

***Laperocheres koorius*, a new genus and species
(Copepoda: Siphonostomatoida: Asterocheridae) associated with the
sponge *Amphimedon* in Australia**

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Abstract.—Both sexes of *Laperocheres koorius*, associated with the littoral sponge *Amphimedon* sp. (Porifera: Demospongiae: Haplosclerida: Niphatidae) in Australia (vicinity of Sydney), are described. The new genus can be distinguished from the 44 genera of the family Asterocheridae by the formula of legs 1–4: the third segment of the endopod of leg 3 with 1,I,1; the first segment of the exopod of legs 1–4 with 1-0; the third segment of the exopod of legs 2–4 with 4 spines. One of the outer spines (the middle) on the third exopodal segment of leg 2 is sexually dimorphic.

The family Asterocheridae Giesbrecht, 1899 is the most specious family of siphonostomatoid copepods associated with marine invertebrates, including about 146 species in 44 genera. The known hosts of asterocherids are bryozoans, cnidarians, echinoderms, sponges, and credibly ascidians (Ivanenko & Smurov 1997). The Australian copepods of this family are poorly known. Nicholls (1944) discovered a number of siphonostomatoids from Southern Australia apparently associated with littoral invertebrates including sponges. In this paper representatives of four genera currently recognized as asterocherids were described (*Acontiophorus* Brady, 1880, *Australomyzon* Nicholls, 1944, *Discopontius* Nicholls, 1944, *Scottocheres* Giesbrecht, 1897). Humes (1987, 1991) found a group of asterocherids from Northern Australia associated with crinoid echinoderms (*Collocheres* Canu, 1893, *Glyptocheres* Humes, 1987) and scleractinian corals (*Hetairosyona*, Humes, 1991; *Tychomyzon*, Humes, 1991). Despite the fact that asterocherids are common and abundant inhabitants of sponges (Humes 1996, Ivanenko 1997), the Australian fauna is virtually unknown,

though other copepods associates of Australian sponges have been described: entomolepidid siphonostomatoids (McKinnon 1988b), harpacticoids (Huys 1990) and artotrogid siphonostomatoids (McKinnon 1988a) which may have originated from sponges.

This paper describes *Laperocheres koorius*, new genus, new species, associated with the littoral sponge *Amphimedon* sp. from the vicinity of Sydney, Australia.

Materials and Methods

The sponge *Amphimedon* sp. (Porifera: Demospongiae: Haplosclerida: Niphatidae) was collected by hand, isolated and then washed in freshwater. After passing the water through a fine-mesh net, the copepods were picked from the residue. Small fragment of the sponge, which is likely a new species, was identified by John N. A. Hooper. Two fragments are deposited in the collections of the Zoological Museum of Moscow State University and the Queensland Museum (QMG 313154).

Measurements and dissections were made in lactic acid, generally following the method proposed by Humes & Gooding

(1964). Specimens were stained by adding a solution of chlorazol black E dissolved in 70% ethanol/30% fresh water. The drawings were made using a camera lucida mounted on a ocular microscope.

In the formula for the armature of legs 1–4, Roman numerals indicate spines and Arabic numerals—setae; left numerals indicate lateral, middle—terminal, right—medial elements.

Asterocheridae Giesbrecht, 1899

Laperocheres, new genus

Diagnosis.—Asterocheridae. Body cyclo-piform; prosome of female more thickened dorsoventrally than in male; urosome 4-segmented in female, 5-segmented in male. Antennule 20-segmented in female with aesthetasc on segment 18; 17-segmented in male, geniculate, with aesthetasc on segment 16. Antennal exopod small with 3 setae, terminal segment of endopod with 3 setae (one much reduced) and claw. Oral siphon reaching base of maxillipeds. Mandible with needle-pointed gnathobase and 1-segmented long palp bearing 2 terminal setae. Maxillule with 4 setae on each lobe. Maxilla 2-segmented. Maxilliped 6-segmented plus terminal claw. Legs 1–4 biramous, 3-segmented. Inner seta on coxa and first exopodal segment of legs 1–4 absent. Third segment of exopod in leg 1 with III,4, legs 2–3 with III,I,4, leg 4 with III,I,3. Third segment of endopod in leg 1 with 1,5, leg 2 with 1,4, legs 3–4 with 1,I,1. Leg 5 with free distal segment bearing 3 setae and proximal segment separated from somite only dorsally. Sexual dimorphism not expressed in maxilliped but shown for legs 2–5.

