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

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ABSTRACT

The first of this series described the oxycephalids contained in the present collection. The present report deals with the families Vibiliidae, Paraphronimidae, Hyperiidae, Phronimidae, Phrosinidae, Lycaeopsidae, Pronoidae, Lycaeidae, Brachyscelidae and Platyscelidae. All the species described are well known forms but a detailed study has enabled me to correct certain defects in the earlier descriptions and also provide accurate illustrations. Part of the material is yet to be identified. These will be included in the third part.

THE present report, the second part of this series, deals with the hyperiid amphipods, excluding oxycephalids, collected on board *R. V. Varuna* from various stations in the Arabian Sea. The first part dealt with the oxycephalids (Pillai, 1966). Part of the material yet to be identified, along with a few gammarids present in the collection, will form the subject-matter of a third part.

As is to be expected in a predominantly holoplanktonic group like the hyperiids, all the species represented are well known. But most of them are very rich in the number of individuals and this has permitted detailed study. Each species is almost fully illustrated and briefly described.

Vibilia armata Bovallius

(Fig. 1)

Vibilia armata Bovallius, 1887, p. 69, pl. 10, figs. 15–22; Chevreux and Fage, 1925, p. 387, fig. 391; Schellenberg, 1927, p. 618, fig. 27; Pirlot, 1930, p. 11.

Vibilia gracilis Bovallius, 1887, p. 65, pl. 9, figs. 14–18.

Vibilia gracilenta Bovallius, 1887, p. 67, pl. 10, figs. 1–14.

Material (Number of specimens given in parentheses).—St. 941, (3); St. 945, (3), St. 953, (1); St. 1044, (1); St. 1046, (4); St. 1161, (1); St. 1278, (1); St. 1278, (1); St. 1278, (1); St. 1290, (1); St. 1292, (2); St. 1294, (1); St. 1298, (1); St. 1298, (6); St. 1300, (2); St. 1310, (1); St. 1312, (2); St. 1329, (1); St. 1329, (1); St. 1329, (3); St. 1335, (2); St. 1337, (1); St. 1337 ,(12); St. 1337, (3); St. 1344, (2); St. 1344, (4); St. 1344, (3); St. 1344, (3); St. 1345, (17); St. 1347, (3); St. 1351, (4); St. 1351, (2); St. 1351, (6); St. 1351, (1); St. 1353, (2); St. 1355, (1); St. 1373, (1); St. 1375, (2); St. 1377, (5); St. 1377, (14); St. 1377, (1); St. 1379, (1); St. 1379, (3); St. 1383, (51); St. 1385, (5); St. 1385, (1); St. 1385, (1); St. 1385, (2); St. 1385, (2); St. 1385, (4); St. 1389, (10); St. 1389, (2); St. 1389, (1); St. 1389, (2); St. 1391, (8); St. 1393, (1); St. 1411, (31); St. 1413, (2); St. 1413, (1); St. 1415, (11); St. 1415, (18); St. 1415, (3); St. 1415, (1); St. 1415, (1); St. 1417, (23); St. 1721, (1); St. 1721, (1); St. 1723, (1); St. 1726, (1); St. 1727, (5); St. 1732, (1); St. 1737, (1); St. 1737, (1); St. 1738, (1); St. 1749, (1); St. 1749, (1); St. 1750, (3).

Specific characters.—First antenna of the male is five-segmented, first segment is stout and carries branched setae, fourth segment abruptly narrows before the middle and its borders are armed

with small setules, there is a small fifth segment carrying four denticles. Second antenna is eight-segmented, third and fourth segments are subequal. Third segment of the palp of the mandible is as long as the first two segments combined and is armed with closely packed spinules.

First peraeopod is not gnathopodal in nature, its fifth and sixth segments are subequal in size and armed with strong barbed setae, seventh segment is strong. Fifth segment of second peraeopod is internally produced forwards into a narrow spiny lobe forming with the sixth segment a subchela, the sixth segment is serrated on both borders. Peraeopods three to seven are robust, third and fourth have comparatively slender second segment, fifth and sixth segments are armed along the inner border with small spines. Second segment of fifth peraeopod is broad, with six spines on the inner distal half of its inner border, inner border of segments four to six is spiny, dactylus is nearly straight and carries a few spines near its base. Sixth peraeopod is very much similar to the fifth but its second segment is slightly narrower. Seventh peraeopod is modified, its second segment is broad, third is very short, inner border of segments four to seven is armed with scales and spinules, seventh segment is large and club-shaped, with characteristic armature.

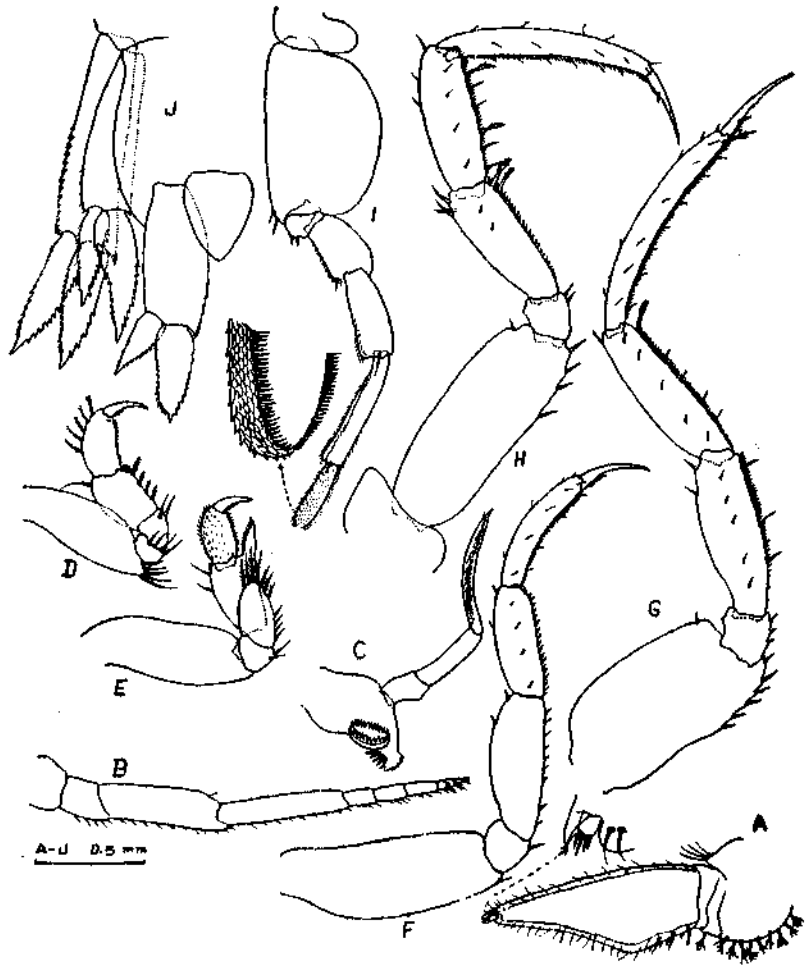

FIG. 1. *Vibilia armata* Bovallius. (A) Antenna 1; (B) antenna 2; (C) mandible; (D) peraeopod 1; (E) peraeopod 2; (F) peraeopod 4; (G) peraeopod 5; (H) peraeopod 6; (I) peraeopod 7; (J) uropods and telson.

Peduncles of the uropods are stout, that of the first uropod is nearly as broad as that of the third, peduncle of the second uropod is as long as that of the third. Distal two-thirds of the outer border of the peduncle of the first uropod shows sparse serrations. Rami of first uropod are subsimilar, exopod of the second and third uropods is smaller than the endopod, endopod of third uropod is broad and suddenly narrows near its apex, both borders of all the rami are serrated. Telson is roughly triangular and apically blunt.

Length 7·4 mm.

Remarks.—In most of the characters the present specimens resemble those which Bovallius described as *V. gracilenta*. However, the proportionate lengths of the segments of the second antenna are different and the telson is slightly broader.

Vibilia viatrix Bovallius

(Fig. 2)

Vibilia viatrix Bovallius, 1887, p. 63, pl. 9, figs. 1-13; Chevreux and Fage, 1925, p. 385, fig. 390; Barnard, 1930, p. 403; Shoemaker, 1948, p. 234; Pirlot, 1930, p. 10.

Material (Number of specimens given in parentheses).—St. 745, (1); St. 953 (1); St. 968, (4); St. 1278, (1); St. 1329, (1); St. 1329, (1); St. 1329, (2); St. 1344, (7); St. 1385, (3); St. 1399, (1); St. 1417, (1); St. 1704, (1); St. 1719, (1); St. 1723, (1); St. 1737, (1); St. 1749, (1); St. 1796, (1); St. 1808, (1); St. 1808, (1).

Specific characters.—The first antenna of the male is five-segmented, fourth segment is very stout and fifth minute, the distal border of the fourth segment is obliquely truncate and hairy, its inner surface carries two longitudinal patches of sensory setae. Second antenna is seven-segmented.

Second segment of first peraeopod has a proximal dorsal bulge, distal part of the inner border of the fifth and the whole of the inner border of the sixth segment are spiny. Fifth segment of the second peraeopod is produced into a large spiny conical process. Inner border of the sixth and seventh segments of the fourth peraeopod is spiny. Second segment of the fifth peraeopod is flattened, with three spine-setae along the lower border, sixth segment is long and spiny. Second segment of the sixth peraeopod is longer than that of the fifth, its fifth segment is spiny along the inner border and carries five strong spines. Second segment of the seventh peraeopod is considerably expanded and flattened; its distal inferior part is produced into a thin conical lobe reaching slightly short of the tip of the fourth segment, borders of the segments are minutely spiny.

Peduncle of the first uropod is about one and one-fourth times the length of the peduncle of the third, that of the second is slightly shorter than that of the third, inner distal border of the peduncle of the first and third uropods is finely pectinate. Rami of the first uropod are long and serrated along both borders, those of second and third are comparatively short. Telson is roughly semicircular.

Length 3·1 mm.

Remarks.—The denticulation of the rami of the uropods in the present specimens is very prominent and the shape of the telson is slightly different from the illustrations given by Chevreux and Fage. More important is the greater prolongation of the second segment of the seventh peraeopod. Since the present specimens are all comparatively small I suspect that this might be a juvenile character. In the illustrations published by Shoemaker the prolongation is prominent but is smaller than in the present specimens. I am not fully satisfied with the identification of the specimens dealt with here.

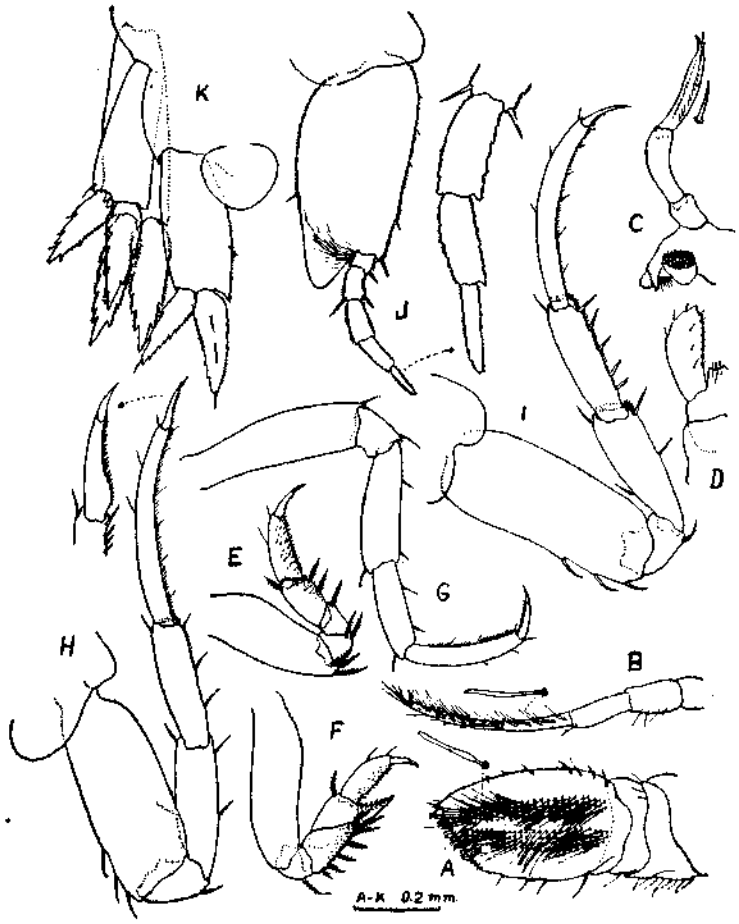

FIG. 2. *Vibilia viatrix* Bovallius. (A) Antenna 1; (B) antenna 2; (C) mandible; (D) maxilliped; (E) peraeopod 1; (F) peraeopod 2; (G) peraeopod 4; (H) peraeopod 5; (I) peraeopod 6; (J) peraeopod 7; (K) uropods and telson.

