

HETEROMYSIDS (CRUSTACEA; MYSIDACEA) FROM NORTHERN AUSTRALIA WITH DESCRIPTION OF SIX NEW SPECIES

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ABSTRACT

Twelve species of heteromysids collected from northern Australia were studied. Six of these species are described as new: *Heteromysis (Olivaemysis) essingtonensis*, *H. (O.) quadrispinosa*, *H. (O.) sexspinosa*, *H. (O.) tenuispina*, *H. gracilis* and *Heteromysoides macrops*. *Heteromysis (Heteromysis) gymnura* W. Tattersall and *H. (Olivaemysis) zeylanica* W. Tattersall are new records for Australian waters.

KEYWORDS: Mysidacea, Heteromysini, taxonomy, northern Australia, new species.

INTRODUCTION

Heteromysids from Australian waters were first reported by W. Tattersall (1927) with descriptions of two species. Since 1979, a series of taxonomic studies has been carried out on specimens from the Great Barrier Reef, Heron Island and northern Australia by Băcescu (1979, 1983, 1986) and Băcescu and Bruce (1980).

The present paper deals with 12 species of heteromysids collected from Darwin Harbour, Northern Territory of Australia and in neighbouring waters. Six of these species, *Heteromysis (Olivaemysis) essingtonensis*, *H. (O.) quadrispinosa*, *H. (O.) sexspinosa*, *H. (O.) tenuispina*, *Heteromysis gracilis* and *Heteromysoides macrops*, are described herein as new species.

With the addition of the present species, the known heteromysid fauna in Australia now consists of 20 species as follows.

From southern Australia: *Heteromysis tasmanica* W. Tattersall, 1927; *H. waitei* W. Tattersall, 1927.

From northeastern Australia: *Heteromysis (Gnathomysis) harpaxoides* Băcescu and Bruce, 1980; *H. (G.) stellata* Băcescu and Bruce, 1980; *H. (Heteromysis) australica* Băcescu and Bruce, 1980; *H. (H.) heronensis* Băcescu, 1979; *H. (H.) tethysiana* Băcescu, 1983; *H. (Olivaemysis) abrucei* Băcescu, 1979; *H. (O.) macrophthalma* Băcescu, 1983; *Heteromysoides longiseta* Băcescu, 1983.

From northern Australia: *Heteromysis (Gnathomysis) harpaxoides* Băcescu and Bruce, 1980; *H. (Heteromysis) australica*

Băcescu and Bruce, 1980; *H. (H.) communis* Băcescu, 1986; *H. (H.) gymnura* W. Tattersall, 1922; *H. (H.) spinosa* Băcescu, 1986; *H. (Olivaemysis) essingtonensis* sp. nov.; *H. (O.) quadrispinosa* sp. nov.; *H. (O.) sexspinosa* sp. nov.; *H. (O.) tenuispina* sp. nov.; *H. (O.) zeylanica* W. Tattersall, 1922; *H. gracilis* sp. nov.; *Heteromysoides macrops* sp. nov.

All the type specimens are stored in the Northern Territory Museum, Darwin, Australia (NTM).

SYSTEMATICS

Heteromysis (Heteromysis) gymnura W. Tattersall

(Fig. 1)

Heteromysis gymnura W. Tattersall, 1922: 500-502; O. Tattersall, 1962: 243-245.

Material. NORTHERN TERRITORY: 2 adult ♂ and 1 immature ♂, NTM Cr.004088, 4.0, 4.3 and 3.7mm, Table Head, Port Essington, 8m, from gorgonian host, 7.viii.1986.

Remarks. Specimens collected are identified as *H. gymnura* W. Tattersall by: (1) large eye lacking a denticle at distal end of medial margin of eyestalk (Fig. 1A); (2) segment 3 of antennal peduncle longer than either of the other 2 segments (Fig. 1B); (3) shape of thoracic endopod 3 (Fig. 1D); (4) lack of spines on inner margin of endopod of uropod; and (5) shape and armature of telson (Fig. 1L). Minor differences are present in thoracic endopods 3-8. In W. Tattersall's specimens thoracic endopod 3 is armed with

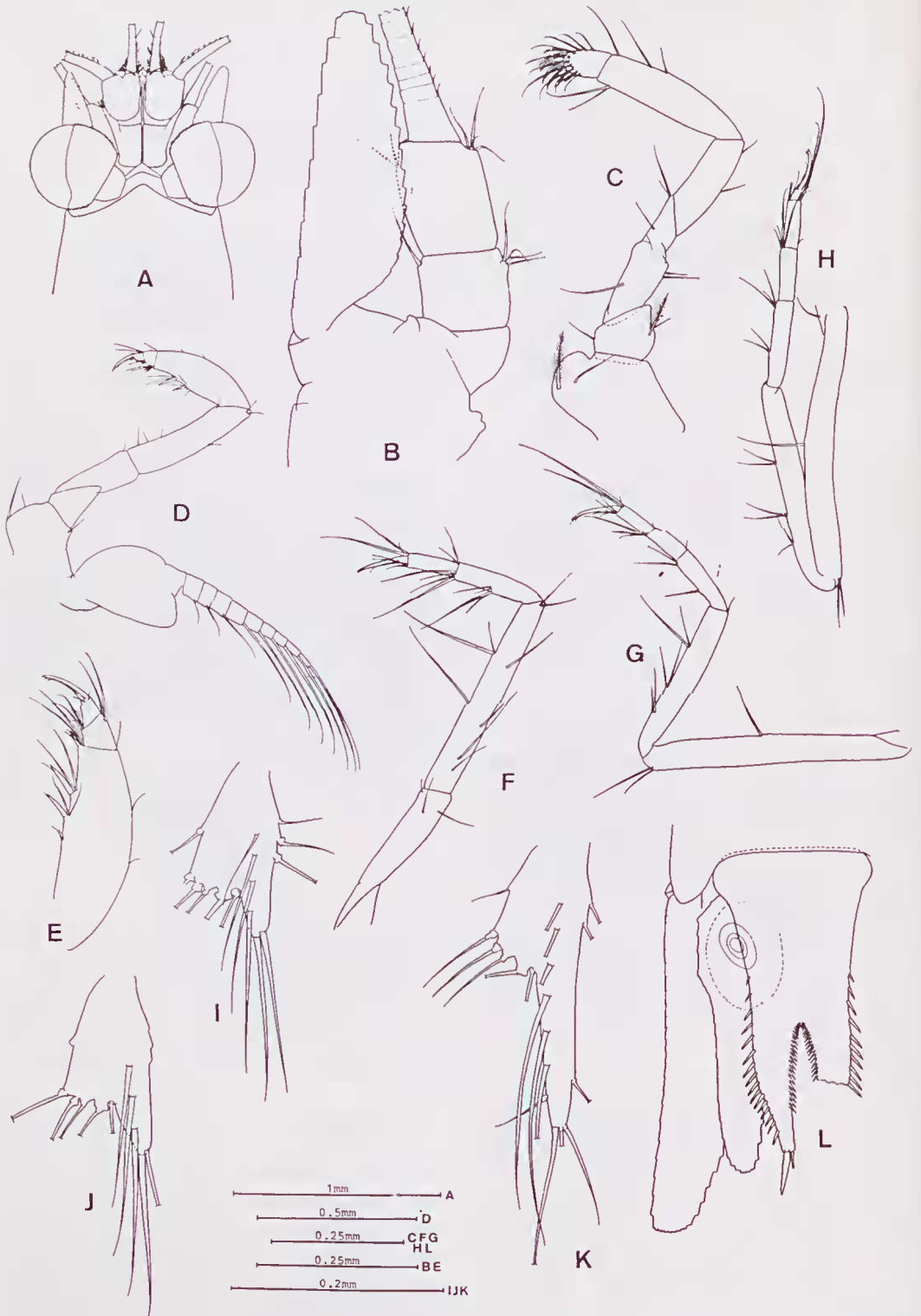


Fig. 1. *Heteromysis (Heteromysis) gymnura* adult ♂: **A**, anterior end; **B**, antenna; **C**, second thoracic endopod; **D**, third thoracic endopod; **E**, extremity of third thoracic endopod; **F**, one of fourth to eighth thoracic endopods; **G**, one of fourth to eighth thoracic endopods; **H**, one of fourth to eighth thoracic endopods; **I**, third pleopod; **J**, fourth pleopod; **K**, fifth pleopod; **L**, uropod and telson.

3 stout spines on inner margin of carpopropodus, while those from Table Head have 4 spines of which the distal 2 overlap each other at almost the same position, giving the appearance of only one spine (Fig. 1E). I think that W. Tattersall (1922) possibly overlooked one of these paired spines. W. Tattersall (1922) described carpopropodus of thoracic endopods 4-8 as being composed of 3 segments. In the Table Head specimens they are also 3-segmented (Fig. 1G, H). However, I found a 2-segmented carpopropodus (Fig. 1F), but I cannot determine its true position.

O. Tattersall (1962) recorded this species from Zanzibar, on the east coast of tropical Africa, illustrated it and later (1967) gave an illustration of the male pleopod 4. Her drawings, however, gave me the impression as if these are of a species distinct from my specimens because of dissimilarities in the male pleopods, antennular peduncle, rostrum, and thoracic endopod 3. Subsequently I examined O. Tattersall's material on loan from the collection of the British Museum (Natural History). The material is composed of 2 specimens, one is a female in fairly good condition and the other is a fragmentary male, divided into 2 parts.

O. Tattersall (1967, Table 1, Fig. 36) indicated the male pleopod 4 to be modified, but I was unable to observe any modification on the fragmentary male. O. Tattersall (1962, Figs 26, 27) described and illustrated the sexual dimorphism of thoracic endopod 3. The present male specimens are allied to that of her female but not to that of the male. However, the discrepancy cannot be clarified because the thoracic endopod 3 is missing in both sexes of her specimens. O. Tattersall (1962) illustrated the female antennular peduncle to be slender, but I did not observe it to be so slender as in her figure (1962, Fig. 25).

In the material from Zanzibar the rostrum is different between sexes, in the female it is longer and covers the basal part of the antennular peduncles, as shown by O. Tattersall (1962, Fig. 25) and in the male it is shorter as shown in Fig. 1A.

Distribution. This species has previously been recorded from the Gulf of Manaar, India (W. Tattersall 1922) and from Zanzibar (O. Tattersall 1962). It seems to be widely

distributed in coastal regions of the tropical Indian Ocean.

Heteromysis spinosa Băcescu
(Fig. 2)

Heteromysis spinosa Băcescu, 1986: 19-22.

Material. NORTHERN TERRITORY: 1 adult ♀, NTM Cr.005491, 3.0mm, Table Head, Port Essington, 11°14.8'S 132°11.2'E, 6m, coral rubble washings, 12. v. 1983, N.L. Bruce; 3 adult ♀, NTM Cr.005029, 2.7, 3.0 and 3.1mm, Fort Hill Wharf, Darwin Harbour, 5m; 23 vii 1986, P. Alderslade. WESTERN AUSTRALIA: 1 adult ♂, NTM Cr. 005476, 2.9mm, Ashmore Reef.

Remarks. The present specimens are easily identified as *H. spinosa* Băcescu, because of the shape of the eye (Fig. 2A). Differences between the type specimen and the present specimens are 6-7 lateral spines on telson of type specimens, while 6-9 spines in present specimens, spines are considerably shorter (Fig. 2D, E) as compared with those of type specimen; number of spines on margin of telson cleft, 3-6 in present specimens (Fig. 2D, E) and 4 in type specimen; inner margin of endopod of uropod armed with 9-11 spines in present specimens (Fig. 2C) as against 6 in type material. Spines may be increase in number and decrease in length during growth; type specimen was subadult (2.5mm), present specimens are adults (2.7 to 3.1mm).

The specimens from Fort Hill Wharf were commensal with sponges.

