



Photidae*

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Abstract

Four genera and ten species of photid are reported from the Great Barrier Reef. Of these, three genera and eight species are new to science.

Key words: Crustacea, Amphipoda, Photidae, Great Barrier Reef, Australia, taxonomy, new genera, new species, *Gammaropsis hephaestus*, *Graciliphotis ruthae*, *Latigammaropsis athenae*, *Latigammaropsis dionysus*, *Latigammaropsis hermes*, *Latigammaropsis hestia*, *Photis aina*, *Photis davei*, *Photis pirloti*, *Virgammaropsis artemis*

Introduction

The Photidae are distributed worldwide in both cold and warm waters. Ten species are recorded here, of which eight are new to science. The diverse genus *Gammaropsis* Liljeborg, 1855 is a catch-all for a number of loosely related taxa. It is currently under revision. Here, two new genera within the complex are established. A new *Photis*-like genus is also established. The genera *Photis* Krøyer, 1842 and *Graciliphotis* **gen. nov.** are unusual among corophiidean amphipods in showing no, or very little, sexual dimorphism.

Materials and methods

The descriptions were generated from a DELTA database (Dallwitz 2005) to the photid genera and species of the world. Material was hand-collected on scuba or snorkel 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.

Photidae Boeck, 1871

Gammaropsis Liljeborg, 1855

Gammaropsis hephaestus sp. nov.

(Figs 1, 2)

Type material. Holotype, male, 6.0 mm, AM P70730, Watsons Bay, Lizard Island (14°39'41"S

145°26'52"E), *Udotea* (green alga) and sand, 8.5 m, P.B. Berents & C. Rakocinski, 24 February 2005 (QLD 1640). Paratypes: 2 females AM P75459, same data as holotype.

Additional material examined. 1 female, AM P70698 (QLD 1640).

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

Etymology. Greek mythology: *Hephaestus*, the God of fire and crafts.

Description. Based on holotype, male, 6.0 mm, AM P70730.

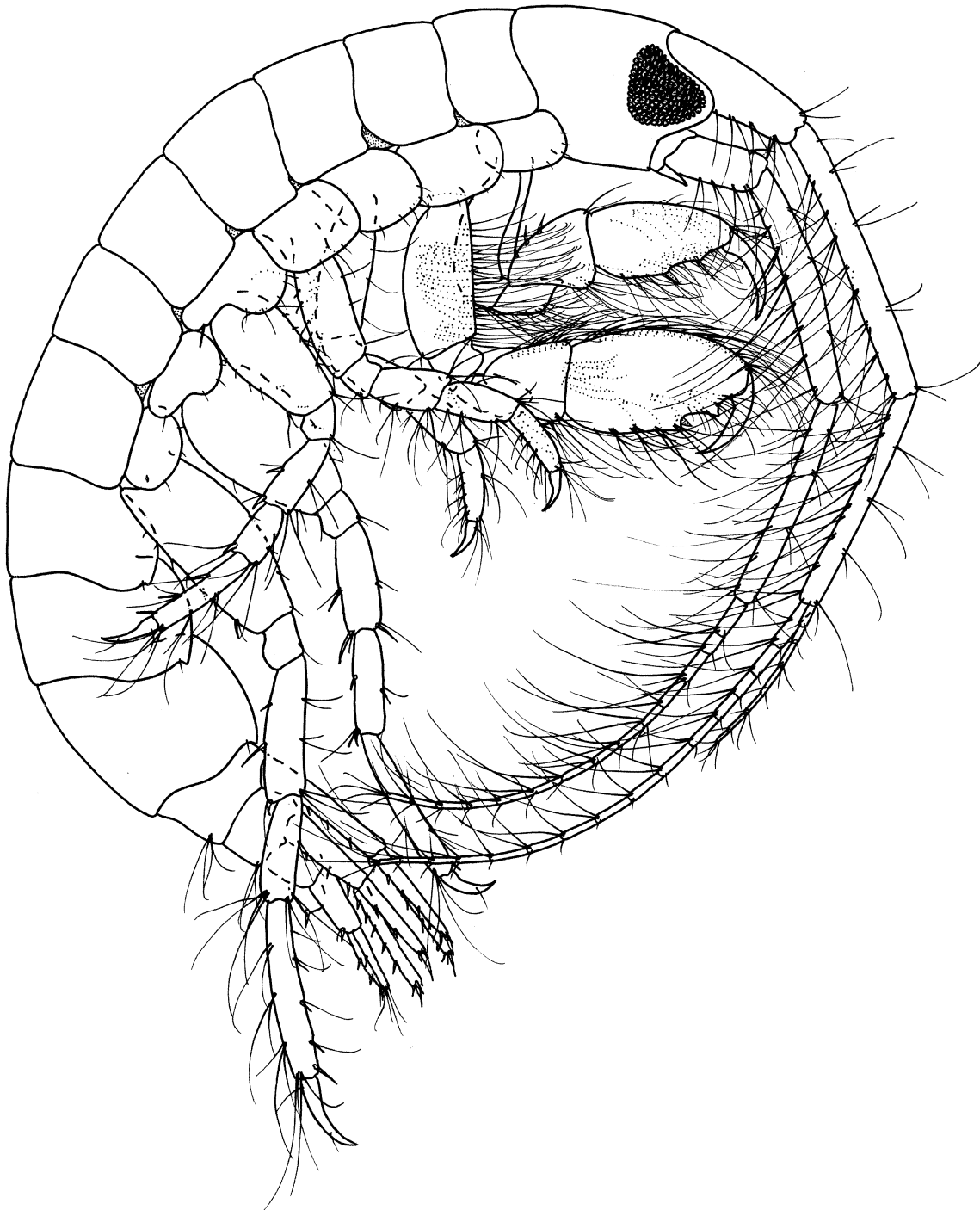


FIGURE 1. *Gammaropsis hephaestus* sp. nov., holotype, male, 6.0 mm, AM P70730, Watsons Bay, Lizard Island, Great Barrier Reef.

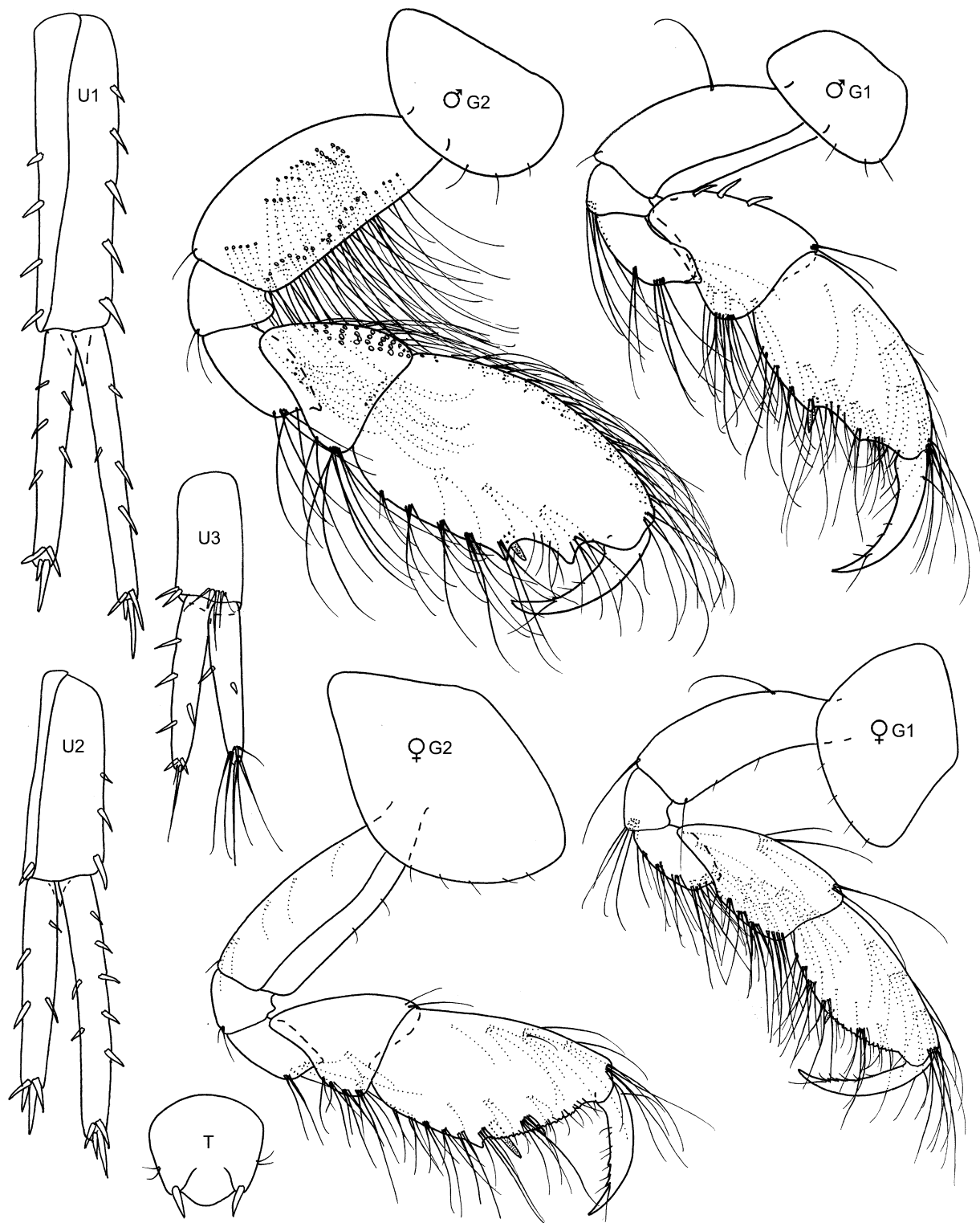


FIGURE 2. *Gammaropsis hephaestus* sp. nov., holotype, male, 6.0 mm, paratype female, 6.4 mm, AM P70730, Watsons Bay, Lizard Island, Great Barrier Reef.

Head. *Head* lateral cephalic lobes rounded, anteroventral margin weakly recessed, not extending behind posterior margin of eye. *Eye* subtriangular, large, more than one quarter length of head length, partially situated within the lateral lobe. *Upper lip* epistome absent. *Mandible palp* article 3 spatulate, widest subdistally. *Antenna 1* peduncular article 1 distinctly shorter than article 3; flagellum with 15 articles;

accessory flagellum distinct and multiarticulate. *Antenna 2* long, over half body length; flagellum distinctly longer than peduncular article 5, with 14 articles.

Pereon. *Coxae 1–2* without spines on distal margin. *Coxa 1* not distally acute. *Gnathopod 1* distinctly different in size from gnathopod 2; carpus anterior margin with robust setae, distinctly shorter than propodus; propodus between 1.5 and 3 x as long as wide, posterodistal margin excavate. *Gnathopod 2* basis anterior margin with dense long setae; carpus with distinct free posterior expansion; propodus long, a little more than twice length of carpus, posterodistal margin with robust setae, with a single excavation; dactylus long, distinctly longer than half length of propodus. *Pereopod 3* merus with few setae on anterior margin. *Pereopods 5–7* basis with few setae. *Pereopod 5* basis slightly expanded, distinctly longer than broad.

Pleon. *Urosomites 1–2* without dorsolateral spines. *Epimeron 3* posterodistal margin with small spine and notch. *Uropod 1* peduncle with short distoventral spine; rami distinctly unequal in length. *Uropod 2* peduncle with distoventral spine; rami distinctly unequal in length. *Uropod 3* biramous; peduncle distinctly shorter than the longest ramus; both rami well developed; outer ramus with terminal fine setae. *Telson* with terminal robust seta on each side.

Female (sexually dimorphic characters). Based on paratype female 6.4 mm, AM P75459. *Gnathopod 1* carpus anterior margin with fine setae only, carpus subequal in length to propodus; posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin with a few short setae only, with weak excavation terminating weakly convex palm.

Habitat. *Udotea* (green alga) and sand.

Remarks. The combination of triangular eye, male gnathopod 1 carpus anterior margin with robust setae and male gnathopod 2 with dense setation on the anterior margin of the basis, carpus and propodus, is not found in any other known *Gammaropsis* species.

Distribution. *Australia*. Queensland: Lizard Island (current study).

***Graciliphotis* gen. nov.**

Type species. *Graciliphotis ruthae* sp. nov.

Etymology. From the Latin *gracilis* = slender and *Photis*, its closest relative.

Diagnosis. Head anteroventral margin strongly recessed, extending behind posterior margin of eye. Eyes situated entirely within the lateral lobe of the head. *Antenna 1* peduncular article 1 longer than article 3; accessory flagellum vestigial or absent. *Coxae* relatively shallow (compared with *Photis*). *Gnathopod 2* subchelate, not greatly enlarged, propodus with no excavations. *Pereopod 5* basis extremely expanded (as long as broad). *Uropods 1–2* peduncle without distoventral spine. *Uropod 3* biramous, one ramus vestigial; outer ramus recurved.

Included species. *Graciliphotis ruthae* sp. nov.

Remarks. This genus is close to *Photis* Krøyer, 1842, but differs in its relatively short, coxae and therefore very gracile appearance, and unornamented male gnathopod 2.

***Graciliphotis ruthae* sp. nov.**

(Figs 3, 4)

Type material. Holotype, male, 2.0 mm, AM P75461, Yonge Reef, Half Mile Opening (14°34'19"S 145°36'51"E), *Halimeda opuntia* (green coralline alga), 10 m, I. Takeuchi, R.T. Springthorpe & O. Coleman, 5 March 2005 (QLD 1829). Paratypes: 3 females, AM P75462, same data as holotype.

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

Etymology. Named for Dr Ruth M. O'Riordan, in recognition of her work on the ecology of chthamalid barnacles.

Description. Based on holotype, male, 2.0 mm, AM P75461 and paratype female 2.0 mm, AM P75462.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* round, large, more than one quarter length of head length, situated entirely within the lateral lobe of the head. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna 1* peduncular article 1 shorter than article 3; flagellum with 6 articles; accessory flagellum vestigial. *Antenna 2* longer than half body length, flagellum distinctly longer than peduncular article 5 with 8 articles.

