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Ischyroceridae*

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* *In*: Lowry, J.K. & Myers, A.A. (Eds) (2009) Benthic Amphipoda (Crustacea: Peracarida) of the Great Barrier Reef, Australia. *Zootaxa*, 2260, 1–930.

Abstract

Eight species in the Ischyroceridae are reported from Lizard Island, northern Great Barrier Reef, Australia. Five species are new to science: *Coxischyrocerus rhombocoxus* **gen. et sp. nov.**, *Tropischyrocerus pugilus* **gen. et sp. nov.**, *Cerapus nudus* **sp. nov.**, *Ericthonius parabrasiliensis* **sp. nov.**, and *Ericthonius tropicalis* **sp. nov.** *Ericthonius pugnax* Dana is new to the Great Barrier Reef. *Ambicholestes magellani* (Just) and *Cerapus volucola* Lowry & Berents have been recorded previously from the area. A single specimen, possibly a new species, is reported as *Ericthonius* sp. *Ischyrocerus inexpectatus* Ruffo (Mediterranean Sea) is transferred to *Coxischyrocerus*. *Ischyrocerus socia* (Myers) from Bora Bora is transferred to *Tropischyrocerus*.

Key words: Crustacea, Amphipoda, Ischyroceridae, Great Barrier Reef, Australia, taxonomy, new genera, new species, *Coxischyrocerus rhombocoxus*, *Tropischyrocerus pugilus*, *Ambicholestes* (*Ambicholestes*) *magellani*, *Cerapus nudus*, *Cerapus volucola*, *Ericthonius parabrasiliensis*, *Ericthonius pugnax*, *Ericthonius tropicalis*

Introduction

This paper deals with eight species of ischyrocerid Amphipoda from Lizard Island and adjacent parts of the Great Barrier Reef. Six species are new to the Great Barrier Reef, five of them new to science. Two of the new species are placed in new genera. The only two ischyrocerids previously reported from the area, *Ambicholestes magellani* Just (1984) and *Cerapus volucola* Lowry & Berents (2005) were not found during the 2005 workshop.

Materials and methods

The higher classification of the Ischyroceridae follows Myers & Lowry (2003). The descriptions were generated from a DELTA database (Dallwitz 2005) and subsequently edited for clarity of language. Material was hand-collected on scuba and is lodged in the Australian Museum, Sydney (AM). A set of colour plates, a list of standard abbreviations and detailed station data is available in Lowry & Myers (2009). A CD (*Benthic Amphipoda (Crustacea: Peracarida) of the Great Barrier Reef: Interactive Keys*) is available with the book or the keys can be accessed at the crustacea.net website.

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Ischyroceridae Stebbing, 1899

Ischyrocerini Stebbing, 1899 (tribe status by Myers & Lowry 2003)

***Coxischyrocerus* gen. nov.**

Type species. *Coxischyrocerus rhombocoxus* **sp. nov.**

Etymology. The name of the genus refers to the enlarged coxa on male gnathopod 2.

Diagnosis. As *Ischyrocerus* (exemplified by the type species *I. anguipes)*, but with gnathopod 2 coxa enlarged compared to 1 and 3; gnathopod 2 ischium with large rounded setose anterior lobe; merus and carpus strongly compressed, shorter than deep; propodus elongate, posterior margin straight, distally with two close-set projections. Pereopod 5 basis with posterodistal lobe and posterior margin concave.

Included species. *Coxischyrocerus inexpectatus* (Ruffo, 1959), **comb. nov.**; *C. rhombocoxus* **sp. nov.**

***Coxischyrocerus rhombocoxus* sp. nov.**
(Fig. 1)

Type material. Holotype, male, 2.2 mm, AM P71497, Yonge Reef, Half Mile Opening (14°34'33"S 145°36'43"E), *Halimeda* and other algae, 10 m, C.S. Serejo, 4 March 2005 (QLD 1819).

Etymology. The epithet refers to the nearly rhomboid shape of the coxa of male gnathopod 2.

Description. Based on holotype, male; female unknown.

Head. *E*yes approximately 1/3 dorsal head length, situated partially within the lateral lobe of the head; lateral cephalic lobes apically acute. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum distinctly longer than peduncular article 3, with 4 articles; accessory flagellum 2-articulate (article 2 minute). *Antenna 2* short (less than 1/2 body length), peduncular articles 4–5 with 4 or more rows of setae per article; flagellum subequal to peduncular article 5, with 3 articles, proximal article longer than combined length of the two distal ones.

Pereon. *Gnathopod 1* distinctly smaller than gnathopod 2; coxa 1 half length of 2 and shorter than 3 and 4; carpus distinctly shorter than propodus; propodus 1.5 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* subchelate with slender setae; coxa rhomboid, distinctly longer than wide, distally tapering, distinctly longer than coxae 1 and 3; carpus nearly 3 x as wide as long; propodus approximately 10 x longer than carpus, elongate, posterior margin basically straight, with 1 large and 1 smaller projection distally; dactylus distinctly longer than half length of propodus, with 2 humps on posterior margin. *Pereopods 3–4* basis weakly expanded, almost linear; merus weakly expanded. *Pereopods 5–7* basis with a few setae; pereopod 5 basis narrower than basis pereopods 6–7, with posterodistal rounded lobe, posterior margin concave; merus not expanded around carpus.

Pleon. *Uropod 1* peduncle dorsolateral margin with a few robust setae. *Uropod 2* peduncle dorsolateral margin without setae, with a few robust setae apically. *Uropod 3* peduncle length approximately 3 x lateral greatest width, broad proximally, narrowing distally. *Telson* subtriangular, with single robust seta on each lateral margin.

Habitat. Among *Halimeda* and other algae; 10 m.

Remarks. Among *Ischyrocerus* species only *I. inexpectatus* Ruffo**,** 1959 (Red Sea; see also Myers 1989) shares with *Coxischyrocerus rhombocoxus* **sp. nov.** the reduced coxa 1, enlarged coxa 2, and a posterodistally lobed pereopod 5 basis with concave hind margin. That species is here transferred to *Coxischyrocerus*. Males of *Coxischyrocerus rhombocoxus* differ from those of *C. inexpectatus* as follows (latter in parentheses): presence of long setae ventrally on antenna 2 peduncle articles 4 and 5 (small, short setae); antenna 2 less than half body length (more than half); flagellum of antennae 1 and 2 short with 4 and 3 articles respectively (7 and 6 articles); coxa 2 anteroventrally with acute angle (rounded); propodus of gnathopod 2 10 x longer than

carpus (6 x), without small thumb proximally on posterior margin (with low thumb), posterodistal projections of unequal size, proximal one larger, pointed (equal size, rounded).

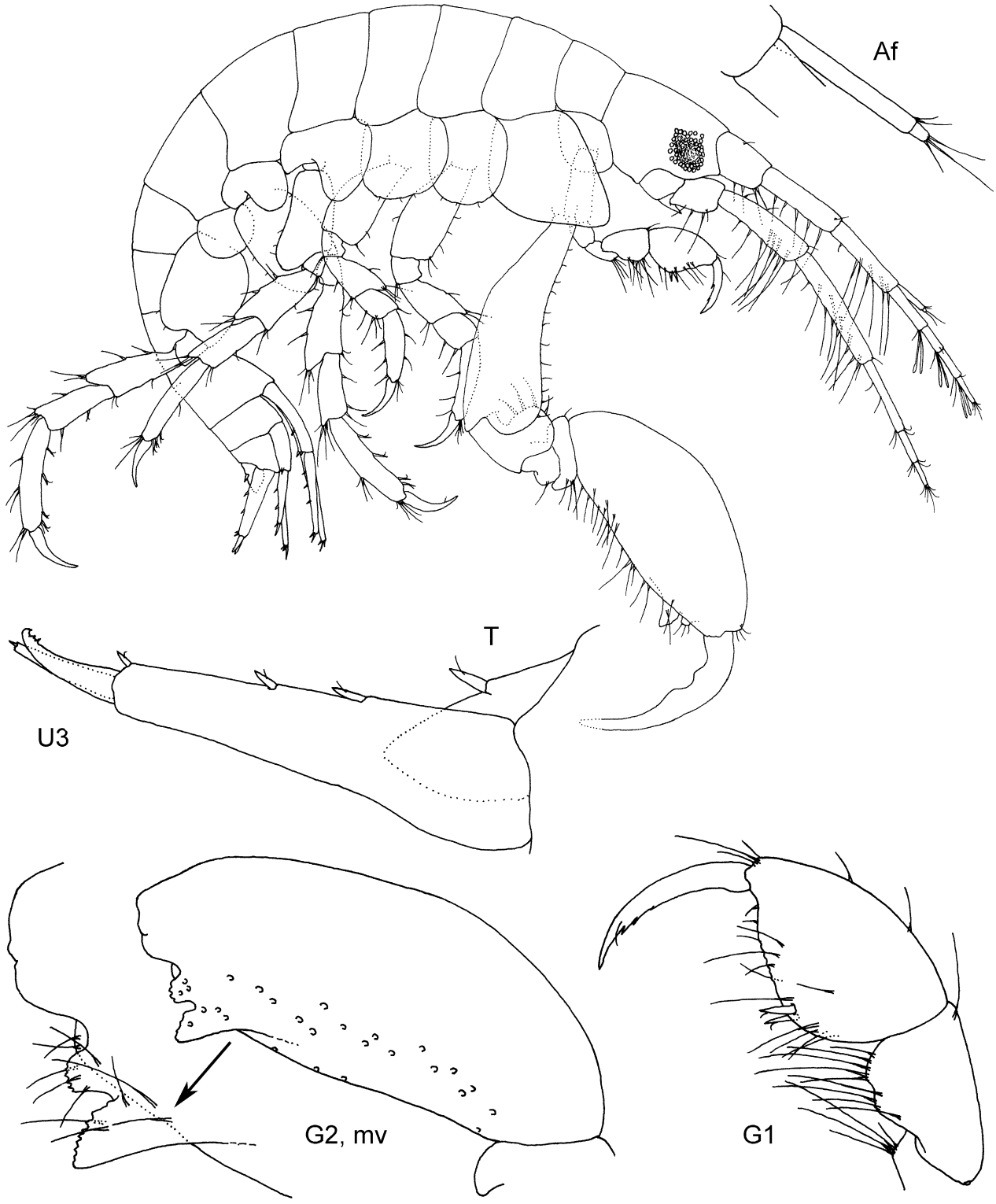

FIGURE 1. *Coxischyrocerus rhombocoxus* **gen. nov., sp. nov.**, holotype, male, 2.2 mm, AM P71497, Yonge Reef, Lizard Island, Great Barrier Reef.

Ischyrocerus parma Myers, 1995 from Madang, northern Papua New Guinea, shares with *Coxischyrocerus rhombocoxus* **gen. nov.**, **sp. nov.** the distinctive configuration of gnathopod 2 ischium to

propodus (Myers 1995: fig. 44 male gnathopod 2), especially the compressed merus and carpus and the large setose anterior flange on the ischium. On the other hand, coxa 2 does not seem to be particularly enlarged, and the combined description of pereopods 5–7 does not indicate a concave posterior margin of pereopod 5 basis. Pending further examination of *Ischyrocerus parma*, its relationship to *Coxischyrocerus rhombocoxus* remains unclear.

Distribution. *Australia*. Queensland: Lizard Island, Great Barrier Reef (current study).

Tropischyrocerus gen. nov.

Type species. *Tropischyrocerus pugilus* **sp. nov.**

Etymology. The name of the genus is a contraction of 'tropical' and *Ischyrocerus* alluding to the known distribution of the component species.

