

Some Amphipoda, Isopoda and Tanaidacea from Cook Strait*†

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Abstract

AMPHIPODA, Isopoda and Tanaidacea collected by members of the Victoria University College Zoology Department from the Cook Strait area are recorded and described. One new species of the amphipod genus *Epimeria* is described together with new species of the isopod genera *Cirolana*, *Rocinela*, *Jaeropsis* and *Pseudidothea*. Species of *Astacilla* and *Iathrippa* (Isopoda) are redescribed.

INTRODUCTION AND ACKNOWLEDGMENTS

THE species listed below are part of collections made by the Zoology Department of Victoria University College, Wellington, New Zealand, in Wellington Harbour and Cook Strait between 1954 and May, 1956, and have kindly been made available to me by Professor L. R. Richardson. My thanks are also due to members of the collecting parties, particularly Mr. J. C. Yaldwyn, for data on collections and for other assistance. Dr. E. W. Bennett provided translations of relevant Russian literature.

STATION DATA

COLLECTION No. VUZ. 3; Stn. KIIB. Off Rangitoto Is. 40°44'30"S; 174°0'E; 17/12/54; Time 2200–2315 hrs; bottom depth 55 fathoms; trap with light on bottom.

VUZ. 6; Stn. GIIB. Off Stephens Island, Cook St. 40°38'30"S, 174°0'E; 18/12/54; 2120–2150 hrs; bottom depth 110 fathoms; trap with light on bottom.

VUZ. 18; Stn. BOQ. Palliser Bay. 41°31'S, 174°55'E; 13/5/55; 0130 hrs; bottom depth 380 fathoms; 2 metre cone net towed at 120–150 fathoms.

VUZ. 19; Stn. CUF. Palliser Bay. 41°32'S, 175°7'E; 13/5/55; 0345 hrs; bottom depth 38 fathoms; grey mud; dredge.

VUZ. 22; Stn. COS. Palliser Bay. 41°33'S, 174°58'30"E; 13/5/55; 1010 hrs; bottom depth 250–300 fathoms; beam trawl.

VUZ. 25; Stn. FOS. Palliser Bay. 41°37'S, 175°2'E; 14/1/56; 2140–2300 hrs; bottom depth 300–540 fathoms; 2 metre cone net towed at about 100 fathoms.

VUZ. 41; Stn. BOP. Palliser Bay. 41°30'30"S, 174°53'E; 19/1/56; 0730–1530 hrs; bottom depth 360 fathoms; long line and baited trap.

VUZ. 43; Stn. BOL. Cook Strait. 41°31'30"S, 174°48'E; 19/1/56; 0940–1100 hrs; bottom depth 70–80 fathoms; beam trawl.

VUZ. 44; Stn. BOK. Cook Strait. 41°31'S, 174°46'E; 19/1/56; 1200–1300 hrs; bottom depth 65–70 fathoms; beam trawl.

VUZ. 48; Stn. BOL. Cook Strait. 41°31'30"S, 174°48'E; 22/2/56; 1210–1330 hrs; bottom depth 70 fathoms; ? sand; beam trawl.

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Vuz. 49; Stn. BOL. Cook Strait. 41°31'30"S, 174°48'E; 22/2/56; 1430-1515 hrs; bottom depth 70 fathoms; ? sand; beam trawl.

Vuz. 51; Stn. DOP. Palliser Bay. 41°35'S, 174°53'E; 22/2/56; 1730-1830 hrs; bottom depth 200-300 fathoms; mud, coral; 2 metre cone net fished on bottom.

Vuz. 53; Stn. HUL. Off C. Palliser. 41°41'S, 175°17'E; 23/2/56; 0100-0215 hrs; bottom depth 250-350 fathoms; (? mud) gravel; beam trawl.

Vuz. 54; Stn. GUL. Off C. Palliser. 41°39'30"S, 175°17'E; 23/2/56; 0300-0450 hrs; bottom depth 50-200 fathoms; mud, gravel; beam trawl.

Vuz. 58; Stn. FOOR. S. of C. Palliser. 42°7'S, 174°57'E; 31/3/56; 0710-1035 hrs; bottom depth 1300 fathoms; grey mud; long line and baited trap.

O. TANAIDACEA

Family TANAIDAE

Leptochelia tenuis (G. M. Thomson), 1880.

Paratanais tenuis Thomson, 1880: 2, pl. 1, fig. 1.

Thomson, 1881: 207-208.

Heterotanais tenuis, Thomson, 1913: 245.

Thomson, 1921: 113.

Leptochelia mirabilis Stebbing, 1905: 6-7, pl. 1.B.

MATERIAL EXAMINED: Station BOL (VUZ. 43), 1 specimen; Station GUL (VUZ. 54), several specimens, 1.2-2.2 mm length, 1 female ovigerous at 1.7 mm.

DISTRIBUTION: Dunedin Harbour; rock pools along the coast; Cook Strait; Gulf of Manaar, Ceylon.

DISCUSSION: Although Thomson's figures are a little sketchy, there is no difficulty in identifying these specimens with his species. The specimens were referred to Dr. Karl Lang of the Naturhistoriska Riksmuseet of Stockholm for generic confirmation and I am grateful to him for the following comment: "There can be no doubt that *Paratanais tenuis* is the same species which Stebbing (1905) has described as *Leptochelia mirabilis*. The species is consequently to be named *Leptochelia tenuis* (Thomson) and *L. mirabilis* is a synonym of this species."

O. AMPHIPODA

S.O. GAMMARIDEA

Family LYSIANASSIDAE

Eurythenes gryllus (Licht.), 1822.

Eurythenes gryllus, Stebbing, 1906: 73.

Chilton, 1911: 563-564.

Barnard, 1932: 58.

Stephensen, 1933: 12-20, figs. 4-7.

MATERIAL EXAMINED: Station FOS (VUZ. 25), 1 female with young in brood-pouch, 24 mm; Station FOOR (VUZ. 58), 1 male, 53 mm; "off Island Bay" (exact locality unknown), 19/9/56, coll. by line fisherman, 2 females, 14-15 mm.

DISTRIBUTION: Northern and Southern Atlantic; Northern Pacific; Cook Strait, N.Z.; Sunday Island, Kermadec Islands (Chilton, 1911).

DISCUSSION: This large species has not previously been known from New Zealand waters and this is probably the shallowest depth from which it has been recorded free-living. Stephensen quotes depths from 1,000-5,000 fathoms. Where it has been taken previously in shallow water, it has always been from fish stomach contents.

The female of this species was formerly known as *Katius obesus* Chevreux.

Family AMPELISCIDAE

Ampelisca chiltoni Stebbing, 1888.

Ampelisca chiltoni Stebbing, 1888: 1042-1046, pl. CIII.

Chilton, 1906: 267-268.

Barnard, 1932: 81.

Ampelisca eschrichtii, Chilton, 1917: 75-93 (Not Krøyer).

Chilton, 1920: 6 (Not Krøyer).

MATERIAL EXAMINED: Station CUF (VUZ. 19), 23 females, 5–11 mm, some ovigerous.

DISTRIBUTION: Cook Strait, N.Z.; Challenger Stn. 167, "off N.Z., June 24, 1874; lat. 39° 32'S., long. 171° 48'E., depth 150 fathoms; bottom blue mud"; Great Barrier Island, 120 fathoms; off Poor Knights Islands, 60 fathoms; Kaipara Harbour, coll. Dr. Cockayne (Chilton, 1906). Undoubtedly taken elsewhere around New Zealand, but true distribution masked by confusion with *A. acinaces*.

DISCUSSION: Barnard (1932) rejects the inclusion of *A. chiltoni* and *A. acinaces* in *A. eschrichtii* as previously proposed by Chilton. After seeing these specimens and comparing them with Stebbing's figures (1888), I am convinced of the distinctness also of the two New Zealand species, *A. chiltoni* and *A. acinaces*. Apart from other small differences, Stebbing shows clearly a difference in the placement of the lower eyes. In *A. chiltoni* these are right on the lower corner of the head; in *A. acinaces* they are on the lower margin of the head *behind* the corner.

Family PHOXOCEPHALIDAE

Heterophoxus stephensi Schellenberg, 1931.

Heterophoxus stephensi Hurley, 1954: 589–593, figs. 29–67.

MATERIAL EXAMINED: Station CUF (VUZ. 19), 2 females, 5 mm.

DISTRIBUTION: Cook Strait; Otago Harbour; Auckland Islands.

DISCUSSION: For the sake of consistency, I am referring these species to *Heterophoxus stephensi* Schellenberg, under which name I have previously described New Zealand specimens. However, Dr. J. L. Barnard (personal communication) has advised me that the New Zealand specimens, which agree very well with Schellenberg's published description of *H. stephensi*, differ from the type specimens in a number of details not mentioned by Schellenberg. Since Dr. Barnard is monographing this family of Gammaridea, I prefer to leave it for him to make the final assessment of the New Zealand species.

Family PARAMPHITHOIDAE

Stebbing, 1906: 320.

Gurjanova, 1955: 187–189 (keys and generic diagnoses).

"Integument indurated, processiferous. Sideplates rigid, some acute. Eyes, when present, prominent. Antenna 1 shorter than antenna 2, flagellum in both many-jointed, accessory flagellum rudimentary or absent. Upper lip not deeply or not incised. Lower lip, inner lobes coalescing with outer or absent. Mandible, accessory plate on right as well on the left. Maxilliped, outer plates broad, not long, scantily armed on inner margin, finger small. Mouthparts in general strongly developed. Gnathopods 1 and 2 not stout in structure, 5th and 6th joints narrow, finger small. Peraeopods 3–5, 2nd joint not widely expanded. Uropod 3, rami lanceolate, longer than peduncle. Telson not large, entire or distally insinuate. Sexual difference very slight."

—Stebbing.

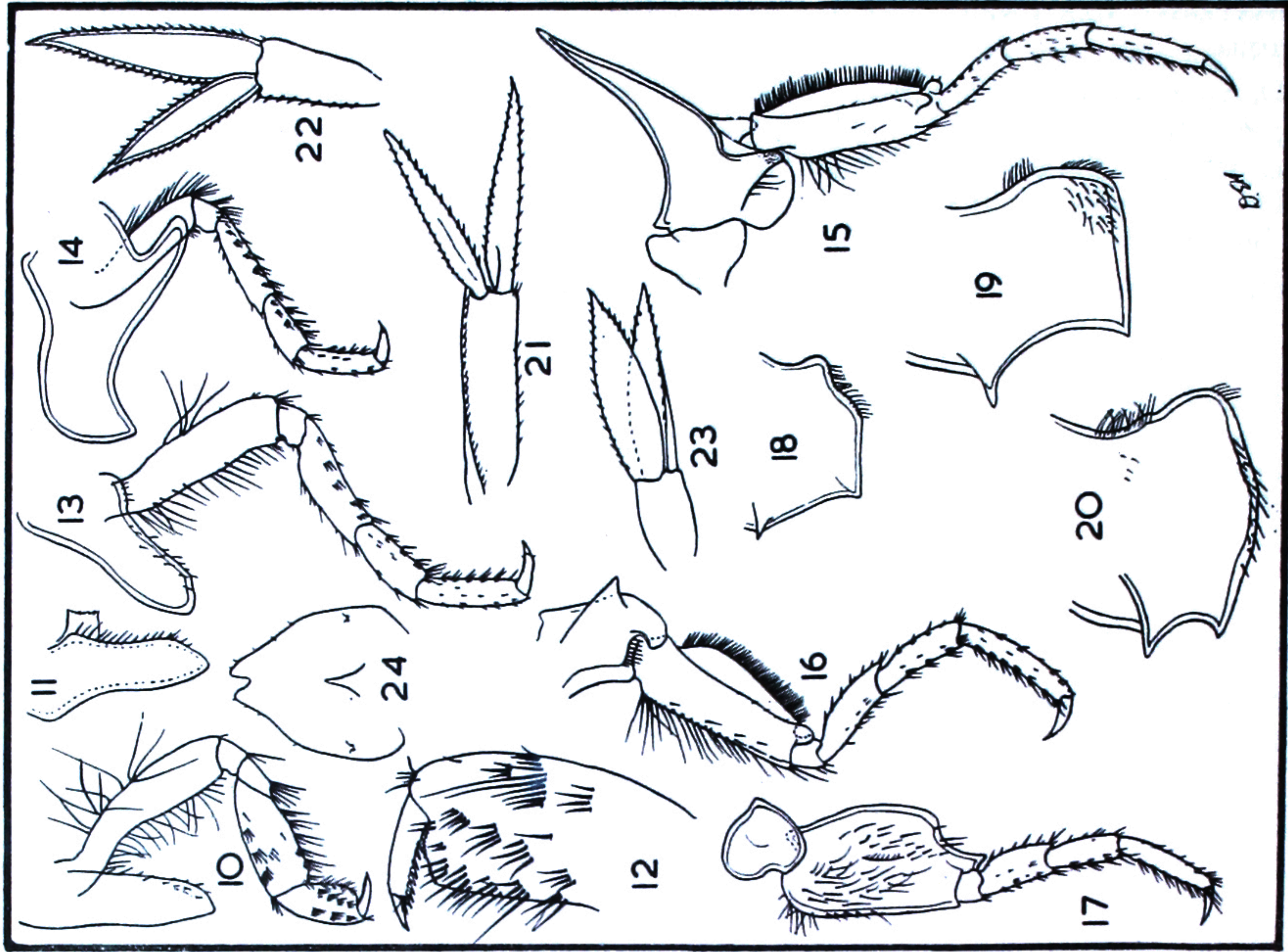
This is the first record of this family from New Zealand waters.

