material.*—St. 1688, 1 female, 1 male; St. 1710, 1 male; St. 1711, 1 female; St. 1737, 1 male; St. 1766, 1 female.

![Fig. 10. *Glossocephalus milne-edwardsi* Bovallius. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 3; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.](image-url)
Specific characters.—The cephalon is comparatively small and hardly forms a rostrum, its anterior end is blunt. First two pereon segments are short but the others are long so that unlike in other oxycephalids the pereonods are well spaced. Abdominal segments are fairly deep and have neither lateral nor postero-lateral spine-like prolongations.

First antenna has a four-segmented flagellum, first flagellar segment is broad and fringed with olfactory setae. Second antenna is folded as usual and armed with well-spaced setules. Pereopods one and two are similar in structure but the second is slightly longer, the process of the fifth segment is spooned and armed with three to four strong spines. Pereopods three and four are sub-similar, third is slightly longer than the fourth, segments are armed along the borders with stiff setules, seventh segment is very small. Fifth pereopod is flattened and car-like, both borders of the segments are serrated and each serration is secondarily armed with microscopic spinules, sixth segment is only slightly shorter than the fifth, seventh segment is very small. Sixth pereopod is almost similar to the fifth, but its sixth segment is more slender than that of the fifth pereopod and much longer than the fifth segment. The seventh pereopod remotely resembles that of other oxycephalids and is formed of a large flat segment followed by four slender segments.

The peduncle of uropods one and two has strongly serrate border, outer ramus is longer than the inner, inner ramus of first uropod is narrow and that of the third is broad. Telson is slightly longer than broad and distally rounded, distal half of its lateral borders is serrated.

Length 12.7 mm.

Remarks.—Shoemaker (1945) illustrated this species but did not attempt a description. The present specimens differ as follows: The first flagellar segment of the first antenna of the male is distally produced. Shoemaker has neither described nor figured the armature of the distal segments of legs five and six. He pointed out the difference in the shape of the cephalon and attributed this to the difference in the size of the specimens. In the present specimens, which include very small ones, the cephalon has evenly curved dorsal side which is not abruptly raised as shown by Shoemaker. The cephalon is apically blunt and not sharply angular as illustrated by Shoemaker.

The small specimens, of both sexes, in the present collection appear to be dimorphic forms. They are seemingly mature, but only a third of the length of the normal ones. In general shape these fully agree with the figure of G. spinifer given by Bovallius (1890, pl. 5, fig. 6).

Distribution.—North and South Atlantic, South Pacific, Indian Ocean, Mediterranean and Red Sea.

Genus *Streetsia* Stebbing

Stebbing, 1888; Bovallius, 1890; Stephensen, 1925; Spandl, 1927; Fage, 1960.

A large number of species have been referred to this genus but Fage recognized only four of them as valid. All the four are represented in the present collection by small numbers. The following key serves to distinguish them.

1. Body stout .................................................. *porcella*
   1. Body slender .................................................. 2

2. Cephalon with a distinct neck constriction, abdominal segments one to three with a pair of sense-organs .................................................. *mindanaensis*
   2. Cephalon without a neck constriction, abdominal segments without sense organs ............. 3

3. Postero-lateral angles of third abdominal segment blunt .................................. *challengeri*
   3. Postero-lateral angles of third abdominal segment pointed .................................. *steenstrupi*
Streetsia porcella (Claus)

(Pl. I—K; Fig. 11)

Oxycephalus porcellus Claus, 1887, p. 71, pl. 24, figs. 7-9; Bovallius, 1887, p. 36; Stebbing, 1888, p. 1587, pl. 203.

Streetsia porcella (Claus), 1890, p. 83, pl. 4, figs. 4-6.

Streetsia porcella Bovallius, 1890, p. 83, pl. 4, figs. 4-6.

Material.—St. 941, 1 female; St. 976, 1 female; St. 1029, 1 female; St. 1245, 1 female; St. 1278, 1 female; St. 1278, 1 female; St. 1292, 2 male; 1 female; St. 1389, 1 male; St. 1415, 1 female; St. 1417, 1 male; St. 1720, 1 male, 1 female; St. 1789, 1 female.

