

AMPHIPOD CRUSTACEANS FROM SURFACE WATERS OF THE SOUTHERN OCEAN DURING 1983-84 SUMMER

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Abstract: Taxonomical study was made on the amphipod crustaceans collected from surface waters of the Southern Ocean (Australasian Sector). Ten species composed of 2 gammaridean and 8 hyperiidean amphipods were identified. Of them, 4 species, viz. *Eusirus microps*, *Paramoera walkeri*, *Vibilia stebbingi* and *Hyperiella antarctica*, are herein illustrated with description or remarks.

1. Introduction

During December/January 1983 and 1984, the KH-83-4 cruise (BIOMASS SIBEX) of the R. V. HAKUHO MARU of the Ocean Research Institute, University of Tokyo collected plankton samples from the surface layers of the area extending from Australia to the Antarctica. Taxonomical study was made on the amphipod crustaceans in these plankton samples. All specimens treated here were supplied by Mr. K. MURAOKA of Kanagawa Prefectural Museum, who participated in the research cruise. The amphipod species identified are as follows:

Gammaridea

Eusiridae

Eusirus microps WALKER

Paramoera walkeri (STEBBING)

Hyperiidea

Vibiliidae

Vibilia stebbingi BEHNING & WOLTERECK

Cyllopus magellanicus DANA

C. lucasii BATE

Hyperiidae

Hyperiella antarctica BOVALLIUS

Parathemisto (Euthemisto) gaudichaudii (GUÉRIN)

P. (E.) gracilipes (NORMAN)

Phrosinidae

Primno macropa GUÉRIN-MÉNEVILLE

Lycaeidae

Brachyscelus cruscolum BATE

The following notices are needed for the terminology of the thoracic legs and the measurements: The first two pairs of thoracic legs are called gnathopods 1 and 2 in

the Gammaridea, so that the remaining five pairs represent pereopods 1–5, though all of the seven pairs are termed pereopods 1–7 in the Hyperiidea. The total length of animal was measured from the distal end of rostrum to the tip of telson, straightening the dorsal curvature of the specimen in the Gammaridea, while in the Hyperiidea, from the front edge of head to the distal end of the farthest extending uropod.

2. Taxonomical Accounts

Eusirus microps WALKER, 1906

(Figs. 1–4)

Eusirus microps: WALKER, 1907, p. 31, pl. 11, fig. 19; CHEVREUX, 1913, p. 167; SCHELLENBERG, 1926, p. 350; BARNARD, 1930, p. 385, fig. 47; 1932, p. 191; STEPHENSEN, 1947, p. 57; BELLAN-SANTINI, 1972a, p. 186; 1972b, figs. 1–2 (not *antarcticus*).

Material examined: Stn. 5 (65°05.1'S, 117°50.7'E), January 20, 1984, 1 ♂, 21 mm in length.

Diagnosis: Dorsal posterior teeth acutely produced backwards on pereonite 7 and the first two pleonites. Coxae 1–4 rather small, subquadrate, shallowly and irregularly crenate on the lower margin. Pleonal epimeron 3 with the lower posterior corner ending in some teeth; the posterior margin not serrate, but nearly smooth. Maxilla 1, inner plates with 5 or 6 setae. Pereopods 1–5 each with a cascade-like projection at the tip of dactylus. Pereopods 3–5 with article 2 ending in a sharp, small tooth at the posterodistal corner. Telson with a small notch at the tip.

Description: Body rather slim, not strongly carinate; head somewhat longer than pereonite 1; eyes not very large, nearly rounded; ocular lobe broad, rather truncated at the distal end. Pleonite 3 with rounded dorsal carina, urosomites 1 and 2 dorsally more or less carinate; the lower posterior corner of pleonal epimera each with a small tooth in epimera 1 and 2, 4–5 teeth in epimeron 3; the lower margin with 3 marginal spines in epimeron 2, only one spine in epimeron 3, and no spine in epimeron 1.

Antenna 1 slender and elongate, reaching beyond the end of pleonite 2; peduncular article 1 shorter than article 2, with 2 prominent, sharply pointed teeth at the distal, the lower tooth accompanied with a spine and a few setae at the base; article 2 also terminated by 3 teeth; article 3 short, subequal to flagellar article 1; flagellum 50-jointed; accessory flagellum linear and filmy, as long as the first flagellar article, the distal end minutely truncated with a few setae. Antenna 2 about half as long as antenna 1, peduncle subequal in length to that of antenna 1; peduncular article 4 longer than 5, flagellum 24-jointed. Both antennae without any calcaeus, but the confrontal margins of both antennal peduncles transversely bounded with setules.

Mandible with incisor undivided in left, divided into two teeth in right; *lacinia mobilis* with 6–7 teeth in left, 2 teeth in right; spine row of 5 spines in left, 7 in right; palp robust and elongate, article 3 falcate, longer than articles 1 and 2 combined. Maxilla 1, article 1 of palp relatively long beyond a half the length of article 2 which is slightly widened distally, the distal end obliquely truncated, with 16 setae in left, 17 in right; outer plate with 11 spines in both left and right; inner plate in left with 6 plumose setae of which 2 are very short, the plate in right with 5 of which one is also very short. Maxilla 2 with outer plate the narrower. Maxilliped, palp robust, article 2 not dentate on

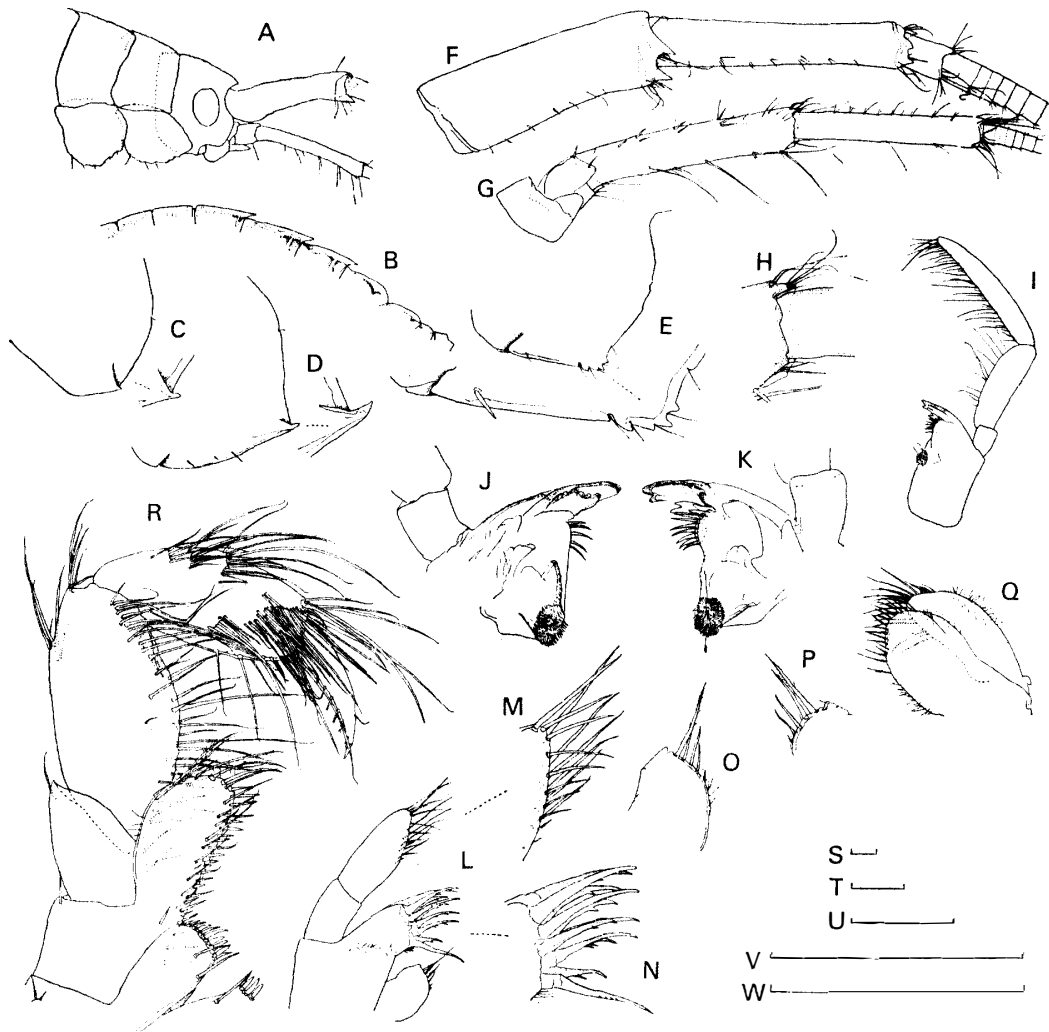


Fig. 1. *Eusirus microps* WALKER, male, 21mm: A, fore part of body; B, dorsal profile of pereonite 5 to pleonite 6; C-E, pleonal epimera 1-3 each with magnification of lower hind corners; F and G, peduncles of antennae 1 and 2, inside view; H, distal part of peduncular article 4 of antenna 2; I, right mandible; J and K, distal parts of trunks of mandibles, left and right; L, maxilla 1, left; M, distal part of the palp; N, tip of the outer plate; O and P, inner plates of maxilla 1, left and right; Q, maxilla 2, right; R, maxilliped, left. Scale: S, 1mm (B); T, 1mm (A); U, 1mm (C-G, I); V, 1mm (H, J-L, Q, R); W, 0.5mm (M-P).

the distal end, article 3 rather large, the surface covered with numerous long setae, finger unguiform with a row of spinules along the inner margin, and with a nail at the tip.