Genus EPIMERA Costa, 1851.

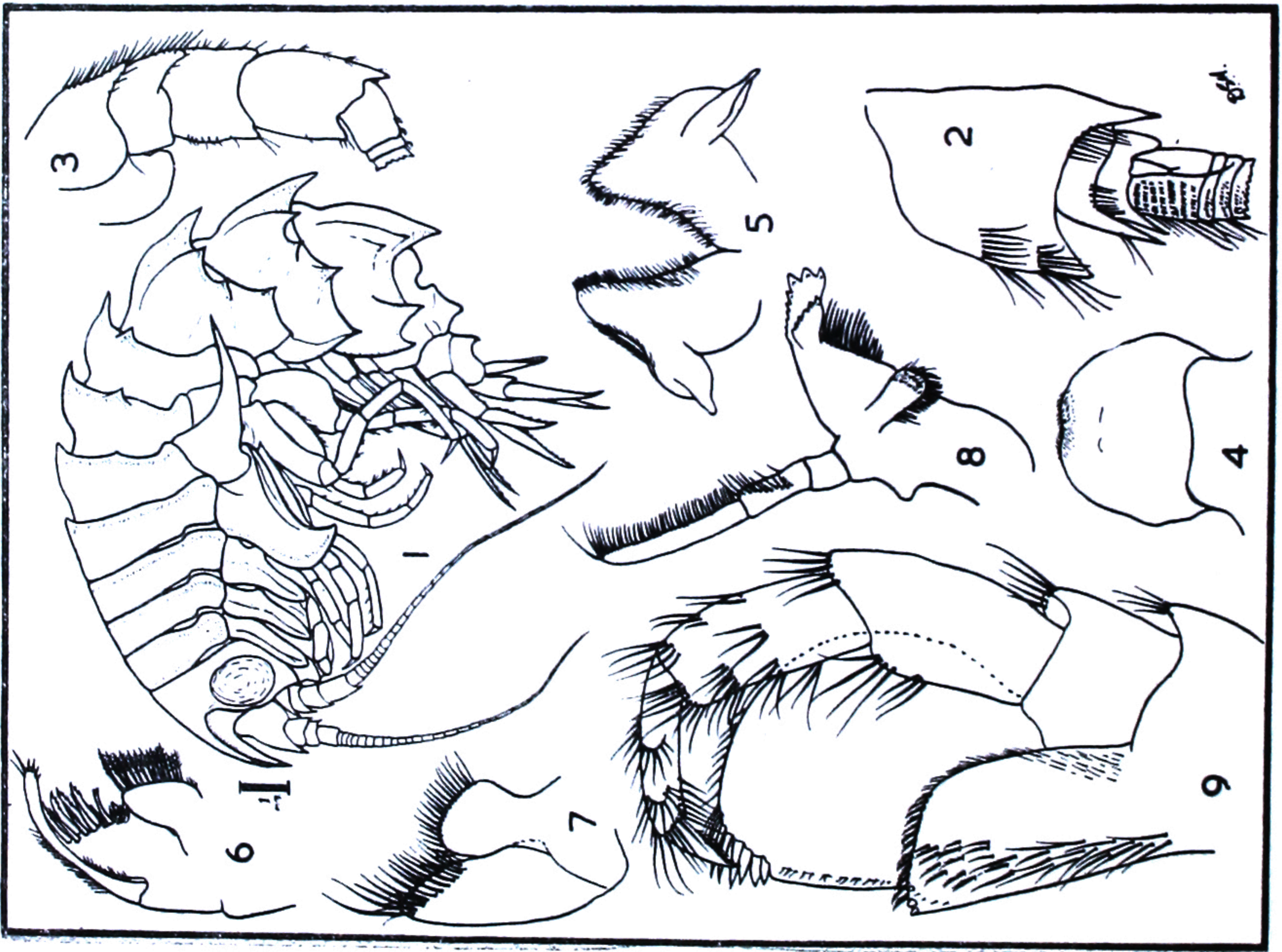
Stebbing, 1906: 321.

Gurjanova 1955: 190–191, 194–198 (key to species).

"Head has well-developed rostrum, mandibles have stout cylindrical molar process with a grinding surface, dentate cutting edge, movable cutting plate, and well developed spine row of spine-like bristles (up to 10 and more). Mandibular palp of 3 segments, end segment stout, often equal in length to 2nd segment. Lower lip without any trace of inner plates. Maxilla 1 has normal 2-segmented palp; inner plate has numerous (more than 10) plumose bristles. Maxilla 2 has more or less equal, short, broad plates; inner without any transverse series of bristles. Maxilliped plates well developed, outer broad and usually



Epimeria victoria n.sp. Male.
 FIG. 10.—Gnathopod 1. FIG. 11.—Gnathopod 2, sideplate. FIG. 12.—Gnathopod 2, propod and dactylos. FIG. 13.—Peraeopod 1. FIG. 14.—Peraeopod 2. FIG. 15.—Peraeopod 3. FIG. 16.—Peraeopod 4. FIG. 17.—Peraeopod 5. FIG. 18.—Epimeral plate 1. FIG. 19.—Epimeral plate 2. FIG. 20.—Epimeral plate 3. FIG. 21.—Uropod 1. FIG. 22.—Uropod 2. FIG. 23.—Uropod 3. FIG. 24.—Telson.



Epimeria victoria n.sp. Male.
 FIG. 1.—Adult male. FIG. 2.—Antenna 1. FIG. 3.—Antenna 2. FIG. 4.—Upper lip. FIG. 5.—Lower lip. FIG. 6.—Maxilla 1. FIG. 7.—Maxilla 2. FIG. 8.—Mandible. FIG. 9.—Maxilliped.

reaching end of palp 2nd joint; inner narrower but almost as long as outer; palp of 4 segments, with well-developed dactylos.

Basal segment of pereopods 3-5 specialised, retaining traces of the wing-like expansion and furnished with a longitudinal keel and with "channels", the latter the result of an adaptation for the protection of the gill cavity, of the young, and of the weakly protected abdominal wall of the body when the animal curls up. As Barnard points out (Barnard 1932, *Discovery Repts*, V. 171), when this curling occurs, the anterior keel of the one basal segment fits into the "channel" of the basal segment of the preceding limb, in the 3rd and 4th pair; but on the basal segment of pr. 5, a lobe is often formed which in the curled position covers the gap between the pleural plates of the anterior abdominal segments. The 5th pereopods are shorter than the 3rd and 4th pairs.

Gnathopods, both pairs weakly developed, slight and short, alike in structure, narrowly subchelate with a short transverse palm and short claw; 5th segment as long as 6th or a little longer.

Telson flat, entire, with a small notch on end margin. Sideplates 1-3 usually sharply narrowed distally and tapering; 4th and 5th plates often form curved pointed expansions which together form an arch along the lower margin of the thoracic region.

Body usually keeled and spined.

First antenna usually shorter than 2nd, no accessory flagellum, or at most a very small one.

Uropod rami lanceolate; 3rd uropods with short peduncle and long broadly lanceolate rami."

—Gurjanova, 1955.

Epimeria victoria n.sp. (Figs. 1-24).

A strongly carinate and spinose amphipod of reasonably large size (up to 20 mm) with quite long antennae and rostrum, large bulging opaque eyes, and long spine-like process on sideplate of 5th segment (pr. 3).

Orange-red pigment spots on body in preservative, especially on posterior margins of segments. Length (rostrum to telson) 20 mm; depth 4 mm; width 4 mm. Eyes almost as wide as head, $\frac{1}{2}$ its depth. Rostrum reaches end of antenna 1 peduncle. Pr. 3 spine reaches past pr. 5 sideplate. Thoracic segment 4 has a small dorsal spine, the following 6 segments have longer dorsal spines; segments from thoracic 5 to abdominal 3 have one upper lateral spine each; abdominal segments 1-3 have, including posterodistal angles of epimeral plates, 4 lateral spines each side.

ANTENNAE. *First:* Flagellum much longer than peduncle; 40 or more segments, proximally short and wide, distally long and slender; 1st as long as last peduncle segment; 1st 16 have crescentic areas of closely-set flaccid setae inferiorly, 1-2 long spines each side of areas; rest have short distal row of very short setae, a stout short spine on every 2nd or 3rd segment. Peduncle, 1st segment about 3 times length 2nd plus 3rd, produced inferiorly and superiorly in sharp projections almost as far as flagellum, long fine spines inferiorly and distally. 2nd and 3rd narrower, inferior angles sharply produced, long fine spines distally; 3rd has short one-segmented accessory flagellum, about $\frac{1}{3}$ length 1st flagellar segment, long end spine. *Second:* Flagellum of 45 or more segments, minute setae on superodistal angles; peduncle 4th and 5th segments subequal, 2nd and 3rd shorter; 2nd has small squarish forwardly projecting lobe inferiorly; segments sharply produced superodistally; 2nd and 3rd have long fine spines superiorly and distally.

MOUTHPARTS. *Upper lip:* Distally barely emarginate, slightly setose. *Lower lip:* Inner plates absent. *Mandible:* Spine row of 20 or so fine-combed spines; molar process a somewhat plate-like setose lobe arising at palp level; palp of 3 segments, 1st $\frac{1}{2}$ length 2nd, 2nd $\frac{1}{2}$ 3rd; strong rows of spine-setae on inner margins of 2nd and 3rd, surface of 3rd very minutely spinose. *Maxilla 1:* Palp of 2 segments, 2nd very long, over-reaches end spines of outer plate, about 4 short end spines; outer plate short, wide, 11 long fine antler-like end spines, many short bristle-spines; inner plate shorter, 14 plumose setae. *Maxilla 2:* Inner plate slightly the shorter and wider; distal margins of both strongly armed with finely pectinate and setose spines. *Maxilliped:* Inner plate reaches end of palp merus; outer reaches end of carpus, both have outer angle rounded; inner strongly spine-setose down cleft, 4-5 short spines on end margin near sharp inner angle, about 15 short setose spines along end margin, bristles down outer. Outer plate has small spine-setae along inner margin, 5-6 stout teeth at inner angle grading off into long fine spines around end margin. Palp segments have outer distal angles spine-setose; merus and carpus subequal, carpus narrower, propod slightly shorter and considerably narrower; ischium inner margin spine-setose; merus has 2 groups of 3-4 long spine-setae; carpus has group $\frac{2}{3}$ along outer margin, 5-6 groups on inner margin, some extending in rows well across surface; propod margins and surface strongly spine-setose; dactylos short, stout, triangular, inner margin has about 9 fine teeth; ends in short nail-spine.

GNATHOPODS. *First:* Subchelate, sideplate distally rounded, width $\frac{1}{4}$ length; 10-11 spines along posterior margin. Basos as long, almost as wide, narrower proximally, margins

have long setae. Ischium small, $\frac{1}{6}$ basos length, $\frac{2}{3}$ merus length, has 2–3 spine-setae posterodistally. Merus subrectangular, narrow, several long spine-setae posterodistally. Carpus subrectangular, $\frac{2}{3}$ basos length, width not $\frac{1}{2}$ length; posterior margin has 6 rows of spine-setae, 3–4 rows on anterior surface. Propod almost as wide, $\frac{1}{2}$ basos length, surface and posterior margin have numerous short rows of spine-setae; short palm minutely pectinate; dactylos longer than palm, strong, has about 8 teeth on inner margin, stout end spine. *Second*: Sideplate somewhat irregular, posterior margin more strongly spined. Basos posterior margin has 3 groups of long setae, anterior a few spine-setae. Otherwise like Gn. 1.

PERAEOPODS. *First*: Sideplate, basos and ischium rather like Gn. 2; merus $\frac{2}{3}$ basos length, narrower; small spines on margins and posterior surface; carpus similar, $\frac{3}{4}$ merus length; propod slightly narrower, as long as merus, has strong spines posteriorly like carpus; dactylos strong, naked. *Second*: Shorter, similar except for sideplate which has sinuous anterior margin, distally rounded to ventral; posterodistal angle sharp, posterior margin distally concave, widening proximally to thumb-like spur; excavate inside spur. *Third*: Sideplate shallow, anteriorly convex, posteriorly produced in long acute spur past 7th thoracic segment. Basos narrow-ovate, width $\frac{2}{5}$ length; anterior margin has long setae proximally, posterior fringed with fine plumose spine-setae; has distinct median carina. Ischium short, posterodistally a little produced in rounded lobe. Merus and carpus subequal, $\frac{1}{2}$ basos length, narrow, spines on margins and surface; propod slightly longer, dactylos has strong end spine. *Fourth*: Sideplate ovate-rectangular, deeper than wide, posterodistally rounded, has also keel produced posterodistally in sharp angle. *Fifth*: Sideplate small, heart-shaped. Otherwise generally like Pr. 3–4, except basos which is widened, width $\frac{2}{3}$ length, posteriorly convex except for concave excavation distally to sharp posterodistal angle which is produced down past ischium; very short median keel; margins except anteroproximally free from setae, but numerous long setae and spine-setae on surface.