Diagnosis. Ischyrocerini with antenna 1 accessory flagellum 2-articulate, second article minute. Coxae 1–5 of equal depth, all less deep than corresponding pereonite; coxa 2 of male wider than 1 and 3, wider than deep, ventral margin concave or straight. Male gnathopod 2 merus and carpus well developed of subequal size, not compressed; carpus anterior margin broadly convex; propodus elongate, posterior margin straight, distally with single projections near insertion of dactylus, posteriorly with thumb; dactylus posterior margin smooth. Female gnathopod 1 propodus slightly smaller than gnathopod 2 propodus, posterior margin evenly convex; gnathopod 2 palm concave (for *T. socia* fide Conlan 1995). Pereopod 5 basis posterior margin not concave.

Included species. *Tropischyrocerus pugilus* **sp. nov.**; *T. socia* (Myers, 1989) **comb. nov.**

Remarks. Conlan (1995) reviewed the ischyrocerid genus *Microjassa* Stebbing, 1899. As a result she removed two species to a new genus *Neoischyrocerus*, together with a species previously in the genus *Jassa*. Conlan (1995: 369) further discussed *Jassa socia* Myers, 1989 (Bora Bora, Society Islands), but despite its resemblance to *Neoischyrocerus lilipuna* (J.L. Barnard, 1970), she rejected its inclusion in that genus on the grounds that it differed in six specific characters from the diagnosis of *Neoischyrocerus*. She transferred the species to *Ischyrocerus*, while noting that a new genus might be warranted for this and other *Ischyrocerus* species.

Ischyrocerus socia and the new species *Tropischyrocerus pugilus* described below share diagnostic characters which differ from *I. anguipes* Krøyer, the type species of *Ischyrocerus* (*Ischyrocerus* still is in need of a full revision, a task beyond the scope of this study, hence the reference to its type species only). *Ischyrocerus socia* (Myers, 1989) is here transferred to the new genus *Tropischyrocerus*.

Tropischyrocerus **gen. nov.** differs from *Neoischyrocerus* by shorter coxae, with male coxa 2 wider than deep, distinctly wider than 1 and 3; by the concave palm of gnathopod 2 in females; propodus of pereopod 3 and 4 lacking robust setae; and by the dactyli of gnathopods 1–2 and pereopods 5–7 lacking facial serration.

Tropischyrocerus pugilus sp. nov.
(Figs 2, 3)

Type material. Holotype, male, 2.4 mm, AM P71567, Yonge Reef, Half Mile Opening (14°34'19"S 145°36'51"E), *Halimeda opuntia* (green coralline algae), 9 m, O. Coleman, 5 March 2005 (QLD 1829). Paratypes: 1 female with fully developed oostegites, 2.1 mm, AM P71376 (QLD 1810); 1 small male, 1.8 mm, AM P71421 (QLD 1808).

Etymology. The epithet is from the Latin *pugil* meaning fist fighter, alluding to the large gnathopod 2 propodus reminiscent of a boxing glove.

Description. Based on holotype, male, 2.4 mm, AM P71567.

Head. *E*yes 1/3 dorsal length of head, situated partially within lateral lobe of head; lateral cephalic lobes apically acute. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum distinctly longer than peduncle article 3, of 4 articles, accessory flagellum directed at 90° to main flagellum, 2-articulate (article 2 minute). (*Antenna 2* not known in male.)

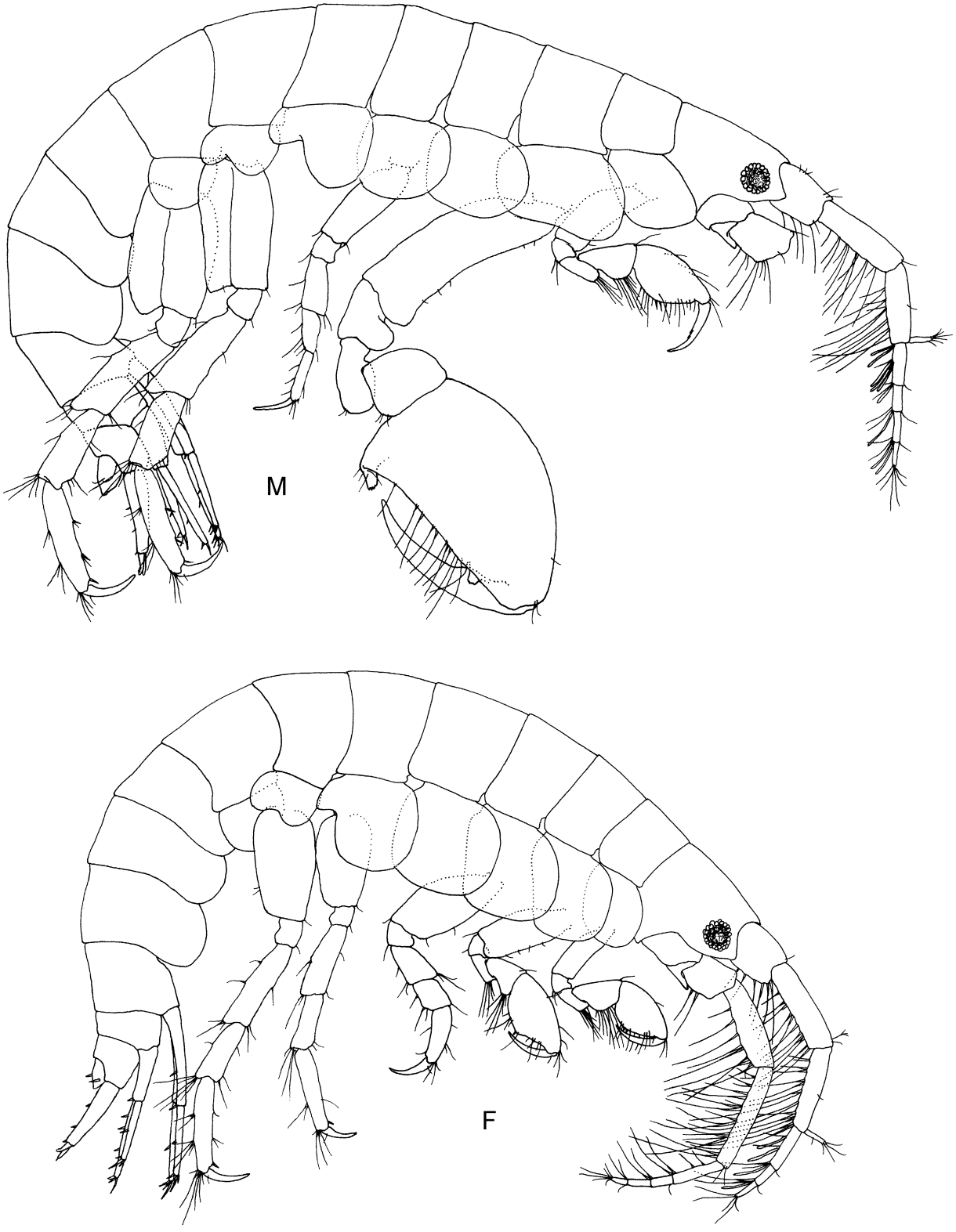

FIGURE 2. *Tropischyrocerus pugilus* **gen. nov., sp. nov.**, M, holotype, male, 2.4 mm, AM P71567, F, paratype, female, 2.1 mm, AM P71376, Yonge Reef, Lizard Island, Great Barrier Reef.

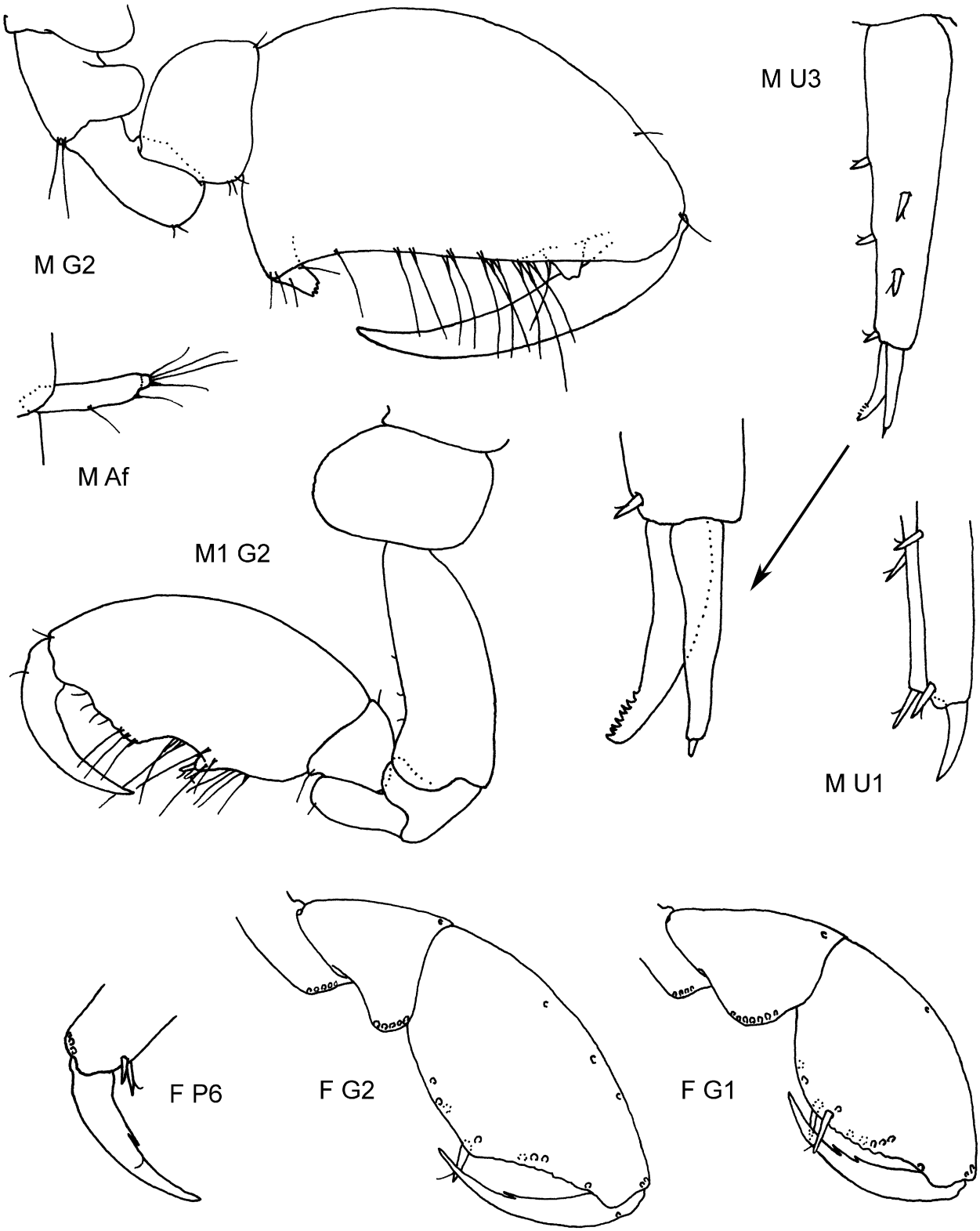

FIGURE 3. *Tropischyrocerus pugilus* **gen. nov., sp. nov.**, M, holotype, AM P71567; M1, paratype, small male, AM P71421; F, paratype, female, AM P71376, Yonge Reef, Lizard Island, Great Barrier Reef. (U1 shows distal part of peduncle with distoventral spine).

Pereon. *Gnathopod 1* distinctly smaller than gnathopod 2; coxa of similar length to coxae 2–4; carpus distinctly shorter than propodus; propodus length 1.7 x width, posterodistal margin evenly rounded.

Gnathopod 2 subchelate; coxa broader than 1 and 3, width 1.5 depth, ventral margin weakly concave; carpus slightly wider than long, anterior margin broadly rounded; propodus length approximately twice width, broadest proximally, anterior margin broadly convex, posterior margin basically straight, proximally with short forward curved thumb, distally with short conical projection; dactylus distinctly longer than half length of propodus, reaching nearly to propodus thumb. *Pereopods 3–4* basis weakly expanded, almost linear; merus weakly expanded. *Pereopods 6–7* (5 missing) basis with nearly parallel margins and angular posterodistal corner, with a few setae.