Gnathopods 1 and 2 similar in shape, but gnathopod 2 somewhat larger than 1; gnathopod 1, article 2 rather robust than that of gnathopod 2, the lower hind corner of articles 4 and 5 densely setose; palmar defined angle armed with large and small spines, 16 in all, of which 8 in the uppermost level view (Fig. 2B), 1 in the median level (Fig. 2C), and 7 in the lower (Fig. 2D). Gnathopod 2, posterodistal corner of article 4 poorly setose, and the posterior lobe of article 5 densely setose; palmar angle armed with 18 spines in all, of which 10 in the upper, 8 in the lower.

Pereopods 1 and 2 similar in shape, and very slender, particularly article 2 much

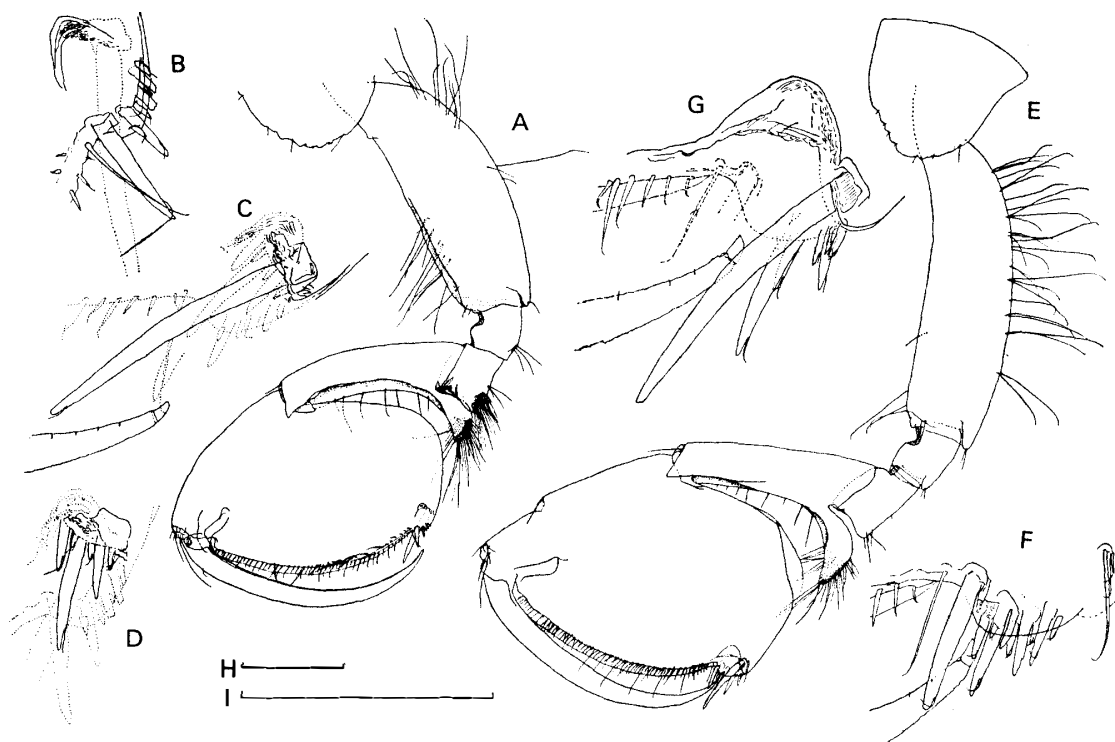


Fig. 2. *Eusirus microps* WALKER, male, 21mm: A, gnathopod 1; B, palmar angle of gnathopod 1, uppermost level view; C, median level of the palmar angle; D, lowest level view of the palmar angle; E, gnathopod 2; F, palmar angle of gnathopod 2, upper level view; G, lower level view of the palmar angle. Scale: H, 1mm (A, E); I, 0.5mm (B-D, F, G).

narrower than those of pereopods 3-5; all articles excluding coxae narrow and linear, and having many fascicles of setae; the long and slender spines armed only along the posterior margin of article 6 (Fig. 3C); dactyl with a cascade-like projection near the tip of the inner margin. Proportion of the length between articles somewhat differs from WALKER's description; in pereopod 1, article 2 about 7 times as long as wide, and clearly longer than the next two combined; article 2 of pereopod 2 rather shorter than that of pereopod 1, and reversely article 5 of the former rather longer than that of the latter.

Pereopod 3 a little shorter than pereopod 4 which is equal in length to pereopod 5. Pereopods 3-5 with the posterior margin rather concave, the posterodistal corner each ending in a triangular acute tooth; all articles excluding coxae armed with many fascicles of spines and long setae; dactyl each with a cascade-like projection as in pereopods 1 and 2.

Uropod 1 with inner ramus subequal to peduncle in length, and longer than the outer; inner margin of peduncle lined with spines; both rami armed with short spines on both margins. Uropod 2, outer ramus about half as long and wide as the inner, and a little shorter than peduncle; outer ramus armed with lined spines along both margins, and the inner with 3 spines only on the outer margin. Uropod 3, rami subequal in both length and width, and longer than peduncle; both rami fringed with spines on both margins; inner margin of inner ramus less setose than that of WALKER's figure.

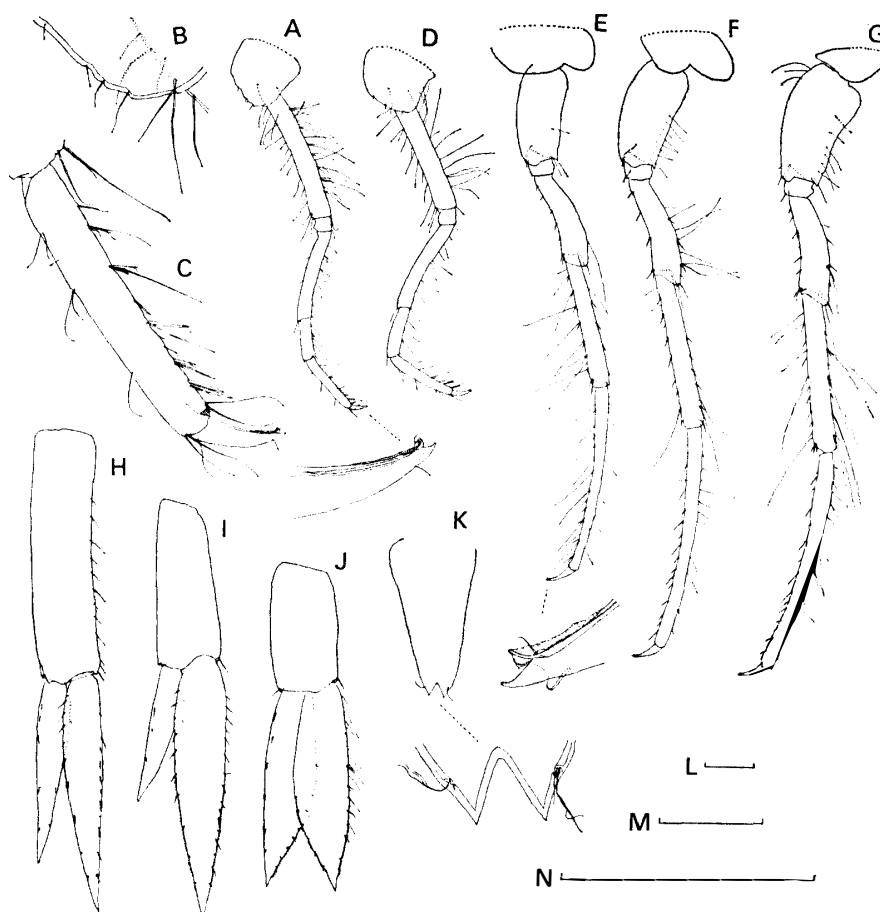


Fig. 3. *Eusirus microps* WALKER, male, 21mm: A, pereopod 1 with magnification of the distal part of dactyl; B, lower distal corner of coxa 3; C, articles 6 and 7 of pereopod 1; D, pereopod 2; E, pereopod 3 with magnification of the distal part of dactyl; F and G, pereopods 4 and 5; H-J, uropods 1-3; K, telson with magnification of the tip. Scales: L, 1mm (A, D-G); M, 1mm (H-K); N, 1mm (B, C).