Type species.—*Laperocheres koorius*, new species.

Etymology.—The generic name is a combination of the name of the area where the copepods were collected (“La Perouse” region) and “cheres”, apparently derived from the Greek “achtheros” meaning distressing or troublesome to.

Remarks.—The asterocherid genera are

combined in one family on the basis of the presence of mandibular palp, the situation of the aesthetasc on the antennule and the form of tergite of metasomites (Stock 1987, 1992). The new species of *Laperocheres* possesses the peculiarities of asterocherids but can not be referred to known genera because of the unique setation of its legs. The third segment of endopod of leg 3 with formula 1,I,1 unreported for other asterocherids (although three elements have been indicated for this segment in three genera: *Peltomyzon* Stock, 1975; *Meandromyzon* Stock, 1989, and *Siphonopontius* Malt, 1991). Although considerable variability exists in leg setation, only this new copepod and five other asterocherid genera (*Psilomyzon* Stock, 1965, *Tuphacheres* Stock, 1965, *Inermocheres* Boxshall, 1990, *Sinopontius* Boxshall, 1990, *Siphonopontius* Malt, 1991), also described from sponges, lack inner seta on the first exopodal segment of legs 1–4. However, *Laperocheres* has four spines on the third exopodal segment of legs 2–4, while the representatives of the other five indicated genera have three spines or one spine. This genus also has the less reduced setation of legs 1–4 in the group of indicated genera. The only exception is the third endopodal segment of leg 3, in *Psilomyzon* which has four setae on this segment (*Laperocheres*—1,I,1).

The remarkable characteristics of the new genus are the only partial, dorsal separation of the proximal segment of leg 5 and the sexual dimorphism in leg 2 previously not clearly shown for other asterocherids.

The dorsoventral thickening of the female prosome observed for *Laperocheres* can be explained by the result of an intercalary growth along the lateral margins of the cephalothorax shield and the tergite of the following somite in a similar to that observed by Smurov & Ivanenko (1993) in the female of the asterocherid *Scottomyzon gibberum* (Scott & Scott, 1894).

Laperocheres koorius, new species
(Figs. 1–4)

Type material.—Two females, 6 males from a gray sponge, depth approximately 1 m, Cape Banks Marine Research Area (La Perouse), vicinity of Sydney, Australia, 34°00'S, 151°15'E, 17.05.1997. K. A. Mirjukov collector. Holotype (no 1193), allotype (no 1194) and 2 paratypes (males) (no 1194–95) deposited in the Zoological Museum of Moscow State University. One paratype male placed in both the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM 285499), and the Museum of Natural History, London (BMNH 1997.911). One paratype male was presented to the Australian Museum, Sydney.

Male.—(Fig. 1A, B). Body cycloform, dorsoventrally flattened. Total length, excluding caudal setae, 0.53 mm (0.51–0.54 mm); greatest width 0.22 mm (0.22–0.23 mm), based on 5 specimens. Dorsoventral thickness of figured specimen on the level of ventral projection between maxilliped and first leg 0.12 mm; ratio of length of prosome to that of urosome 1.4:1; ratio of length to width of prosome 1.36:1. Prosome consisting of 4 articles: cephalothorax and 3 metasomites bearing legs 2–4, respectively. Position of prosomal appendages as in Fig. 1c. Shield of cephalothorax and metasomal tergites with numerous pores and sensillae. Lateral margin of shield ornamented with pores on ventral surface. Tergite of metasomites with heavily sclerotized ventrolateral margins (Fig. 1C). Urosome (Fig. 1D, E) consisting of 5 somites: somite with leg 5 having posterodorsal projection, genital somite bearing leg 6 and 3 abdominal somites; all somites with pores and sensilla.

Caudal ramus (Fig. 1F): ratio of outer length to greatest width 3:1, armed with 6 setae.

Rostral area (Fig. 1C): triangular in ventral view. One pore in posterior angle and two sensillae in anterior angles.

Antennule (Fig. 2A, B): geniculate, 17-segmented. Armature of segments is as follows: 2, 2, 2, 2, 2, 2, 2, 2, 7, 1, 2, 2+2, 2, 2, 2, 3+1 aesthetasc, and 10 setae, respectively. Aesthetasc on segment 16. Segment 10 reduced, partly overlapped by segment 9 armed with 7 setae, one of which reduced. Segment 12 with 2 pairs of setae, one of which in middle part of segment.