Distribution. Previously only known from Darwin Harbour, Northern Territory of Australia.

Heteromysis (Heteromysis)
communis Băcescu
(Fig. 3)

Heteromysis communis Băcescu, 1986: 22-24.

Material. NORTHERN TERRITORY: 1 immature ♀, NTM Cr.005222, 2.5mm, Dudley Point Reef, Darwin Harbour, 10m, sponge washings, 31.viii.1982, R. Williams; 1 immature ♀, NTM Cr.005223, 2.9mm, same data as above; 1 immature ♀, 3.2mm and 1 immature ♂, 3.0mm, NTM Cr.005224, same data as above; 1 immature ♂ (damaged) and 1 juvenile, NTM Cr.005225, same data as above; 3 adult ♂, NTM Cr.005504, 3.4, 3.3

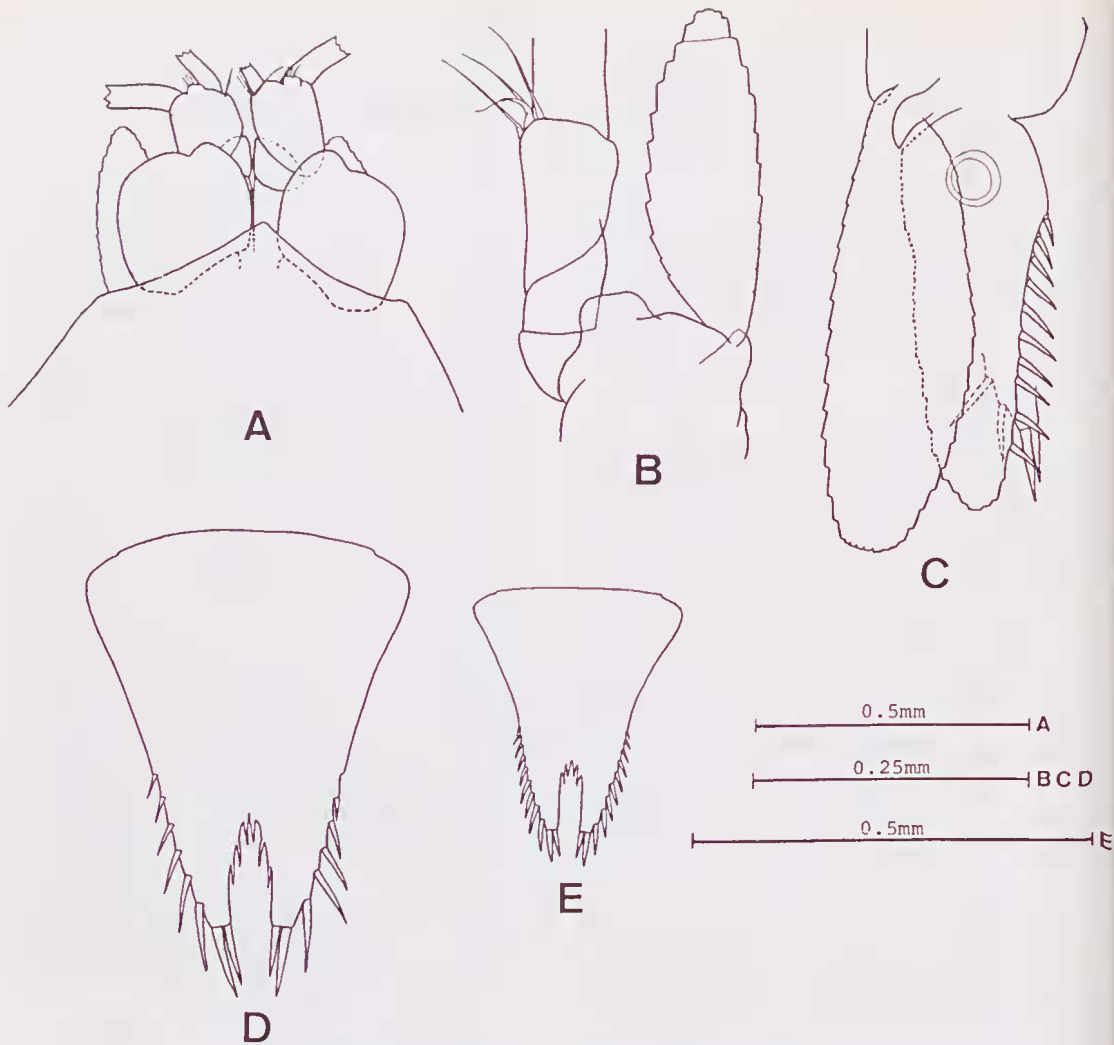


Fig. 2. *Heteromysis (Heteromysis) spinosa* adult ♀ : A, anterior end; B, antenna; C, uropod; D, telson; E, telson.

and ca 3.3mm, Fort Hill Wharf, Darwin Harbour, 75m, 23.vii.1986, P. Alderslade.

Remarks. The present specimens differ from those described by Băcescu (1986) in the following ways: (1) distal end of medial margin of eyestalk pointed in dorsal view in type specimens, but not so in present specimens (Fig. 3A); (2) carpopropodus of male thoracic endopod 3 is 3 times as long as broad in present specimens (Fig. 3C) as against 4 times in type specimens, and (3) penis of type specimen armed with only a single seta in anterior distal angle, while that of present specimens armed with 2 setae in anterior distal angle and a seta on middle of posterior margin (Fig. 3G).

This species has the following specific characteristics in addition to those given in the original description. Male rostrum triangular with narrowly rounded apex extending to midlength of segment 1 of antennular peduncle and covering basal part of eyestalks (Fig. 3A). Merus of thoracic endopod 3 subequal to carpopropodus in length, inner margin with 4 small flagellate spines and triangular process distally (Fig. 3C, E). Thoracic endopod 4 with 4-segmented carpopropodus more slender and less hirsute than posterior pairs, and with straight claw distally (Fig. 3F).

The present specimens were collected with sponges.

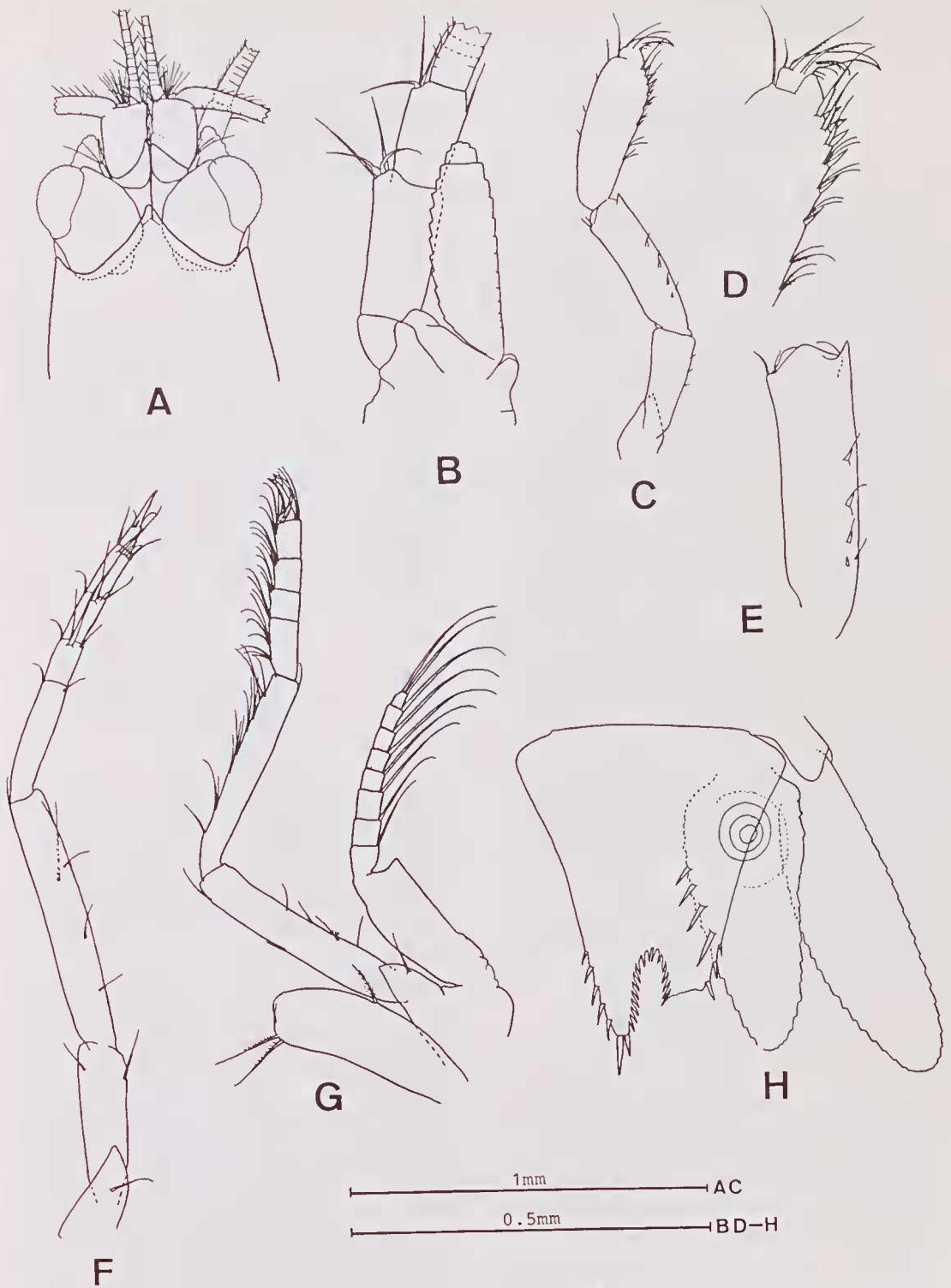


Fig. 3. *Heteromysis (Heteromysis) communis* adult ♂: A, anterior end; B, antenna; C, third thoracic endopod; D, extremity of third thoracic endopod; E, merus of third thoracic endopod; F, fourth thoracic endopod; G, eighth thoracic limb and penis; H, uropod and telson.

Distribution. Previously only known from Darwin Harbour, Northern Territory of Australia.

Heteromysis (Heteromysis) australica Băcescu and Bruce

(Fig. 4)

Heteromysis (Heteromysis) australica Băcescu and Bruce, 1980: 63-65.

Material. NORTHERN TERRITORY: 1 adult ♂, 5.3mm and 1 adult ♀ with embryos, 5.5mm, NTM Cr.005219, Dudley Point Reef, Darwin Harbour, 12°25'S 130°49.1'E reef flat, 6.ix.1982, A.J. Bruce.

Remarks. The present specimens differ from the original description of *H. (H.) australica* in the following respects: (1) rostrum short and rounded in present specimens (Fig. 4A), but long and pointed in type specimens; (2) carpopropodus of thoracic endopod 3 of present specimens with small hook at posterior angle of outer margin (Fig. 4D), but not illustrated on type material; (3) penis of present specimens more robust and without seta (Fig. 4G), while that of type material with one seta on anterior margin; and (4) telson sinus deeper, $\frac{1}{3}$ of telson length (Fig. 4I) while that of type specimens is $\frac{1}{4}$ of telson length.

Present specimens may be distinct from *H. australica*, because of differences in rostrum and penis, which seem to be specific. However, more specimens from both localities need to be examined to support this contention.

Distribution. Known from Heron Island, Queensland (Băcescu and Bruce 1980) and Darwin Harbour (present data).

Heteromysis (Olivaemysis) zeylanica W. Tattersall

(Fig. 5)

Heteromysis zeylanica W. Tattersall, 1922: 499-500.

Material. NORTHERN TERRITORY: 2 adult ♂, NTM Cr.005499, 3.8 and 4.0mm, Dudley Point Reef, Darwin Harbour, 12° 25'S 130° 49.1'E, reef flat, 6 ix 1982, A.J. Bruce.