Vibilia australis Stebbing

(Fig. 3)

Vibilia australis Stebbing, 1888, p. 1287, pl. 149.

Material.—St. 2131, 4 specimens.

Specific characters.—First antenna is six-segmented, inner border and inner ventral surface of the fourth segment are prominently hairy, the distal third of its inferior border is concave and the segment abruptly narrows distalwards, fifth and sixth segments are small. Second antenna is four-segmented, fourth segment is as long as the combined lengths of the second and third segments. First peraeopod is not gnathopodal in shape, inner part of the sixth segment is produced into conspicuous apically serrate processes, seventh segment is large, with distinct unguis. Second gnathopod is subchelate, fifth segment is produced at its inner distal part into a long stout apically sharp process with irregularly dentate inner border, inner border of the sixth segment is cut into sharp teeth. Peraeopods three to six are comparatively stout, third and fourth are subsimilar, second

segment is the longest, inner border of the sixth and seventh segments is feebly spiny. Fifth and sixth peraeopods are subsimilar, their second segment is flattened and the sixth segment is elongated, inner border of the fifth, sixth and seventh segments of the sixth peraeopod is conspicuously spiny. Seventh peraeopod is characteristic, its seventh segment is apically drawn out and is covered with stiff setules.

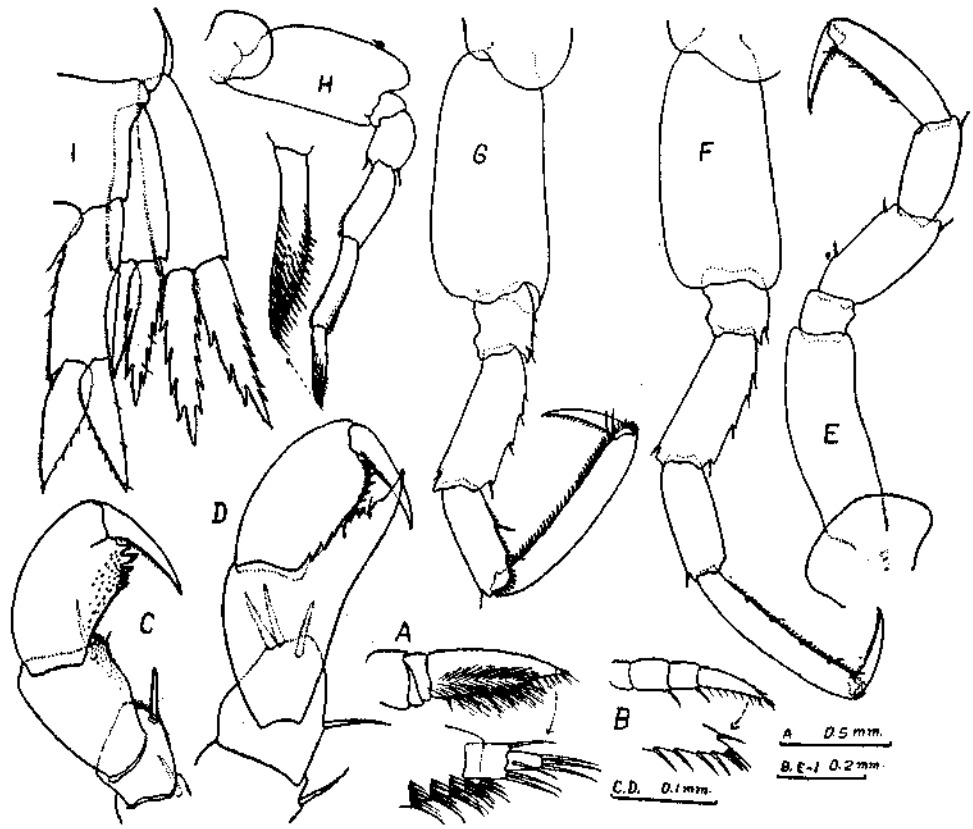

FIG. 3. *Vibilia australis* Stebbing. (A) Antenna 1; (B) antenna 2; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

Telson is nearly triangular, as long as broad and only slightly immersed in the urosome. Peduncle of the first uropod very slightly overreaches the peduncle of the second, the rami are subsimilar, with prominent serrations along both borders, serrations on the outer border are smaller and closer, inner border of the peduncle is closely serrate. Peduncle of the second uropod is longer than the rami, its inner border is minutely serrate, outer ramus is longer than the inner and serrate like the rami of the first uropod, inner ramus has both borders finely serrate. Peduncle of the third uropod is only slightly shorter than that of the first, inner ramus is broader than the outer, outer border of outer ramus is smooth, inner border of outer ramus and both borders of the inner ramus are irregularly serrate.

Length 3·6 mm.

Remarks.—The present specimens resemble those described by Stebbing except in minor details. The denticulation of the sixth segment of the first two peraeopods is slightly different and the seventh segment of the seventh peraeopod abruptly narrows near the tip and ends in an acute point.

Paraphronima crassipes Claus

(Fig. 4)

Paraphronima crassipes Bovallius, 1889, p. 30, pl. 2, figs. 11–15; Stephensen, 1924, p. 77; Chevreux and Fage, 1925, p. 390, fig. 393; Spandl, 1927, p. 166; Irie, 1948, p. 347, fig. 4.

Material (Number of specimens given in parentheses).—St. 1278, (1); St. 1294, (1); St. 1335, (1); St. 1337, (1); St. 1351, (1); St. 1373, (1); St. 1385, (1); St. 1385, (1); St. 1389, (1); St. 1393, (1); St. 1411, (1); St. 1415, 1); St. 1417, (1); St. 1721, (1); St. 1748, (2); St. 1749, (1); St. 1762, (1); St. 1779, (2); St. 1805, (1).

Specific characters.—Cephalon is nearly as long as deep. Peraeon is about half as deep as the cephalon. Telson is very small and triangular with rounded apex. The penultimate segment of the first antenna of the male is enlarged and hairy, last segment is minute. Second antenna of the male has its second segment equal to the rest of the limb. First peraeopod is comparatively short and stout, fourth segment has its inner distal angle conically produced and surmounted by about five strong spines, fifth segment carries two stout inner distal spines. Second peraeopod is long and slender, with subcylindrical segments. Peraeopods three to seven successively decrease in length, and seventh is only slightly shorter than the sixth. All the peraeopods have a robust build.

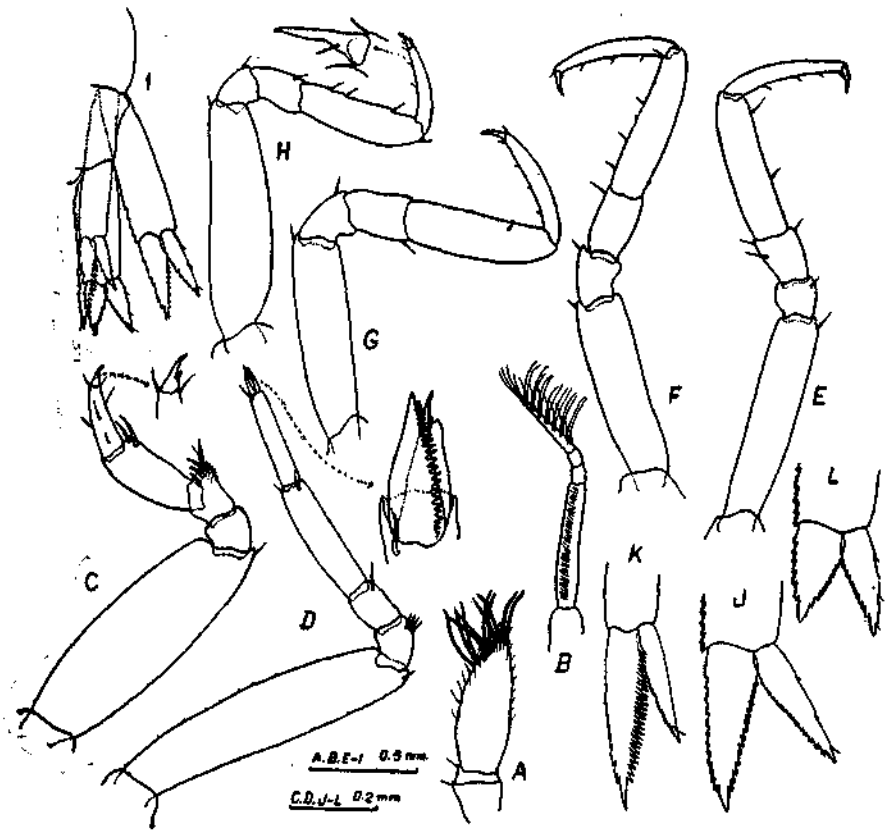

FIG. 4. *Paraphronima crassipes* Claus. (A) Antenna 1; (B) antenna 2; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson; (J–L) uropods 1–3.

Peduncle of the first uropod is nearly twice as long as the inner ramus, distal part of the inner border is serrated, both borders of the inner ramus and inner border of the outer ramus are serrated. Peduncle of the second uropod is nearly one and a half times the length of the inner ramus, outer ramus is feebly serrated, inner ramus is comparatively long, its inner border carries a few teeth and the outer border is armed with a closely packed row of sharp long teeth. Peduncle of the third uropod is stout, slightly more than twice as long as the rami, its inner border is fully serrated, both borders of the inner ramus and the inner border of the outer ramus are serrated.

Length 6·6 mm.

Hyperioides longipes Chevreux

(Fig. 5)

Hyperioides longipes Chevreux, 1900, p. 143, pl. 17, fig. 2; Stephensen, 1924, p. 94; Chevreux and Fage, 1925, p. 407, fig. 405; Schellenberg, 1927, p. 637, fig. 42; Spandl, 1927, p. 164; Pirlot, 1930, p. 19; Barnard, 1930, p. 414; Shoemaker, 1945, p. 238.

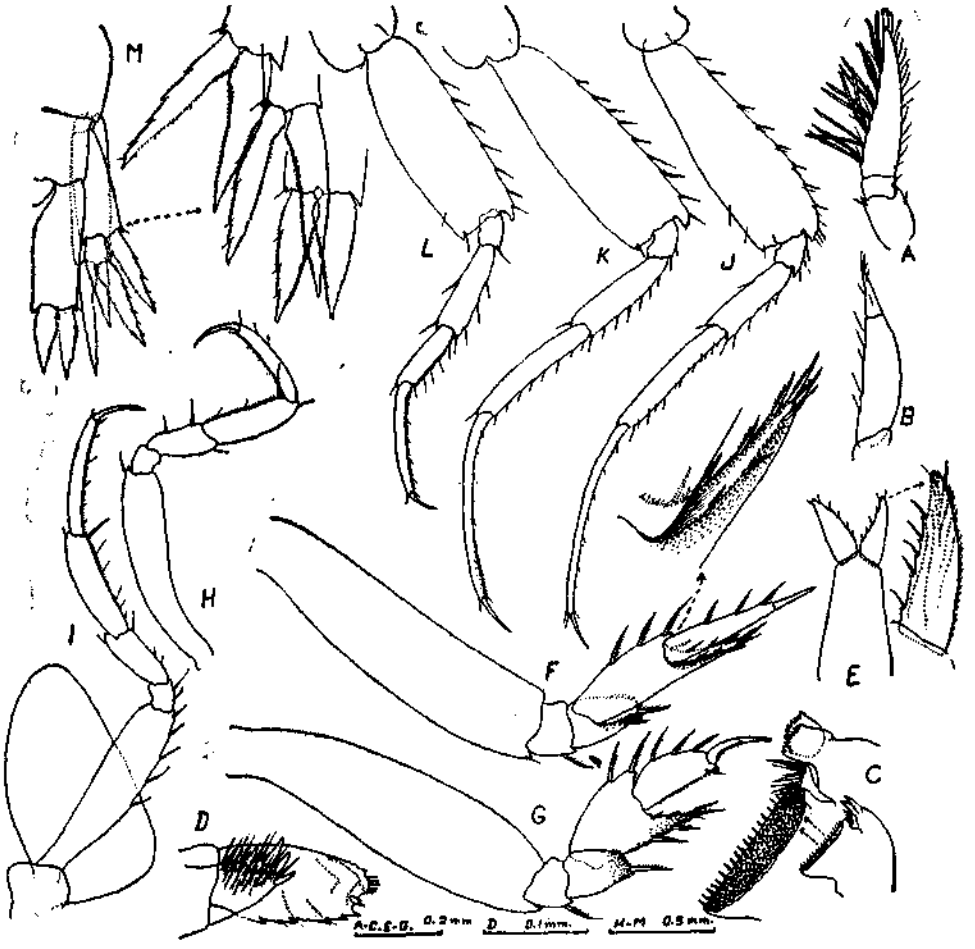

FIG. 5. *Hyperioides longipes* Chevreux. (A) Antenna 1; (B) antenna 2; (C) mandible; (D) maxilla 1; (E) maxilliped; (F) peraeopod 2; (G) peraeopod 1; (H) peraeopod 3; (I) peraeopod 4; (J) peraeopod 5; (K) peraeopod 6; (L) peraeopod 7; (M) uropods and telson.

