

Crustacea Amphipoda Caprellidea : Caprellids from the western Pacific (New Caledonia, Indonesia and the Philippines)

Diana R. LAUBITZ

Canadian Museum of Nature
P.O. Box 3443, Station D, Ottawa
Ontario, K1P 6P4, Canada

ABSTRACT

Seventeen species of Caprellidea were collected by expeditions to the western Pacific (New Caledonia, Indonesia, and the Philippines). Although none of the species are new to the region, most of them have been reported only rarely. Illustrations and brief descriptions are given.

RÉSUMÉ

Crustacea Amphipoda Caprellidea : Caprelles de l'Indo-Pacifique (Nouvelle-Calédonie, Indonésie, et Philippines).

Dix-sept espèces de Caprellidea ont été récoltées au cours de campagnes océanographiques dans l'Ouest-Pacifique (Nouvelle-Calédonie, Indonésie, Philippines). Toutes ces espèces ont déjà été signalées dans cette région, mais presque toutes sont considérées comme rares. Des illustrations et des descriptions brèves sont incluses.

INTRODUCTION

French oceanographic expeditions to the western Pacific Ocean in the neighbourhood of the Philippines, Indonesia, and New Caledonia have made small but significant collections of Caprellidea. The total number of specimens is not great (85, from 20 stations) but it comprises 17 species, many of which have not been reported since their original description.

There have been very few studies on southwestern Pacific caprellids. MAYER's (1903) *Siboga* Expedition monograph gives the best overview of the region, and contains many species descriptions. Three studies of the Sri Lankan fauna (MAYER, 1904; SIVAPRAKASAM, 1969, 1977) are a useful source of supplementary information.

Knowledge of the species of the region remains very sparse, despite these new collections, because of the small number of specimens available.

Each species has been illustrated in detail and redescribed briefly. Complete synonymies and distribution records can be found in MCCAIN & STEINBERG (1970); these have been updated only where necessary.

The specimens are mostly very small and many, especially from deep water collections, are in poor condition. Frequently, the buccal mass had to be removed in one piece and then teased apart. Some characters readily visible in the temporary mount seemed to disappear in the permanent slide. Thus, some of the figures or details therein are composites, either of the same specimen in different media or of several specimens.

The higher classification of the Caprellidea is still in a state of flux, as shown by VASSILENKO's (1974) thoughtful but tentative familial groupings. For the present paper, the genera are grouped according to affinities that are becoming apparent during my current ongoing investigations of all genera and their characteristics. Similarly, I have not attempted to create new genera for the taxa that do not fit under the present system for generic diagnosis.

In the lists of material examined the capital letters preceding the station number refer to the gear used : KG : Usnel corer; G : Okean grab; DR : rectangular dredge; DW : Waren dredge; CP : beam trawl.

LIST OF STATIONS

CORINDON 2. Indonesia.

Station G 251. — 6.11.1980, 0°53.7'S, 119°29.6'E, 65 m : *Metaprotella sandalensis*.

Station G 261. — 7.11.1980, 1°56.8'S, 119°16.8'E, 60 m : *Propodalirius insolitus*.

MUSORSTOM 2. Philippines.

Station DR 33. — 24.11.1980, 13°32.3'N, 121°07.5'E, 135 m : *Monoliropus falcimanus*.

ESTASE 2. Philippines.

Station DW 1. — 14.11.1984, 14°05.16'N, 120°01.46'E, 2200 m : genus incertum of Phtisicid group.

MUSORSTOM 3. Philippines.

Station DR 117. — 3.06.1985, 12°31'N, 120°39.5'E, 95 m : *Metaprotella sandalensis*, *Metaprotella novaehollandiae*, *Monoliropus agilis*, *Paradeutella laevis*, *Paraprotella prima*, *Proliropus dubius*, *Protella similis*.

BIOCAL. New Caledonia.

Station KG 6. — 12.08.1985, 20°34.99'S, 166°52.67'E, 700 m : genus incertum of Phtisicid group.

Station DW 8. — 12.08.1985, 20°34.35'S, 166°53.90'E, 435 m : *Paradeutella laevis*.

Station DW 36. — 29.08.1985, 23°08.64'S, 167°10.99'E, 650 m : genus incertum of Caprellinoides group.

Station DW 44. — 30.08.1985, 22°47.30'S, 167°14.30'E, 440 m : *Paradeutella spinosa*.

Station DW 46. — 30.08.1985, 22°53.05'S, 167°17.08'E, 570 m : *Orthoprotella mayeri*, *Paradeutella spinosa*.

Station DW 51. — 31.08.1985, 23°05.27'S, 167°44.95'E, 700 m : *Monoliropus* sp., *Paradeutella spinosa*.

Station CP 61. — 02.09.1985, 24°11.67'S, 167°31.37'E, 1070 m : *Protoplesius enigma*.

Station KG 73. — 04.09.1985, 22°12.95'S, 167°29.14'E, 1285 m : genus incertum of Caprellinoides group.

Station CP 75. — 04.09.1985, 22°18.65'S, 167°23.30'E, 825 m : *Protoplesius enigma*.

Station DW 77. — 05.09.1985, 22°15.32'S, 167°15.40'E, 440 m : *Orthoprotella mayeri*.

Station DW 83. — 06.09.1985, 20°35.07'S, 166°53.99'E, 460 m : *Protoplesius enigma*.

MUSORSTOM 4. New Caledonia.

Station DW 222. — 30.09.1985, 22°57.6'S, 167°33.0'E, 410-440 m : *Paradeutella spinosa*.

BIOGEOCAL. New Caledonia.

Station CP 232. — 12.04.1987, 21°34'S, 166°27'E, 760-790 m : *Metaprotella novaehollandiae*.

Station CP 290. — 27.04.1987, 20°37'S, 167°03.5'E, 760-920 m : *Paedaridium miserum*.

LAGON

28.07.1989, Baie des Citrons, 5 m : *Caprella scaura*.

Most of the stations yielded only one species of caprellid. However, MUSORSTOM 3 station 117 was extraordinarily rich in both specimens and species : 49 specimens in 7 species. The reason for this is not known.

LIST OF SPECIES

Family Phtisicidae	<i>Paradeutella spinosa</i> Mayer, 1903
Subfamily Phtisicinae	<i>Propodalirius insolitus</i> Mayer, 1903
<i>Metaproto novaehollandiae</i> (Haswell, 1880)	<i>Metaprotella sandalensis</i> Mayer, 1898
<i>Protoplesius enigma</i> Mayer, 1903	<i>Monoliropus agilis</i> Mayer, 1903
Genus aff. Phtisicid group	<i>Monoliropus falcimanus</i> Mayer, 1904
Caprellinoides group	<i>Monolirus</i> sp.
<i>Paedaridium miserum</i> Mayer, 1903	<i>Orthoprotella mayeri</i> Barnard, 1917
<i>Proliropus dubius</i> Mayer, 1903	<i>Paraprotella prima</i> Mayer, 1903
Genus aff. Caprellinoides group	<i>Protella similis</i> Mayer, 1903
	<i>Caprella scaura</i> Templeton, 1836
Family Caprellidae	
<i>Paradeutella laevis</i> Mayer, 1903	

Although all of these species have been reported from the Indo-Pacific region, new local records are noted. *Propodalirius insolitus* is new to Indonesia; *Metaproto novaehollandiae*, *Orthoprotella mayeri*, *Paedaridium miserum*, *Paradeutella laevis*, *Paradeutella spinosa* and *Protoplesius enigma* are new to New Caledonia; *Metaproto novaehollandiae*, *Monoliropus agilis*, *Monoliropus falcimanus*, *Paradeutella laevis*, *Paraprotella prima*, *Proliropus dubius*, and *Protella similis* are new to the Philippines.

SYSTEMATIC ACCOUNT

Family PHTISICIDAE Vassilenko, 1968

Subfamily PHTISICINAE Vassilenko, 1968

Genus *METAPROTO* Mayer, 1903

Metaproto novaehollandiae (Haswell, 1880)

Fig. 1

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 3.06.1985 : 1 ♂ 4.8 mm.

New Caledonia. BIOGEOCAL : stn 232, 21°34'S, 166°27'E, 760-790 m, 12.04.1987 : 1 ♀ incomplete.

REMARKS. — The two specimens of this species are in very poor condition. The female consists of pereonites 2, 3, and 4 only. The male has been figured to the extent possible.

The maxilliped is missing; other mouthparts covered in debris. At the apex of the mandibular palp, only 2 long setae could be seen; margin with short dense setae. Maxilla 1 spiniform setae are denticulate. Gnathopod 1 missing. Abdomen also obscured by debris.

The identification of these specimens is based on the combination of fully segmented pereopods 3 and 4, abdominal appendages, and the arrangement of the proximal palmar spiniform setae on gnathopod 2. The small male has not developed the inflated gnathopod palm shown by the 15 mm type specimen (HASWELL, 1886).

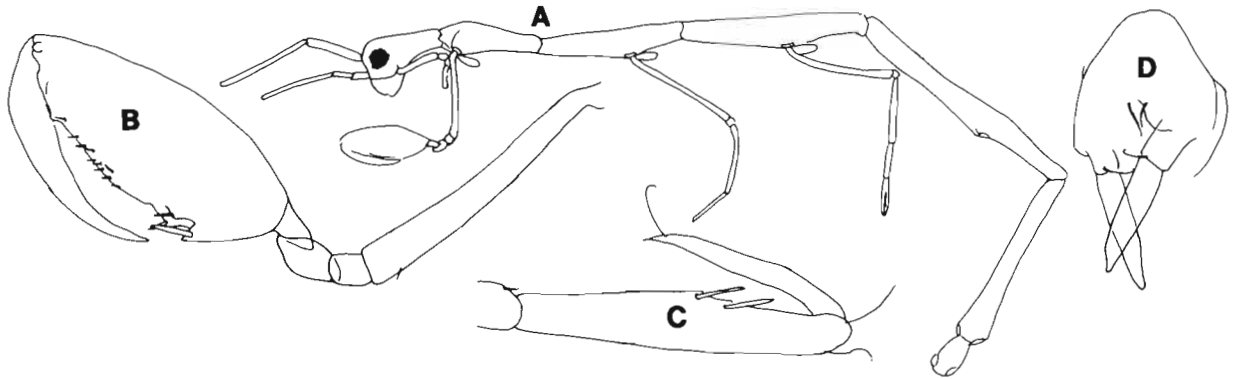


FIG. 1. — *Metaproto novaehollandiae*, ♂ 4.8 mm : A, whole animal; B, gnathopod 2; C, propodus of pereopod 4; D, abdomen, ventral.

DISTRIBUTION. — Reported from SE Australia, Banda Sea, Papua New Guinea, South Africa (MCCAIN & STEINBERG, 1970); 4-36 m. New to the Philippines and New Caledonia, to 790 m; associated fauna, antipatharians, echinoderms.