Antenna (Fig. 2C): a small coxa, elongate basis ornamented with row of scales anteriorly, 1-segmented exopod and 3-segmented endopod. Exopod short, longer than wide, armed with 3 setae: 2 terminal and 1 subterminal. First segment of endopod elongate, with setules along outer and inner margins. Second segment short, triangular, with one distal seta. Third segment with terminal claw and 3 setae, one of which reduced.

Oral siphon (Fig. 2E): formed by labrum and labium joined laterally, reaching nearly to base of maxillipeds.

Mandible (Fig. 2D): a gnathobase and palp. Gnathobase with needle-pointed apex, toothed subapically. Palp long, 1-segmented, with scales and 2 unequal terminal setae.

Maxillule (Fig. 2F): bilobed. Inner lobe about 2.5 times longer than outer lobe, armed with 4 terminal setae, and ornamented medially with spinules. Outer lobe with 4 setae, one of which hardly observed.

Maxilla (Fig. 5G): 2-segmented. Proximal part of first segment anteriorly with row of scales, ventrally with aesthetasc-like element. Distal claw-like segment serrated medially.

Maxilliped (Fig. 3A, B): 6-segmented. First segment with medial seta and ventral pore. Second segment long, unarmed. Segments 3–5 short, armed posterodistally with 2, 1, 1 setae. Segment 6 long, with distal claw and seta.

Legs 1–4 (Fig. 3C, D, E, G, J): biramous, each ramus 3-segmented. Protopods 2-segmented, intercoxal sclerites present in all legs. Formula for armature is as follows:

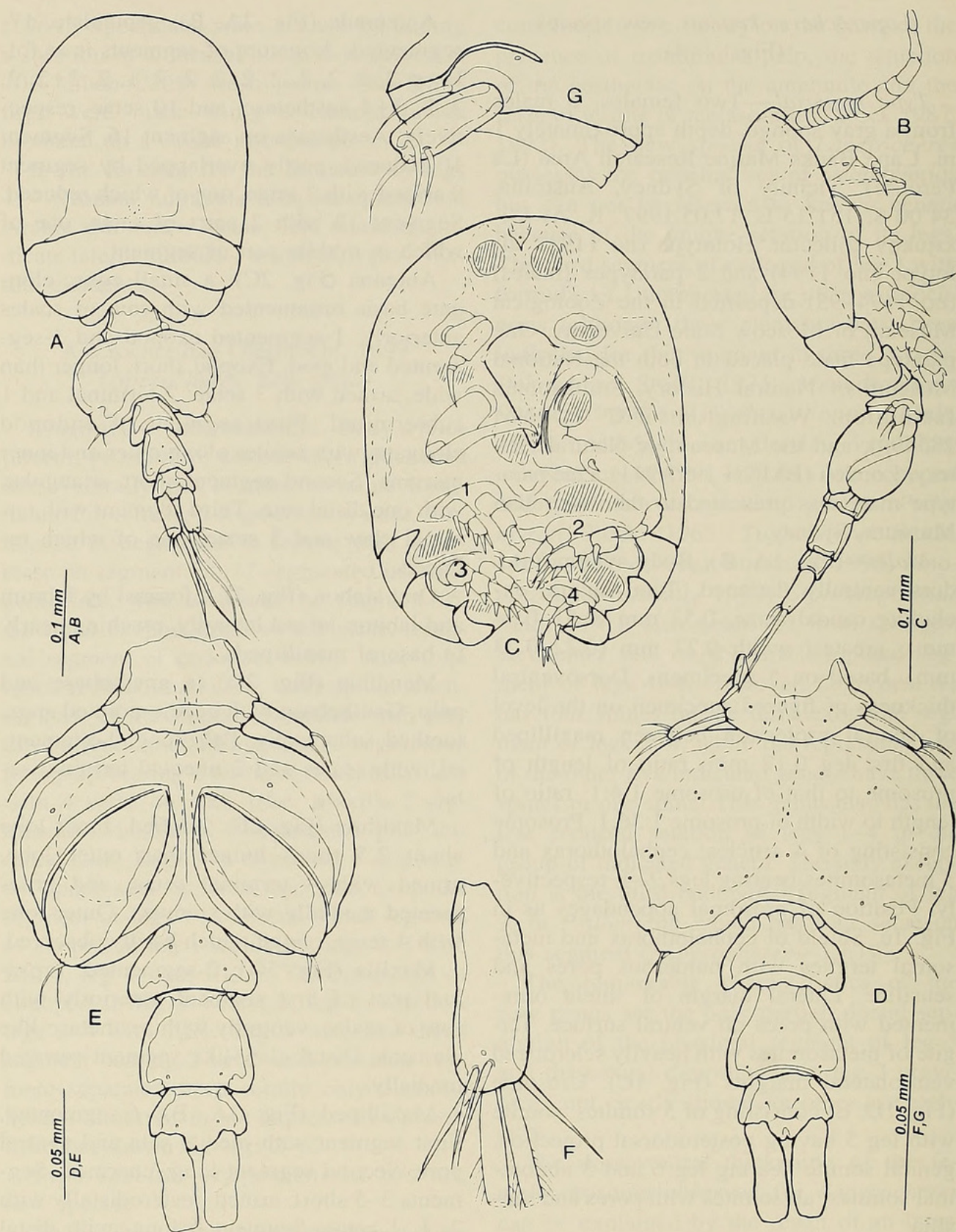


Fig. 1. *Laperocheres koorius* n. gen. n. sp. Male. A, Habitus, dorsal; B, Habitus, lateral; C, Prosome, ventral (1-4 - legs 1-4); D, Urosome, dorsal; E, Urosome, ventral; F, Left caudal ramus, dorsal; G, Leg 5, lateral.