Material (Number of specimens given in parentheses).—St. 1294, (1); St. 1710, (3); St. 1746, (1); St. 1773, (4); St. 1808, (1).

Specific characters.—The cephalon is rather deep with the eyes covering almost the whole of its surface. Peraeon segments are rather short and as broad as the first three abdominal segments. Telson is very small and semicircular.

First antenna of the female is three-segmented, third segment is long. Second antenna is three-segmented but the second partition is indistinct. Mandible is well developed, with all the parts distinct, palp is absent. First maxilla is of the usual type, its inner lobe carries five strong teeth. Second segment of the first two peraeopods is very long, longer than the rest of the limb, fifth segment of first peraeopod is internally produced into a conical lobe, that of the second peraeopod forms a hollowed long process embracing the slender sixth segment. Third and fourth peraeopods are of the same pattern, but the fourth is longer and more prominently armed. Peraeopods five to seven are similarly constructed but become progressively shorter, inner border of segments of the fifth and sixth peraeopods carries well spaced spine-setae, inner border of segments five and six of seventh peraeopod is spiny.

Peduncle of first uropod is slightly longer than that of third, outer border of outer ramus has widely spaced teeth and inner border of inner ramus very fine serrations. Inner border of outer ramus and outer border of inner ramus are closely serrated and as in *Hyperia* have a basal concavity armed with longer spines. Peduncle of the second uropod is only slightly longer than the rami, the armature of the rami is identical to that of the first. Peduncle of the third uropod is fairly stout, rami are short, outer ramus is slightly longer than the inner.

Length 3·4 mm.

Phronima sedentaria (Forskal)

(Fig. 6)

Phronima sedentaria Stebbing, 1888, p. 1357, pl. 162 B; Bovallius, 1889, p. 354, pl. 16, figs. 1–3; Stephensen, 1924, p. 414, figs. 50–51; Chevreux and Fage, 1925, p. 393, fig. 396; Mogk, 1927, p. 127; Schellenberg, 1927, p. 639, fig. 44; Pirlot, 1930, p. 12; Irie, 1948, p. 349, fig. 7; Hurley, 1955, p. 166, figs. 188–218.

Material (Number of specimens given in parentheses).—St. 1254, (2); St. 1278, (1); St. 1335, (1); St. 1389, (1); St. 1750, (1); St. 1750, (1); St. 1752, (1); St. 1752, (1).

Specific characters.—First antenna of female is two-segmented, distal segment is nearly four times as long as the basal and carries on its outer edge about nine to ten pairs of aesthetasks. First two peraeopods are very much similar, but the second is much longer than first, second segment of both is as long as the rest of the limb, inner distal angle of segments three and four is slightly produced and that of fifth segment is strongly produced and prominently spiny, the whole surface of segments five and six is spiny. Peraeopods three and four are of the same type, but the third is more slender than second. In the third peraeopod the inner border of segments five and six is spiny but in the fourth peraeopod the sixth segment alone is spiny. Second segment of the fifth peraeopod is nearly as long as the rest of the limb, inner distal angle of third segment is strongly produced, sixth segment is clearly longer than broad and its inner distal part is produced into a long slightly curved thumb, distal border is produced into a conspicuous conical process carrying a row of setae on its outer border, seventh segment is a long claw bulged at the middle of its inner border, the bulge carries a row of setae, the nail is very small. The sixth and seventh peraeopods again are of the same type but the second segment of the sixth peraeopod is comparatively short but in the seventh peraeopod much longer than the rest of the limb, in both peraeopods the inner distal angle of segments two and three is produced and acute, basal inner part of the fourth segment in both peraeopods is backwardly produced, dactylus is very small, apically trifid and bent at right angles in the

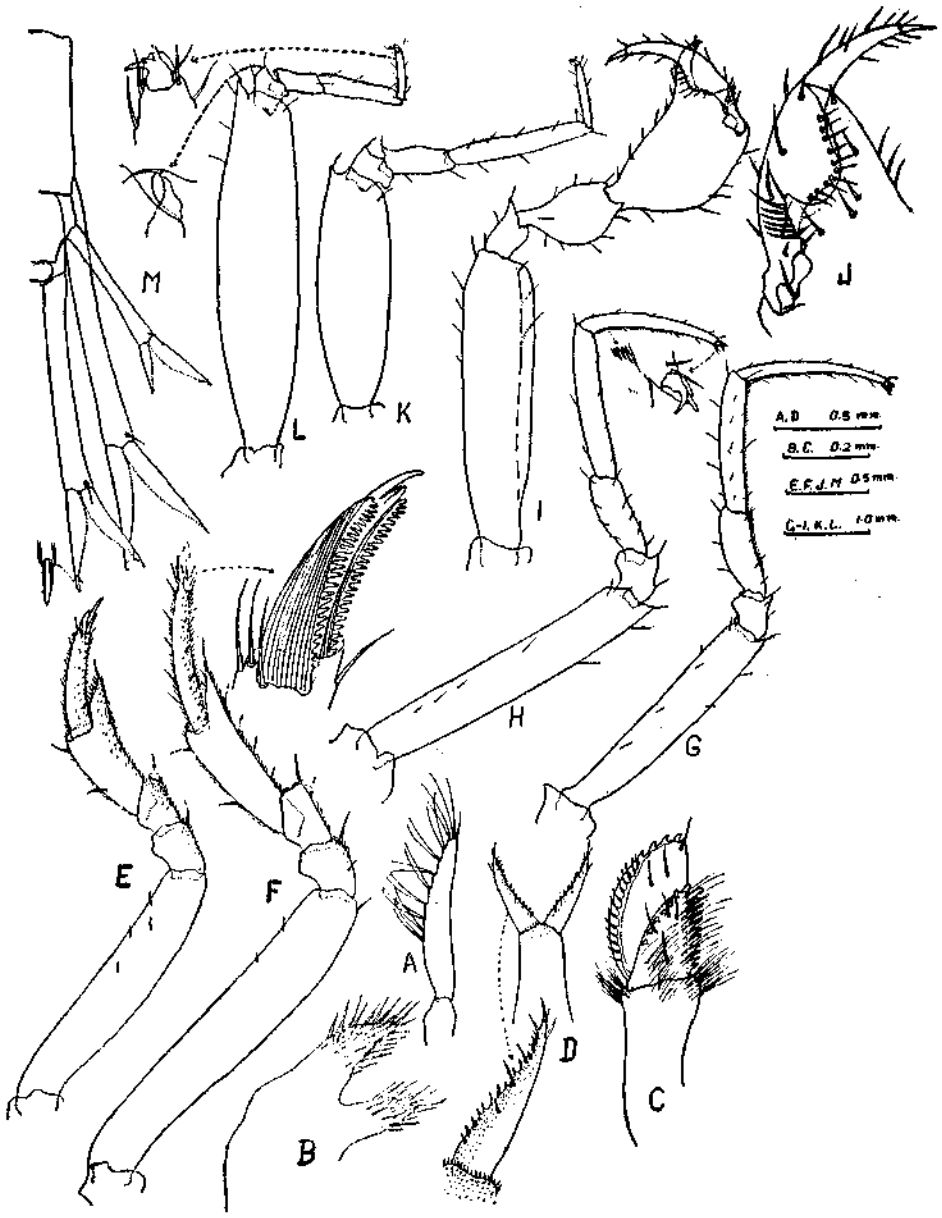

FIG. 6. *Phronima sedentaria* (Forskal). (A) Antenna 1; (B) maxilla 2; (C) maxilla 1; (D) maxilliped; (E) peraeopod 1; (F) peraeopod 2; (G) peraeopod 3; (H) peraeopod 4; (I) peraeopod 5; (J) same, chela; (K) peraeopod 6; (L) peraeopod 7; (M) uropods and telson.

uropods are long and slender, peduncle of the first uropod reaches slightly short of the tip of the peduncle of the third. Second uropod is short, its peduncle is nearly half the length of that of first. The rami of the first and third uropods are subsimilar, with smooth outer border and finely pectinate inner border. The rami of the second uropod are similarly armed but the inner ramus is smaller than the outer. Telson is transversely ovate, with the hind border bilobed.

Length 20·2 mm.

Phronima atlantica Guerin

(Fig. 7)

Phronima atlantica Voesseler, 1901, p. 21, pl. 2, figs. 1–10; Stephensen, 1924, p. 121; Chevreux and Fage, 1925, p. 395, fig. 397; Schellenberg, 1927, p. 641, fig. 45; Pirlot, 1930, p. 14.

Material (Number of specimens given in parentheses).—St. 953, (1); St. 976, (2); St. 1245, (3); St. 1245, (1); St. 1256, (1); St. 1256, (1); St. 1278, (2); St. 1278, (1); St. 1278, (1); S). $1278_{,3}$(1); St. 1302, (1); St. 1329, (1); St. 1329, (1); St. 1333, (1); St. 1351, (2); St. 1389, (2); St. 1389, (1); St. 1411, (2); St. 1413, (1); St. 1415, (1); St. 1415, (2); St. 1415, (1); St. 1703, (1); St. 1721, (1); St. 1724, (1); St. 1730, (1); St. 1735, (1); St. 1738, (1); St. 1748, (1); St. 1749, (1); St. 1749, (1); St. 1750, (1); St. 1752, (1); St. 1775, (1); St. 1796, (1); St. 1811, (1).

Specific characters.—The first flagellar segment of the first antenna of the male is stout and profusely hirsute, this is followed by five segments, of which the third and fourth are long. Second antenna has a three-segmented peduncle. Peraeopods one and two are subsimilar, but the second is longer than first, but compared to those of *P. sedentaria* they are stout. Segments four to six are pectinate and the inner distal corner of the fifth segment is produced into a triangular spiny lobe which in the first peraeopod is larger than in the second. Second segment of third peraeopod is only slightly longer than the sixth segment, inner border of segments four to six is prominently hirsute. Fifth peraeopod is stout, inner distal corner of segments two and three is not produced, sixth

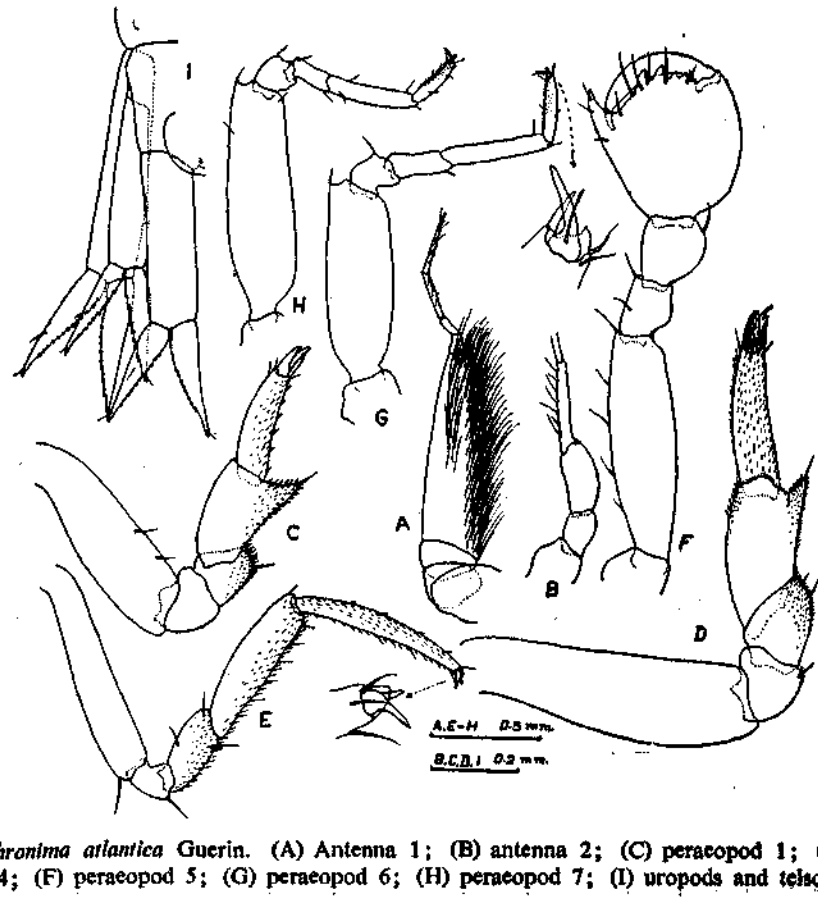

FIG. 7. *Phronima atlantica* Guerin. (A) Antenna 1; (B) antenna 2; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

segment is nearly equal in length and breadth, inner distal angle is prolonged into a prominent slightly curved thumb about a third of the length of the segment proper, distal border is produced into two apically blunt processes followed by two low triangular elevations, there are also about four submarginal long setae. The sixth and seventh peraeopods are subsimilar but show difference in the length of the second segment just as in *P. sedentaria*, inner distal corner of the second and third segments is only very slightly produced and instead of the strong basal backward prolongation, there is only a small elevation on the fourth segment, the claw is longer than in *P. sedentaria* and there is a strong spine originating from the inner distal angle of the sixth segment.