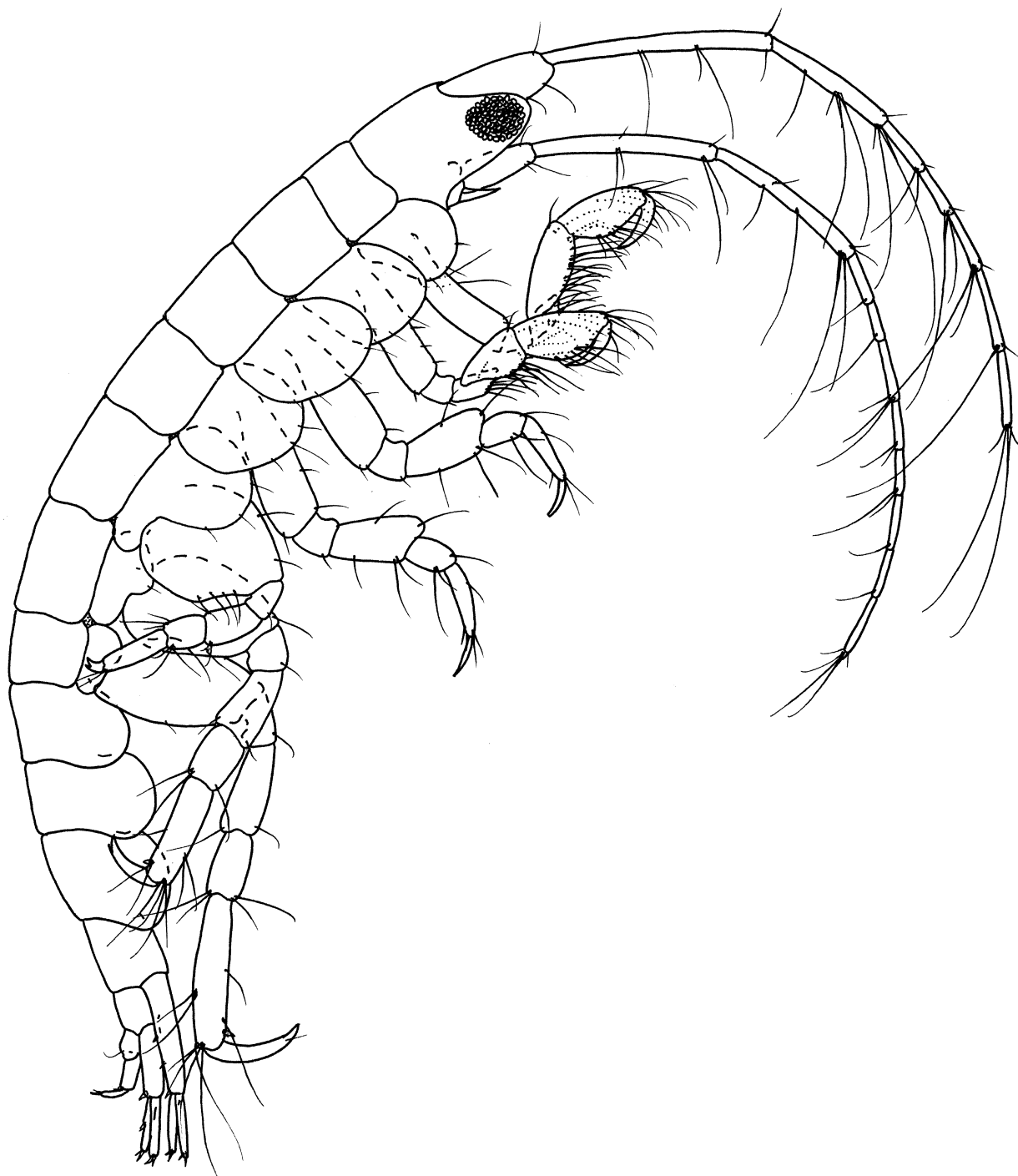


FIGURE 3. *Graciliphotis ruthae* gen. nov., sp. nov., holotype, male, 2.0 mm, AM P71483, Yonge Reef, Lizard Island, Great Barrier Reef.

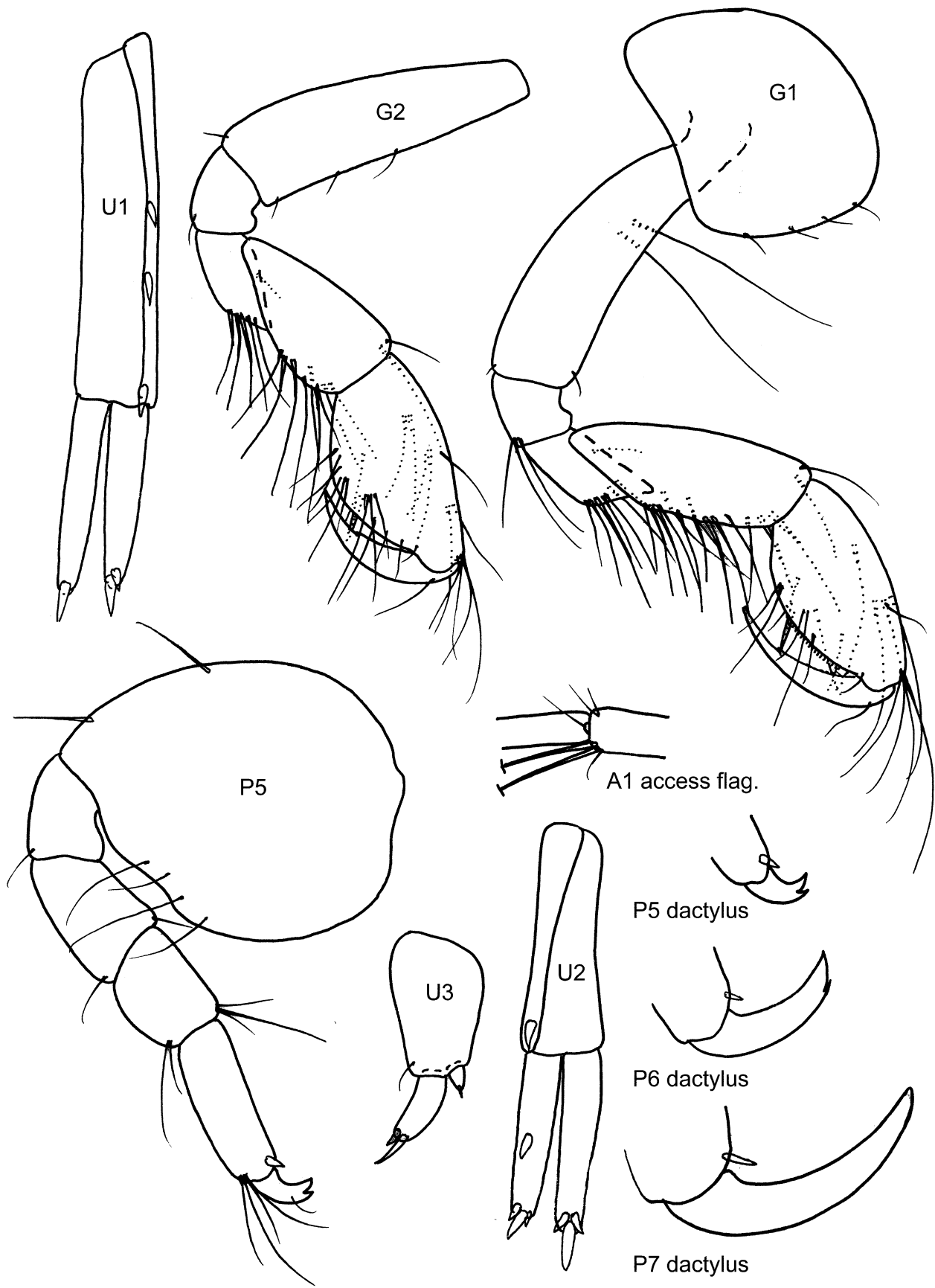


FIGURE 4. *Graciliphotis ruthae* gen. nov., sp. nov., male, 2.0 mm, paratype female, 2.0 mm, AM P71483, Yonge Reef, Lizard Island, Great Barrier Reef.

Pereon. *Coxae 1-5* as broad or broader than long, sparsely fringed with setae; coxa 1 not produced forward. *Gnathopod 1* carpus longer than propodus; propodus 1.5 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2 basis* anterior margin with a few short setae; carpus without distinct free posterior expansion; propodus only a little longer than carpus, posterodistal margin with robust seta, palm evenly convex, with no excavations; dactylus long, distinctly longer than half length of propodus. *Pereopod 3* merus with a few long setae on anterior margin; propodus less than 4 x as long as broad. *Pereopod 5* basis extremely expanded, as long as broad; with few setae on anterior margin; dactylus with accessory spine on anterior margin. *Pereopod 6* dactylus with vestigial accessory spine on anterior margin. *Pereopod 7* dactylus lacking accessory spine on anterior margin.

Pleon. *Epimeron 3* posterodistal margin rounded. *Uropod 1* peduncle without distoventral spine; rami subequal in length. *Uropod 2* peduncle without distoventral spine; rami subequal in length. *Uropod 3* peduncle short and stout, distinctly longer than the outer ramus; inner ramus vestigial; outer ramus with terminal robust setae. *Telson* with terminal robust seta on each side.

Female. Not sexually dimorphic.

Habitat. Among *Halimeda opuntia*.

Remarks. See remarks section under genus.

Distribution. *Australia*. Queensland: Yonge reef, Lizard Island (current study).

***Latigammaropsis* gen. nov.**

Type species. *Gammaropsis atlantica* Stebbing, 1888.

Etymology. From the Latin *latus* = broad (relating to the relatively broad uropod 3 peduncle) as a prefix to *Gammaropsis*, its close relative.

Diagnosis. *Gammaropsis sensu lato* with head anterodistal margin strongly recessed; lateral cephalic lobes rounded; labrum lacking acute epistome; mandible palp article 3 spatulate, widest subdistally; coxae 1–2 without serrations on distal margin; pleon segments lacking spines; uropod 3 peduncle short and broad, rami short and stout; outer ramus blunt-ended with a small second article bearing two fine setae, bordered on distal end of first segment by one or more robust setae; inner ramus subequal with or shorter than outer ramus, narrowing distally, with a single small robust seta inserted at its tip, lateral margins naked or with one or two robust setae.

Included species. *Latigammaropsis abbotti* (J.L. Barnard, 1965), *L. afra* (Stebbing, 1888), *L. athenae* **sp. nov.**, *L. atlantica* (Stebbing, 1888), *L. christenseni* (Myers, 1995), *L. dionysus* **sp. nov.**, *L. gemina* (Myers, 1995), *L. grandimana* (Ledoyer, 1978), *L. hermes* **sp. nov.**, *L. hestia* **sp. nov.**, *L. kaumaka* (J.L. Barnard, 1970), *L. pacifica* (Schellenberg, 1938), *L. pali* (J.L. Barnard, 1970), *L. photisimilis* (Ruffo, 1969), *L. planodentata* (Myers, 1995), *L. togoensis* (Schellenberg, 1925).

Remarks. This genus defines the ‘*atlantica*’ group of *Gammaropsis sensu lato*. This genus is found in all tropical seas. The shape of uropod 3 is diagnostic.

***Latigammaropsis athenae* sp. nov.**

(Figs 5, 6, Pl. 5D)

Type material. Holotype, male, 5.0 mm, AM P71191, North Point, Lizard Island (14°38’45”S 145°27’18”E), coral rubble from granite rock face with some corals, turf algae, 16 m, C. Rakocinski, 28 February 2005 (QLD 1728). Paratypes: 1 male, 2 females, AM P75470, same data as holotype.

Additional material examined. 1 male, AM P71182 (QLD 1730); 1 female, AM P71218 (QLD 1768).

Type locality. North Point, Lizard island, Queensland, Australia (14°38’45”S 145°27’18”E).

Etymology. Greek mythology: *Athenae*, the Goddess of domestic arts.

Description. Based on holotype, male, 5.0 mm, AM P71191.

Head. *Head* lateral cephalic lobes rounded, anteroventral margin strongly recessed, extending behind posterior margin of eye. Eye lageniform, large, one quarter or more of head length, partially situated within the lateral lobe. *Mandible palp* article 3 spatulate, widest subdistally. *Antenna 1* peduncular article 1 longer than article 3; flagellum with 11 articles; accessory flagellum distinct and multiarticulate. *Antenna 2* short (distinctly less than 1/2 body length); flagellum distinctly longer than peduncular article 5, with 8 articles.

Pereon. *Coxae 1–2* without spines on distal margin. *Coxa 1* not distally acute. *Gnathopod 1* distinctly different in size from gnathopod 2; carpus anterior margin with fine setae only, subequal in length to propodus; propodus between 1.5 and 3 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin with dense long setae; carpus with distinct free posterior expansion; propodus very long, 4 x as long as carpus, posterodistal margin with robust seta, and with a single excavation; dactylus distinctly longer than half length of propodus. *Pereopod 3* merus with few setae on anterior margin. *Pereopods 5–7* basis with few setae. *Pereopod 5* basis extremely expanded, as long as broad.

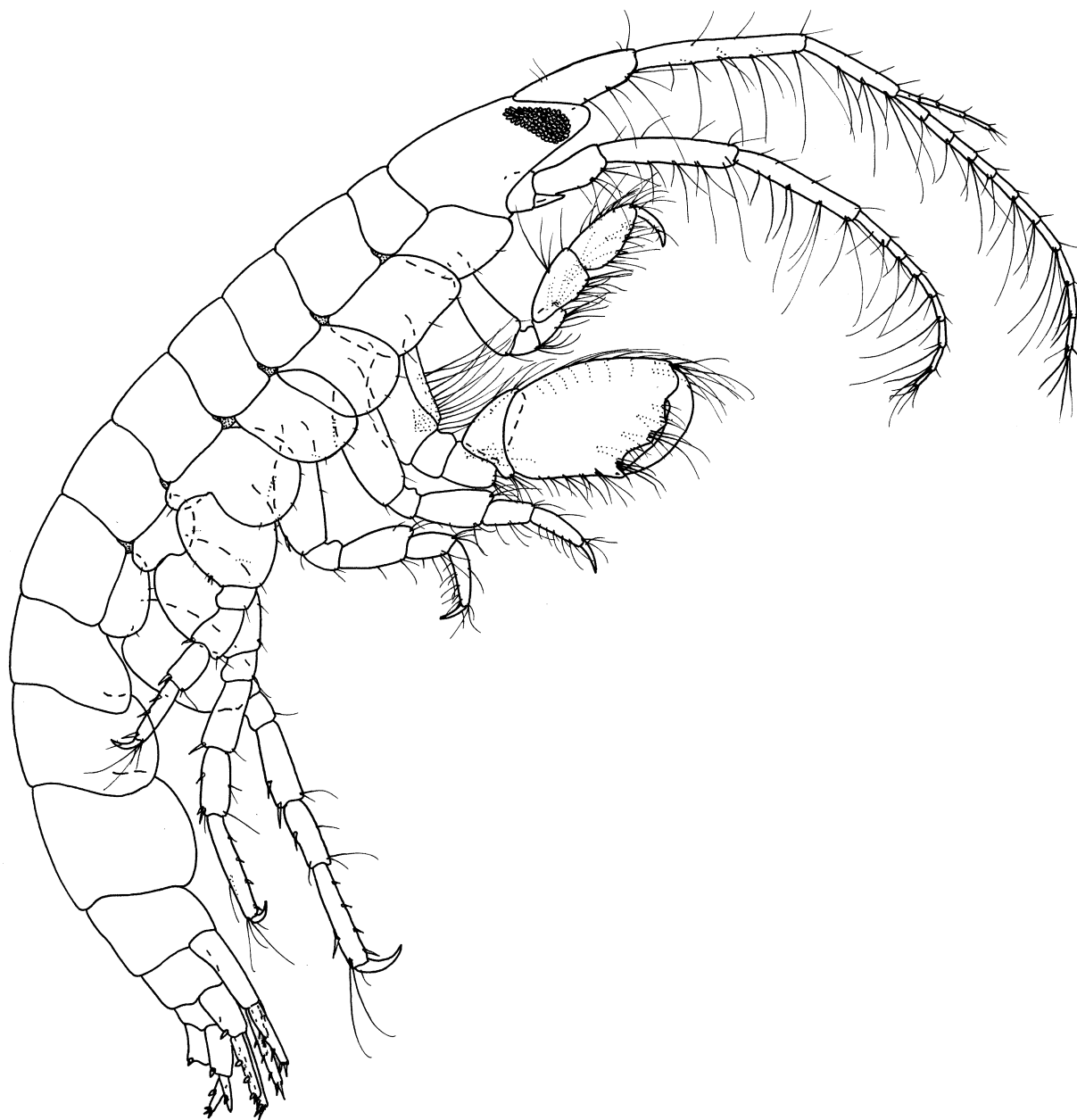


FIGURE 5. *Latigammaropsis athenae* gen. nov., sp nov., holotype, male, 5.0 mm, AM P71191, North Point, Lizard Island, Great Barrier Reef.