EPIMERAL PLATES. Basically subrectangular, 1st and 3rd wider than deep, 2nd deeper than wide, posterodistal angles more or less acute, a strong tooth medially along concave posterior margins, setae and spine-setae anteriorly and ventrally.

UROPODS. *First*: Rami and peduncle subequal, lanceolate, margins strongly spined. *Second*: Rami about $\frac{1}{2}$ as long again as peduncle. *Third*: Rami about 3 times peduncle length. *Telson*: Ovate-triangular, a few minute marginal spines; distally notched, a small triangular process in midline near base.

MATERIAL EXAMINED: Station BOL (VUZ. 48), 14 spp., 13–17 mm (includes 3 ovigerous females); Station BOL (VUZ. 49), 11 spp., 13–17 mm.

TYPES: Slides Oc. 1, (VUZ. 48).

DISTRIBUTION: Cook Strait.

DISCUSSION: This species is distinguished from other known species of *Epimeria*, as listed in Gurjanova (1955), by the number and extent of the lateral spines on the thoracic and abdominal segments.

Species of *Epimeria* are normally taken in depths of 400 metres and more.

Family GAMMARIDAE

Melita festiva? (Chilton, 1885).

Moera festiva Chilton, 1885: 1037, pl. 46, fig. 2.

Melita festiva Chilton, 1916: 359–362, figs. 1–2.

Hurley, 1954: 602.

MATERIAL EXAMINED: Station CUF (VUZ. 19), 1 male, 8 mm.

DISTRIBUTION: Auckland Harbour; Cook Strait, N.Z.; ? Sydney Harbour, Australia.

DISCUSSION: I have previously commented (Hurley, 1954) on the obvious confusion of two New Zealand species under *Ceradocus rubromaculatus*. Dr. K. Sheard (personal communication) tells me he is quite certain that Chilton's *M. festiva* (Australia, 1885) and *M. festiva* (New Zealand, 1916) belong in *Melita*, and that Stephensen's inclusion of these in *C. rubromaculatus* is in error. "The Australian species is quite common in Sydney Harbour and Chilton has figured the rami of Uropod III of the New Zealand one quite well—it conforms to that from Australia."

This specimen agrees with Chilton's (1916) in the pleon and generally in other features although gnathopod 2 is not as long proportionately as in his fig. 1, and is considerably more toothed in the palm. Uropod 3 is missing in this specimen which makes specific identification a little less positive than could have been desired. Since the New Zealand specimens have not been finally confirmed as identical with the Australian type material—although indications are that the two are identical—I have left this as *M. festiva*?

It is possible that the second gnathopod palm is subject to variations like those indicated by Sheard (1939) for the *Ceradocus* (*Denticeradocus*) complex.

Family PHOTIDAE

Eurystheus thomsoni? (Stebbing), 1888.

Gammaropsis thomsoni Stebbing, 1888: 1103–1107, pl. CXV.

Eurystheus thomsoni, Stebbing, 1906: 613–614.

MATERIAL EXAMINED: Station GUL (VUZ. 54), 29 females and juveniles, up to 4½ mm, mostly very small, some ovigerous; 1 male.

DISTRIBUTION: Cook Strait; Challenger Stn. 168, "off New Zealand, July 8, 1874; lat. 40°28'S.; long. 177°43'E.; depth 1,100 fathoms; bottom blue mud; bottom temperature 37.2°".

DISCUSSION: This species is identified with considerable doubt. The females are reasonably like that described by Stebbing, but the male has 3 spines, 1 dorsal and 2 lateral. These specimens are obviously distinct from the other *Eurystheus* taken at the same station, and the differences are emphasised by the complete leaching out of the pigment of the eyes in this species.

Eurystheus sp.

MATERIAL EXAMINED: Station GUL (VUZ. 54), 36 females and juveniles, 1–4 mm, some ovigerous.

DISCUSSION: It is difficult to identify these with any of the several poorly described species from New Zealand since most of the descriptions depend on the male for good characteristic features, and males are lacking from this collection.

Family PODOCERIDAE

Podocerus cristatus (G. M. Thomson), 1879.

Cyrtophium cristatum Thomson, 1879: 331–332, pl. XVI, figs. 9–15.

Thomson, 1881: 219–220, fig. 8.

Podocerus cristatus, Chilton, 1926: 513–515, fig. 2.

MATERIAL EXAMINED: Station GUL (VUZ. 54), 4 specimens, 2–5 mm, one at 5 mm a female with developed broodplates.

DISTRIBUTION: Cook Strait; Otago Harbour.

DISCUSSION: The second gnathopod is slightly shorter and stouter than that shown by Stebbing but this may be a normal sexual difference. Chilton mentions specimens from Cook Strait. "The New Zealand species (of *Podocerus*) are common on the coast, frequently being found at the roots of seaweed, on the sea-squirt *Boltenia*. . . . Other specimens were . . . taken on sertularians". I can confirm that this species is commonly found in similar habitats in Otago Harbour.

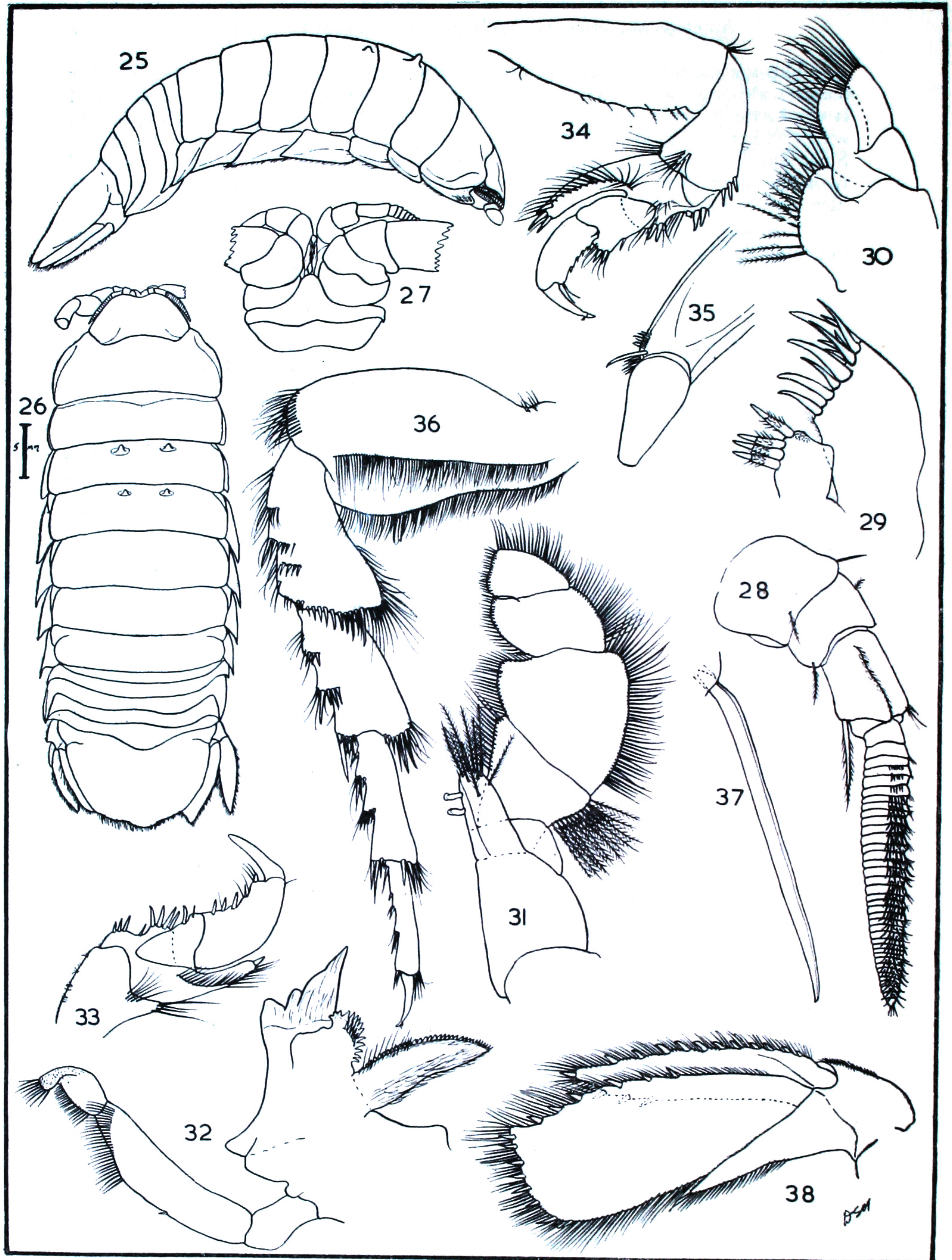
S.O. HYPERIIDEA

Family PHRONIMIDAE

Phronima sedentaria (Forsk.), 1775.

Phronima sedentaria Hurley, 1955: 166–170, figs. 188–218.

MATERIAL EXAMINED: Station COS (VUZ. 22), 1 female, 28 mm, with "salp-house". Station BOQ (VUZ. 18), 1 female, 20 mm.



Cirolana quadripustulata n.sp. Male.

FIG. 25.—Adult male, side view. FIG. 26.—Adult male, dorsal view. FIG. 27.—Ventral surface of head showing frontal lamina. FIG. 28.—Antenna 1. FIG. 29.—Maxilla 1. FIG. 30.—Maxilla 2. FIG. 31.—Maxilliped. FIG. 32.—Mandible. FIG. 33.—Peraeopod 1. FIG. 34.—Peraeopod 2. FIG. 35.—Peraeopod 2, dactylos. FIG. 36.—Peraeopod 7. FIG. 37.—Male stylet. FIG. 38.—Uropod.

DISTRIBUTION: Cosmopolitan (cf. Hurley, 1955).

DISCUSSION: This is the common species of *Phronima* found around New Zealand. Almost all of the references in the New Zealand literature to this species are under the name *Phronima novae-zealandiae*.

Order ISOPODA
S.O. FLABELLIFERA
Family EURYDICIDAE

***Cirolana quadripustulata* n.sp.** (Figs. 25–38).

Diagnosis: Very large, 40–60 mm. Frontal lamina long, thin; maxilla 1 has 4 spines on inner plate; antenna 1 almost reaches 1st thoracic segment; antenna 2 reaches 5th. Eyes long, subrectangular. Peraeopod 7, 2nd segment broad, setose; abdominal segment 3 strongly produced laterally to cover 4th and 5th and reaching base of uropod. Male, thoracic segments 3 and 4 have each 2 small tubercles dorsally, those on 3rd segment prominent, those on 4th less distinct. Penial processes are indistinct tubercles; appendix masculina long, slender, barely curved at tip.

Body: Head width more than twice length, anterior margin somewhat concave. Eyes of 10–11 rows of ocelli from 2nd antenna peduncle back to posterior margin of head, cover most of side of head which is separated from dorsal surface by slight ridge. Body segments of more or less equal width, 1st and 4th longest; coxal plates distinct, ventrally setose, last 4 with slightly produced acute posterodistal angles, 7th reaches back to partly cover lateral surface of 2nd abdominal segment. 3rd and 4th abdominal segments laterally produced back to base of uropod. Telson distally rounded, setose, has 7 spines along distal margin.

ANTENNAE. *First:* Short, as long as eye and lying along it; flagellum of 38–40 short wide segments, each has row of long flaccid sensory setae, forming tract along entire flagellum. Peduncle 1st segment not quite twice length 2nd; 2nd about $\frac{3}{4}$ 3rd; each has 1–2 plumose setae on margins, an especially long one on inner distal angle of 3rd; 3rd has bristled flange lengthwise down surface. *Second:* Flagellum longer than peduncle, of more than 50 segments. Peduncle, 2nd segment about $\frac{1}{2}$ length 3rd, 3rd and 4th subequal, $\frac{1}{2}$ length 5th.

MOUTHPARTS. Maxilliped has 2 coupling spines.

PERAEOPODS. *First:* 4th and 5th segments posteriorly subequal but overlapping each other; 4th has about 4 spines distally on posterior margin, 3 on protuberance $\frac{1}{2}$ along; posterodistally produced in setose-margined thumb about $\frac{1}{3}$ along 6th segment, stout end spine on thumb. 5th has spine, seta, along posterior margin. Segment 6 has posterior margin as long as 5th, anterior twice as long, has 5 spines and setae. Dactylos long, tapering. *Second:* Generally similar, 3rd segment has 3 strong spines on posterodistal angle; 4th has 3 strong spines on anterodistal thumb which reaches $\frac{1}{2}$ along segment 6; 5th has spine medially, 2 distally on posterior margin, is more distinct from segment 4 than in Gn. 1. Segment 6 slightly longer than 5, has 4–5 short spines on posterior margin. Dactylos has group of small spines near small end boss. *Seventh:* 2nd segment broad, especially distally where width $\frac{1}{2}$ length; strongly setose on rounded anterodistal angle, all along posterior margin, also right along median surface flange. 3rd segment $\frac{2}{3}$ 2nd, triangular, anteriorly spinose and setae, posteriorly setose, distally spinose. 4th and 5th subequal, slightly shorter than 3rd; 4th–6th segments have 3–4 groups of spines and setae on anterior margin, spines and setae on posterodistal angle, rest of posterior margin naked; 6th slightly shorter than 5th.