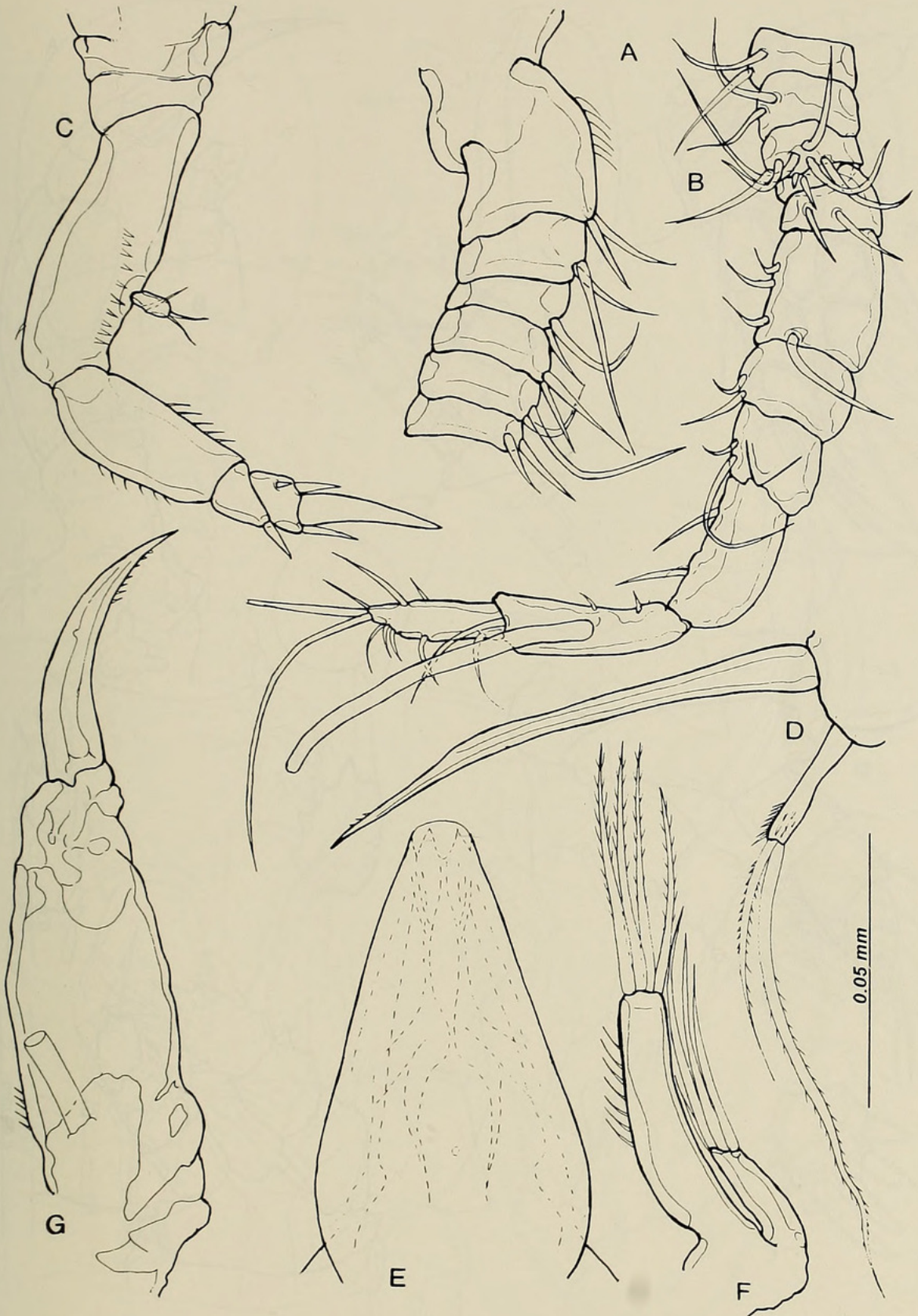


Fig. 2. *Laperocheres koorius* n. gen. n. sp. Male. A, Antennule, segments 1-6, lateral; B, Antennule, segments 7-17, anterior; C, Antenna, anterior; D, Mandible; E, Oral siphon, anterior; F, Maxillule; G, Maxilla.