Pleon. *Uropod 1* peduncle dorsolateral margin with a few robust setae. *Uropod 2* peduncle dorsal margin without setae. *Uropod 3* peduncle approximately 3.5 x proximal lateral width, broad proximally, narrowing distally. *Telson* subtriangular, with single robust seta on each lateral margin.

Habitat. Among the green algae *Halimeda* and *Caulerpa*, 9–16 m.

Remarks. Females of *Tropischyrocerus pugilus* are similar to males, except for sexually dimorphic much smaller gnathopod 2 with a concave palm, and coxa 2 which in females is slightly longer than wide, evenly rounded ventrally and similar to coxa 3. Basis of pereopods 3–4 are slightly broader than in male.

Coxa 2 in young males is less wide than in large males, and ventral margin concavity is poorly developed. The enlarged gnathopod 2 propodus of large males develops gradually; Fig. 3 M1 G2 shows the gnathopod of a 1.8 mm long male.

Tropischyrocerus pugilus differs from *T. socia* as follows: antennae shorter, stouter, peduncle of antenna 1 as long as head and first one and a half pereonites (head and first 3 pereonites in *T. socia*); coxa 2 in male ventrally concave (straight); gnathopod 2 propodus in male ovoid, thumb forward curved (elongate, thumb perpendicular to propodus posterior margin).

Distribution. *Australia*. Queensland: Young Reef (current study).

Siphonoecetini Just, 1983 (tribe status by Myers & Lowry 2003)

***Ambicholestes* Just, 1998**

***Ambicholestes* (*Ambicholestes*) *magellani* (Just, 1984)**
(Fig. 4)

Caribboecetes magellani Just, 1984: 57, figs 1C, 16, 17.
Ambicholestes (*Ambicholestes*) *magellani*. —Just, 1998: 32.

Material examined. 2 females, Zoological Museum, Copenhagen, base of bommies, off Research Point, Lizard Island, 8 m.

Type locality. Mactan Island, Cebu, The Philippines.

Habitat. Coarse sand and coral rubble in 3–33 m depth. Like most other siphonoecetines *Ambicholestes magellani* occupies foreign objects such as empty mollusc shells (Fig. 4) or polychaete tubes, to the front end of which they add a short tube of fine sand and/or coarse shell debris.

Remarks. Just (1998) reported *Ambicholestes magellani* from various localities along the Great Barrier Reef from Lizard Island in the north to Heron Island in the south. The species was not found during the present survey. Only *Ambicholestes magellani* and *A. trilobatus* Just, 1998 (Elizabeth Reef, north of Lord Howe Island, Tasman Sea) have the anterior margin of the basis of gnathopod 2 lobate. Males as well as females of *Ambicholestes magellani* differ from *A. trilobatus* as follows: gnathopod 2 basis with two lobes (three lobes in *A. trilobatus*), frontal margin of head broadly rounded in dorsal view (with long, acute rostrum), pleosome and urosome dorsally smooth (densely covered with long and short setules).

Distribution. *Australia*. Queensland: Great Barrier Reef (Just, 1998). *The Philippines*: Cebu (Just, 1984).

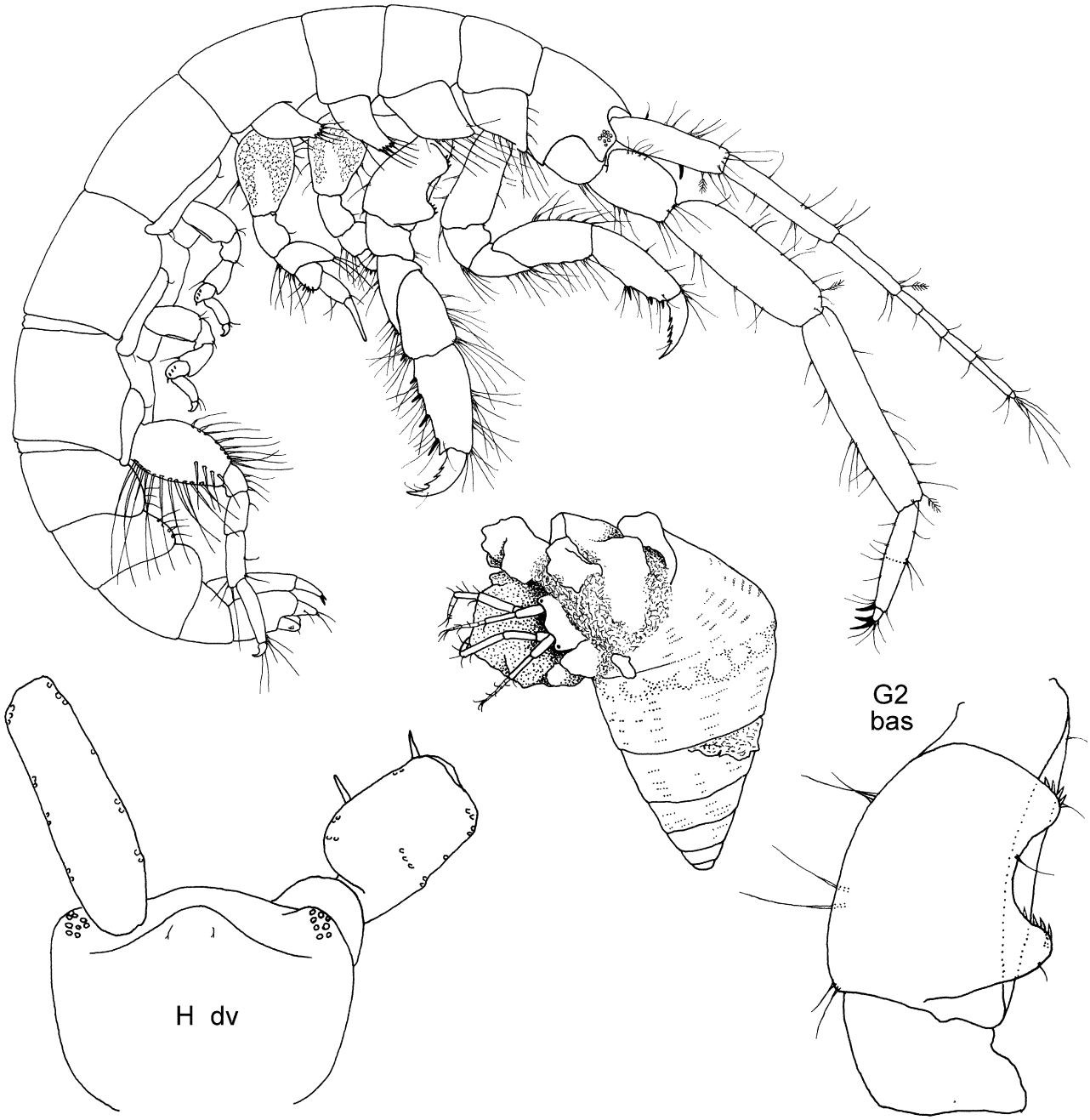

FIGURE 4. *Ambicholestes* (*Ambicholestes*) *magellani* (Just, 1984), female, habitus and a second female in abode, Zoological Museum, Copenhagen. Both off Research Point, Lizard Island, Great Barrier Reef. H dv, Head in dorsal view; G2 bas, bilobed basis of gnathopod 2.

Cerapus Say, 1817

Cerapus nudus sp. nov.

(Figs 5, 6, Pl. 3G)

Type material. Holotype, male, 2.4 mm, AM P70908, Cobia Hole, Lizard Island (14°39'09"S 145°26'51"E), sediment, 17 m, Australian Museum Party, 25 February 2005 (QLD 1672). Paratypes: 1 subadult female, AM P70810 (QLD 1654); 1 juvenile female, AM P70870 (QLD 1654); 1 male, 1 female 3.6 mm (illustrated), AM P70834 (QLD 1666); 1 juvenile male, 2 tubes, AM P70813 (QLD 1666); 1 damaged female with tube, AM P70783 (QLD 1666); 1 male, 1 female, AM P75646 (QLD 1672).

Type locality. Cobia Hole, Lizard Island, Queensland, Australia (14°39'09"S 145°26'51"E).

Etymology. The epithet *nudus* is Latin for naked, alluding to the near complete lack of setae on coxae and pereopods 3–7.

Description. Based on male holotype, 2.4 mm, AM P70908.

Head. *R*ostrum short, 0.13 x length head, apically subacute; lateral cephalic lobes with distal corner acute, subocular margin deeply recessed. *Antenna 1* peduncular article 1 not produced anterodistally and anteromedially, slightly swollen along posterior margin, posterodistal corner not produced; articles 2 and 3 with 5 rows of long setae on posterior margin: flagellum with 4 articles, proximal one the longest, all with many aesthetascs. Antenna 2 as long as 1; flagellum with 3 articles, proximal one as long as remaining 2 combined. Mandible palp article 3 slender, blade-like.

Pereon. *Pereonite 1* without lateral keel, without sternal keel. *Pereonites 2–3* without sternal keel. *Pereonite 5* length 1.7 x depth. *Gnathopod 1* coxa not fused to pereonite 1, width 1.3 x depth, without anteroventral lobe; basis length 2.5 x width; carpus, length 1.3 x width, with broad, setose posterior lobe; propodus palm acute, defined by barbed slender setae. *Gnathopod 2* carpochelate; coxa not fused to pereonite 2, width 2.3 x depth; basis short, broad, length 2 x width; carpus broad, length 1.1 x width; palm shallowly excavated, anterodistal tooth small, located near articulation with propodus, posterodistal tooth well defined, medium, length 1.3 x width; propodus very broad, slightly curved, length 2.1 x width, without tooth on posterior margin, posterodistal corner smooth, without teeth; dactylus length 0.9 x propodus.

Pereopods 3 and *4* coxa not fused to pereonite, length 2.3 x depth; basis, length twice width, evenly rounded, with slender setae along anterior margin, without denticles along anterior margin; ischium length 2.3 x width; merus long, length 1.6 x width. *Pereopod 5* coxa width 1.6 x length, triangular, without patches of small setae; with a few slender setae along ventral margin; merus with anterior lobe extending beyond anterior margin of carpus, posterior lobe with 3 slender setae; propodus with 1 seta on midposterior margin; dactylus short, uncinate with one accessory hook. *Pereopods 6* and *7* coxa without setal fringe ventrally, without patches of small setae near margins, coxa 6 triangular, coxa 7 ventrally rounded; basis with at most a single small slender seta on posterior margin; merus width 1.6 x length, dactylus short, uncinate, with one accessory hook.

Pleon. *Uropod 1* biramous, peduncle with distoventral corona of cuticular teeth (not shown in Fig. 6), length 1.4 x length of outer ramus; outer ramus with 3 lateral slender setae, with large apical robust seta and smaller slender setae; inner ramus 0.6 length of outer ramus, with 1 apical robust seta and 1 slender seta. *Uropod 2* uniramous, length of peduncle 4 x width, 3.3 x length of ramus; ramus small, with denticles and single apical seta. *Uropod 3* uniramous, peduncle length 1.4 x width; ramus with 4–5 apical curved hooks. *Telson* length 2.1 x width, deeply cleft, each lobe dorsally with 10 anteriorly directed hooks in 3 rows.

Female (sexually dimorphic characters). Based on paratype, 3.6 mm, AM P70834. *Antennae* more slender and with fewer aesthetascs than in male, antenna 1 with 3, antenna 2 with 5 flagellar articles, article 1 as long as and more heavily setose than peduncle article 5. *Gnathopod 2* similar to 1, but slightly larger. *Pereonites 3–5* and coxae successively more elongate than in male; pereonite 4 length 2.7 x depth, coxa width 3.2 length; pereonite 5 length about 3.4 x depth, 2.5 x longer than in male. *Coxa 5* enormously enlarged, broadly rounded ventrally, partly infolded under body. *Coxa 6* rounded rectangular. *Coxa 7* rounded triangular.