Remarks. The present specimens differ from the original description of *H. zeylanica* in the following points: (1) antennal scale longer than antennal peduncle (Fig. 5B), but shorter in type specimens; (2) antennal

peduncle with segment 2 longer than 3 (Fig. 5B), while both segments equal in length in type specimens; (3) carpopropodus of thoracic endopod 3 with 6 spines (Fig. 5C), as against type specimens with 4 or 5 spines; and (4) carpopropodus of thoracic endopod 4 divided into 3 subsegments (Fig. 5D) and into 6 subsegments in endopods 5-8 (Fig. 5E), while in type specimens these endopods have 4 subsegments.

W. Tattersall (1922) did not describe the male pleopods. Males of the present specimens have modified pleopods 2-4; pleopod 2 armed with 7 strong flagellate spines on distal half of inner margin (Fig. 5F), pleopod 3 with obliquely rounded distal margin armed with 9 flagellate spinules (Fig. 5G), and pleopod 4 similar to pleopod 3 but slightly larger and armed on obliquely rounded distal margin with 16 flagellate spinules which are smaller than those of pleopod 3 (Fig. 5H).

Distribution. Known from the Gulf of Manaar, India (W. Tattersall 1922) and Darwin (present data).

Heteromysis (Olivaemysis) essingtonensis sp. nov.

(Figs 6, 7)

Type material. HOLOTYPE — ♂, NTM Cr.005492, 6.1mm, Table Head, Port Essington, Northern Territory, 4m, rubble washings, 12.v.1983, N.L. Bruce, ALLOTYPE — ♀ with embryos, NTM Cr.005492, 6.2mm, same data as holotype. PARATYPE — ♂, NTM Cr.005493, 6.3mm, same data as holotype except 6m.

Additional material. NORTHERN TERRITORY: 1 immature ♀, NTM Cr.005500, 5.2mm, Table Head, Port Essington, 8m, from gorgonian host, 7.viii.1986.

Description. Anterior margin of carapace produced into triangular rostrum with narrowly rounded apex and concave lateral margins, reaching base of antennular peduncle (Fig. 6A, C), anterolateral corners rounded, posterior margin of carapace emarginate, exposing last thoracic somite dorsally.

Eye with cornea occupying $\frac{1}{3}$ of whole eye and slightly narrower than stalk; stalk gradually becoming broader posteriorly as proximolateral angle swells out laterally, without spine at distal end of medial margin, medial margin sparsely hispid (Fig. 6A, C).

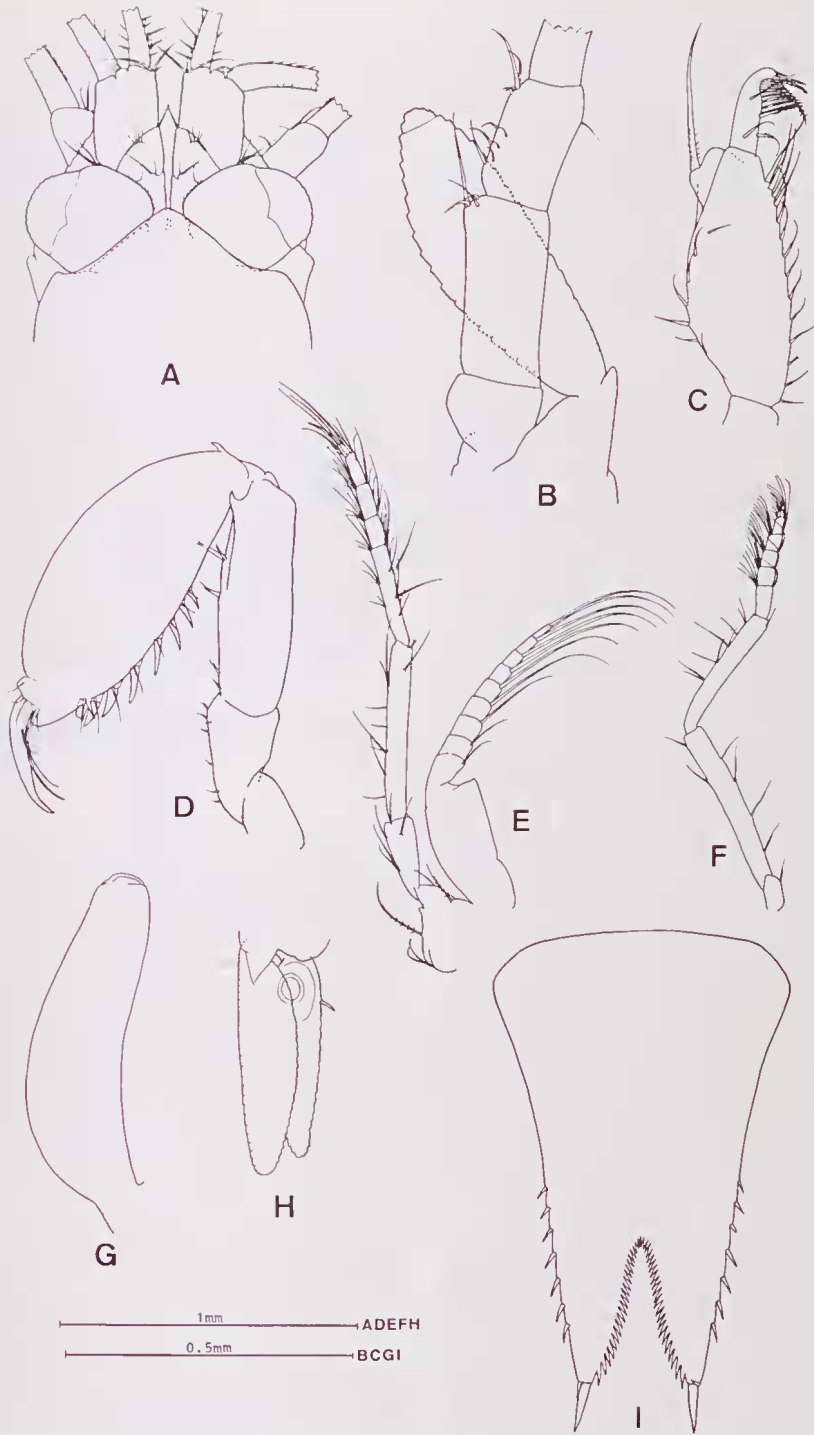


Fig. 4. *Heteromysis (Heteromysis) australica* adult ♂ except E, adult ♀ : A, anterior end; B, antenna; C, mandibular palp; D, right third thoracic endopod; E, fourth thoracic limb; F, one of fifth to eighth thoracic endopods; G, penis; H, uropod; I, telson.

Antennular peduncle not showing large differences between sexes except small processus masculinus in male, segment 1 with prolonged outer distal corner tipped with several setae, segment 2 triangular in dorsal view with oblique connection with segment 3, segment 3 with inner margin shorter than outer margin and armed with one seta at middle and with 3 setae at distal corner, 2 of which grow forwardly and one outwardly; flagellate spine (Fig. 6B) present at each inner distal angle of 3 peduncular segments (Fig. 6A, C).

Antennal scale elliptical, less than 3 times as long as broad, extending to midlength of segment 3 of antennular peduncle, setose all round, distal suture present; antennal peduncle longer than scale, shorter than antennular peduncle, with segment 2 longest (Fig. 6D).

Labrum with triangular anterior margin with obtusely pointed apex.

Other mouthparts and thoracic endopods 1 and 2 as shown in Fig. 6E-I.

Thoracic endopod 3 robust, not showing marked sexual dimorphism, merus less than 3 times longer than broad, sparsely armed with setae, carpopropodus about 2 times as long as broad, inner margin smooth in proximal half and armed with 6 strong flagellate spines on distal half, terminal claw very strong (Fig. 7A,B). Carpopropodus of remaining thoracic endopods divided into 3 subsegments in endopod 4, 5 in endopods 5 and 7, and 6 in endopod 6 (Fig. 7C), condition in endopod 8 unknown due to damage.

Uropod setose all round; exopod extending beyond telson by $\frac{1}{3}$ of its length, 3.5 times longer than broad; endopod somewhat shorter than exopod, inner margin slightly concave, with 13-15 spines increasing in length distally along entire length exclusive of short distance near apex (Fig. 7D).

Telson longer than last abdominal somite, 1.2 times longer than broad, lateral margin slightly concave, with 18-21 spines increasing in length distally along entire length; apical lobes terminating in 2 spines, inner spine shorter than outer and equal in size to distalmost spine on lateral margin; sinus 2/7 of telson length, widest in middle part, with 12-14 small spines in about proximal half (Fig. 7E).

All pleopods of both sexes uniramous and unsegmented; female pleopods subequal, increasing in length posteriorly; male pleopods 1, 2 and 5 similar to those of female,

pleopod 3 modified, with 14 flagellate spinules on distal end obliquely rounded, pleopod 4 similar to pleopod 3, with 16 flagellate spinules (Fig. 7F).

Remarks. This species is closely related to *H. abrucei* collected from Heron Island, northeastern Australia, in its general form, and by having telson with spines along entire length of lateral margins and with spines in proximal half of sinus. Between these species, however, the following differences may be noted: (1) apex of rostrum narrowly rounded in new species, while obtusely pointed in *H. abrucei*; (2) eyes bear a denticle at distal end of medial margin of cystalk in *H. abrucei*, whereas this denticle is absent in new species; and (3) endopod of uropod furnished with 13-15 spines on almost the entire length of inner margin in new species, while *H. abrucei* is armed with only 3 spines on inner margin near statocyst.

Etymology. The species is named after the locality in which it was collected.

Heteromysis (Olivaemysis) quadrispinosa
sp. nov.

(Fig. 8)

Type material. HOLOTYPE — ♀ with embryos, NTM Cr.005494/A, 4.6mm, Table Head, Port Essington, Northern Territory, 11° 14.8'S 132° 11.2'E, 4m, rubble washings, 12 v 1983. ALLOTYPE — ♂, NTM Cr.005494/B, same data as holotype.

Additional material. NORTHERN TERRITORY: 1 immature ♀ and 1 immature ♂, NTM Cr.005494, 3.8 and 3.4mm, same data as holotype; 1 adult ♀ with embryos, NTM Cr.005495, 4.5mm, same data as holotype except 6m and coral washings.

Description. Carapace produced anteriorly into triangular rostrum with very narrowly rounded or pointed apex extending to midlength of antennular peduncle segment 1, lateral margins of rostrum slightly concave (Fig. 8A, B), anterolateral corners of carapace rounded, posterior margin emarginate, leaving last thoracic somite exposed dorsally.

Eye extending laterally, with hemispherical cornea narrower than stalk and occupying less than half of whole organ; stalk with well developed denticle at distal end of medial margin (Fig. 8A, B).