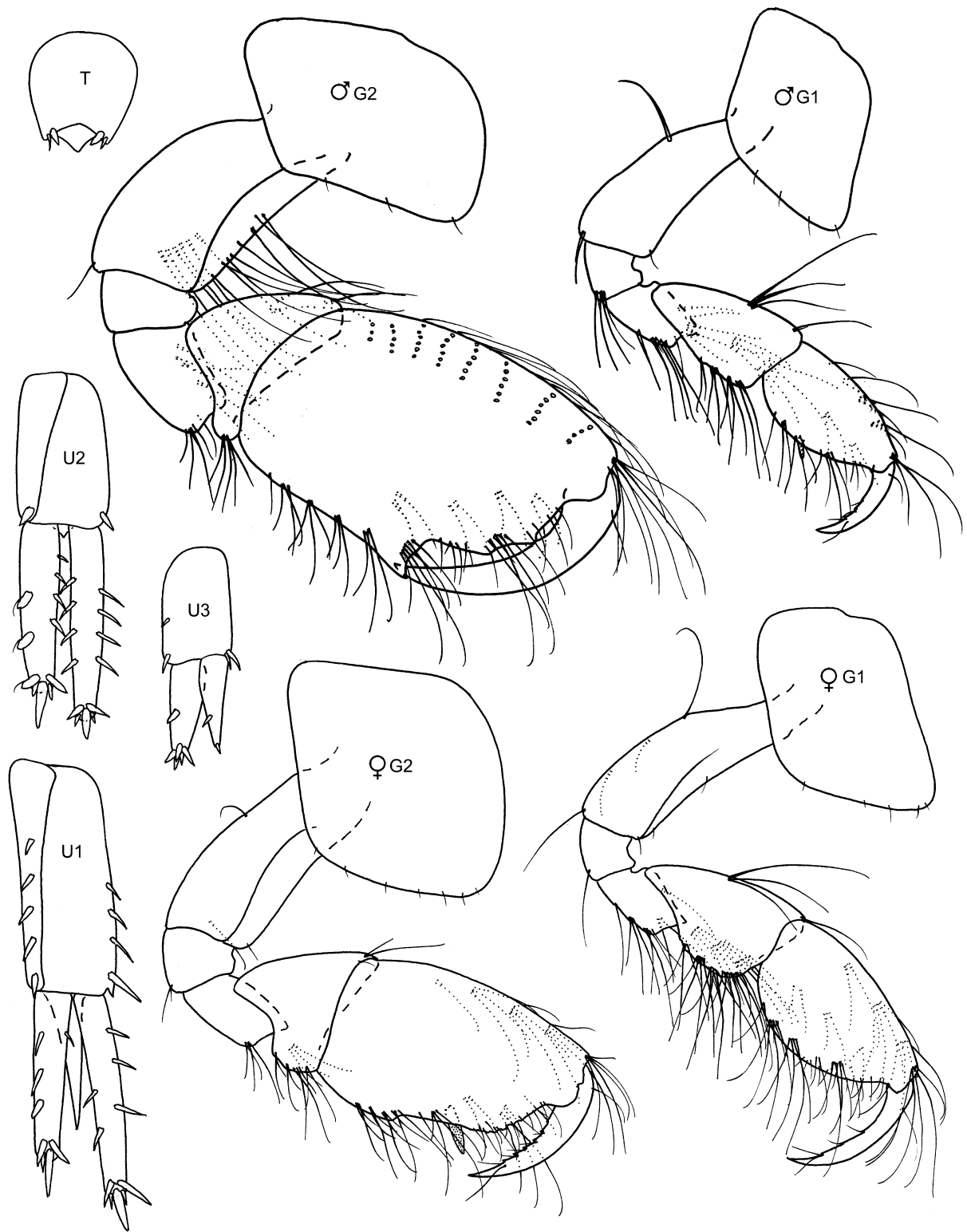


FIGURE 6. *Latigammaropsis athenae* **gen. nov., sp nov.**, holotype, male, 5.0 mm, paratype female, 5.0 mm, AM P71191, North Point, Lizard Island, Great Barrier Reef.

Pleon. *Urosomites* 1–2 without dorsolateral spines. *Epimeron* 3 posterodistal margin rounded. *Uropod* 1 peduncle with long distoventral spine; rami distinctly unequal in length. *Uropod* 2 peduncle with distoventral spine; rami distinctly unequal in length. *Uropod* 3 biramous; peduncle subequal to the longest ramus; both rami well developed; outer ramus with terminal robust seta. *Telson* with terminal robust seta on each side.

Female (sexually dimorphic characters). Based on paratype female 5.0 mm, AM P71191. *Gnathopod* 2 basis anterior margin with few setae; propodus long, less than 2.5 x as long as carpus, palm with weak excavation.

Habitat. Coral rubble and encrusting algae.

Remarks. This species is most similar to material described under the name *Gammaropsis atlantica* from Hawaii by Barnard (1970), but differs in the female gnathopod 2. In present material the propodus of that appendage has a very weak excavation on the posterior margin, that extends from the short palm to a proximal position. In Hawaiian material the acute palm terminates with a small tooth at the posterior margin.

Distribution. *Australia*. Queensland: Lizard Island (current study).

Latigammaropsis dionysus sp. nov.

(Figs 7, 8)

Type material. Holotype, male, 3.0 mm, AM P70966, 200 m north of Bird Islet, Lizard Island (14°41'28"S 145°27'53"E), mixed coralline algae & epiphytes from shallow reef flat, 2.6 m, R.T. Springthorpe, 26 February 2005 (QLD 1687). Paratypes: 4 males, 8 females, 1 juvenile, AM P75458, same data as holotype.

Additional material examined. 1 male, 2 females, AM P70786 (QLD 1668); 2 males, 2 females, AM P70984 (QLD 1693); 1 male, 1 female, AM P71327 (QLD 1783); 5 males, 8 females, 4 juveniles, AM P71552 (QLD 1823); 2 males, 3 females, AM P71571 (QLD 1823); 1 male, 2 females, AM P71574 (QLD 1829).

Type locality. 200 m north of Bird Islet, Lizard island, Queensland, Australia (14°41'28"S 145°27'53"E).

Etymology. Greek mythology: *Dionysus*, the God of wine.

Description. Based on holotype, male, 3.0 mm, AM P70966.

Head. *Head* lateral cephalic lobes rounded, anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* round, large (1/4 or more of head length), partially situated within the lateral lobe. *Labrum* epistome absent. *Mandible palp* article 3 distinctly shorter than article 2; spatulate, widest subdistally. *Antenna* 1 peduncular article 1 a little longer than article 3; flagellum with 9 articles; accessory flagellum distinct and multiarticulate. *Antenna* 2 short, distinctly less than 1/2 body length; flagellum distinctly longer than peduncular article 5, with 6 articles.

Pereon. *Coxae* 1–2 without spines on distal margin. *Coxa* 1 not distally acute. *Gnathopod* 1 distinctly different in size from gnathopod 2; carpus anterior margin with fine setae only, subequal in length to propodus; propodus between 1.5 and 3 x as long as wide, posterodistal margin evenly rounded. *Gnathopod* 2 basis anterior margin with few setae; carpus with distinct free posterior expansion; propodus very long, 4 x as long as carpus, posterodistal margin with robust seta, and with a single excavation; dactylus short, distinctly half or less than half length of propodus. *Pereopod* 3 merus with few setae on anterior margin. *Pereopods* 5–7 basis with few setae. *Pereopod* 5 basis extremely expanded, as long as broad.

Pleon. *Urosomites* 1–2 without dorsolateral spines. *Epimeron* 3 posterodistal margin rounded. *Uropod* 1 peduncle with short distoventral spine; rami distinctly unequal in length. *Uropod* 2 peduncle without distoventral spine; rami subequal in length. *Uropod* 3 biramous; peduncle subequal to the longest ramus; both rami well developed; outer ramus with terminal fine setae. *Telson* with terminal robust seta on each side.

Female (sexually dimorphic characters). Based on paratype female 3.1 mm, AM P75458. *Gnathopod* 2 propodus less than 2.5 x length of carpus, palm without distinct excavation.

Habitat. Coralline algae and rubble.

Remarks. *Latigammaropsis dionysus* **sp. nov.** resembles *L. afra* (Stebbing, 1888), but has a round eye, whereas in *L. afra* it is reniform. It also differs markedly from *L. afra* in the weakly acute palm of the male gnathopod 2. It is more similar to material described by J.L. Barnard (1970) from Hawaii under the name *Gammaropsis afra*. In Hawaiian material, however, the male gnathopod 2 palm is convoluted whereas in present material the palm is almost straight. This species differs from *L. athenae* in lacking long setae on the male gnathopod 2. It is very similar to *L. hermes* **sp. nov.** (see remarks section for that species).

Distribution. *Australia.* Queensland: Lizard Island (current study).

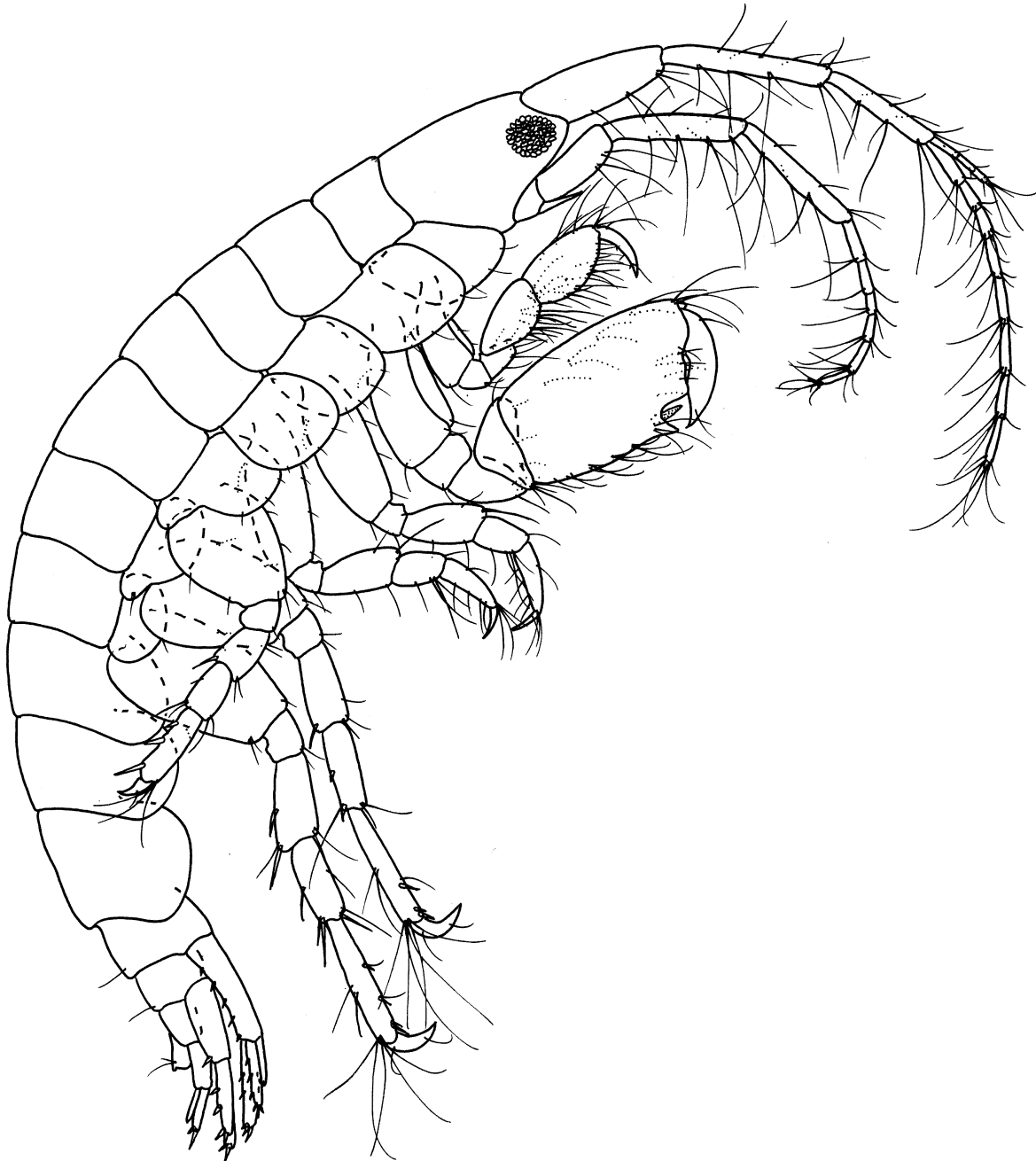


FIGURE 7. *Latigammaropsis dionysus* **gen. nov., sp. nov.**, holotype, male, 3.0 mm, AM P70966, 200 m north of Bird Islet, Lizard island, Great Barrier Reef.