Specific characters.—The body is comparatively stout and strongly built, quite unlike that of other species. The cephalon is comparatively short and produced into a short downwardly curved rostrum which is nearly half the length of the cephalon proper. First three abdominal segments

Fig. 11. Streetsia porcella (Claus). (A) peraeopod 1; (B) peraeopod 2; (C) peraeopod 4; (D) peraeopod 5; (E) peraeopod 6; (F) peraeopod 7; (G) uropods and telson.
Pelagic amphipods in C.M.F.R.I. collections—1

The cephalon is nearly a third of the total length of the animal and is produced into a long slender rostrum with feebly serrate inferior border. Postero-lateral angles of the...

Streetsia challengeri Stebbing

Length 9·1 mm.

Remarks.—The neck constriction shown by Stebbing is absent. The dorsal margin of the second segment of the fifth pereopod and the distal half of that of the sixth pereopod is serrated but this has not been shown by Stebbing. Likewise the third segment of the sixth pereopod is produced into a large spiny lobe overlapping the fourth segment which also has not been shown by Stebbing. Second segment of the seventh pereopod is slightly more elongated than in Stebbing's figure of this appendage.

Distribution.—North and South Atlantic, Mediterranean, Sea of Japan, New Zealand and the Arabian Sea.

Specific characters.—The cephalon is nearly a third of the total length of the animal and is produced into a long slender rostrum with feebly serrate inferior border. Postero-lateral angles of the...
first two abdominal segments are not produced. Telson is nearly as long as the last abdominal segment and is apically drawn out.

Fifth segment of first pereaeopod is expanded at its inner distal part but is not produced, its border is armed with a few sharp spines; sixth segment is broad and its cutting edge is straight and feebly serrated. Inner distal angle of the fifth segment of the second pereaeopod is produced into a long spine, distal border has two to three spines, sixth segment is rather slender, with two inner distal spines, inner border is finely serrate. Third and fourth pereaeopods are subsimilar and armed with slender spine-setae. Second segment of the fifth pereaeopod is considerably flattened and elongated, its upper border is nearly straight, and feebly serrated, outer distal angle of the second segment is slightly produced, succeeding segments are armed with short stiff setae along the inner border. Second segment of the sixth pereaeopod is shorter but broader than that of the fifth pereaeopod, its upper border is distally serrated, its lower distal part is prolonged into a prominent conical process which is very characteristic of this species, outer distal angle of the second segment is produced in a sharp process, segments three to six are armed with closely packed spines. Second segment of seventh pereaeopod is rather short and longer than the rest of the limb, seventh segment is represented by a spine.

Peduncle of the first uropod just reaches the base of the third uropod, its inner border is finely spiny, inner ramus is broader and longer than the outer and closely serrate, outer ramus is sparsely serrate. Peduncle of the second uropod is shorter than the inner ramus, latter is longer and broader than the outer. Peduncle of the third uropod is as long as the inner ramus, latter stops far short of the tip of the telson.

Length 10.9 mm.
Remarks.—This species is apparently quite variable. When compared to the detailed description by Stebbing (1888) the following differences emerge. In Stebbing’s figure the cephalon is nearly cylindrical with the rostrum subequal to the cephalon proper in length. In the present specimens the cephalon perceptibly narrows distally and the rostrum is comparatively short. In this character Spandl’s figure agrees with mine. Stebbing has shown the posterolateral corners of the third abdominal segment slightly produced; they are blunt in mine. In Stebbing’s specimen the last abdominal segment is only half as long as the telson but in mine they are nearly equal in length. In the appendages also variations are observed. The most important difference is the absence of the distal prolongation of the second segment of the second peraeopod. This is only a sign of immaturity (Stephensen, 1925). The lower distal prolongation of the second segment of the sixth peraeopod is very characteristic of this species and hence there is very little difficulty in referring the present specimens to *S. challengeri*. *S. challengeri* very closely resembles *S. steenstrupi* (Bovallius).