Tube. Uniformly fine sediment and detritus.

Habitat. Infaunal sand and rubble dwellers; 17 m.

Remarks. *Cerapus nudus* **sp. nov.** differs from congeners in the Indo-Pacific by the distinctive paucity of setae on coxae and pereopods 3–7, and by its slender, elongate antennae, especially in the female. For specific differences from the only other species of *Cerapus* reported from Lizard Island, *C. volucola*, see that species below.

Distribution. *Australia*. Queensland: Lizard Island, Great Barrier Reef (current study).

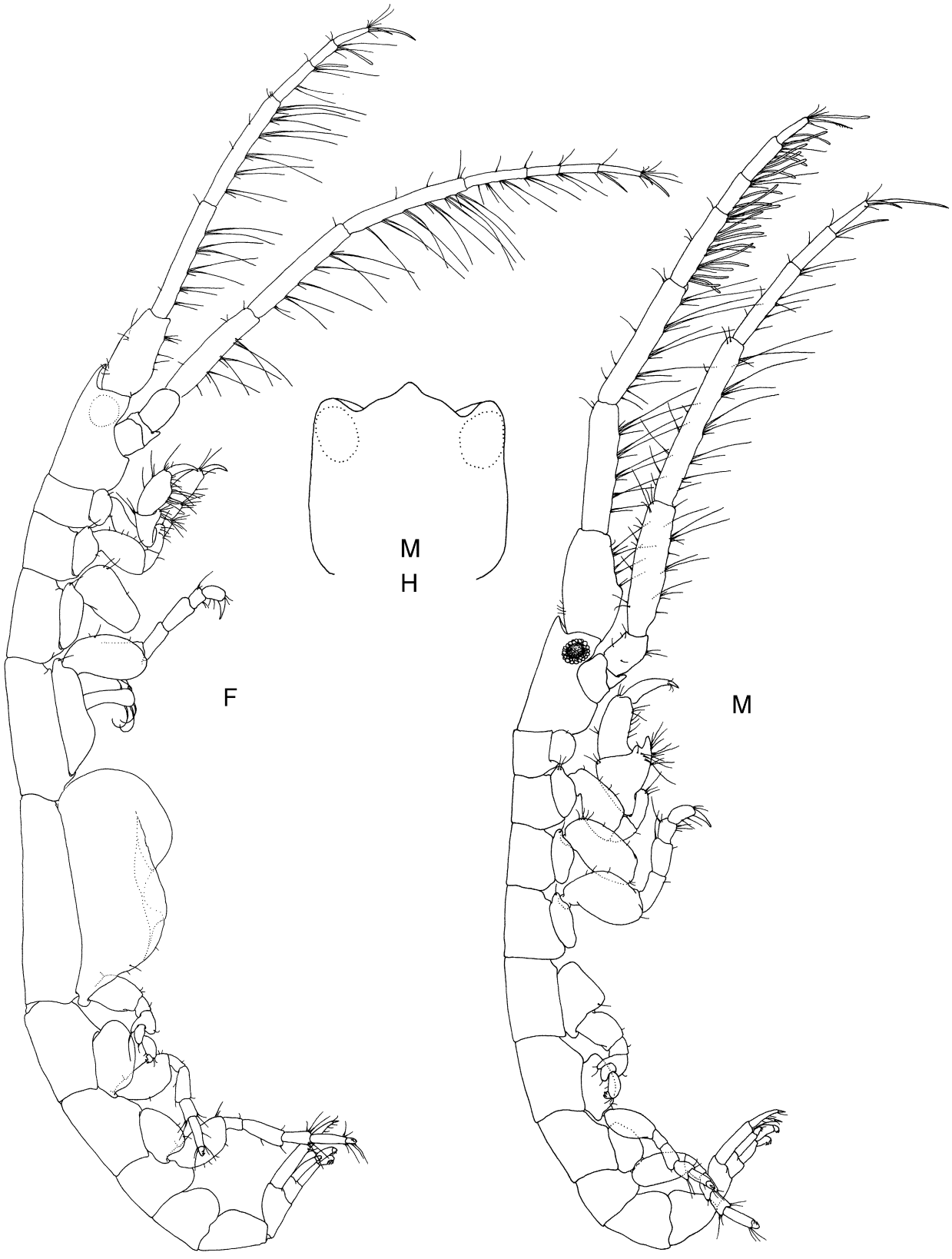

FIGURE 5. *Cerapus nudus* **sp. nov.**, M, holotype, male, 2.4 mm, AM P70908, F, paratype, female, 3.6 mm, AM P70834, Cobia Hole, Lizard Island, Great Barrier Reef. H, dorsal view of head.

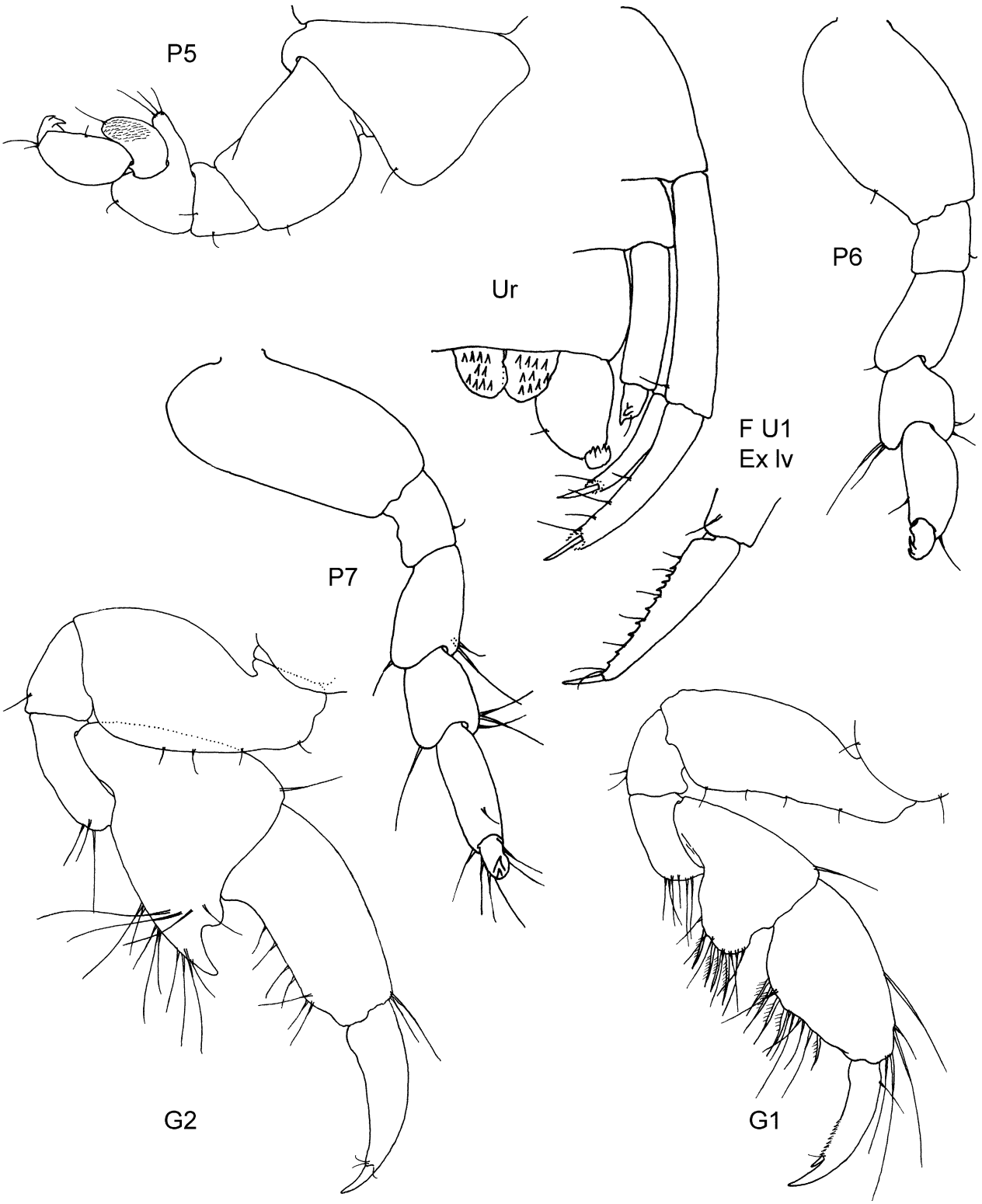

FIGURE 6. *Cerapus nudus* **sp. nov.**, holotype, male, 2.4 mm, AM P70908, except F, paratype, female, 3.6 mm, AM P70834, Cobia Hole, Lizard Island, Great Barrier Reef. Ex lv, exopod lateral view.

***Cerapus volucola* Lowry and Berents, 2005**
(Fig. 7)

Cerapus volucola Lowry & Berents, 2005: 160, figs 7–9.

Type locality. False Orford Ness, north-east of Cape York, Australia.

Habitat. Algal or seagrass dwellers. Littoral; 3–38 m.

Tube. A cylindrical wrap of seagrass and algae.

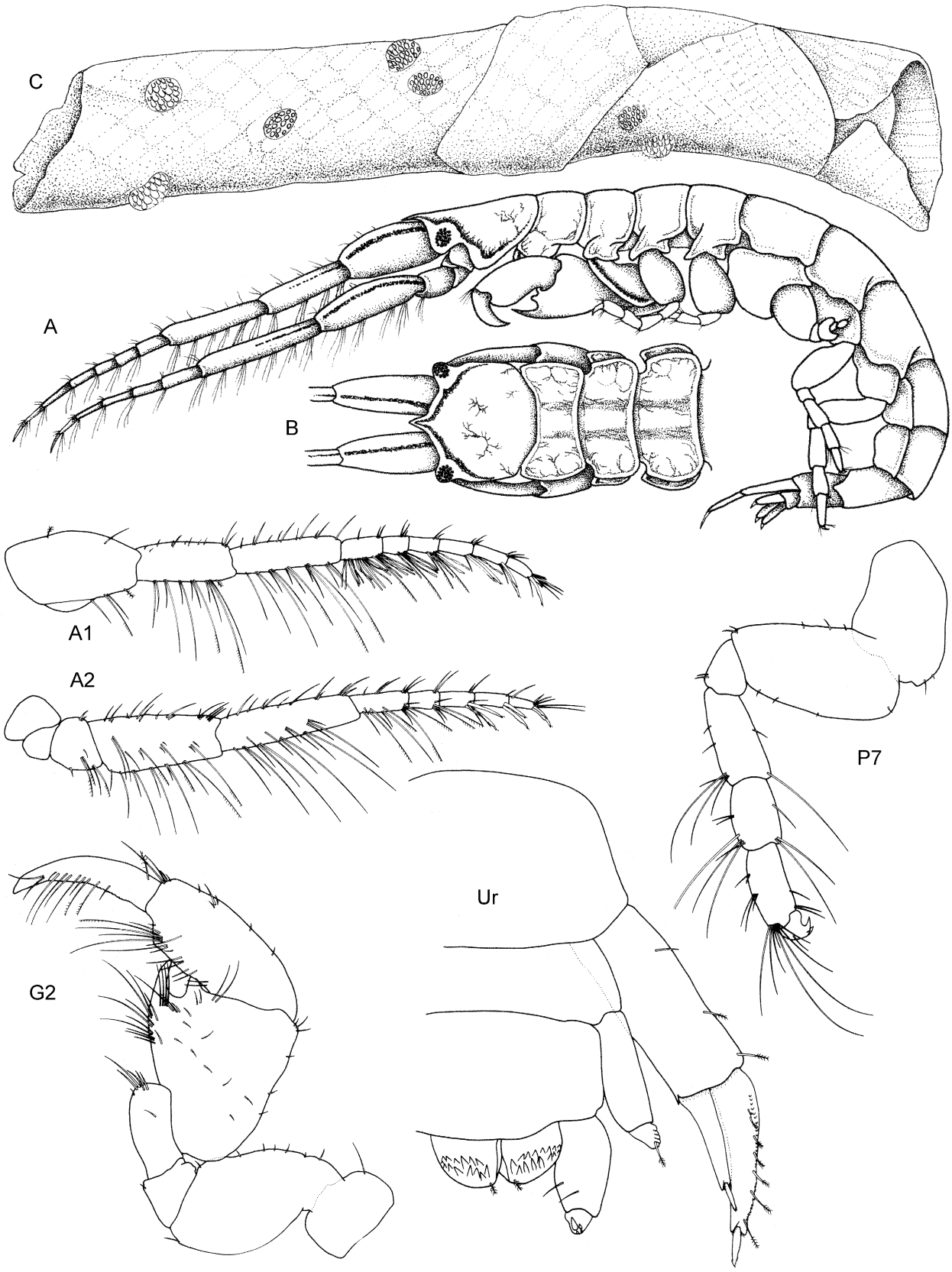

FIGURE 7. *Cerapus volucola* Lowry & Berents, 2005, male A and B, lateral and dorsal view, C, tube, False Orford Ness, Great Barrier Reef. Reproduced and rearranged from Lowry & Berents (2005).