Genus *PROTOPLESIUS* Mayer, 1903

Protoplesius enigma Mayer, 1903

Fig. 2

MATERIAL EXAMINED. — New Caledonia. BIOCAL : stn 61, 24°11.67'S, 167°31.37'E, 1070 m, 02.09.1985 : 1 ♂ 5 mm. — Stn 75, 22°18.65'S, 167°23.3'E, 825 m, 04.09.1985 : 1 ♀ 5 mm. — Stn 83, 20°35.07'S, 166°53.99'E, 460 m, 06.09.1985 : 1 ♀ 5 mm.

REMARKS. — The male specimen is in very poor condition, missing pereonite 7 and abdomen. However, the characters of the two sexes appear to be essentially similar.

MAYER (1903) described two species of *Protoplesius*, distinguished by differences in the propodus of pereopods 6 and 7. In the absence of these appendages, identification is based on body characters such as the anterolateral projection and the dorsal hump on pereonite 2.

Antenna 1 peduncular segment 3 longer (female) or subequal to flagellar segment 1; flagellum 5-segmented in male. Antenna 2 flagellar segment 3 minute. Mouthparts of the usual phtisicid type : mandibular palp terminal setae varied from 1-2-1 to 1-4-1, mandible without molar, lacinia mobilis with accessory plates; maxilla 1 outer plate with 6 denticulate spiniform setae apically. Male and female gnathopod 2 similar, with a double row of spinelike setae along the mid palmar edge.

This species has not been reported since its description. MAYER's (1903) specimens were larger, up to 13 mm, but our specimens show no obvious differences except for slight variation in the body proportions.

DISTRIBUTION. — Type locality, Banda Sea; 2081-2798 m. New to New Caledonia; 460 to 1070 m; associated fauna, sponges, annelids, echinoderms.

Genus *incertum*

Fig. 3

MATERIAL EXAMINED. — Philippines. ESTASE 2 : stn 1, 14°05.16'N, 120°01.46'E, 2200 m, 14.11.1984 : 1 ♂ incomplete.

New Caledonia. BIOCAL : stn 6, 20°34.99'S, 166°52.67'E, 2340 m, 12.08.1985 : 1 ♂ 2 mm.

REMARKS. — Both of these specimens are in very poor condition. The incomplete one consists of only head-pereonite 4. They are very similar to one another, but the Philippines specimen is larger and has more slender antennae.

The mouthparts could not be dissected, but what could be seen of them showed them to be typical of the subfamily Phtisicinae; the mandibular palp terminal setal formula is 1-1 and the incisor region of the right mandible is complex. No eyes could be found. Antenna 1 and 2 have a 2-segmented flagellum. Gnathopod 1

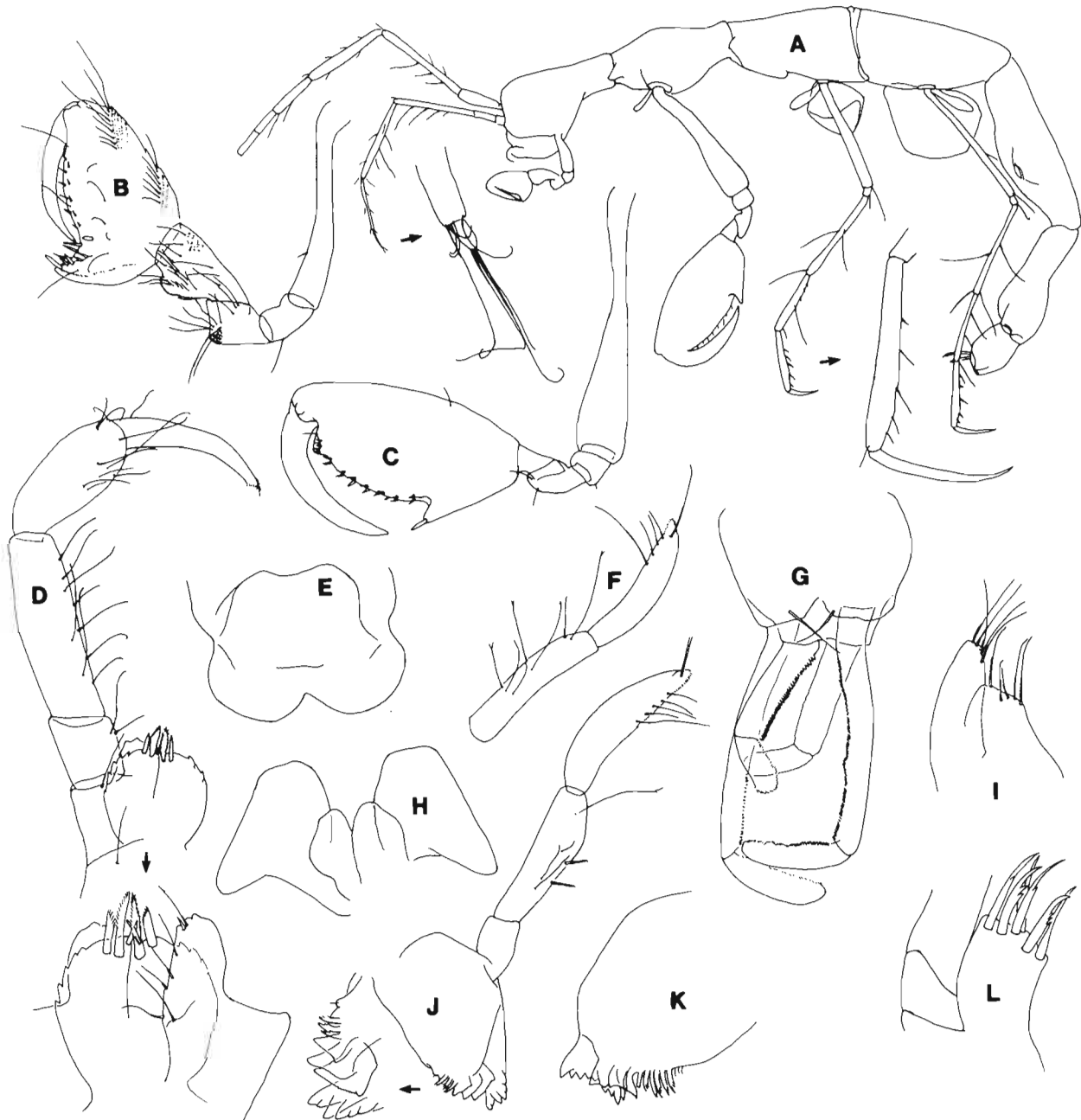


FIG. 2. — *Protoplesius enigma*, ♀ 5 mm : A, whole animal; B, gnathopod 1; C, gnathopod 2; D, maxilliped; E, upper lip; F, mandibular palp, partial (other ♀); G, abdomen, ventral; H, lower lip; I, maxilla 2; J, right mandible; K, left mandible; L, maxilla 1.

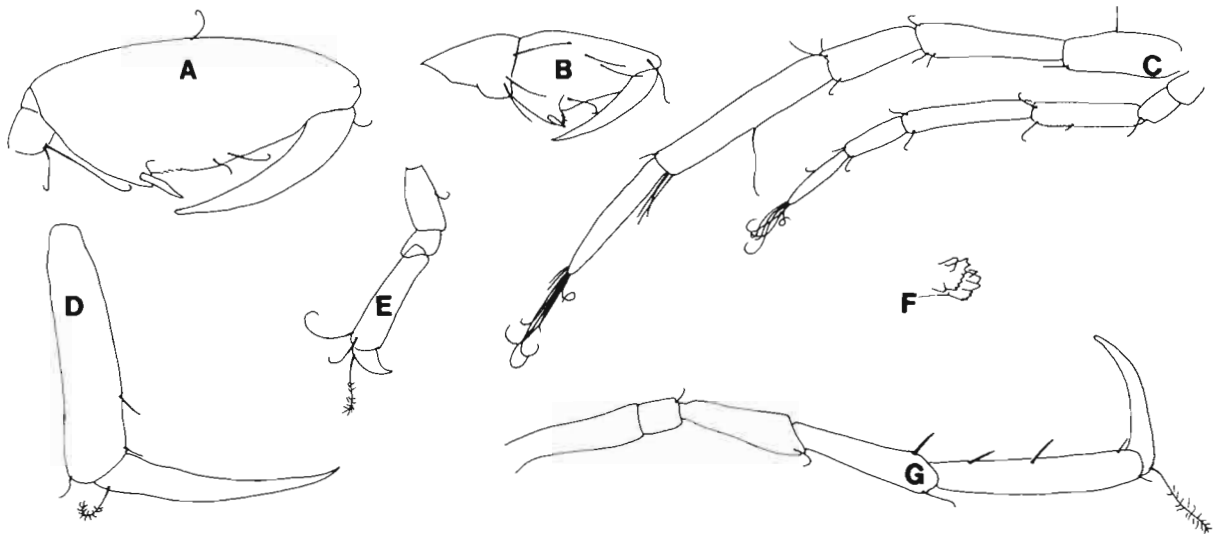


FIG. 3. — Genus aff. Phtisid group, ♂ : A, gnathopod 2; B, gnathopod 1; C, antenna 1 and 2; D, propodus of pereopod 3; E, pereopod 5; F, incisor region of right mandible; G, pereopod 7.

propodus is typical of the family, and there are 3 pairs of gills, 6-segmented pereopods 3 and 4, and a 4-segmented pereopod 5 bearing a dactyl. The abdomen appears to be very simple with perhaps setose lobes.

These specimens do not fit the diagnostic formula for any of the phtisid genera. *Quadrisegmentum* Hirayama, 1988, the only other genus with a 4-segmented pereopod 5 has a complex abdomen. *Protogeton* Mayer, 1903, and *Pseudoproto* Mayer, 1903, which both have a simple abdomen have a 6-segmented pereopod 5.

CAPRELLINOIDES Group

REMARKS. — A small group of genera including those whose presence in the subfamily Dodecadinae was questioned by VASSILENKO (1974). Characterized by very small or absent inner plates and small to very small outer plates on the maxillipeds, and a very sparsely setose gnathopod 1. The mouthparts and the pereopod 5 tend to be unusual, and the abdomen bears no more than one pair of 1-segmented appendages. Includes *Caprellinoides* Stebbing, *Paedaridium* Mayer, *Proliropus* Mayer, *Pseudaeginella* Mayer (including *Fallotritella* McCain) and probably other genera.

Genus *PAEDARIDIUM* Mayer, 1903

Paedaridium miserum Mayer, 1903

Fig. 4

MATERIAL EXAMINED. — New Caledonia. BIOGEOCAL : stn 290, 20°37'S, 167°03.5'E, 920-760 m, 27.04.1987 : 1 ♀ 6 mm.

REMARKS. — The single specimen is more than twice the size of those mentioned in MAYER's (1903) original description, the only previous report, but apart from being more slender is in good agreement.

No eyes could be seen. Antenna 1 last peduncular segment shorter than the first flagellar segment. Antenna 2 apical segment with unusual shape. The mouthparts are very simple, with few setae. Right mandible lacinia mobilis serrate, incisor with 7 teeth, left mandible with 6-toothed lacinia and incisor, molar absent; maxilla 1 outer plate with 6 smooth spiniform setae apically. The outer plate on the maxilliped is barely developed. The terminal segment on pereopod 5 is minute.