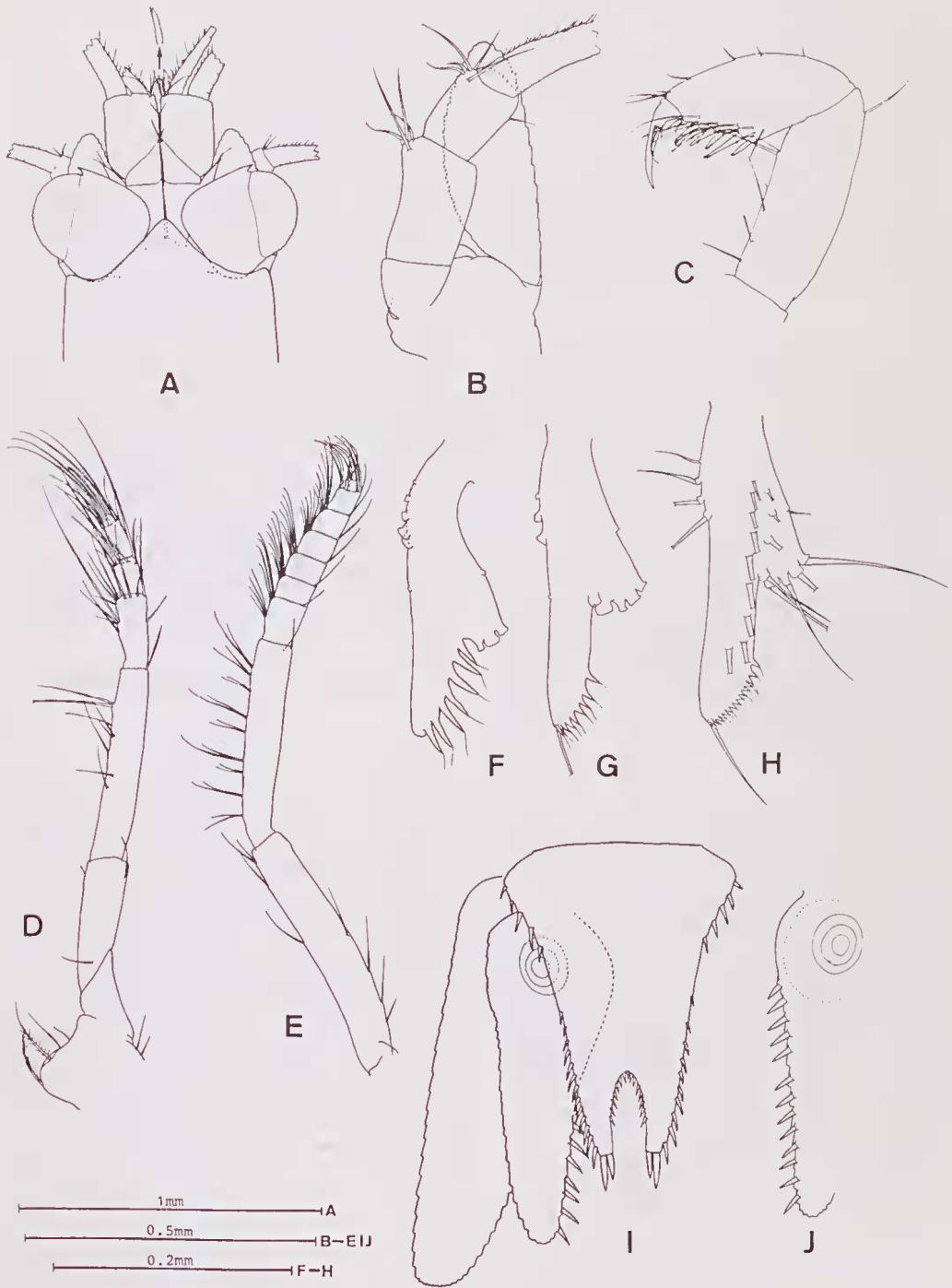


Fig. 5. *Heteromysis (Olivaemysis) zeylanica* adult ♂: A, anterior end; B, antenna; C, extremity of third thoracic endopod; D, fourth thoracic endopod; E, one of fifth to eighth thoracic endopods; F, second pleopod; G, third pleopod; H, fourth pleopod; I, uropod and telson; J, inner margin of endopod of uropod.

Antennular peduncle robust, segment 1 with outer distal corner greatly extending anteriorly and tipped with several setae, segment 2 obliquely articulated with segment 3, with 2 setae at inner distal corner, segment 3 with one flagellate spine and 3 setae at inner distal corner, one of these thick, long, and extending laterally (Fig. 8A, B).

Antennal scale elongate elliptical, nearly 3 times longer than broad, reaching midlength of segment 3 of antennular peduncle, setose all round, distal suture present. Antennal peduncle extending to apex of scale (Fig. 8C).

Thoracic endopod 3 robust, merus more than 3 times longer than broad, with 4 spinous setae on outer side, carpopropodus about 2 times as long as broad, furnished on distal 2/3 of inner margin with 4 flagellate spines, 2 distal spines arranged in a pair, terminal claw very strong (Fig. 8D, E).

Thoracic endopod 4 slender, with 3-subsegmented carpopropodus, subsegment 1 equal to combined length of subsegments 2 and 3 (Fig. 8F). Thoracic endopods 5-8 with 6-subsegmented carpopropodus, dactylus very small, ending in slender claw (Fig. 8G).

Male thoracic somites 2-7 with simple triangular sternal process.

Marsupium composed of 2 pairs of brood laminae.

Uropod with both rami broad, setose all round; endopod extending for 1/4 of its length beyond apex of telson, with 4 spines in statocyst region on inner margin; exopod extending for 1/7 of its length beyond apex of endopod, inner margin slightly more convex than outer (Fig. 8H, I).

Telson longer than last abdominal somite, triangular with apical sinus, slightly longer than broad, lateral margin nearly straight, furnished with 10-12 spines along entire length, densely on distal half and proximal 1/4, and sparsely on middle part, apex of lobes furnished with 2 spines, inner spine subequal to distalmost spine on lateral margin and less than half as long as outer spine; apical sinus about 1/3 of telson length, with 31 slender spines in holotype and 23 spines in allotype along entire length of margin (Fig. 8I, J).

In male, pleopod 1 not modified, small; pleopod 2 slightly modified, with one flagellate spine on apex and one on inner margin (Fig. 8K); pleopod 3 modified, with 6 flagellate spinules on obliquely rounded apex and

3 flagellate spinules on inner margin (Fig. 8L); pleopod 4 similar to pleopod 3 in structure but much broader, with more than 30 flagellate spinules on obliquely rounded apex (Fig. 8M); pleopod 5 not modified, smaller than pleopod 4 (Fig. 8N).

Remarks. The new species is related to *H. brucei* O. Tattersall and *H. abrucei* in: (1) rostrum with pointed or very narrowly rounded apex; (2) eyestalk with a denticle at distal end of medial margin; (3) endopod of uropod with spines on inner margin near statocyst; and (4) telson with spines along entire length of lateral margin. However, the new species differs from the two latter species in the armature of telson sinus, the armature on carpopropodus of thoracic endopod 3 and the number of lateral spines on telson, and moreover, it is distinguishable from *H. abrucei* by the number of subsegments of thoracic endopods 5-8 and the structure of male pleopods 3,4.

Etymology. The species is named after the 4 spines on the carpopropodus of thoracic endopod 3.

Heteromysis (Olivaemysis) sexspinosa
sp. nov.

(Figs 9, 10)

Material. HOLOTYPE — ♀ with embryos, NTM Cr.005501, 5.9mm, Table Head, Port Essington, Northern Territory, 8m, from gorgonian host, 7 viii 1986.

Additional material. NORTHERN TERRITORY: 1 adult ♀, 5.7mm, 2 immature ♀, 4.0 and 4.1mm, and 1 immature ♂, 3.4mm, NTM Cr.005501, same data as holotype.

Description. Carapace produced into triangular rostrum with rounded apex and slightly concave lateral margins, extending anteriorly to midlength of antennular peduncle segment 1 (Fig. 9A), anterolateral corner of carapace rounded, posterior margin emarginate, leaving last thoracic somite exposed dorsally.

Eye with hemispherical cornea narrower than stalk, eyestalk with well developed denticle at distal end of medial margin (Fig. 9A).

Antennular peduncle robust, segment 1 with distolateral corner strongly produced anteriorly and tipped with several setae, segment 3 connected with segment 2 obliquely, furnished at distomedial end with one flagel-

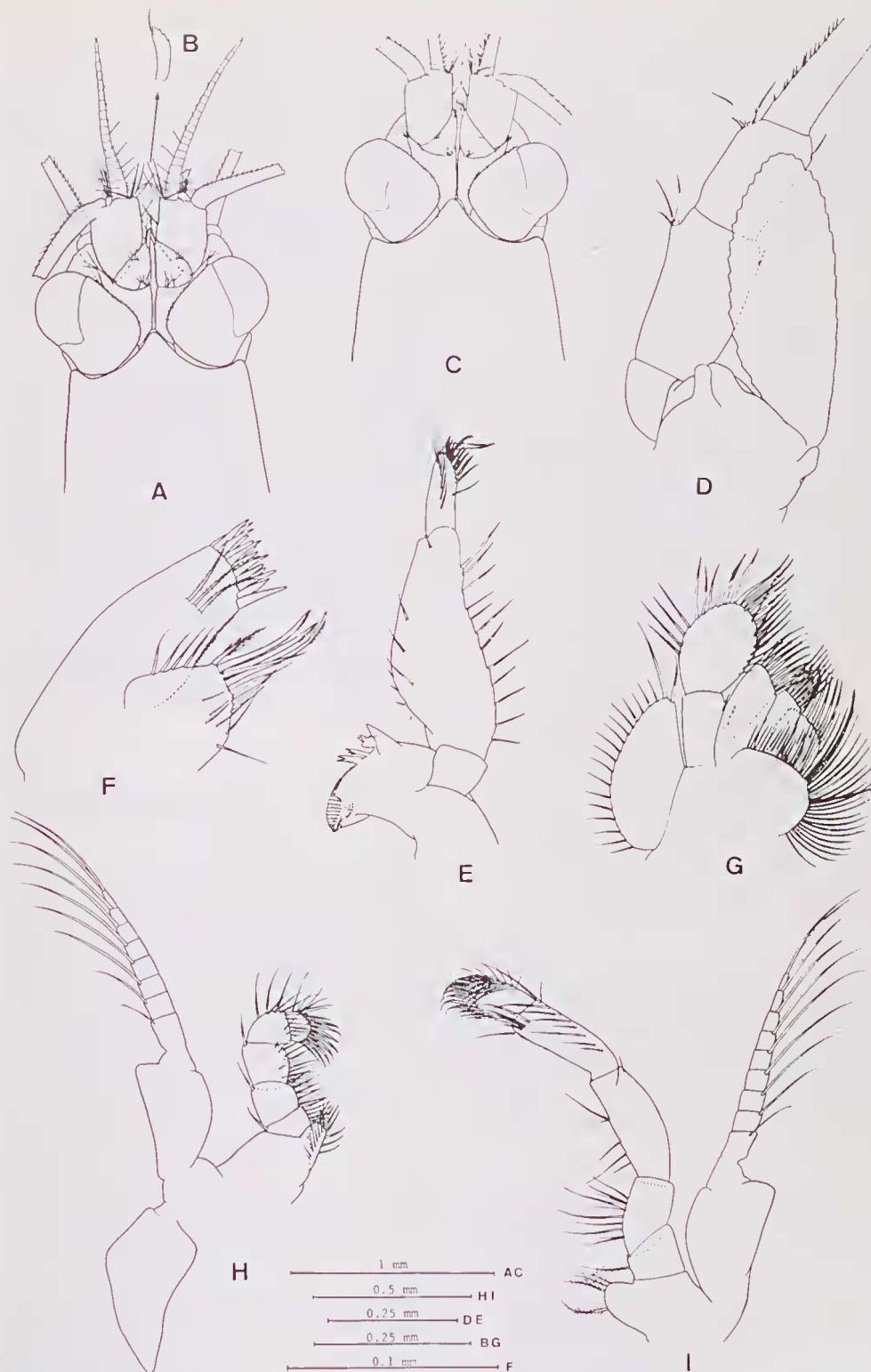


Fig. 6. *Heteromysis (Olivaemysis) essingtonensis* holotype except C, allotype: **A**, anterior end; **B**, flagellate spine on third segment of right antennular peduncle; **C**, anterior end; **D**, antenna; **E**, mandible; **F**, maxillule; **G**, maxilla; **H**, first thoracic limb; **I**, second thoracic limb.

late obtuse spine and 3 setae, one of these thick, long and extending laterally (Fig. 9A).