Distribution.—Hawaiian Islands, North and South Atlantic, South Pacific, Indian Ocean, Arabian Sea and the Mediterranean.

*Streetsia steenstrupi* (Bovallius)

(Pl. I—M; Fig. 13)

*Oxycephalus steenstrupi* Bovallius, 1887, p. 37.

*Oxycephalus longiceps* Stebbing, 1888, p. 1591, pl. 204 B.

*Streetsia steenstrupi* Bovallius, 1890, p. 89, pl. 3, figs. 2-6, t.-figs.; Fage, 1960, p. 42, figs. 25-27.

Material.—St. 1044, 1 female; St. 1278, 1 female.

Specific characters.—Cephalon is elongated and about a third of the total length of the animal, Rostrum is comparatively short with feebly serrate border. Posterolateral corners of the first three abdominal segments are acute but not produced, except those of the third. Telson is elongated and tapering, almost as long as the last abdominal segment.

First peraeopod is rather stout and of uniform width, fifth segment is cylindrical with feebly serrated inner border, inner distal part is produced into a narrow process, distal border is very indistinctly dentate, sixth segment is rather broad and its inner distal angle is prolonged beneath the seventh segment. Fifth segment of second peraeopod is minutely pectinate along the inner border, inner distal angle is prolonged into a large triangular process almost reaching the tip of the sixth segment, distal border is weakly dentate, sixth segment is comparatively slender, seventh is long. Peraeopods three and four are subsimilar, third is slightly shorter but broader than the fourth. Second segment of fifth peraeopod is expanded, the dorsal side is straight and weakly dentate, outer distal part of the third segment is expanded into a flat lobe with spiny border, overlapping the fourth segment. Second segment of sixth peraeopod is broader than that of the fifth, third segment is greatly expanded, segments four to six are strongly spiny. Seventh peraeopod is of the usual pattern with large leaf-like second segment.

Peduncle of the first uropod just reaches the base of the third uropod, its inner distal border is spiny, inner ramus is more strongly dentate than the outer. Peduncle of the second uropod is as long as the outer ramus, both rami are sparsely dentate. Peduncle of the third uropod is as long as the outer ramus and its inner border is finely pectinate.

Length 10.7 mm.

Remarks.—In the shape of the cephalon of the female there is much difference between the illustrations of Stebbing and Fage; mine are like those of Fage. There is, however, no doubt about
the identity because of the very exact similarity in the shape of the fifth segment of the first peraeopod and of the third segment of the sixth peraeopod.

![Diagram of Streetsia steenstrupi](image)

**Streetsia steenstrupi** (Boylius).

(A) Peraeopod 1; (B) peraeopod 2; (C) peraeopod 3; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.

**Streetsia mindanaonis** (Stebbing)

(Pl. I—N; Fig. 14)

*Leptocotis mindanaonis* Stebbing, 1888, p. 1598, pl. 204 c.

*Streetsia mindanaonis* Bovallius, 1890, p. 93; Fage, 1960, p. 45, figs. 28–32.

**Material.—** St. 1302, 1 male; St. 1385, 1 male; St. 1393, 1 male; St. 1397, 1 male; St. 1723, 1 male.

**Specific characters.**—Cephalon is slightly more than one-third the total length of the animal and in the male is divisible into a neck, a cephalon proper housing the eyes and a long curved rostrum. First three abdominal segments have their postero-lateral angles acute but are not produced backwards, each carries a pair of sense organs. Telson is about two-thirds the length of the last abdominal segment and is apically drawn out and acute.