DISTRIBUTION. — Type locality, Banda Sea; 2081 m. New to New Caledonia; 760-920 m; associated fauna, sponges, coelenterates, echinoderms, annelids.

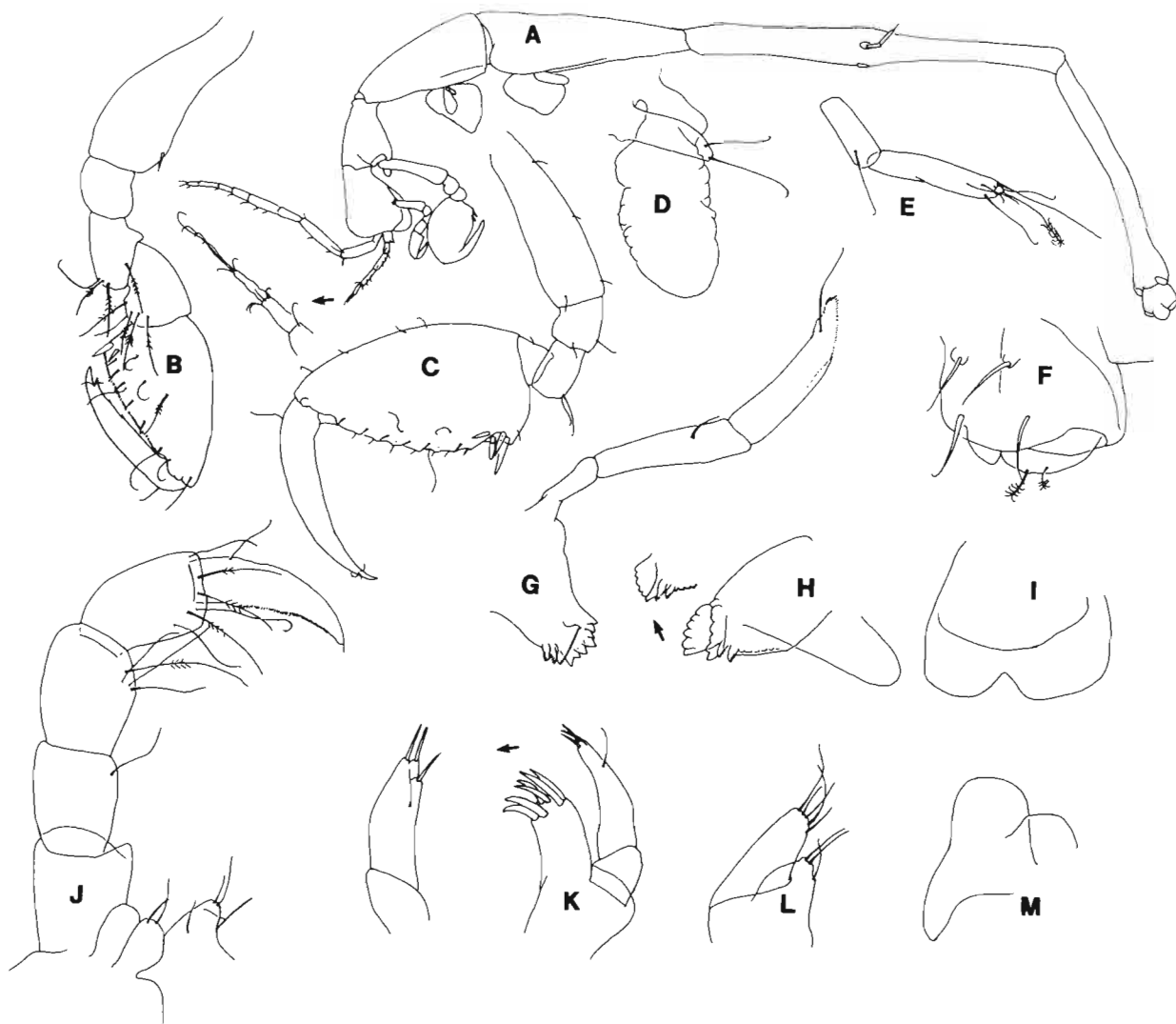


FIG. 4. — *Paedaridium miserum*, ♀ 6 mm : A, whole animal; B, gnathopod 1; C, gnathopod 2; D, pereopod 3; E, pereopod 5; F, abdomen, ventrolateral; G, right mandible; H, left mandible; I, upper lip; J, maxilliped; K, maxilla 1; L, maxilla 2; M, lower lip, partial.

Genus *PROLIROPUS* Mayer, 1903

Proluropus dubius Mayer, 1903

Fig. 5

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 1 ♀ 2.5 mm.

REMARKS. — This is the second specimen recorded for this species, and the first female.

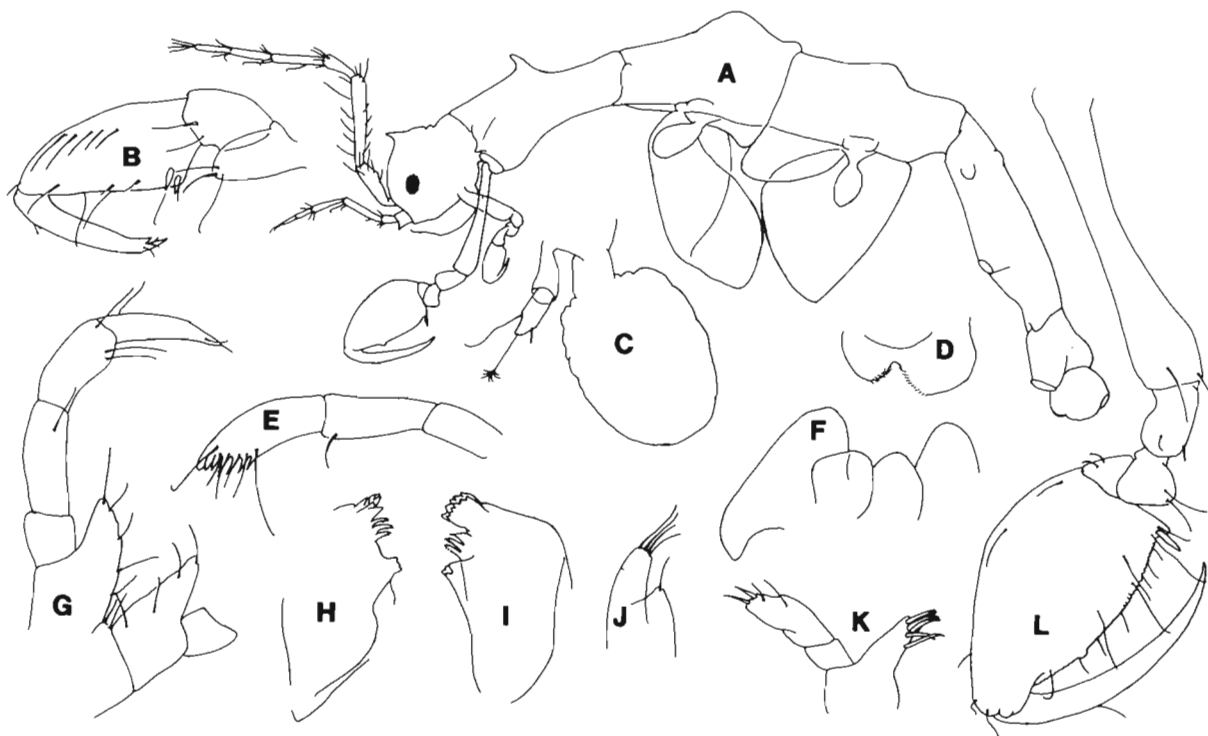


FIG. 5. — *Proliropus dubius*, ♀ 2.5 mm : A, whole animal; B, gnathopod 1; C, pereopod 4; D, upper lip; E, mandibular palp; F, lower lip; G, maxilliped; H, right mandible; I, left mandible; J, maxilla 2; K, maxilla 1; L, gnathopod 2.

The mandible is unlike any other caprellid : the palp terminates in a series of large serrations among which the apical setae arise; the molar is small, truncate, with four marginal projections (like a human molar) and not strongly chitinized; right incisor 5-toothed, lacinia mobilis with 2 sharp teeth; left incisor with 5 teeth, lacinia with 6. Maxilla 1 outer plate with 6 smooth spiniform setae apically.

Antenna 1 has a setose peduncle, last segment smaller than or equal to first flagellar segment. The eye is multifaceted. There is a single spine on the head, and another at mid pereonite 2; pereonite 3 and 4 each have a middorsal hump.

MAYER's original specimen was a 2 mm long male with which the present female agrees well enough to not warrant describing it as a new species. Minor differences may reflect only sexual dimorphism or growth stages.

DISTRIBUTION. — Type locality, Singapore; 9-11 m. New record for the Philippines, to 95 m.

Genus *incertum*

Fig. 6

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL : stn 36, 23°08.64'S, 167°10.99'E, 650 m, 29.08.1985 : 1 ♀ 3 mm. — Stn 73, 22°12.95'S, 167°29.14'E, 1285 m, 04.09.1985 : 1 ♀ 5.5 mm.

REMARKS. — These specimens have all of the characteristics of the Caprellinoides group but they do not agree with any of the genera in this group.

The larger of the two specimens is described here, with differences in the smaller being noted in parentheses. Antenna 1 peduncular segment 3 is about 4 times longer than (subequal to) flagellar segment 1 and subequal to (half) peduncular segment 2. Antenna 2 flagellum 2- (4-) segmented. No eyes were found. The mandibular palp is

2-segmented with an apical plate [palette of MAYER (1904)] and 3 apical setae; molar absent; right lacinia mobilis serrate, incisor 6-toothed; left lacinia and incisor 5-toothed. Maxilliped inner plate minute, outer plate barely developed. Maxilla 1 outer plate bears 6 smooth spiniform setae.

There are 3 pairs of gills, the first pair very small. Pereopod 3 and 4 very small and 1-segmented. Pereopod 5, 4-segmented, terminating in a seta; inserted in the middle third of pereonite 5. The abdomen appears to bear setose lobes.

These specimens most closely resemble *Paedaridium*. Differences in the mandibular palp, pereopod 5, and abdomen would currently exclude them from this genus.