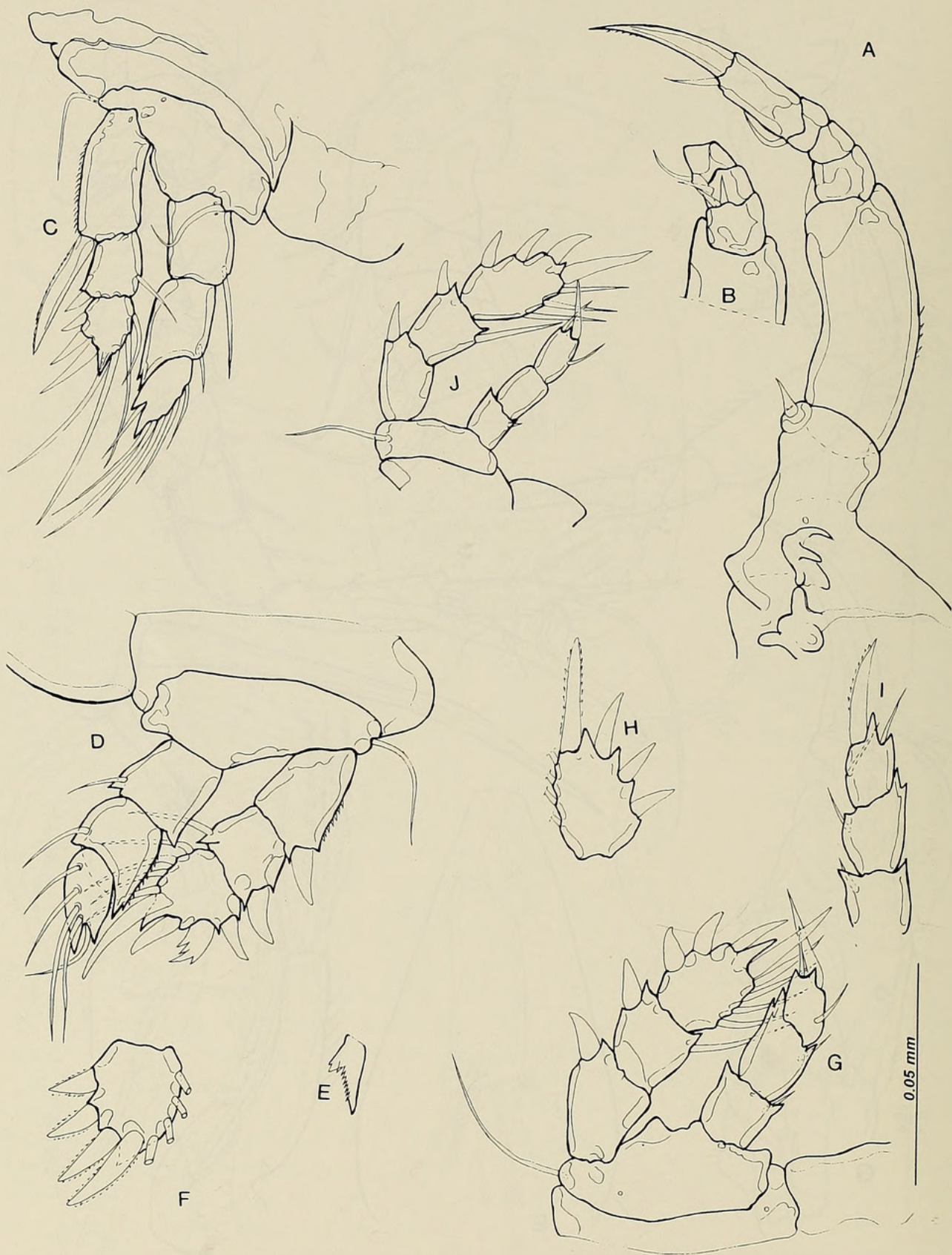


Fig. 3. *Laperocheres koorius* n. gen. n. sp. A, Male, maxilliped, anterior; B, Male, maxilliped, detail of segments 3-5, posterior; C, Male, leg 1, anterior; D, Male, leg 2, posterior; E, Male, leg 2, modified outer spine on distal segment of exopod, lateral; F, Female, leg 2, distal segment of exopod, posterior; G, Male, leg 3, anterior; H, Female, leg 3, distal segment of exopod; I, Female, leg 3, endopod; J, Male, leg 4, posterior.