Remarks. Lowry & Berents (2005) reported *Cerapus volucola* from near Lizard Island. The species was not found during the present survey. *Cerapus volucola* differs from *C. nudus* **sp. nov.** in many characters, including coxae 1–4 fused to pereonites (coxa 1 in female not fused); coxae 3 and 4 with acute anteroventral lobe; a sharply acute rostrum (dorsal view); shorter antennae with more flagellar articles; dactylus of gnathopod 2 with posterior row of long setae; all pereopods with more and longer setae; telson lobes with 14–15 dorsal hooks in 2 rows; tube constructed of plant material.

Distribution. *Australia*. Entire Great Barrier Reef south to North Stradbroke Island (Lowry & Berents 2005). *Papua New Guinea*. Madang Lagoon (Lowry & Berents 2005).

Ericthonius Milne Edwards, 1830

Remarks. Species of *Ericthonius* have only recently been reported from Australia. Eight species are now known from around this continent (one more than from the North Atlantic (Myers & McGrath 1984)): *E. brevicarpus* Vader & Myers, 1996; *E. coxacanthus* Moore, 1988; *E. forbesii* Hughes & Lowry, 2006; *E. parabrasiliensis* **sp. nov.**; *E. pugnax* Dana, 1852; *E. rodneyi* Hughes & Lowry, 2006; *E. tacitus* Moore,1988; and *E. tropicalis* **sp. nov.** All eight species are found along the east coast of Australia from Tasmania to Lizard Island in the northern part of the Great Barrier Reef. Two of the species, *E. pugnax* and *E. coxacanthus*, are also reported from Western Australia.

All species from Lizard Island, and indeed all species from Australia, belong to the main Group 1 of *Ericthonius* defined by Myers & McGrath (1984) as having stridulating ridges on coxa 2 in males; coxa 2 widely separated from 1 and 3; and male gnathopod 2 carpus with two posterodistal teeth. Within *Ericthonius* Group 1 a subgroup can be discerned: species with a row of robust setae along the posterior margin of the male gnathopod 2 carpus proximal to the distal teeth, as opposed to species with slender setae only. In Australia, species with robust setae are *E. coxacanthus*, *E. tacitus* and *E. tropicalis* **sp. nov.** The only other known species belonging in this subgroup is *E. ledoyeri* Barnard & Karaman, 1991 from Madagascar and Mauritius. None of the Atlantic Group 1 species has such robust setae, and the subgroup thus appears to be confined to the Indo-West? Pacific.

Ericthonius parabrasiliensis sp. nov.
(Figs 8, 9)

Type material. Holotype, male, 4.6 mm, AM P70718, Watsons Bay, Lizard Island (14°39'41"S 145°26'52"E), scrapings from mooring block on sandy bottom, 8.3 m, P.B. Berents & L. Hughes, 24 February 2005 (QLD 1636). Paratypes: 1 male, AM P70693 (QLD 1636); 1 ovigerous female, 5.2 mm, AM P70675 (QLD 1644).

Type locality. Watsons Bay, Lizard Island, Queensland, Australia (14°39'41"S 145°26'52"E).

Etymology. The prefix *para* indicates the similarity of this new species to *Ericthonius brasiliensis*.

Description. Based on male holotype, 4.6 mm, AM P70718.

Head. *E*yes large, 2/5 dorsal length of head, situated mainly within lateral lobe of head. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum distinctly longer than peduncular article 3, with 13 articles, each with a single aesthetasc. (*Antenna 2* not known in male.)

Pereon. *Gnathopod 1* distinctly smaller than gnathopod 2; coxa about half length and width of coxa 2, not ventrally setose; basis with midposterior broad expansion; merus with posterodistal forward pointing spine; carpus distinctly longer than propodus; propodus length slightly less than 1.5 x width, posterior margin evenly rounded. *Gnathopod 2* carpochelate; coxa 2 separated from coxa 1 and 3 (but not widely), subquadrate, about as broad as deep, much larger than 1 and 3–4, with stridulation ridges along ventral convex margin and cluster of slender setae on anteroventral margin; carpus with distinct free posterodistal expansion with two carpal teeth, posterior margin of carpus with slender setae only; propodus length 2/3 carpus length,

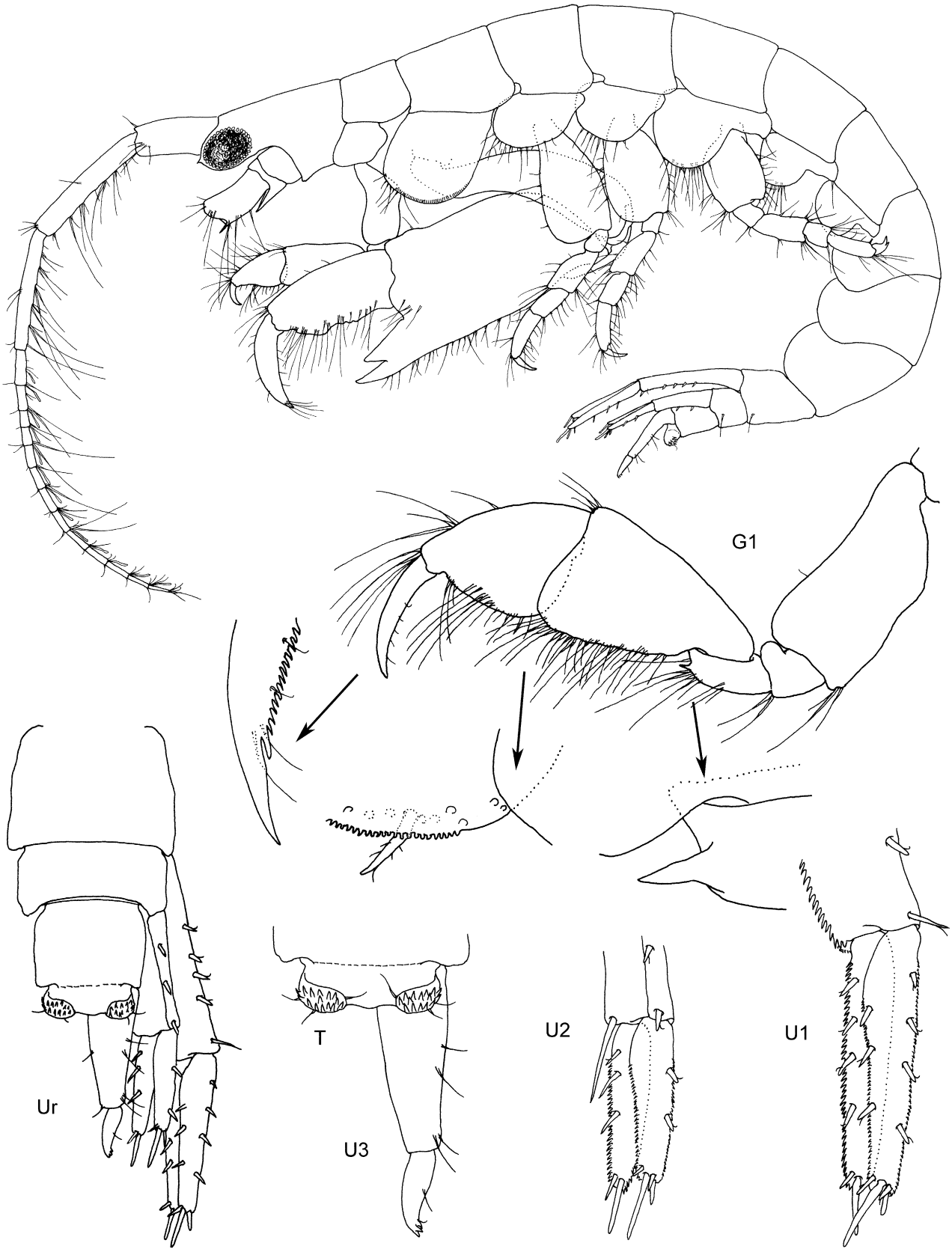

FIGURE 8. *Ericthonius parabrasiliensis* **sp. nov.**, holotype, male, 4.6 mm, AM P70718, Watsons Bay, Lizard Island, Great Barrier Reef.