Uropods 1-3, both margins of all rami more or less minutely pectinated. Telson reaching beyond the end of peduncle of uropod 3, with a very shallow notch and a pair of fascicle of setae on the outer margin near the distal acute point.

Remarks: The present specimen agrees well with WALKER's description and figures except for details, and the subquadrate shape of coxae 1-4 characteristic of this species is also conformed to BARNARD's (1930) and BELLAN-SANTINI's (1972b) figures. As for the characteristic cascade-like projection of the dactyl in all pereopods, WALKER described, "Dactylus slightly curved, the point blunt with a curved tooth near it," and the point appears to be drawn in his figure for pereopod 5 (WALKER, 1907, p. 32, pl. 11). In the Antarctic region, *E. antarcticus* THOMSON and *E. perdentatus* CHEVREUX have hitherto been known in addition to the present species. *E. microps* WALKER is easily distinguished from the above two species by coxae 1-4, the inner plate of maxilla 1, and the dactyl of pereopods.

Distribution: Antarctic circumpolar species, northerly found as far as Bouvet Island. The localities are as follows: McMurdo Sound (WALKER, 1907); Petermann

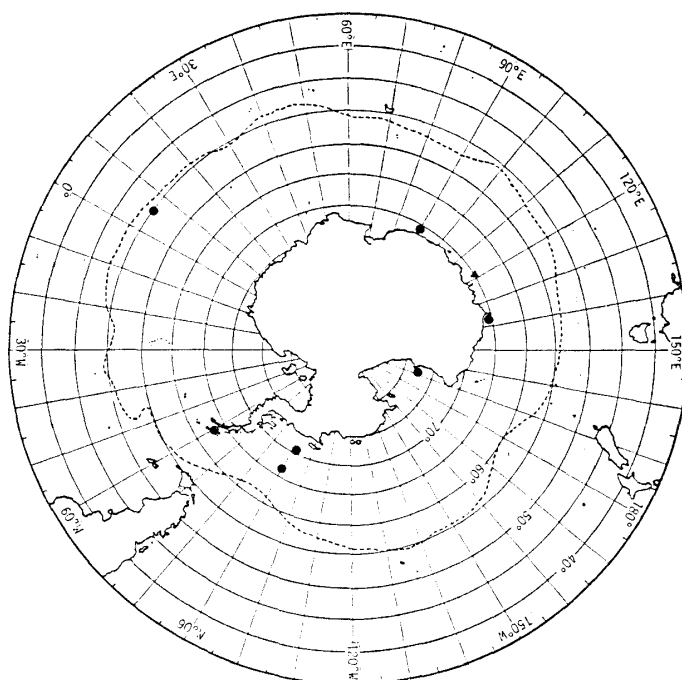


Fig. 4. *Eusirus microps* WALKER, locality records so far reported (refer to the text). Triangle indicates the present record.

Island (CHEVREUX, 1913); 'Gauss' Winter Station, 50–350 m (SCHELLENBERG, 1926); north of Bouvet Island, 55 m; South Shetland Islands, 0–5 m (BARNARD, 1932); Peter Island, 330 m (STEPHENSEN, 1947); Adélie Land, 136–142°E, 60–240 m (BELLAN-SANTINI, 1972a). Each locality is plotted in Fig. 4.

Paramoera walkeri (STEBBING, 1906)

(Figs. 5–7)

Atylus antarcticus WALKER, 1903, p. 58, pl. 11, figs. 91–97.

Atylus walkeri STEBBING, 1906, p. 728; WALKER, 1907, p. 34.

Bovallia walkeri: CHEVREUX, 1913, p. 169, figs. 53–55.

Paramoera walkeri: STEPHENSEN, 1927, p. 327 (in key); SCHELLENBERG, 1929, p. 281 (in revision); BARNARD, 1930, p. 388; SCHELLENBERG, 1931, p. 197; BARNARD, 1932, p. 206; NICHOLLS, 1938, p. 114, fig. 52, f, m and 58, a, b; BELLAN-SANTINI, 1972a, p. 186; 1972b, p. 688.

Material examined: Stn. PI-2 (64°17.6'S, 135°48.3'E), January 16, 1984, 1 ♀ with oostegites not well developed, 10 mm in length.

Description: Body dorsally carinate, the slight elevation begins on pereonite 3, the prominent backward projection continued from pereonite 6 to pleonite 2, the carina on pleonite 3 not narrowly projected but largely rounded posteriorly, pleonite 4 showing a slight dorsal depression. Head about as long as the first two pereonites; rostrum about one-fourth the length of peduncular article 1 of antenna 1, and narrowing distally, but not acute at apex; lateral cephalic lobe large, truncated anteriorly as in CHEVREUX's figure for *Bovallia walkeri*; postantennal corner not produced; eyes rather large, oval; coxa 4 deeper than broad, coxa 5 with posterior lobe deeper than the

anterior; pleonal epimera 1–3 with posterior margin minutely crenulated, bearing a row of spinules, the lower margin bearing 4 spines in epimeron 3, 2 in epimeron 2, and 1 in epimeron 1.

Antenna 1 much longer than 2, peduncular article 1 as long as articles 2 and 3 combined, article 2 more than twice as long as 3, flagellum 34-jointed, accessory flagellum formed of subconical articulate lappet bearing 2 long and 2 short setae on the apex.

