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The Melitidae of Lizard Island and Adjacent Reefs, The Great Barrier Reef, Australia (Crustacea: Amphipoda)

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ABSTRACT. This paper is the first study of melitid amphipods from tropical Australia. Seventeen species of Melitidae in the genera *Ceradocus*, *Dulichella*, *Elasmopus*, *Maera*, *Mallacoota* and *Pareiasmopus* are recorded from Lizard Island and adjacent reefs. In addition *Ceradocus hawaiiensis* Barnard is recorded from Heron Island. Seven new species are described: *Ceradocus oxyodus*, *C. wooree*, *C. yandala*, *Elasmopus crenulatus*, *E. spinicarpus*, *Maera griffini* and *Mallacoota balara*. A lectotype is established and described for *Pareiasmopus suensis*. The diagnosis for the genus *Mallacoota* is expanded and a key to the known species included.

None of the Melitidae from Lizard Island and adjacent reefs has been recorded from southern or south-eastern Australia. Madagascar and Mauritius have the highest number of melitid species in common with the Lizard Island area.

BERENTS, P.B., 1983. The Melitidae of Lizard Island and adjacent reefs, the Great Barrier Reef, Australia (Crustacea:Amphipoda). Records of the Australian Museum 35(3): 101-143.

The Gammaridea of the Great Barrier Reef have not been previously studied. The only published work is that of K.H. Barnard (1931) who reported on the Amphipoda collected by the Great Barrier Reef Expedition conducted by the British Museum in 1928-29. He reported briefly on 14 species from 11 families and the only Melitidae were identified as *Ceradocus rubromaculatus* and *Maera* sp. J.L. Barnard (1976) stressed that little is known of tropical Amphipoda, especially when compared with studies of the group in cold temperate waters.

Recently major collecting programmes with the emphasis on small invertebrates have been carried out by the Australian Museum in the Lizard Island area on the northern Great Barrier Reef. Dr P.A. Hutchings and P.B. Berents sampled reef rock communities (Hutchings and Weate, 1977, 1979). An expedition to sample algal and soft bottom communities was conducted by Dr J.K. Lowry and Dr A.R. Jones. These collections are the basis of this study.

The aim of this study is to record the species of melitid amphipods from Lizard Island and adjacent reefs. New species are described, and for those species already known, the morphology of populations from Lizard Island is compared with other populations described in the literature. The distributions of the species among different habitats and localities in the Lizard Island area are compared. The Melitidae of Lizard Island are

compared with melitid faunas from southern Australia and the Indo-Pacific.

Sampling was carried out at Lizard Island and adjacent reefs, which allowed sampling of the fringing reefs of a high island, a coral cay and outer barrier reefs (Fig.1).

Lizard Island (14°40'S, 145°28'E) lies 18 nautical miles north-east of Cape Flattery on the Queensland coast. It is a high rocky island surrounded by fringing reefs that enclose and protect a shallow lagoon from the prevailing south-east trade winds which blow from March to November. The north-west monsoon affects the region from December to March.

Yonge Reef (14°36'S, 145°38'E) lies 10 nautical miles north-east of Lizard Island. It is part of the chain of shelf edge reefs that follows the continental shelf from the Murray islands (9°58'S) south to approximately 16°S (Orme, 1978). It is a cusped ribbon reef with a backward growth of reef formed by strong currents (Veron, 1978). Behind the reef is a sheltered lagoon-like area with a sandy bottom and scattered bommies known as the reef back. The outer slope at Yonge Reef drops to 40 metres with sand and rubble at the bottom of the slope.

Eagle Islet (14°42'S, 145°23'E) is a coral cay 5 nautical miles south-east of Lizard Island. The reef surrounding Eagle Islet is 2 nautical miles long and 1.5 nautical miles wide.

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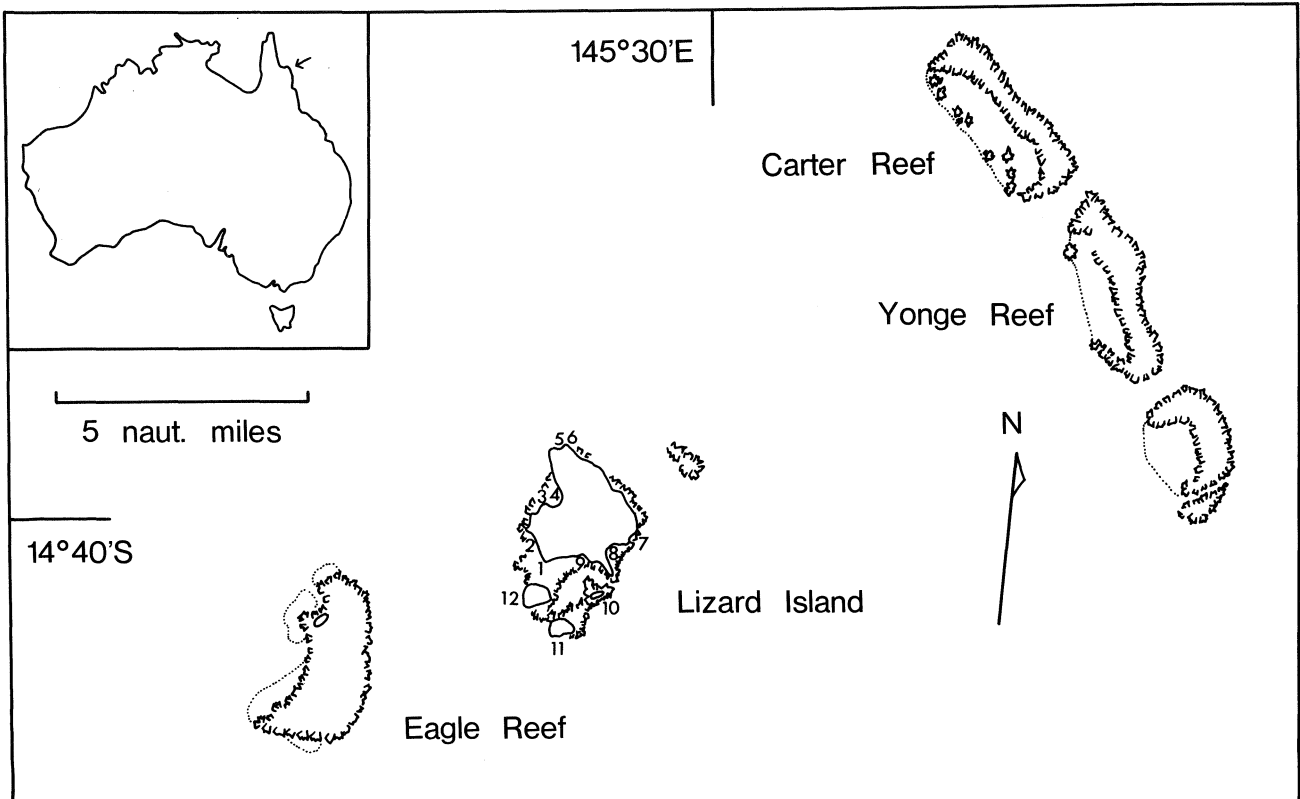


Fig. 1. Map of Lizard Island and adjacent reefs. 1, Station Beach; 2, Casuarina Beach; 3, Chinaman's Head; 4, Watson Bay; 5, Mermaid Cove; 6, North Point; 7, Crystal Beach; 8, Coconut Beach; 9, Mangrove Beach; 10, Bird Islet; 11, South Island; 12, Palfrey Island.

Material from this study has been lodged in the Australian Museum (AM), the United States Museum of Natural History (USNM) and the British Museum (Natural History) (BMNH).

All sublittoral samples were taken using scuba. Collecting techniques varied with the particular habitat being sampled. Sediment samples were collected using an air lift operated from scuba which retained the sediment in a nylon mesh bag. Amphipods were separated from the sediment in an elutriator, in which water was forced through the sediment, allowing the amphipods to float to the surface. The air lift was also used to sample the epifauna of coral heads and gorgonians. Samples of reef rock and dead coral were taken using a hammer and chisel, and immediately placed in a plastic bag and sealed (Hutchings and Weate, 1977, 1979). Samples of algae and seagrasses were placed in fine mesh bags. The fauna from these samples were sorted using a horizontal riffle tray.

The length of the whole animal was measured from the apex of the rostrum to the base of the telson, along the dorsal outline of the body viewed from the lateral aspect. The method described by Barnard and Drummond (1978) was used for measuring dissected parts. The term "mark" as defined by Barnard and Drummond (1978) was used in describing some parts: "Mark (M) followed by a number 0-100 refers to a point on an appendage, article or ramus, the distance from

which point to the base of the structure is expressed as the percentage of the total length of that structure."

The number of specimens examined from each sampling site is stated in brackets following the number of the sampling site. Details of sampling sites are listed in Appendix A.

The following code is used for labelling figures:

- H = profile of head
- Al = antenna 1
- MP = maxillipeds
- MX1 = maxilla 1
- MX2 = maxilla 2
- MD = mandible
- C1-C7 = coxa 1 to coxa 7
- G1 = gnathopod 1
- G2 = gnathopod 2
- P3-P7 = pereopod 3 to pereopod 7
- D3-D7 = dactylus of pereopod 3 to dactylus of pereopod 7 (setae of article 6 not shown)
- PLN1-PLN3 = pleonite 1 to pleonite 3
- UR1-UR3 = urosomite 1 to urosomite 3
- U3 = uropod 3
- T = telson
- EP3 = third pleonal epimeron
- r = right
- l = left
- n = specimen no. 3
- x = specimen no. 4.

Family MELITIDAE Bousfield

Genus *Ceradocus* Costa

Sheard (1939) recorded four species of *Ceradocus* from southern and south-eastern Australia: *C. sellickensis* Sheard, *C. serrata* (Bate), *C. rubromaculatus* (Stimpson) and *C. ramsayi* (Haswell). J.L. Barnard (1972a) also examined collections from southern and south-eastern Australia and described a new species *C. dooliba*. The only species previously recorded from tropical Australia was *C. rubromaculatus* which K.H. Barnard (1931) recorded from Low Isles, Great Barrier Reef. Examination of these specimens in the British Museum (Natural History) showed them to be *Ceradocus oxyodus* n.sp.

Three new species of *Ceradocus* are described from Lizard Island and adjacent reefs. *Ceradocus rubromaculatus* was not found in the material examined. *Ceradocus hawaiiensis* Barnard has not been previously recorded in Australia. Specimens of *C. hawaiiensis* from the southern Great Barrier Reef have recently been deposited in the Australian Museum and are documented herein.

Ceradocus (Denticeradocus) hawaiiensis Barnard, 1955

Fig. 2

Ceradocus hawaiiensis J.L. Barnard 1955: 5-8, figs 2,

3.—1970:115, fig. 65; 1971:70, fig. 41; Ledoyer, 1972: 207-213, figs 30, 31; 1978:266-267.

Material. 14 specimens, AM P30646, Heron Island, Great Barrier Reef (23°26' S, 151°55' E) commensal with the hermit crab *Dardanus megistos*, A.J. Bruce, 11 July 1980.

Diagnosis. Accessory flagellum 6-articulate; coxa 1 anteroventral corner acute; second gnathopods asymmetrical; article 6 of larger second gnathopod with transverse deeply toothed palm; article 2 of peraeopods 5-7, posteroventral corner acute; posterior margin of pleonites 1, 2, 3 with 13-17, 10-15, 6-11 dorsal teeth respectively; posterior margin of epimera 1 and 2 entire; epimeron 1 ventral margin may have 1 notch; epimeron 2 ventral margin 1-2 notches; epimeron 3 with 2 notches on ventral margin, 1 tooth on posterior margin; posterior margin of urosomites 1, 2, 3 with 2-3, 2-3, 0 dorsal teeth respectively; telson wider than long, deeply cleft, apices tapering to a point each bearing 2-4 spines.

Remarks. The material examined fits the description of *C. hawaiiensis* from Hawaii (J.L. Barnard 1955, 1970, 1971). The number of dorsal teeth on the posterior margin of pleonite 3 is variable, however, all specimens examined showed 3 curved teeth at each extremity of the dorsal margin. The number of smaller teeth between these 6 teeth is variable.

Distribution. Hawaii (type locality); Madagascar; Mauritius; Heron Island.

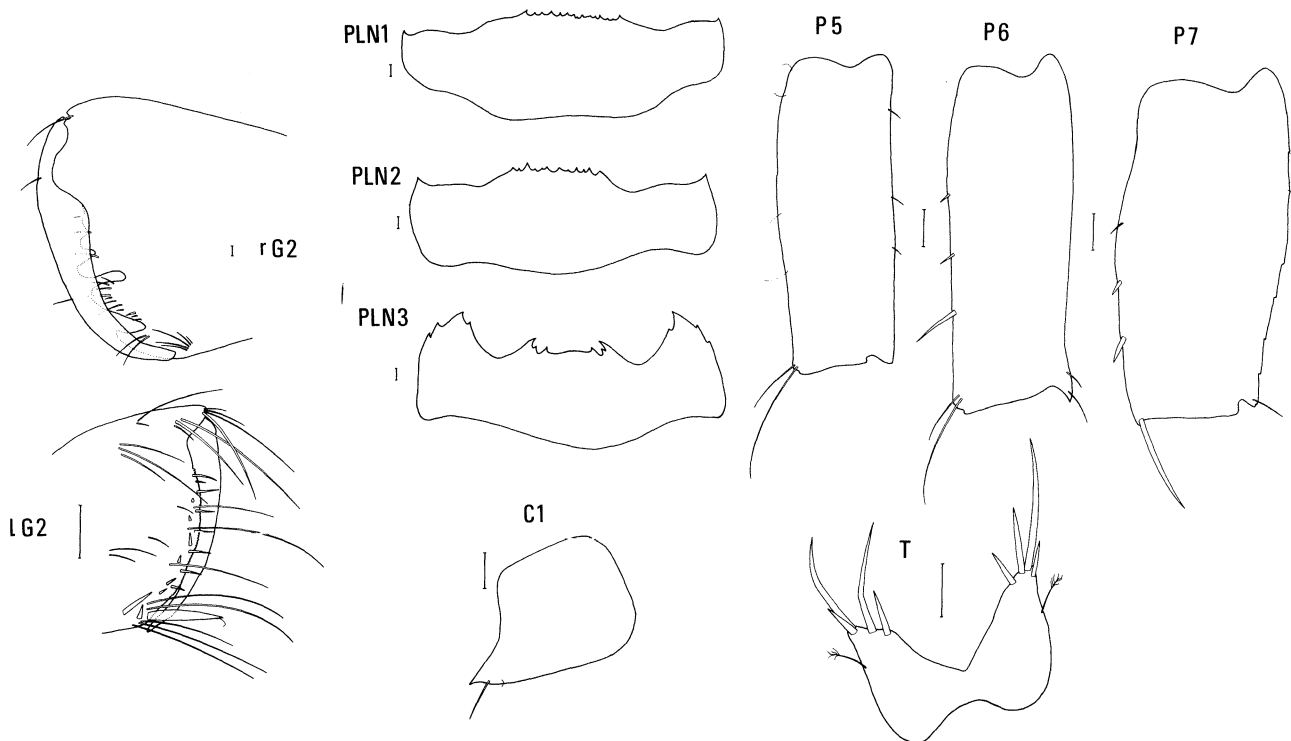


Fig. 2. *Ceradocus hawaiiensis* Barnard, female, 4.8 mm, AM P30646; pleonites 1-3, female, 6.4 mm, AM P30646. Scale lines represent 0.1 mm.