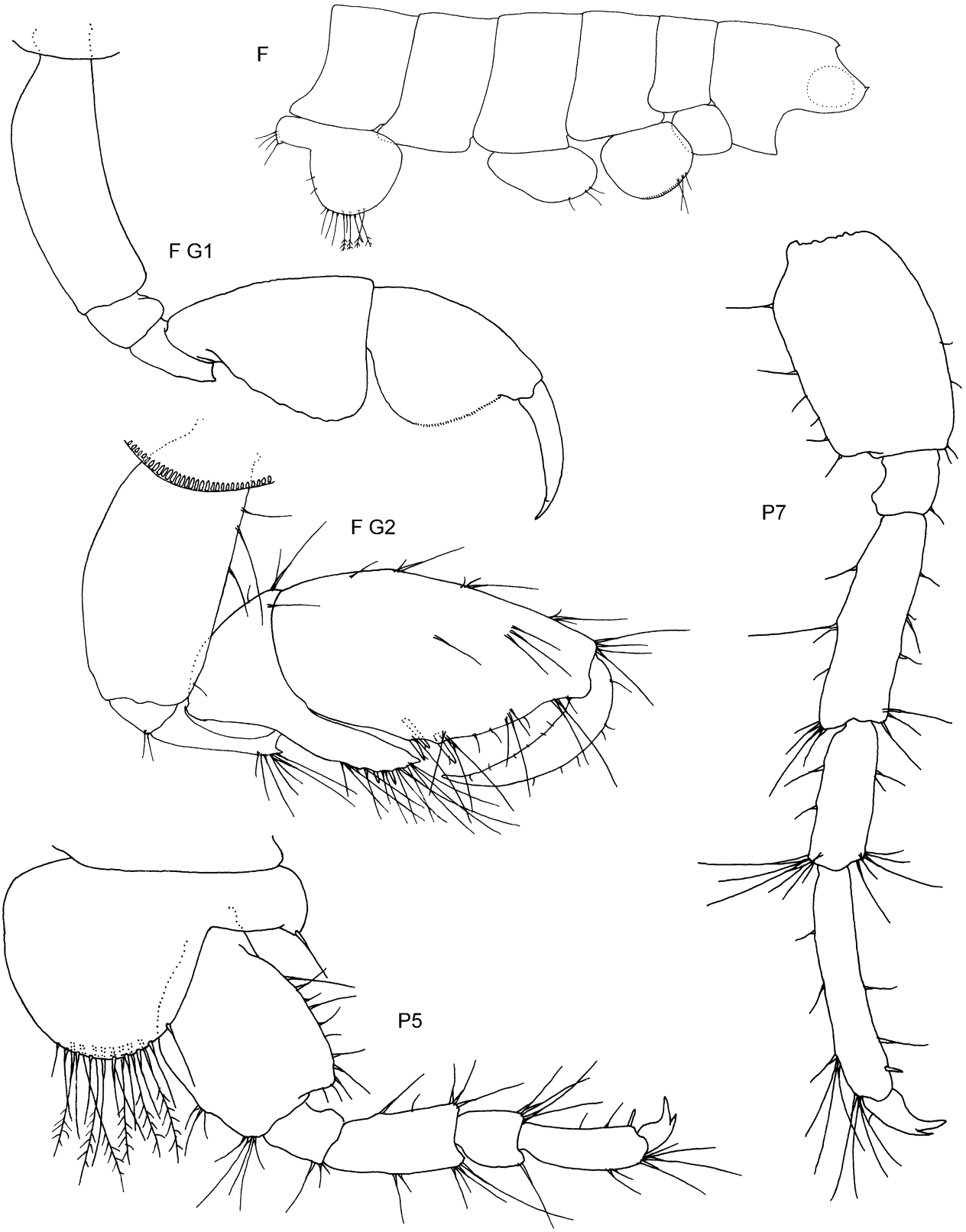

FIGURE 9. *Ericthonius parabrasiliensis* **sp. nov.**, holotype, male, 4.6 mm, AM P70718, except F, paratype, female, 5.2 mm, AM P70675, Watsons Bay, Lizard Island, Great Barrier Reef (setae on F G1 omitted, but as in male Fig.8 G1).

rectangular, posterior margin with low rectangular projection in distal third and flat rounded midposterior bump; dactylus approximately 2/3 length of propodus, with apical tuft of setae. *Pereopods 3–4* coxae, ventral margin setose; basis anterodistally expanded, flask shaped; merus weakly expanded. *Pereopod 5* coxa ventral margin with many long slender and plumose setae, basis posterodistal corner approximately right angled. Pereopod 7 basis length approximately 1.5 width, posterodistal corner rounded right angled.

Pleon. *Urosomites* 1 and 2 with dorsal pair of upright slender setae. *Uropod 1* peduncle dorsolateral margin with row of 5 robust setae, outer ramus with 4 lateral and 3 medial robust setae, inner ramus with 4 medial robust setae, apically with 2–3 robust setae. *Uropod 2* peduncle dorsolateral margin with 3 robust setae, medial margin with single long robust seta distally, outer ramus lateral margin with 2 robust setae, medial margin without setae; inner ramus lateral margin without setae, medial margin with 3 robust setae, both rami with 2–3 robust setae apically, one of which is twice as long as the others. *Uropod 3* peduncle length approximately 2.5 x greatest width, broad proximally, narrowing distally, with 4 dorsolateral slender setae; ramus length approximately 3 x width, distally cusped. *Telson* midlength 1/3 greatest width, lateral lobes with 2 rows of recurving hooks, distance between lobes equals width of each lobe.

Female (sexually dimorphic characters). Based on paratype, 5.2 mm, AM P70675. *Gnathopod 1* basis without posterior swelling. *Gnathopod 2* coxa rounded, only slightly longer than 1 and 3, with stridulation ridges ventrally; carpus projection with row of 2–4 robust setae on posterior margin and acute apex; propodus posterior margin evenly convex, with group of 3 robust setae level with ventral apex of carpus; dactylus without apical setae.

Habitat. On overgrown mooring blocks and lines, 5 to ca. 8 m depth.

Remarks. Males of *Ericthonius parabrasiliensis* **sp. nov.** are similar to *E. brasiliensis* (Dana, 1853) in possessing a posterior swelling on the basis of gnathopod 1, although a much shallower one than in the latter species. No other species of *Ericthonius* has such a swelling on the basis of gnathopod 1. In both sexes, the eyes in *E. parabrasiliensis* are much larger than in *E. brasiliensis*; the shape of coxae 3–4 differs, and coxa 5 in *E. brasiliensis* lacks a combination of long slender and plumose marginal setae.

Distribution. *Australia*. Queensland: Lizard Island, Great Barrier Reef (current study).

Ericthonius pugnax Dana, 1852

(Figs 10, 11)

Ericthonius pugnax Dana, 1852: 218.
Ericthonius pugnax. —Moore, 1988: 727, fig. 14. —Myers, 1995: 80, figs 40–42.
For synonymy and further list of records see Moore, 1988: 727, 729.

Material examined. Sixty one specimens in all. 1 male, 4 females, AM P70661 (QLD 1639); 1 male, 2 females, AM P70700 (QLD 1640); female (illustrated), 4.8 mm, AM P70755 (QLD 1645); 3 males, 3 females, AM P70719 (QLD 1645); 4 males, 2 ovigerous females, 2 juveniles, 3 broken specimens, AM P70738 (QLD 1645); 4 males, 6 females, AM P75647 (QLD 1645); 1 male, 1 female, AM P70731 (QLD 1648); 2 females, AM P70850 (QLD 1666); 2 males, 1 female, AM P70961 (QLD 1687); 1 ovigerous female, AM P70955 (QLD 1697); 2 males, 2 females, 1 juvenile, AM P71299 (QLD 1716); 2 juvenile, AM P71284 (QLD 1763); 1 male (illustrated), 3.7 mm, AM P71267 (QLD 1771); 5 males, 2 females**,** AM P75648 (QLD 1771); 1 male, broken, 1 female, AM P75649 (QLD 1823).

Type locality. Sulu Sea, Indonesia.

Description. Based on male, 3.7 mm, AM P71267, and male, 3.4 mm, AM P75648.

Head. *E*yes 1/3 dorsal length of head, situated mainly within lateral lobe of head. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum distinctly longer than peduncular article 3, with 10 articles, most with single aesthetasc. *Antenna 2* only slightly longer than 1, peduncular articles 4 and 5 with 4–5 rows of setae; flagellum distinctly longer than peduncular article 5, with 10 articles.

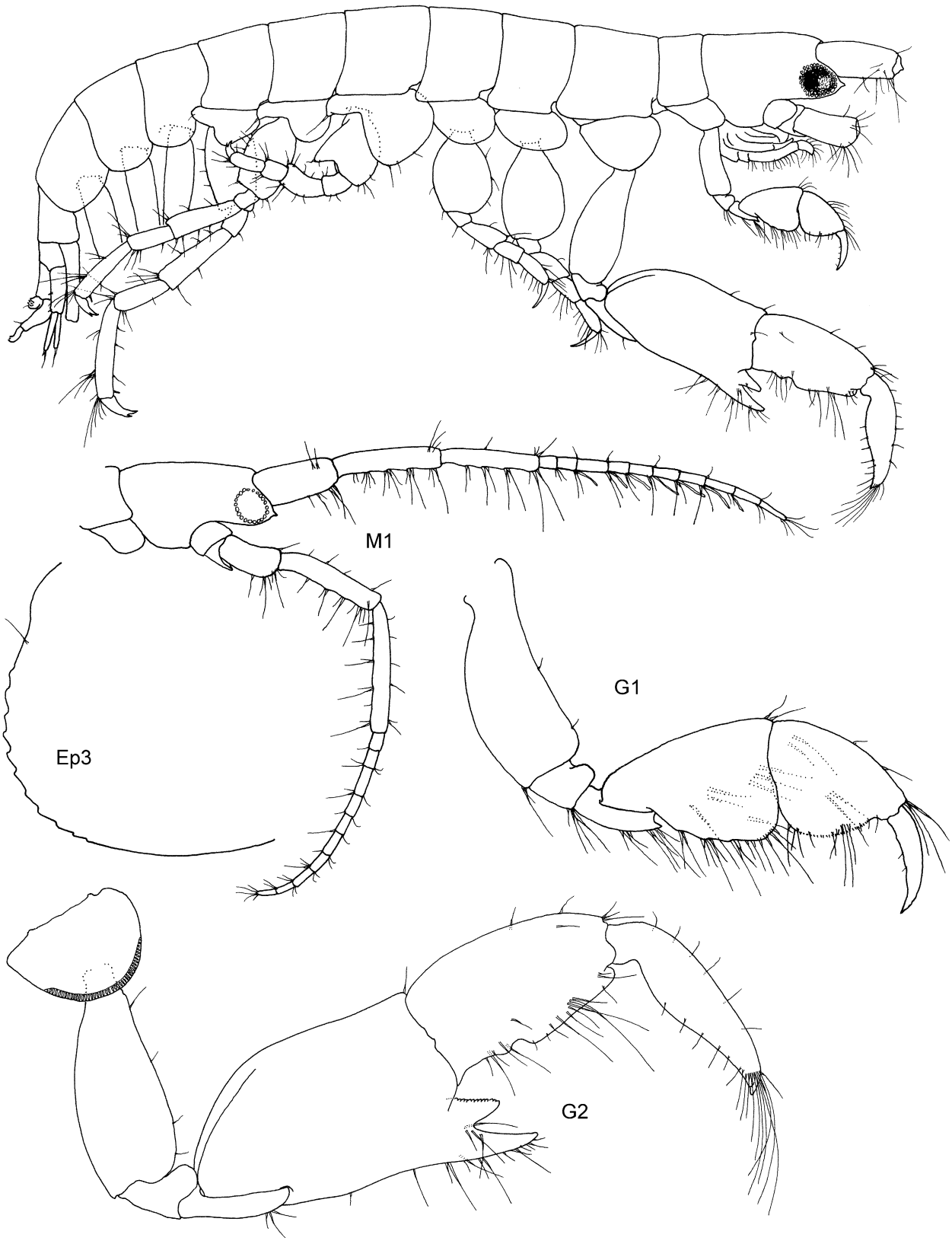

FIGURE 10. *Ericthonius pugnax* Dana, 1852, male, 3.7 mm, AM P71267, except M1, male, 3.4 mm, AM P75648**,** Casuarina Beach, Lizard Island, Great Barrier Reef. Gnathopods 1–2 (not to scale).