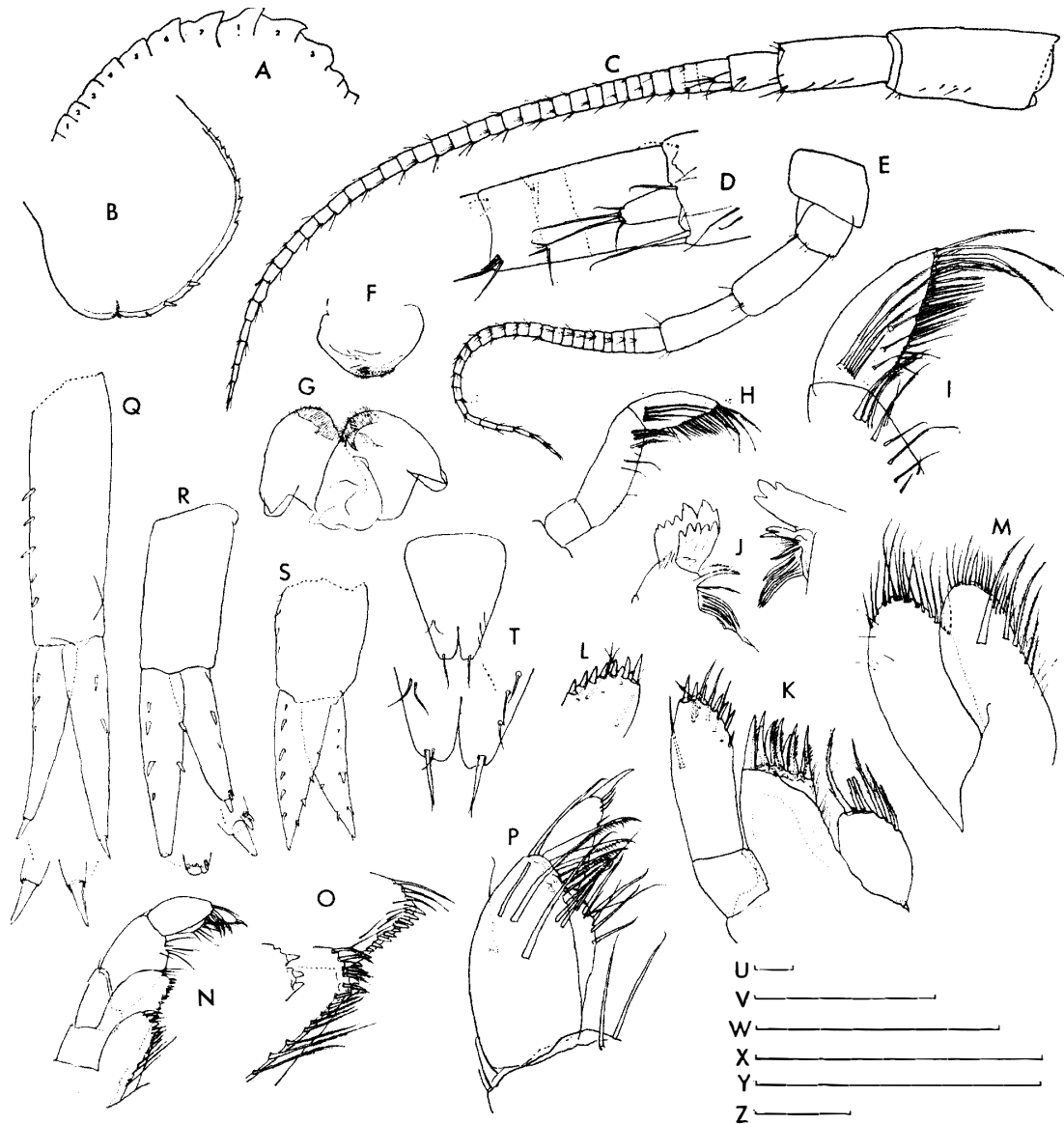


Fig. 5. *Paramoera walkeri* (STEBBING), female with oostegites, 10 mm: A, dorsal profile of pereon and pleon; B, pleonal epimeron 3; C–D, antenna 1 and its accessory flagellum; E, antenna 2; F, upper lip; G, lower lip; H–I, mandibular palp and the distal part; J, distal parts of the trunks of mandibles, left and right; K–L, left maxilla 1 and distal end of palp of right maxilla 1; M, maxilla 2; N–P, maxilliped, its outer and inner plates, and distal part of the palp; Q–S, uropod 1 (left) and uropods 2–3 (right); T, telson. Scales: U, 1mm (A); V, 1mm (C, E); W, 1mm (B); X, 1mm (H, N, Q–T); Y, 0.5mm (D, F, G, I–M, O); Z, 0.1mm (P).

Antenna 2, peduncular article 4 longer and broader than 5, flagellum 27-jointed. Both antennae bearing no calcaeus or aesthetasc.

Upper lip rounded, lower lip lacking inner lobes. Mandibular palp article 3 shorter than 2; incisor with 7 teeth in left, 3 in right; *lacinia mobilis* with 5 teeth; maxilla 1 with inner plate bearing 6 plumose setae in both left and right, bearing confined mainly toward apex; the outer plate with 11 spines in both sides, the palp with 7 rather slender spines in left, with 7 rather stout spines in right; maxilla 2, inner plate large, subequal in height to outer plate, and bearing weakly submarginal oblique row of 6 plumose setae. Maxillipeds, outer plate not reaching the end of article 2 of palp, the inner margin fringed with a row of spine-like teeth; the inner margin of inner plate fringed with a row of plumose setae, the apex with 3 stout teeth; article 3 of palp bearing a bunch of 5–6 serrated spine-like setae near the base of article 4 which has a nail.

Gnathopods 1 and 2 almost alike, gnathopod 2 only slightly larger than 1. Gnathopod 1 with article 5 subtriangular, not produced to posterior lobe; article 6 longer than 5, slightly longer than broad, the palm forming a nearly continuous curve with the posterior margin, the defining corner bearing a group of 8 spines, composed of a row of 4 spines on the uppermost level, a single longest one on the medial, and a row of 3 ones on the lowermost; dactyl with inner margin crenulated.

Pereopods 1 and 2 similar except for coxae, article 2 as long as articles 4 and 5 combined which are equal in length to each other, article 6 a little longer than 5. Pereopods 3–5, article 2 with posterior margin weakly and minutely crenulated, the margin slightly concave in pereopods 3 and 4, obviously convex in pereopod 5; articles 4–6 of pereopod 3 progressively longer; pereopod 4, article 4 shorter than 5 which is equal to 6; in pereopod 5, article 4 equal to 5 which is shorter than 6. Dactyl of all pereopods rather short and stout, with a small seta attached to weak hump on the inner margin.

Uropod 1 with peduncle longer than rami, uropod 2 with peduncle longer than outer ramus, but shorter than inner ramus; uropod 3 with peduncle shorter than rami; all uropods with outer ramus shorter than inner, especially in uropod 2; the rami in uropods 1 and 2, bearing the second article, and lanceolate in uropod 3. Telson subtriangular, longer than broad, the cleft about one-fourth the length, the apices obliquely truncated, each bearing a long spine.

Remarks: The specimen agrees well with CHEVREUX's description and figures for *Bovallia walkeri*, except the relative lengths of articles 4–6 of pereopods 3–5, and that of peduncle to rami of uropod 1. Both WALKER (1903) and CHEVREUX (1913) did not describe fully the oral parts, and not give their drawing at all. NICHOLLS (1938) figured only two appendages of maxillae 1 and 2 for this species, which just fit for those of the present specimen, especially in both inner plates.

As regards the both inner plates, BARNARD (1972a, p. 186) diagnosed for the genus *Paramoera*, "setae on inner plate of maxilla 1 occupying most of medial margin", and "maxilla 2 bearing strong submarginal oblique row of setae on inner plate."; for example, see BARNARD, 1972b, fig. 39g in p. 84, and fig. 38b in p. 83, both for *Paramoera chevreuxi* (STEPHENSON). Those of the present specimen, however, somewhat differ from his diagnosis; as seen in my drawing, the setae on the inner plate of maxilla 1 are confined nearly toward the apex, though the plate is not narrow but broad, and maxilla 2 bearing weakly submarginal oblique row of setae on the inner plate, just as in those of