Ceradocus (Denticeradocus) oxyodus n.sp.

Figs 3, 4

(14°40.5'S, 145°26.6'E), under stones at low tide mark, J.K. Lowry, A.R. Jones and P.C. Terrill, 11 October 1978, LI-39.

Ceradocus rubromaculatus.—K.H. Barnard, 1931:124.

Type material. HOLOTYPE, male, 8.9 mm, AM P31716; 3 PARATYPES, AM P31717, Casuarina Beach, Lizard Island

Diagnosis. Accessory flagellum 6-articulate; coxa 1 anteroventral corner acute; second gnathopods symmetrical; palm of second gnathopod oblique, defined by cusp armed with 2 stout spines, palmar

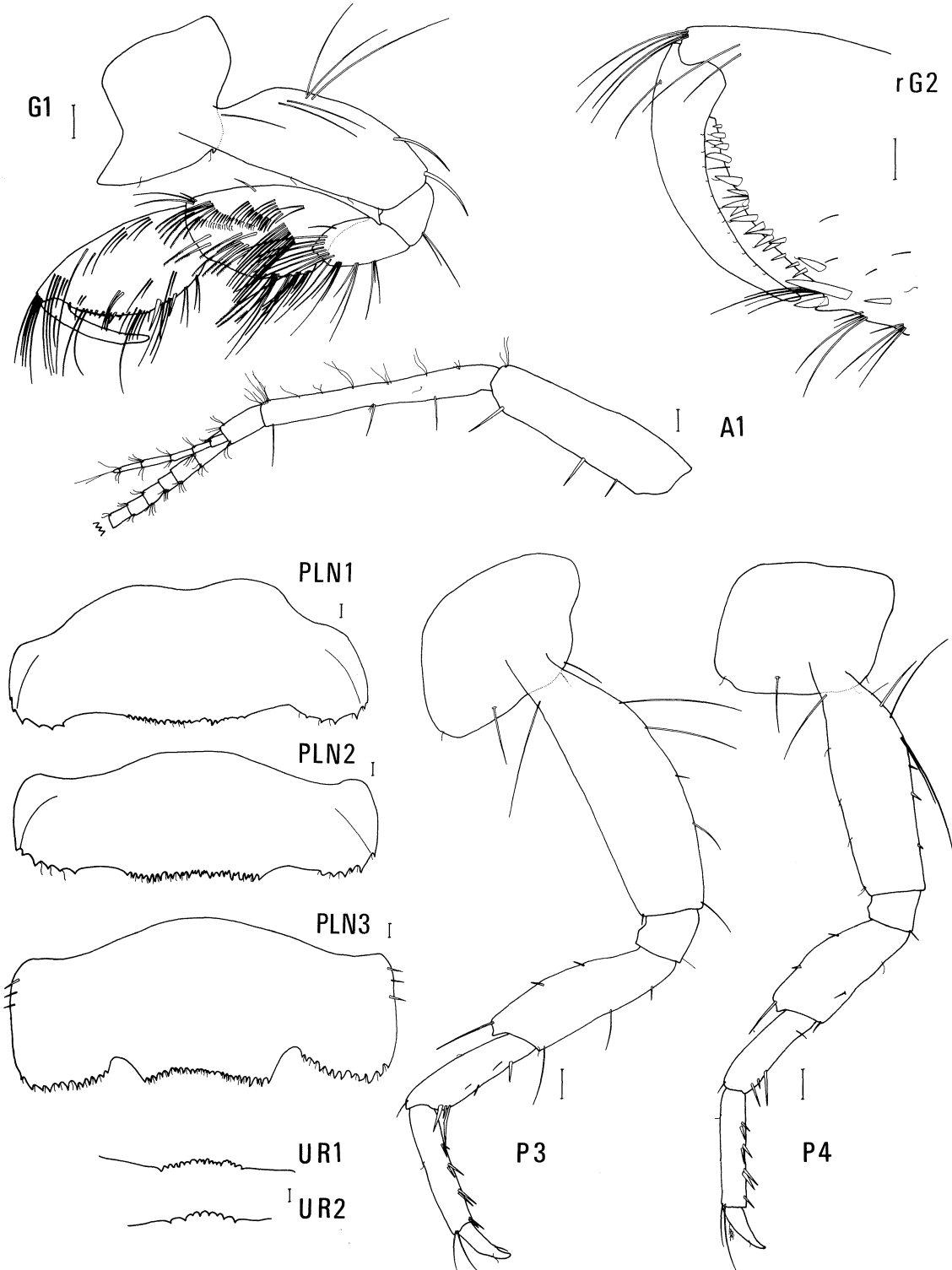


Fig. 3. *Ceradocus oxyodus* n.sp., holotype, male 8.9 mm, LI-39. Scale lines represent 0.1 mm.

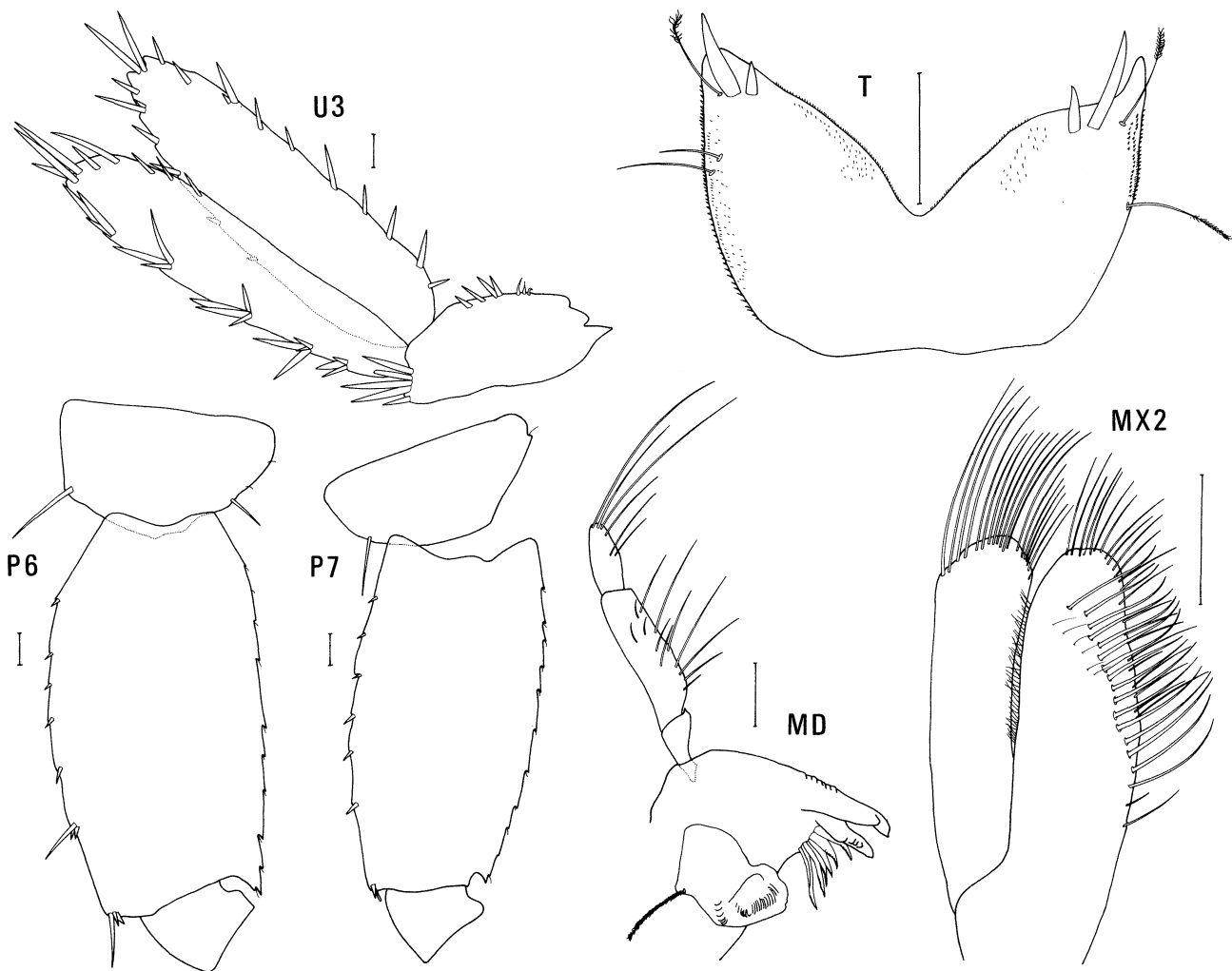


Fig. 4. *Ceradocus oxyodus* n.sp., holotype, male 8.9 mm, LI-39. Scale lines represent 0.1 mm.

margin spinous; article 2 of pereopods 5-7, posteroventral corner acute; posterior margin of pleonites 1, 2, 3 with 14-26, 18-29, 19-26 dorsal teeth respectively; epimeron 1 posterior margin with 4-5 teeth; epimeron 2 posterior margin with 5 teeth; epimeron 3 ventral margin entire, posterior margin bearing 10-12 teeth; posterior margin of urosomites 1, 2 with 8-18, 7-8 dorsal teeth respectively; telson tumid, wider than long, cleft midway to base, apices each bearing 2 spines and plumose seta.

Description. Holotype male, 8.9 mm. *Head* as long as first two pereopods, cheek notch narrow. *Antenna 1*: 1.7 times as long as antenna 2; peduncle and flagellum equal, article 1 armed with 3 ventral spines, article 2 slightly longer than article 1, bearing 3 stout ventral setae, article 3, 0.2 times as long as article 2; flagellum 21-articulate; accessory flagellum 6-articulate, article 6 small, extending to distal margin of article 5 of primary flagellum. *Antenna 2*: peduncle 2.6 times as long as flagellum, gland cone on article 2 extends to M67 on article 3; flagellum 12-articulate.

Mandible with incisor and 7 accessory blades; lacinia mobilis armed with 4 teeth; molar triturating with ragged seta; palp 3-articulate, article 1 equal to article 3, article 2 twice as long as article 1; article 1 with small medial cusp. *Maxilla 1*: inner plate broad with 12 terminal setae; outer plate armed with 9 barbed spine teeth; palp 2-articulate with 12 terminal setae. *Maxilla 2*: plates equal in length, both with terminal setae; inner plate with fine marginal setae, oblique row of medial setae. *Maxillipeds*: inner plate truncate, row of 11 plumose setae from inner margin to apex; outer plate ovate, 16 plumose setae at apex and along inner margin; palp 4-articulate, inner margin of articles 2 and 3 setose.

Gnathopod 1: coxa as long as wide, anterior margin excavate, posteroventral corner notched, anteroventral corner acute; article 2, 0.4 times as wide as long; article 4 anterior and posterior margins converging to a point, distally setose; article 5 subequal to article 6, posterior margin setose, 3 rows superior medial setae with some setae pectinate, some inferior medial setae pectinate; article 6 posterior margin sparsely setose, superior

medial setae long, oblique palm defined by 2 stout spines, small spines spaced along palmar margin. *Gnathopod 2*: larger, more robust than gnathopod 1; article 4 posteroventral corner drawn to a sharp point, anteroventral corner smoothly rounded; article 5 compressed, posteroventral corner setose; article 6, superior medial setae paired, inferior medial setae sparse, posterior margin bearing groups of setae, oblique palm defined by a cusp armed with 2 stout spines, palmar margin spinous; dactylus curved, inner margin sparsely setose.

Peraeopod 3: coxa 1.2 times as wide as long; article 4, 1.3 times as long as article 5, 2 small spines on anterior margin, anteroventral corner broad, armed with large spine; article 5 equal to article 6, posterior margin with 2 pairs of small spines, posteroventral corner armed with 2 large and 1 small spine; article 6, pairs of spines spaced along posterior margin; dactylus apically constricted, inner margin bearing seta and setule at constriction. *Peraeopod 4* very similar in size and proportions to *peraeopod 3*. *Peraeopod 6*: coxa 1.6 times as wide as long, ventral margin armed with two stout spines; article 2 posterior margin serrate, posteroventral corner acute, anterior margin spinous; articles 4, 5 and 6 subequal; articles 5 and 6, groups of spines spaced along anterior and posterior margins. *Peraeopod 7* very similar in size and proportions to *peraeopod 6* except coxa twice as wide as long, ventral margin armed with one stout spine.

Pleonites: posterior margin of dorsal surface of pleonites 1, 2, 3 armed with 21, 29, 26 teeth respectively. *Epimeron 1* with lateral ridge, 2 notches on ventral margin, posterior margin with 4 teeth. *Epimeron 2* with lateral ridge, tooth at posteroventral corner, posterior margin with 5 teeth. *Epimeron 3* ventral margin entire, bearing 3 spines, posterior margin with 12 teeth.

Urosomites 1 and 2: posterior margin of dorsal surface with 18 and 8 teeth respectively. *Urosomite 3*: posterior margin entire. *Uropod 3*: peduncle 0.6 times as long as rami, distal margin spinous; rami equal; outer ramus, distal margin bearing long spines; inner ramus distal and inner margins armed with long spines. *Telson* tumid, wider than long, cleft midway to base, apices each bearing 2 spines and plumose seta, margins of lobes lined with 'stubble-like' spines.

Female not known.

Remarks. The specific epithet *oxyodus* is taken from the Greek for "sharp-toothed", referring to the armature of the pleonites and urosomites of this species.

Ceradocus oxyodus is assigned to the subgenus *Denticeradocus* because pleonites 1-3 are multidentate dorsally. The armature of pleonites 1-3 of *C. oxyodus* is similar to that of *C. serratus* as shown by J.L. Barnard (1972a) but urosomite 1 of *C. serratus* has the dorsal teeth arranged coronately. *Ceradocus oxyodus* is also similar to *C. serratus* in the shortened gland cone of antenna 2, the long article 3 of the mandibular palp, the presence of a strong sharp tooth on epimeron 2, and the even distribution of teeth on urosomites 1 and 2.

J.L. Barnard (1972a) distinguished *C. dooliba* from *C. serratus* on the basis of these characters and he considered that *C. serratus* and *C. dooliba* may be "cryptic or sibling partners". *Ceradocus oxyodus* resembles *C. dooliba* in the normal peduncle of antenna 2 (not shortened as in *C. serratus*) and the palm of gnathopod 2 which is oblique, spinous and defined by a spinous cusp.