PLEOPODS. Male stylet on 2nd reaches about $\frac{2}{3}$ down endopod.

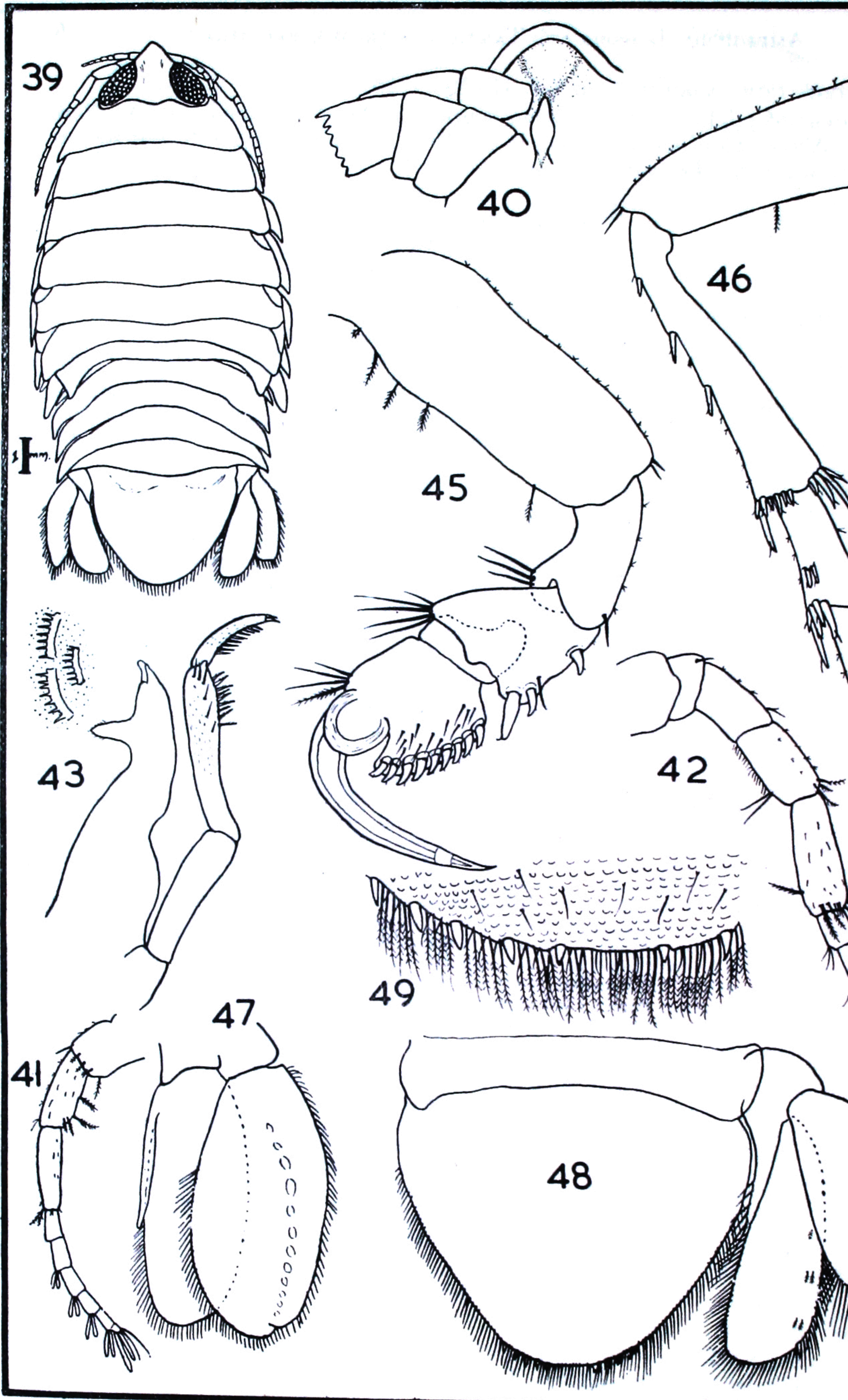
UROPODS. Long acute peduncle process reaches $\frac{1}{2}$ down endopod, has setose outer margin. Exopod slender, width about $\frac{1}{4}$ length, about 11 spines down outer margin, 3 on inner, 1 on distally narrowed tip, margins setose; exopod reaches about $\frac{2}{3}$ down wide subrectangular endopod which has 6 spines on outer margin, outer distal angle distinct, inner rounded, distal margin has 8 spines, all margins setose. Distal width about $\frac{1}{3}$ length.

MATERIAL EXAMINED: Station COS (VUZ. 22), 2 males, 52–58 mm; Station BOP (VUZ. 41), 9 females, 42–48 mm; "Thomas Carrol", 4/4/53, Palliser Bay, 40 fathoms, 1 male, 60 mm.

TYPES: Slides Oc. 7 (VUZ. 22, male).

DISTRIBUTION: Cook Strait, N.Z.

DISCUSSION: Despite the large size of this species and the great number of species of *Cirolana* already known, I cannot identify these specimens with any previously described species. The prominent tubercles on the back of the male, and the strong backward prolongation of the 3rd abdominal segment are especially characteristic.



Rocinela garricki n.sp. Male.

FIG. 39.—Adult male. FIG. 40.—Ventral surface of head showing frontal lamina. FIG. 41. 42.—Antenna 2. FIG. 43.—Mandible and detail from palp surface. FIG. 44.—Maxilliped. F 1. FIG. 46.—Peraeopod 7. FIG. 48.—Pleotelson and uropod. FIG. 49.—Portion of pleotelson surface.

The males from Station COS are noteworthy for the presence of developing gasteropod eggs on the ventral surface of the body between the legs. This is to my knowledge the first record of this unusual association. There is no evidence to indicate whether this develops into a commensal or parasitic relationship when the gasteropod is fully grown or not.

Cirolana pellucida Tattersall, 1921.

Cirolana pellucida Tattersall, 1921: 206-207, pl. II, figs. 4-10.

MATERIAL EXAMINED: Station KIIB (VUZ. 3), 'Regina, Stephens Island, 541217A', 4 females, 6-17 mm; Station GIIB (VUZ. 6), 1 female, 17 mm; Station CUF (VUZ. 19), 1 male, 8 mm, 1 female, 7 mm.

DISTRIBUTION: Cook Strait; Terra Nova Stations 86, 129, 130 "off Three Kings Islands, plankton, from the surface and 3 metres"; Terra Nova Station 133, Spirits Bay, near N. Cape, N.Z., plankton, at 20 metres.

DISCUSSION: Tattersall has remarked on the thin pellicle of this species, evident here in specimens from Station KIIB and CUF. Those from Station KIIB have a harder exoskeleton. The eyes show some variation; the KIIB specimens have a large subrectangular eye along most of the head; the GIIB specimen has one eye like this, the other superficially smaller and rounder like the CUF specimens. This is almost certainly due to leaching out of pigment. The CUF male has a somewhat blunter penis than that figured by Tattersall for his specimens; the GIIB specimen has small brownish-red pigment spots still visible over the body.

Family AEGIDAE

Rocinela garricki n.sp. (Figs. 39-49).

DIAGNOSIS: Frontal margin of head triangular, subacute; frontal lamina longer than wide. Peraeopod 1, 3rd segment lacks spines; 5th has 3 strong spines, 6th has 9 closely-set spines on posterior margin. Last 4 peraeopods notably different from 1st 3.

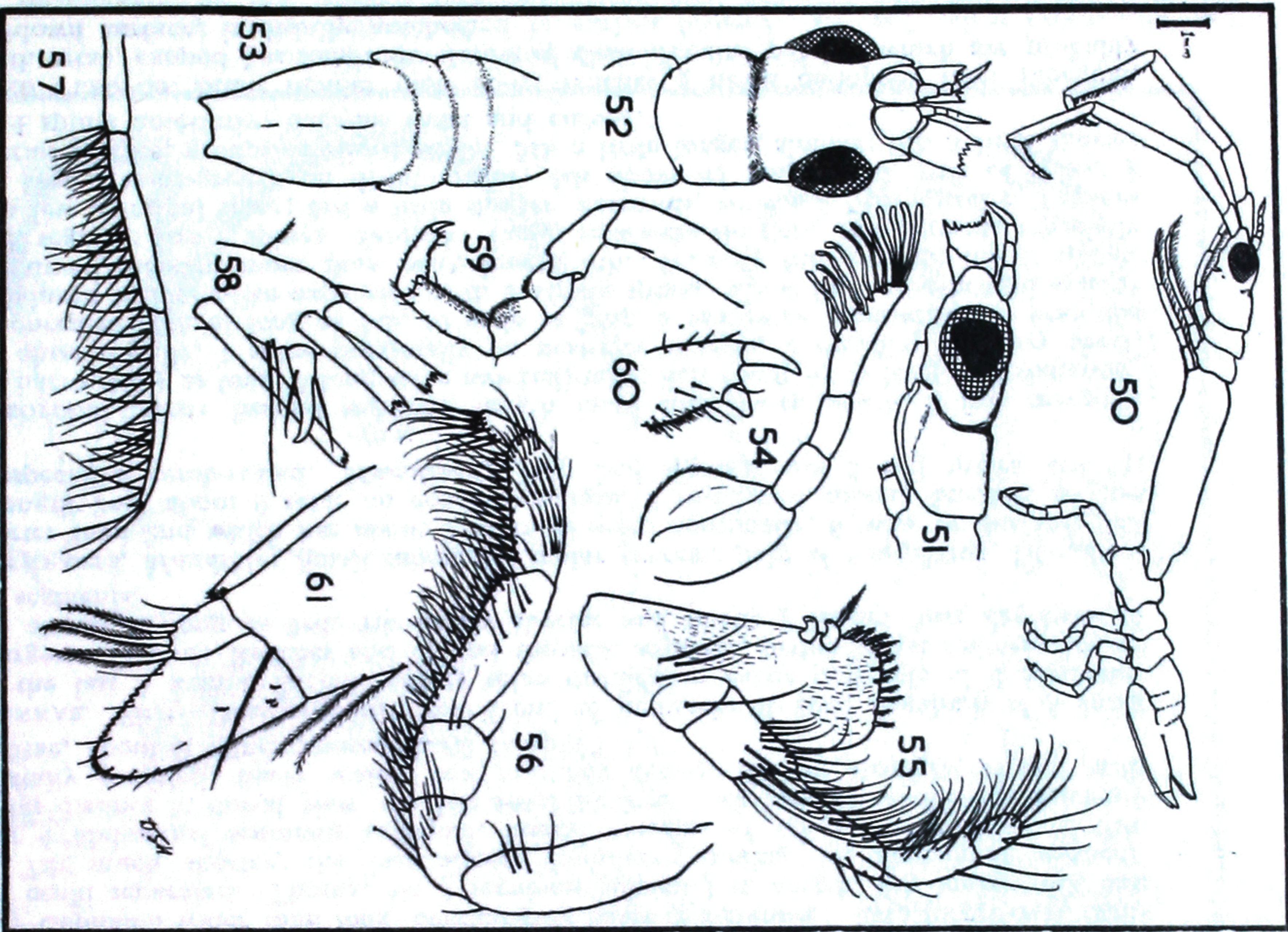
BODY: Cephalon wider than long, overhanging bases of antennae. Eyes large, oval, well-separated, ocelli separated. Thorax, 1st 3 segments subequal in length, 4th longer, 6th and especially 7th much shorter, the last almost completely hiding 1st abdominal segment. Remaining 4 abdominal segments subequal, lateral margins of 4th covering those of 5th. Coxal plates distinct in dorsal view, the last reaching well back past 1st abdominal segment. Telson distally rounded, finely scaled and minutely setose, margin strongly fringed with plumose setae, about 9 spines around distal margin.

ANTENNAE. *First:* Does not quite reach end of peduncle of 2nd; flagellum of 6 small segments, the last 5 with 2 flaccid sensory setae distally on each; peduncle of 3 segments, 3rd the largest. *Second:* Reaches end of 2nd thoracic segment, peduncle 1st segment longer than 2nd, almost as long as 3rd, 4th barely shorter and about $\frac{3}{4}$ length 5th; flagellum of about 11 segments.