Peduncle of the first uropod is the longest, about one and one-fourth times the length of that of the third, the latter is broadest and subequal to that of the second in length, the rami of all the uropods are subsimilar, the inner ramus being slightly longer than the outer, inner border of all the rami is serrate and the outer border smooth. Telson is nearly circular and deeply immersed in the abdomen.

Length 9·0 mm.

Phronimella elongata Claus

(Fig. 8)

Phronimella elongata Stebbing, 1888, p. 1370, pl. 163; Bovallius, 1889, p. 389, pl. 16, figs. 52-67; Stephensen, 1924, p. 130; Chevreux and Fage, 1925, p. 399, fig. 400; Mogk, 1927, p. 141; Pirlot, 1930, p. 15; Shoemaker, 1945, p. 236; Irie, 1948, p. 349, fig. 10.

Material (Number of specimens given in parentheses).—St. 743, (2); St. 1245, (1); St. 1254, (2); St. 1256, (2); St. 1256, (1); St. 1258, (3); St. 1278, (13); St. 1278, (2); St. 1278, (8); St. 1278, (2); St. 1278, (1); St. 1310, (1); St. 1356, (2); St. 1373, (1); St. 1727, (1); St. 1735, (1); St. 1739, (1); St. 1749, (2); St. 1749, (1); St. 1750, (1); St. 1750, (2).

Specific characters.—The body is long and slender with long slender peraeopods. First segment of the flagellum of the first antenna of the male is enlarged and hirsute, distally produced below the next segment. Second antenna has a three-segmented peduncle and long multisegmented flagellum. Peraeopods one and two are of the same type, but the second is longer, fifth segment is conically produced at the inner distal angle, slightly more produced in the second peraeopod than in the first, sixth segment is spiny and the seventh is fairly long. Third and fourth peraeopods are very long and slender, the former longer than the latter. Second segment of the third peraeopod carries two teeth along its inner border and the third peraeopod carries four teeth, inner distal angle of the third segment of the fourth peraeopod is slightly produced. Fifth peraeopod is stout, its second segment carries five inner and three outer teeth, third segment has one inner tooth, fourth has two inner teeth, fifth segment broadens distalwards, its inner and distal borders carry a row of eight sharp teeth steadily increasing in length up to the fifth, last two teeth are small, seventh segment is fairly long and reaches two-thirds the length of the fifth segment when folded backwards. As in *Phronima* the sixth and seventh peraeopods differ only in the proportionate length of the second segment in comparison with the rest of the limb, the distal inner corner of the second and third segments is sharply produced.

Peduncle of the first uropod is slightly longer than that of the third but narrower, rami are subequal in length and finely pectinate along both borders. Second uropod is reduced to a one-segmented lamina.

In the female the first antenna is a two-segmented short appendage. The fifth segment of the fifth peraeopod is more slender and elongated than in the male and carries ten to eleven teeth. The teeth arming the fifth peraeopod are obviously subject to considerable variation. Outer borders of the rami of the first and third uropods are smooth. Second uropod is still more reduced in size than in the male.

Length 10·7 mm.

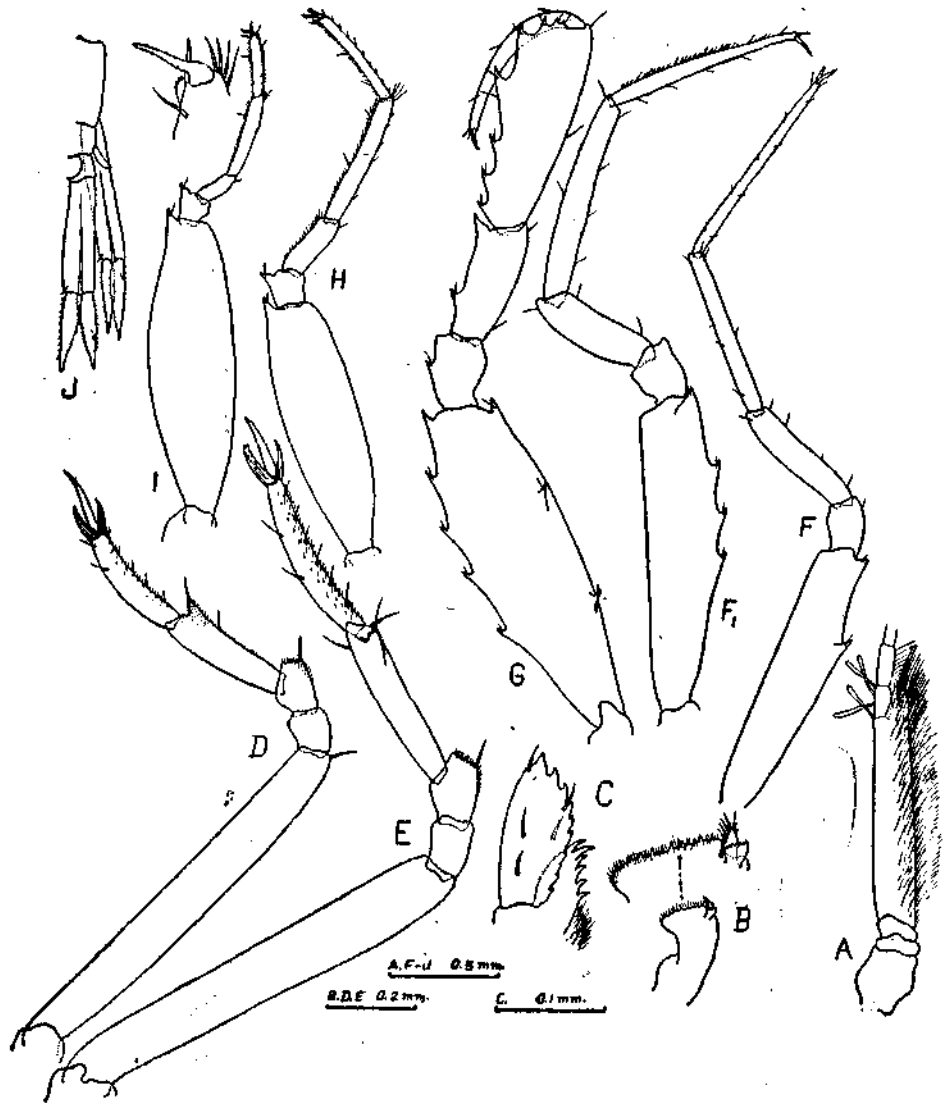

FIG. 8. *Phronimella elongata* Claus. (A) Antenna 1; (B) mandible; (C) maxilla 1; (D) peraeopod 1; (E) peraeopod 2; (F) peraeopod 3; (F_1) peraeopod 4; (G) peraeopod 5; (H) peraeopod 6; (I) peraeopod 7; (J) uropods and telson.

Primno macropa Guerin

(Fig. 9)

Euprimno macropus Bovallius, 1889, p. 400, pl. 17, figs. 23–40, pl. 18, figs. 1–2; Chevreux and Fage, 1925, p. 416, fig. 411; Schellenberg, 1927, p. 643, fig. 46.

Primno macropa Barnard, 1930, p. 424; Hurley, 1955, p. 172, figs. 219–235.

Material (Number of specimens given in parentheses).—St. 941 (1); St. 1045, (1); St. 1245 (1); St. 1329, (1); St. 1337 (2); St. 1373, (1); St. 1375 (1); St. 1395, (1); St. 1413, (1); St. 1719, (1); St. 1721, (1); St. 1723, (1); St. 1725, (1); St. 1727, (1); St. 1732, (1).

Specific characters.—First antenna of male is three-segmented, first two segments are stout and the third is small. First peraeopod is very slender and non-chelate, sixth segment carries along its outer border stiff hairs, seventh segment is likewise hairy and bifid. Second peraeopod is non-chelate, its second segment is comparatively stout. Third and fourth peraeopods are slender and identical, inner border of fourth segment is cut into four teeth, segments four to seven carry stiff spinules especially on the inner surface. Fifth peraeopod is massive, dorsal distal part of its second segment is expanded and cut into three broad teeth with finely serrated border, fourth segment is transversely broadened, fifth segment is very stout and oblong, its inner border is produced into a row of about eleven strong teeth of which the first, third, seventh and ninth are longer than the others, each tooth carries a subapical spinule, sixth segment is covered with very small spinules, seventh segment has a curved tip and reaches the base of the fifth segment when closed. Second segment of the sixth peraeopod is rather broadened and its dorsal distal border is cut into four broad teeth with pectinate border, fourth and fifth segments are fairly broad and spiny along the inner border, seventh segment is fairly long. Seventh peraeopod is modified but all the segments are present, second segment is enlarged and flattened, seventh segment carries a few spinules.

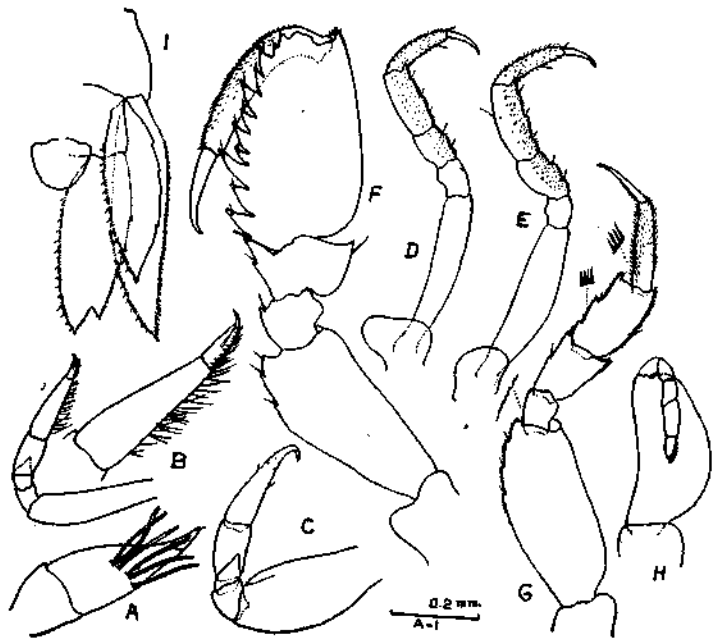

FIG. 9. *Primno macropa* Guerin. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 3; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

Telson is semicircular and slightly immersed in the urosome. Uropods are simple uniramous lamellae not demarcated into peduncle and rami. First uropod slightly overreaches the tip of the third, its outer border is finely serrate and the inner border pectinate. Second uropod is the narrowest and is as long as the third, its inner border is pectinate and the outer border has four teeth. Third uropod is the broadest and has a subapical outer pointed process, outer border of the second and third uropods is lobed.

Length 2·3 mm.

Remarks.—The specimen described above is not fully adult and this obviously accounts for the slight difference in the armature of the fifth segment of the fifth peraeopod and of the shape of the

seventh peraeopod and the uropods. Adults do not show any important differences from previous records.

Anchylomera blossevillei M. Edwards

(Fig. 10)

Anchylomera blossevillei Stebbing, 1888, p. 1453, pl. 177; Chevreux and Fage, 1925, p. 414, fig. 410; Spandl, 1927, p. 167, fig. 7; Barnard, 1930, p. 425; Pirlot, 1930, p. 21; Irie, 1948, p. 353, fig. 18.

Material (Number of specimens given in parentheses).—St. 941, (1); St. 1241, (2); St. 1256, (1); St. 1278, (8); St. 1278, (11); St. 1278, (2); St. 1278, (7); St. 1278, (59); St. 1278, (1); St. 1285, (4); St. 1290, (7); St. 1290, (21); St. 1292, (7); St. 1294, (4); St. 1298, (1); St. 1300, (1); St. 1329, (1); St. 1337, (2); St. 1337, (1); St. 1351, (1); St. 1370, (1); St. 1389, (1); St. 1389, (1); St. 1395, (1); St. 1397, (1); St. 1415, (3); St. 1415, (3); St. 1415, (18); St. 1721, (1); St. 1738, (2); St. 1746, (1); St. 1747, (3); St. 1752, (1); St. 1762, (1).