Ceradocus oxyodus was found under stones on a sandy beach at low tide.

Distribution. Lizard Island (type locality).

Ceradocus (Ceradocus) woorree n.sp.

Figs 5, 6

Type material. HOLOTYPE, male, 6.9 mm, AM P31714, eastern end of Mangrove Beach, Lizard Island (14°41'S, 145°27.5'E), from sediment, 1.5 m depth, A.R. Jones, 10 October 1978, LI-37; PARATYPE, male, 5.9 mm, AM P31715, Casuarina Beach, Lizard Island (14°40.5'S, 145°26.6'E), under stones at low tide mark, J.K. Lowry, A.R. Jones and P.C. Terrill, 11 October 1978, LI-39.

Diagnosis. Accessory flagellum 5-articulate; coxa 1 anteroventral corner smoothly rounded; second gnathopods asymmetrical, right or left may be larger; palm of larger second gnathopod undefined, spinous with spinous distal protusion; article 2 of *peraeopods* 5-7, posteroventral corner smoothly rounded; pleonites and urosomites lacking dorsal teeth; posterior and ventral margins of epimera entire; telson longer than wide, deeply cleft, apices tapering to a point, each bearing large spine, 2 small spines, plumose seta.

Description. Holotype male, 6.9 mm. *Head* as long as first two *peraeonites*, eye brown in alcohol, cheek notch narrow, anteroventral corner obtuse; *Antenna 1*: 1.3 times as long as antenna 2; peduncle and flagellum subequal, article 1 armed with 3 ventral spines, equal to article 2; article 3, 0.3 times as long as articles 1 and 2; flagellum 17-articulate; accessory flagellum 5-articulate, article 5 small, extending to distal margin of article 5 of primary flagellum. *Antenna 2*: peduncle 3 times as long as flagellum, gland cone extending beyond article 3; flagellum 11-articulate.

Mandible with incisor and 7 accessory blades; lacinia mobilis bearing 4 teeth; molar triturating with ragged seta; palp 3-articulate, article 2 twice as long as article 1, article 1 with acute distal process, articles 2 and 3 sparsely setose. *Maxilla 1*: inner plate quadrate with terminal plumose setae; outer plate with fine setae along inner margin, armed with 7 barbed spine teeth; palp 2-articulate, terminally setose. *Maxilla 2*: inner plate ovate, apically setose, line of medial setae, outer plate quadrate, apically setose. *Maxillipeds*: inner plate apex truncate bearing plumose setae, inner marginal setae fine; outer plate ovate, apical setae plumose; palp 4-articulate, article 2 longest, inner margin setose.

Gnathopod 1: coxa quadrate, ventral margin sparsely setose, anteroventral corner smoothly rounded, posteroventral corner notched; article 4 anterior and

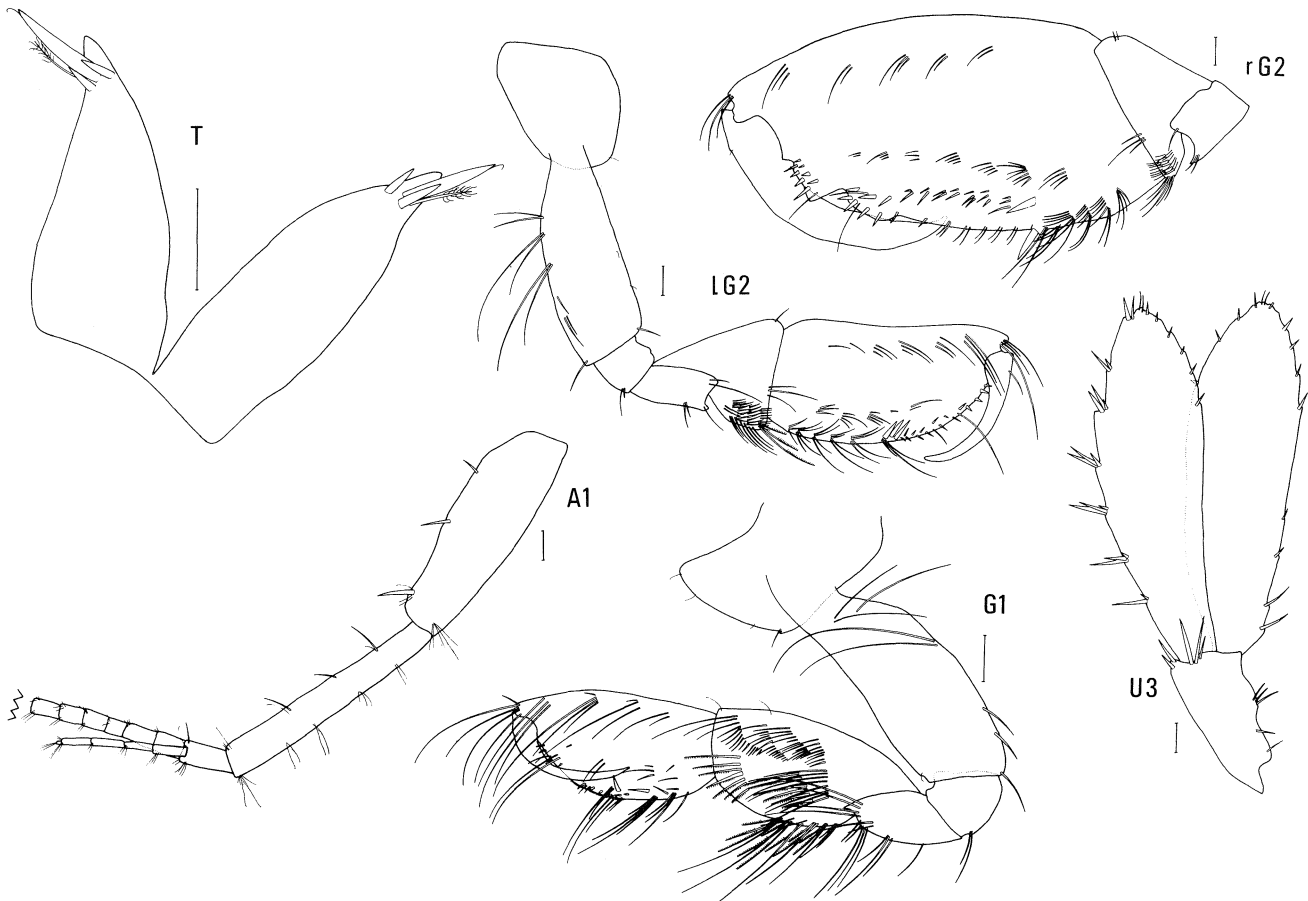


Fig. 5. *Ceradocus woorree* n.sp., holotype, male 6.9 mm, LI-37; gnathopod 1, paratype, male, 5.9 mm, LI-39. Scale lines represent 0.1 mm.

posterior margins converging to acute point, distal setae extending across article 5; article 5 ovate, posterior margin setose with some pectinate setae, 4 rows of superior medial setae, 3 rows of inferior medial setae, the 2 distal rows comprising pectinate setae; article 6 ovate, 0.9 times as long as article 5, posterior margin bearing groups of setae, spines medial to margin, superior medial setae long, oblique palm confluent with posterior margin, defined by stout spine, palm bearing small spines; dactylus slender. *Left gnathopod 2* slightly larger, more robust than gnathopod 1; article 4 posteroventral corner acute; article 5 compressed, posteroventral corner setose; article 6, superior and inferior medial setae short, posterior margin bearing groups of setae, oblique palm confluent with posterior margin defined by 3 stout spines, palm armed with small spines; dactylus slender. *Right gnathopod 2* larger, more robust than gnathopod 1 and left gnathopod 2; article 4 posteroventral corner acute; article 5 compressed, posteroventral corner setose; article 6 robust, 0.6 times as wide as long, 5 groups of short superior medial setae, 7 groups of short inferior medial setae, posterior margin bearing groups of setae, 2 stout spines midway along posterior margin, groups of short setae form line medial to posterior margin, undefined palm confluent with

posterior margin; palm spinous with spinous distal protrusion; dactylus stout.

Peraeopod 3: coxa almost as wide as long; article 4 slightly longer than article 5, setae spaced along anterior margin, broad anteroventral corner bearing seta; article 5, posterior margin sparsely setose; article 6 subequal to article 5, pairs of spines spaced along posterior margin; dactylus apically constricted, inner margin bearing seta and 2 setules at constriction. *Peraeopod 4* very similar in size and proportions to peraeopod 3 except article 4 is 1.3 times as long as article 5. *Peraeopod 5*: coxa 1.3 times as wide as long; article 2, posterior margin entire, longer than anterior margin, posteroventral corner smoothly rounded; article 4 subequal to article 5, ventral margin twice as wide as dorsal margin, anteroventral and posteroventral corners broad; article 5, subequal to article 6; articles 5 and 6, groups of spines spaced along anterior and posterior margins. *Peraeopod 6* very similar in proportions to peraeopod 5 except in following ways: 1.4 times as long as peraeopod 5, coxa 1.5 times as wide as long, article 2 posterior margin slightly serrate, articles 5 and 6 more spinous. *Peraeopod 7* very similar in proportions to peraeopod 5 except in following ways: 1.2 times as long as peraeopod 5, coxa 1.6 times as wide as long, article

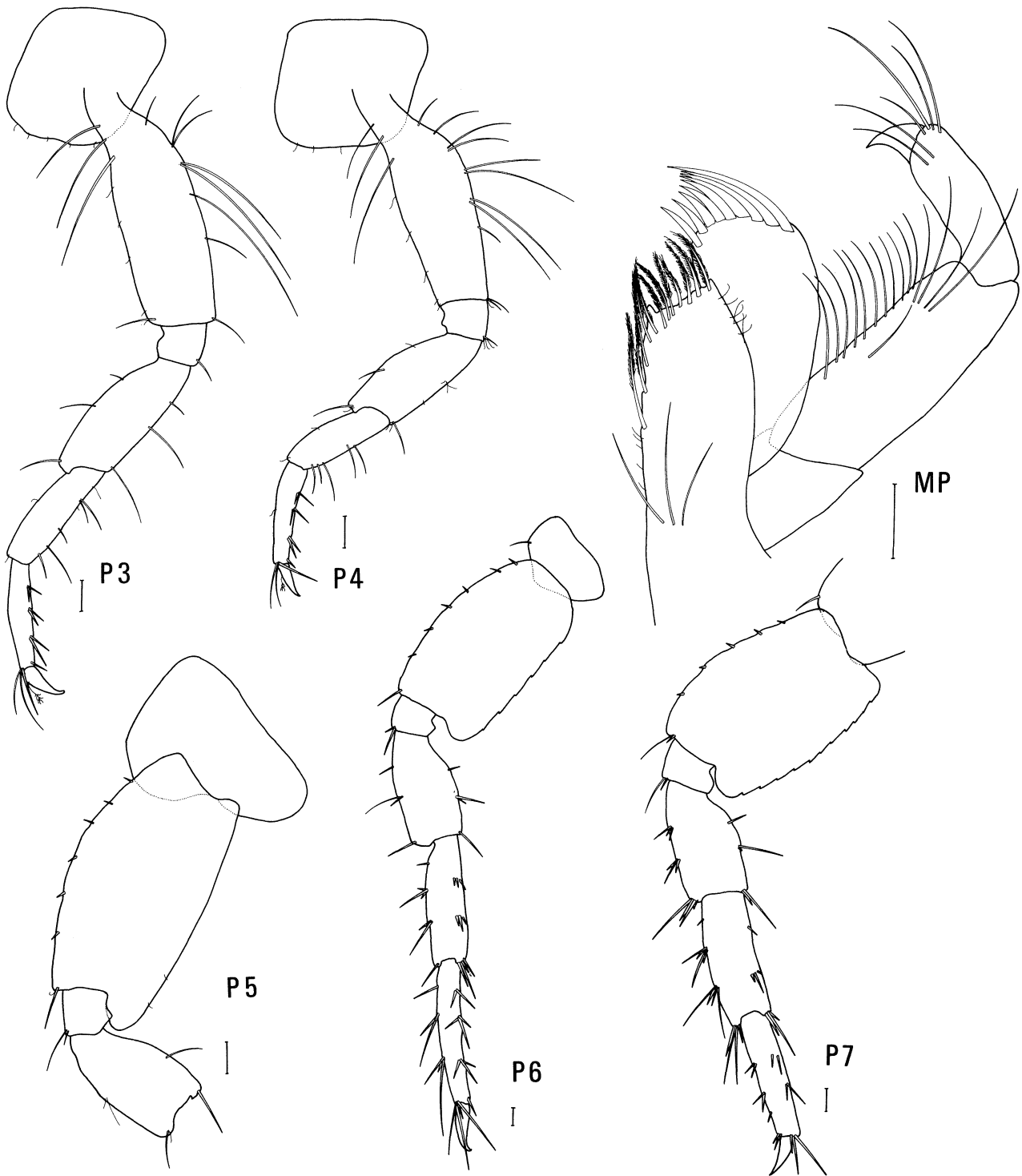


Fig. 6. *Ceradocus woorree* n.sp., holotype, male 6.9 mm, LI-37. Scale lines represent 0.1 mm.

2 posterior margin serrate, articles 4, 5 and 6 more spinous.

Epimera 1, 2, 3 posterior and ventral margins entire, posteroventral corners acute.

Uropod 3: peduncle 0.5 times as long as rami, distal margin spinous; rami equal; outer ramus distal margin bearing small spines, outer margin spinous; inner ramus

distal margin bearing small spines, inner margin sparsely spinous. *Telson* longer than wide, deeply cleft, apices tapering to a point, each bearing large spine, 2 small spines, plumose seta.

Female not known.

Variation. The paratype has the left second gnathopod larger than the right and of the same form

as the right gnathopod of the holotype. Conversely the small right second gnathopod of the paratype is of the same form as the left second gnathopod of the holotype.

Remarks. The specific epithet *woorree* is taken from an Aboriginal word meaning "sea".

Ceradocus woorree is assigned to the subgenus *Ceradocus* because pleonites 1-3 are not multidentate dorsally (Sheard, 1939). *Ceradocus (Ceradocus) woorree* is the only species in the subgenus that lacks dorsal teeth on the urosomites as well as the pleonites. J.L. Barnard (1952) described *C. paucidentatus* from California, which also lacks dorsal teeth on pleonites 1-3 but has 1 or 2 dorsal teeth on urosomite 1, and 1 dorsal tooth on urosomite 2. Fox (1973) considered that *C. paucidentatus* "casts some doubt on the validity of Sheard's (1939) separation" because it lacks a single mid-dorsal tooth on any pleonites and this is a characteristic feature of the subgenus *Ceradocus*. For the same reason *C. woorree* and *C. shoemakeri* Fox, 1973 do not conform with Sheard's (1939) separation.