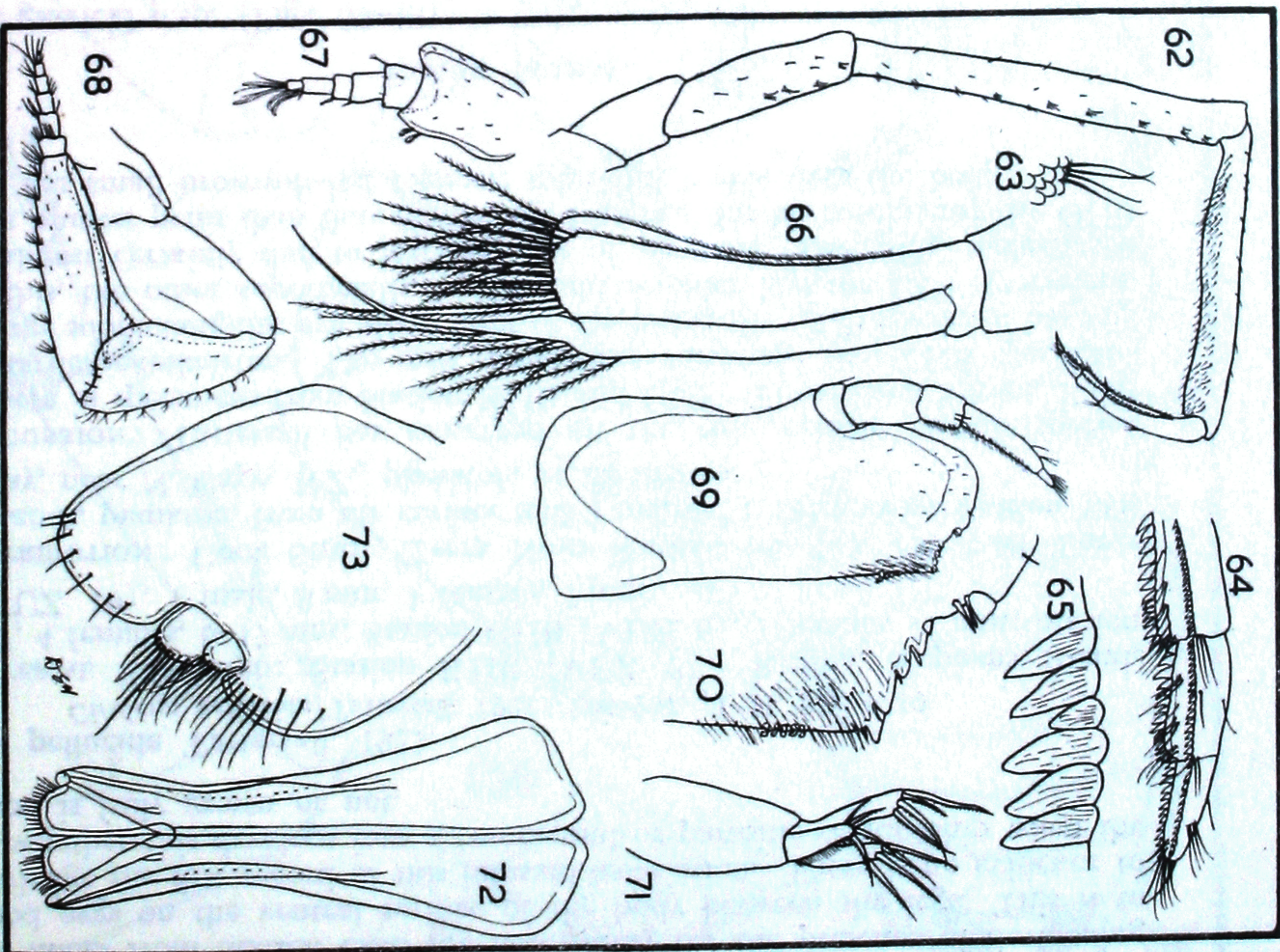
MOUTHPARTS. *Mandible:* Small tubercular molar process; palp of 3 segments, 1st naked, barely shorter than 2nd which has about 9 plumose setae marginally, 6 setae on surface; 3rd about $\frac{1}{2}$ length 2nd, about 9 setae on concave margin, 2 small end spines. Surface, of 2nd segment especially, comb-scaled. *Maxilliped:* Palp 2nd segment has 3 end spines, one on surface.

PERAEOPODS. *First:* Second segment, length more than twice width, a few marginal setae; 3rd narrower, $\frac{1}{2}$ as long, 3 long setae anterodistally; 4th about $\frac{2}{3}$ as long, subtriangular, 5-6 setae anterodistally, 1 spine proximally on posterior margin, 2 distally; 5th very short, partially concealed; 6th as long as 4th, as wide as long, a few setae anterodistally; posterior margin produced in blade-like expansion with 9 strong spines, a few fine setae behind spines; 7th long, curved, slender, more than twice length 6th. *Second:* 6th segment has 8 spines. *Third:* 6th segment has 7 spines. *Seventh:* Long, relatively slender; 2nd segment especially long, has a few marginal setae; 3rd a little shorter, narrower, widens a little distally, 3 spines anteriorly, strong spine-groups on distal angles; 4th about $\frac{2}{5}$ length 3rd, pair of spines $\frac{1}{2}$ along anterior surface, groups on distal angles, 5th a little longer, similar; 6th a little shorter than 5th, 4 spines anteriorly; dactylos short and curved.

SECOND PLEOPOD. Blunt slender male stylet reaches $\frac{1}{2}$ down endopod; rami subequal, fringed with setae, exopod has longitudinal row of clear circular patches which are probably glandular down surface, is distally notched.



Astacilla levis Thomson & Anderton. Male.
 Fig. 50.—Adult male. Fig. 51.—Head and 1st thoracic segment, side view. Fig. 52.—Head and 1st thoracic segment, dorsal view.
 Fig. 53.—Pleotelson, dorsal view. Fig. 54.—Antenna 1. Fig. 55.—Maxilliped. Fig. 56.—Pereopod 1. Fig. 57.—Pereopod 2. Fig. 58.—Pereopod 3, dactylos. Fig. 59.—Pereopod 4. Fig. 60.—Pereopod 5, dactylos. Fig. 61.—Uropod.



Astacilla levis Thomson & Anderton. Male.
 Fig. 62.—Antenna 2. Fig. 63.—Antenna 2, detail of scales and setae. Fig. 64.—Antenna 2, flagellum. Fig. 65.—Antenna 2, flagellum, detail of margin. Fig. 66.—Pleopod 2 and male stylet.
Jaeropsis palliseri n.sp. Male.
 Fig. 67.—Antenna 1. Fig. 68.—Antenna 2. Fig. 69.—Maxilliped. Fig. 70.—Maxilliped, endite detail. Fig. 71.—Maxilla 2. Fig. 72.—Pleopod 1. Fig. 73.—Uropod.

UROPOD. Rami ovate, endopod slightly the longer, the more rounded distally; margins strongly setose; 7 spines on outer margin of exopod, about 3 distally on outer margin of endopod. Peduncle inner process reaches $\frac{1}{2}$ down endopod.

MATERIAL EXAMINED: Station BOL (VUZ. 43), 1 male, 15.5 mm.

TYPES: Slides Oc. 5.

DISTRIBUTION: Cook Strait.

DISCUSSION: In general, this species is very close to *R. orientalis* (cf. Hale, 1925; Stebbing, 1905). It is distinguished from this and all other species of the genus by the 9 spines on segment 6 of pereopod 1. *R. latis* (Southwell, 1915) has 8 spines but is stated to have "the four gressorial legs . . . very similar to the 1st 3 pairs of legs but a little more slender". The species is named for Mr. J. A. Garrick who has been responsible for much of the collecting.

Family SPHAEROMIDAE

Sub-family *Sphaerominae* - *Sphaerominae* *Platybranchiatae*

Cassidina typha M. Edwards, 1840.

Cassidina typha M. Edwards, 1840: 224, pl. 32, figs. 10-16.

Tattersall, 1921: 226-227.

Cassidina neo-zealanica G. M. Thomson, 1889: 264, pl. 14, figs. 1-4.

MATERIAL EXAMINED: Station BOL (VUZ. 43), 8 specimens; Station BOK (VUZ. 44), 2 males, 10 mm, 6 females, 6-9 mm; Station BOL (VUZ. 48), 1 male, 12 mm; Station BOL (VUZ. 49), 1 female, 8 mm, ovigerous; 2 males, 10-11 mm.

DISTRIBUTION: Cook Strait, Bay of Islands, Akaroa Harbour, Spirits Bay, Otago Harbour, Blueskin Bay.

DISCUSSION: This flattened plate-like species is common on sandy bottoms around New Zealand from 0-100 fathoms. Thomson refers to it being found frequently on seaweed. It is common amongst the debris taken in flatfish trawls off Otago Harbour.

Family SEROLIDAE

Serolis bromleyana, Suhm, 1874.

Serolis bromleyana Suhm, 1874: xix.

Beddard, 1884: pp. 53-57, pl. iv.

Sheppard, 1933: 329-330, 280.

MATERIAL EXAMINED: Station BOP (VUZ. 41), 2 males, 22-23 mm, 3 females, 22-26 mm; Station DOP (VUZ. 51), 1 male, 15 mm (incomplete), 3 females, 11-23 mm, one at 23 mm ovigerous; Station HUL (VUZ. 53), 6 females, 12-20 mm; Station GUL (VUZ. 54), 48 males, 15-28 mm, 15 ovigerous females, 23-28 mm, 17 juveniles, 7-15 mm; Station FOOR (VUZ. 58), 1 female, ovigerous, 34 mm.

DISTRIBUTION: Cook Strait; "off the east coast of New Zealand, in 1,100 and 700 fathoms, and close to the Antarctic Ice-Barrier in 1,975 fathoms".

DISCUSSION: These trilobite-looking animals are apparently common and perhaps even a dominant part of the bottom fauna in the deeper waters around New Zealand.