Specific characters.—The third segment of the first antenna of the male is distally produced. The first peraeopod is comparatively stout, segments five to seven are covered with fine setules producing a hispid appearance, the seventh segment is short. Second peraeopod is longer than first but is distally more slender, its seventh segment is drawn out into a long slender claw. Peraeopods

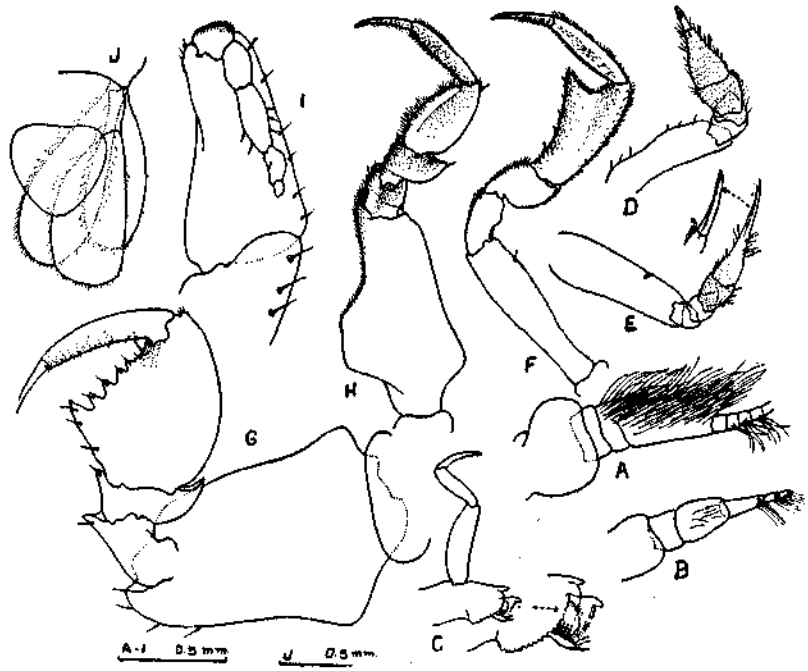

FIG. 10. *Anchylomera blossevillei* M. Edwards. (A) Antenna 1; (B) antenna 2; (C) mandible; (E) peraeopod 1; (E) peraeopod 2; (F) peraeopod 4; (G) peraeopod 5; (H) peraeopod 6; (I) peraeopod 7; (J) uropods and telson.

three and four are very much similar except that in the third, the inner distal prolongation of the fifth segment is less pronounced than that of the fourth peraeopod. Segments five to seven of both third and fourth peraeopods are covered with microscopic stiff setules. Fifth peraeopod is very character-

istic, the second segment is expanded and proximally produced on both sides so that the length of the segment is only slightly more than its maximum width, third segment is produced at the inner distal part and the fourth segment is produced at the outer distal part, the fifth segment is massive and nearly as long as broad, its obliquely truncate distal border is cut into six to seven large rounded cusps, each carrying a spine-seta, the first cusp is large, sixth segment is slender and covered with fine setules, the claw is short. Second segment of the sixth peraeopod is expanded beyond its base and its inner border has a matting of fine stiff setules, segments three to five are flattened and comparatively broad and nearly completely covered with setules, sixth and seventh segments are slender, but like the previous segments, are covered with setules. All the usual number of segments are present in the seventh peraeopod, the second segment is flattened and narrows distalwards, succeeding segments are folded backwards, seventh segment is very small. Uropods are flat uniramous laminae with finely setose border. Telson is large and roughly equal in length and width.

Length 6·4 mm.

Remarks.—The description given by Bovallius clearly applies to the present specimens except in minor details. The inner distal projection of the fifth segment of peraeopods one and two is slightly different in shape, with a pronounced concavity on the distal border. The fifth segment of the sixth peraeopod is longer. The telson is more rounded in my specimens. In the last character the present specimens resemble those which Bovallius described as *A. hunteri* M. Edwards.

Phrosina semilunata Risso

(Fig. 11)

Phrosina semilunata Stebbing, 1888, p. 1424, pl. 176; Bovallius, 1889, p. 426, pl. 18, figs. 3–30; Chevreux and Fage, 1925, p. 143, fig. 409; Schellenberg, 1927, p. 644, fig. 47; Spandl, 1927, p. 168, figs. 60–61; Pirlot, 1930, p. 23; Barnard, 1930, p. 424; Irie, 1948, p. 353, fig. 17.

Material (Number of specimens given in parentheses).—St. 742, (1); St. 960, (1); St. 1044, (1); St. 1157, (1); St. 1245, (4); St. 1254, (1); St. 1256, (1); St. 1265, (3); St. 1278, (2); St. 1278, (1); St. 1298, (1); St. 1300, (2); St. 1329, (2); St. 1329, (1); St. 1333, (4); St. 1335, (1); St. 1337, (3); St. 1349, (1); St. 1351, (1); St. 1385, (1); St. 1373, (2); St. 1375, (1); St. 1377, (1); St. 1383, (5); St. 1385, (4); St. 1385, (1); St. 1385, (2); St. 1385, (4); St. 1385, (3); St. 1393, (1); St. 1393, (3); St. 1395, (1); St. 1411, (4); St. 1411, (1); St. 1413, (1); St. 1413, (4), St. 1415, (2); St. 1415, (1); St. 1691, (1); St.1704, (1); St. 1736, (4); St. 1739 (2); St. 1749, (1); St. 1752, (1); St. 1752, (1).

Specific characters.—In the male the head is antero-dorsally produced into a pair of apically acute horns overhanging the first pair of antennae. Eyes nearly completely occupy the sides of the head. Peraeon is deep and swollen and the abdomen is dorsally carinate.

First antenna of the female consists of a short basal segment and a long distal segment. First two peraeopods are constructed on the same pattern, but the first is smaller than the second, the lower border of the third and fourth segments carries long hairs, the succeeding segments are spiny. In the second peraeopod the fourth segment alone is hairy and the succeeding segments are not spiny. The third and fourth peraeopods are of the same type, but the fourth is stouter, borders of all the segments carry long spines mixed with spinules, the fifth segment is expanded and distally cut into a row of teeth, the first tooth is very long and the sixth folds against this tooth to form a subchela. Fifth peraeopod is comparatively very large, second segment is expanded and serrated along the border, third segment is triangular and produced at the distal corners, its dorsal side is channelled with the distal ends of the two ridges produced into strong processes, fourth segment is drawn out at its upper distal part, fifth segment is as long as the two previous segments combined and is distally drawn out into a strong spine, its lower border is cut into six teeth of which the

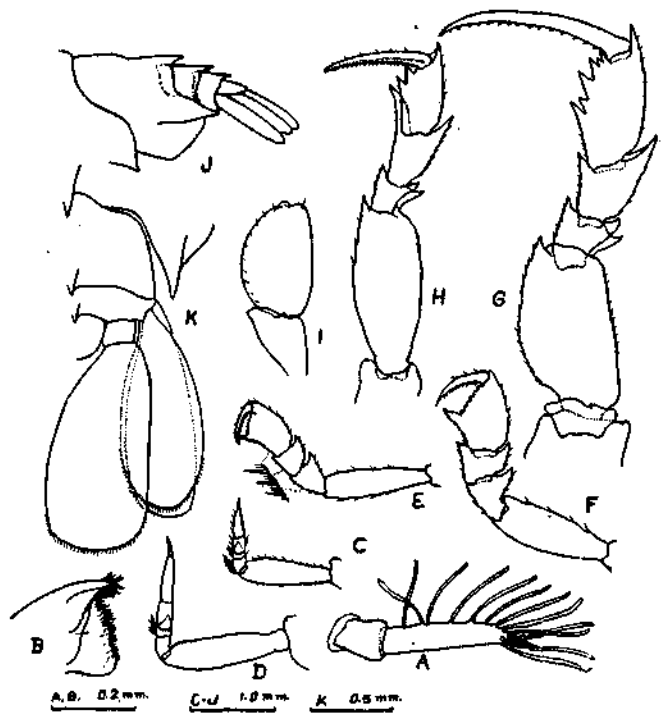

FIG. 11. *Phrosina semilunata* Risso. (A) Antenna 1; (B) mandible; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 3; (F) peraeopod 4; (G) peraeopod 5; (H) peraeopod 6; (I) peraeopod 7; (J) abdomen, pleopods and telson, lateral view; (K) same, dorsal view.

second, fifth and sixth are short, seventh segment is very long and only slightly shorter than the combined length of segments three to six. Sixth peraeopod is similar to the fifth in construction but its fifth segment is smaller and has only three teeth on the inner side, the inner distal angle of the fourth segment is produced below the fifth into a long process, sixth segment is stout. Seventh peraeopod is modified into a one-segmented small lamina carrying a small distal lobe. Uropods are uniramous membranous laminae with finely setose border, the third uropod is much longer than the first two which are subequal in size. Telson is semicircular and sunk into the abdomen.

Length 8·6 mm.

Eupronoe armata Claus

(Fig. 12)

Eupronoe intermedia Stebbing, 1888, p. 1517, pl. 188; Spandl, 1927, p. 222.

Eupronoe armata Stephensen, 1925, p. 159; Spandl, 1927, p. 224, fig. 42; Barnard, 1930, p. 427.

Material (Number of specimens given in parentheses).—St. 749, (1); St. 977, (1); St. 1032, (1); St. 1044, (1); St. 1045, (3); St. 1164, (2); St. 1233, (1); St. 1241, (1); St. 1245; (1); St. 1258, (1); St. 1278, (1); St. 1278, (2); St. 1278, (1); St. 1278, (3); St. 1285, (2); St. 1294, (4); St. 1298, (6); St. 1300, (2); St. 1306, (3); St. 1310, (3); St. 1312, (1); St. 1329, (2); St. 1329, (1); St. 1329, (1); St. 1335, (1); St. 1344, (1); St. 1351, (1); St. 1375, (2); St. 1397, (3); St. 1397, (1); St. 1404, (1);

St. 1411, (4); St. 1691, (7); St. 1711, (1); St. 1719, (3); St. 1720, (8); St. 1721, (2); St. 1721, (5); St. 1721, (6); St. 1722, (4); St. 1723, (5); St. 1724, (4); St. 1725, (3); St. 1727, (5); St. 1732, (25); St. 1736, (1); St. 1737, (4); St. 1737, (2); St. 1737, (1); St. 1737, (12); St. 1737, (2); St. 1737, (1); St. 1738, (2); St. 1738, (5); St. 1747, (2); St. 1749, (3); St. 1749, (1); St. 1750, (1); St. 1750, (6); St. 1752, (1); St. 1761, (1); St. 1762, (2); St. 1763, (2); St. 1807, (1); St. 1809, (2).

Specific characters.—First antenna of the male is comparatively stout, first segment of the flagellum is distally swollen and the rest of the flagellum is therefore shifted to the lower distal part. Second segment of the first peraeopod is rather thin and characteristically twisted, third segment is small, fourth and fifth segments are highly flattened with their inner border closely serrated, sixth segment has its inner border sparsely serrated, seventh segment is long and slender. Second peraeopod is quite different from the first, its fourth segment is exactly like that of the first peraeopod but the inner distal part of the fifth segment is produced into a large conical process with serrate border almost reaching the tip of the sixth segment, sixth and seventh segments resemble those of the first peraeopod. Third and fourth peraeopods are subsimilar, with short second segment, inner border of segments four to six is minutely spiny. Second segment of fifth peraeopod is oblong, with a few broad serrations along the upper distal part of its border, inner border of segments four to six is spiny. Second segment of sixth peraeopod is highly expanded, its dorsal border is nearly straight and the dorsal distal part is expanded and cut into broad teeth and overhangs the third segment, segments four to six have their inner border armed with prominent spines and the distal inner part of the fourth and fifth segments is produced forwards into a large apically rounded, internally spiny lobe. Seventh peraeopod is reduced to a two-segmented lamina, its distal segment is very small, inner border of both segments is spiny.

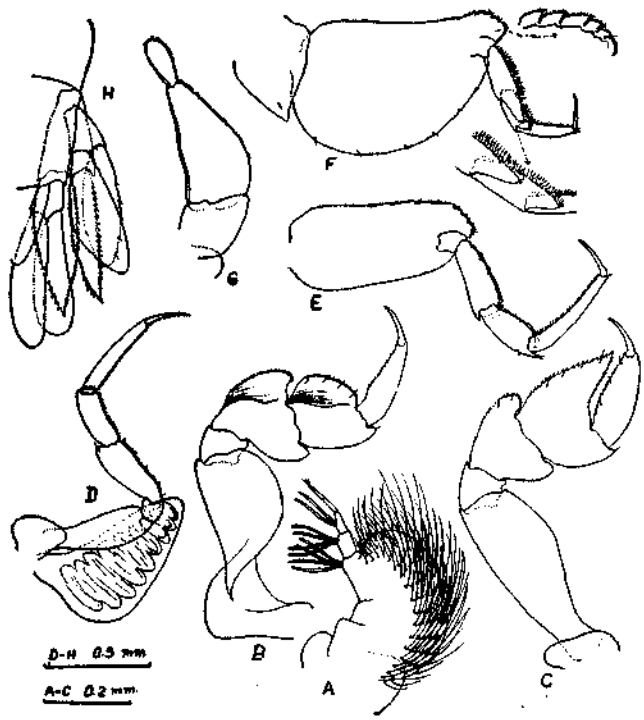

FIG. 12. *Eupronoe armata* Claus. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.