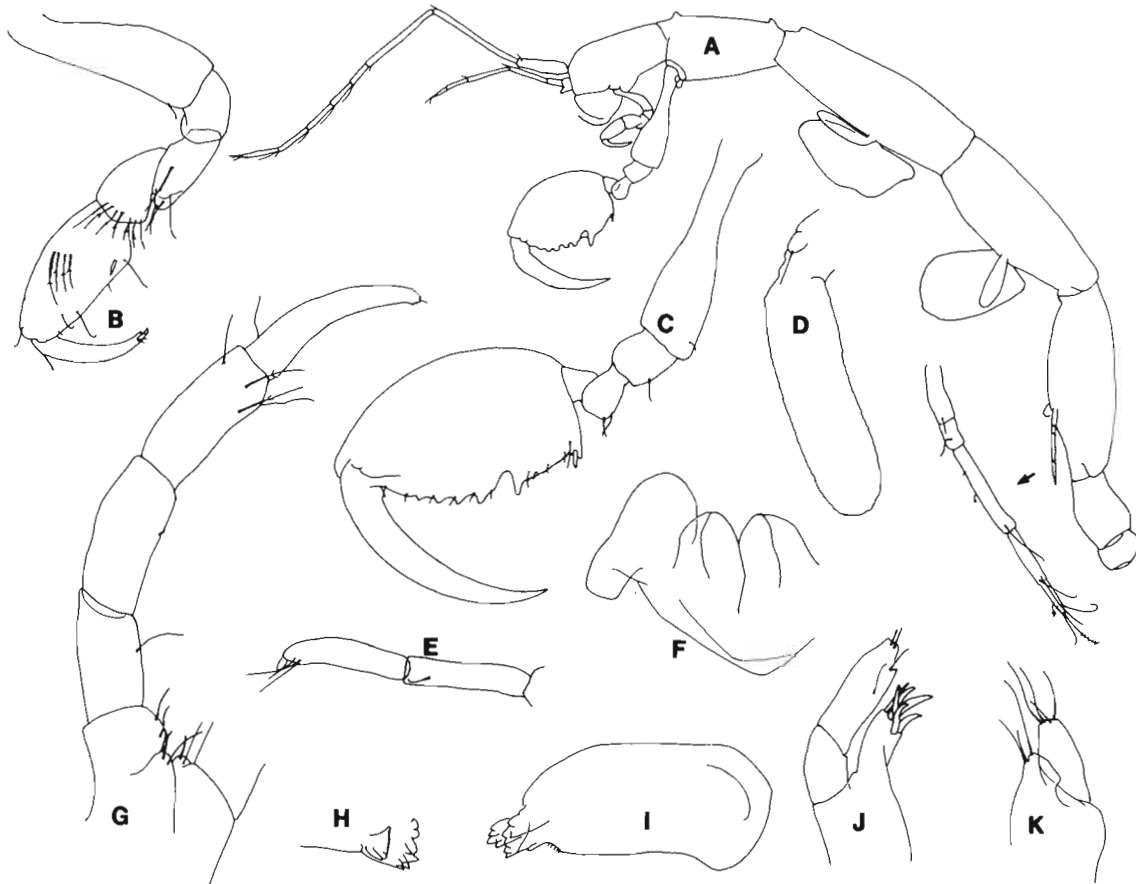


FIG. 6. — Genus aff. *Caprellinoides* group, ♀ 5.5 mm : A, whole animal; B, gnathopod 1; C, gnathopod 2; D, pereopod 4; E, mandibular palp; F, lower lip, partial; G, maxilliped; H, right mandible, incisor region; I, left mandible; J, maxilla 1; K, maxilla 2.

Family CAPRELLIDAE Leach, 1814

Genus *PARADEUTELLA* Mayer, 1890.

Paradeutella laevis Mayer, 1903

Fig. 7

MATERIAL EXAMINED. — Philippines. MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 1 ♂ 3 mm.

New Caledonia. BIOCAL : stn 08, 20°34.35'S, 166°53.90'E, 435 m, 12.08.1985 : 3 ♀ up to 4 mm.

REMARKS. — The three female specimens are in very poor condition : gnathopod 2, pereopods 5, 6, and 7, and most of antenna 2 are missing in all of them. Based on its smaller size, it is assumed that the male specimen is not mature.

The mouthparts are essentially identical to those illustrated for *Paradeutella spinosa*, except for the mandibular palp. This terminates in an apical plate but does not have the proximal plates; x of setal formula was 2 or 3. Antenna 1 peduncle with setae, peduncular segment 3 subequal to flagellar segment 1. Male gnathopod 2 disproportionately large.

This is the first report of this species since its description.

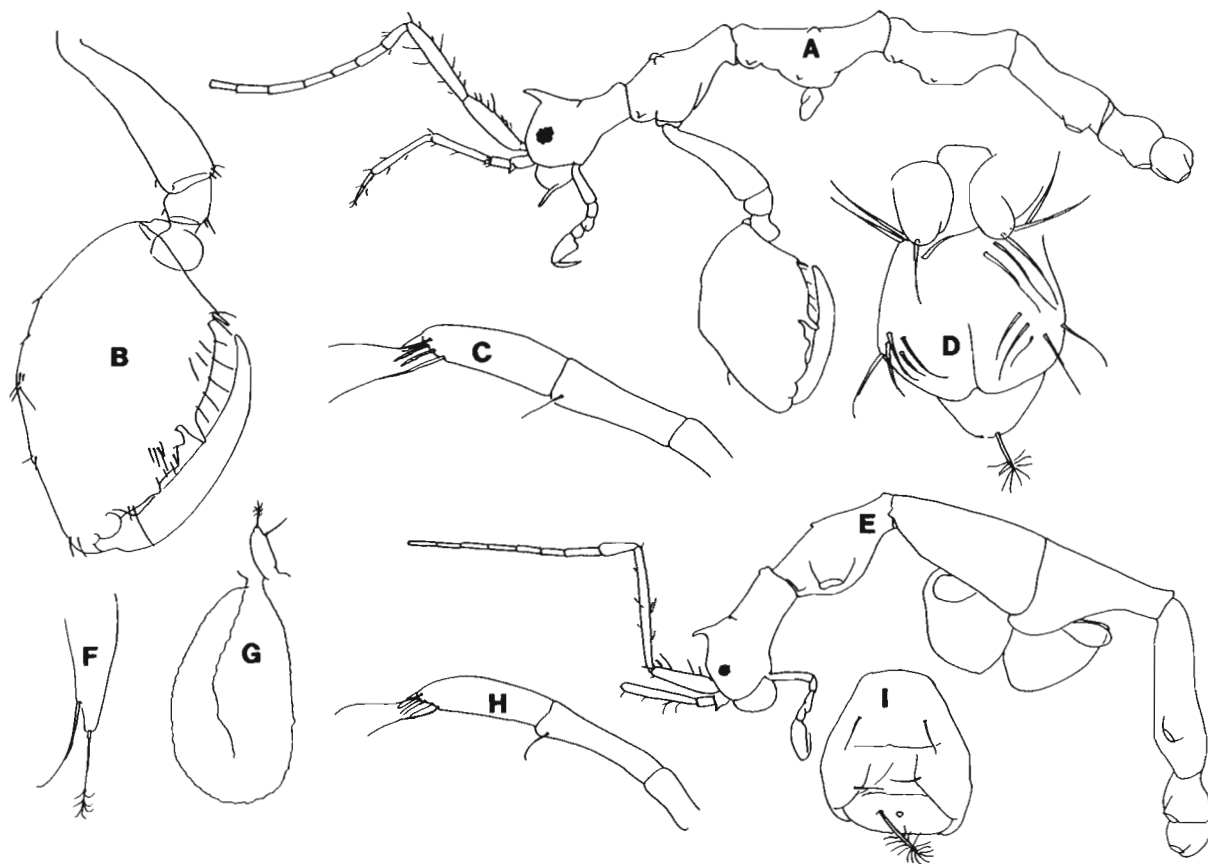


FIG. 7. — *Paradeutella laevis*, ♂ 3 mm : A, whole animal; B, gnathopod 2; C, mandibular palp; D, abdomen, ventral. — ♀ 4 mm : E, whole animal; F, pereopod 4; G, pereopod 3; H, mandibular palp; I, abdomen, ventral.

DISTRIBUTION. — Type locality, Singapore; intertidal. New to New Caledonia and the Philippines; 95 and 435 m.

Paradeutella spinosa Mayer, 1903

Fig. 8

MATERIAL EXAMINED. — New Caledonia. BIOCAL : stn 44, 22°47.3'S, 167°14.3'E, 440 m, 30.08.1985 : 7 ♀. — Stn 46, 22°53.05'S, 167°17.08'E, 570 m, 30.08.1985 : 2 ♂; 1 ♀. — Stn 51, 23°05.27'S, 167°44.95'E, 700 m, 31.08.1985 : 2 ♂. — MUSORSTOM 4 : stn 222, 22°57.6'S, 167°33'E, 410-440 m, 30.09.1985 : 1 ♀.

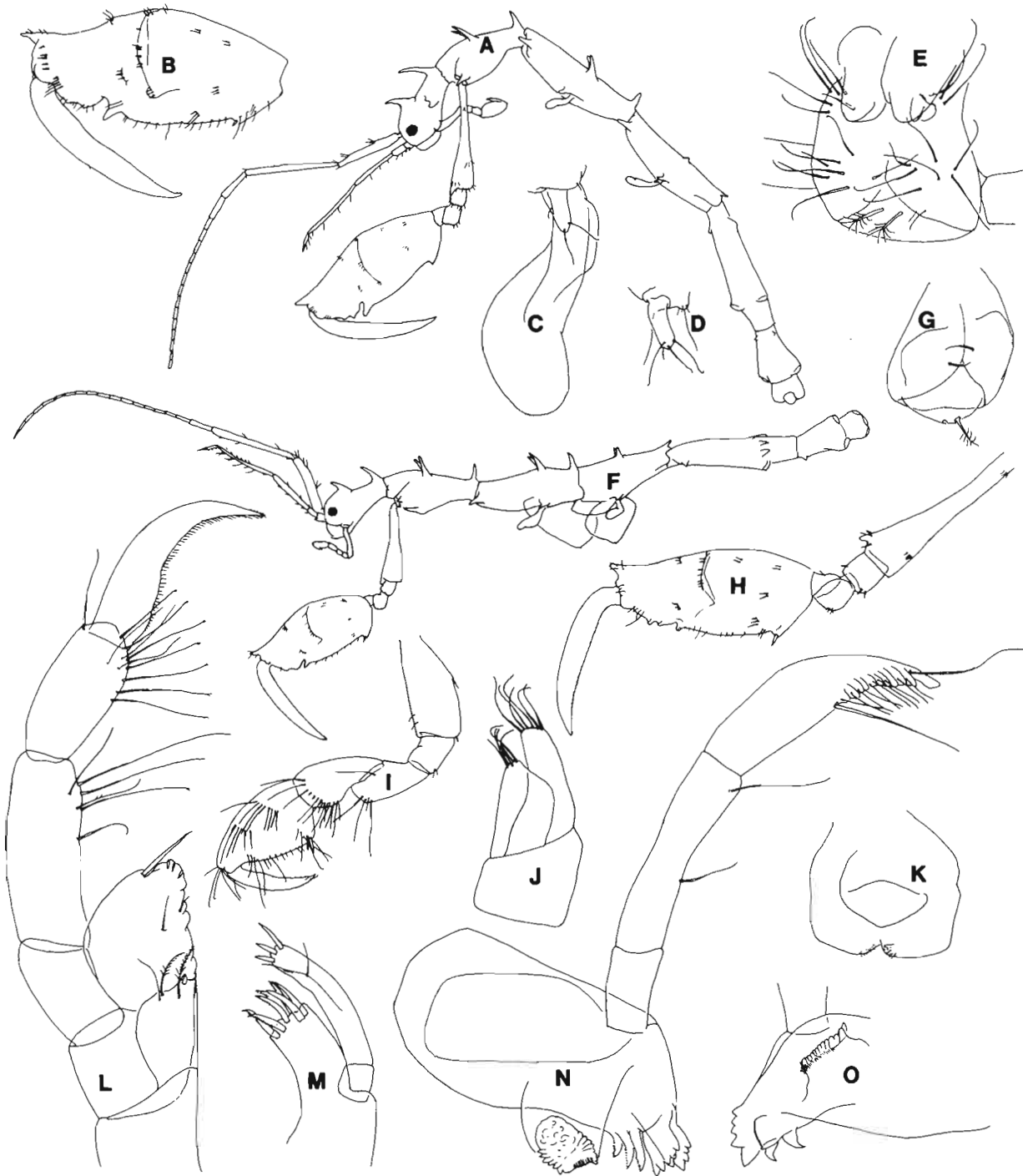


FIG. 8. — *Paradeutella spinosa*, ♂ 10 mm : A, whole animal; B, gnathopod 2 propodus; C, pereopod 3; D, pereopod 4; E, abdomen, ventral. — ♀ 9 mm : F, whole animal; G, abdomen, ventral; H, gnathopod 2; I, gnathopod 1; J, maxilla 2; K, upper lip; L, maxilliped; M, maxilla 1; N, left mandible; O, right mandible.