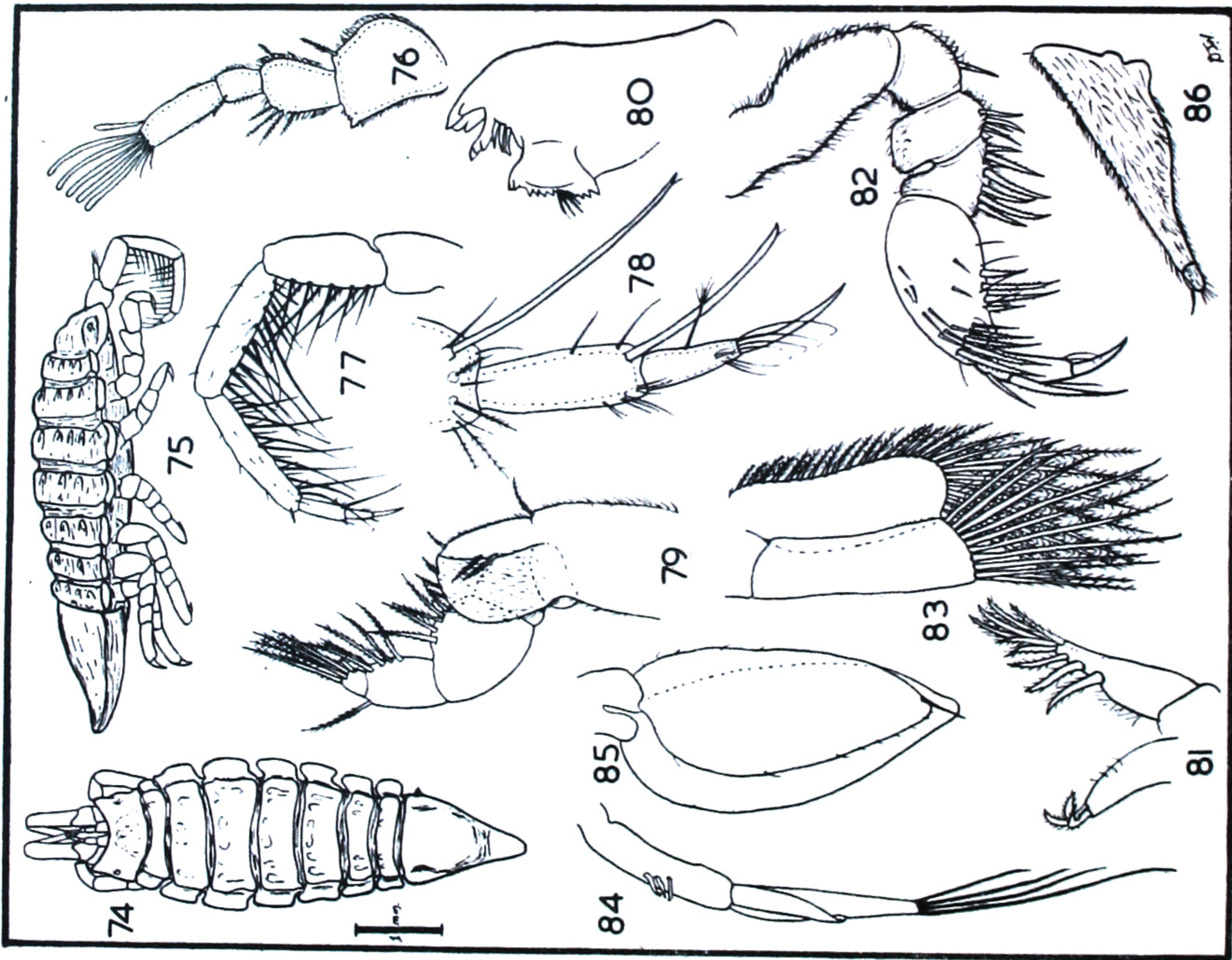
Sub-Order VALVIFERA

Family ARCTURIDAE

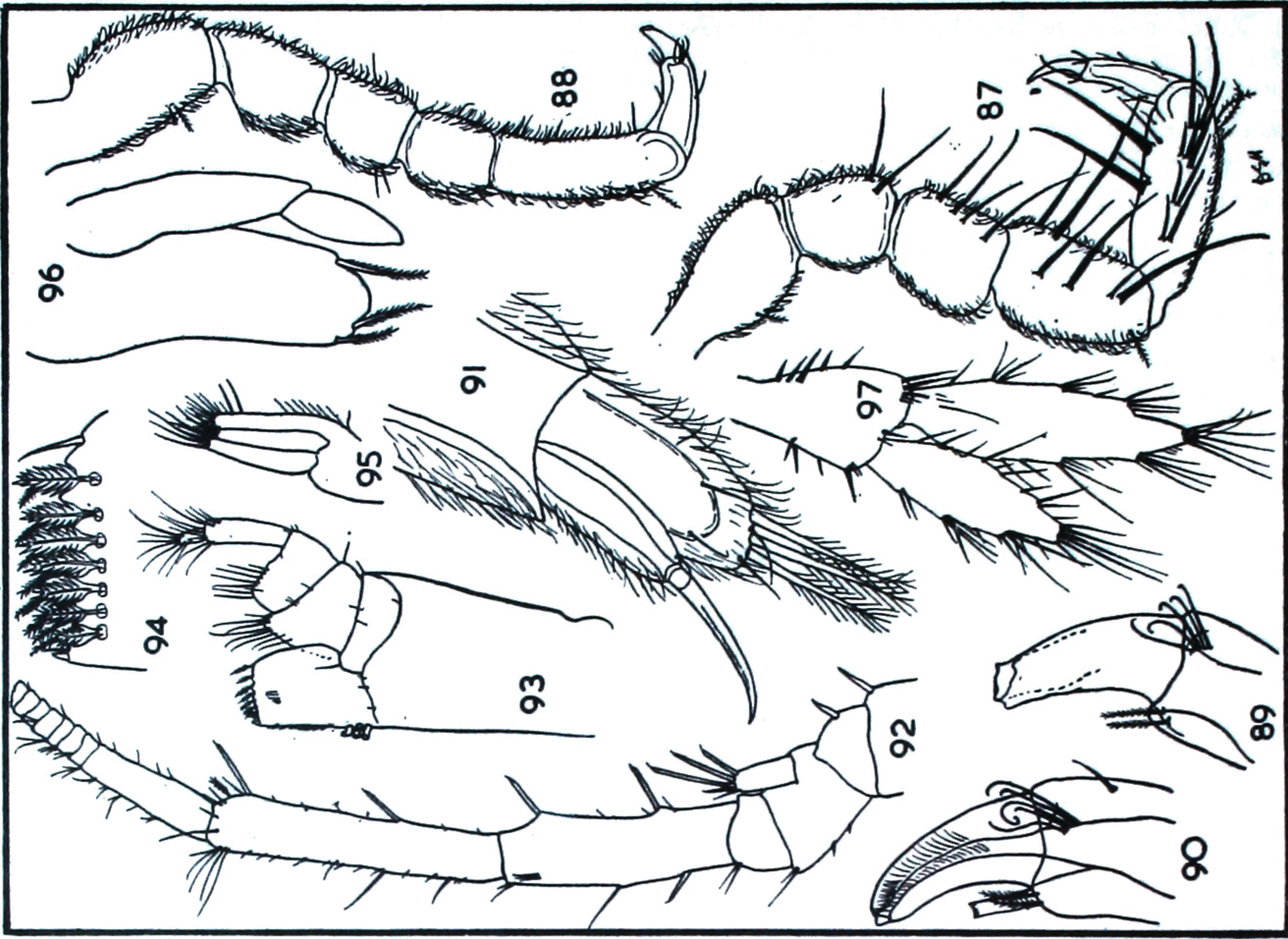
Astacilla levis Thomson & Anderton, 1921. (Figs. 50-66).

Astacilla sp. Thomson & Anderton, 1921: 114-115, text-fig.

BODY. Smooth and whitish; head anteriorly rounded, fused with 1st thoracic segment, segmentation indicated only by distinct groove with short incision at base of groove ventrally. Eyes black, large, subtriangular. Head and 1st 3 segments about $\frac{3}{4}$ length 4th thoracic segment, 2nd and 3rd segments subequal and each slightly shorter than 1st; 4th barely shorter than remaining thoracic and abdominal segments combined. Abdominal segments smooth, fused, segmentation indicated only by slight ventral incisions, shallow grooves, 1st especially faint. Pleotelson fused, defined only by shallow groove.



Pseudidothea richardsoni n.sp. Female.
 FIG. 74.—Adult female, dorsal view. FIG. 75.—Adult female, side view. FIG. 76.—Antenna 1. FIG. 77.—Antenna 2. FIG. 78.—Antenna 2, flagellum. FIG. 79.—Maxilliped. FIG. 80.—Mandible. FIG. 81.—Maxilla 1. FIG. 82.—Pleopod 1. FIG. 83.—Pleopod 2. FIG. 84.—Pleopod 3. FIG. 85.—Uropod. FIG. 86.—Uropod.



Pseudidothea richardsoni n.sp. Female.
 FIG. 87.—Pleopod 2. FIG. 88.—Pleopod 7. FIGS. 89-90.—Pleopod 7, left and right dactyli. FIG. 91.—Uropod. FIG. 92.—Antenna 1. FIG. 93.—Maxilliped. FIG. 94.—Maxilliped, detail of endite. FIG. 95.—Maxilla 2. FIG. 96.—Pleopod 3. FIG. 97.—Uropod.

ANTENNAE. *First*: Basal segment a little expanded, ovate. *Second*: Peduncle 2nd segment $\frac{3}{4}$ length 3rd; 3rd not $\frac{1}{2}$ length 4th; 5th $\frac{3}{4}$ 4th; 3-segmented flagellum not $\frac{2}{3}$ length 5th, has stout end nail; flagellar segments have double row of strong spine-teeth right along inferior surface. Peduncle segments have fine scattered setae on surface, scaled around bases of setae. Antennae as long as head and 1st 4 thoracic segments.

MOUTHPARTS. *Maxilliped*: Has 2 coupling spines.

PERAEPODS. *First*: Normal, claw absent. *Second-Fourth*: End segment has short but distinct terminal claw. *Fifth*: Dactylos has 2 end spines; inner margin has 4-5 small corrugations proximally.

PLEOPODS. Male stylet on 2nd longer than pleopod rami, its proximal $\frac{3}{5}$ relatively stout, distal $\frac{2}{5}$ tapering to long slender seta-like process.

UROPODS. Secondary ramus $\frac{1}{3}$ to $\frac{1}{2}$ length primary, much smaller, has 3 long plumose end setae, a smaller marginal seta.

MATERIAL EXAMINED: Station BOL (VUZ. 43), 1 male, 12.5 mm; Station BOL (VUZ. 49), 1 male, 11 mm (Slide Oc. 2), 1 female, 12 mm, ovigerous.

DISTRIBUTION: Cook Strait; "trawl in 17 fathoms, about 3 miles east-south-east of Otago Heads, on the 30th December, 1919" (G. M. Thomson).

DISCUSSION: Thomson and Anderton have briefly described and figured a species for which they suggest the name *Astacilla levis* might be used. I believe these specimens belong to their species, although they do not give a great deal of information. The species is easily distinguished from most other smooth-bodied *Astacilla* species, e.g. *falclandica*, *kerguelensis*, *macilenta*, *algensis*, *deducta*, *vicaria* and *magellanica*, with which it might otherwise be identified, by the three apical setae on the secondary ramus of the uropod.

Other New Zealand species are *falclandica* (Tattersall, 1921: 244), *fusiformis* (Hale, 1946: 185), and *tuberculata* (Thomson, 1879a: 416).

Family PSEUDIDOTHEIDAE

Ohlin, 1901: 274-276.

Nordenstam, 1933: 112-113.

"Besides the usual male appendix on the endopodite of the second pair of pleopods, also the first pair of pleopods is in the male transformed into a copulatory organ. Body elongate. Segments of pleon all coalesced. Antennulae small. Flagellum consisting of one joint. Antennae strong, half as long as body. Peduncle 4-jointed, 1st and 2nd joint being coalesced, with the suture visible only from below, flagellum 2-jointed. Palpus of maxillipeds 5-jointed. Second-seventh pairs of pereopods of nearly the same size and structure, with prehensile dactylus. First pair much the shorter, its propodus and dactylus strong and armed with stout, in part serrated spines. Uropods with two small lamellae."

—Ohlin.

Genus PSEUDIDOTHEA Ohlin, 1901.

Ohlin, 1901: 276.

Nordenstam, 1933: 113.

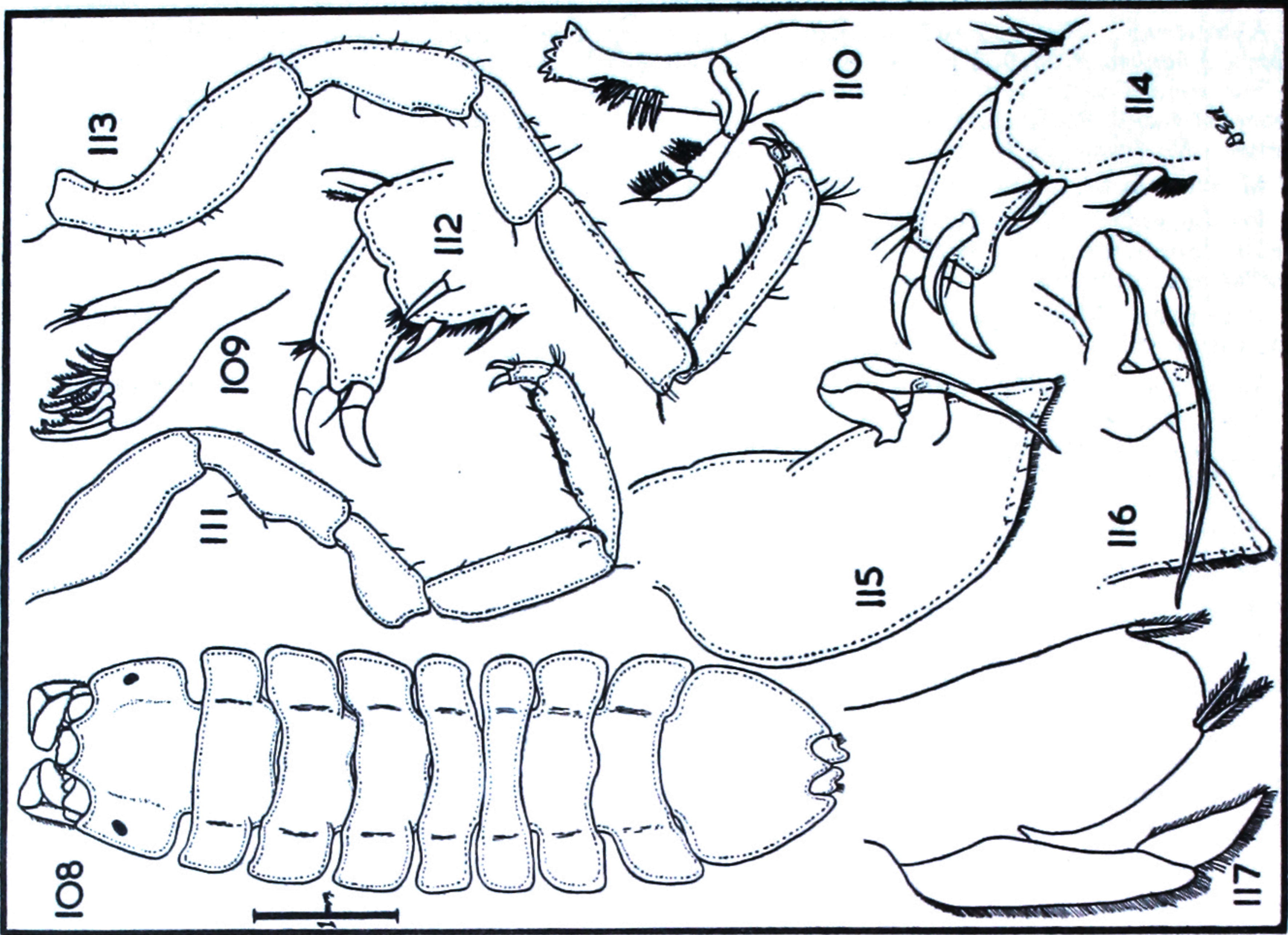
"Head fused with the first segment of the pereion, being separated from the latter only by a faint groove. Eyes small, situated laterally. Coxae developed as incomplete, not very distinct, rings around the proximal ends of the basipodites of the second to seventh pereopods. All segments of abdomen fused into one piece. Antennae with a two-jointed flagellum. Maxillipeds with a five-jointed palp. First pair of pereopods prehensile. Penis cleft distally. Second male pleopod with the exopodite transformed and traversed by a diagonal channel. Uropods with two branches, the 'secondary' branch being about three-fourths the length of the lateral one and provided with a single large seta at the tip."