Antennal scale elongate elliptical, 2.5 times longer than broad, extending to mid-length of antennular peduncle segment 3, inner margin more convex than outer margin, setose all round, distal suture invisible. Antennal peduncle not reaching apex of scale, combined length of segments 2 and 3 subequal to scale length (Fig. 9B).

Mouthparts and thoracic endopods 1 and 2 as shown in Fig. 9C-E and Fig. 10A, B; in holotype some setae and spines may be abnormal in their shape and colour.

Thoracic endopod 3 robust, merus slightly less than 3 times longer than broad, carpopropodus less than 2 times as long as broad, furnished on distal half of inner margin with 6 flagellate spines, proximal 2 spines more slender than distal 4 arranged in 2 pairs, terminal claw very strong (Fig. 10C, D).

Thoracic endopod 4 slender, with 3-subsegmented carpopropodus shorter than merus, subsegment 1 equal to combined length of subsegments 2 and 3 (Fig. 10E).

Thoracic endopods 5-8 with 7- or 8-subsegmented carpopropodus (in holotype, 8-subsegmented in endopods 5 and 7, and 7-subsegmented in endopods 6 and 8), dactylus very small, terminating in slender claw (Fig. 10F). Exopods of thoracic limbs composed of 8 segments in limb 1, and 9 in limbs 2-8 in addition to basal plate (Fig. 10B, C, F).

Marsupium composed of 2 pairs of brood laminae.

Uropod with both rami broad, setose all round; endopod extending for $\frac{1}{4}$ of its length beyond apex of telson, with 2 spines in statocyst region on inner margin; exopod less than 4 times as long as broad, extending for $\frac{1}{5}$ of its length beyond apex of endopod, inner margin slightly more convex than outer (Fig. 10G).

Telson longer than abdominal somite 6, triangular with apical sinus, 1.2 times longer than broad, lateral margin slightly concave in proximal half and slightly convex in distal half, with 18-19 spines along entire length, spines densely arranged on distal $\frac{1}{2}$ and proximal $\frac{1}{4}$ and sparsely arranged in middle, apex of telson lobes with 2 spines, inner spine subequal to distalmost spine on lateral margin and outer spine more than 2 times as long as inner; apical sinus more than $\frac{1}{4}$ of telson

length, with 25 slender spines along entire margin (Fig. 10H).

Remarks. *Heteromysis macrophthalma* Băcescu is closely allied to *H. sexspinoso* in many points. However, *H. sexspinoso* differs from the former species by having: (1) carpopropodus of thoracic endopods 5-8 consisting of 7 or 8 subsegments, while *H. macrophthalma* has 6 subsegments; (2) lateral margin of telson with 18-19 spines along entire length (an adult female, 5.7mm, with embryos in marsupium, collected at the same station with the holotype, possessed an unarmed part as in *H. macrophthalma*, Fig. 10I), while *H. macrophthalma* has 15 spines along the entire margin but separated by a median gap; (3) carpopropodus of thoracic endopod 3 with 6 flagellate spines, proximal 2 separated from each other, while *H. macrophthalma* has 2 to 3 smaller spines in addition to 6 larger spines with proximal 2 close together; and (4) body length is larger (5.7-5.9mm) than in *H. macrophthalma* (4-5mm).

Adult male is unknown.

Etymology. The species is named after the 6 spines on the carpopropodus of thoracic endopod 3.

Heteromysis (Olivaemysis) tenuispina sp. nov.
(Fig. 11)

Type material. HOLOTYPE — ♂, NTM Cr. 005496, 4.2mm, Table Head, Port Essington, 11° 14.8'S 132° 11.2'E, 6m, rubble washings, 12.v.1983.

Additional material. NORTHERN TERRITORY: 1 adult ♂, NTM Cr.005497, 4.2mm, Coral Bay, Port Essington, 11° 11.0'S 132° 03.4'E, 6m, coral reef edge, 16.v.1983, N.L. Bruce. WESTERN AUSTRALIA: 1 adult ♂, 4.2mm, 1 immature ♀, 3.6mm and 1 juvenile, 2.4mm, NTM Cr.005226, North West Shelf, 16° 34'S 121° 27'E; 40m, coralline rock washings; 17.viii.1985, B.C. Russell. QUEENSLAND: 1 near-adult ♂, NTM Cr.005477, 3.6mm, Torres Strait, 10° 03.2'S 142° 39.6'E, P. Blyth.

Description. Carapace with frontal margin produced anteriorly into short triangular rostrum with concave lateral margins and narrowly rounded apex extending slightly beyond base of antennular peduncle (Fig. 11A), anterolateral corners rounded, post-

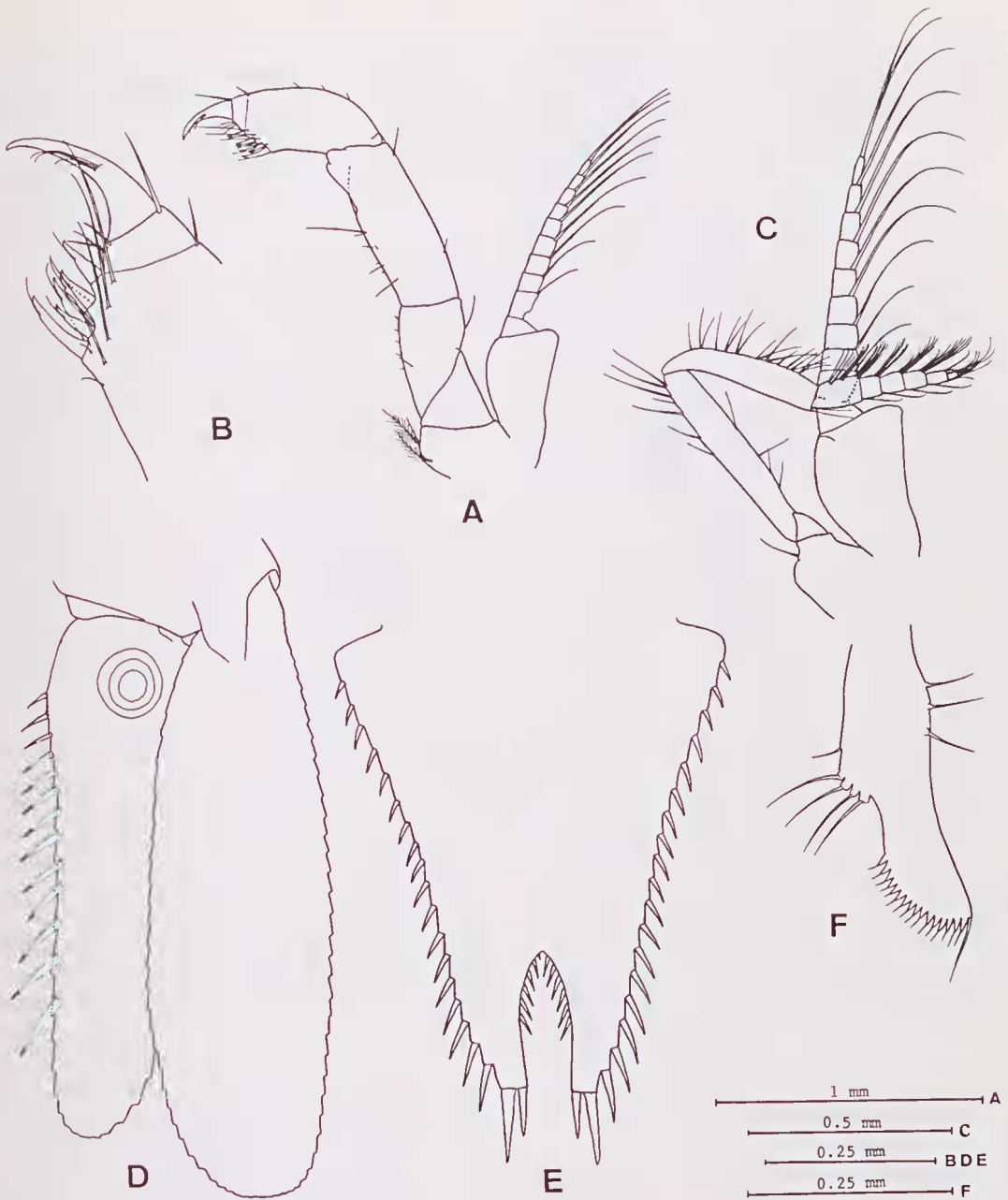


Fig. 7. *Heteromysis (Olivaemysis) essingtonensis* holotype: A, third thoracic limb; B, extremity of third thoracic limb; C, eighth thoracic limb; D, uropod; E, telson; F, fourth pleopod.

erior margin emarginate, leaving last thoracic somite exposed dorsally.

Eye with cornea narrower than stalk; eye-stalk with prominent denticle at distal end of medial margin (Fig. 11A).

Antennular peduncle robust, segment 1 with prolonged distolateral angle tipped with several setae, segment 2 with long inner mar-

gin and very short outer margin for oblique connection with segment 3, with 2 setae at distomedial corner, segment 3 broader than preceding segment, armed on middle of medial margin with one seta and at distomedial corner with one flagellate spine and 3 setae, one seta stout and extending outwardly (Fig. 11A).

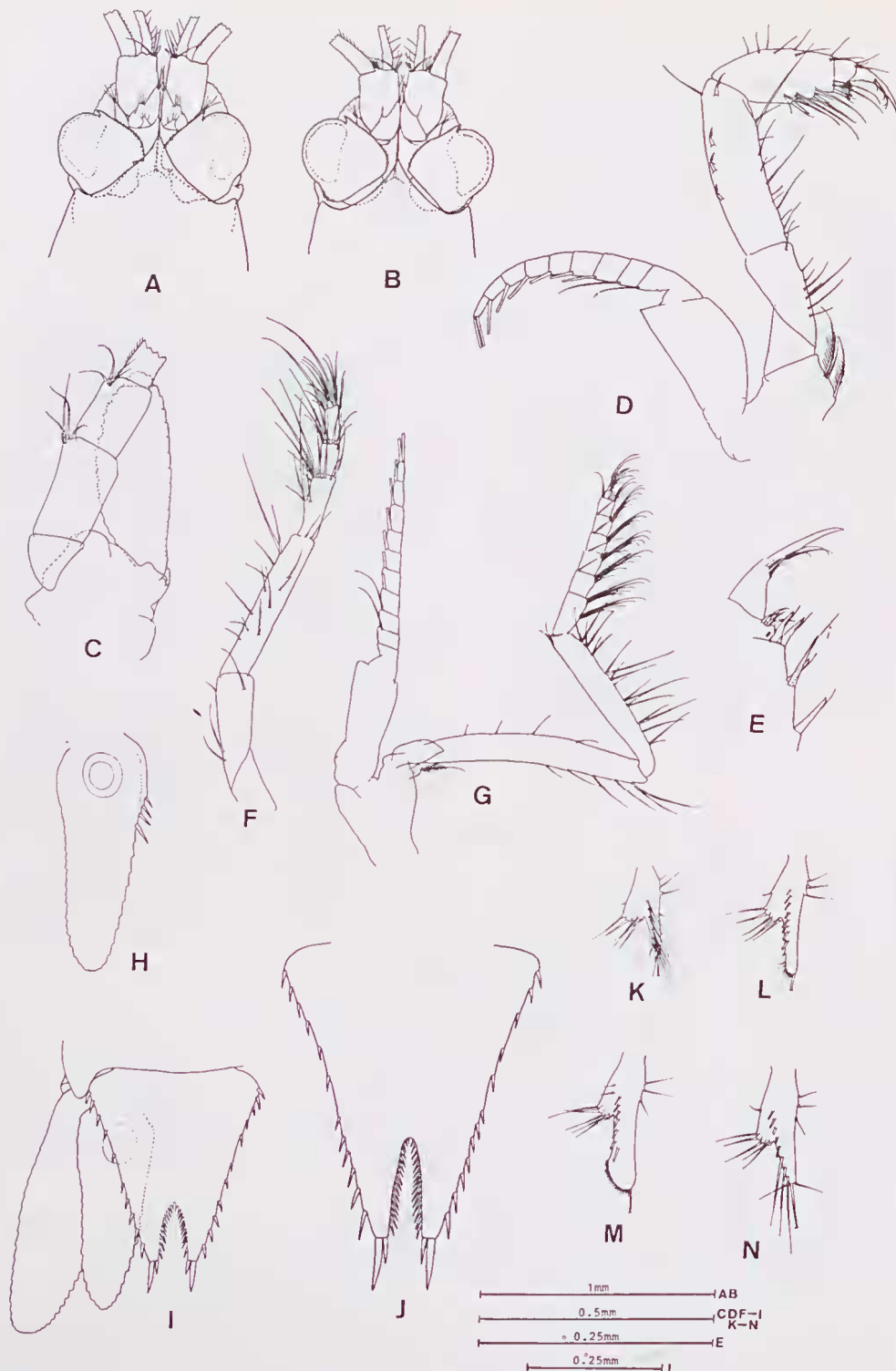


Fig. 8. *Heteromysis (Olivaemysis) quadrispinosa* A, C-H, J, holotype, B, I, K-N, allotype: A, anterior end; B, anterior end; C, antenna; D, third thoracic limb; E, extremity of third thoracic endopod; F, fourth thoracic endopod; G, eighth thoracic limb; H, endopod of uropod; I, uropod and telson; J, telson; K, second pleopod; L, third pleopod; M, fourth pleopod; N, fifth pleopod.