Ceradocus woorree seems closely related to *C. aviceps* described by K.H. Barnard (1940) from South Africa.

Both these species have telson cleft to base, and posterior and ventral margins of the third pleonal epimeron entire. The gnathopods of *C. aviceps* are distinct from *C. woorree* in that gnathopod 1 has article 5, 3.5 times as long as article 6, and the second gnathopods are symmetrical with a short, stout, strongly hooked dactylus.

Ceradocus woorree was found in sediment and under stones from low tide mark to 1.5 metres depth.

Distribution. Lizard Island (type locality).

Ceradocus (Denticeradocus) yandala n.sp.

Figs 7, 8

Type material. HOLOTYPE, male, 4.5 mm, AM P31718, fringing reef, between Bird Islet and South Island, Lizard Island (14°42' S, 145°28' E), from reef rock, 12 m depth, P.B. Berents and P.A. Hutchings, 11 January 1977, 76 LIZ A; ALLOTYPE, 4.0 mm, AM P31719, type locality, P.B. Berents, 24 August 1976; 3 PARATYPES, AM P31720, type locality, P.B. Berents and P.A. Hutchings, 11 January 1977; 1 PARATYPE, AM P31721, fringing reef, between Bird Islet and

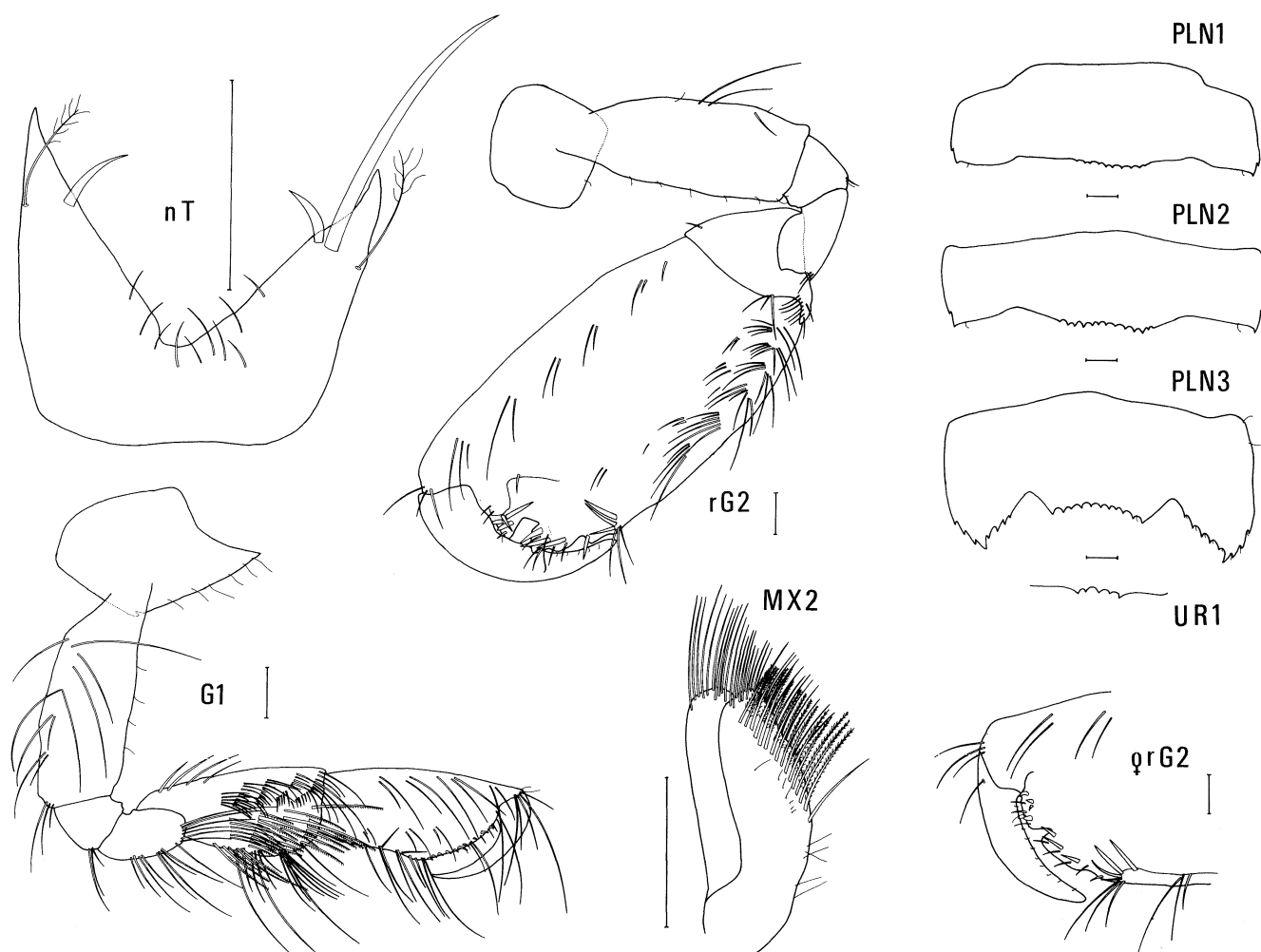


Fig. 7. *Ceradocus yandala* n.sp., holotype, male 4.5 mm, 75 LIZ A; female, allotype, 4.0 mm, 76 LIZ A; n = female, 4.4 mm, 76 LIZ A. Scale lines represent 0.1 mm.

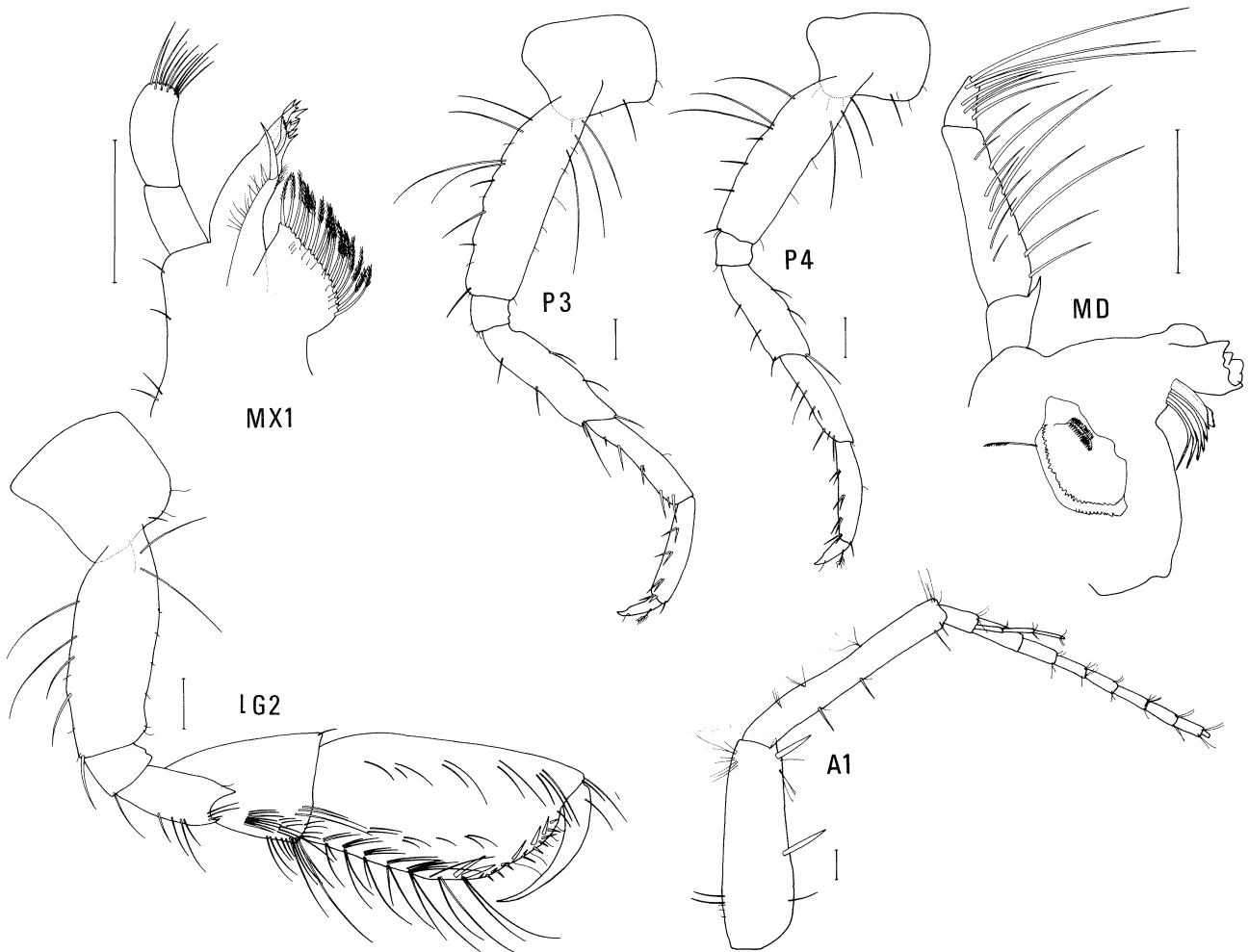


Fig. 8. *Ceradocus yandala* n.sp., holotype, male 4.5 mm, 76 LIZ A. Scale lines represent 0.1 mm.

South Island, Lizard Island (14°42'S, 145°28'E), from mixed algae and coral rubble, 24–27 m depth, J.K. Lowry, 7 October 1978, LI-21.

Diagnosis. Accessory flagellum 4-articulate; coxa 1 anteroventral corner acute; second gnathopods asymmetrical, article 6 of larger second gnathopod with oblique palm defined by 3 spines, mid-palmar sinus quadrate, palm with proximal indentation armed with spine; posterior margin on pleonites 1, 2, 3 with 9–14, 11–17, 11–18 dorsal teeth respectively; epimera 1 and 2 posterior margin entire; epimeron 3 posteroventral corner acute, posterior and ventral margins serrate; posterior margin of urosomite 1 with 5–7 dorsal teeth; telson as wide as long, cleft 75%, apices tapering to a point, one large and one small spine on each lobe.

Description. Holotype male, 4.5 mm. *Head* slightly longer than first two pereoponites; eye dark brown in alcohol, ommatidia discrete; cheek notch gaping, anteroventral corner drawn to sharp point. *Antenna 1*: 1.3 times as long as antenna 2; peduncle longer than flagellum, articles 1 and 2 with 2 ventral spines, article 1 anteroventral corner extended to form sharp cusp,

article 2 longest; flagellum 8-articulate, article 8 small; accessory flagellum 4-articulate, article 4 small, extending beyond article 2 of primary flagellum. *Antenna 2*: peduncle twice as long as flagellum, article 4 longest, article 5 subequal to article 4, cone gland on article 2 extending to M63 on article 3; flagellum 5-articulate.

Mandible with incisor and 7 accessory blades; lacinia mobilis stout; molar triturating with ragged seta; palp 3-articulate, article 3 subequal to article 1, article 2, 2.5 times as long as article 1, article 1 with medial cusp.

Maxilla 1: inner plate quadrate with 18 terminal plumose setae; outer plate armed with 8 spine teeth; palp 2-articulate, terminally setose. *Maxilla 2*: outer plate with distal setae; inner plate with distal setae and lateral setae on inner margin, stout plumose setae arise medially. *Maxillipeds*: inner plate apex truncate, bearing plumose setae, inner marginal setae long; outer plate ovate, apical setae plumose; palp 4-articulate, article 2 longest, 2.4 times as long as article 1 and dactylus, 1.6 times as long as article 3.

Gnathopod 1: coxa as long as wide, anteroventral corner acute, posteroventral corner notched, ventral

margin sparsely setose; article 5 equal to article 6, 9 rows of medial setae, with some pectinate setae, anterior margin sparsely setose, posterior margin setose with pectinate setae and long simple setae; article 6 with sparse superior medial setae, posterior margin sparsely setose, oblique palm confluent with posterior margin, palmar margin armed with small spines; dactylus slender. *Left gnathopod 2* larger, more robust than gnathopod 1; coxa quadrate; article 4 anteroventral and posteroventral corners sharply produced; article 5, 0.6 times as long as article 6, posteroventral corner setose; article 6, 0.5 times as wide as long, superior and inferior medial setae sparse, oblique palm defined by 2 spines and 3 setae, palmar margin spinous; dactylus slender. *Right gnathopod 2* larger, more robust than gnathopod 1 and left gnathopod 2; coxa quadrate; article 2, 0.4 times as wide as long, anterior and posterior margins sparsely setose, stout medial seta at M 74; article 4 posteroventral corner sharp; article 5 compressed, 0.3 times as long as article 6, posteroventral corner extending along posterior margin of article 6; article 6, 0.6 times as wide as long, superior medial and inferior medial setae sparse, oblique palm defined by 3 spines and 4 setae, mid-palmar sinus quadrate with group of 5 proximal and 3 distal spines, proximal indentation of palm with spine; medial ridge distally; dactylus robust, inner margin sparsely setose.

Peraeopod 3: coxa 1.4 times as wide as long; article 4, 1.2 times as long as article 5; article 5 setae spaced along anterior and posterior margins; article 5, 3 spines along posterior margin, posteroventral corner with 3 spines; article 6 subequal to article 5, 4 pairs of spines including pair of locking spines along posterior margin; dactylus apically constricted, 2 setae and plumose setule at constriction. *Peraeopod 4* very similar in size and proportions to *peraeopod 3*.

Pleonites: posterior margin of dorsal surface of pleonites 1, 2, 3 armed with 10, 13, 11 teeth respectively. *Epimera 1 and 2*: posteroventral corner acute, ventral margin notched. *Epimeron 3*: posteroventral corner defined by sharp tooth, ventral margin bearing 3 teeth, posterior margin serrate with 4 or 5 teeth.

Urosomite 1: posterior margin of dorsal surface bearing 5 teeth. *Telson* as wide as long, cleft 75%, apices tapering to a point, one large and one small spine on each lobe at M70, large spine as long as telson, plumose seta on each lobe proximal to spines, fine setules in cleft.

Allotype female, 4.0 mm. Similar to holotype except in following ways: *Antenna 1*: flagellum longer than peduncle, 16-articulate, article 16 small; accessory flagellum extending beyond article 3 of primary flagellum.

Maxilla 1: inner plate bearing 13 terminal seta.

Gnathopod 1: palmar margin less spinous. *Right gnathopod 2*: palmar margin less spinous, sinus and indentation of palm smaller. *Peraeopods 3 and 4*: articles 5 and 6 less spinous. *Pleonites*: posterior margin of dorsal surface of pleonites 1, 2, 3 armed with 9, 11, 14 teeth respectively. *Epimeron 3*: ventral margin bearing 2 teeth.