Telson is triangular, with blunt apex. Peduncle of the first uropod is only about half the length of the inner ramus, rami are nearly subequal in length, with serrate borders, inner ramus is nearly twice as broad as the outer. Second uropod has a very short peduncle, rami are laminate and elliptic, inner ramus is broader than the outer, outer border of outer ramus has about five setae. Third uropod is sub-similar to the second, with short peduncle and laminate rami, the rami increase in width distalwards and their outer border is characteristically concave. All the uropods overreach the telson.

Length 7·4 mm.

Remarks.—According to Barnard (1930) *E. intermedia* Stebbing is synonymous with *E. armata* Claus. The present specimens are in perfect agreement with those described by Stebbing.

Lycaeopsis zamboangae (Stebbing)

(Figs. 13, 13 *a*)

Phorcorhaphis zamboangae Stebbing, 1888, p. 1452, pl. 180; Chevreux, 1900, p. 148, pl. 8, fig. 1.

Lycaeopsis zamboangae Spandl, 1927, p. 213; Pirlot, 1930, p. 28.

Material (Number of specimens given in parentheses).—St. 1046, (1); St. 1278, (1); St. 1298, (1); St. 1312, (1); St. 1351, (1); St. 1353, (1); St. 1383, (1); St. 1393, (1); St. 1407, (1); St. 1413, (1); St. 1710, (1); St. 1721, (1); St. 1750, (1).

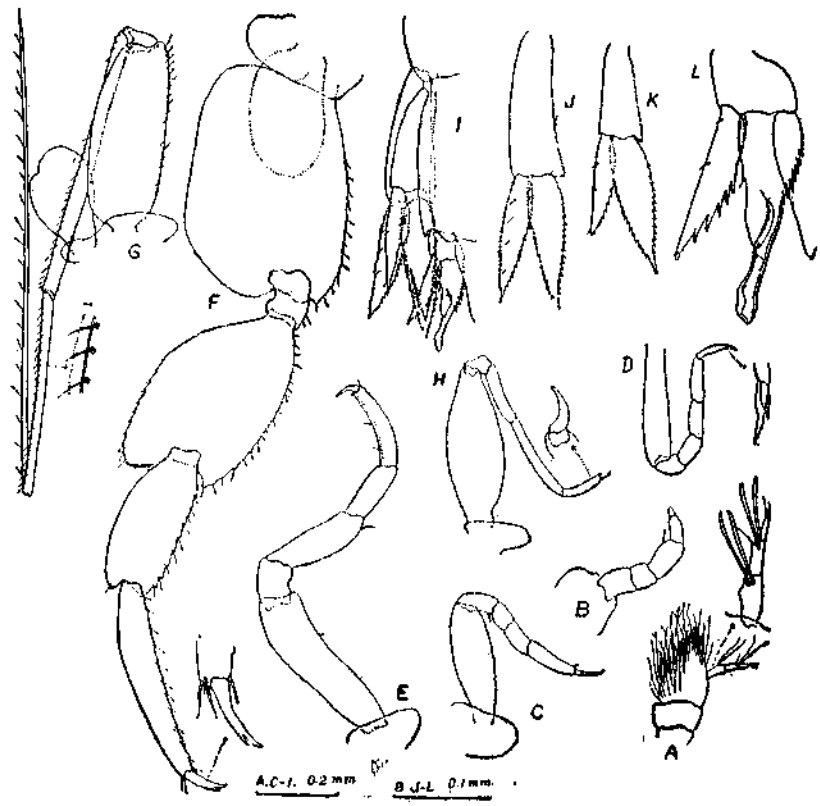

FIG. 13. *Lycaeopsis zamboangae* (Stebbing). (A) Antenna 1; (B) antenna 2; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 6; (G) peraeopod 5; (H) peraeopod 7; (I) uropods and telson; (J-L) uropods 1-3.

Specific characters.—First antenna of the male has the basal segment of the flagellum conically produced and hirsute, the rest of the flagellum originates far below the apex of the first segment. Second antenna is five-segmented, third segment carries a seta, fifth segment is very small. Peraeopods one and two are very slender and non-chelate, second segment of first peraeopod is broader than that of second. Third and fourth peraeopods are rather stout, sixth segment has an inner row of microscopic setules. Fifth peraeopod is very characteristic, its second segment is elongate oblong with a row of short stiff setae along the upper border, segments four and five are slender and very long, with fine setules along the outer border, fifth segment is only two-thirds as long as the fourth, sixth segment is longer than the two previous segments combined and is armed with scattered setae. Sixth peraeopod is also very characteristic, its second segment is very much flattened, fourth segment is flattened like the second but narrower, its ventral border is feebly serrate, upper border of sixth segment is prominently but sparsely serrate, sixth segment is armed like the fifth but slender and long, seventh segment is apically cleft. Seventh peraeopod is complete but reduced in size, second segment is fairly broad, but the succeeding segments are slender, together exceeding the length of the second segment.

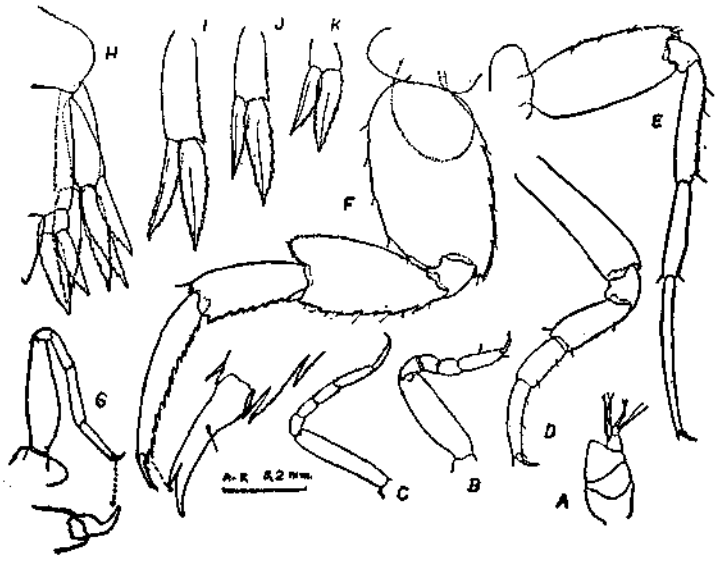

FIG. 13 *a*. *Lycaeopsis zamboangae* (Stebbing). Immature male. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson; (I–K) uropods 1–3.

First uropod slightly overreaches the tip of the telson, its peduncle is slightly longer than the rami, latter have serrate border. Peduncle of the second uropod is shorter than the inner ramus, borders of inner ramus are serrate, outer ramus is comparatively small, its outer border is smooth. Third uropod is modified and considerably overreaches the telson. Peduncle is short but broad, outer ramus is prominently serrate along the inner border, inner ramus has its outer border smooth and part of the inner border serrate, distal part is bifid, outer lobe is blunt and ovate and the inner is prolonged into a long rod with slightly swollen tip.

Length 2·5 mm.

Remarks.—Pirlot has described in detail the variations within this species due to difference in age and sex. Judging from his illustrations all the specimens in the present collection are males. There are a few immature specimens which appear to resemble the juveniles described by Pirlot.

These specimens show conspicuous difference particularly in the shape of peraeopods five to seven and uropod three. I have illustrated a juvenile to emphasise these differences.

Lycaea pulex Marion

(Fig. 14)

Lycaea pulex Stebbing, 1888, p. 1567; Chevreux, 1900, p. 156; Chevreux and Fage, 1925, p. 429, fig. 419; Pirlot, 1930, p. 24; Shoemaker, 1945, p. 243.

Material.—(Number of specimens given in parentheses).—St. 953, (1); St. 1029, (1); St. 1278, (1); St. 1379, (1); St. 1379, (2); St. 1721, (1); St. 1722, (1); St. 1725, (4); St. 1736, (1); St. 1750, (1); St. 1807, (5); St. 1808, (1); St. 1808, (2); St. 1809, (2).

Specific characters.—Peraeopods one and two are subsimilar but the second is slightly more slender than the first and longer. Second segment of the first peraeopod is more swollen than that of the second and the inner part of the fifth segment is indistinctly spiny. Second segment of second peraeopod is somewhat cylindrical and the fifth segment only very indistinctly spiny, seventh segment of both peraeopods is slender and claw-like. Second segment of third and fourth peraeopods is narrow and long, hardly broader than the fourth segment. Second segment of fifth and sixth peraeopods is enlarged, that of fifth is longer but narrower than that of sixth, inner border of segments three to six of sixth peraeopod is prominently spiny. Seventh peraeopod is modified, with large flattened second segment, rest of the limb is comparatively very small, seventh segment has a basal inner spine-like process, the distal part is drawn out and spiny.

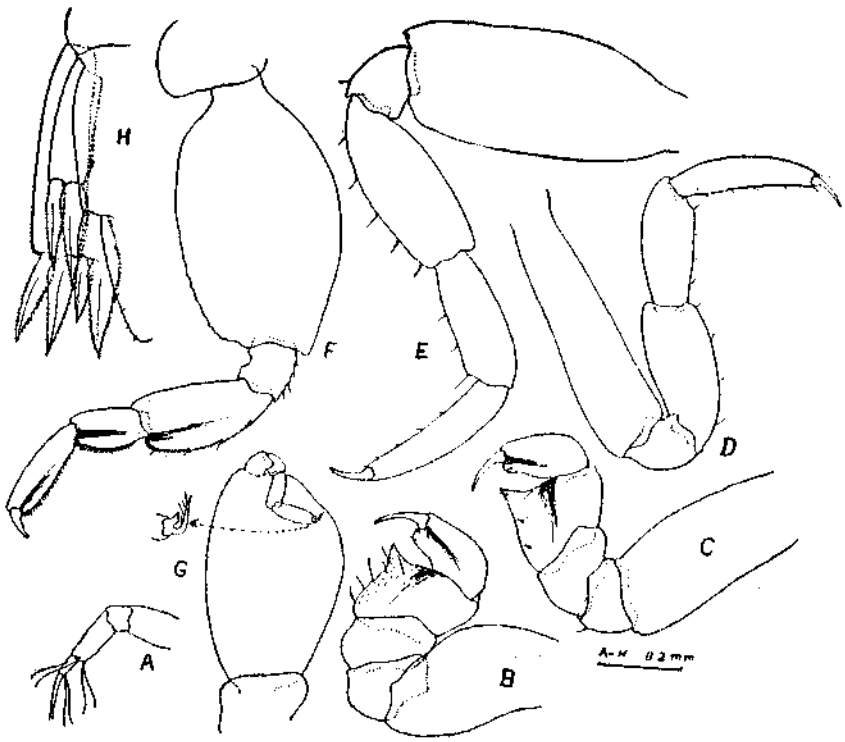

FIG. 14. *Lycaea pulex* Marion. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.

Telson is linguiform and only slightly shorter than the last urosome segment. Peduncle of the first uropod is long and stout, reaching the distal border of the peduncle of the third uropod, distal part of both borders is serrated, rami are short, nearly a third of the length of the peduncle, with serrate borders, and reaching the tip of the inner ramus of the third uropod. Peduncle of the second uropod stops short of the base of the peduncle of the third uropod, its inner border is serrated, inner ramus is longer than other, outer border of outer ramus is smooth. Peduncle of the third uropod is fused with the inner ramus, latter overreaches the telson, outer ramus is shorter and narrower than the inner ramus, latter is nearly straight and overreaches the telson.

Length 4 mm.

Brachyscelus crusculum Spence Bate

(Fig. 15)

Brachyscelus crusculum Stebbing, 1888, p. 1544, pl. 195 and 196; Chevreux and Fage, 1925, p. 427, fig. 418; Stephensen, 1925, p. 172; Schellenberg, 1927, p. 649, fig. 49; Spandl, 1927, p. 210; Pirlot, 1930, p. 25; Irie, 1948, p. 355, fig. 23.