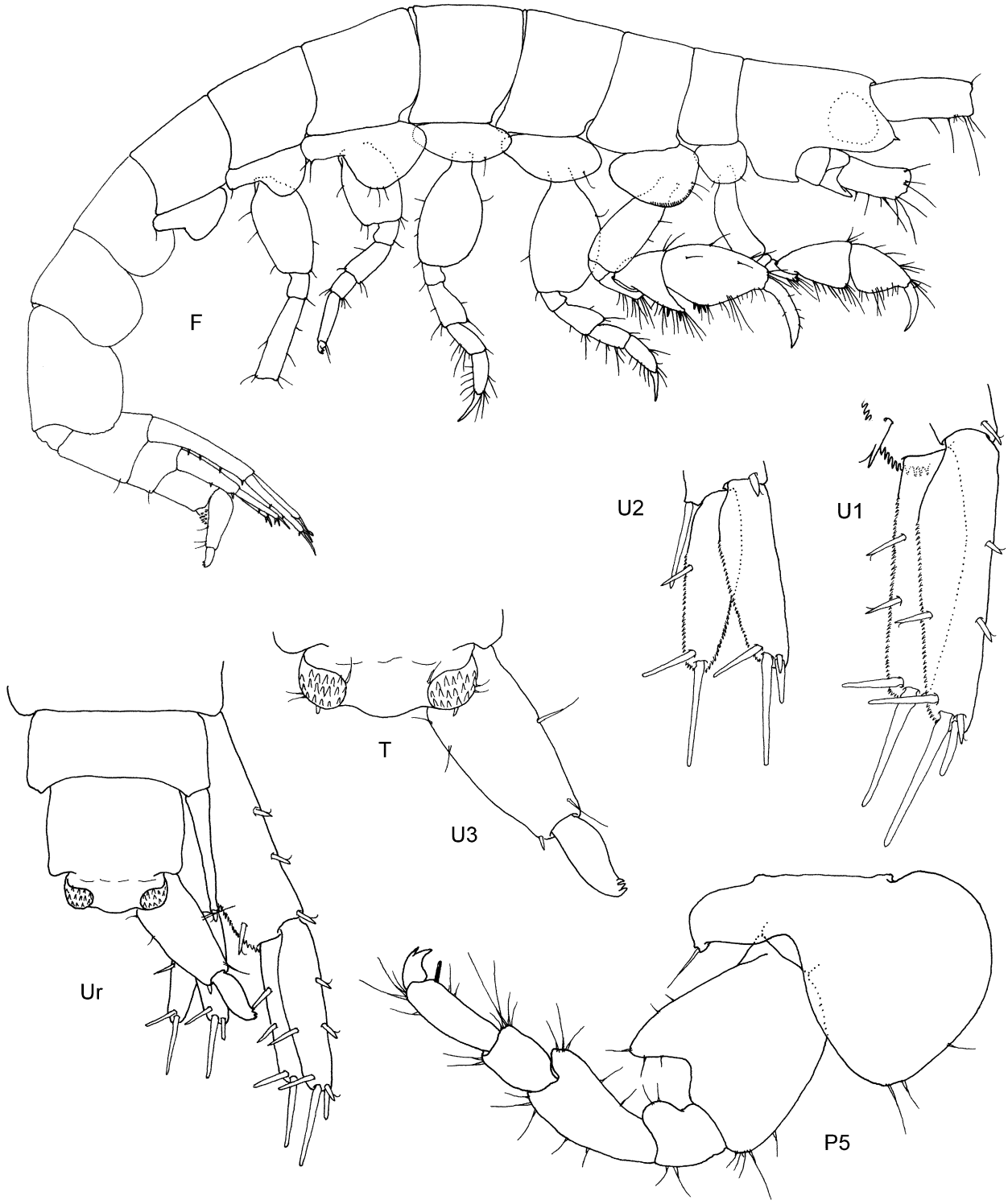

FIGURE 11. *Ericthonius pugnax* Dana, 1852, male, 3.7 mm, AM P71267, except F, female, 4.8 mm, AM P70755, Casuarina Beach, Lizard Island, Great Barrier Reef.

Pereon. *Coxae 1–4* not ventrally setose. *Gnathopod 1* distinctly smaller than gnathopod 2; coxa about 2/3 length and half width of coxa 2; carpus distinctly longer than propodus; propodus length 1.5 width, posterodistal margin evenly rounded. *Gnathopod 2* carpochelate; coxa 2 widely separated from coxa 1 and 3, rounded, distinctly broader than deep, with stridulation ridges along ventral margin; basis widening distally, length approximately 2.5 width; carpus with distinct free posterior expansion with two carpal teeth, posterior

margin of carpus with slender setae only; propodus length 3/4 carpus length, rectangular, posterior margin with low rectangular projection in distal 2/3; dactylus as long as propodus, with apical tuft of long setae. *Pereopods 3–4* basis distally expanded, flask shaped; merus weakly expanded. *Pereopods 5* coxa with a few short slender setae along ventral margin, basis with distinctive posterodistal tongue-shaped lobe overreaching ischium. *Pereopod 7* basis length 1.5 width.

Pleon. *Uropod 1* peduncle dorsolateral margin with row of 3–4 robust setae, outer ramus with 2 lateral and 1 medial robust setae, inner ramus with 2 robust setae on medial margin. *Uropod 2* peduncle dorsolateral margin with 1 or 2 robust setae, medial margin with single long robust seta distally; outer ramus without lateral or medial robust setae; inner ramus lateral margin without setae, medial margin with single robust seta. *Uropod 3* peduncle length approximately twice greatest width, broad proximally, narrowing distally, with 2 dorsolateral slender setae; ramus length approximately twice width.

Female (sexually dimorphic characters). Based on female, 4.8 mm, AM P70755. Similar to male, except for sexually dimorphic gnathopod 2. Females share with males stridulation ridges on coxa 2, but lack the tongue-shaped posterior lobe on basis pereopod 5.

Habitat. Seagrass beds and blue-green algae; sediment among coral rubble; 1–11 m depth, Lizard Island; to 200 m depth elsewhere.

Remarks. *Ericthonius pugnax* males are easily distinguished from its congeners by the tongue-like posterior lobe on the basis of the male pereopod 5. The Lizard Island material is most similar to specimens of *E. pugnax* from Madang, Papua New Guinea, illustrated by Myers (1995: 80, fig. 40), especially in the shape of the posterior margin of gnathopod 2 propodus. Hyperadult males of *E. pugnax* were not present in the material studied.

Distribution. *Australia*. Lizard Island (current study). *Ericthonius pugnax* is widely distributed in the Indo-West Pacific tropical to temperate waters from Madagascar north-and eastward to Japan and south to New Zealand (see map of distribution in Hirayama 1985, fig. 160). More recently the species has been reported from Western Australia (Moore 1988) and Papua New Guinea (Myers 1995).

***Ericthonius tropicalis* sp. nov.**
(Figs 12, 13)

Type material. Holotype, male, 3.1 mm, AM P71491, Yonge Reef, Half Mile Opening (14°34'19"S 145°36'51"E), among *Halimeda opuntia* (green coralline algae), 10 m, I. Takeuchi, R.T. Springthorpe & O. Coleman, 5 March 2005 (QLD 1823). Paratypes (110 specimens in all): 6 small females, AM P75644 (QLD1687); 2 small males**,** 1 female, AM P70961 (QLD 1687); 8 males, 14 females, AM P71392 (QLD 1791); 1 female, 3.1 mm (illustrated), 6 males, 11 females, same data as holotype AM P75645 (QLD 1823); 3 males, 4 females, AM P71506 (QLD 1823); 10 males varying sizes, 6 females some ovigerous, 6 juveniles, AM P71544 (QLD 1823); 3 males, 1 female, AM P71517 (QLD 1827); 6 females, some ovigerous, AM P71575 (QLD1823); 5 males, 16 females, AM P71578 (QLD 1829); 1 ovigerous female, AM P71550 (QLD 1833).

Type locality. Yonge Reef, Half Mile Opening, Queensland, Australia (14°34'19"S 145°36'51"E).

Etymology. The epithet denotes the environment where this species was found.

Description. Based on holotype, male, 3.1 mm, AM P71491.

Head. Eyes approximately 1/3 dorsal head length, situated within lateral lobe of head. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum distinctly longer than peduncular article 3, with 8 articles, each with a single aesthetasc. *Antenna 2* only slightly longer than 1, peduncular articles 4 and 5 with 4–5 irregular rows of setae; flagellum distinctly longer than peduncular article 5, with 7 articles.

Pereon. *Coxae 1–4* not setose on margin. *Gnathopod 1* distinctly smaller than gnathopod 2; coxa about 0.5 length and width of coxa 2; propodus about 4/5 length of carpus; propodus length 1.5 width, posterior margin deeply rounded in middle. *Gnathopod 2* carpochelate; coxa 2 widely separated from and deeper than

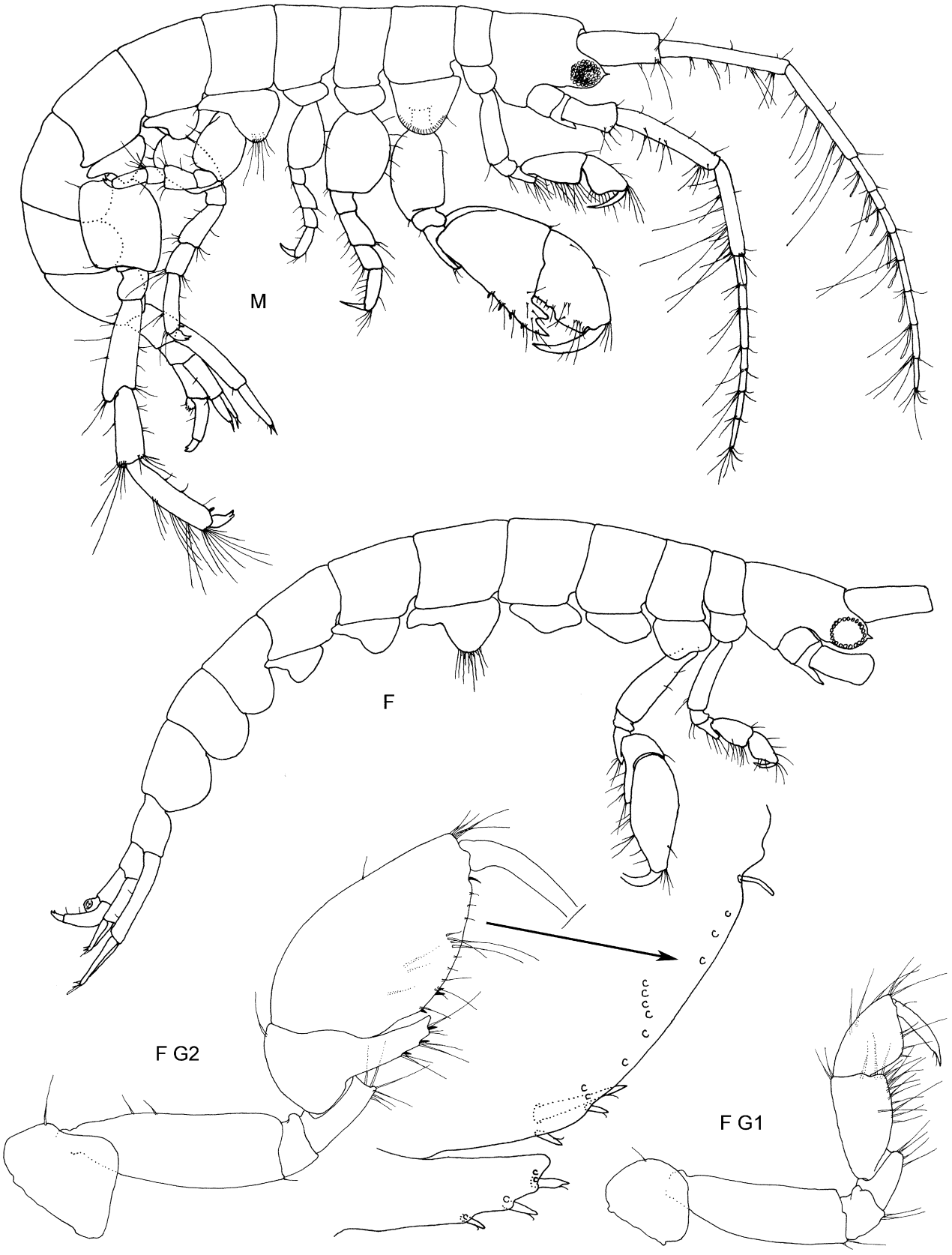

FIGURE 12. *Ericthonius tropicalis* **sp. nov.**, M, holotype, male, 3.1 mm, AM P71491, F, paratype, female, 3.1 mm, AM P75645, Yonge Reef, Lizard Island, Great Barrier Reef.