Antennal peduncle extending to mid-length of antennular peduncle segment 3. Antennal scale extending to distal end of antennal peduncle, more than 2.5 times longer than broad, lanceolate, inner margin more convex than outer margin, setose all round, distal suture present (Fig. 11B).

Thoracic endopods 1 and 2 as shown in Fig. 11C, D.

Thoracic endopod 3 with merus slightly more than 2 times as long as broad and armed with long seta at middle of inner margin, carpopropodus less than 2 times as long as broad, inner margin with 2 pairs of strong spines on distal part and pair of slender spines at end of proximal naked part (Fig. 11E, F).

Thoracic endopod 4 slender, with 3-subsegmented carpopropodus (Fig. 11H); thoracic endopods 5-8 slender, carpopropodus divided into 6-7 subsegments (Fig. 11I) (in holotype, subdivided into 6 in endopod 5 and into 7 in endopods 6-8); thoracic exopods distal to basal plate 9-segmented in exopod 1 and 10-segmented in exopods 2-8 (Fig. 11D, H).

Male pleopods 1 short, equal to side lobe in length; pleopod 2 modified, tapering, inner margin armed with 3 spines becoming longer and stouter distally (Fig. 11J); pleopod 3 modified, with rounded apical margin armed with 20 flagellate spinules (Fig. 11K); pleopod 4 similar to pleopod 3 in shape but larger, furnished on rounded apical margin with 29 flagellate spinules, each spinule smaller than those of pleopod 3 (Fig. 11L); pleopod 5 not modified, equal to pleopod 3 in length.

Uropod setose all round; endopod extending slightly beyond tip of apical spines of telson, tapering, with 9 spines along inner margin from statocyst region to distal $\frac{3}{5}$; exopod more than 3 times longer than broad, extending for $\frac{1}{6}$ of its length beyond apex of endopod (Fig. 11M).

Telson described based on right half because spines on left lateral margin abnormally arranged: telson triangular with apical sinus, 1.3 times longer than broad, 1.3 times longer than last abdominal somite, lateral margin naked and concave for proximal $\frac{3}{5}$, convex and furnished with 13 spines in distal $\frac{2}{5}$, lateral spines increasing in length distally, followed by apical ones without gap, apical lobes of telson narrower distally, armed on

narrow distal end with 2 spines, outer spine slightly longer than inner, longest among all marginal spines; sinus deep, $\frac{1}{3}$ of telson length, narrower in mouth than in middle part, with 16 spines on proximal half of sinus margin (Fig. 11O).

Remarks. The present new species resembles *H. minuta* O. Tattersall from Singapore (O. Tattersall 1967) and *H. coralina* Modlin from Florida (Modlin 1987) by having: (1) eye with a denticle at end of medial margin of stalk; (2) telson with spines on only distal $\frac{2}{5}$ of lateral margin; and (3) telson sinus with spines on only proximal half of margin. However, it is easily distinguishable from *H. minuta* by the thoracic endopod 3, which is 2 times as long as broad in the new species, as against 7.5 times in *H. minuta*, and from *H. coralina* by the endopod of uropod, the new species bears 9 spines from statocyst region to distal $\frac{3}{5}$ of the inner margin while *H. coralina* has 5 spines in statocyst region.

A specimen from Coral Bay differs from the holotype by having (1) thoracic endopod 3 with a pair of more slender proximal spines on carpopropodus (Fig. 11F), (2) male pleopod 4 with 35 flagellate spinules, (3) telson wider (Fig. 11N); and (4) telson sinus shallower, broader at apex and with 9 spines on proximal $\frac{1}{3}$ of margin. These differences, especially appearance of telson, gives the impression of another species, but I judged this specimen to belong to *H. tenuispina* from many other similarities such as rostrum, eye, thoracic limbs, endopod of uropod, etc.

Etymology. The species is named after the 2 slender spines on the carpopropodus of thoracic endopod 3.

Heteromysis (Gnathomysis) harpaxoides
Băcescu and Bruce

Heteromysis (Gnathomysis) harpaxoides
Băcescu and Bruce, 1980: 68-70

Material. WESTERN AUSTRALIA: 1 adult ♂, NTM Cr.005475, 4.9mm, Ashmore Reef; from *Dardanus* sp.

Distribution. This species has been previously recorded from Wistari Reef, Great Barrier Reef.

Heteromysis gracilis sp. nov.

(Fig. 12)

Type material. HOLOTYPE — ♀ with embryos, NTM Cr.005502, 5.1mm, Dudley

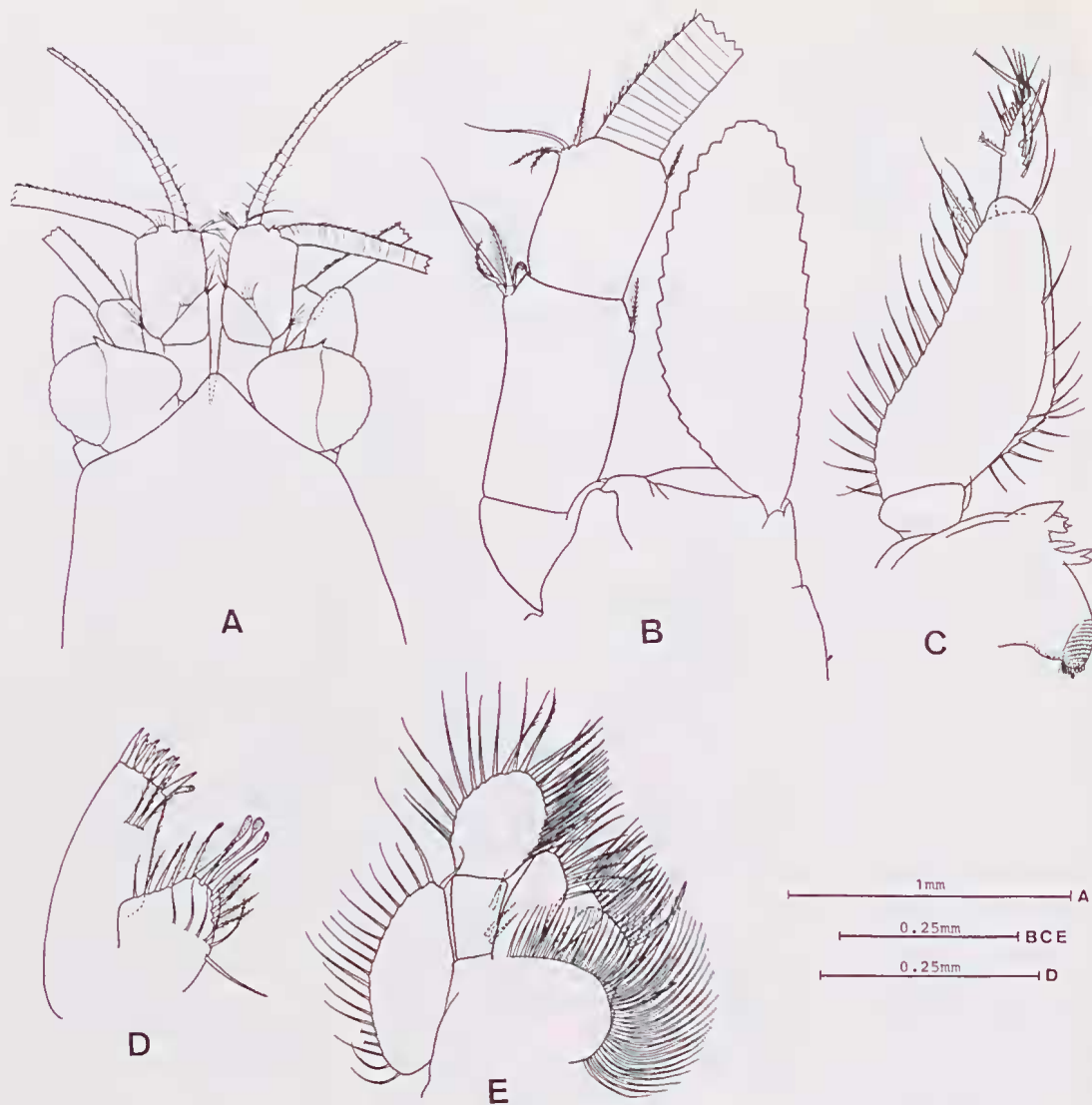


Fig. 9. *Heteromysis (Olivaemysis) sexspinosa* holotype: A, anterior end; B, antenna; C, mandible; D, maxillule; E, maxilla.

Point Reef, Darwin, 12° 25'S 130° 49.1'E, reef flat, 6.ix.1982, A.J. Bruce.

Description. Body relatively slender for this genus (Fig. 12A).

Carapace produced in triangular rostrum with pointed apex, extending to midlength of antennular peduncle segment 1 (Fig. 12B), anterolateral corner rounded, posterior margin emarginate, leaving last thoracic somite exposed dorsally (Fig. 12A).

Eye large, without denticle at distal end of medial margin of stalk, cornea hemispherical, slightly wider than stalk, occupying more than half of whole eye (Fig. 12B).

Antennular peduncle rather slender, segment 1 with prolonged distolateral corner tipped with several setae, segment 2 triangular in dorsal view, with 2 setae at distomedial corner, segment 3 articulating with segment 2 obliquely, with one seta on middle of inner margin and 3 setae at distomedial corner, but lacking flagellate spine with obtuse tip (Fig. 12B).

Antennal scale shorter than antennular peduncle, lanceolate, about 4 times longer than broad, outer margin straight, inner margin evenly convex, setose all round, distal suture invisible (Fig. 12C). Antennal pedun-



Fig. 10. *Heteromysis (Olivaemysis) sexspinosa* holotype except I, adult ♀ : A, first thoracic endopod; B, second thoracic limb; C, third thoracic limb; D, extremity of third thoracic endopod; E, fourth thoracic endopod; F, eighth thoracic limb; G, uropod; H, telson; I, right lateral margin of telson.

cle not extending to apex of scale, segment 2 occupying nearly half of peduncle length (Fig. 12C).

Labrum with triangular anterior margin with obtusely pointed apex.

Thoracic endopod 2 with dactylus fringed with setae, terminal claw short and slender (Fig. 12D).