Variation. Inner plate of maxilla 1 may have 13–18 terminal plumose setae. A 4.4 mm female was found with the outer plate of maxilla 1 bearing 9 spine teeth. All material examined exhibited asymmetry of gnathopod 2, and either the right or left gnathopod may be enlarged.

Remarks. The specific epithet *yandala* is taken from an Aboriginal word meaning “spear with a long point”, which alludes to the shape of the third epimeron.

Ceradocus yandala is assigned to the subgenus *Denticeradocus* because pleonites 1-3 are multidentate dorsally. *Ceradocus yandala* resembles *C. mahafalensis*, which Ledoyer (1979) described from Madagascar. The armature of pleonites 1-3 and urosomite 1 is similar but urosomite 2 is toothed in *C. mahafalensis*. The palm of the larger second gnathopod of *C. mahafalensis* is less spinous and does not have a quadrate mid-palmar sinus. Both species have the gland cone of antenna 2 extending about $\frac{2}{3}$ along article 3 of the peduncle but the telson in *C. mahafalensis* is longer than wide and the apices more spinous than in *C. yandala*.

Ceradocus yandala was found in algae, coral rubble and reef rock samples taken around Lizard Island to depths of 27 metres.

Distribution. Lizard Island (type locality).

Genus *Dulichchiella* Stout

Karaman and Barnard (1979) revived the genus *Dulichchiella* Stout for those species within the genus *Melita* that have male gnathopod 2 showing strong diversity from right to left sides. The species included in *Dulichchiella* were *D. appendiculata* (Say), *D. australis* (Haswell), *D. exilii* (Fritz Müller), *D. fresneli* (Audouin) and *D. spinosa* (Stout).

Two species of *Dulichchiella* have previously been recorded in Australia. *Dulichchiella australis* (Haswell, 1880a) was described from Port Jackson. *Dulichchiella fresneli* has been recorded by Stebbing (1910) from off Manning River and Botany Bay, and by Chilton (1921) from Sanders Bank, Kangaroo Island.

Dulichchiella appendiculata was found in the material from Lizard Island and adjacent reefs.

Dulichchiella appendiculata (Say, 1818)

Fig. 9

Gammarus appendiculatus Say, 1818:377-379.

Melita appendiculata.—Stebbing, 1906:428; J.L. Barnard, 1962: 107, 109; 1970:161, fig. 101; 1971:85; Feeley and Wass, 1971:17; Griffiths, 1973:286; 1974a: 191; 1974b:237; Ledoyer, 1978:282; 1979:86, fig. 50; Ortiz, 1978:8; Hirayama and Kikuchi, 1979:67-77, figs 2-6.

Dulichchiella appendiculata.—Karaman and Barnard, 1979:152-153.

Material. AM P30123 to AM P30126 from the following stations: 75 LIZ D-1 (1), L1-2 (6), L1-27 (5), L1-28 (2).

Diagnosis. Accessory flagellum 4-5 articles; male second gnathopods asymmetrical, article 6 and dactylus

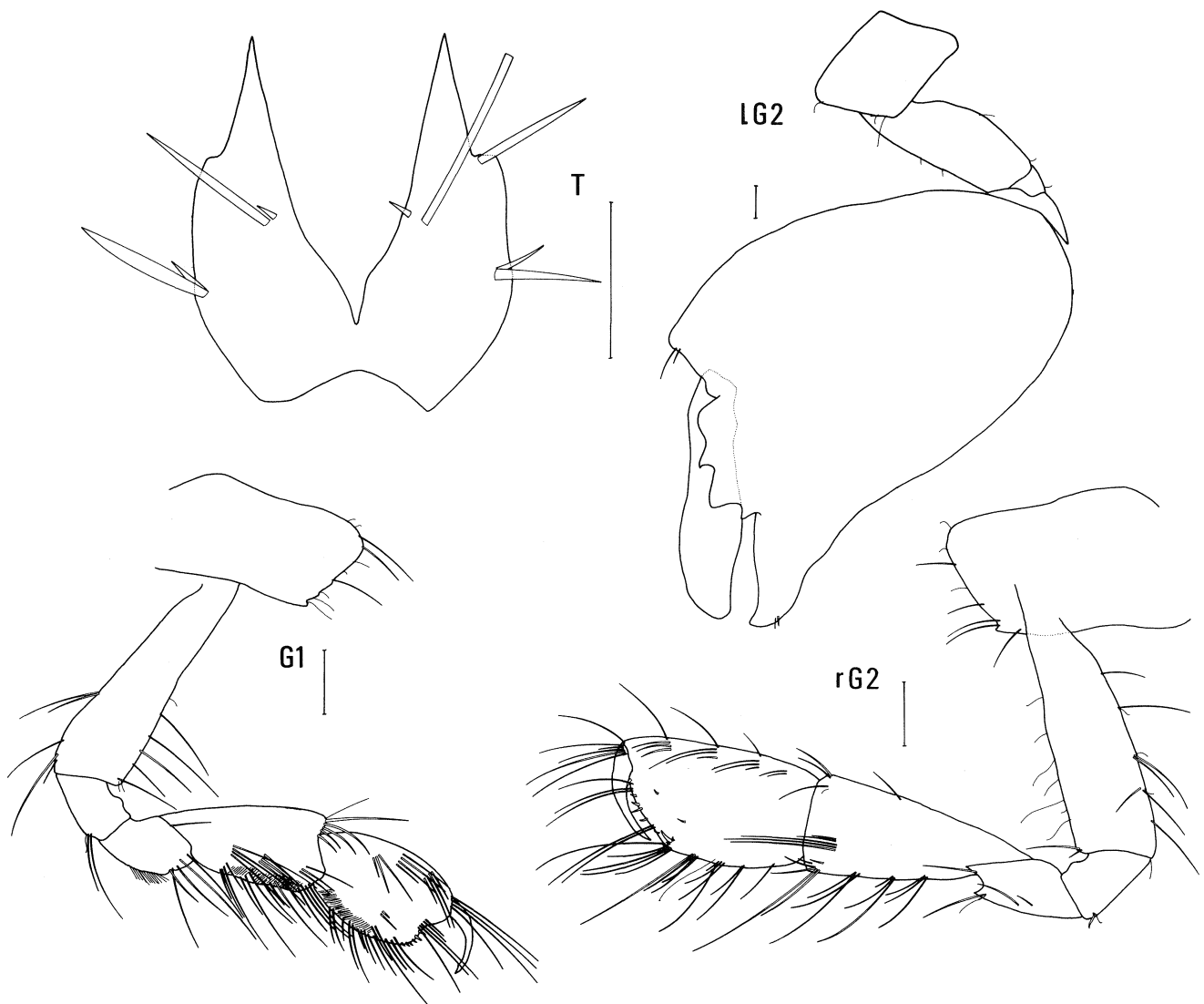


Fig. 9. *Dulichiella appendiculata* (Say), male, 4.3 mm, LI-28. Scale lines represent 0.1 mm.

of larger second gnathopod much enlarged; dactylus of pereopods with accessory tooth; pleonites 1-3 with 7 dorsal teeth on posterior margin; third pleonal epimeron with posteroventral corner extended to sharp cusp; telson longer than wide, deeply cleft.

Remarks. *Dulichiella appendiculata* was described from Georgia, U.S.A. (Say, 1818). It has been reported from Hawaii, Chesapeake Bay, east and west coasts of southern Africa, Mauritius, Cuba, Madagascar and Japan. Feeley and Wass (1971) recorded *D. appendiculata* from the York River in Chesapeake Bay from waters of 13.6‰ salinity. It seems unlikely that the same species occurs on the Great Barrier Reef and in estuarine conditions on the east coast of the United States.

Dulichiella fresneli (Audouin) was described from Egypt and has also been reported with an extensive geographical distribution. *Dulichiella appendiculata* and *D. fresneli* were synonymized by J.L. Barnard (1970)

as *D. appendiculata*, but Karaman and Barnard (1979) revived *D. fresneli*. Many records of these species do not give descriptive details of figures.

Say's (1818) original description was not detailed but he did note that pleonites 1-3 had seven dorsal teeth on the posterior margins. The material examined from Lizard Island has seven dorsal teeth in a consistent pattern on pleonites 1-3. J.L. Barnard's (1970) material from Hawaii also had seven dorsal teeth in the same pattern as the Lizard Island material. J.L. Barnard (1962) noted a dorsal tooth formula of 7-7-7 for pleonites 1-3 but did not illustrate the pattern of armature.

The material from Lizard Island closely resembles J.L. Barnard's (1970) Hawaiian material and must be assigned to *Dulichiella appendiculata* since it fits Say's (1818) description.

Dulichiella appendiculata was found in reef rock covered in coralline algae *Halimeda* and *Lithothamnion*

at Yonge Reef, at a depth of 36 metres on the outer slope. At Lizard Island it was found in seagrass *Halophila* and algae *Caulerpa*, *Udotea* and drift algae from 7 to 27 metres.

Distribution. Georgia, U.S.A. (type locality); Hawaii; Chesapeake Bay; Mozambique; SW Africa; Natal; Mauritius; Cuba; Madagascar; Japan; Lizard Island; Yonge Reef.

Genus *Elasmopus* Costa

Sheard (1937) listed seven species of *Elasmopus* occurring in Australia; however, five of these have since been transferred to other genera. *Elasmopus boeckii* (Haswell) and *E. viridis* (Haswell) are now in the genus *Maera*; *E. diemenensis* (Haswell) and *E. subcarinatus* (Haswell) are transferred to *Mallacoota*; and *E. suensis* (Haswell) to *Parelmopus*. The Australian species remaining in *Elasmopus* are *E. rapax* (Costa) and *E. crassimanus* (Miers) from Port Jackson. J.L. Barnard (1958) considered the latter to be a dubious species.

J.L. Barnard (1974) recorded three species of *Elasmopus* from southern Australia: *E. yunde* Barnard, *E. menurte* Barnard and *E. bollonsi* Chilton. He found *Elasmopus* to be a rare genus in the collection examined from warm temperate Australia. In the material examined from Lizard Island and adjacent reefs, *Elasmopus* was found to be a diverse and abundant genus which suggests that the genus is more successful in tropical Australia than in temperate Australia.

The number of species of *Elasmopus* recorded in Australia is increased by five with the material from Lizard Island and adjacent reefs.

Elasmopus crenulatus n.sp.

Figs 10, 11, 12

Type material. HOLOTYPE, male, 3.5 mm, AM P30095, off Chinaman's Ridge, Watson's Bay, Lizard Island (14°40'S, 145°27'E), from reef rock, 7 m depth, P.A. Hutchings, 28 July 1977, 76 LIZ B; ALLOTYPE, 4.8 mm, AM P30096, type locality, P.B. Berents, 25 August 1976; 2 PARATYPES, AM

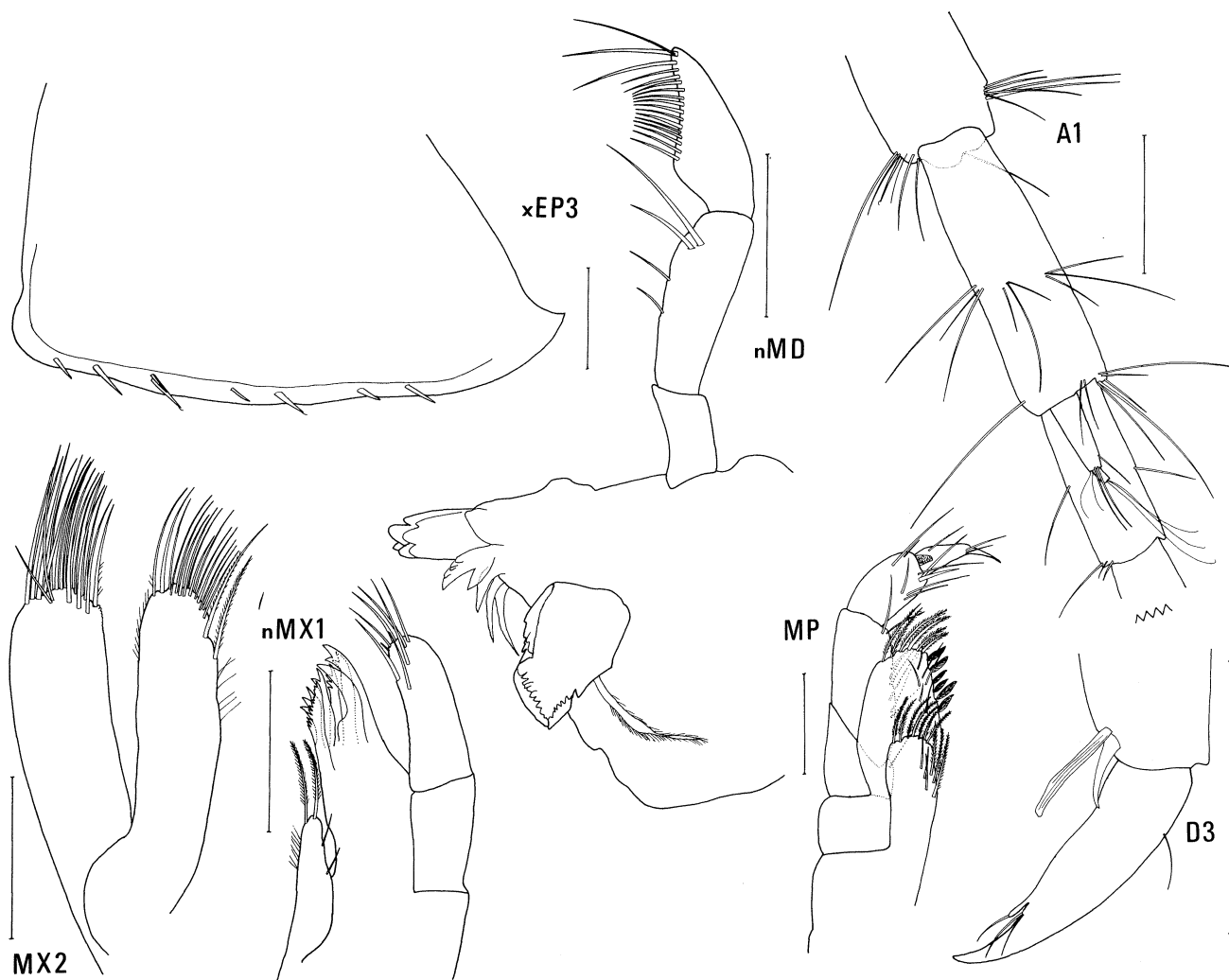


Fig. 10. *Elasmopus crenulatus* n.sp., holotype, male, 3.5 mm, 76 LIZ B; n = male, 3.3 mm, 76 LIZ B; x = male, 2.5 mm, 76 LIZ B. Scale lines represent 0.1 mm.