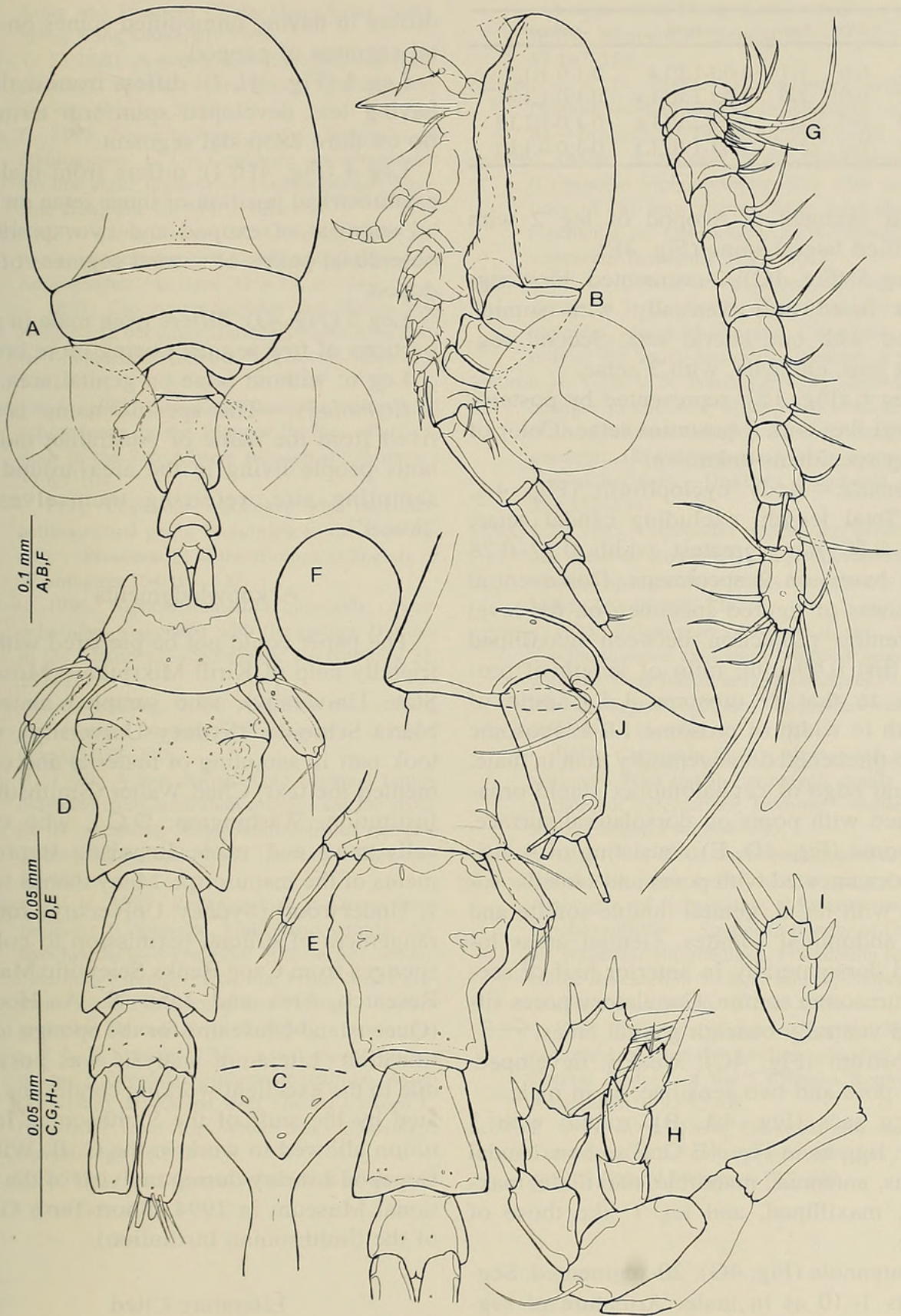


Fig. 4. *Laperocheres koorius* n. gen. n. sp. Female. A, Habitus, dorsal; B, Habitus, lateral; C, Rostrum, ventral; D, Urosome, dorsal; E, Urosome, ventral; F, Egg; G, Antennule, segments 9-20, lateral; H, right leg 4, posterior; I, Left leg 4, distal segment of exopod, posterior; J, Leg 5, lateral.

	coxa	basis	exopod	endopod
Leg 1	0-0	1-1	I-0;I-1;III,4	0-1;0-1;1,5
Leg 2	0-0	1-0	I-0;I-1;III,I,4	0-1;0-1;1,4
Leg 3	0-0	1-0	I-0;I-1;III,I,4	0-1;0-1;1,I,1
Leg 4	0-0	1-0	I-0;I-1;III,I,3	0-1;0-0;1,I,1

Distal segment of exopod of leg 2 with modified lateral spine (Fig. 3E).

Leg 5 (Fig. 1G): 2-segmented. First segment fused only ventrally with somite, armed with one lateral seta. Second segment free, elongate, with 3 setae.

Leg 6 (Fig. 1E): represented by postero-ventral flap with 2 posterior setae. Color of living specimens unknown.

Female.—Body cyclopiform (Fig. 4A, B). Total length, excluding caudal setae, 0.55–0.58 mm; greatest width 0.27–0.28 mm, based on 2 specimens. Dorsoventral thickness of figured specimen on the level of ventral projection between maxilliped and first 0.49 mm; ratio of length of prosome to that of urosome 1.4:1; ratio of length to width of prosome 1.2:1. Prosome more thickened dorsoventrally than in male. Lateral edge of cephalothorax shield ornamented with pores on dorsolateral surface. Urosome (Fig. 4D, E) consisting of 4 articles ornamented with pores and sensilla: somite with leg 5, genital double-somite and two abdominal somites. Genital areas located dorsolaterally in anterior half of second urosomal somite. Copulatory pores situated ventrally beneath genital areas.

Rostrum (Fig. 4C): weakly developed, with pore and two sensillae, as in male.

Egg sacs (Fig. 4A, B): round, with 3 eggs. Egg as in Fig. 4F. Oral siphon, caudal ramus, antennae, mandible, maxillule, maxillae, maxilliped, and leg 1 like those of male.

Antennule (Fig. 4G): 20-segmented. Segments 1–10 as in male. Armature of segments is as follows: 2, 2, 2, 2, 2, 2, 2, 2, 7, 1, 2, 2, 2, 2, 2, 2, 2, 2+1 aesthetasc, 2, and 10 setae, respectively. Aesthetasc on segment 18, segment 10 reduced.

Leg 2 (Fig. 3F): same as in male, but

differs in having unmodified spines on distal segment of exopod.

Leg 3 (Fig. 3H, I): differs from male in having less developed spiniform terminal tip on third exopodal segment.

Leg 4 (Fig. 4H, I): differs from male in asymmetrical position of inner setae on distal segment of exopod and two spiniform outerdistal points of second segment of endopod.

Leg 5 (Fig. 4J): differs from male in proportions of free segment being more broad.

Leg 6: without setae on genital area.

Etymology.—The specific name is derived from the name of Australian indigenous people living in the area around the sampling site, referring themselves as “koori”.

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