—Nordenstam.

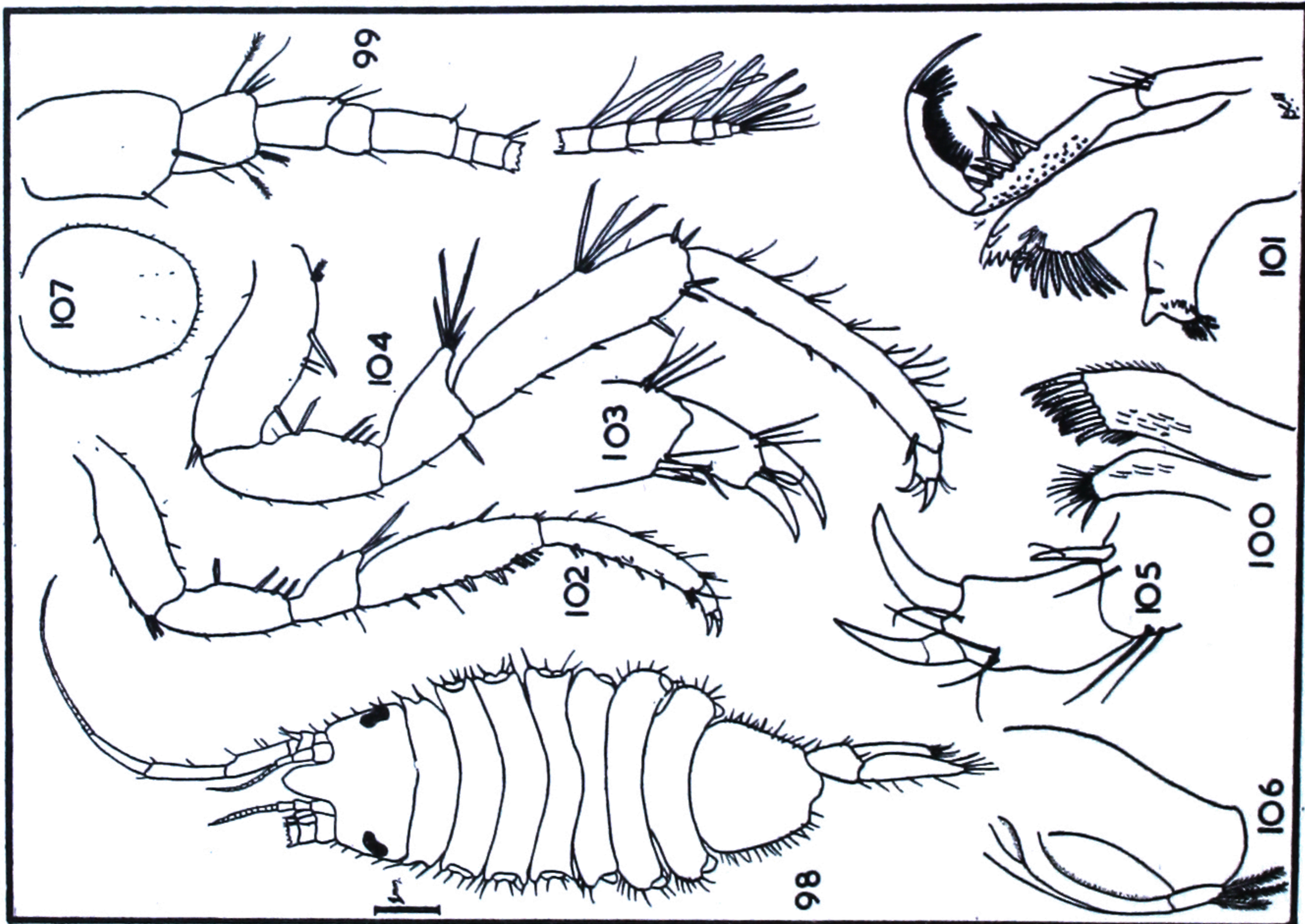
Pseudidothea richardsoni n.sp. (Figs. 74-91).

DIAGNOSIS: Antenna 2, last 3 segments of peduncle have inferior margin well supplied with long strong spine-setae; peraeopods, 2nd segments lack marginal tubercles; uropod, primary ramus has 3 plumose setae distally.

BODY. Cephalon anteriorly concave; anterolateral angles quite sharp but not greatly produced; body segments separated by quite deep grooves; sutures difficult to see especially with the rather "dirty" appearance of the animal, the finely setose body collecting a heavy



Jaeropsis palliseri n.sp. Male.
 Fig. 108.—Adult male. Fig. 109.—Maxilla 1. Fig. 110.—Mandible.
 Fig. 111.—Pereopod 1. Fig. 112.—Pereopod 1, dactylos. Fig. 113.—Pereopod 7. Fig. 114.—Pereopod 7, dactylos. Fig. 115.—Pleopod 2. Fig. 116.—Pleopod 2, detail. Fig. 117.—Pleopod 3.



Iathrippa longicauda (Chilton). Female.
 Fig. 98.—Adult female. Fig. 99.—Antenna 1. Fig. 100.—Maxilla 1.
 Fig. 101.—Mandible. Fig. 102.—Pereopod 1. Fig. 103.—Pereopod 1, dactylos. Fig. 104.—Pereopod 7. Fig. 105.—Pereopod 7, dactylos. Fig. 106.—Pleopod 2. Fig. 107.—Operculum.

fur of sediment; body segments mildly tuberculate, the tubercles really little more than suggested (and a little exaggerated in the figures). Limbs, pleon, and uropods quite setose and furred.

ANTENNAE. *First*: First segment subrectangular, almost as wide as long, almost as long as 2nd and 3rd combined; slightly longer than 4th which has end tuft of about 6 flaccid sensory setae. Finely furred margins, a few plumose setae, especially on 2nd segment. *Second*: Peduncle, 2nd segment $\frac{2}{3}$ length 3rd, 3rd slightly shorter than subequal 4th and 5th, the last 2 having a few fine surface setae, the last 3 having strong spines on inferior margins. Flagellum short, 1st segment with long end seta inferiorly, 2nd with terminal "nail" spine as long as itself. Furred.

MOUTHPARTS. *Maxilliped*: Endite furred, quite wide, almost ovate, rounded end margin has about 4 plumose setae; no sign of coupling hooks. Palp 1st 2 segments short, 3rd ovate, as long as 4th and 5th combined, has about 5 short plumose setae on inner margin; 4th slender, has 4-5 plumose setae on inner margin, one on outer distal angle; 5th a short dome $\frac{1}{2}$ length 4th, has about 4 terminal plumose setae. *Mandible*: Left has lacinia, 3 spines in spine row; molar process short, distally wide with jagged end margin, 4 setae in middle of end margin. *Maxilla 1*: Outer plate has 11 plumose setae; inner plate narrow, slightly shorter, has 3 plumose end setae.

PERAEOPODS. *First*: Short, strong, ischium about $\frac{1}{2}$ basos length, carpus as long as ischium, merus shorter; all 4 segments finely furred; ischium has 1 spine on posterior margin, merus about 4, carpus about 7 denticulate spines. Propod, ovately triangular, as long as basos, width $\frac{1}{2}$ length, 4 strong denticulate spines on posterior margin, several rows of spines on surface distally. Dactylos strong, $\frac{1}{2}$ propod length, has 2 strong denticulate spines on posterior margin, a strong end spine-claw. *Second*: Basos and carpus subequal in length, merus slightly shorter, ischium still shorter; propod almost as long as merus plus carpus; segments furred; dactylos $\frac{1}{2}$ propod length, has strong end-claw, a few fine setae. Ischium has 2 strong spine-setae on posterior margin, merus 4, carpus 6; propod has 2 very strong ones on posterior margin, about 4 rows of 2-3 slimmer spines down median surface. *Third*: Like 2nd. *Fourth-Sixth*: Like 7th. *Seventh*: Basos and propod subequal, ischium, merus and carpus successively shorter, carpus about $\frac{1}{2}$ propod, all furry with a few fine setae on margins; dactylos claw truncate on left peraeopods, sharp on right.

PLEOPODS. *First*: Peduncle has 3 coupling spines; one ramus about $\frac{1}{2}$ length other which has 4 long end setae. *Second*: Rami subequal, subrectangular, strongly fringed with plumose setae. *Third*: Ovate-lanceolate, one ramus little larger than other, a few fine marginal setae; one stronger end seta on shorter ramus.

UROPODS. Furry; subtriangular, ramus very short, ovate-triangular, has 3 plumose setae distally; secondary about $\frac{2}{3}$ as long, narrow, has an equally long and slightly curved strong end spine.

MATERIAL EXAMINED: Station BOL (VUZ. 43), 1 female, ovigerous, 4.9 mm long, 1.2 mm wide.

HOLOTYPE: Slides Oc. 6.

DISTRIBUTION: Cook Strait.

DISCUSSION: This specimen is very close to Ohlin's *Pseudidothea bonnieri*, the type of the genus and family. However, there are sufficient small differences, I feel, to warrant establishing a separate species—the second in the family—and the finding of a male may reveal further differences in the pleopods from *P. bonnieri*.

The most significant features are the end setae of the main uropod ramus; the lack of tubercles on the peraeopods; and the strong spination of the second antennae.

Sub-Order ASELLOTA

Family PARASELLIDAE

Group *Ianirini*

Iathrippa longicauda (Chilton), 1884. (Figs. 92-107).

Janira longicauda Chilton, 1884: 250, pl. 18, fig. 2a.

Thomson, 1889: 265-266.

Tattersall, 1921: 200, pl. 1, fig. 6.

Ianira (Iathrippa) longicauda, Nordenstam, 1933: 173-176, text-figs. 40 a-h.

Iathrippa longicauda Nierstrasz, 1941: 286.

DIAGNOSIS (FEMALE): Anterolateral angles of cephalon more or less rounded, not significantly produced anteriorly; rostrum triangulate, reaching distal end of 3rd peduncle segment of antenna 2. Epimeral plates visible dorsally, between lateral angles of segments 2-4 of body, posterodistally on segments 5-7. Pleotelson margins smooth, setose, slight

indication distally of rounded median lobe. Uropods longer than pleotelson, rami somewhat lanceolate, inner the longer.

BODY. Somewhat flattened, white in preserved specimen. Lateral margins of body setose.

ANTENNAE. *First:* Reaches $\frac{1}{2}$ along 5th peduncle segment of antenna 2; distal flagellar segments have each a flaccid sensory seta; flagellum of 15 segments, segments not especially widened. *Second:* 1st 4 peduncle segments together a little shorter than 5th, have several strong spines and setae; 5th $\frac{3}{4}$ length 6th; 5th and 6th have 1-2 long spines on each margin, setae; 1st flagellar segment nearly $\frac{1}{2}$ length last peduncle segment; flagellum of 55 or more segments; accessory scale on 3rd peduncle segment, reaches end of 4th, has 4 end spines, setae.

MOUTHPARTS. *Maxilliped:* Has 3 coupling spines; endite distal margin has 8-9 plumose setae; 7 large bush-setae, small spine on inner distal angle, longer one on rounded outer angle. Palp, 1st 3 segments as wide as endite, inner distal angles setose, 4th and 5th segments slender, distally setose, 5th $\frac{1}{3}$ length 4th; 4th as long as 2nd and 3rd combined. *Maxilla 1:* Inner plate has 4 strong setae, fine bristles; outer has 11 denticulate spines. *Maxilla 2:* Outer plate lappets have 4 end setae each; inner has numerous end setae. *Mandibles:* Lacinia present; spine row of 9 denticulate spines; mandibular process long, not narrowing but truncate, has upper angle produced a little in tooth, lower has slender spine and 5-6 plumose setae; a few minute teeth on surface. Palp of 3 segments, 1st and 3rd subequal, about $\frac{2}{3}$ length 2nd; 1st has about 3 setae on distal angle; 2nd has about 7 strong denticulate spines, comb-scales on surface; 3rd has long terminal spine, row of about 20 denticulate spines on concave margin.

PERAEOPODS. *First:* Carpus and propod subequal, carpus broader but not noticeably ovate, width not $\frac{1}{3}$ length; posterior margin has 11-12 spines, seta or two, otherwise entire; propod posterior margin has 7-8 spines, otherwise entire. Dactylos has 2 claws, setae. *Seventh:* Carpus barely shorter than propod, has about 3 spines, setae, anteriorly; propod has about 5 spines; dactylos as in 1st. *Others:* All dactyli have 2 claws.

PLEOPODS. Third has exopodite slightly longer than endopodite, of 2 segments; endopodite has 2 plumose setae distally on inner margin, one on outer.

OPERCULUM. Ovate, distally rounded, margins have short fine setae.