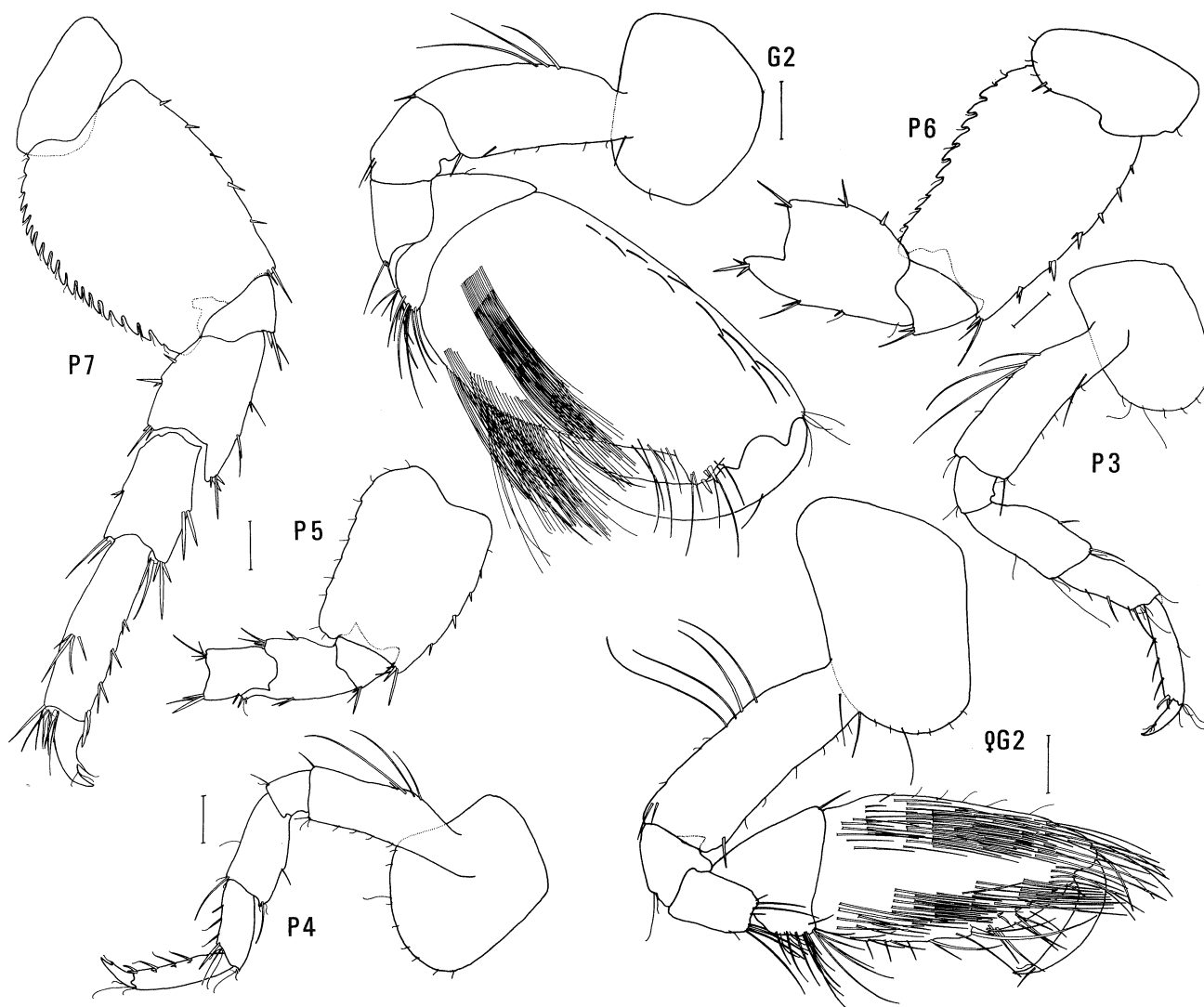


Fig. 11. *Elasmopus crenulatus* n.sp., holotype, male, 3.5 mm, 76 LIZ B; female = allotype, 4.8 mm, 76 LIZ B. Scale lines represent 0.1 mm.

P30097, type locality, P.A. Hutchings, 28 July 1977; 2 PARATYPES, AM P30098, type locality, P.B. Berents and P.M. Berents, 8 April 1977; 2 PARATYPES, male, 3.3 mm, USNM 190703, female, 3.8 mm, USNM 190702, type locality, P.B. Berents and P.A. Hutchings, 19 January 1978; 3 PARATYPES, BMNH 1981:623:3, type locality, male 2.5 mm, P.B. Berents and P.A. Hutchings, 19 January 1978; male, 3.3 mm, P.A. Hutchings, 28 July 1977; female, 3.3 mm, P.B. Berents and P.M. Berents, 8 April 1977.

Additional material. AM P30099 to AM P30105 from the following stations: 75 LIZ 1-2 (1), 76 LIZ A (1), 76 LIZ B (1), LI-1 (8), LI-11 (4), LI-48 (5), LI-50 (4); 3 specimens, AM P31722, between Direction Island and Prison Island, Cocos (Keeling) Islands, Indian Ocean (12°5'S, 96°53'E), from dead coral and encrusting algae in channel in reef crest, 4 m depth, F.H. Talbot, 8 October 1979.

Diagnosis. Accessory flagellum 2-articulate; article 5 of male gnathopod 2 compressed, posterior lobe setose; article 6 of male gnathopod 2 ovate, dense medial setae covering palmar region, palm densely setose with

distal spinous protrusion; article 6 of pereopods 3 and 4 with distal pair of locking spines comprising large striate chisel spine and smaller unstriated curved spine; article 2 of pereopods 5-7 lacking long posterior setae; article 2 of pereopods 6 and 7 crenulate for entire margin; article 6 of pereopods 5-7 with distal pair of unequal slightly curved striate locking spines; third pleonal epimeron with posteroventral cusp, posterior margin entire; telson as wide as long, cleft midway, inner margin of lobes extended to form apical points, each with 2-3 apical spines.

Description. Holotype male, 3.5 mm. *Head* as long as first two pereopods; eye dark brown in alcohol, ommatidia discrete, cheek notch narrow. *Antenna 1* almost twice as long as antenna 2; peduncle longer than flagellum, article 1 with distal spine, article 2 subequal to article 1, article 3, 0.6 times as long as article 2; flagellum 8-articulate; accessory flagellum 0.5 times as long as first article of primary flagellum, 2-articulate,

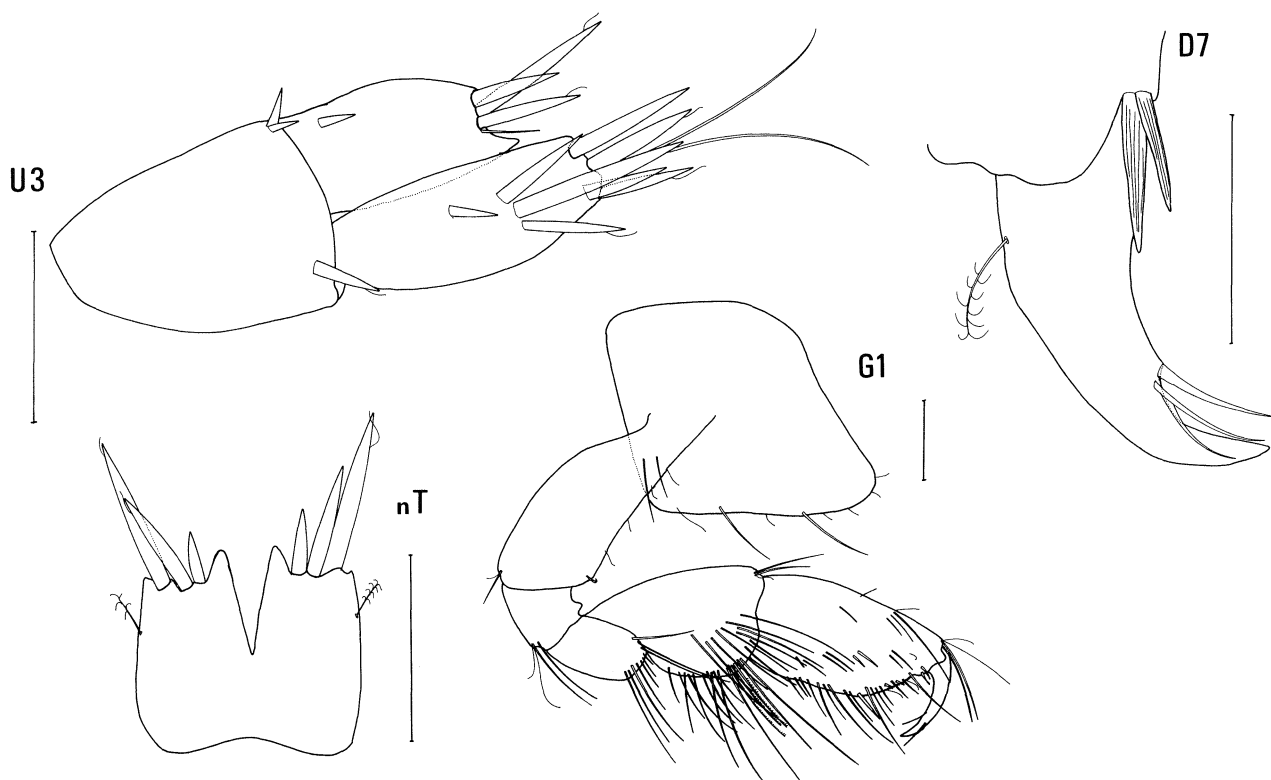


Fig. 12. *Elasmopus crenulatus* n.sp., holotype, male 3.5 mm, 76 LIZ B; n = female, 3.8 mm, 76 LIZ B. Scale lines represent 0.1 mm.

article 2 small. *Antenna 2*: peduncle longer than flagellum, article 3 longest, article 4 subequal to article 3; flagellum 6-articulate.

Mandible with incisor and 3 accessory blades; lacinia mobilis bifid; molar triturating with ragged seta; palp 3-articulate, article 2, 1.7 times as long as article 1, article 3 falcate with comb-like row of medial setae. *Maxilla 1*: inner plate with 2 terminal plumose setae and fine marginal setae; outer plate broad, armed with 7 barbed spine teeth; palp 2-articulate, distally setose. *Maxilla 2*: inner and outer plate with distal setae, outer plate with fine medial and marginal setae. *Maxillipeds*: inner and outer plates with plumose apical and inner marginal setae; palp 4-articulate, article 2, 1.6 times as long as article 1, articles 3 and dactylus equal and subequal to article 1, pincushion lobe at articulation of article 3 and dactylus.

Gnathopod 1: coxa almost as long as wide, anteroventral corner produced and smoothly rounded, ventral margin sparsely setose; article 5 anterior margin twice as long as posterior margin, posterior margin setose with some pectinate setae, setae arising medially; article 6 twice as long as wide, posterior margin setose, 4 pairs of inferior medial setae, oblique palm defined by stout spine, palm with sparse setae and spines; dactylus bearing 2 setae extending length of palm. *Gnathopod 2* larger, more robust than gnathopod 1; coxa almost as wide as long; article 2, 1.2 times as long as coxa, strong seta on each of anteroventral and

posteroventral corners; article 5 compressed, posterior margin setose; article 6 ovate, posterior margin densely setose, dense medial setae covering palmar regions, oblique palm confluent with posterior margin, densely setose with distal spinous protrusion; dactylus slender.

Peraeopod 3: coxa 1.4 times as long as wide; article 2, 1.3 times as long as coxa; article 5 with setae spaced along posterior margin; article 6 with setae spaced along posterior margin, distal pair of locking spines comprising one striate chisel spine and one unstriate curved spine; dactylus apically constricted, inner margin bearing seta and two setules at constriction. *Peraeopod 4* very similar in size and proportions to peraeopod 3 except: coxa 1.2 times as long as wide, articles 5 and 6 more setose. *Peraeopod 5*: article 2, anterior margin bearing small spines, posterior margin weakly serrate, sparsely setose and lacking long setae, article 4 anterior margin produced halfway along article 5; article 5, 0.6 times as long as article 4. *Peraeopod 6*: coxa 1.8 times as wide as long with 2 posteroventral spines and several setae; article 2 anterior margin spinous, posterior margin crenulate for entire margin, each crenulation with a seta projecting from within; article 4 anterior margin extended downwards. *Peraeopod 7* more robust and setose than peraeopod 6; coxa twice as wide as long; article 2 anterior margin spinous, posterior margin crenulate for entire margin, each crenulation with a seta projecting from within; article 4 anterior margin produced downwards; article 5, 0.8 times as long as

article 4, anterior and posterior margins spinous; article 6, 1.5 times as long as article 5, anterior margin spinous, distal pair of unequal slightly curved striate locking spines; dactylus apically constricted, inner margin with a seta and 2 setules at constriction.

Third pleonal epimeron with posteroventral cusp, ventral margin bearing single spines and one pair of spines, posterior margin entire.

Uropod 3: peduncle equal to outer ramus, distal margin spinous; outer ramus with 3 apical spines and 2 long setae, 3 spines at M66, single spines medially at M12 and M45; inner ramus 0.7 times as long as outer ramus, bearing 3 apical spines and a short seta. *Telson* as wide as long, cleft midway to base, inner margins of lobes extended to form apical points each with 3 apical spines.

Allotype female, 4.8 mm. Similar to holotype except in following ways: *Gnathopod 2*: coxa 0.7 times as wide as long; article 6 elongate, superior and inferior medial setae in rows for length of article, palmar margin partly obscured by inferior medial setae, palm defined by stout spine, sparsely setose with row of submarginal spines; oostegite slender, as long as article 2, with 4 lateral and 1 terminal brood setae. *Telson* with 2 apical spines on 1 lobe, 3 apical spines on other.

Variation. Accessory flagellum varies from half as long as article 1 of primary flagellum, to as long as article 1 of primary flagellum. The outer ramus of uropod 3 may have 3-5 apical spines, and the inner ramus may have 2 or 3 apical spines. The telson may have 2 or 3 apical spines on each lobe. Females smaller than the allotype have article 6 of gnathopod 2 less setose.

Remarks. The specific epithet *crenulatus* (L. *crenula* = a notch) refers to the characteristic posterior margin of the second article of peraeopods 6 and 7.

Elasmopus crenulatus shows some similarities with *E. yunde* Barnard from Western Australia in the densely setose palmar region of the male gnathopod 2 and the crenulate posterior margin of article 2 of peraeopod 7. However, *E. yunde* is only crenulate for the distal half of the posterior margin of article 2 of peraeopod 7 and peraeopod 6 lacks any crenulation of the margin. The telson of both species is similar but that of *E. yunde* is more deeply cleft.