The basal flagellar segment of the first antenna of the male is rounded at the lower distal part and bluntly produced at the upper distal. First peraeopod is shorter but stouter than the second, fifth segment is produced into a conical unarmed process at the inner distal part, inner part of sixth segment is expanded and feebly toothed. The inner distal angle of the fifth segment of the second
Peraeopod is considerably produced, with the cutting edge minutely spiny, inner border of the sixth segment is similarly armed. Third and fourth peraeopods are subsimilar and armed with long stiff setae, sixth segment is feebly spiny. Second segment of fifth peraeopod is elongated and flattened, nearly twice as long as broad, its upper border is partly serrate, inner border of sixth segment is spiny. Second segment of sixth peraeopod is comparatively broad and its upper border is serrate, fourth segment is armed with strong spines, interspersed with longer ones, fifth and sixth segments have uniform spines. Second segment of seventh peraeopod is as long as the rest of the limb.

Peduncle of the first uropod stops short of the base of the third uropod, its inner border is strongly serrated, outer border of outer ramus and inner border of inner ramus are closely serrated. Peduncle of second uropod stops slightly short of the base of that of the third, its inner border is feebly serrated, teeth on the inner border of the rami are armed with subsidiary teeth, the outer border of the inner ramus has secondarily armed teeth near the tip but the rest of the border is closely spiny. Peduncle of the third uropod is slightly shorter than the rami, all the uropods stop far short of the tip of the telson.

**Fig. 14. Strepsis minnamoonga (Stebbing).** (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 3; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

Length 10.0 mm.

**Remarks.**—In previous descriptions of this species by Stebbing (1888) and Fage (1960) adequate attention has not been paid to the finer details like the very specific armature of the rami of the uropods.
S. mindanaonis shows very close resemblance to Leptocotis temuiroditis but can be easily distinguished by the comparatively longer neck, the spines on the fourth segment of the sixth peraeopod which are at right angles to the long axis of the segment (at an angle in Leptocotis) the nearly transverse hind border of the third abdominal segment (very oblique in Leptocotis) and the subsimilar rami of the first uropod (inner ramus is very small in Leptocotis).

Distribution.—Recorded from all the oceans.

Genus Rhabdosoma Adams and White

Stebbing, 1888; Spandl, 1927; Fage, 1960.

Of the six species Fage recognised in this genus only two are contained in the present collection. They differ thus:

1. Fifth segment of first peraeopod with an accessory process on the inner side, outer ramus of second and third uropods rudimentary.

2. Fifth segment of first peraeopod without accessory process, outer ramus of second and third uropods normally developed.

Rhabdosoma whitei Spence Bate

(Fig. 15)

Rhabdosoma whitei Spence Bate, 1862, p. 345, pl. 54, fig. 7; Spandl, 1927, p. 208, fig. 31; Barnard, 1930, p. 436; Stephensen, 1925, p. 297; Barnard, 1931, p. 132; 1937, p. 193; Pirfot, 1938, p. 373; Shoemaker, 1945, p. 255; Fage, 1960, p. 97, fig. 71.

Xiphocephalus whitei Bovallius, 1890, p. 125, pl. 7, figs. 1–20, t.-figs.

Material.—St. 1254, 1 female; St. 1378, 5 males, 1 female; St. 1278, 1 female; St. 1278, 1 male; St. 1312, 1 female; St. 1329, 1 female; St. 1355, 1 female; St. 1373, 1 male; St. 1383, 2 females; St. 1385, 2 females; St. 1399, 1 male, 1 female; St. 1409, 1 female, 2 males; St. 1411, 1 male; St. 1763, 1 female; St. 1766, 1 male; St. 1799, 1 female; St. 1802, 1 male.

Specific characters.—The fifth segment of the first peraeopod is internally produced into a large conical lobe reaching far beyond the distal border of the sixth segment, sixth segment is likewise strongly produced at the inner distal part and its borders are feebly serrate. In the male the prolongation of the sixth segment is rounded. The prolongation of the fifth segment of the second peraeopod is narrow and as long as the sixth segment, the prolongation of the latter segment is very small and more rounded in the male. Peraeopods three and four are subsimilar but the fourth is longer. Fifth peraeopod is very much elongated with sparsely distributed spinules. Sixth peraeopod is shorter and more slender than the fifth, segments three to six are internally armed with small spines arranged in series, on fifth and sixth segments the members of a series show a tendency to get fused basally. Peraeopods two to six carry large branchial lobes attached to the inner side of the coxal plates and overlapping successively but they do not overlap ventrally. Seventh peraeopod is reduced to an oval lamina, its coxal plate is somewhat crescentic, with the hinder part produced.