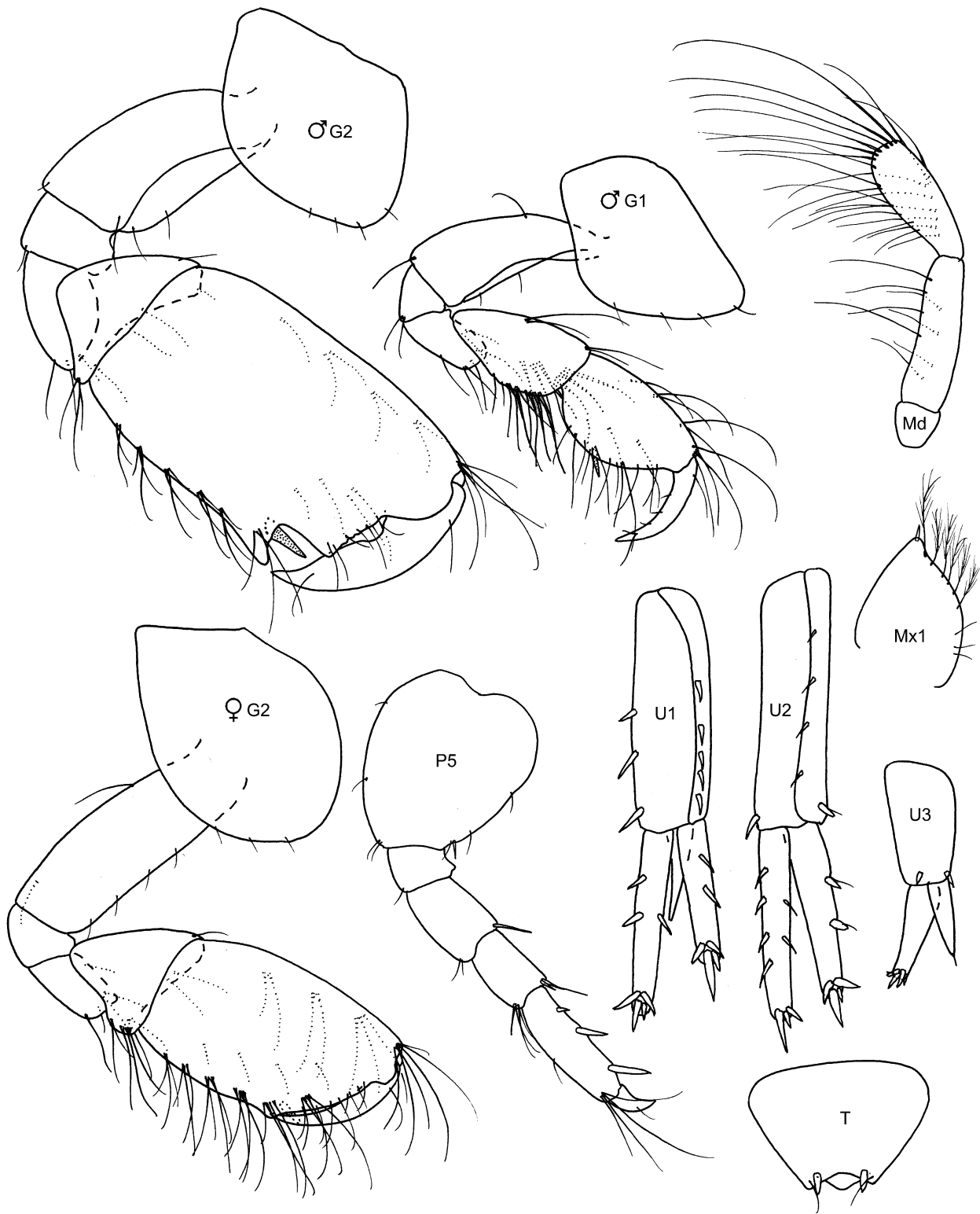


FIGURE 8. *Latigammaropsis dionysus* **gen. nov., sp. nov.**, holotype, male, 3.0 mm, paratype, female 3.1 mm, AM P70966, 200 m north of Bird Islet, Lizard island, Great Barrier Reef.

***Latigammaropsis hermes* sp. nov.**

(Figs 9, 10)

Type material. Holotype, male, 2.5 mm, AM P71531, Yonge Reef, Half Mile Opening (14°34'19"S 145°36'51"E), *Halimeda opuntia* (green coralline alga), 10 m, I. Takeuchi, R.T. Springthorpe & O. Coleman, 5 March 2005 (QLD 1823). Paratypes: 13 unsexed, AM P75463, same data as holotype.

Additional material examined. 1 male, 4 females, AM P70635 (QLD 1621); 1 male, 1 female, AM P71318 (QLD 1781); 2 males, AM P71340 (QLD 1804).

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

Etymology. Greek mythology: *Hermes*, messenger of the Gods

Description. Based on holotype, male, 2.5 mm, AM P71531.

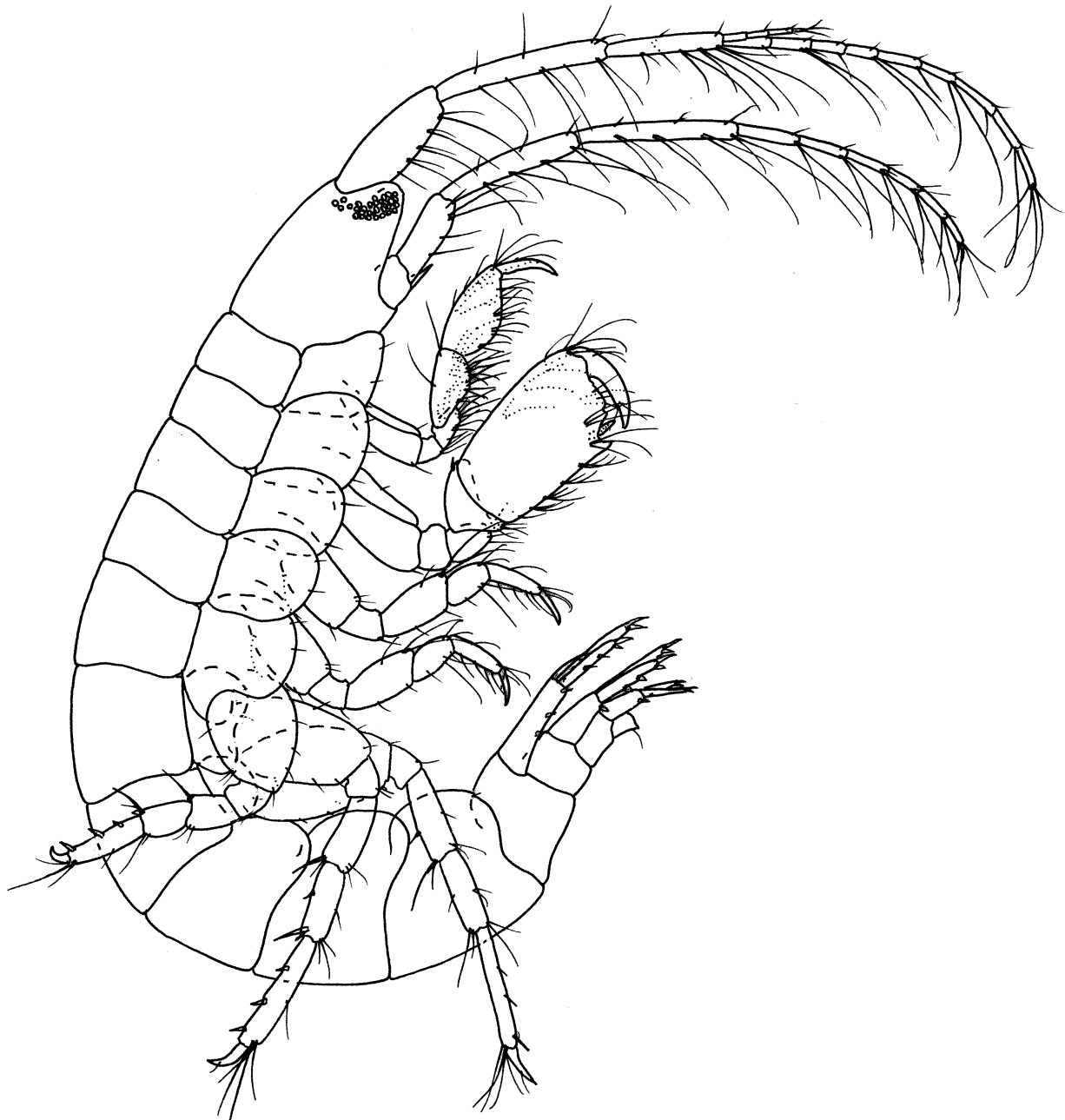


FIGURE 9. *Latigammaropsis hermes* gen. nov., sp. nov., holotype, male, 2.5 mm, AM P71531, Yonge Reef, Lizard Island, Great Barrier Reef.

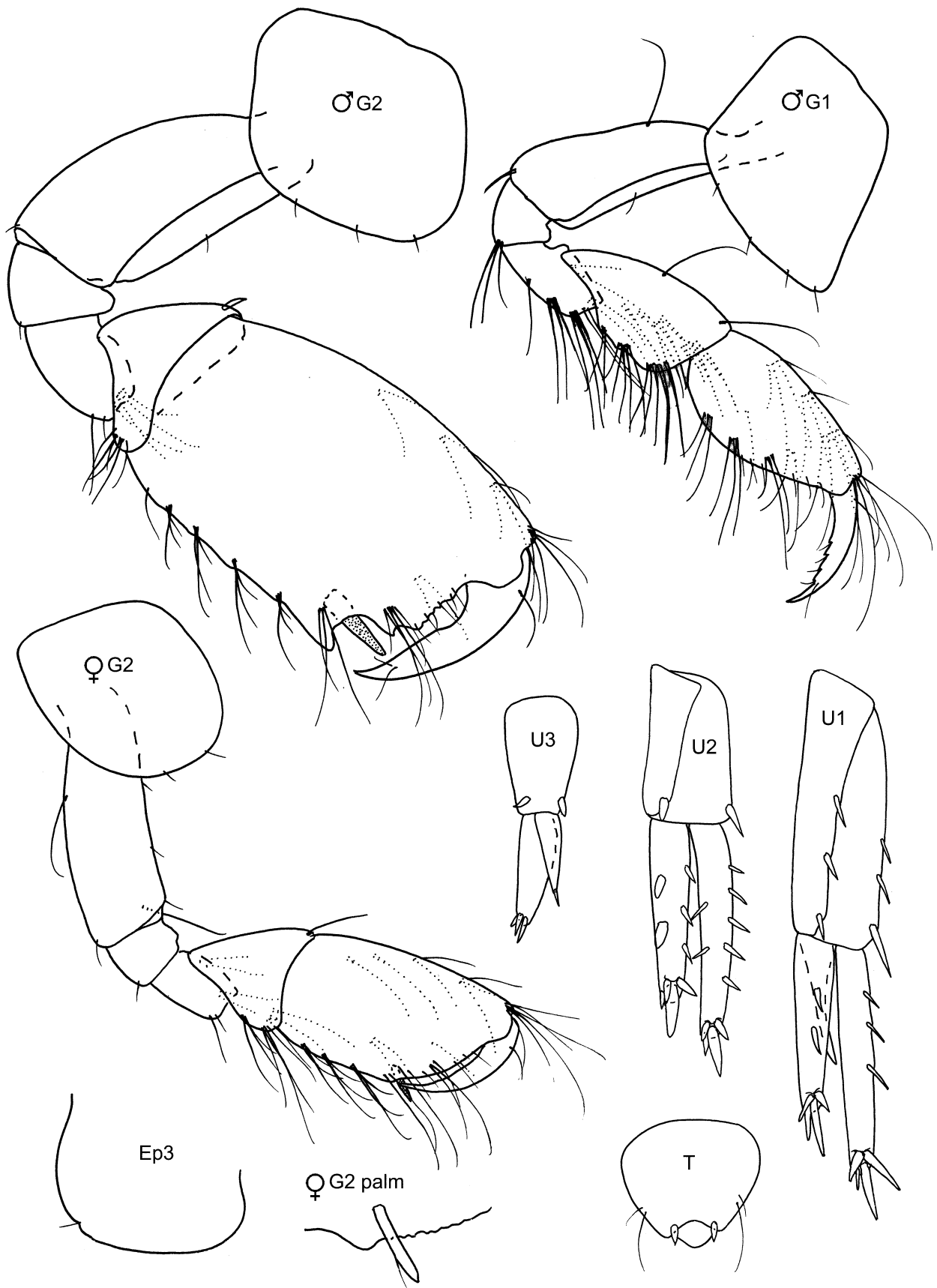


FIGURE 10. *Latigammaropsis hermes* gen. nov., sp. nov., holotype, male, 2.5 mm, AM P71531, female, 2.4 mm, AM P70635, Yonge Reef, Lizard Island, Great Barrier Reef.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye; eye lageniform, small, distinctly less than one quarter head length, eyes partially situated within the lateral lobe of the head; lateral cephalic lobes rounded. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna 1* peduncular article 1 subequal with article 3; flagellum with 10 articles; accessory flagellum distinct and multiarticulate. *Antenna 2* long, more than half body length, flagellum distinctly longer than peduncular article 5, with 6 articles.

Pereon. *Coxae 1–2* without spines on distal margin. *Gnathopod 1* of distinctly different size from gnathopod 2; carpus anterior margin with fine setae only, subequal to propodus; propodus twice as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin with few setae; carpus with distinct free posterior expansion; propodus very long, more than 2.5 x as long as carpus, posterodistal margin with robust seta and with multiple excavations; dactylus short, half length of propodus. *Pereopod 3* merus with short or few long setae on anterior margin. *Pereopod 5* basis with few setae, slightly expanded, distinctly longer than broad.

Pleon. *Urosomites 1–2* without dorsolateral spines. *Epimeron 3* posterodistal margin with small spine and notch. *Uropod 1* peduncle with long distoventral spine; rami distinctly unequal in length. *Uropod 2* peduncle without distoventral spine; rami distinctly unequal in length. *Uropod 3* peduncle subequal to the longest ramus; both rami well developed; outer ramus with terminal robust seta. *Telson* with terminal robust seta on each side.

Female (sexually dimorphic characters). Based on female, 2.4 mm, AM P70635. *Gnathopod 2* carpus without distinct free posterior expansion; propodus less than 2.5 x as long as carpus, posterodistal margin with robust seta, with no excavations; dactylus long, distinctly longer than half length of propodus.

Habitat. Among sponges, *Halimeda* and coral rubble.

Remarks. *Latigammaropsis hermes* **sp. nov.** is very similar to *L. dionysus* **sp. nov.** but has a reniform eye and longer antenna 2. The male gnathopod 1 is also more slender than in *L. dionysus* **sp. nov.**

Distribution. *Australia.* Queensland: Lizard Island (current study).

***Latigammaropsis hestia* sp. nov.**

(Figs 11, 12)

Type material. Holotype, male, 5.0 mm, AM P5476, Picnic beach, Palfrey Island, (14°41'70"S 145°26'92"E), rock rubble, S.E. LeCroy, 4 July 2001 (SEL/LZI 2-7). Paratype: 1 female, 4.9 mm, AM P5477, same data as holotype.