Material (Number of specimens given in parentheses).—St. 745, (6); St. 941, (2); St. 945, (2); St. 976, (1); St. 977, (1); St. 1029, (1); St. 1032, (1); St. 1044, (1); St. 1118, (1); St. 1256, (1); St. 1292, (2); St. 1310, (1); St. 1329, (1); St. 1329, (4); St. 1329, (1); St. 1335, (2); St. 1353, (2); St. 1383, (1); St. 1385, (1); St. 1413, (1); St. 1415, (1); St. 1711, (1); St. 1719, (3); St. 1720, (1); St. 1721, (1); St. 1722, (1); St. 1723, (6); St. 1738, (7); St. 1739, (1); St. 1739, (1); St. 1748, (1); St. 1752, (1); St. 1752, (1); St. 1779, (3); St. 1805, (1).

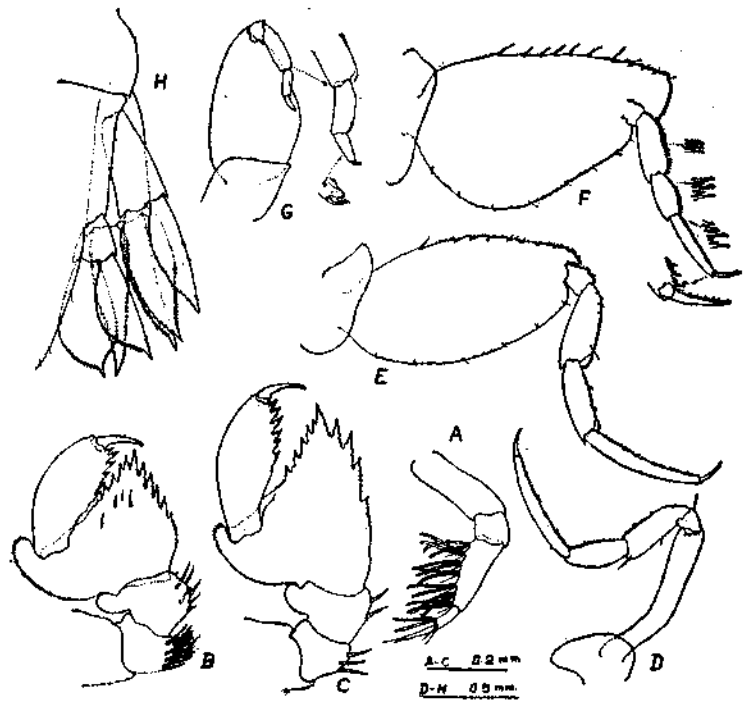

FIG. 15. *Brachyscelus crusculum* Spence Bate. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.

Specific characters.—First two peraeopods are subsimilar, but the second is slightly longer and stouter. In the first peraeopod the inner distal part of the third segment has a bunch of stiff spine-setae but in the second there are only three setae. Likewise the fourth segment of the first peraeopod has a large number of setae. The fifth segment in both peraeopods is highly flattened and the outer distal part forms a large rounded lobe with serrate border, reaching beyond the base of the sixth segment, this lobe is more conspicuous in the second leg, sixth and seventh segments are similar in both peraeopods. Legs three and four are slender, with the inner border of the sixth segment serrated. Second segment of fifth peraeopod is elongate-ovate with its upper border cut into a series of broad teeth with pectinate margin, segments three to six have finely serrate inner border. Second segment of sixth peraeopod is broader than that of fifth and carries a row of spine-setae along the upper border, distal part is expanded into a thin lobe with broad teeth, inner border of segments four to six is strongly spiny. Second segment of seventh peraeopod is longer than broad, other segments are small.

Telson is as long as the urosome and elongate triangular, with blunt apex. Peduncle of the first uropod is shorter than the rami and reaches the base of the third uropod, outer ramus is slightly shorter and narrower than the inner and its outer border is smooth. Second uropod is similar to the first in construction but the rami are broader. Peduncle of the third uropod is very short, roughly equal in length and width, outer border of outer ramus is smooth and distal half of inner border is serrate, inner ramus is broader than the outer and the distal half of its borders is serrated, both rami are highly flattened.

Length 7·3 mm.

Euthamneus platyrhynchus (Stebbing)

(Fig. 16)

Thamneus platyrhynchus Stebbing, 1888, p. 1558, pl. 198; Schellenberg, 1927, p. 650, fig. 50.

Euthamneus recurvirostris Chevreux, 1900, p. 154, pl. 18, fig. 2.

Euthamneus platyrhynchus, Spandl, 1927, p. 210.

Material.—St. 1721, 2 females.

Specific characters.—Body is somewhat dorso-ventrally flattened, cephalon is comparatively small, with large lateral eyes, peraeon is nearly oval.

Second segment of first peraeopod is longer than the rest of the limb, its dorsal border carries a row of short setae, outer distal part of third and fourth segments carries several long stiff setae, fifth segment is expanded and its inner distal conical part is armed with five marginal spine-like prolongations, inner border of sixth segment has two teeth, seventh segment has two obsolete teeth on the inner border. In overall shape the second peraeopod is similar to the first but its second segment is comparatively short and the inner distal prolongation of the fifth segment has only five teeth, sixth segment has three to four teeth along the inner margin. Third and fourth peraeopods are subsimilar, second segment is as long as the combined length of the next three segments, fourth and fifth segments are prominently hirsute, sixth segment is as long as fifth, seventh is short. Second segment of fifth peraeopod is flattened and roughly oblong, with a dorsal marginal row of setae, fourth, fifth and sixth segments are prominently hirsute. Sixth peraeopod is very much similar to the fifth but the inner border of the fifth and sixth segments is denticulate, seventh segment has six blunt inner teeth. Seventh peraeopod is modified, second segment is roughly elliptic, with four dorsal setae, all the succeeding segments are present but small, seventh segment is a small curved claw, the inner distal angle of the sixth segment is produced into three blunt teeth working against the seventh segment.

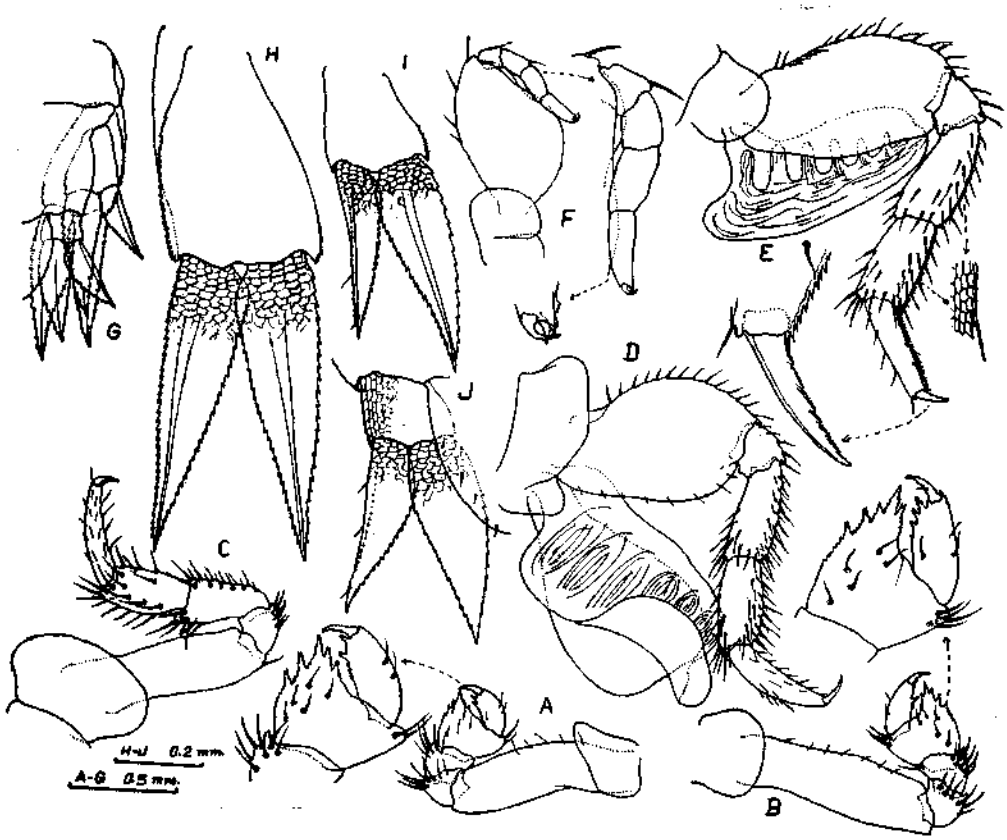

FIG. 16. *Euthamneus platyrhynchus* (Stebbing). (A) Peraeopod 1; (B) peraeopod 2; (C) peraeopod 4, (D) peraeopod 5; (E) peraeopod 6; (F) peraeopod 7; (G) uropods and telson; (H–J) uropods 1–3.

Peduncle of all the uropods is short but broad, rami of the first uropod are subsimilar with the endopod slightly longer, borders are serrate, outer border of the peduncle is also serrated. Outer ramus of the second uropod is much smaller than the inner, both borders of both rami are serrate. Third uropod is subsimilar to the second, but its peduncle is very short. Telson is roughly semi-circular.

Length 8·1 mm.

Remarks.—The present collection includes only two females, both badly preserved. They show a few conspicuous differences from the description given by Stebbing. The most important among these is the prominently hirsute nature of the peraeopods. So also the surface of the appendages shows hexagonal markings. Probably these specimens will have to be assigned to a new species but I think it is more prudent to wait till additional material becomes available.

As observed by Spandl (1927) and Schellenberg (1927) *E. recurvirostris* Chevreux, (1900) is the same as *E. platyrhynchus*.

Parascelus typhoides Claus

(Fig. 17)

Parascelus typhoides Chevreux and Fage, 1925, p. 424, fig. 416; Spandl, 1927, p. 262, fig. 55; Shoemaker, 1945, p. 260; Irie, 1948, p. 354, fig. 21; Hurley, 1955, p. 183, figs. 252–271.

Material (Number of specimens given in parentheses).—St. 745, (1); St. 748, (3); St. 960, (3); St. 1032, (3); St. 1045, (1); St. 1046, (3); St. 1118, (1); St. 1157, (3); St. 1161, (5); St. 1164, (5); St. 1167, (1); St. 1278, (2); St. 1278, (3); St. 1278, (3); St. 1278, (10); St. 1278, (2); St. 1351, (1); St. 1377, (3); St. 1385, (1); St. 1397, (2); St. 1399, (1); St. 1413, (1); St. 1413, (1); St. 1415, (1); St. 1415, (1); St. 1415, (5); St. 1704, (2); St. 1710, (1); St. 1721, (5); St. 1721, (4); St. 1722, (1); St. 1736, (1); St. 1737, (6); St. 1737, (6); St. 1737, (11); St. 1738, (6); St. 1738, (3); St. 1739, (1); St. 1746, (1); St. 1749, (4); St. 1752, (7); St. 1761, (1); St. 1763, (3); St. 1766 (1); St. 1773, (3); St. 1773, (1); St. 1775, (1); St. 1801, (3); St. 1802, (3); St. 1802, (4); St. 1802, (1); St. 1808, (5); St. 1808, (3); St. 1809, (3); St. 1811, (4).

Specific characters.—First antenna of female is comparatively stout and six-segmented. Second segment of first peraeopod is as long as or even slightly longer than the rest of the limb, succeeding segments are short and carry long setae. Second peraeopod is similar to the first but its second segment is more slender and longer and the succeeding segments carry a large number of setae.

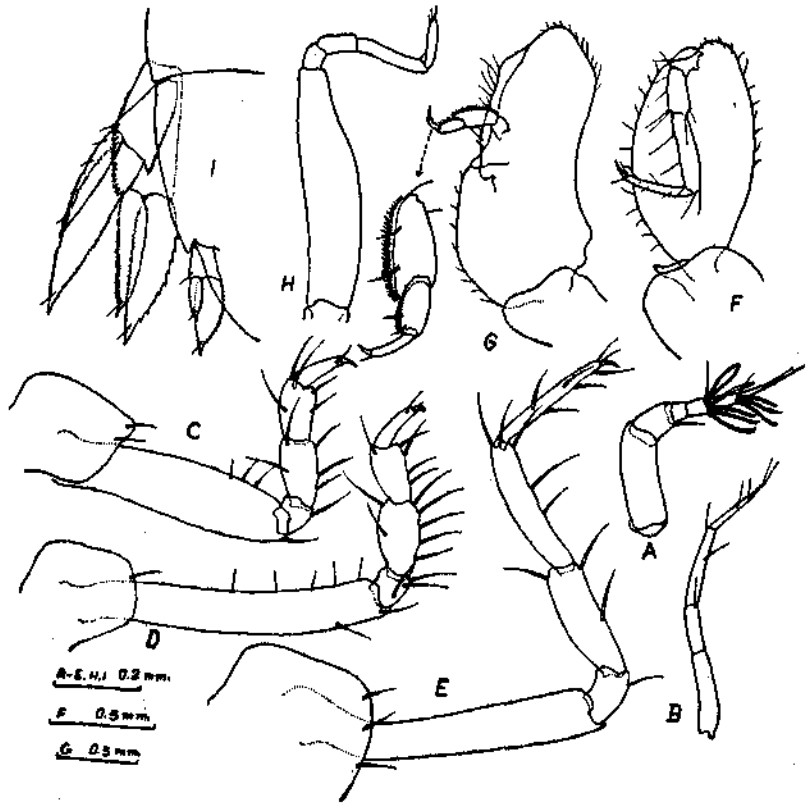

FIG. 17. *Parascelus typhoides* Claus. (A) Antenna 1; (B) antenna 2; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

Third and fourth peraeopods are very long, with scattered long setae. Second segment of fifth peraeopod is expanded and oblong, with hairy border, succeeding part of the limb is reduced in size but longer than the second segment. Sixth peraeopod is highly modified, its second segment forms a very broad, irregularly shaped elytra with a few scattered marginal setae, succeeding part of the limb is considerably reduced in size and displaced to the ventral side of the second segment, third segment is small, fourth is comparatively stout and its inner border is serrated and with two setae, fifth segment is also armed along the inner border with a row of teeth and a seta, seventh segment is

very small. Seventh peraeopod is very small, its second segment is long, subequal in length to the rest of the limb, fifth segment carries one seta and the sixth three setae, seventh segment is apparently absent.