UROPODS. Outer ramus about $\frac{2}{3}$ length inner; peduncle $\frac{1}{2}$ inner, widening distally; peduncle and rami all strongly spined and setose.

MATERIAL EXAMINED: Station GUL (VUZ. 54), 1 female, 8.5 mm (Slides Oc. 4).

DISTRIBUTION: Cook Strait; Lyttelton Harbour (Chilton); "Terra Nova" Station 96, 7 miles E. of North Cape, 70 fathoms, bottom fauna, 1 ovigerous female, 4.5 mm (Tattersall, 1921); Campbell Islands, Falkland Islands, S. Georgia, Magellan Straits, W. Chile (cf. Nordenstam, 1933).

DISCUSSION: This specimen agrees quite well with Chilton's original description, and with Nordenstam's supplementary details. Tattersall's figure is a little generalised and even inaccurate since he shows the epimeral plates as part of the lateral margins of the segments. It should be noted, however, that the dactyli in this specimen all have 2 claws whereas Nordenstam mentions 3.

I have followed Nierstrasz rather than Nordenstam in generic classification, not because of any strong views on the subject but because Nierstrasz's is the more recent paper.

Group JAEROPSINI
Genus JAEROPSIS Koehler
Richardson, 1905: 476-477.
Nordenstam, 1933: 190.

***Jaeropsis palliseri* n.sp.** (Figs. 67-73, 108-117).

DIAGNOSIS: Eyes near lateral margin. Anterolateral angles of cephalon bluntly rounded, not significantly produced anteriorly. Rostral process subrectangular, anterior margin somewhat sinuate. Maxilliped endite has 5 coupling spines. Distal angle of maxilliped palp 2nd segment not produced. Pleotelson margins smooth, entire. Exopodite of uropod has 1 segment. Body has purplish-brown pigmentation with white mottling on all segments, posterolateral portion of head and lateral angles of body somites unpigmented.

BODY. Animal elongate, flattened, dorsally smooth, lacking noticeable setae. Cephalon wider than long. Frontal margin has shallow lateral concavities separated by central shallow, but more anteriorly produced, concavity, into which rostral projection fits. Eyes dorsal, a

little in front of halfway. Peraeon has no epimeral plates visible in dorsal view. 1st and 2nd somites equally long, 5th shortest. Pleotelson wide, shield-like. Posterior median projection semi-acute, does not reach distally as far as tips of uropods.

ANTENNAE. *First*: Of 6 segments, 1st as long as other 5, twice as wide, has scattered fine setae, 2 plumose sensory setae on distal angle. Last 2 segments have 2 elongate flaccid sensory setae each, a few fine setae. *Second*: Peduncle 5th segment about $\frac{3}{4}$ length 6th, both distally expanded on inner margin; outer and end margins and surface of 6th have fine setae; 6th segment of peduncle $\frac{3}{4}$ length 1st flagellar segment which is more than twice length remaining 5 flagellar segments; segments all setiferous, 1st especially on surface and outer margin.

MOUTHPARTS. *Maxilliped*: Palp of 5 increasingly narrower segments, 1st short, $\frac{1}{3}$ length 2nd, $\frac{1}{4}$ length 4th; 3rd almost twice length 1st and 5th; inner margins of 3rd and 4th bristled, a few setae especially on end of 5th. Endite has only about one distinct spine on inner concavity of end margin, but about 5 spine-teeth. *Maxilla 1*: Inner plate has 4 apical setae, outer 11 denticulate spines. *Maxilla 2*: Outer plate lappets have 4 apical setae each, inner plate also has 4. *Mandible*: Lacinia absent. Incisive part has 5-6 teeth, setal row of 9 setae; molar long and needle-like, damaged in mounted appendage. Palp of 3 segments, 1st slightly longer than subequal 2nd and 3rd; 2nd has 5 plumose setae distally, 3rd has 10-11 along inner margin.

PERAEOPODS. *First*: Dactylos has 2 claws, propod has 5 spines on posterior margin, most of margin and distal $\frac{1}{4}$ of carpus posterior margin finely tooth-combed. *Seventh*: Dactylos has 3 claws, propod posterior margin has 6 spines, is finely tooth-combed. *Others*: Have 3 claws like 7th.

PLEOPODS. 1st in male has produced rounded posterolateral angles, medially produced setiferous end margin.

UROPOD. Peduncle, wide, subrectangular, with rounded angles, end margin setose, medially excavate with small scale-like rami, both rami distally setose.

MATERIAL EXAMINED: Station BOL (VUZ. 43), Holotype male, length 5.3 mm; width 1.4 mm.

HOLOTYPE: Slides Oc. 3.

DISTRIBUTION: Cook Strait.

DISCUSSION: According to Chilton (1912), young specimens of *neo-zelanica* (? = *curvicornis*; cf. Stebbing, 1905: 51-52, pl. XI.C) have several serrations on the pleon margins, older specimens have one serration. Since his material came from several localities, I am inclined to believe that he had more than one species; in any event, it appears that his material was different from the species described above. Nearest to *J. palliseri* are *J. paulensis* and *J. lobata*; the latter appears to be distinct in rostral process and, by inference from its possible identity with *J. dubia* (Menzies, 1951), in the uropods and other features.

LITERATURE CITED

- BARNARD, K. H. 1932. Amphipoda. *Discovery Reports*, 5: 1-326, pl. 1, text-figs 1-174.
- BEDDARD, F. E. 1884. Report on the Isopoda collected by H.M.S. Challenger during the years 1873-76. Part I. The Genus *Serolis*. *Challenger Reports*, Zool. 11: 1-85, 10 pls.
- CHILTON, C. 1884. Additions to the sessile-eyed Crustacea of New Zealand. *Trans. N.Z. Inst.* 16: 249-265, pls. 17-21.
- 1885. Notes on a few Australian Edriophthalmata. *Proc. Linn. Soc. N.S.W.*, 9 (4): 1035-1044, pls. 46-47.
- 1906. Report of some Crustacea dredged off the coast of Auckland. *Trans. N.Z. Inst.*, 38: 265-269.
- 1911. The Crustacea of the Kermadec Islands. *Trans. N.Z. Inst.* 43: 544-573, figs. 1-4.
- 1912. Miscellaneous notes on some New Zealand Crustacea. *Trans. N.Z. Inst.* 44: 128-135.
- 1916. Some Australian and New Zealand Gammaridae. *Trans. N.Z. Inst.* 48: 359-370, figs. 1-6.
- 1917. The identity of the two Amphipods, *Ampelisca eschrichtii* Kröyer and *A. macrocephala* Liljeborg, considered from an Antarctic point of view. *J. Zool. Res.*, 2 (2): 75-93, text-figs. 1-7.
- 1920. Some New Zealand Amphipoda: No. 1. *Trans. N.Z. Inst.* 52: 1-8, figs. 1-5.
- 1926. New Zealand Amphipoda: No. 6. *Trans. N.Z. Inst.* 56: 512-518, figs. 1-4.

- GURJANOVA, E. F. 1955. Novye Vidy Bokoplavov (Amphipoda, Gammaridea) iz Severnoj Chasti Tikhogo Okeana. *Trudy Zool. Inst. Akad. Nauk. SSSR*, 18: 166-218, text-figs. 1-23.
- HALE, H. M. 1925. Review of Australian Isopods of the Cymothoid group. Part I. *Trans. R. Soc. S. Aust.*, 49: 128-185, figs. 1-28.
- 1946. Isopoda Valvifera. B.A.N.Z.A.R.E. Reports, Ser. B, 5 (3): 162-212, figs. 1-30.
- HURLEY, D. E. 1954. Studies on the New Zealand Amphipodan Fauna. No. 3. The Family Phoxocephalidae. *Trans. R. Soc. N.Z.*, 81 (4): 579-599, text-figs. 1-5.
- 1954a. Studies on the New Zealand Amphipodan Fauna. No. 4. The Family Gammaridae, including a revision of the fresh-water genus *Phreatogammarus* Stebbing. *Trans. R. Soc. N.Z.*, 81 (4): 601-618, text-figs. 1-4.
- 1955. Pelagic amphipods of the Sub-Order Hyperiidea in New Zealand waters. I—Systematics. *Trans. R. Soc. N.Z.*, 83 (1): 119-194, text-figs. 1-17, map.
- MENZIES, R. J. 1951. New marine Isopods, chiefly from Northern California, with notes on related forms. *Proc. U.S. Nat. Mus.*, 101: 105-156, figs. 9-33.
- MILNE-EDWARDS, H. 1840. *Histoire naturelle des Crustacés, comprenant l'anatomie, la physiologie, et la classification de ces animaux*. Libraire Encyclopédique de Boret, Paris. Vol. 3: v + 638 pp. Atlas, 32 pp., 42 pls.
- NIERSTRASZ, H. F. Die Isopoden der Siboga-Expedition. IV. Isopoda Genuina. III. Gnathiidea, Anthuridea, Valvifera, Asellota, Phreatocoidea, Monogr. XXXIId, *Siboga-Expedition*, pp. 235-308, figs. 1-66.
- NORDENSTAM, A. 1933. Marine Isopoda of the Families Serolidae, Idotheidae, Pseudidotheidae, Arcturidae, Parasellidae and Stenetriidae mainly from the South Atlantic. *Further Zool. Res. Swedish Antarct. Exped. 1901-1903*, 3 (1): 1-284, 2 pls., 78 figs.
- OHLIN, A. 1901. Isopoda from Tierra del Fuego and Patagonia. I. Valvifera. *Svenska Exped. till Magellansländerna*, 2 (11): 261-306, pls. 20-25.
- RICHARDSON, H. 1905. A monograph of the Isopods of North America. *Bull. U.S. Nat. Mus.*, 54: LIII + 727 pp., 740 figs.
- SHELLENBERG, A. 1931. Gammariden und Caprelliden des Magellangebietes, Sudgeorgiens und der Westantarktis. *Further Zool. Res. Swedish Antarct. Exped., 1901-1903*, 11 (6): 1-290, 1 pl., 136 text-figs.
- SHEARD, K. 1939. Studies in Australian Gammaridea. (1). The Genus *Ceradocus*. *Rec. S. Austr. Mus.*, 6 (3): 275-295, text-figs. 1-8.
- SHEPPARD, E. M. 1933. Isopod Crustacea. Part I. The Family Serolidae. *Discovery Reports*, 7: 253-362, pl. 14, 22 figs.
- SOUTHWELL, T. 1915. Notes from the Bengal Fisheries Laboratory, Indian Museum. (7). Description of a new species of Isopod Crustacean parasitic on the Bhukti (*Lates calcarifer*). *Rec. Indian Museum*, 11 (4): 321-322, pl. 28.
- STEBBING, T. R. R. 1888. Report on the Amphipoda collected by H.M.S. Challenger during the years 1873-76. *Challenger Reports, Zool.* 29: xxiv + xiii + 1737 pp., 212 pls., 1 map. (3 vols.).
- 1905. Report on the Isopoda. *Ceylon Pearl Oyster Fisheries, 1905; Suppl. Repts.*, 33: 1-64, 12 pls.
- 1906. Amphipoda Gammaridea. *Das Tierreich*, 21: xxxix + 806 pp., 127 figs.
- STEPHENSON, K. 1933. The Gothaab Expedition, 1928. Amphipoda. *Medd. om Grønland*, 79 (7): 1-88, text-figs. 1-31, 2 tables.
- SUHM, R. VON W. 1874. Von der Challenger Expedition. Briefe an C. Th. v. Siebold: No. ii. *Zeitschr. f. Wiss. Zool.*, 24: xix.
- TATTERSALL, W. M. 1921. Crustacea. Part VI.—Tanaidacea and Isopoda. *British Ant. ("Terra Nova") Exped. 1910, Nat. Hist. Repts, Zool.*, III (8): 195-258, figs. 1-2, pls. 1-11.
- THOMSON, G. M. 1879. Additions to the Amphipodous Crustacea of New Zealand. *Ann. Mag. Nat. Hist.*, ser. 5 (4): 329-333, pl. 16.
- 1879a. On two new Isopods (*Arcturus*, sp., and *Tanais*, sp.) from New Zealand. *Ann. Mag. Nat. Hist.*, ser. 5 (5): 415-418, pl. 19, figs. 1-6.
- 1880. New species of Crustacea from New Zealand. *Ann. Mag. Nat. Hist.*, ser. 5 (6): 1-6, pl. 1.
- 1881. Recent additions to, and notes on, New Zealand Crustacea, *Trans. N.Z. Inst.*, 13: 204-221, pls. 7-8.
- 1889. Notes on, and recent additions to, the New Zealand Crustacean Fauna. *Trans. N.Z. Inst.* 21: 259-268, pls. 13-14.
- 1913. The natural history of Otago Harbour and the adjacent sea, together with a record of the researches carried on at the Portobello Marine Fish Hatchery: Part I. *Trans. N.Z. Inst.* 45: 225-251, pl. 10.
- THOMSON, G. M. AND ANDERTON, T. 1921. History of the Portobello Marine Fish-Hatchery and Biological Station. *Bull. Board. Sci. & Art, N.Z.*, 2: 1-131, text-figs.