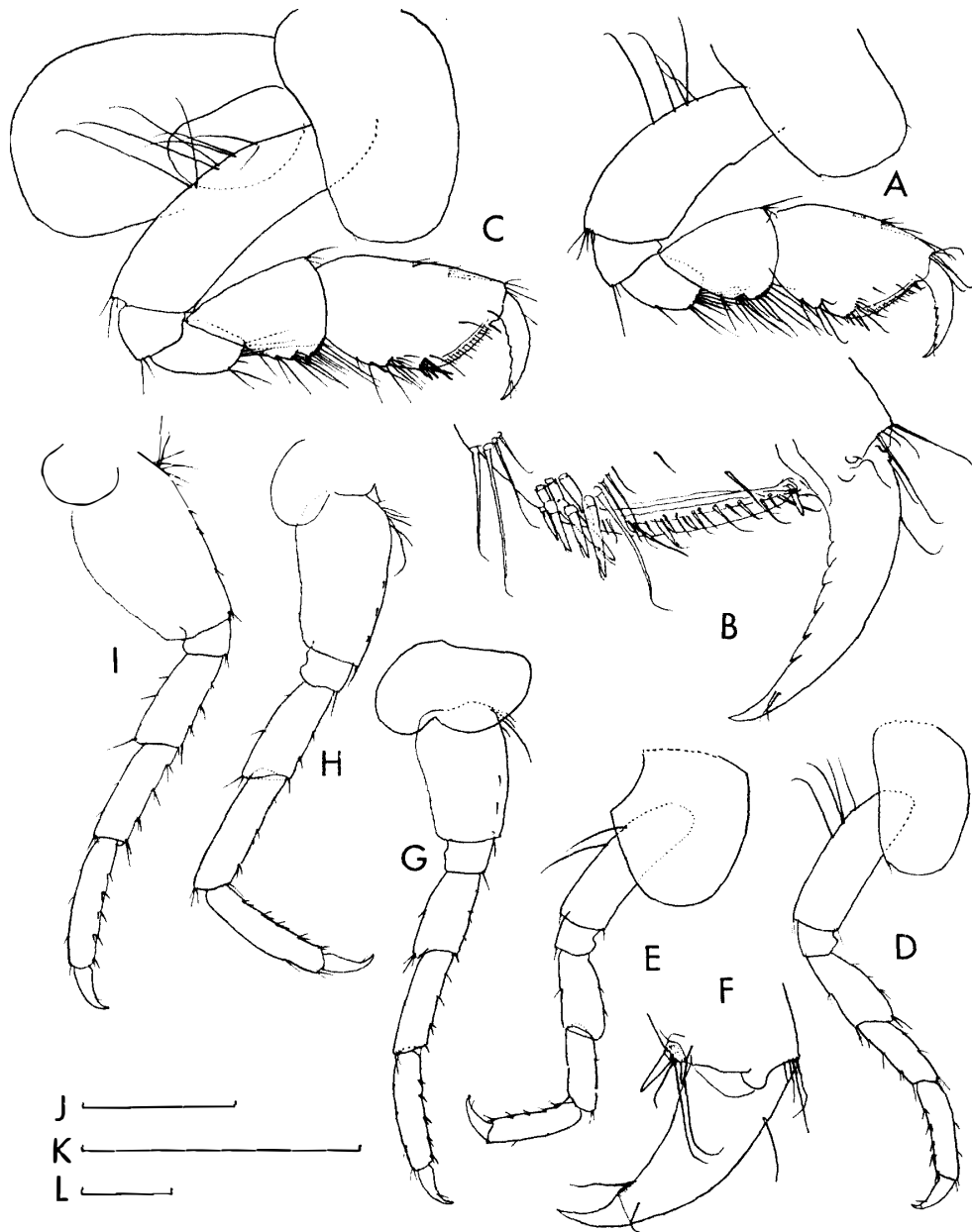


Fig. 6. *Paramoera walkeri* (STEBBING), female with oostegites, ♀10 mm: A-B, gnathopod 1 and magnification of its distal part; C, gnathopod 2; D, pereopod 1; E-F, pereopod 2 and magnification of its distal part; G-I, pereopods 3-5. Scales: J, 1mm (D, E, G-I); K, 1mm (A, C); L, 0.1mm (B, F).[‡]

the genus *Pontogeneia* or *Accedomoera*. The generic diagnosis remains questionable to me now.

Distribution: Antarctic circumpolar species, northerly found[‡] to South Georgia, all littoral. Each locality so far reported is as follows: Cape Adare beach, 10m (WALKER, 1903); McMurdo Sound, 0-10fms (WALKER, 1907); South Shetland Islands (CHEVREUX, 1913); McMurdo Sound and off Cape Adare, 10-250m (BARNARD, 1930); South Georgia, 5-310m (SCHELLENBERG, 1931); South Shetlands and South Georgia, cove

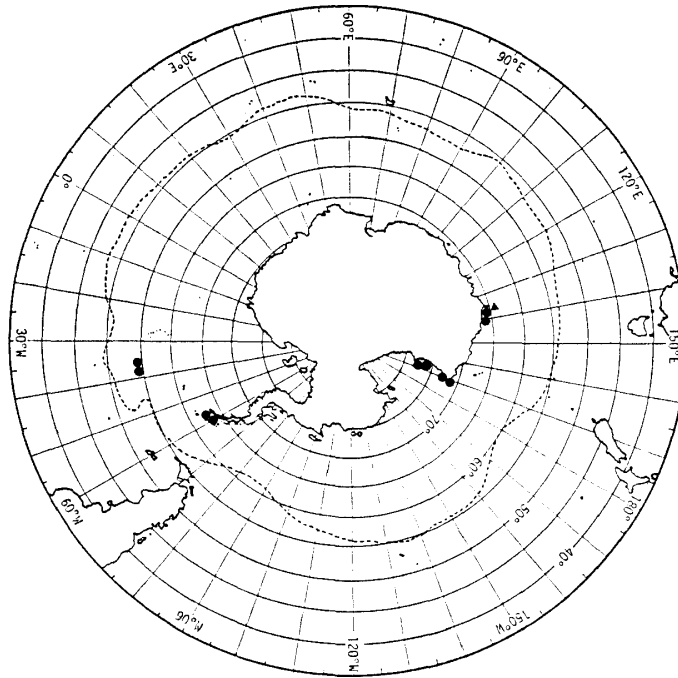


Fig. 7. *Paramoera walkeri* (STEBBING), locality records (refer to the text).
Triangle indicates the present record.

and 525 m (BARNARD, 1932); Commonwealth Bay, 3–5 fms (NICHOLLS, 1938); Adélie Land, 136–142°E (BELLAN-SANTINI, 1972a). The above localities are shown in Fig. 7.

Vibilia stebbingi BEHNING & WOLTERECK, 1912

(Figs. 8 and 9)

Vibilia stebbingi: HURLEY, 1955, p. 125, figs. 1–22 (with references); 1960a, p. 111; 1960b, p. 279; KANE, 1962, p. 298; VINOGRADOV, 1962, p. 19.

Material examined: Stn. 2 (52°08.6'S, 149°40.3'E), December 17, 1983, 1 ♂, 12.5 mm long, and 1 ♀, 7.2 mm long.

Diagnosis: Posterior corners of the last urosome segment not produced distally. Eyes yellowish-brown, moderate in size. Antenna 1, flagellum has only one distinct small end article, the first obviously shorter than the lengths of head and the first two pereon segments combined, broadly ovate, somewhat truncated inferodistally. Pereopod 1 has 3 prominent setose spines on posterodistal angle of carpus. Carpal process of pereopod 2 nearly as long as propus. Pereopods 5 and 6 less than 1.5 times as long as pereopods 3 and 4, the dactyl long and slender. Pereopod 7, article 2 shorter than the succeeding articles all combined. Uropods 1 and 2, inner margin of outer ramus coarsely toothed distally, finely toothed proximally. Uropods 2 and 3, peduncle longer than rami.

Remarks: The specimens agree well with HURLEY's figures for *V. stebbingi*? (1955) except for some details. He identified his specimen to *V. stebbingi* with a question in his 1955's paper, but it was certified by his subsequent paper (1960a) that the specimen was *V. stebbingi* without doubt. He made up therein a new key to *V. viatrix*, *V. propinqua*, *V. antarctica*, and *V. stebbingi* which are very similar to one another,