Type locality. Palfrey Island, Lizard Island, Queensland, Australia (14°41'70"S 145°26'92"E).

Etymology. Greek mythology: *Hestia*, Goddess of the hearth

Description. Based on holotype, male, 5.0 mm, AM P5476.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* lageniform, small, distinctly less than one quarter head length, eyes partially situated within the lateral lobe. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna 1* peduncular article 1 subequal with article 3; flagellum with 13 articles; accessory flagellum distinct and multiarticulate. *Antenna 2* short, less than one third body length, flagellum distinctly longer than peduncular article 5 with 6 articles.

Pereon. *Gnathopod 1* carpus subequal to propodus; propodus less than 1.5 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin without setae; carpus with distinct free posterior expansion; propodus about 2.5 x as long as carpus, posterodistal margin without robust seta, with multiple excavations; dactylus long, distinctly longer than half length of propodus. *Pereopod 3* merus with few setae on anterior margin. *Pereopod 5* basis extremely expanded, as long as broad, with few setae on anterior margin.

Pleon. *Urosomites* 1–2 without dorsolateral spines. *Epimeron* 3 posterodistal margin rounded. *Uropod* 1 peduncle with long distoventral spine; rami distinctly unequal in length. *Uropod* 2 peduncle without distoventral spine; rami distinctly unequal in length. *Uropod* 3 peduncle subequal to the longest ramus; both rami well developed; outer ramus with terminal robust seta. *Telson* with terminal robust seta on each side.

Female (sexually dimorphic characters). Based on paratype female 4.9 mm, AM P5477. *Gnathopod* 2 carpus without distinct free posterior expansion; propodus, posterodistal margin with robust seta, with no excavations.

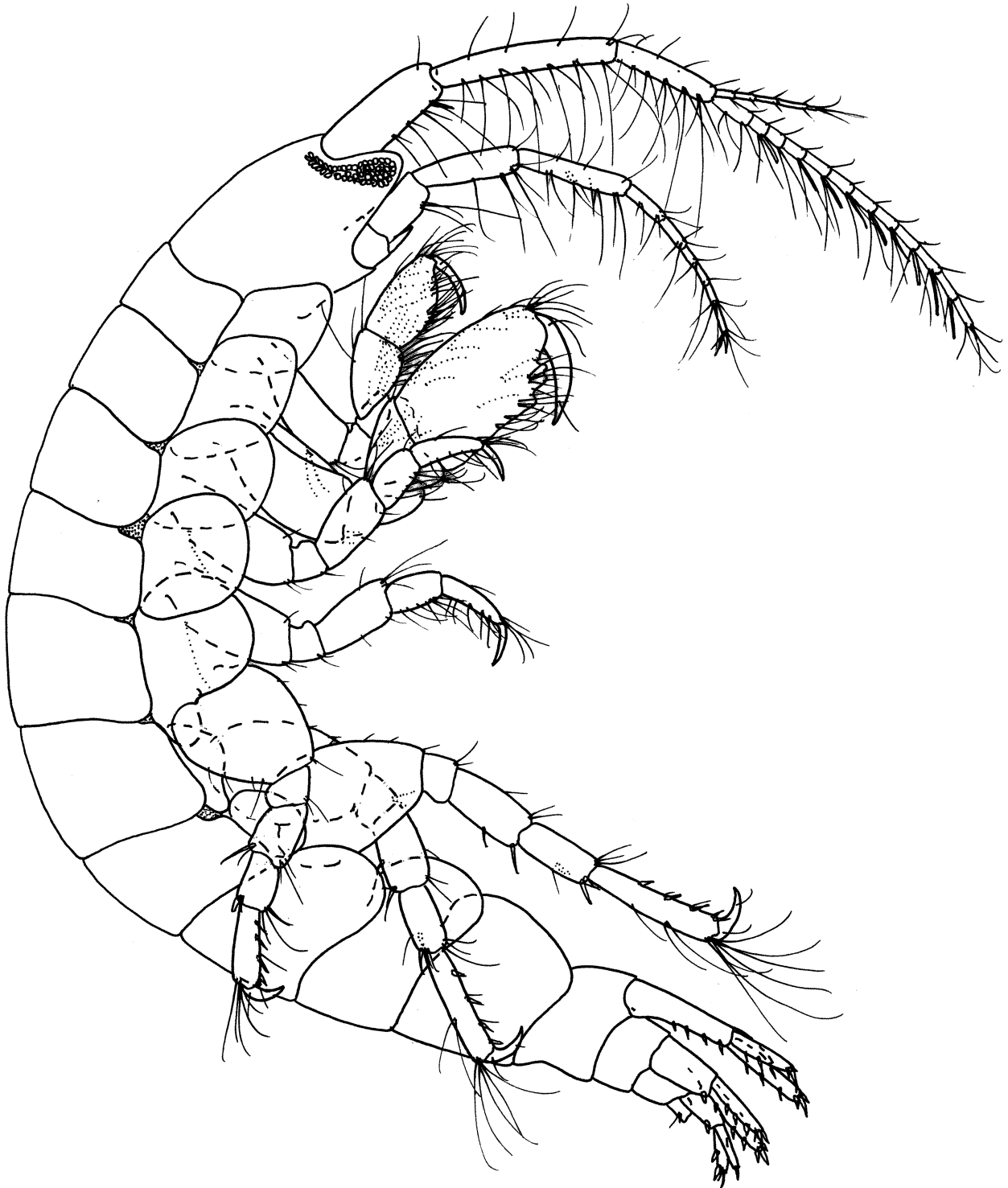


FIGURE 11. *Latigammaropsis hestia* gen. nov., sp. nov., holotype, male, 5.0 mm, AM P5476, Palfrey Island, Lizard Island, Great Barrier Reef.

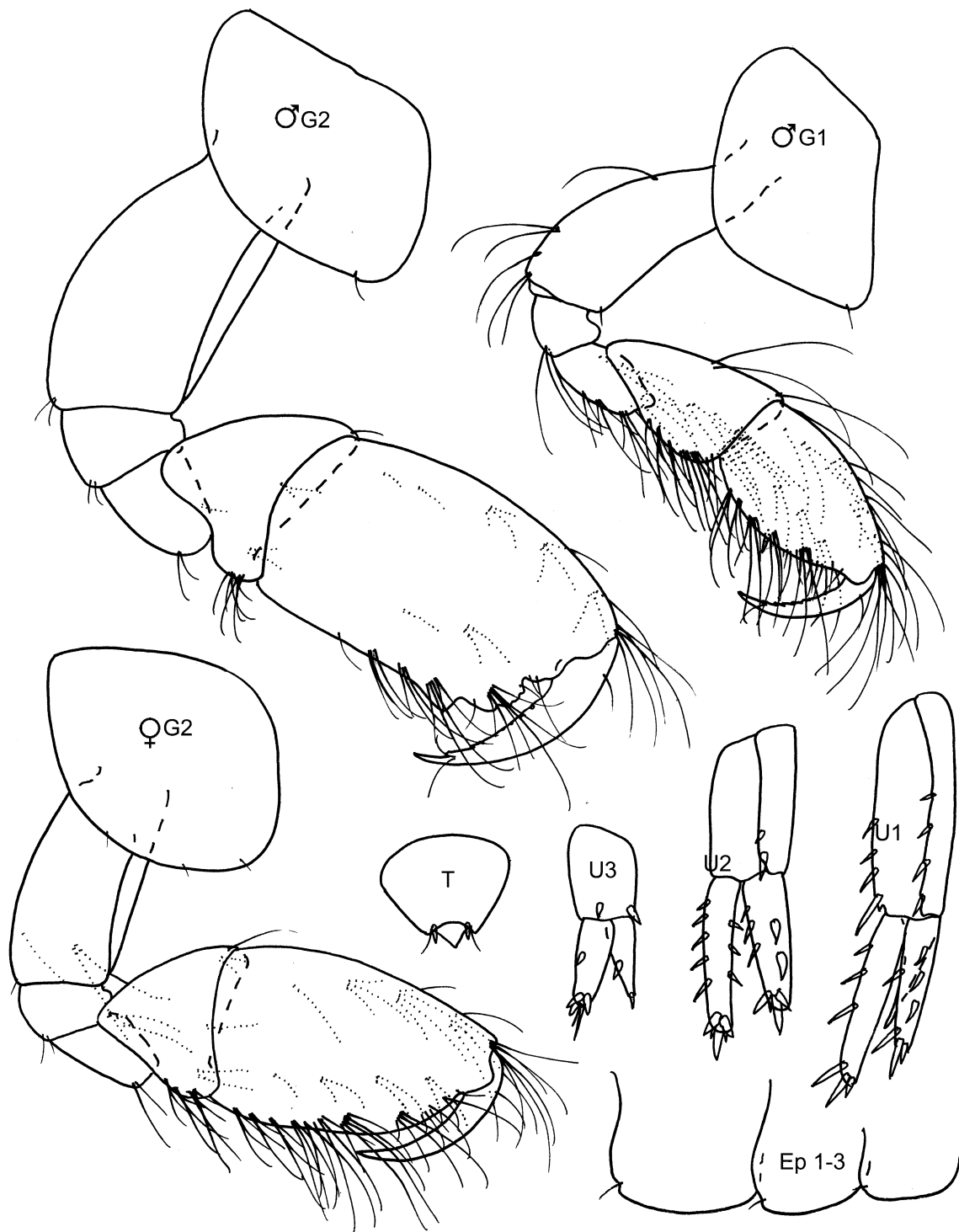


FIGURE 12. *Latigammaropsis hestia* **gen. nov., sp. nov.**, holotype, male, 5.0 mm, paratype female 5.0 mm, AM P5476, Palfrey Island, Lizard Island, Great Barrier Reef.

Habitat. Rock rubble.

Remarks. *Latigammaropsis hestia* **sp. nov.** differs from other species in the *L. afra/atlantica* complex in having the dactylus of the male gnathopod 2 significantly overlapping the palm. It also differs in having the posterodistal margin of the propodus of the male gnathopod 2, developed into a flat shelf rather than into a forward produced spine.

Distribution. *Australia.* Queensland: Lizard Island (current study).

Photis Krøyer, 1842

Photis aina J.L. Barnard, 1970

(Figs 13, 14)

Photis aina J.L. Barnard, 1970: 185, figs 121, 122.

Photis (Cedrophotis) aina. —J.L. Barnard, 1991: 225.

Material examined. 1 male, 1 female, AM P71406 (QLD 1808); 1 male AM P71419 (QLD 1829); 1 male, 2 females AM P71565 (QLD 1829).

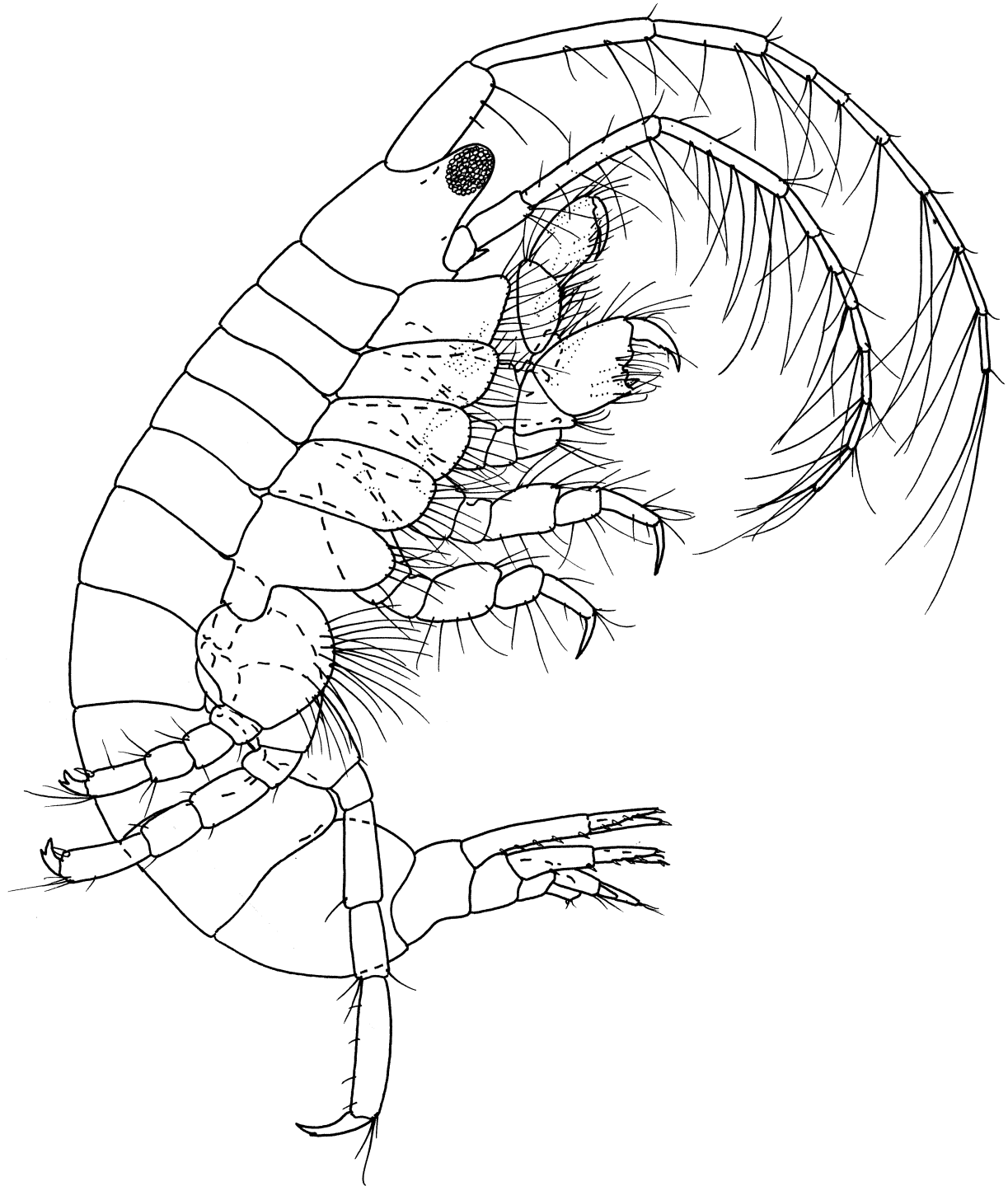


FIGURE 13. *Photis aina* Barnard, 1970, male, 2.5 mm, AM P71406, Yonge Reef, Lizard Island, Great Barrier Reef.