Thoracic endopod 3 slender, merus 6 times longer than broad, inner margin slightly convex, terminating in denticle, with 3 long and one short flagellate spines, outer margin slightly concave, carpopropodus longer than merus, 6 times longer than broad, inner margin with 8 spines along almost entire length, terminal claw small, $\frac{1}{5}$ as long as carpopropodus (Fig. 12E). Thoracic endopod 4 slender, carpopropodus divided into 5 subsegments, subsegment 1 long, $\frac{1}{3}$ of carpopropodus length, dactylus small, terminating in slender claw 3.5 times longer than dactylus (Fig. 12F). Remaining thoracic endopods missing; exopods of thoracic limbs 9-segmented in addition to basal plate (Fig. 12E, F).

Endopod of uropod extending for $\frac{1}{5}$ of length beyond apex of telson, with 17 spines on inner margin from statocyst region to near apex, spines more slender on distal half than on proximal half; exopod of uropod exceeding apex of endopod by $\frac{1}{6}$ of length (Fig. 12G).

Telson triangular with apical sinus, 1.3 times longer than broad, lateral margin with 11-12 spines increasing in length posteriorly along almost entire length except on unarmed proximal $\frac{1}{5}$ to $\frac{1}{6}$, apex armed with 2 spines, outer spine 1.5 times longer than inner, apical sinus about $\frac{1}{5}$ of telson length, with 14 spinules on proximal $\frac{3}{4}$ of margin (Fig. 12H).

Remarks. This new species bears the following characteristics: (1) eye without denticle at distal end of medial margin of stalk; (2) thoracic endopod 3 with slender carpopropodus 6 times longer than broad; (3) endopod of uropod with spines throughout the inner margin; and (4) telson with spines along almost the entire length of lateral margin.

In these points the new species is similar to *H. armoricana* from the Atlantic coast of France (Nouvel 1940) and *H. eideri* from the Mediterranean coast of France (Băcescu 1941). However, it is distinguishable from

the two latter species by the number and arrangement of spines on the carpopropodus of thoracic endopod 3 and on the lateral margin of the telson.

Male is unknown.

Etymology. The species is named after the shape of body and thoracic appendages.

Heteromysoides macrops sp. nov.

(Fig. 13)

Type material. HOLOTYPE — ♀, NTM Cr.005498, 2.8 mm, Coral Bay, Port Essington, 11° 12.0'S 132° 03.0'E, 3-4m N.L. Bruce.

Description. Body depressed dorso-ventrally.

Carapace with frontal margin produced into short triangular rostrum with straight lateral margins, covering basal part of eyes (Fig. 13A), anterolateral corners rounded, posterior margin emarginate, leaving last thoracic somite uncovered dorsally.

Eye large, rectangular, flattened, completely covering antennular peduncle segment 1 in dorsal view, with small cornea located distolaterally in dorsal view (Fig. 13A).

Antennular peduncle robust, segment 1 with prolonged distolateral angle tipped with several setae, segment 2 short, connected obliquely with segment 3, segment 3 about as long as segment 1, broader than segment 2, with 4 long setae at distomedial angle (Fig. 13A, B).

Antennal peduncle slightly shorter than antennular peduncle, segment 2 more than 2 times as long as broad, about half of peduncle length. Antennal scale lanceolate, extending slightly beyond distal margin of segment 2 of own peduncle, less than 3 times longer than broad, inner margin more convex than outer margin, setose all round, distal suture present (Fig. 13C).

Labrum wider than long, with triangular anterior margin with obtusely pointed apex.

Thoracic endopod 2 rather robust, carpopropodus shorter than merus and 2 times as long as dactylus (Fig. 13D).

Thoracic endopod 3 missing. Thoracic endopod 4 slender, merus about 1.3 times longer than ischium, carpopropodus slightly longer than merus, 4-subsegmented, subsegment 1 longer than following 2 subsegments together but shorter than following 3 subseg-

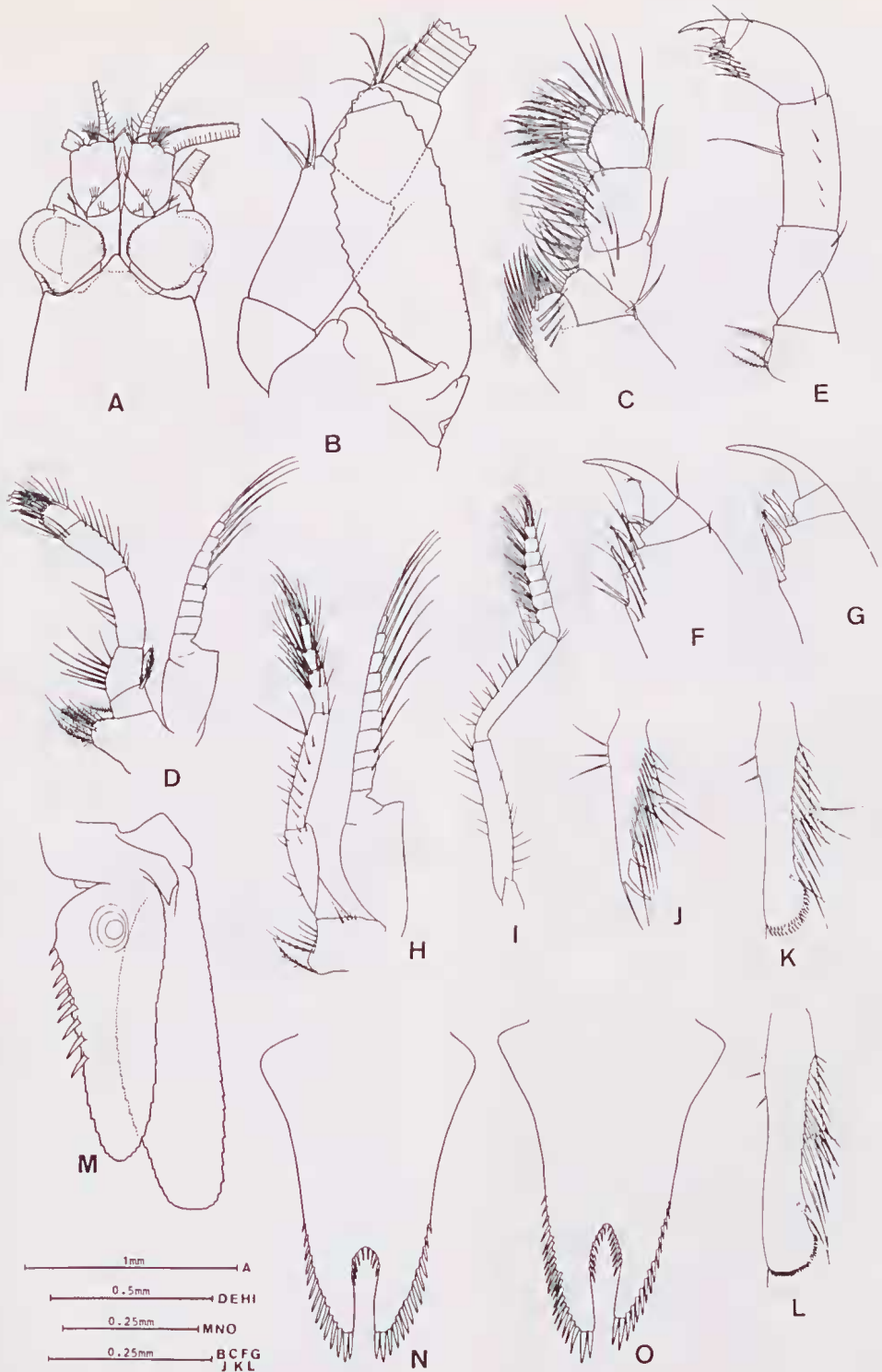


Fig. 11. *Heteromysis (Olivaemysis) tenuispina* holotype except G, N, adult ♂: A, anterior end; B, antenna; C, first thoracic endopod; D, second thoracic limb; E, third thoracic endopod; F, extremity of third thoracic endopod; G, extremity of third pleopod; H, fourth thoracic limb; I, eighth thoracic endopod; J, second pleopod; K, third pleopod; L, fourth pleopod; M, uropod; N, telson; O, telson.

ments together (Fig. 13E). Thoracic endopod 5 missing. Thoracic endopods 6-8 equal in structure, merus subequal to ischium, slightly longer than carpopropodus, carpopropodus 4-subsegmented, subsegment 1 slightly longer than following 2 subsegments combined, with 3 groups of setae on inner margin, subsegments 2 and 3 with one group of setae at distal end of inner margin (Fig. 13F). Thoracic exopods with small basal plate with rounded distolateral corner, natatory part 7- or 8-segmented (Fig. 13E,F).

First 5 abdominal somites subequal, somite 6 about 1.3 times longer than somite 5.

Female pleopods uniramous, unsegmented, increasing in length posteriorly, pleopod 5 twice as long as pleopod 1.

Uropod setose all round; endopod extending beyond telson for $\frac{1}{3}$ length of endopod, inner margin straight, armed with 8-9 small spines from statocyst to near apex, these spines arranged irregularly and increasing in length distally; exopod slightly longer than endopod, with inner and outer margins convex (Fig. 13G).

Telson triangular with apical sinus, slightly longer than wide, lateral margin slightly concave, naked in proximal half and armed on distal half with 8 spines increasing in length distally, each apex furnished with 2 spines, outer spine twice longer than inner one, apical sinus U-shaped, shallow, $\frac{1}{9}$ of telson length, with 3 spines at base and one spine on each lateral margin (Fig. 13H).

Remarks. Five species of *Heteromysoides* have been recorded as follows: *H. cotti* Calman from Canary Islands (Calman 1932), *H. spongicola* Băcescu from Cuba (Băcescu 1968), *H. longiseta* Băcescu from Heron Island (Băcescu 1983), *H. dennisi* Bowman from the Bahamas (Bowman 1985) and *H. berberae* Băcescu and Müller from Somalia (Băcescu and Müller 1985). The shape of eye and the marginal spines of telson relate the new species to *H. cotti* and *H. longiseta*. However, it is easily distinguishable from *H. cotti* by the length of eye, the number of subsegments on carpopropodus of thoracic endopods 5-8 and the arrangement of spines on endopod of uropod, and from *H. longiseta* by lacking long setae on pleopods.

Etymology. The species is named after the large eye.