Elasmopus crenulatus also shows similarity to *E. serricatus* Barnard from California, Galapagos Islands, Ecuador and Panama. *Elasmopus serricatus* has a crenulate posterior margin of article 2 of peraeopod 7 but article 2 of peraeopod 6 is not crenulate. The palm of the male second gnathopod of *E. serricatus* is densely setose and has a distal spinous protrusion similar to that of *E. crenulatus*. *Elasmopus serricatus*, however, also has a naked tooth on the mid-palm, and the posterior margin of the third pleonal epimeron is notched. The telson of *E. serricatus* is similar to that of *E. crenulatus*; however, in the male the apical spines are shown by J.L. Barnard (1979) to be subterminal, which is characteristic of the *E. rapax* group. The apical spines of the telson

of *E. crenulatus* are terminal, which suggests that this species does not fit J.L. Barnard's definition of the *E. rapax* group.

The male second gnathopod of *E. pecteniscrus* (Bate) is similar to that of *E. crenulatus* but the medial face of article 6 is less setose. Peraeopod 6 of *E. pecteniscrus* has an extended lobe on the posteroventral margin of article 2 which is crenulate, but the rest of the margin and the posterior margin of article 2 of peraeopod 7 are not crenulate.

Elasmopus crenulatus was found in algae, including the brown algae *Dictyota* and the green algae *Chlorodesmis*, coral rubble and reef rock samples taken around Lizard Island to depths of 12 metres.

Distribution. Lizard Island (type locality); Cocos (Keeling) Islands.

Elasmopus hooheno Barnard, 1970

Fig. 13

Elasmopus hooheno J.L. Barnard, 1970:120-121, fig. 70.—1971:71, 74-75, figs 33-35; Ledoyer, 1972:217, pls 35, 36; 1978:269-271; 1979:69, fig. 40.

Material. AM P30106 to AM P30110 from the following stations: 76 LIZ A (1), 76 LIZ B (68), 76 LIZ 16 (3), LI-11 (3), LI-48 (1); 5 specimens, AM P31824, between Direction Island and Prison Island, Cocos (Keeling) Islands, Indian Ocean (12°5'S, 96°53'E), from dead coral and encrusting algae in channel in reef crest, 4 m depth, F.H. Talbot, 8 October, 1979.

Diagnosis. Accessory flagellum 2-articulate; article 5 of gnathopod 2 compressed, posterior lobe sparsely setose; article 6 of gnathopod 2 tapering distally, oblique palm confluent with posterior margin, palmar margin defined by cusp, mid-palmar cusp setose, distal protrusion spinous; article 6 of peraeopods 3 and 4 with distal pair of locking spines comprising large striate chisel spine and smaller simple spine; article 6 of peraeopods 5-7 with distal pair of striate simple locking spines; posterior margin of third pleonal epimeron serrate; telson wider than long, lobes weakly excavate apically, each bearing 2-3 spines.

Remarks. J.L. Barnard noted in his description of *E. hooheno* that he probably had not described any terminal males, and the holotype he designated is a male 4.3 mm in length. The material I examined provided the opportunity to study males up to 6.3 mm in length, but it is not known whether these are terminal males. The material examined here differs from Barnard's description in the following ways: *gnathopod 2*: in all males examined the dactylus is shorter than the palm, and articles 5 and 6 may be more setose; *peraeopods 3-4*: distal locking spines on article 6 are not as strongly sabre-shaped but resemble a chisel spine; *peraeopods 5-7*: more setose in larger males. *Third pleonal epimeron* ventral margin is more setose and the posterior margin more serrate in larger males, as predicted by Barnard (1970). *Telson*: larger males have three apical spines.

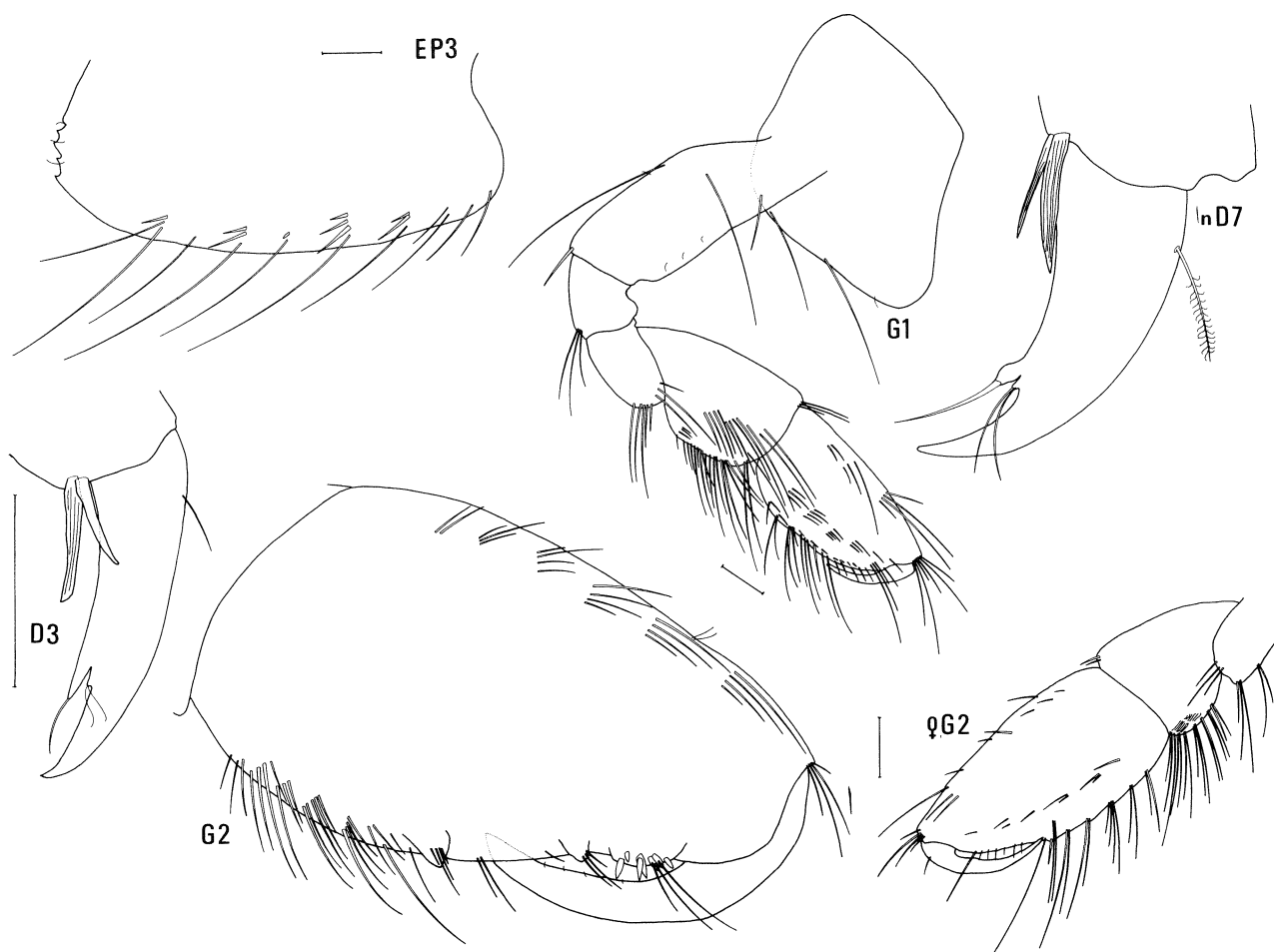


Fig. 13. *Elasmopus hooheno* Barnard, male, 6.3 mm, 76 LIZ B; n = male, 4.2 mm, 76 LIZ B; female, 3.3 mm, 76 LIZ A. Scale lines represent 0.1 mm.

Elasmopus hooheno was found in large numbers in algae, coral rubble and reef rock samples taken in shallow water around Lizard Island.

Distribution. Hawaii (type locality); Madagascar; Mauritius; Lizard Island; Cocos (Keeling) Islands.

Elasmopus pocillimanus (Bate, 1862)

Fig. 14

Moera pocillimanus Bate, 1862:191-192, pl. 34, fig. 7.

Maera pocillimanus.—Stebbing, 1888:35.

Elasmopus pocillimanus.—Della Valle, 1893:733, pl. 1, fig. 4, pl. 22, figs 23-25; Stebbing, 1906:443-444; Chevreux, 1910:225, pl. 16, figs 1, 2; Kunkel, 1910:56-59, fig. 21; Chevreux and Fage, 1925:246-247, fig. 257; Schellenberg, 1938:56, fig. 28; J.L. Barnard, 1970:130-131, figs 77-78; 1971:71, 75, figs 34-35; Ledoyer, 1972:217, 219, pl. 37; 1973:52, 91; 1979:73; Ortiz, 1978:7.

Elasmopus levis.—Kunkel, 1918:103, fig. 24 (fide Schellenberg, 1938).

Material. AM P30111 to AM P30113 from the following stations: 75 LIZ T-1 (1), 75 LIZ V-3 (1), 76 LIZ 16 (2).

Diagnosis. Accessory flagellum 1-4 articles; article 5 of gnathopod 2 compressed, posterior lobe setose; article 6 of gnathopod 2 with oblique palm confluent with posterior margin, palmar margin with slight distal spinous protrusion, medial palmar face with hollow defined by ridge bearing 2 spines; article 6 of pereopods 3 and 4 with distal pair of large striate sabre spines; article 6 of pereopods 5-7 with distal pair of striate locking spines comprising one large sabre spine and one simple curved spine; third pleonal epimeron with posteroventral cusp, posterior margin entire; telson as wide as long, cleft 60%, apices rounded, each lobe with one mid-lateral spine and pair of setules.

Remarks. My material is very similar to J.L. Barnard's (1970) Hawaiian material. The anteroventral corner of the head is rounded with an incision as described by Schellenberg (1938) and figured by J.L. Barnard (1970) rather than sharp as figured by Chevreux and Fage (1925). The accessory flagellum of Chevreux and Fage's (1925) material is 2-articulate, that of Schellenberg's (1938) specimen has only one article, and J.L. Barnard (1970) stated that the accessory flagellum

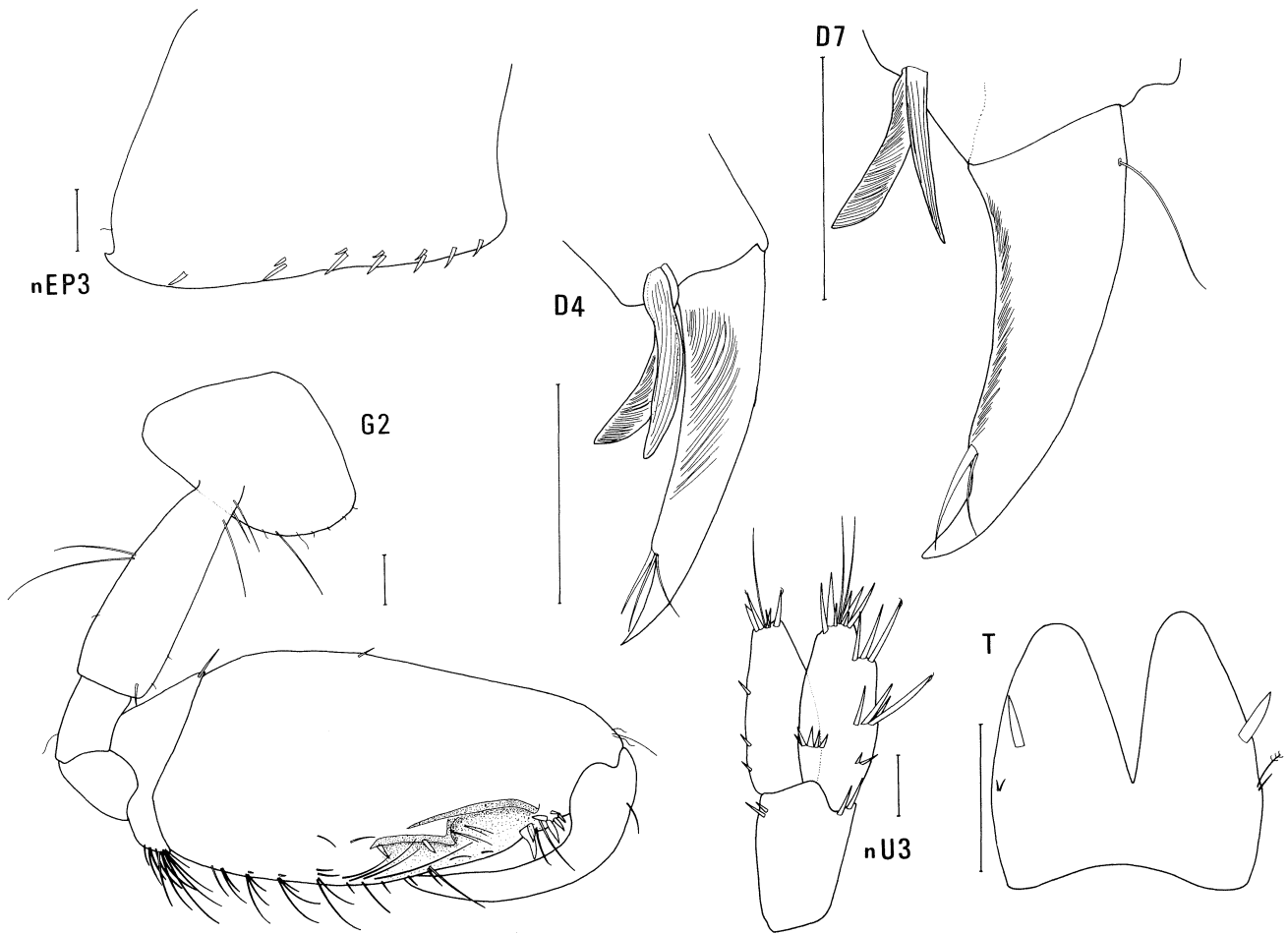


Fig. 14. *Elasmopus pocillimanus* (Bate), male, 4.9 mm, 76 LIZ 16; n = male, 7.2 mm, 76 LIZ 16. Scale lines represent 0.1 mm.

“is about 3-articulate”. My material has 3 articles in the accessory flagellum.

There were no females in the material examined. Female *E. pocillimanus* are not known from the Indo-Pacific since Schellenberg (1938) and J.L. Barnard (1970, 1971) also did not find any females in the collections they examined.

Elasmopus pocillimanus was collected from shallow water at Lizard Island and from the reef back at Yonge Reef. It was found in dead staghorn *Acropora* coral and in reef rock covered with coralline algae *Lithothamnion* and *Halimeda*.

Distribution. Mediterranean (type locality, Genoa); Bermuda; Gilbert Islands; Hawaii; Madagascar; Cuba; Lizard Island; Yonge Reef.

Elasmopus pseudaffinis Schellenberg, 1938

Figs 15, 16

Elasmopus pseudaffinis Schellenberg, 1938:53-54, fig. 25.— J.L. Barnard, 1965:501-503, figs 12, 13; Ledoyer, 1972:219-222, pls 38, 39; 1978:273, fig. 29; 1979:73.

Material. AM P30114 and AM P30115 from the following stations: LI-50 (4), LI-62 (5).