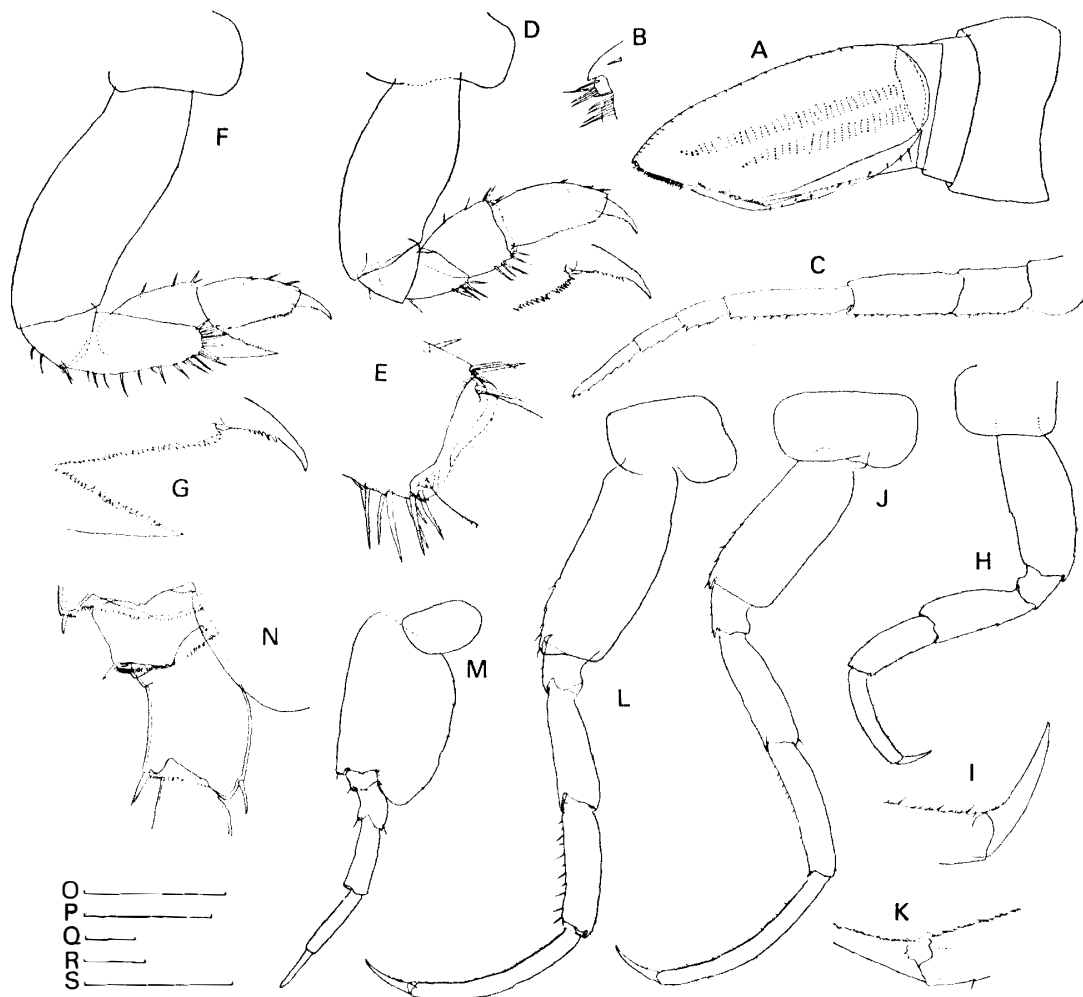


Fig. 8. *Vibilia stebbingi* BEHN. & WOLT., male 12.5mm: A-B, antenna 1 (right, inside) and end article of the flagellum; C, antenna 2 (left, outside); D-E, pereopod 1 and distal end of the article 5; F-G, pereopod 2 and confrontal margin of the articles 5-7; H-I, pereopod 3 and posterior margin of the distal part; J-K, pereopod 5 and anterior margin of the distal part; L, pereopod 6; M-N, pereopod 7 and articles 3-4 of the leg. Scales: O, 1mm (H, J, L-M); P, 0.5mm (A, C, D, F); Q, 0.1mm (I, K, N); R, 0.1mm (E, G); S, 0.1mm (B).

instead of dichotomy 3 of HURLEY's (1955) key based on the original BEHNING's key (1913). According to the key, *V. stebbingi* is easily distinguished from the most akin species, *V. antarctica*, by having only one small distinct end segment on the large flagellum of antenna 1 (two in *V. antarctica*). From *V. viatrix* and *V. propinqua*, it is firstly separated by an arrangement of teeth on the inner margin of outer ramus of uropod 1. Uropod 1, outer ramus with inner margin evenly toothed throughout the length in *V. viatrix* and *V. propinqua*, while it is coarsely toothed distally, finely toothed proximally in *V. antarctica* and *V. stebbingi*. The above-mentioned diagnostic characters are herein illustrated together with the other details.

Distribution: Cosmopolitan species. "Mediterranean; Atlantic about 35°N-30°S; Eastern Pacific; New Zealand" (HURLEY, 1955), and in Southern Hemisphere, "extending from the Equator to the Antarctic continent" (HURLEY, 1969).

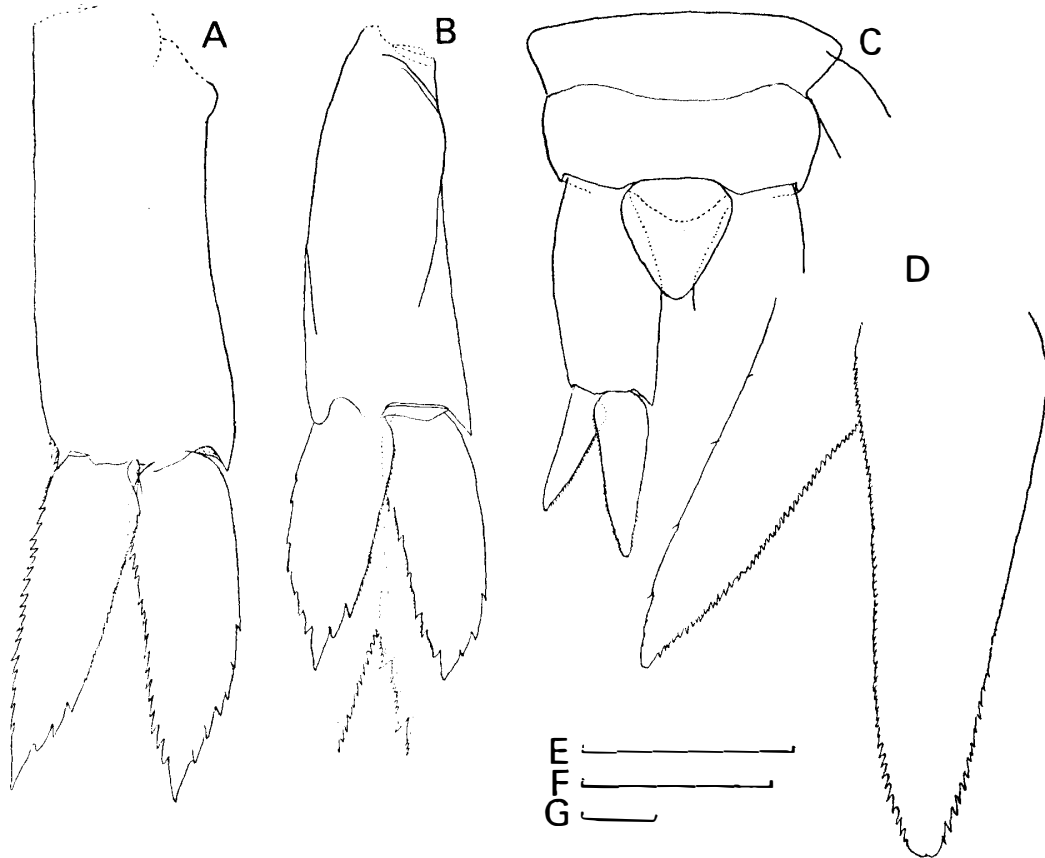


Fig. 9. *Vibia stebbingi* BEHN. & WOLT., male, 12.5mm: A-B, uropods 1-2; C, uropod 3 and telson; D, magnification of the rami of uropod 3. Scales: E, 1mm (C); F, 0.5mm (A, B); G, 0.1mm (D).

Cylopus magellanicus DANA, 1852

Cylopus magellanicus: HURLEY, 1955, p. 129, figs. 23-50 (with references); 1960a, p. 111; 1961, p. 398; VINOGRADOV, 1962, p. 21.

Material examined: Stn. 2 (52°08.6'S, 149°40.3'E), December 17, 1983, 1 ♂, 13.5 mm long and 1 ♀, 11.0 mm long.

Distribution: "Antarctic species, occurring from the Antarctic continent to the Subtropical Convergence" (HURLEY, 1969).

Cylopus lucasii BATE, 1862

Cylopus lucasii: BOVALLIUS, 1889, p. 16, with figs. after BATE; BARNARD, 1930, p. 409; 1932, p. 266; HURLEY, 1960a, p. 111; VINOGRADOV, 1962, p. 21.

Cylopus antarcticus SPANDL, 1927, p. 175, fig. 12.

Material examined: Stn. PI-2 (64°17.6'S, 135°48.3'E), January 16, 1984, 2 ♀♀, 16 mm and 9.5 mm long.

Distribution: "Antarctic species, occurring from the Antarctic continent to the Antarctic Convergence" (HURLEY, 1969). This species appears to occur still nearer toward the Antarctica than *C. magellanicus* as seen in Map 4 of HURLEY (1969).

Hyperiella antarctica BOVALLIUS, 1887

(Figs. 10-12)

Hyperiella antarctica: BOVALLIUS, 1887, p. 566, pl. 45, figs. 72-80; 1889, p. 242, text-fig. & pl. 11, figs. 42-51; STEWART, 1913, p. 256; BARNARD, 1930, p. 414; 1932, p. 275, fig. 161; KANE, 1962, p. 301; VINOGRADOV, 1962, p. 25; BOWMAN, 1973, p. 27, figs. 20n, 21g-i.