Key to the heteromysid fauna in Australia

1. Eye cylindrical, cornea more or less globular, occupying distal portion of stalk; male pleopods modified or not modified genus *Heteromysis* 2
 - Eye quadrangular, flattened, cornea located at distolateral corner of stalk; male pleopods not modified
..... genus *Heteromysoides* 20
- 2(1). Eye with a distinct denticle at distal end of medial margin of eyestalk 3
 - Eye without such a denticle 10
- 3(2). Lateral margin of telson with spines on distal half only
..... *H. (Olivaemysis) tenuispina* sp. nov.
 - Lateral margin of telson with spines throughout entire margin (sometimes with unarmed gap) 4
- 4(3). Endopod of uropod with more than 10 spines along entire inner margin
..... *H. zeylanica* W. Tattersall
 - Endopod of uropod with 2-4 spines in statocyst region of inner margin 5
- 5(4). Lateral margin of telson with unarmed gap 6
 - Lateral margin of telson with spines throughout 7
- 6(5). Carpopropodus of thoracic endopod 3 with small spines in addition to strong spines; thoracic endopods 5-8 with 6-subsegmented carpopropodus; body length 4-5mm
..... *H. (Olivaemysis) macrophthalmma* Băcescu
 - Carpopropodus of thoracic endopod 3 without small spines; thoracic endopods 5-8 with 7- or 8-subsegmented carpopropodus; body length 5.7-5.9mm
..... *H. (Olivaemysis) sexspinosa* sp. nov.
- 7(6). Telson sinus with spines on proximal $\frac{2}{3}$ *H. (Olivaemysis) abrucei* Băcescu
 - Telson sinus with spines along entire margin 8
- 8(7). Lateral margin of telson with longer interval between last marginal spine and apical spine than other intervals between lateral spines; body length 8-11mm *H. waitei* W. Tattersall
 - Interval between last marginal spine

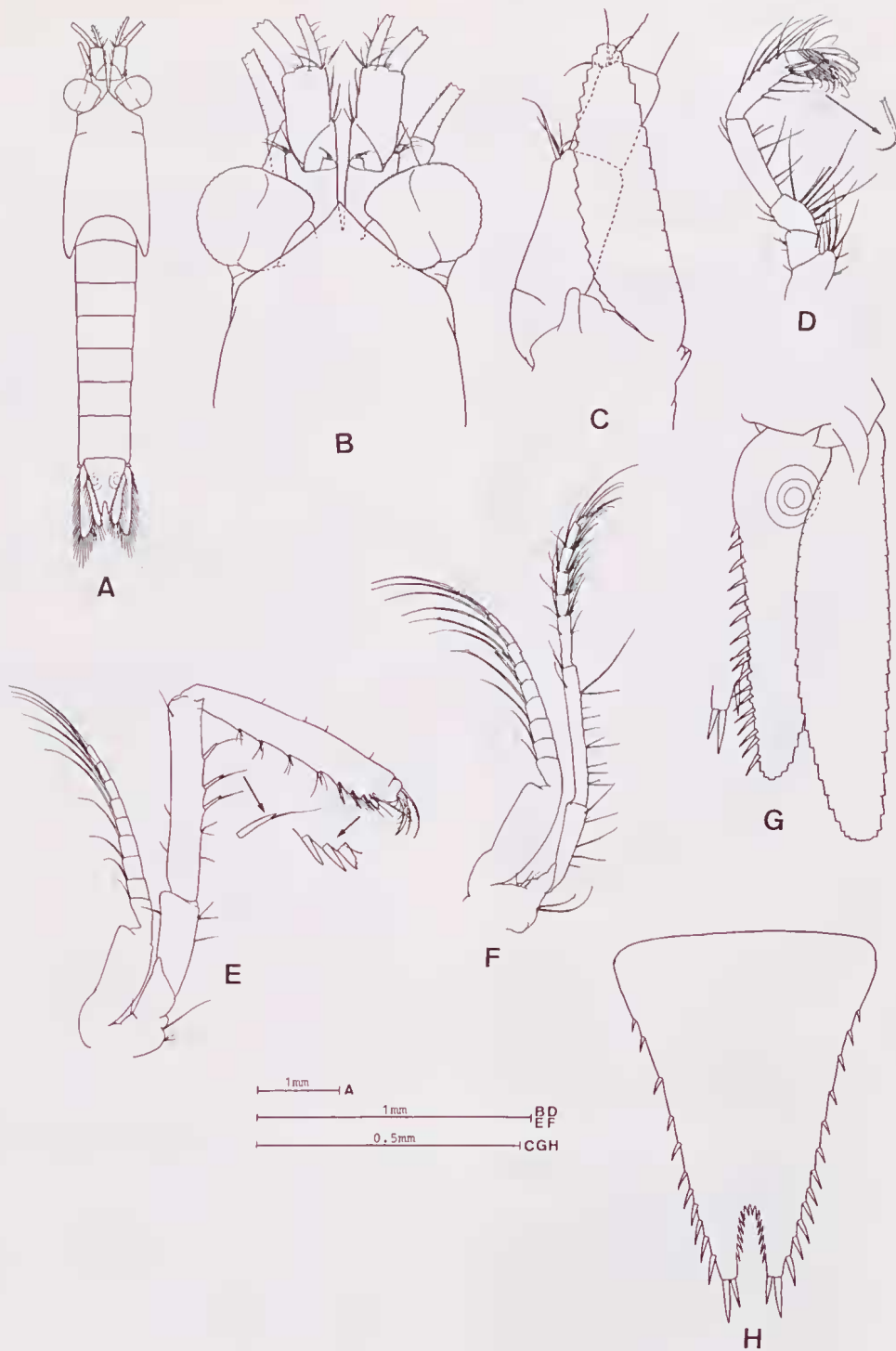


Fig. 12. *Heteromysis gracilis* holotype: A, dorsal view of body; B, anterior end; C, antenna; D, second thoracic endopod E, third thoracic limb; F, fourth thoracic limb; G, uropod; H, telson.

- and apical spines of telson similar to intervals between other marginal spines 9
- 9(8). Rostrum obtusely pointed; thoracic endopods 5-8 with 6-subsegmented carpopropodus; telson with about 11 spines on lateral margin; telson sinus about $\frac{1}{3}$ as long as telson
 *H. (Olivaemysis) quadrispinosa* sp. nov.
 Rostrum rounded; thoracic endopods 5-8 with 7- or 8-subsegmented carpopropodus; telson with about 18 spines on lateral margin; telson sinus about $\frac{1}{4}$ as long as telson
 *H. (Olivaemysis) sexspinosa* sp. nov.
- 10(2). Merus of thoracic endopod 3 with serrate inner margin, carpopropodus huge 11
 Merus of thoracic endopod 3 without serrate inner margin 12
- 11(10). Carapace with about 4 rows of minute tubercles on anterior $\frac{1}{4}$
 *H. (Gnathomysis) stellata* Băcescu and Bruce
 Carapace without such tubercles on carapace
 *H. (Gnathomysis) harpaxoides* Băcescu and Bruce
- 12(10). Eye with cornea located at distolateral corner, as in *Heteromysoides* spp. *H. (Heteromysis) spinosa* Băcescu
 Eye with cornea more or less hemispherical and located at distal end of stalk 13
- 13(12). Three antennular peduncle segments each with flagellate spine at distomedial corner
 *H. (Olivaemysis) essingtonensis* sp. nov.
 Antennular peduncle without flagellate spine on any segment 14
- 14(13). Entire lateral margin of telson with spines except short distance on proximal part; thoracic endopod 3 with carpopropodus 6 times longer than broad; telson sinus more than $\frac{1}{3}$ as long as telson .. *H. gracilis* sp. nov.
 Lateral margin of telson without spines on proximal $\frac{1}{2}$ - $\frac{1}{3}$; carpopropodus of thoracic endopod 3 less than 3 times longer than broad (except nearly 5 times in *H. communis*) 15
- 15(14). Endopod of uropod without spines 16
 Endopod of uropod with spines ...
 17
- 16(15). Telson sinus more than $\frac{1}{3}$ as long as telson, with more than 40 spines on margin; lateral margin of telson with about 16 spines; merus of thoracic endopod 3 without flagellate spines *H. (Heteromysis) gymnura* W. Tattersall
 Telson sinus about $\frac{1}{4}$ as long as telson, with about 10 spines on margin; lateral margin of telson with 5 spines; merus of thoracic endopod 3 with flagellate spines
 *H. (Heteromysis) tethysiana* Băcescu
- 17(16). Endopod of uropod with 16 spines along entire inner margin; telson with 13-15 spines on distal $\frac{2}{3}$ of lateral margin
 *H. tasmanica* W. Tattersall
 Endopod of uropod with less than 5 spines on proximal half of inner margin; telson with less than 7 spines on distal half of lateral margin 18
- 18(17). Apex of telson with 2 spines with inner spine longer; endopod of uropod with one spine
 *H. (Heteromysis) australica* Băcescu and Bruce
 Apex of telson with 2 spines with outer spine longer; endopod of uropod with more than 2 spines ...
 19
- 19(18). Endopod of uropod with 2 spines .
 *H. (Heteromysis) heronensis* Băcescu
 Endopod of uropod with 4-5 spines
 *H. (Heteromysis) communis* Băcescu
- 20(1). Eye as long as broad; pleopods 2-5 with enormous terminal seta
 *H. longiseta* Băcescu
 Eye longer than broad; pleopods 2-5 without such seta
 *H. macrops* sp. nov.

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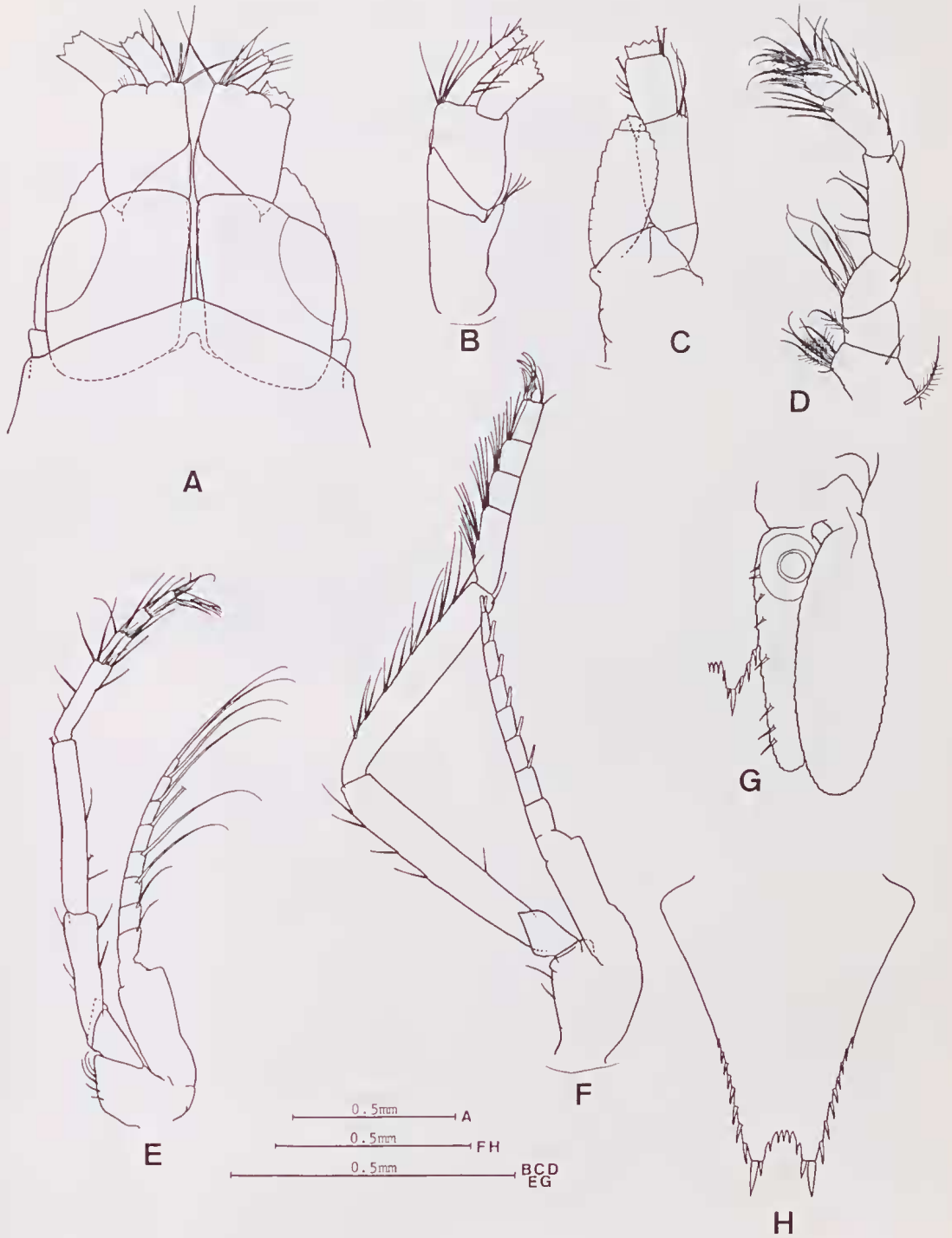


Fig. 13. *Heteromysoides macrops* holotype: A, anterior end; B, antennule; C, antenna; D, second thoracic endopod; E, fourth thoracic limb; F, eighth thoracic limb; G, uropod; H, telson.

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