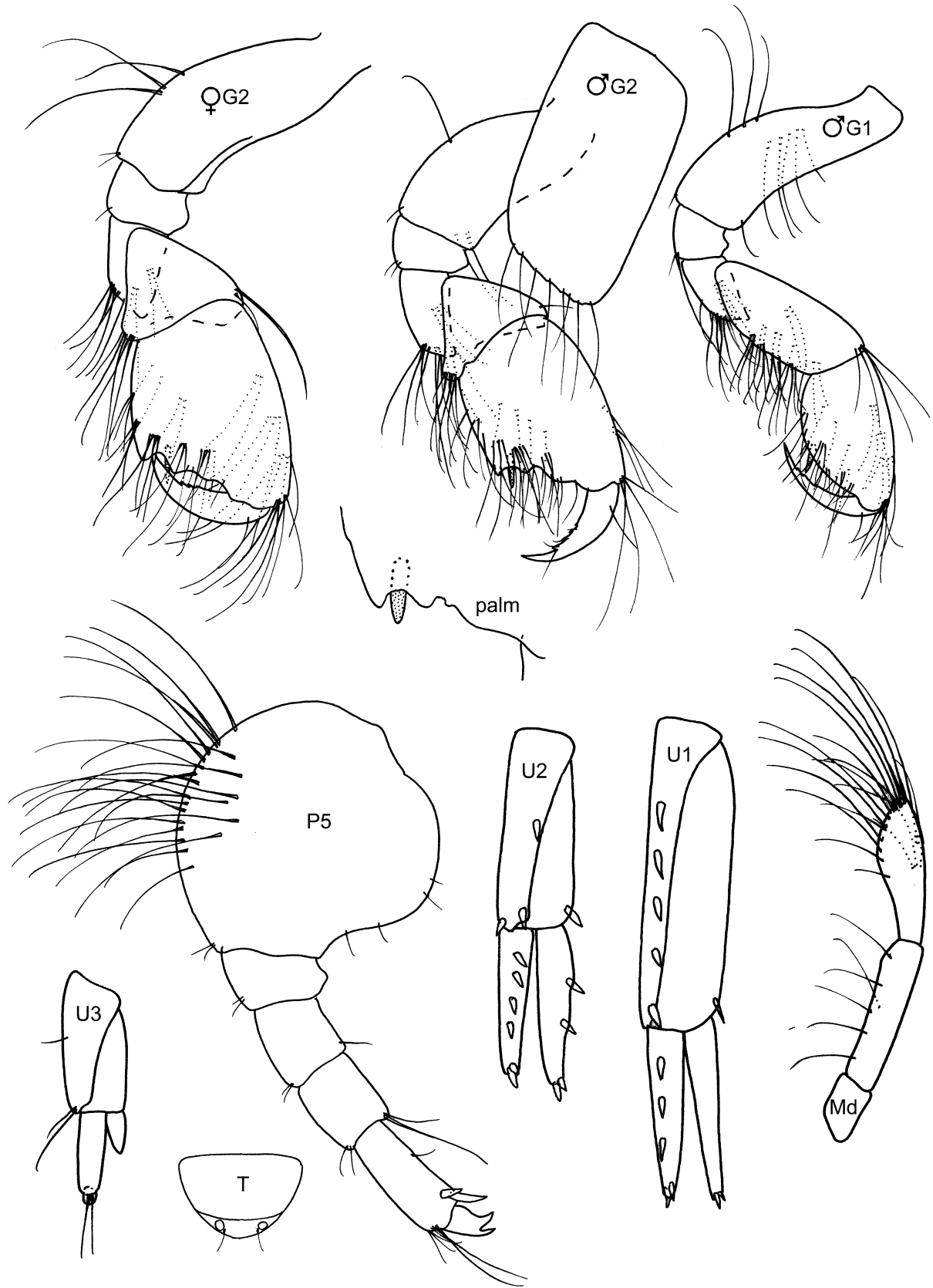


FIGURE 14. *Photis aina* Barnard, 1970, male, 2.5 mm, female 2.6 mm, AM P71406, Yonge Reef, Lizard Island, Great Barrier Reef.

Type locality. Off Ewa beach, Oahu, Hawaii (~21°18'33"S 158°1'29"E).

Description. Based on male, 2.5 mm, AM P71406.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* oval, medium size, about one quarter head length, situated entirely within the lateral lobe. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna 1* peduncular article 1 subequal with article 3; flagellum with 8 articles and lacking aesthetascs; accessory flagellum absent. *Antenna 2* long, about half body length; flagellum distinctly longer than peduncular article 5 with 7 articles.

Pereon. *Coxae 1-5* longer than broad, fringed with very long setae; coxa 1 anterodistal margin weakly produced forward. *Gnathopod 1* carpus subequal to propodus; propodus less than 1.5 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin lacking long setae; carpus with distinct free posterior expansion; propodus over twice length of carpus, posterodistal margin with robust seta, palm with multiple excavations; dactylus long, more than half length of propodus. *Pereopod 3* merus with several very long setae on anterior margin; propodus less than 4 x as long as broad. *Pereopod 5* basis extremely expanded. as long as broad; basis with many long setae along anterior margin. *Pereopods 5-7* dactyls each with accessory spine on anterior margin.

Pleon. *Epimeron 3* posterodistal margin rounded. *Uropod 1* peduncle without distoventral spine; rami subequal in length. *Uropod 2* peduncle without distoventral spine; rami subequal in length. *Uropod 3* peduncle slender, distinctly longer than outer ramus; inner ramus about half length of outer ramus; outer ramus with terminal fine setae. *Telson* with terminal blunt robust seta on each side.

Female (sexually dimorphic characters). Based on female 2.6 mm, AM P71565 *Gnathopod 2* carpus a little longer than that of male.

Habitat. Among *Halimeda opuntia*.

Remarks. This species is easily recognisable by its setose coxae and relatively long inner ramus of uropod 3. This latter is a plesiomorphic state in *Photis* and was responsible for this species being placed, with *P. malinalco* J.L. Barnard, 1967 in a subgenus *Cedrophotis* by Barnard (1967). Long coxal setae are also found in *Dodophotis distinguenda* (Ruffo, 1955), but that species has a vestigial inner ramus on uropod 3 and in *P. lamellifera* Schellenberg, 1928, from which it differs in the longer carpus of gnathopod 1, as well as by its longer uropod 3 inner ramus. Long coxal setae are found also in the Californian species *P. brevipes* Shoemaker, 1942, *P. californica* Stout, 1913 and *P. conchicola* Alderman, 1936, but all three species have the male gnathopod 2 with a large spine on the posterodistal margin of the propodus.

Distribution. *Australia.* Queensland: Lizard Island (current study). *USA.* Hawaii: Oahu (J.L. Barnard 1970)

***Photis davei* sp. nov.**

(Figs 15, 16)

Type material. Holotype, male, 3.2 mm, AM P75474, Casuarina Beach, Lizard Island (14°40'77S 145°26'85"E), fine slightly muddy sand, kick-net, S.E. LeCroy, 0.5 m, 5 July 2001 (SEL/LZI-5-1). Paratypes: 2 females, AM P75475, same data as holotype.

Type locality. Casuarina Beach, Lizard island, Queensland, Australia (14°40'77S 145°26'85"E).

Etymology. Named for Dr David McGrath in appreciation of more than three decades of cooperative work on North Atlantic amphipods.

Description. Based on holotype, male, 3.2 mm, AM P75474.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* round, small, less than one quarter head length, situated entirely within the lateral lobe. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna 1* peduncular articles 1 and 3 subequal in length; flagellum with 8 articles, bearing aesthetascs on most articles; accessory flagellum absent. *Antenna 2* short about half body length; flagellum distinctly longer than peduncular article 5 with 7 articles.

Pereon. *Coxae* 1–5 longer than broad, sparsely fringed with short setae; coxa 1 unproduced. *Gnathopod* 1 carpus subequal to propodus; propodus twice as long as wide, posterodistal margin evenly rounded. *Gnathopod* 2 basis anterior margin lacking setae; carpus without distinct free posterior expansion; propodus twice as long as carpus, posterodistal margin without robust seta, palm with multiple excavations; dactylus distinctly longer than half length of propodus. *Pereopod* 3 merus with several very long setae on anterior margin; propodus elongate, more than 5 x as long as broad. *Pereopod* 5 basis slightly expanded, distinctly longer than broad, with few setae on anterior margin. *Pereopods* 5–7 dactyls each with accessory spine on anterior margin.

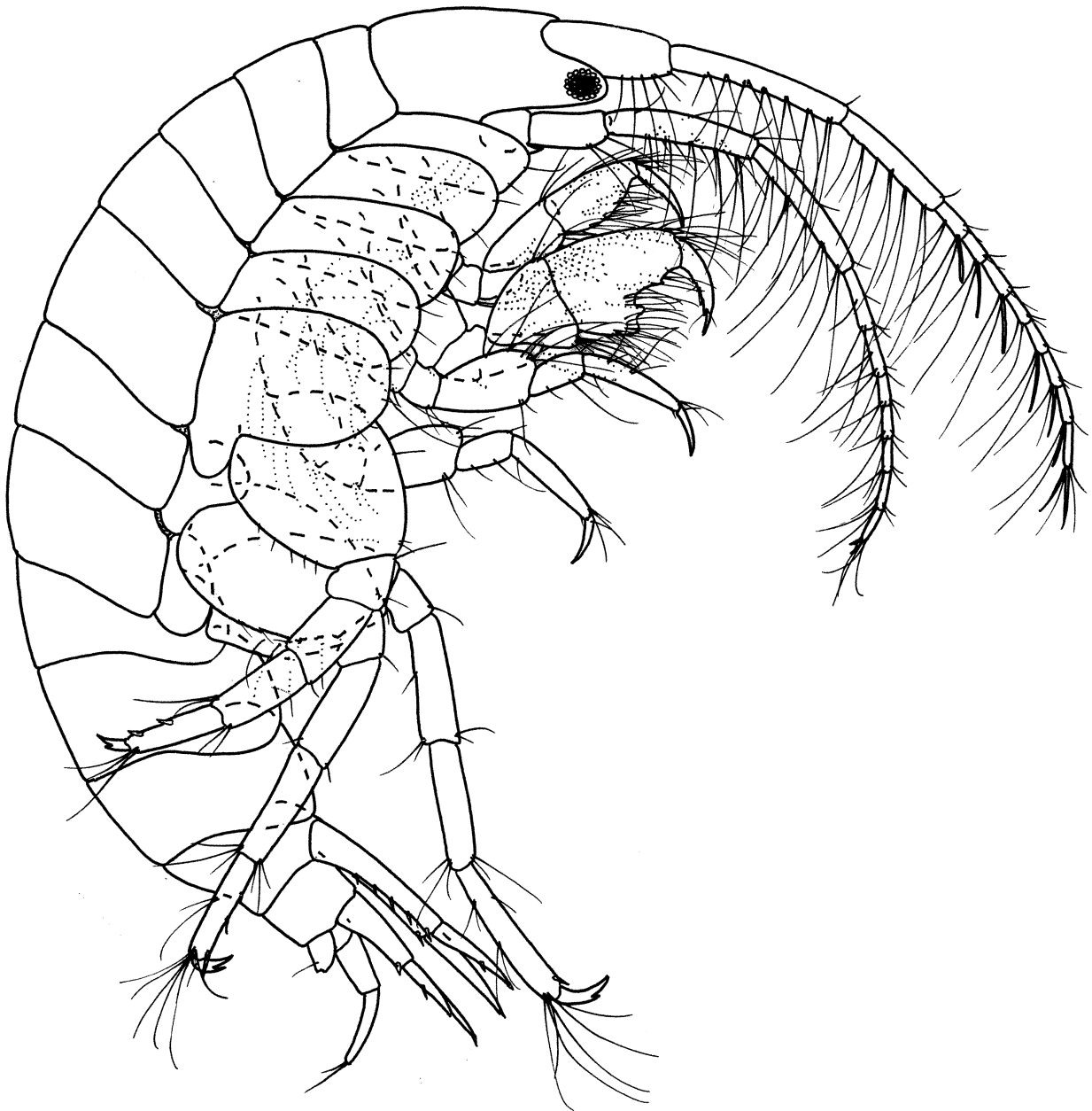


FIGURE 15. *Photis davei* sp. nov., holotype, male, 3.2 mm, AM P75474, Casuarina Beach, Lizard Island, Great Barrier Reef.

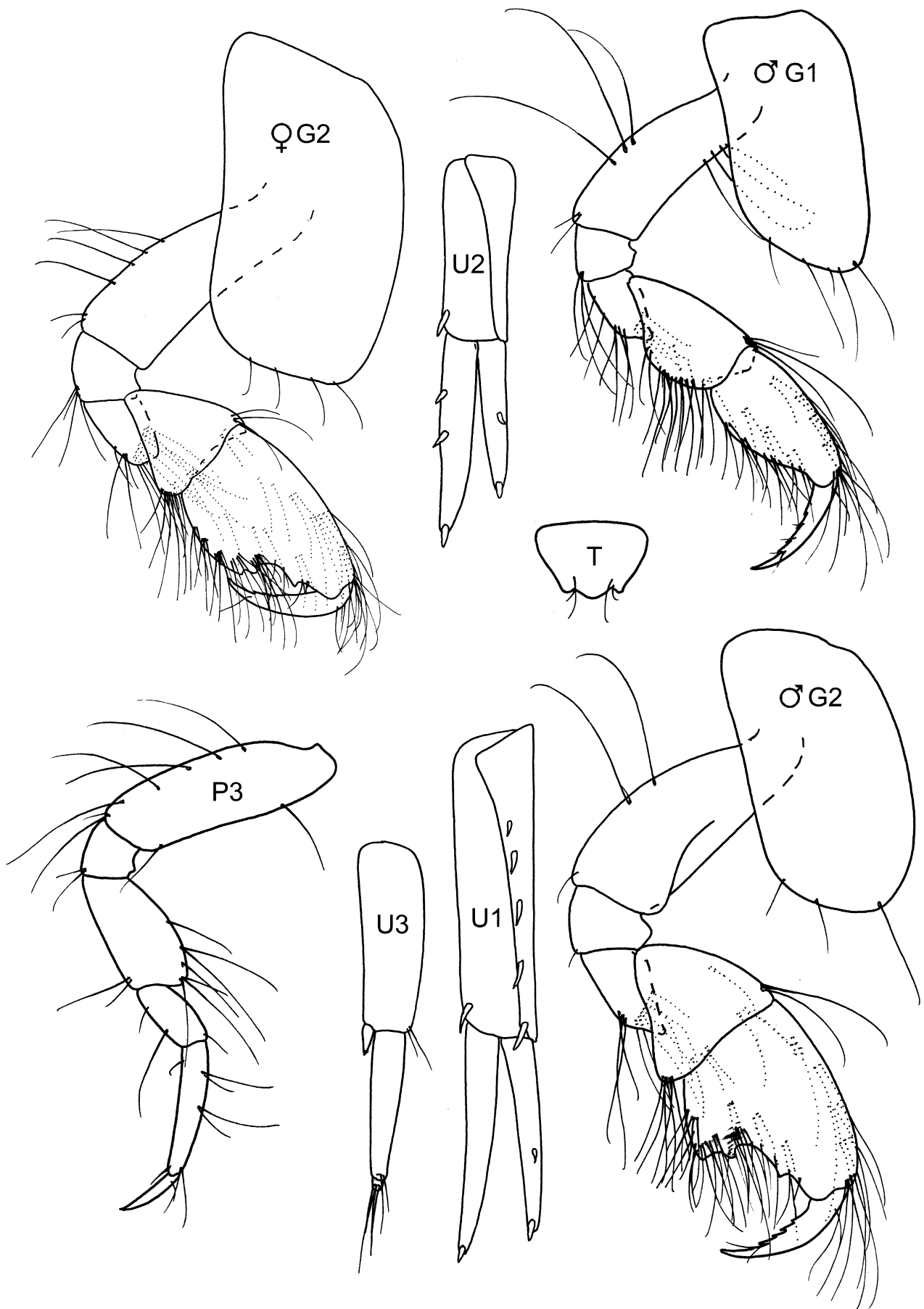


FIGURE 16. *Photis davei* sp. nov., holotype, male, 3.2 mm, AM P75474, paratype female, 3.1 mm, AM P75475, Casuarina Beach, Lizard Island, Great Barrier Reef.