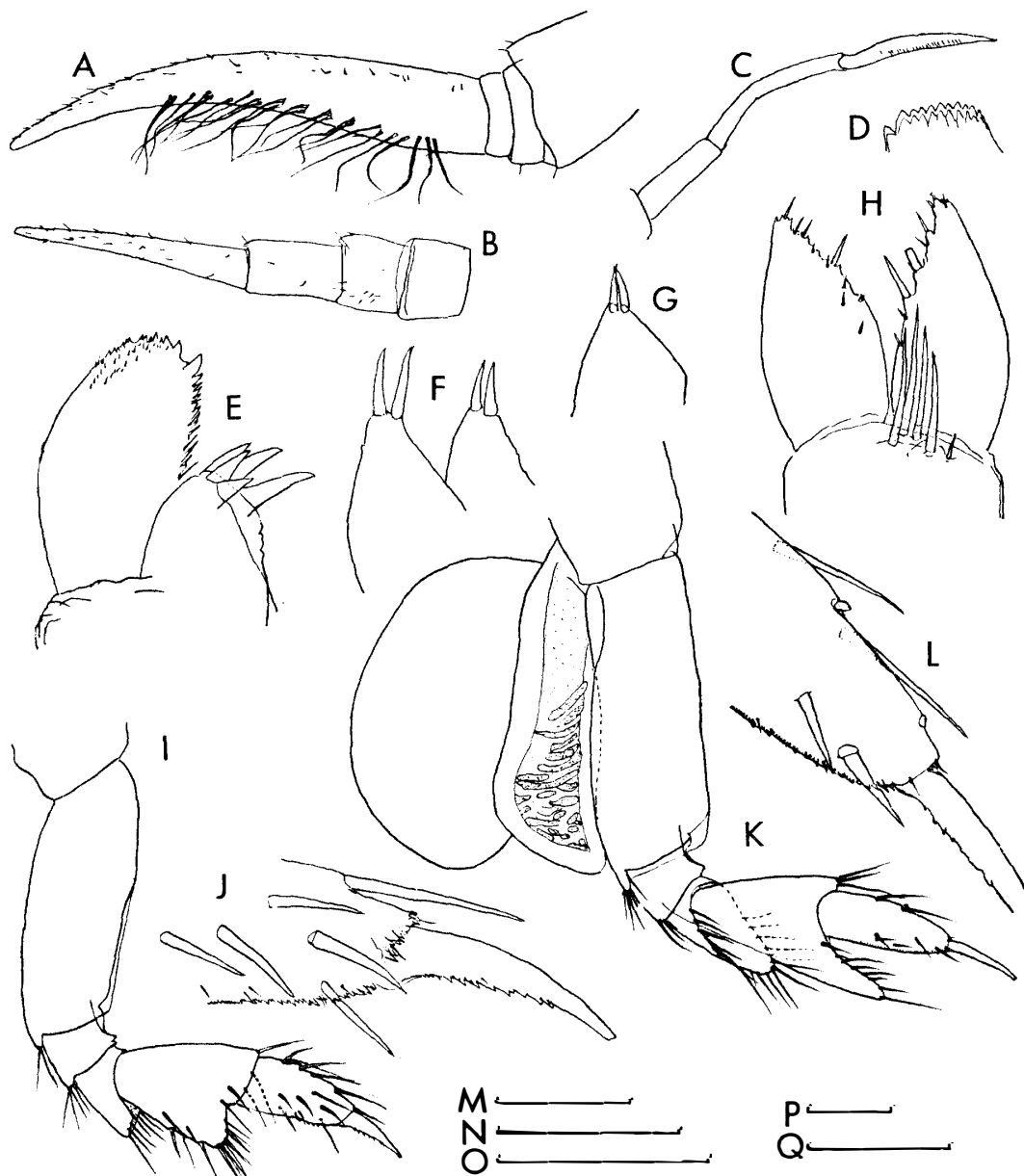


Fig. 10. *Hyperiella antarctica* BOVALLIUS, female with oostegites, 8.5mm: A, antenna 1 (right, inside); B, antenna 2 (left, outside); C-D, palp and incisor of right mandible; E-F, maxillae 1-2 (left, setae omitted); G-H, inner (setae omitted) and outer lobes of maxillipeds; I-J, pereopod 1 and its distal part; K-L, pereopod 2 and its distal part. Scales: M, 0.5mm (I, K); N, 0.5mm (A, B); O, 0.5mm (C); P, 0.1mm (E-H, J, L); Q, 0.1mm (D).

Material examined: Stn. 6 (60°03.1'S, 116°04.5'E), January 22, 1984, 1 ♀, bearing oostegites well developed, 8.5mm in length.

Remarks: *H. antarctica* BOVALLIUS is very closely related to *H. dilatata* STEBBING, but the present specimen is identified with the former by the less prominent postero-ventral corners of pleonal epimera, the less pointed processes of anterodistal corners of articles 2-4 of pereopods 5-7, and the broader shape of endopod of uropod 3. BOWMAN (1973) said, "Figures of the uropods of the female *H. antarctica* have not yet been published, and I am unable to evaluate BARNARD's statement concerning them". The present specimen is undoubtedly considered female by having the well-developed oostegites, and by having only four segments in antennae 1 and 2 respectively. The shape of endopod of uropod 3 in the present specimen just resembles that of BOWMAN's figure for the male *H. dilatata* (1973, p. 29, fig. 21b), hence it appears that endopod of the male uropod 3 is broader than that of the female in each species, and endopod of *H. antarctica* is likewise broader than that of *H. dilatata* in the same sex respectively.

The other characters are described as follows: The corner of pleonal epimeron 1 not entirely rounded, but somewhat angular as in BOWMAN's figure for *H. antarctica*

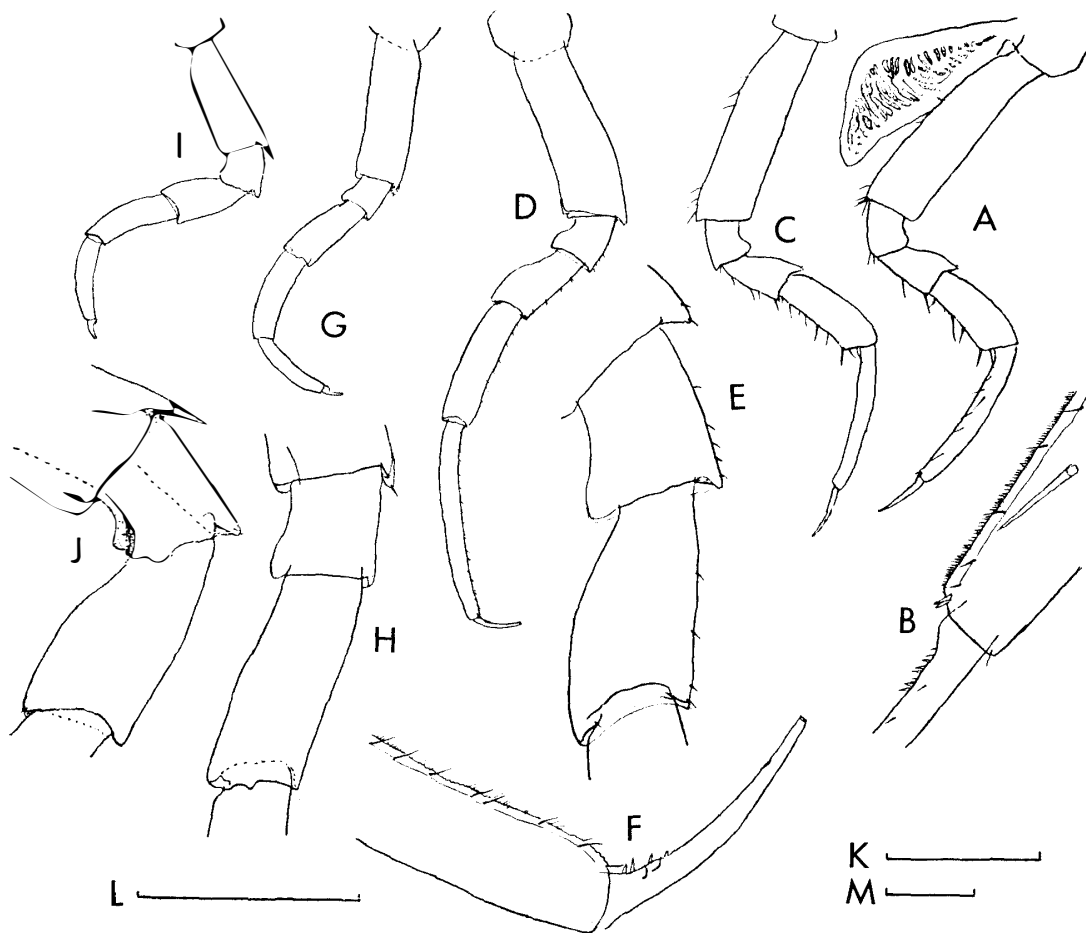


Fig. 11. *Hyperielliella antarctica* BOVALLIUS, female with oostegites, 8.5mm: A-B, pereopod 3 and its distal part; C, pereopod 4; D-F, pereopod 5, its articles 2-4, and the distal part; G-H, pereopod 6 and its articles 2-4; I-J, pereopod 7 and its articles 2-4. Scales: K, 1mm (A, C, D, G, I); L, 0.5mm (E, H, J); M, 0.1mm (B, F).