REMARKS. — MAYER'S (1903) original specimens were only 2 mm long; among the specimens listed above, the largest male was 10 mm and the largest female 9 mm.

The spination of the body is uniform among males and females. Antenna 1 peduncular segment 3 is just longer than flagellar segment 1; the flagellum has up to 17 segments. Antenna 2 flagellum is minute, no more than one third length of last peduncular segment. Mandible with molar, right lacinia mobilis serrate, left 5-toothed; the palp terminates in an apical plate proximal to which is a series of plates from between which the apical setae arise. Maxilla 1 outer plate bears 6 denticulate spiniform setae apically. The maxilliped inner plate bears an apical tooth and 3 setae, outer plate has a terminal seta and irregular inner margin. The propodus of the gnathopod 2 is very large and has a setose lateral ridge.

This is only the second report of *P. spinosa*. However, this species is superficially extremely similar to *Pseudoprotella phasma* (Montagu), a well known North Atlantic species. It is therefore probable that the records of the latter species from Tasmania (CHILTON, 1921; GUILER, 1952) and South Africa (GRIFFITHS, 1975, 1976) apply to *Paradeutella spinosa*.

DISTRIBUTION. — Type locality Singapore; intertidal. ? Tasmania; ? S. Africa. New to New Caledonia; 410-440 to 700 m.

Genus *PROPODALIRIUS* Mayer, 1903

Propodalirius insolitus Mayer, 1903

Fig. 9

MATERIAL EXAMINED. — Indonesia. CORINDON 2 : stn 261, 1°56.8'S, 119°16.8'E, 60 m, 07.11.1980 : 1 ♂ 4.5 mm.

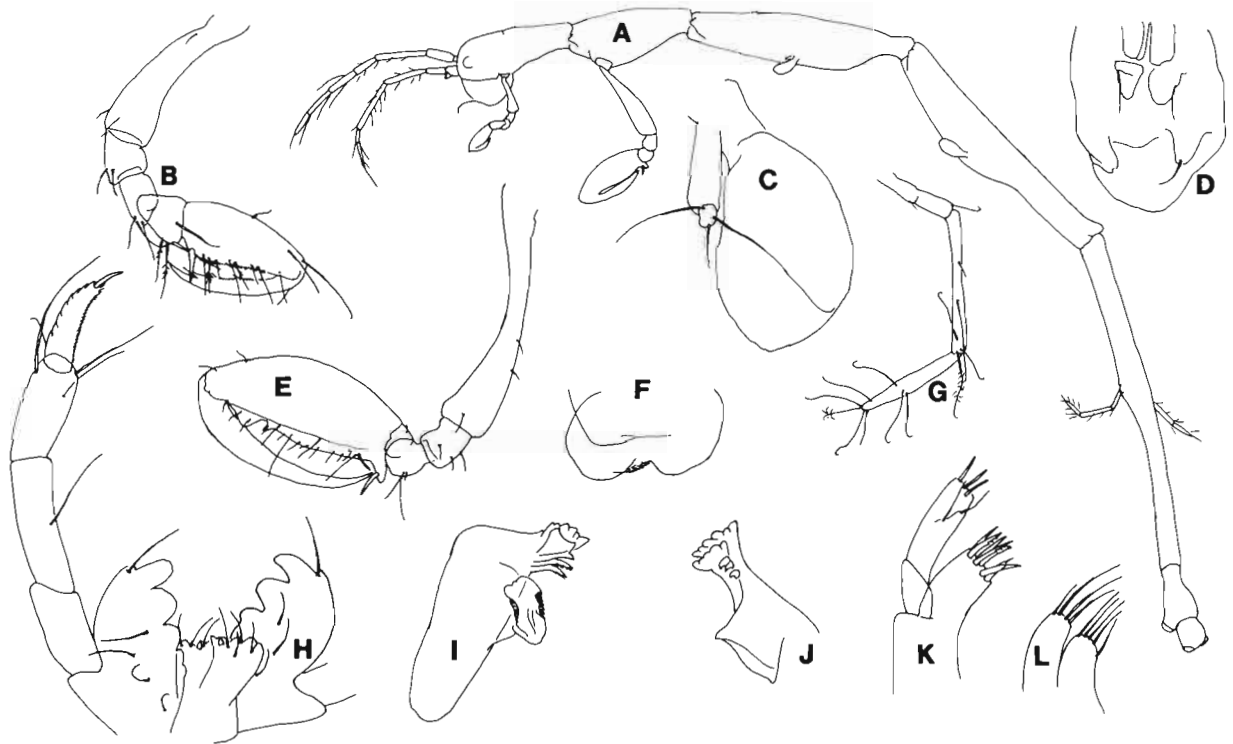


FIG. 9. — *Propodalirius insolitus*, ♂ 4.5 mm : A, whole animal; B, gnathopod 1; C, pereopod 4; D, abdomen, ventral; E, gnathopod 2; F, upper lip; G, pereopod 5; H, maxilliped; I, right mandible; J, left mandible; K, maxilla 1; L, maxilla 2.

REMARKS. — This species is readily recognised by its very characteristic maxilliped, gnathopod 1, and abdomen.

Antenna 1 peduncular segment 3 smaller than flagellar segment 1. Antenna 2 is setose, but these are not swimming setae although they were described as such by MAYER (1903). There is a bulge on the head where one would expect the eye to be, but no facets could be found.

Mandible with molar, right lacinia mobilis broadly 3-toothed, left 5-toothed; maxilla 1 outer plate bears 7 denticulate spiniform setae apically. The maxilliped inner plate is apically scalloped with one tooth and few setae; the outer plate has 3 large medial lobes, one apical seta and few surface setae; the dactyl of the palp is apically truncate, bearing a terminal stout seta, and laterally the margin is complex.

Gnathopod 1 bears few setae; the propodus has 1 long slender defining spine. Pereopods 3 and 4 are usually 2-segmented but may be 1-segmented (see ARIMOTO, 1980). Pereopod 5 is 4-segmented, but the suture between the 2 proximal segments is indistinct.

DISTRIBUTION. — Type localities, Gulf of Thailand, Korean Straits, Japan; 9-18 m. New to Sulawesi; 60 m.

Genus *METAPROTELLA* Mayer, 1890

Metaprotella sandalensis Mayer, 1898

Fig. 10

MATERIAL EXAMINED. — **Indonesia.** CORINDON 2 : stn 251, 0°53.7'S, 119°29.6'E, 65 m, 06.11.1980 : 1 ? ♂.
Philippines. MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 8 ♂; 12 ♀.

REMARKS. — Among the specimens examined the largest male is 10 mm, the largest female 8 mm. Some of the specimens were spinier than those illustrated, with a spine anterior to the eye, posterior to gnathopod 1, and anterior and posterior to the gnathopod 2 attachment.

Antenna 1 peduncular segment 3 at least six times longer than flagellar segment 1. Eyes large and multifaceted. Mandible with molar, right lacinia mobilis serrate, incisor with 5 teeth, left lacinia and incisor 5-toothed; maxilla 1 outer plate bears 7 denticulate spiniform setae. The maxilliped inner plate has 1 apical tooth and 4 setae; the outer plate has an apical seta and its inner margin has a finely fringed appearance; palp segment 3 is extended on its inner margin to overhang the dactyl.

Gnathopod 2 of both male and female bears a row of "pegs" ("Stiften" of MAYER, 1903) on the propodus palm. These not only appear to drop off very easily, they also become very hard to see in a permanent mount.

MAYER (1903) described a number of named varieties of *M. sandalensis*, and SCHELLENBERG (1938) described a further one. This species is widely distributed in the Indo-Pacific and it is likely that the varieties illustrate growth stages and local variations. The specimens investigated here have characters of varieties *typica* and *doligocephala*.

DISTRIBUTION. — Widespread Indo-Pacific : Ceylon, Thailand, Malaysia, Indonesia, northern Australia, SW Pacific islands, Philippines, Japan (MCCAIN & STEINBERG, 1970; ARIMOTO, 1976); intertidal to 36 m, new record to 95 m.

Genus *MONOLIROPUS* Mayer, 1903

Monoliropus agilis Mayer, 1903

Fig. 11

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 1 ♂ 4.5 mm; 3 ♀ up to 4 mm.