Pleon. *Epimeron* 3 posterodistal margin rounded. *Uropod* 1 peduncle, without distoventral spine; rami distinctly unequal in length. *Uropod* 2 peduncle without distoventral spine; rami distinctly unequal in length. *Uropod* 3 peduncle slender, distinctly longer than outer ramus; inner ramus vestigial; outer ramus with terminal fine setae. *Telson* without robust setae.

Female (sexually dimorphic characters). Based on paratype female 3.1 mm, AM P75475. *Gnathopod* 2 similar to that of male, but propodus a little longer.

Habitat. Muddy sand.

Remarks. This species resembles *P. brevicaudata* Stebbing, 1888, but differs in the very elongate propodus of pereopods 3–4 as well as in differences in the shapes of gnathopods 1 and 2. In the elongate propodus of pereopods 3–4 this species resembles *P. paeowai* Myers, 1995, from Papua New Guinea. That species however, has an even more slender propodus and very elongate dactylus on these appendages. It further differs from *P. paeowai* in its smaller eye, longer coxa 1 and longer carpus in the female gnathopod 2. It differs from *P. pirloti* Myers, 1985 in its much smaller eye and complexly excavated palm of gnathopod 2. It differs from *P. aina* J.L. Barnard, 1970 in lacking long setae on the coxae. It shows some similarity with *P. sinensis* Ren, 2006, but differs from that species in the vestigial inner ramus of uropod 3, that of *P. sinensis* being fully half the length of the outer ramus.

Distribution. *Australia.* Queensland: Casuarina Beach, Lizard Island (current study).

Photis pirloti Myers, 1985

(Figs 17, 18)

Photis pirloti Myers, 1985: 88, fig. 68. —Myers, 1995: 72, figs 37, 38.

Material studied. 1 female, AM P70843 (QLD 1661).

Type locality. Nananui Ra, Fiji (17°20'S 177°76'E).

Description. Based on female, 2.5 mm, AM P70843.

Head. *Head* anteroventral margin strongly recessed, extending behind posterior margin of eye. *Eye* oval, medium size, about one quarter head length, situated entirely within the lateral lobe. *Mandible palp* article 3 distinctly shorter than article 2, spatulate, widest subdistally. *Antenna* 1 peduncular article 1 shorter than article 3; flagellum with 8 articles and bearing aesthetascs on alternate articles; accessory flagellum absent. *Antenna* 2 long, more than half body length; flagellum distinctly longer than peduncular article 5 with 7 articles.

Pereon. *Coxae* 15 longer than broad, sparsely fringed with short setae; coxa 1 unproduced. *Gnathopod* 1 carpus subequal to propodus; propodus between 1.5 and 3 x as long as wide, posterodistal margin evenly rounded. *Gnathopod* 2 basis anterior margin with a few short setae; carpus with distinct free posterior expansion; propodus less than 2.5 x as long as carpus, posterodistal margin without robust seta, palm with a single excavation; dactylus longer than half length of propodus. *Pereopod* 3 merus with many very long setae on anterior margin; propodus less than 4 x as long as broad. *Pereopod* 5 basis slightly expanded, distinctly longer than broad; with few setae on anterior margin. *Pereopods* 5–7 dactylus each with accessory spine on the anterior margin.

Pleon. *Epimeron* 3 posterodistal margin rounded. *Uropod* 1 peduncle without distoventral spine; rami subequal in length. *Uropod* 2 peduncle without distoventral spine; rami distinctly unequal in length. *Uropod* 3 peduncle slender, subequal to the outer ramus; inner ramus vestigial; outer ramus with terminal fine setae. *Telson* without robust setae.

Male (not yet collected in Australia). *Coxae* 3–5 with stridulating ridges. *Gnathopod* 2 basis with anterodistal flange bearing stridulating ridges, propodus with more deeply indented excavation.

Habitat. Among coral rubble, sponges and *Halimeda*.

Remarks. This species is distinguished from other species recorded from Australia, by the single, smooth excavation on the palm of gnathopod 2 in both sexes.

Distribution. *Australia.* Queensland: Lizard Island (current study). *Fiji.* Viti Levu: Nananui Ra (Myers 1985). *Papua New Guinea.* Madang Lagoon (Myers 1995).

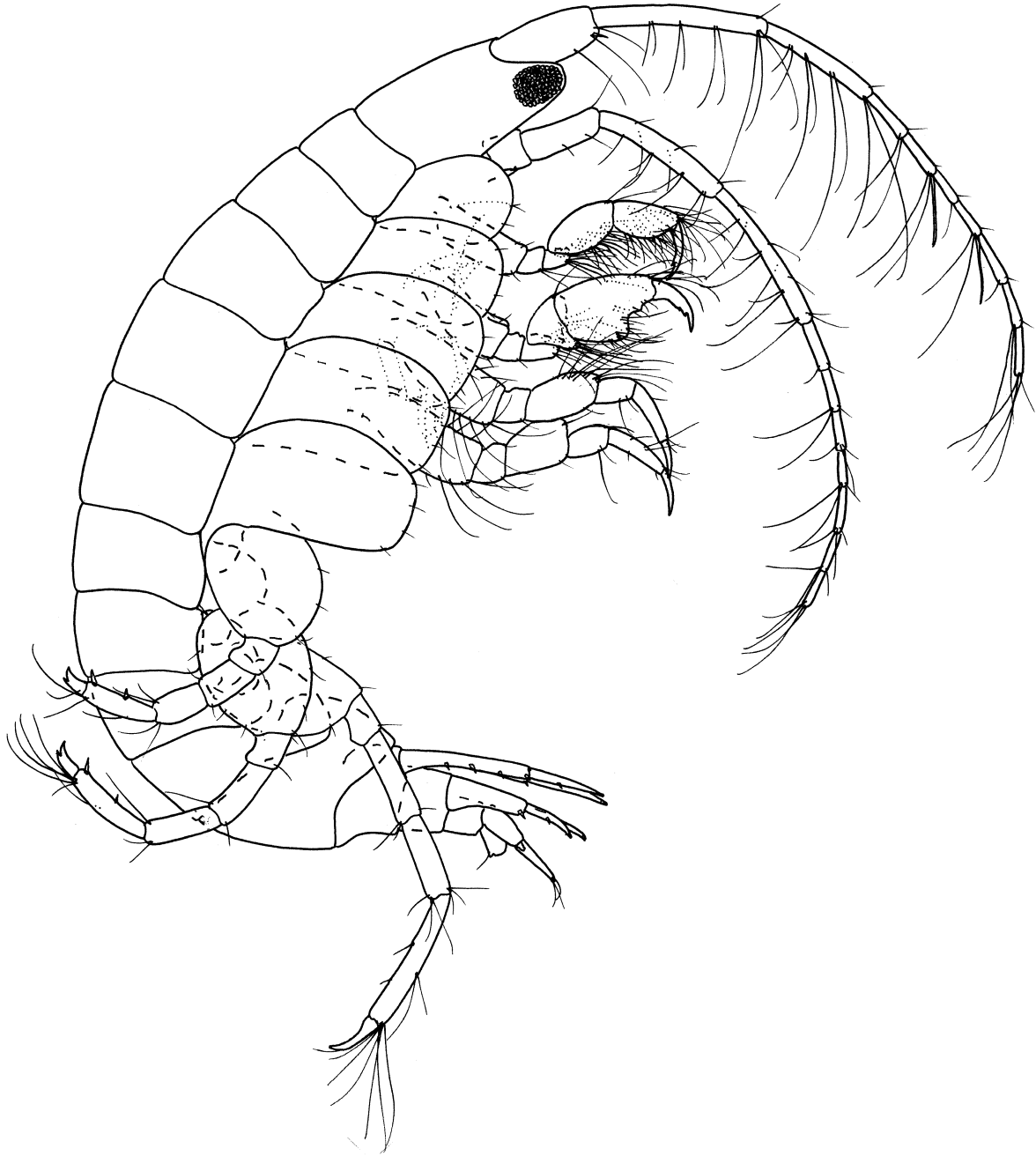


FIGURE 17. *Photis pirloti* Myers, 1985, female, 2.5 mm, AM P70843, Cobia Hole, Lizard Island, Great Barrier Reef.

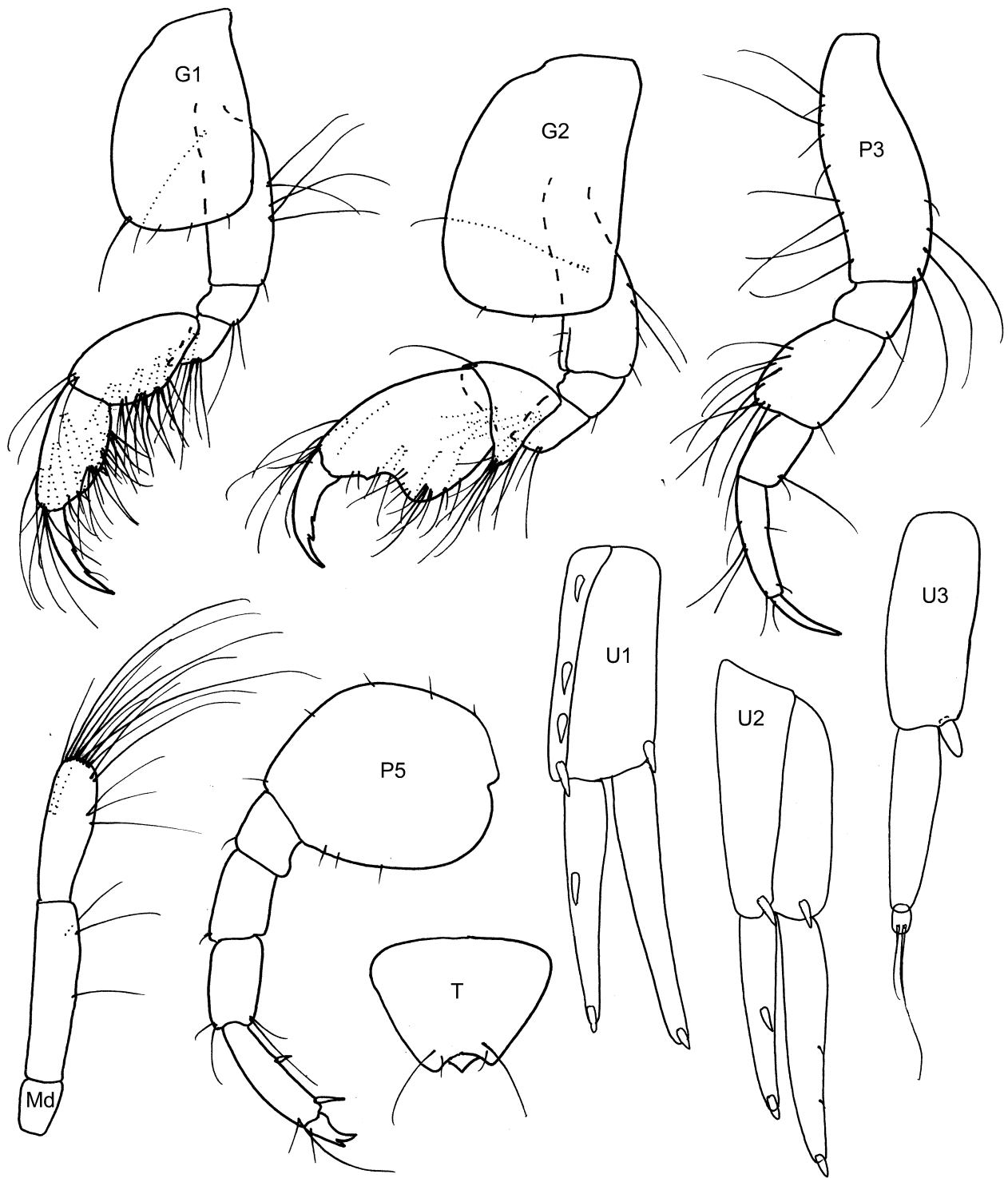


FIGURE 18. *Photis pirloti* Myers, 1985, female, 2.5 mm, AM P70843, Cobia Hole, Lizard Island, Great Barrier Reef.

***Virgammaropsis* gen. nov.**

Type species. *Virgammaropsis artemis* sp. nov.

Etymology. Latin: *Virga* meaning a rod (referring to the unexpanded pereopods), as a prefix to *Gammaropsis*, a related genus.

Diagnosis. Head anteroventral margin weakly recessed, not extending behind posterior margin of eye; lateral cephalic lobes rounded. Mandible palp article 3 rod-shaped, parallel-sided. Antenna 1 peduncular article 1 longer than article 3; accessory flagellum distinct and multiarticulate. Coxae 1–2 without spines on distal margin. Coxa 1 not distally acute. Gnathopod 2 distinctly larger than gnathopod 1. Gnathopods 1–2 and pereopods 3–5 (probably also 6 and 7) with weakly expanded bases. Urosomites 1–2 without dorsolateral spines.

Included species. *Virgammaropsis artemis* sp. nov.

Remarks. *Virgammaropsis* differs from *Gammaropsis* Liljeborg, in its poorly recessed head, parallel-sided article 3 of mandibular palp and weakly expanded pereopod bases. It resembles *Falcigammaropsis* Myers, 1995 from Papua New Guinea, in the parallel-sided article 3 of the mandibular palp, and in the form of the male gnathopod 2. It differs from that genus however in lacking an acute epistome, in the unexpanded basis of pereopod 5 (and probably also the unknown pereopods 6–7), and in the absence of spines on urosomite 1.