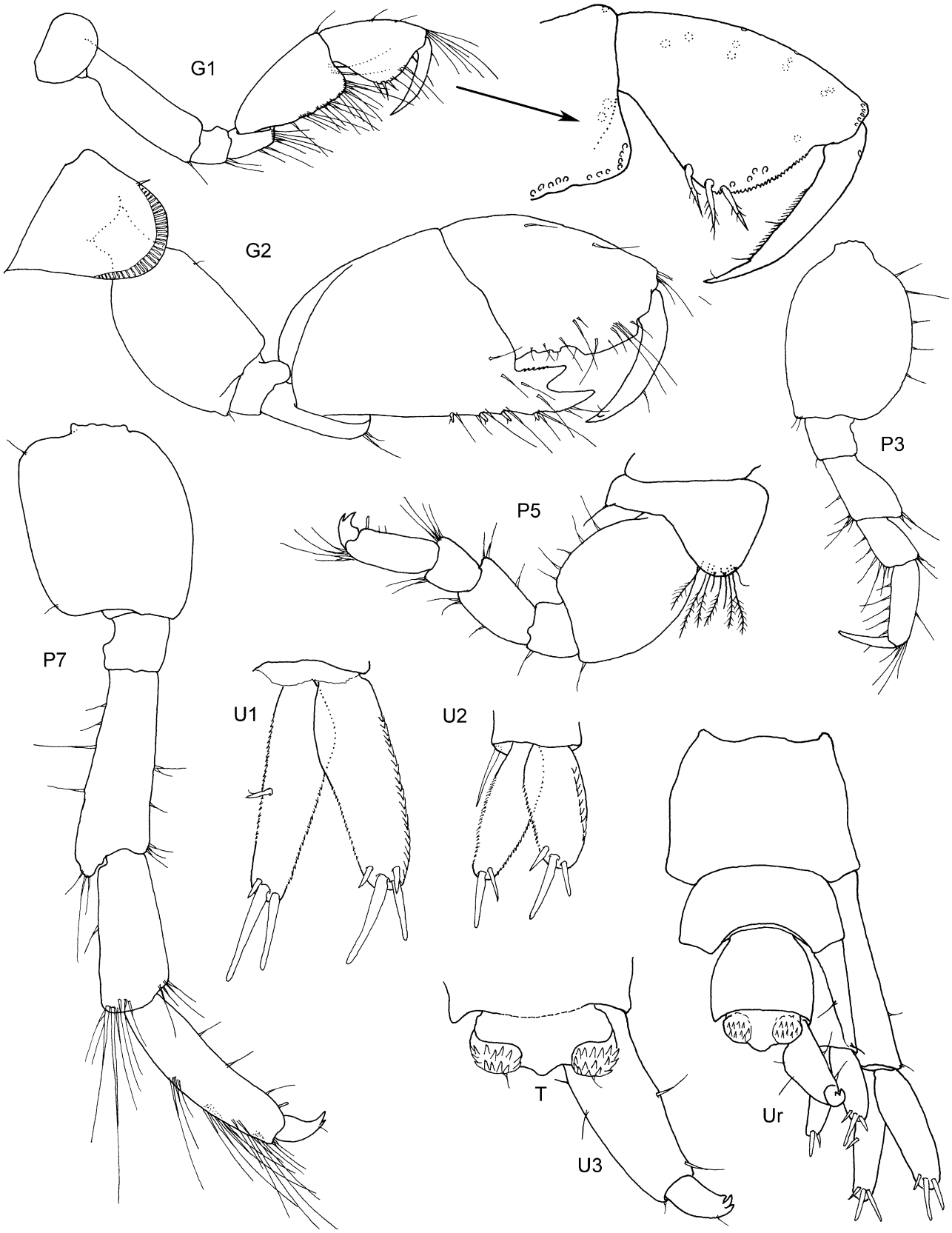

FIGURE 13. *Ericthonius tropicalis* **sp. nov.**, holotype, male, 3.1 mm, AM P71491, Yonge Reef, Lizard Island, Great Barrier Reef.

coxa 1 and 3, rounded, width approximately 1.5 length, with stridulation ridges along ventral margin; basis short, broad, length 1.8 width; carpus with distinct free posterior expansion, with two carpal teeth, posterior margin of carpus with row of short robust setae and associated slender setae; propodus length subequal to carpus, rectangular, posterior margin with low rectangular projection in distal half and small humps more proximally; dactylus slightly shorter than propodus length, without apical tuft of setae. *Pereopods 3–4* basis expanded, subovoid; merus weakly expanded. *Pereopod 5* coxa with long slender and plumose setae along ventral margin, basis posterodistal corner rounded, not lobed. *Pereopod 7* basis broad, length 1.1 width.

Pleon. *Uropod 1* peduncle dorsolateral margin with a few slender setae; outer ramus with apical robust setae only, inner ramus with apical robust setae and single robust seta on medial margin. *Uropod 2* peduncle dorsolateral margin with a few slender setae, medial margin with single long robust seta distally, rami without lateral or medial setae. *Uropod 3* peduncle length 2.5 width, broad proximally, narrowing distally, with 2 dorsolateral slender setae, ramus length approximately twice width, distally cusped. *Telson* midlength approximately twice greatest width, lateral lobes with 2 or 3 irregular rows of recurving hooks.

Female (sexually dimorphic characters). Based on female, 3.1 mm, AM P75645.Similar to male, except for sexually dimorphic gnathopod 2. Gnathopod 2 coxa width 1.5 length, ventral margin concave, without stridulation ridges. Coxae 3 and 4 wider than in male.

Habitat. Seagrass beds; *Halimeda* beds; mixed algae on rubble and shallow reefs. 1–10 m depth.

Remarks. Males of *Ericthonius tropicalis* **sp. nov.** differ from the following Australian *Ericthonius* species by having a row of robust setae along the ventral margin of gnathopod 2 carpus: *E. brevicarpus*, *E. forbesii*, *E. parabrasiliensis* **sp. nov.**, *E. pugnax* and *E. rodneyi*. It differs from the two Australian *Ericthonius* species with such a row of robust setae as follows: *E. coxacanthus* has a long acute projection anteroproximally on coxa 2; *E. tacitus* lacks long plumose setae on the ventral margin of coxa 5, and uropods 1 and 2 peduncles have rows of robust setae (a few slender setae only in *E. tropicalis*). *Ericthonius tropicalis* appears to differ from all other *Ericthonius* species by its unusually broad basis of pereopod 7 in relation to its length. Females of *E. tropicalis* differ from all other *Ericthonius* species by the squarish coxa 2 having the ventral margin concave.

Distribution. *Australia*. Queensland: Lizard Island, Great Barrier Reef (current study).

Ericthonius sp.
(Fig. 14)

Material examined. 1 male, AM P75643 (QLD 1823).

Remarks. The single male was found in a sample with seven specimens of *Ericthonius tropicalis* **sp. nov**., and two specimens of *E. pugnax*. *Ericthonius* sp. lacks robust setae along the posterior margin of the carpus, which aligns it with the subgroup of Australian species comprising *E. pugnax*, *E. parabrasiliensis* **sp. nov.**, *E. forbesii*, *E. brevicarpus* and *E. rodneyi*. *Ericthonius* sp. lacks an apical tuft of long setae on gnathopod 2 dactylus (*E. pugnax*, *E. parabrasiliensis*, *E. forbesii*) and a posterior lobe on pereopod 5 basis (*E. pugnax*). It further differs from *E. parabrasiliensis* in the shape of coxa 2. *Ericthonius* sp. is closest to *E. brevicarpus* in possessing an anteroproximal projection on coxa 2, the projection being, however, much smaller and more pointed than in the latter species. *Ericthonius* sp. lacks a posterodistal spine on the merus of gnathopod 2 present in *E. brevicarpus*. A tuft of very long slender setae emerging from the posterodistal lobe of the merus of pereopods 6 and 7 and distinctly overreaching the carpus seems to be a unique feature of *Ericthonius* sp.

Ericthonius sp. appears to represent an undescribed species, but the single specimen is damaged and unsuitable for formal description.

Habitat. Among *Halimeda opuntia*; 10 m.

Distribution. *Australia*. Queensland: Lizard Island, Great Barrier Reef (current study).

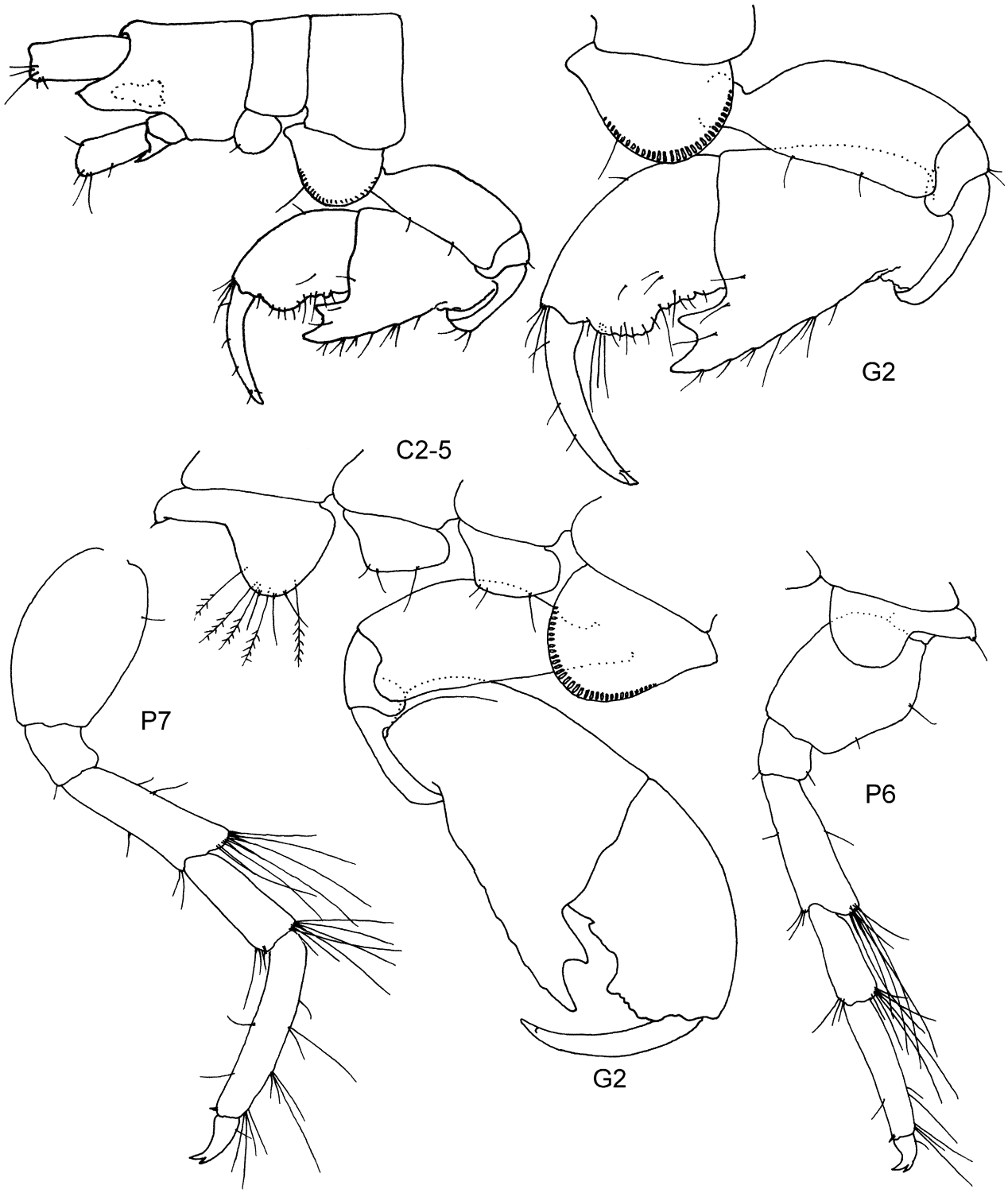

FIGURE 14. *Ericthonius* sp., male, AM P75643, Yonge Reef, Lizard Island, Great Barrier Reef.

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I am grateful to the Australian Museum, Sydney, and my colleagues there, Jim Lowry and Penny Berents, for providing me with the opportunity to participate in the Lizard Island Amphipod Workshop. Without the intense collecting and sorting efforts and good spirit of all the participants the results would have been far less impressive. Anonymous reviewers' comments significantly improved the manuscript.

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