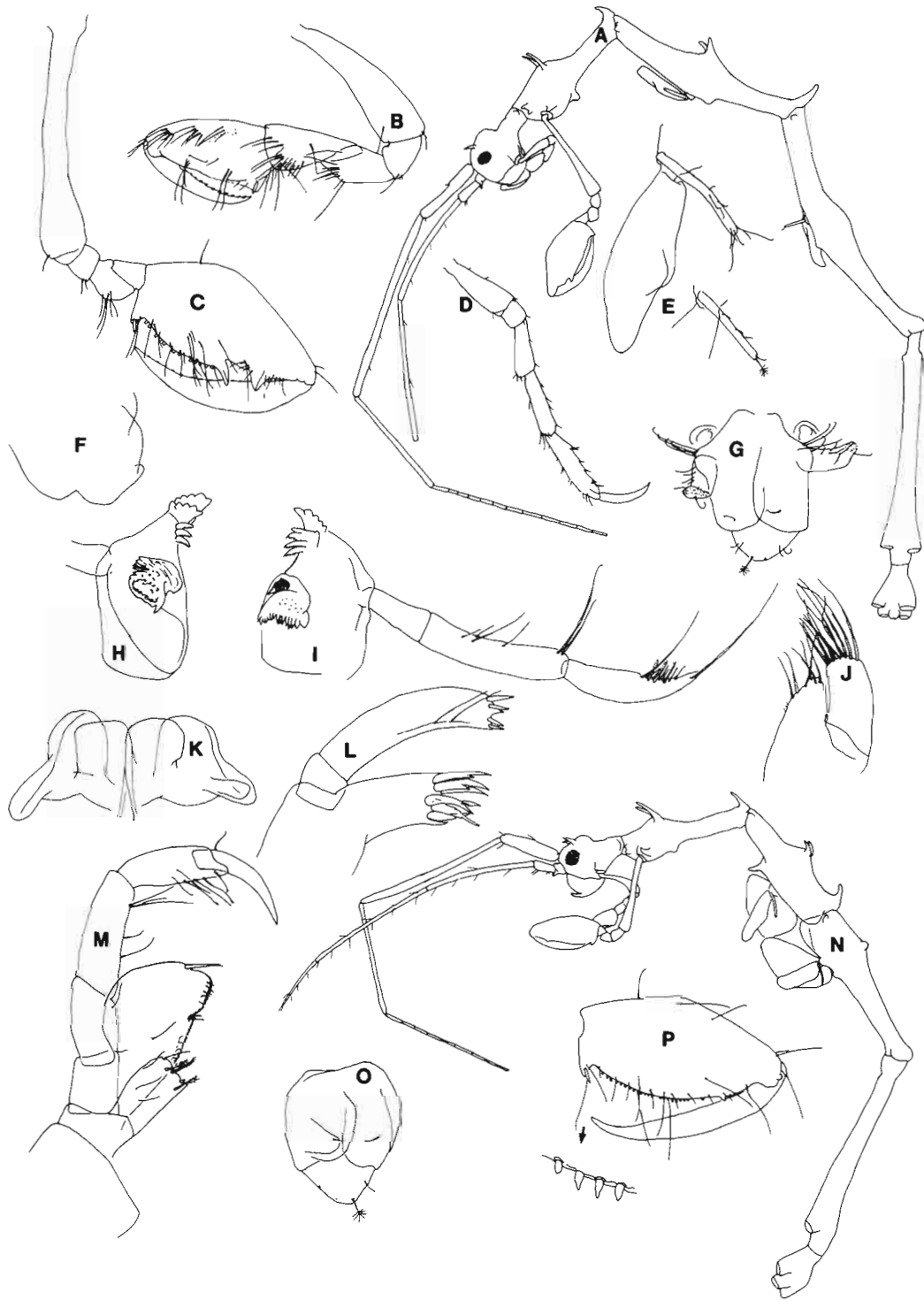


FIG. 10. — *Metaprotella sandalensis*, ♂ 10 mm : A, whole animal; B, gnathopod 1; C, gnathopod 2; D, pereopod 7; E, pereopod 3, with gill, and 4, to same scale; F, upper lip; G, abdomen, ventral; H, left mandible; I, right mandible; J, maxilla 2; K, lower lip; L, maxilla 1; M, maxilliped. — ♀ 8 mm : N, whole animal; O, abdomen, ventral; P, gnathopod 2 propodus, showing pegs.

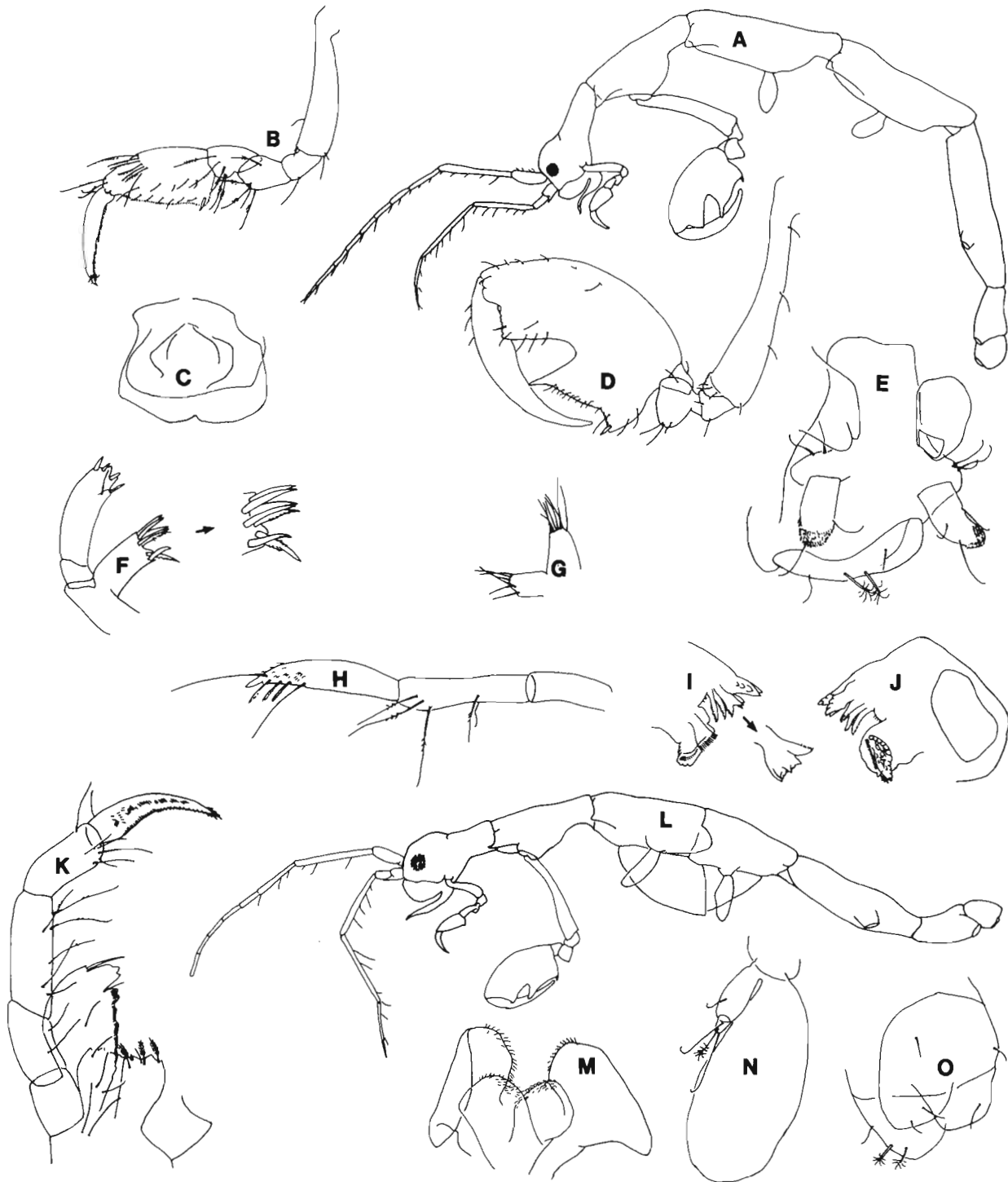


FIG. 11. — *Monoliropus agilis*, ♂ 4.5 mm : A, whole animal; B, gnathopod 1; C, upper lip; D, gnathopod 2; E, abdomen, ventral; F, maxilla 1; G, maxilla 2; H, mandibular palp; I, right mandible, partial; J, left mandible; K, maxilliped. — ♀ 4 mm : L, whole animal; M, lower lip; N, pereopod 3; O, abdomen, ventrolateral.

REMARKS. — The 3 species in the genus *Monoliropus* show considerable overlap of characters. The specimens above are very small compared to *M. agilis* at 7 mm (MAYER, 1903), *M. falcimanus* at 11 mm (MAYER, 1904) and *M. tener* at 13 mm (ARIMOTO, 1968). They agree most closely with *M. agilis*, particularly in the male abdomen and the lateral sculpturing of the body. However, a notable difference is that pereopod 3 and 4 are 2-segmented in our specimens.

Antenna 1 peduncular segment 3 is longer than flagellar article 1. Antenna 2 is setose and comparatively long. The eye is multifaceted. Mandible with molar, right lacinia mobilis cusped, incisor 5-toothed, left lacinia and incisor 5-toothed; maxilla 1 outer plate bears 7 denticulate spiniform setae. The maxilliped inner plate has an uneven apex with 1 tooth and 4 setae; the outer plate has a terminal seta and indented and irregular inner margin.

The abdomen of the male is as illustrated by MAYER (1903) with a strongly setose distal portion on the appendage.

DISTRIBUTION. — Type localities, Gulf of Thailand, Seram Sea and Banda Sea; 9-55 m. Southwestern Australia (MCCAIN & STEINBERG, 1970). New to Philippines, to 95 m.

Monoliropus falcimanus Mayer, 1904

Fig. 12

MATERIAL EXAMINED. — Philippines. MUSORSTOM 2 : stn 33, 13°32.3'N, 121°07.5'E, 135 m, 24.11.1980 : 3 ♂; 1 1/2 ♀.

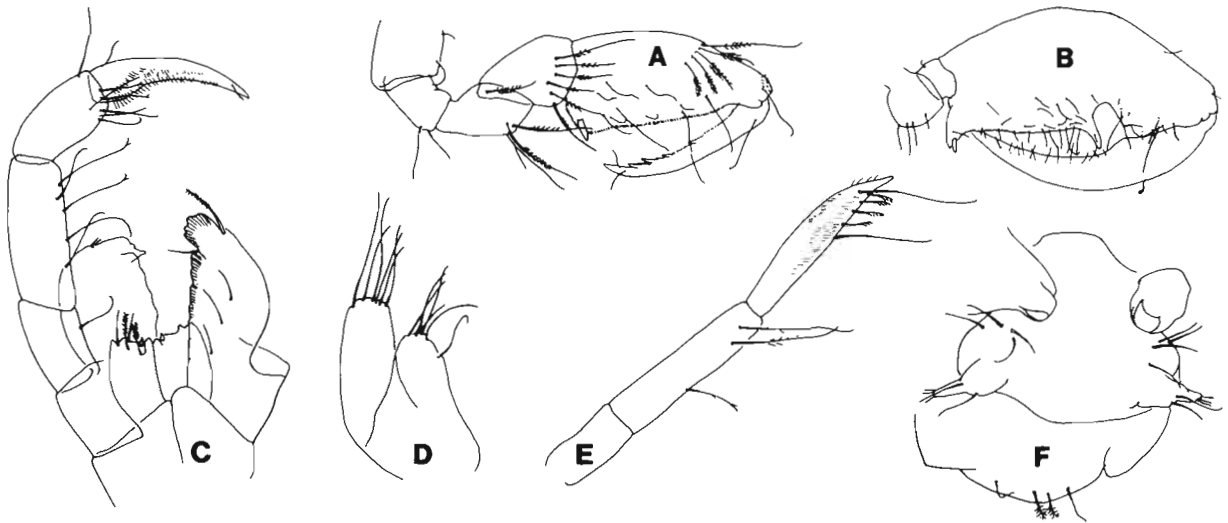


FIG. 12. — *Monoliropus falcimanus*, ♂ 4.5 mm : A, gnathopod 1; B, gnathopod 2 propodus; C, maxilliped; D, maxilla 2; E, mandibular palp; F, abdomen, ventral.