***Virgammaropsis artemis* sp. nov.**

(Figs 19, 20)

Type material. Holotype, male, 1.7 mm, AM P71493, Yonge Reef, Half Mile Opening (14°34'33"S 145°36'43"E), *Halimeda* and other algae from channel between reefs, 10 m, C.S. Serejo, 4 March 2005 (QLD 1819).

Type locality. Yonge Reef, Half Mile Opening, Lizard Island, Queensland, Australia (14°34.556'S 145°36.726'E).

Etymology. Greek mythology: *Artemis*, virgin goddess of the hunt.

Description. Based on holotype, male, 1.7 mm, AM P71493.

Head. Head lateral cephalic lobes rounded, anteroventral margin weakly recessed, not extending behind posterior margin of eye. Eye round, large, one quarter or more head length, partially situated within the lateral lobe. *Antenna 1* peduncular article 1 longer than article 3; flagellum with 11+ articles (broken); accessory flagellum distinct and multiarticulate. *Antenna 2* missing. *Mandible* palp article 3 subequal in length with article 2, parallel-sided.

Pereon. *Coxae 1–2* without spines on distal margin. *Coxa 1* not distally acute. *Gnathopod 1* of distinctly different size from gnathopod 2; carpus anterior margin with fine setae only, subequal in length to propodus; propodus between 1.5 and 3 x as long as wide, posterodistal margin evenly rounded. *Gnathopod 2* basis anterior margin with few setae; carpus with distinct free posterior expansion; propodus long, more than four x as long as carpus, posterodistal margin with robust seta, and with multiple excavations; dactylus distinctly longer than half length of propodus. *Pereopod 3* merus with few setae on anterior margin. *Pereopod 5* basis with few setae, slightly expanded, distinctly longer than broad. *Pereopods 6–7* missing.

Pleon. *Urosomites 1–2* without dorsolateral spines. *Epimeron 3* posterodistal margin with small spine and notch. *Uropod 1* peduncle with short distoventral spine; rami subequal in length. *Uropod 2* peduncle without distoventral spine; rami subequal in length. *Uropod 3* biramous; peduncle subequal to the longest ramus; outer ramus with terminal robust setae. *Telson* with terminal robust seta on each side.

Female. Unknown

Habitat. *Halimeda* and other algae.

Remarks. *Virgammaropsis artemis* sp. nov. is readily distinguished by its weakly recessed head, its weakly expanded pereopod 5 basis and its rod-shaped mandibular palp article 3.

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

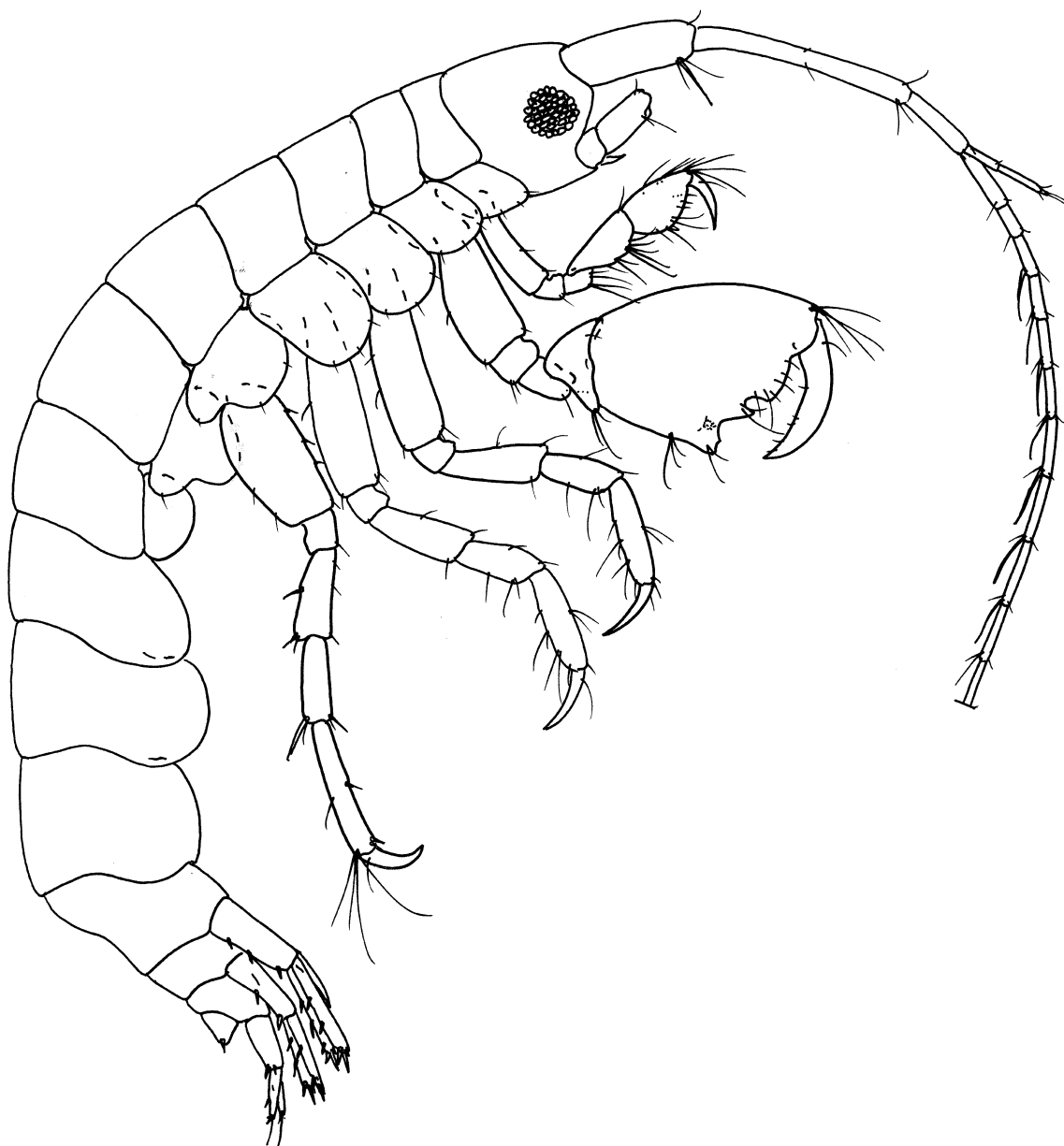


FIGURE 19. *Virgammaropsis artemis* **gen. nov. sp. nov.**, holotype, male, 1.7 mm, AM P71493, Yonge Reef, Lizard Island, Great Barrier Reef.

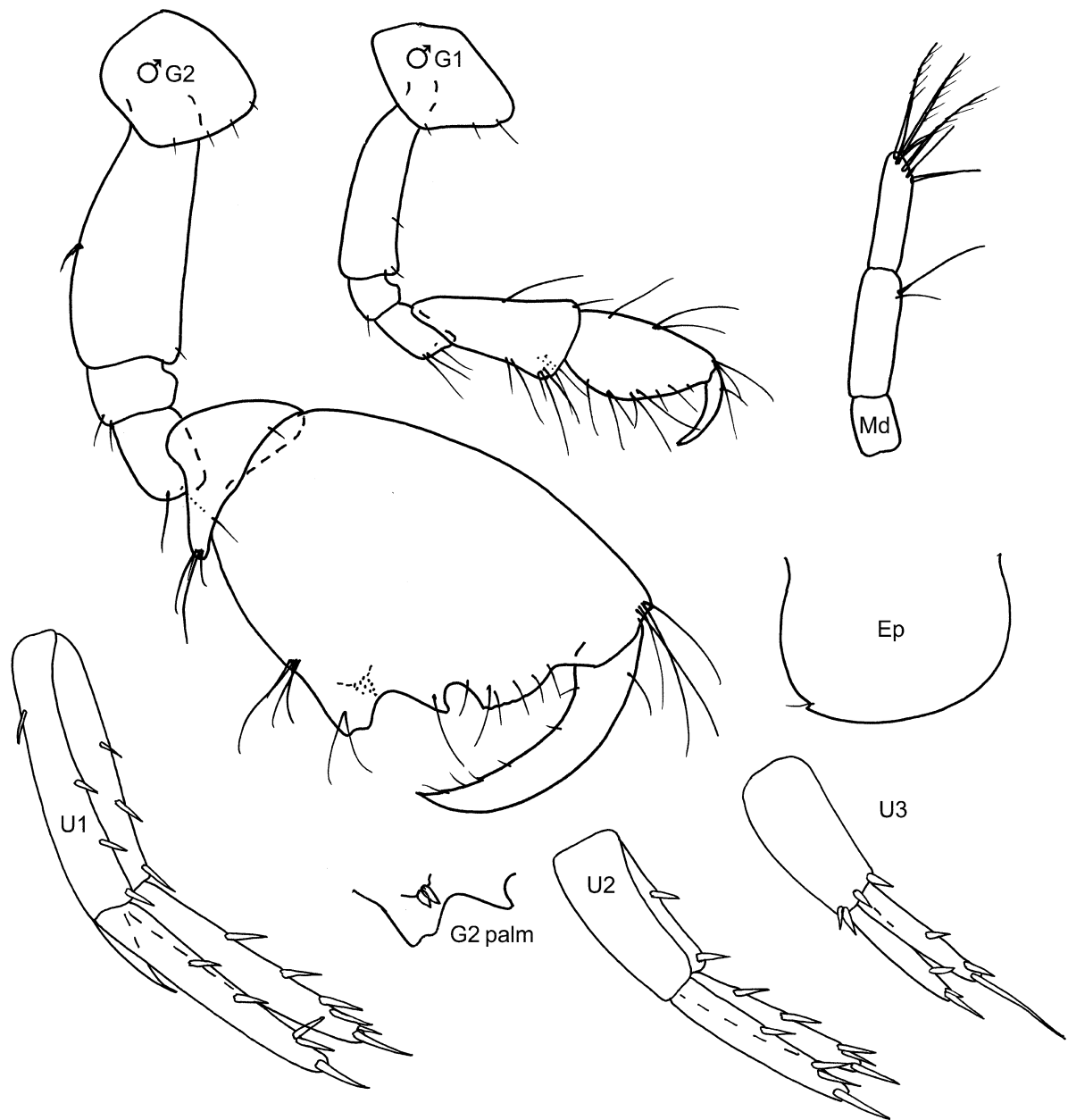


FIGURE 20. *Virgammropsis artemis* **gen. nov. sp. nov.**, holotype, male, 1.7 mm, AM P71493, Yonge Reef, Lizard Island, Great Barrier Reef.

References

- Alderman, A.L. (1936) Some new and little known amphipods of California. *University of California Publications in Zoology*, 41, 53–74.
- Barnard, J.L. (1965) Marine Amphipoda of atolls in Micronesia. *Proceedings of the United States National Museum*, 117, 459–551.
- Barnard, J.L. (1967) Bathyal and abyssal gammaridean Amphipoda of Cedros Trench, Baja California. *Bulletin of the United States National Museum*, 260, 1–205.
- Barnard, J.L. (1970) Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. *Smithsonian Contributions to Zoology*, 34, 1–286.

- Barnard, J.L. & Karaman, G.S. (1991) The families and genera of marine gammaridean Amphipoda (except marine gammaroids). *Records of the Australian Museum, Supplement*, 13(1&2), 1–866.
- Boeck, A. (1871) Crustacea Amphipoda borealia et arctica. *Forhandlinger i Videnskabs-Selskabet i Christiania* 1870, 81–280.
- Dallwitz, M.J. (2005) Overview of the DELTA System. <http://delta-intkey.com>. Last accessed (8/9/2007).
- Krøyer, H. (1842) Une nordiske Slaegter og Arter af Amfipodernes Orden, henhørende til Familien Gammarina. (Forelobigt Uddrag af et større Arbejde). *Naturhistorisk Tidsskrift*, 4, 141–166.
- Ledoyer, M. (1978) Amphipodes gammariens (Crustacea) des biotopes cavitaires organogènes récifaux de l'île Maurice (Océan Indien). *The Mauritius Institute Bulletin*, 8(3), 197–332.
- Liljeborg, V. (1855) Öfversigt af de inom Skandinavien hittills arterna af släktet Gammarus Fabr. *Konliga Svenska Vetenskaps Akademiens Handlingar*, 12, 443–460.
- Lowry, J.K. & Myers, A.A. (2009) Foreword. In: Lowry, J.K. & Myers, A.A. (Eds), Benthic Amphipoda of the Great Barrier Reef, Australia. *Zootaxa*, 2260, 17–108.
- Myers, A.A. (1985) Shallow-water, coral reef and mangrove Amphipoda (Gammaridea) of Fiji. *Records of the Australian Museum, Supplement*, 5, 1–143.
- Myers, A.A. (1995) The Amphipoda (Crustacea) of Madang Lagoon: Aoridae, Isaeidae, Ischyroceridae and Neomegamphopidae. *Records of the Australian Museum, Supplement*, 22, 25–95.
- Ren, X. (2006) Crustacea Amphipoda Gammaridea (I). *Fauna Sinica Invertebrata*, 41, i–x, 1–588.
- Ruffo, S. (1955) Etudes sur les crustacés amphipodes XLIII. Une nouvelle espèce de *Photis* de Madagascar (Amphipodes Photidae). *Le Naturaliste Malagache*, 7, 195–200.
- Ruffo, S. (1969) Studi sui crostacei anfipodi. LXVII. Terzo contributo alla conoscenza degli anfipodi del Mar Rosso. *Memorie del Museo Civico di Storia Naturale, Verona*, 17, 1–77.
- Schellenberg, A. (1925) Crustacea VIII: Amphipoda. *Beitrage zur Kenntnis der Meeresfauna Westafrikas*. Hamburg, 111–204.
- Schellenberg, A. (1928) Report on the Amphipoda. Zoological results of the Cambridge Expedition to Suez Canal, 1924. *Transactions of the Zoological Society of London*, 22, 633–692.
- Schellenberg, A. (1938) Litorale Amphipoden des tropischen Pazifiks nach Sammlungen von Prof. Bock (Stockholm), Prof. Dahl (Berlin) und Prof. Pietschmann (Wein). *Kunliga Svenska Vetenskapsakademiens Handlingar*, Series 3, 16(6), 1–105.
- Shoemaker, C.R. (1942) Amphipod crustaceans collected on the Presidential Cruise of 1938. *Smithsonian Miscellaneous Collections*, 101, 1–52.
- Stebbing, T.R.R. (1888) Report on the Amphipoda collected by H.M.S. Challenger during the years 1873–1876. *Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873–76, Zoology* 29, 1–1737, pls 1–210.
- Stout, V.R. (1913) Studies in Laguna Amphipoda. II. *Zoologische Jahrbücher. Abteilung für Systematik, Ökologie un Geographie der Tiere*, 34, 633–659.