Inner ramus of first uropod is subequal to the outer in length and width and is apically curved outwards in a characteristic fashion, its borders are closely toothed, outer ramus has its borders armed with well-spaced spines. Inner ramus of second uropod is fused with the peduncle and is longer and wider than the outer. The rami of the third uropod are similar to those of the second. Telson is an apically acute long process clearly overreaching the third uropod.
Length 65.6 mm.

Remarks.—Reviewing the observations of Schellenberg (1933) and Stephensen (1925), concerning the breeding habits of this species, Fage (1960) observed that between the first pair of branchiae exists an anterior window which permits the entry of water into the marsupium and that the branchiae of the posterior pair are free, through which the expulsion of the young takes place. I have had the opportunity to study only preserved specimens, many of which contain embryos numbering up to 40, arranged compactly in two rows. Every embryo faces obliquely upwards and forwards. By slightly pressing the marsupium one could easily make them come out through the anterior opening of the marsupium. In one large specimen the marsupium contained larvae as well as eggs and unhatched larvae and the eggs were at the hinder part. This probably indicates that the expulsion of the embryos takes place through the anterior opening of the marsupium. But I have no other positive evidence in support of this observation.

Distribution.—Very common in the tropical part of the Atlantic, Indian and Pacific Oceans.
Rhabdosoma armatum Milne Edwards

(Fig. 16)


Xiphocephalus armatus Bovallius, 1890, p. 119, pl. 6, t.-figs.

Material.—St. 1278, 1 female.

Specific characters.—The first peraeopod is comparatively stout, its fifth segment is produced into a large process reaching the tip of the seventh segment, its inner border is dentate and the outer distal part carries a stout process. Inner distal part of the sixth segment is also produced into a large triangular process. Seventh segment is apically blunt. The prolongation of the fifth segment of the second peraeopod is very long, that of the sixth segment is triangular. Peraeopods three and four are subsimilar, fourth segment is very stout and is the longest. Fifth peraeopod is the longest and its second and fourth segments are swollen, the borders of the second segment are feebly dentate. Second segment of the sixth peraeopod is swollen, following segments are slender and armed along the inner border with sharp spines falling into series. Seventh peraeopod is reduced to a pear-shaped lamina, its coxal plate is roughly rectangular with concave inferior border. Inferior border of the abdominal segments is serrate. Peraeopods two to six carry large branchial plates.
Fig. 17. Showing the distribution of species in the area of collection.
Fig. 18. Showing the distribution of species in the area of collection.
Both rami of the first uropod are free from the peduncle, inner ramus is similar to that of R. whitei but the outer ramus is twice as long as the inner. Inner ramus of the second and third peraeopods is fused with the peduncle, outer ramus is very small. The telson is apically acute and overreaches the third uropod.

The surface of the body including that of the telson is prominently spiny.

Length 116.9 mm.

Remarks.—In general aspects R. armatum resembles R. whitei but can be easily distinguished by the spiny body, the presence of an accessory process on the fifth segment of the first peraeopod, by the swollen fourth segment of peraeopods three, four and five and the shape of the coxal plate of the seventh peraeopod. The rudimentary nature of the outer ramus of the second and third uropods is also very characteristic of R. armatum.

Propagation is similar to that of R. whitei. The single female in the present collection has its brood pouch filled with 43 embryos.

The length of the present specimen is rather high for a tropical individual. The rostrum was partly broken and when complete the animal would have been 15-20 mm. longer than given above.

Distribution.—Previously recorded from the tropical and subtropical parts of the Atlantic, Indian and Pacific Oceans.

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Note: The table above represents a sample of data related to the detention of gear. Each row contains information about the type of gear, the date and time of detention, and the date and time the gear was expired. The data is formatted to show the relationship between the date of detention and the date of expiration, indicating the time frame within which the gear was valid for use.