REMARKS. — These specimens are almost identical to *M. agilis*, described above. The gnathopod 2, in both sexes, has a more slender propodus with a different outline to the palm. The male abdominal appendages are constricted halfway along their length and are not as setose distally, bearing only a few longer setae. The largest male is 4.5 mm and the largest female 2.5 mm, which is about half the size of MAYER's specimens.

From the literature it appears probable that both *M. tener* Arimoto, 1968, and *Orthoprotella hamata* Arimoto, 1981, are synonymous with *M. falcimanus*, but this will have to be determined by looking at specimens.

DISTRIBUTION. — Type locality, Ceylon. Gulf of Mannar (SIVAPRAKASAM, 1969, 1977); South Africa (GRIFFITHS, 1973, 1974, 1976); 18-440 m. New to Philippines; 135 m.

Monoliropus sp.

Fig. 13

MATERIAL EXAMINED. — New Caledonia. BIOCAL : stn 51, 23°05.27'S, 167°44.95'E, 700 m, 31.08.1985 : 1 ♀ approx. 12 mm.

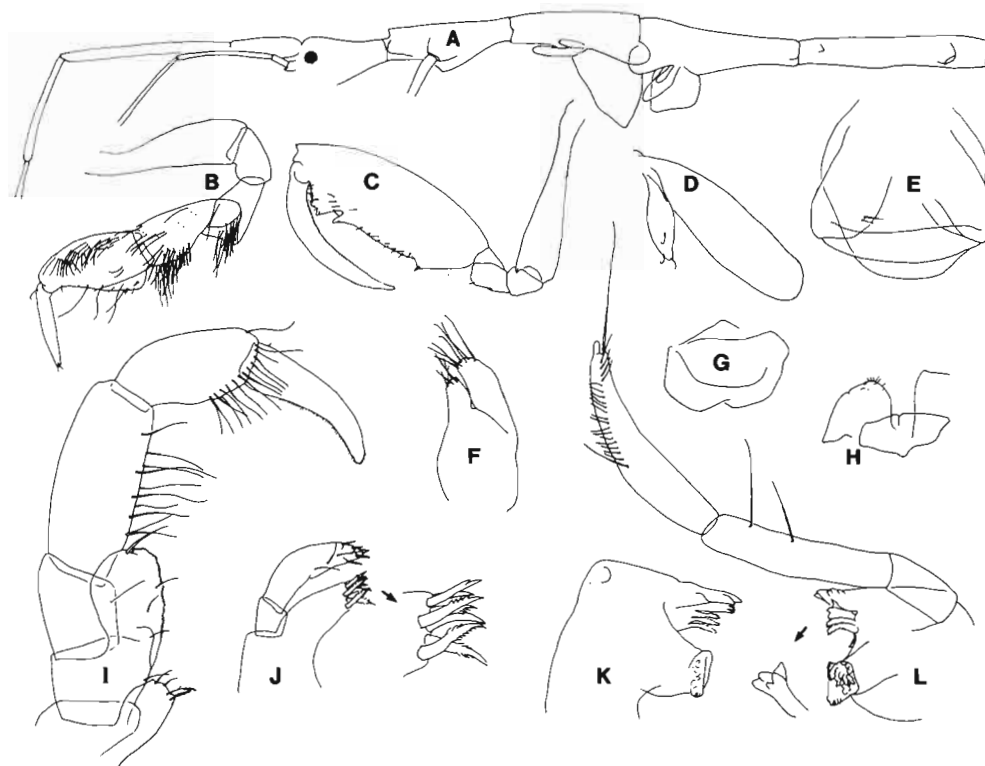


FIG. 13. — *Monoliropus* sp., ♀ 12 mm : A, whole animal; B, gnathopod 1; C, gnathopod 2; D, pereopod 3; E, abdomen, ventral; F, maxilla 2; G, upper lip; H, lower lip, partial; I, maxilliped; J, maxilla 1; K, left mandible; L, right mandible.

REMARKS. — The single specimen in poor condition is close to both *Monoliropus* and *Orthoprotella*, and it is placed in *Monoliropus* on the basis of its mouthparts.

Antenna 1 peduncular segment 3 is longer than flagellar segment 1. A multifaceted eye is present. Pereonite 2 has a dorsal step-like projection anterodorsally, anterolateral projections, and a ventral keel at the insertion of gnathopod 2.

Mouthparts similar to *M. agilis* but more setose. Maxilliped outer plate inner margin uneven and serrate. Gnathopod 1 strongly setose. Gnathopod 2 propodus slender.

Genus *ORTHOPROTELLA* Mayer, 1903

REMARKS. — The genera *Protella*, *Orthoprotella* and *Metaprotella* are very similar. In the male abdomen, *Protella* and *Metaprotella* have 1-segmented appendages, in *Orthoprotella* they are 2-segmented. Pereonites 6 and 7 are fused in *Metaprotella*, partially fused in *Orthoprotella*, separate in *Protella*. In *Metaprotella*, but not the other two genera, the dactyl of the maxilliped palp is overhung by the previous segment. The listed specimens (below) are identified as *Orthoprotella mayeri*.

Orthoprotella mayeri K.H. Barnard, 1917

Fig. 14

MATERIAL EXAMINED. — New Caledonia. BIOCAL : stn 46, 22°53.05'S, 167°17.08'E, 570 m, 30.08.1985 : 1 ♀ 8 mm. — Stn 77, 22°15.32'S, 167°15.4'E, 440 m, 05.09.1985 : 1 ♀ 7.5 mm.

Antenna 1 peduncular segment 3 smaller than flagellar segment 1. Eyes multifaceted. Mandible with molar, right lacinia mobilis serrate, incisor 5-toothed, left lacinia and incisor 5-toothed; maxilla 1 outer plate bears 7 denticulate spiniform setae. There is no dorsal spination [developed after size 8-10 mm according to BARNARD (1925)]. Pereonites 6 and 7 are fused dorsally but not ventrally. Gnathopod 2 propodus is similar to MAYER'S (1903) figures although no sign of pegs was found on the present specimens.

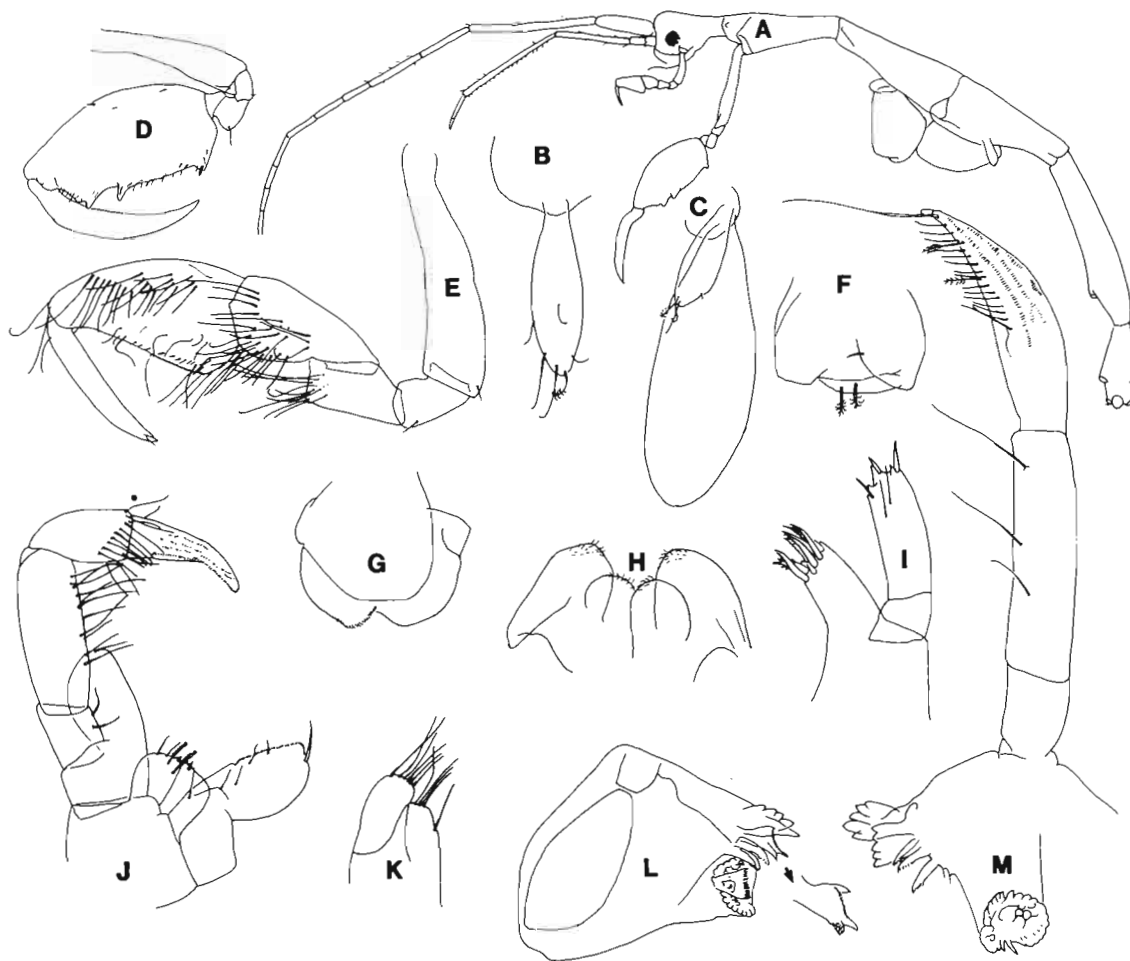


FIG. 14. — *Orthoprotella mayeri*, ♀ 7.5 mm : A, whole animal; B, pereopod 3; C, pereopod 4. — ♀ 8 mm : D, gnathopod 2; E, gnathopod 1; F, abdomen, ventral; G, upper lip; H, lower lip; I, maxilla 1; J, maxilliped; K, maxilla 2; L, right mandible; M, left mandible.

DISTRIBUTION. — Type locality, South Africa. Singapore and Sydney, Australia (MCCAIN & STEINBERG, 1970); 13-120 m. New to New Caledonia; to 570 m; associated fauna, sponges, hydrozoa, echinoderms.

Genus *PARAPROTELLA* Mayer, 1903*Paraprotella prima* Mayer, 1903

Fig. 15

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 4 ♂; 9 ♀.

REMARKS. — The largest male and female specimens are 8 mm and 7 mm respectively, compared to 6 and 10 mm reported by MAYER (1903) and the 12 mm male of ARIMOTO and MURANO (1981). The anterior spination of this species is quite variable, and the present specimens have lateral and ventral as well as dorsal spines.

Antenna 1 peduncular segment 3 as long as (female) or longer than (male) flagellar segment 1. Eyes multifaceted. Mandible with molar, right lacinia mobilis serrate, incisor 5-toothed, left lacinia and incisor 5-toothed. The apical setal row on the mandibular palp appears to be variable: the number of proximal setae may be 1 to 3; also, the palp terminates in an apical plate, proximal to which is a series of plates from between which the x setae arise. Maxilla 1 outer plate bears 7 denticulate spiniform setae. The maxilliped inner plate has an uneven apical margin with 1 tooth and 4 setae, outer plate has 1 (or 2) apical setae and an irregular inner margin.