(1973, p. 28, fig. 20n). Anterodistal corner of article 2 of pereopod 7 bearing a prominent spine at the apex as in STEBBING's description and figure for *H. dilatata* (STEBBING, 1888). The posterior margins of article 6 of pereopods 1–2, articles 5–6 of pereopods 3–4, and the anterior margins of articles 5–6 of pereopod 5 are all more or less pectinated or serrated minutely; their dactyls each bearing several small teeth or pectination on the inner margin near the base; on the contrary, those of pereopods 6–7 entirely smooth.

Concerning the oral parts, BOVALLIUS did not figure at all, but BOWMAN illustrated them for *H. dilatata*. In the specimen at my hand, the incisor of right mandible has 11 teeth (Fig. 10D) (left one unfortunately missing), but 8 in BOVALLIUS's description, and 10 in BOWMAN's figure. Mandibular palp article 3 with a row of spinules as in BOWMAN's figure, but not described by BOVALLIUS. Maxilla 1, inner plate with 5 spines at the apex as in BOWMAN's figure, but 4 in BOVALLIUS description. Maxilla 2, inner plate with 2 spines as in outer plate, but in BOWMAN's figure there is only one spine on the inner, unlike on the outer. Maxillipeds with 4 long and 1 short bristles at the base of outer lobes, but in BOWMAN's figure, the one short bristle presents in a remote position.

My drawing for the long olfactory hairs along the lower margin of the flagellum

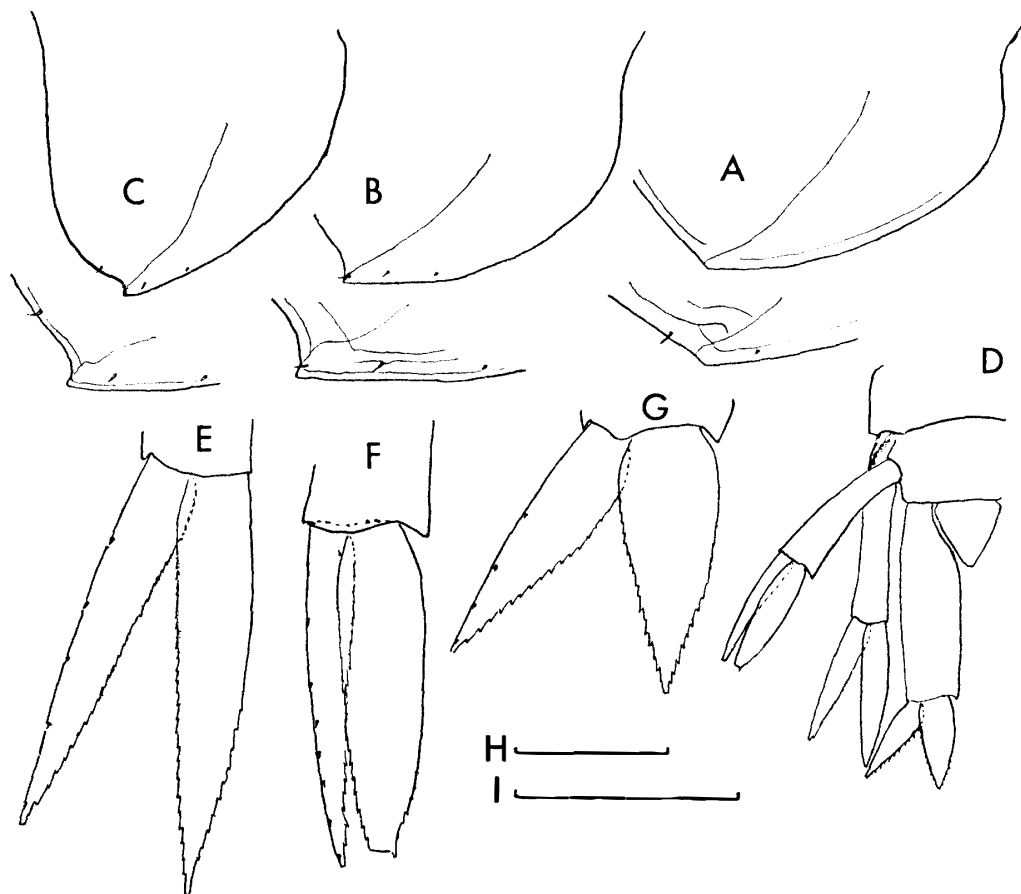


Fig. 12. *Hyperielliella antarctica* BOVALLIUS, female with oostegites, 8.5 mm: A–C, pleonal epimera 1–3 each with magnification of the corner; D, uropods and telson; E–G, uropods 1–3. Scales: H, 1mm (D); I, 0.5mm (A–C, E–G).

of antenna 1 may not be a true picture in their natural state because of the casual frizzling of the hairs from the middle toward the tip, and they are possibly broad to the tip as in BOWMAN's figure. Several notes mentioned above may be helpful to resolve whether *H. antarctica* and *H. dilatata* are distinct species with each other or not.

Distribution: "Occurring between the Subtropical Convergence and the edge of the pack ice" (HURLEY, 1969).

Parathemisto (Euthemisto) gaudichaudii (GUÉRIN, 1925)

Parathemisto (Euthemisto) gaudichaudii: BARNARD, 1930, p. 420; 1932, p. 280; HURLEY, 1955, p. 161, figs. 159–174; 1960a, p. 112; 1961, p. 599; BOWMAN, 1960, p. 379, figs. 16a and 17; VINOGRADOV, 1962, p. 26.

Material examined: Stn. 1 (44°59.7'S, 150°04.7'E), December 14, 1983, 2 ♂♂, both 12.5 mm long and 1 ♀, 14.0 mm long; Stn. 2 (52°08.6'S, 149°40.3'E), December 17, 1983, 1 ♀, 14.0 mm long.

Distribution: In the Northern Hemisphere, it is "widely distributed in the cooler part of the North Atlantic with a few scattered records from the warm water" (BOWMAN, 1960), and in the Southern Hemisphere, Antarctic circumpolar, "occurring from the Antarctic continent to the Subtropical Convergence" (HURLEY, 1969).

Parathemisto (Euthemisto) gracilipes (NORMAN, 1869)

Parathemisto (Euthemisto) gracilipes: BARNARD, 1930, p. 421; HURLEY, 1955, p. 153, figs. 133–158, 176 and 178; 1961, p. 599; BOWMAN, 1960, p. 375, figs. 11a–i, 14–15 and 16b; VINOGRADOV, 1962, p. 26.

Material examined: Stn. 1 (44°59.7'S, 150°04.7'E), December 14, 1983, 1 ♀, with oostegites, 8 mm in length.

Distribution: This species is said to live in warmer water than *P. gaudichaudii*. Northern Hemisphere: It is widely distributed in European seas, northerly to 40°N; in the Pacific, found in the East China Sea and the Yellow Sea (BOWMAN, 1960). Southern Hemisphere: "Subtropical Convergence region, mostly neritic around New Zealand and southern Australia" (HURLEY, 1969).

Primno macropa GUÉRIN-MÉNEVILLE, 1836

Primno macropa: BOWMAN, 1978, p. 3, figs. 1–2, 3a–c and 4 (with references).

Material examined: Stn. 5 (65°01.7'S, 118°14.7'E), January 19, 1984, 1 ovig. ♀, 15 mm in length.

Distribution: According to BOWMAN's revision on the species of this genus (BOWMAN, 1978), it is said that *Primno macropa* is found only at higher latitudes at present as follows: In the Northern Hemisphere, Japan and Okhotsk Sea, Bering Sea, Gulf of Alaska, British Columbia, and southerly to California. In the Southern Hemisphere, Chile (type locality), off Three Kings Is. (New Zealand), and Antarctic circumpolar from the Subtropical Convergence to the Antarctica.

Brachyscelus cruscolum BATE, 1861

Brachyscelus cruscolum: STEBBING, 1888, p. 1544, 1547, pls. 195, 196; CHEVREUX and FAGE, 1925, p. 427, fig. 418; STEPHENSEN, 1925, p. 172; BARNARD, 1930, p. 432; 1932,

p. 292; SHOEMAKER, 1945, p. 242; VINOGRADOV, 1962, p. 27; PILLAI, 1966, p. 225, fig. 15.

Material examined: Stn. 7 (45°02.9'S, 115°00.6'E), January 26, 1984, 1 ♂, 8.0 mm in length.

Distribution: Cosmopolitan species: Atlantic (northerly to 65°N, SW of Iceland) (STEPHENSON, 1923), Mediterranean, Arabian Sea, Indian Ocean, East Indies, and North Pacific (northerly to 35°N, between Japan and Honolulu) (STEBBING, 1888); in the Southern Hemisphere, "from the equator to the Antarctic continent" (HURLEY, 1969).

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