Telson is a broad-based triangle with rounded apex. First uropod reaches the tip of the third uropod, its peduncle is as long as the inner ramus, inner border of the latter carries well-spaced teeth, outer border is closely serrated, outer border of outer ramus is conspicuously serrated and the inner border feebly serrated, outer border of its peduncle carries prominent serrations. Second uropod reaches the tip of the first, its peduncle is short with serrated inner border, outer ramus is small and the inner very large, both borders of both rami are closely serrated. Third uropod is small, with dissimilar rami, overreaching the telson, borders of the rami are closely serrated.

Length 4·0 mm.

Platyscelus serratulus Stebbing

(Fig. 18)

Platyscelus serratulus Stebbing, 1888, p. 1470; Chevreux and Fage, 1925, p. 422, fig. 414; Shoemaker, 1925, p. 51, figs. 20–21; Stephensen, 1925, p. 215; Pirlot, 1930, p. 37; Barnard, 1930, p. 437; Shoemaker, 1945, p. 259.

Material (Number of specimens given in parentheses).—St. 1233, (2); St. 1245, (2); St. 1245, (4); St. 1256, (4); St. 1285, (1); St. 1310, (3); St. 1312, (3); St. 1329, (3); St. 1329, (1); St. 1333, (1); St. 1375, (3); St. 1381, (1); St. 1407, (7); St. 1411, (1); St. 1413, (2); St. 1704, (9); St. 1723, (9); St. 1737, (123); St. 1747, (2); St. 1748, (1); St. 1749, (5); St. 1752, (5); St. 1799, (1).

Specific characters.—Basal segment of the flagellum of the first antenna of the male is stout and is followed by three slender segments. Peraeopods one and two are subchelate and subsimilar, fourth segment of both is externally expanded, inner distal part of fifth segment is produced into a large conical process with prominently serrated border, that of first peraeopod fails to reach the tip of the sixth segment while that of the second peraeopod overreaches the sixth segment, inner border of the sixth segment of both legs is serrated. Third and fourth peraeopods are slender and long, with practically no kind of armature. Second segment of fifth peraeopod is roughly ovate and enlarged, rest of the limb is slender and feebly spiny along the inner border, second segment shows hexagonal markings especially near the periphery. Second segment of the sixth peraeopod is an irregular elytra with hexagonal markings, rest of the limb is short and displaced towards the ventral side of the second segment, inner border of the fourth and fifth segments is prominently spiny, seventh segment is apparently absent. Seventh peraeopod consists of a large elongate oblong curved lamina and two small segments, its coxal plate shows hexagonal sculpturing.

Telson is triangular, with rounded apex. Peduncle of the first uropod stops short of the base of the third uropod, its outer border is prominently serrated, rami are somewhat leaf-like, with feebly serrated border, inner ramus is longer and broader than the outer. Peduncle of the second uropod is very short, inner ramus is large, borders of the rami are feebly serrated. Inner ramus of third uropod is considerably larger than the outer and is fused with the peduncle and slightly overreaches the tip of the telson. The dorsal surface of the body shows scattered spinules.

Length 5·1 mm.

Remarks.—As pointed out by Barnard (1930) the figure of the seventh peraeopod given by Chevreux and Fage (1925) is quite unlike what is found in the present specimens. Their illustration of the uropods is also not very correct. The spinulation of the body and the sculpturing of the appendages do not appear to have been noticed before. From published literature it appears that this species shows some intraspecific variations. My illustrations are based on an adult male,

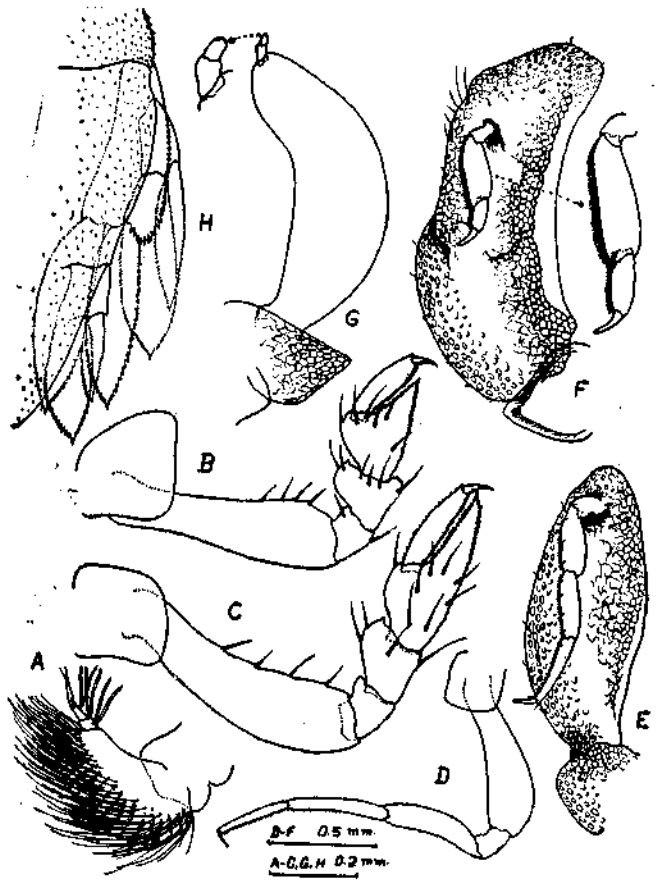

FIG. 18. *Platyscelus serratulus* Stebbing. (A) Antenna 1; (B) peraeopod 1; (C) peraeopod 2; (D) peraeopod 4; (E) peraeopod 5; (F) peraeopod 6; (G) peraeopod 7; (H) uropods and telson.

Tetrathyrus forcipatus Claus

(Fig. 19)

Tetrathyrus forcipatus Stebbing, 1888, p. 1484; Chevreux and Fage, 1925, p. 422, fig. 415; Stephensen, 1925, p. 224; Spandl, 1927, p. 240, fig. 48; Barnard, 1930, p. 439; Shoemaker, 1945, p. 259; Irie, 1948, p. 354, fig. 20.

Material (Number of specimens given in parantheses).—St. 745, (1); St. 976, (8); St. 1029, (1); St. 1055, (4); St. 1085, (3); St. 1118, (3); St. 1167, (2); St. 1256, (1); St. 1272, (3); St. 1290, (1); St. 1292, (9); St. 1294, (1); St. 1298, (1); St. 1329, (4); St. 1329, (4); St. 1335, (1); St. 1337, (1); St. 1355, (2); St. 1368, (1); St. 1373, (1); St. 1377, (1); St. 1383, (2); St. 1385, (1); St. 1397, (4); St. 1397, (12); St. 1407, (1); St. 1407, (2); St. 1413, (1); St. 1417, (1); St. 1688, (6); St. 1703, (16); St. 1711, (3); St. 1719, (6); St. 1720, (5); St. 1721, (1); St. 1721, (5); St. 1724, (14); St. 1725, (1); St. 1726, (1); St. 1727, (11); St. 1732, (8); St. 1737, (1); St. 1737, (25); St. 1738, (11); St. 1740, (2); St. 1746, (2); St. 1749, (5); St. 1750, (5); St. 1750, (5); St. 1752, (3); St. 1763, (3); St. 1807, (3); St. 1808, (1); St. 1808, (7); St. 1808, (7); St. 1813, (2).

Specific characters.—Basal flagellar segment of the first antenna of the male is only moderately enlarged, this is followed by four small segments. Second segment of first peraeopod is as long

as the rest of the limb and has a dorsal distal bulge, segments four and five are somewhat broad, sixth segment is produced at its inner distal part into a small hollowed projection against which the seventh segment closes producing a chela. Second peraeopod is similar to the first but its second segment is longer and the inner border of the fourth and fifth segments carries more setae. Peraeopods three and four are very long and slender, second segment is the longest. Second segment of the fifth peraeopod is expanded into a large elongate-oblong lamina projecting as a rounded lobe beyond the insertion of the third segment, the rest of the limb is slender and long. Second segment of the sixth peraeopod is a large irregular elytra-like plate, the rest of the limb is very small and inserted near the distal two-thirds of its ventral side, fourth segment has its inner border strongly spiny and is distally produced into a lobe overlapping the fifth segment, inner border of the fifth and sixth segments also is spiny. Seventh peraeopod is an elongate-oblong lamina slightly curved dorsalwards, there is a small second segment.

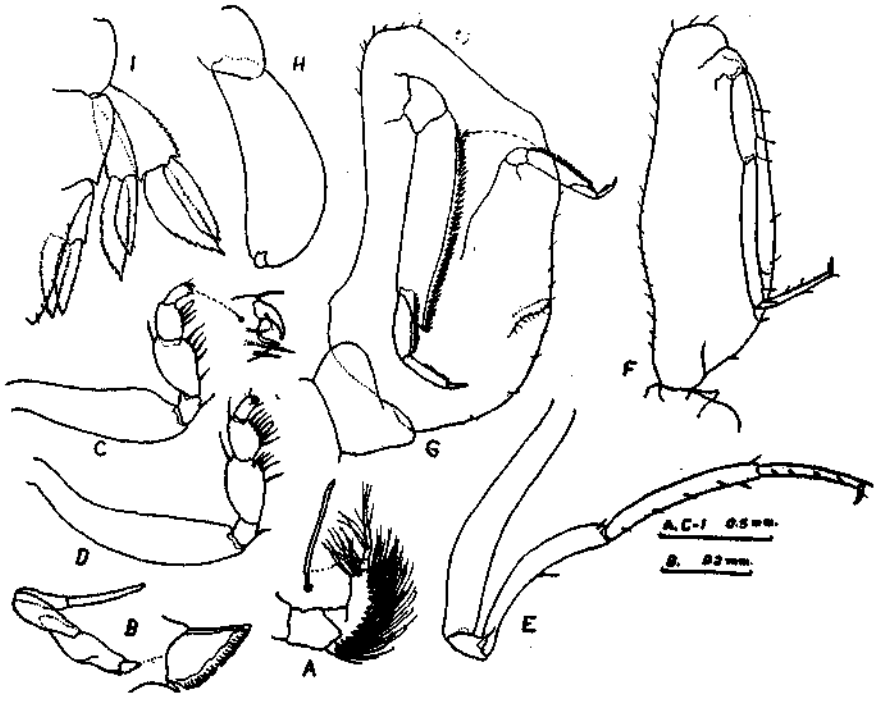

FIG. 19. *Tetrathyrus forcipatus* Claus. (A) Antenna 1; (B) mandible; (C) peraeopod 1; (D) peraeopod 2; (E) peraeopod 4; (F) peraeopod 5; (G) peraeopod 6; (H) peraeopod 7; (I) uropods and telson.

Telson is almost completely fused with the last urosome segment, nearly twice as long as the latter and steadily narrows towards the blunt apex. Peduncle of the first uropod reaches the tip of the peduncle of the second uropod, its outer distal part is serrated, rami are as long as the peduncle, with the distal half of their borders serrated, inner ramus is nearly twice as broad as the outer and also slightly longer than the latter. Inner distal part of the peduncle of the second uropod is indistinctly spiny, rami are dissimilar, outer border of outer ramus is smooth. Rami of the third uropod are subsimilar, stopping slightly short of the tip of the telson, inner ramus is fused with the peduncle.

Length 3·2 mm.

Remarks.—Both Chevreux and Fage (1925) and Spandl (1927) have shown the seventh peraeopod as a single segment which is apically drawn out and acute. But in the present specimens there

is a small second segment. But for this character the present specimens are in accord with previous descriptions.

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