Gnathopod 2 of male, propodus more slender and palm more developed than female. Both sexes have palmar pegs.

DISTRIBUTION. — Type localities, Singapore; Korea; Gulf of Thailand; Nagasaki, Japan; 9-46 m. Off the Boso Peninsula, Japan; 330 m (ARIMOTO & MURANO, 1981). New to Philippines; 95 m.

Genus *PROTELLA* Dana, 1852*Protella similis* Mayer, 1903

Fig. 16

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn 117, 12°31'N, 120°39.5'E, 95 m, 03.06.1985 : 6 ♂; 3 ♀.

REMARKS. — The largest male and female specimens are 10 mm and 9 mm respectively. All specimens were dorsally smooth. Lateral sculpturing was variable but usually strongly developed anteriorly on pereonite 2 and frequently differed on the two sides of the body. Some areas of the body surface bear closely packed microtubercles which give it a rough cobble-stone appearance.

Antenna 1 is very long (about as long as the body) with subequal peduncular segments 2 and 3. Eyes multifaceted and bulging laterally. Mandible with molar, right lacinia mobilis serrate, incisor 5-toothed, left lacinia and incisor 5-toothed; maxilla 1 outer plate bears 7 denticulate spiniform setae. Maxilliped inner plate with uneven apical margin bearing 1 tooth and 3 setae, outer plate with apical seta and jagged margin.

Gnathopod 1, carpus longer than propodus. Gnathopod 2 propodus palm with pegs. Pereopod 5 more slender and with a less developed palm than pereopods 6 and 7.

This is only the second report of this species.

DISTRIBUTION. — Type localities, several locations in Indonesia and Thailand; 13-400 m. New to Philippines; 95 m.

Genus *CAPRELLA* Lamarck, 1801*Caprella scaura* Templeton, 1836

MATERIAL EXAMINED. — **New Caledonia**, Baie des Citrons, 5 m, 28.07.1989 : 1 ♀.

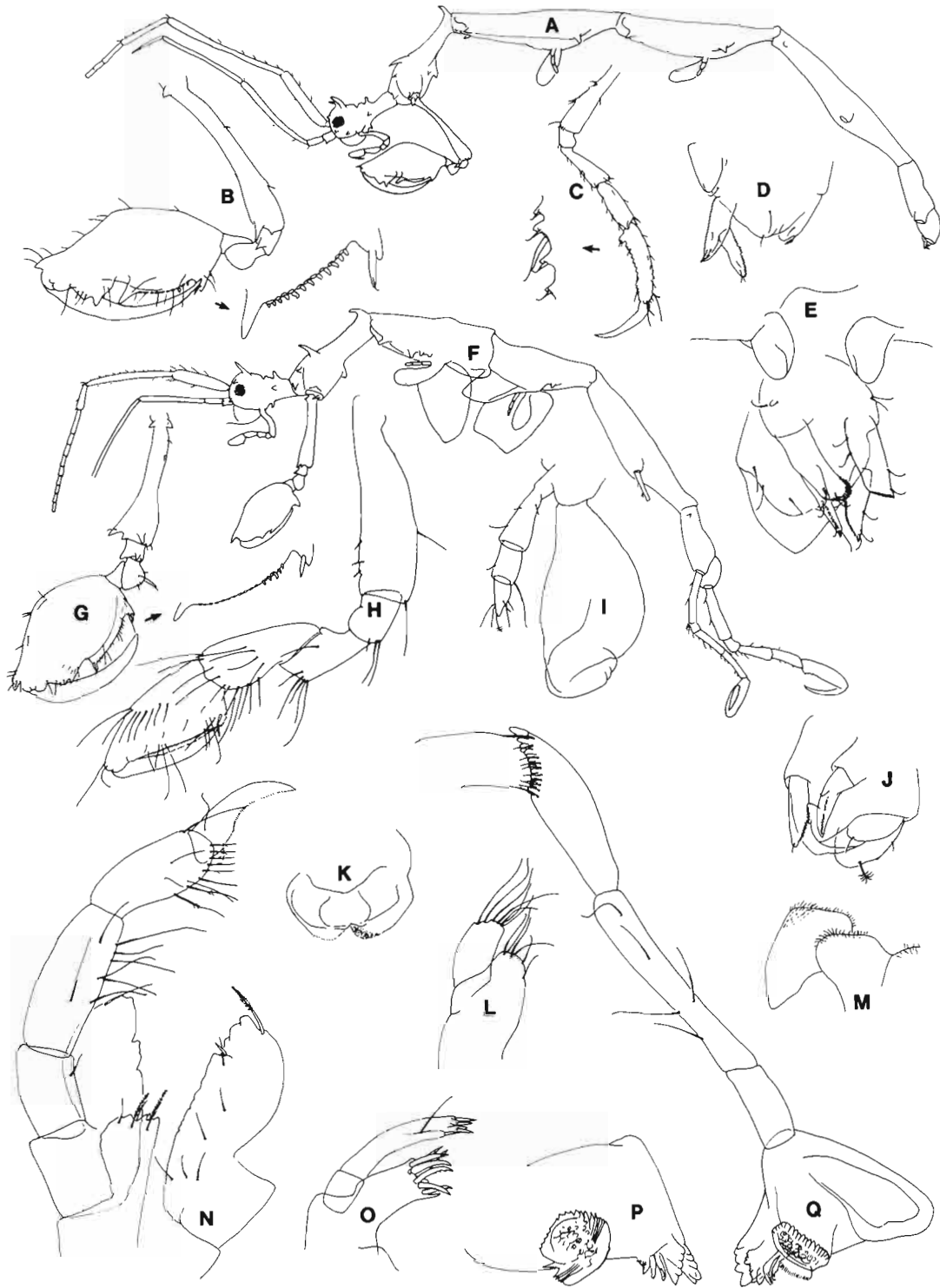


FIG. 15. — *Paraprotella prima*, ♂ 8 mm : A, whole animal; B, gnathopod 2, showing pegs; C, pereopod 7; D, abdomen, lateral; E, abdomen, ventral. — ♀ 7 mm : F, whole animal; G, gnathopod 2, showing pegs; H, gnathopod 1; I, pereopod 4; J, abdomen, ventrolateral; K, upper lip; L, maxilla 2; M, lower lip, partial; N, maxilliped; O, maxilla 1; P, left mandible; Q, right mandible.

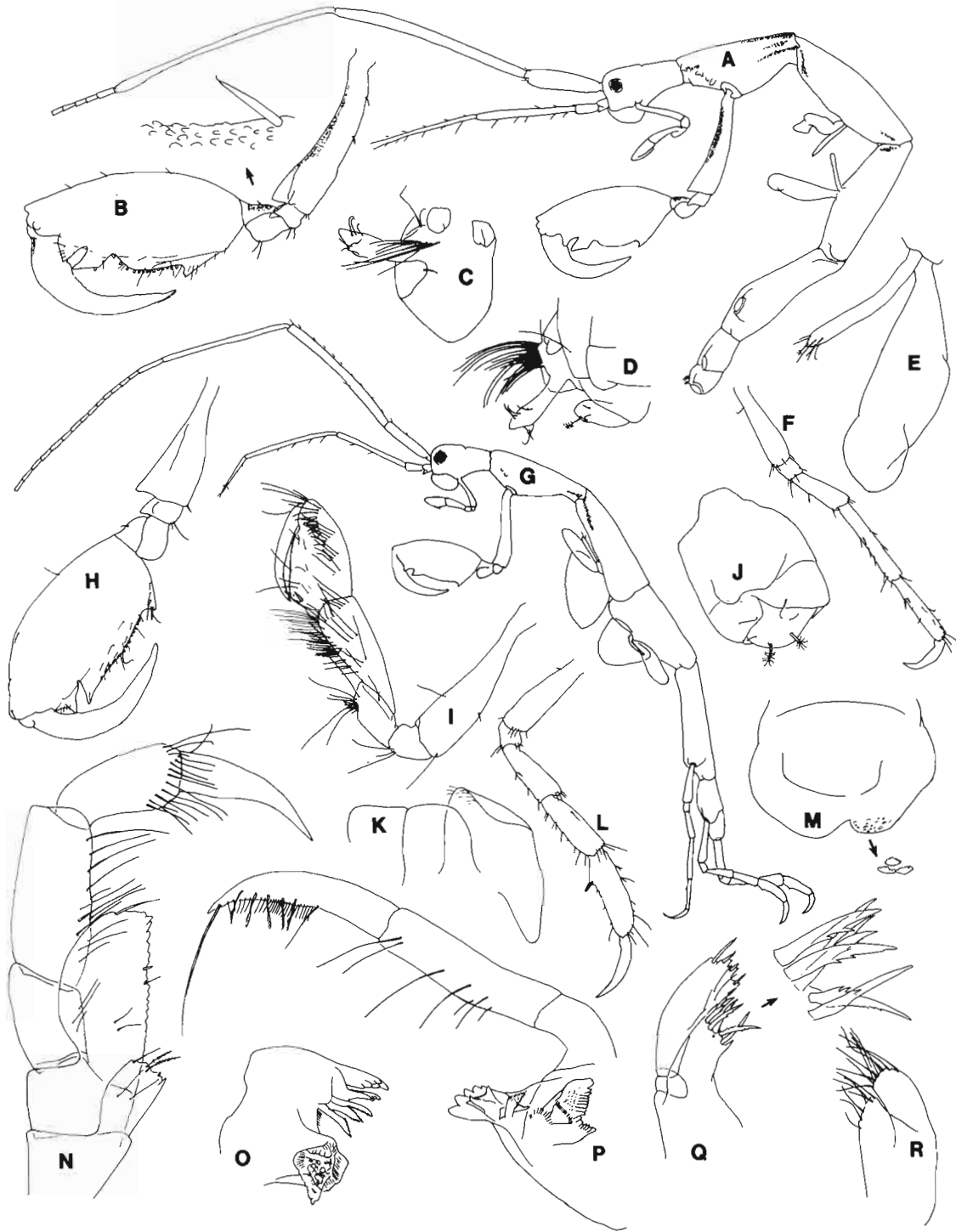


FIG. 16. — *Protella similis*, ♂ 10 mm : A, whole animal; B, gnathopod 2; C, abdomen, ventral, partial; D, abdomen, lateral; E, pereopod 4; F, pereopod 5. — ♀ 9 mm : G, whole animal; H, gnathopod 2; I, gnathopod 1; J, abdomen, ventral; K, lower lip, partial; L, pereopod 6; M, upper lip; N, maxilliped; O, left mandible; P, right mandible; Q, maxilla 1; R, maxilla 2.

REMARKS. — *Caprella scaura* is a very widely distributed species, and is well characterized in the literature. This specimen belongs to the forma *typica* of MAYER (1890) (MCCAIN, 1968; ARIMOTO, 1976).

DISTRIBUTION. — Type locality Rio de Janeiro, Brazil. Caribbean, Japan, Australia, Indian Ocean (MCCAIN & STEINBERG, 1970). New to New Caledonia.

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