Diagnosis. Accessory flagellum 3-4 articles; article 5 of gnathopod 2 compressed, posterior lobe setose; article 6 of male gnathopod 2 elongate, oblique palm confluent with posterior margin, defined by a stout spine, palmar margin with stout spines, distal protrusion spinous, submarginal spines stout; article 6 of pereopods 3 and 4 with distal pair of unstriated locking spines comprising one stout chisel spine and one curved spine; article 6 of pereopods 5-7 with distal pair of locking spines comprising 2 unstriated simple spines; third pleonal epimeron with postventral cusp, posterior margin entire; telson longer than wide, cleft almost to base, apices notched with 1-3 stout spines at base of each notch.

Description. Male 11.5 mm. *Head* as long as first two pereonites, eye not filling lobe, ommatidia close-packed, cheek notch narrow. *Antenna 1*: peduncle equal to antenna 2; article 1 equal to article 2, with distal spine, article 3, 0.4 times as long as article 2; accessory flagellum 1.8 times as long as article 1 of primary

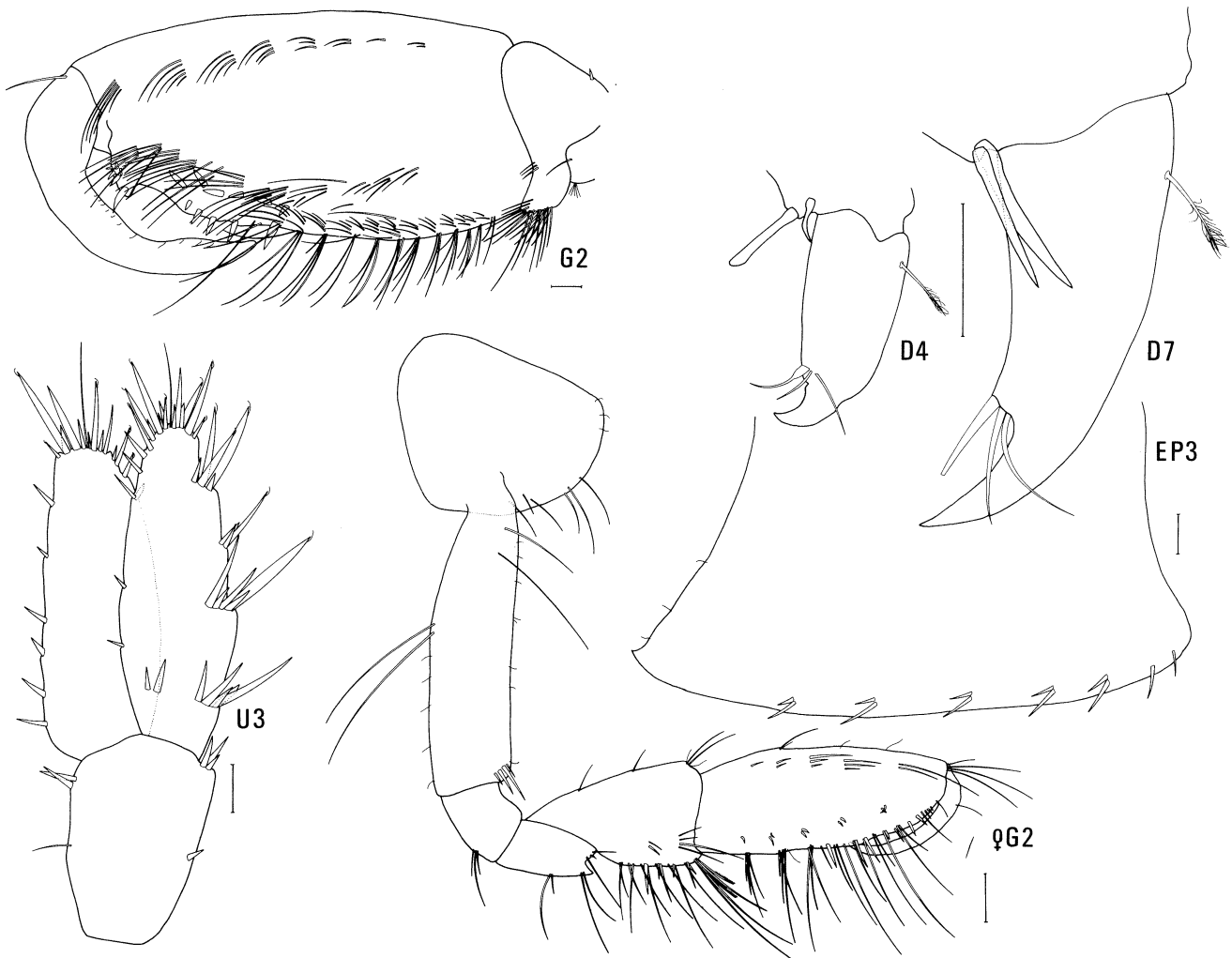


Fig. 15. *Elasmopus pseudaffinis* Schellenberg, male, 11.5 mm, LI-62; female = 7.1 mm, LI-62. Scale lines represent 0.1 mm.

flagellum, 4-articulate, article 4 small. *Antenna 2*: peduncle longer than flagellum, article 3 longest, article 4 subequal to article 3; flagellum 12-articulate.

Mandible with incisor and 3 accessory blades; lacinia mobilis bifid; molar triturating with long ragged seta; palp 3-articulate, article 2 twice as long as article 1, article 3 falcate with comb-like row of medial setae.

Maxilla 1: inner plate with 2 terminal plumose setae and fine marginal setae; outer plate broad, armed with 7 barbed spine teeth; palp 2-articulate, distally setose.

Maxilla 2: inner and outer plates with distal setae, outer plate with fine medial and marginal setae. *Maxillipeds*: inner and outer plates with plumose apical and marginal setae; palp 4-articulate, article 2 twice as long as articles 1, 3 and dactylus, pincushion lobe at articulation of article 3 and dactylus.

Gnathopod 1: coxa as long as wide, anteroventral corner slightly produced and smoothly rounded, ventral margin sparsely setose; article 5 anterior margin almost twice as long as posterior margin, posterior margin densely setose with some pectinate setae, 3 medial comb

rows of setae; article 6 almost twice as long as wide, posterior margin setose, 2 superior medial comb rows of setae, 4 inferior medial comb rows of setae, oblique palm defined by 2 stout spines, palm with submarginal setae and spines; dactylus extending length of palm. *Gnathopod 2* larger, more robust than gnathopod 1; coxa rounded, almost as wide as long with sparse ventral setae; article 2, 1.7 times as long as coxa; article 5 compressed with small spine on anterior margin, posterior margin densely setose; article 6 elongate, posterior margin with tufts of setae, superior medial setae short, inferior medial setae extending across palm, palm confluent with posterior margin, defined by a stout spine, palmar margin with 4 stout spines, distal spinous protrusion and 6 stout submarginal spines; dactylus stout, inner margin sparsely setose.

Peraeopods 3 and 4 similar except coxa 3, 1.4 times as long as wide. *Peraeopod 4*: coxa quadrate, posterior margin shallowly excavate; article 5 posterior margin spinous; article 6 posterior margin spinous, distal pair of locking spines comprising one stout chisel spine and

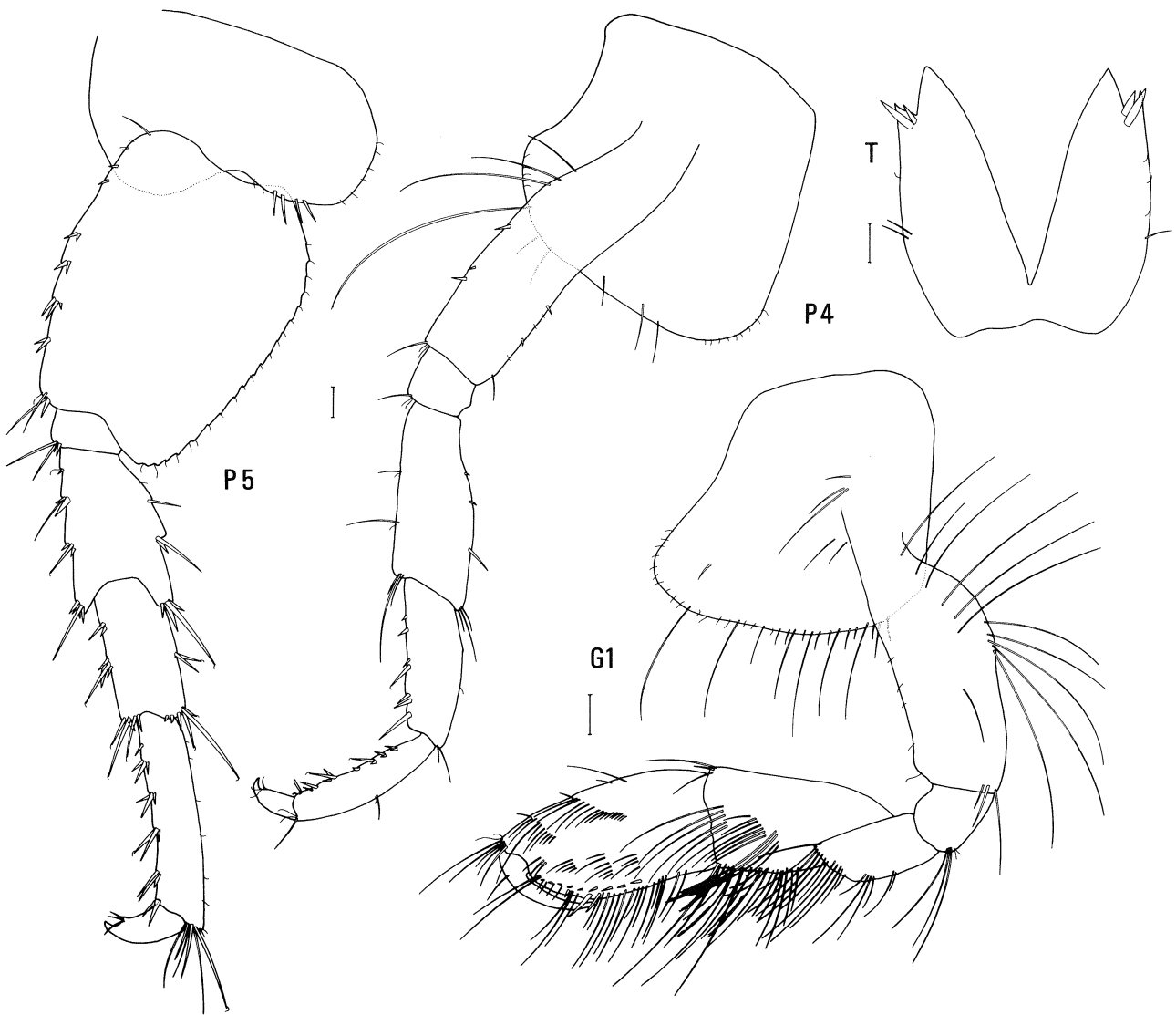


Fig. 16. *Elasmopus pseudaffinis* Schellenberg, male, 11.5 mm, LI-62. Scale lines represent 0.1 mm.

one curved spine; dactylus apically constricted, inner margin bearing seta and 2 setules at constriction. *Peraeopod 5*: coxa 1.6 times as wide as long, bilobed ventrally, 4 spines and sparse setae on posteroventral margin; article 2, anterior margin spinous, posterior margin weakly serrate, sparsely setose and lacking long setae; article 4 widening distally, anterior and posterior margins spinous and produced downwards; article 5 subequal to article 4, anterior and posterior margins spinous; article 6, 1.5 times as long as article 5, anterior margin spinous, distal pair of locking spines comprise 2 simple spines; dactylus apically constricted inner margin bearing a seta and 2 setules at constriction. *Peraeopod 6*: very similar proportions to peraeopod 5 but 1.7 times as long; coxa bearing 2 posteroventral spines; articles 2, 3, 4, 5 and 6 more spinous and setose than peraeopod 5. *Peraeopod 7*: very similar to peraeopod 6 in size and proportion.

Third pleonal epimeron with posteroventral cusp, ventral margin bearing 5 pairs of spines and 2 single spines anteriorly, posterior margin entire.

Uropod 3: peduncle 0.7 times as long as outer ramus, distal margins spinous; outer ramus ovate, apically spinous with a seta, outer margin armed with groups of spines, inner margin armed with single spines, 2 medial spines at M15; inner ramus subequal to outer ramus, apically spinous with a seta, outer margin armed with single spines. *Telson* longer than wide, cleft almost to base, apices notched with 2 stout spines at base of each notch.

Female 7.1 mm. Similar to male except in following ways: *Gnathopod 1* less robust and less setose. *Gnathopod 2* less robust; coxa 0.8 times as long; article 2, 1.4 times as long as coxa; article 5 not compressed, posterior margin 0.5 times as long as anterior margin, spine on anterior margin absent,

posterior margin with tufts of setae; article 6 extremely elongate with short superior medial setae and inferior medial spines, stout spine distal to defining spine, palm with spines and setae, lacking distal protrusion.

Variation. *Gnathopod 1* less setose in smaller males; *Gnathopod 2* in smaller males, articles 5 and 6 less setose and less spinous; *Peraeopod 4*: articles 5 and 6 may be more or less setose than in peraeopod 4 figured, independent of size of male; *Peraeopod 6 and 7*: in smaller males, article 6 is less spinous; *Telson*: in both males and females, the larger apical spine may be up to twice the size of that figured. *Uropod 3*: the number of spines in each group of spines is variable, independent of the size of the specimen.

Remarks. J.L. Barnard (1965) found considerable variation amongst the specimens in the Micronesia collection, and he mentions the third pleonal epimeron in particular. The specimens examined from the Great Barrier Reef do not show such variation. The third pleonal epimeron of males, females and juveniles is produced posteroventrally to form a cusp. Schellenberg (1938) figures a notched posteroventral corner and J.L. Barnard (1965) refers to a "small sharp tooth" enclosed in the notch, but these characters are not observed in the material I examined.

Schellenberg (1938) described the palm of the male second gnathopod with a distal conical tooth and a more proximal truncate tooth bearing two spines. The specimen he described is 5 mm long. J.L. Barnard (1965) also figured the second gnathopod of a male 5 mm in length and showed a similar arrangement of teeth on the palm, although the distal tooth is truncate rather than conical. J.L. Barnard (1965) figured the second gnathopod of a 9 mm male and it appears that in larger specimens the truncate tooth is not as prominent and the entire palmar margin is more spinous. The male described from the Great Barrier Reef is 11.5 mm in length and the palm is like that of J.L. Barnard's 9 mm specimen. The smaller males examined (4.4 mm and 6.4 mm) have only a distal conical tooth and a spinous palmar margin. The margin is not as spinous as that of the 11.5 mm male of J.L. Barnard's 9 mm male.

J.L. Barnard (1965) noted that female *E. pseudaffinis* are indistinguishable from *Elasmopus minimus*, found by Chevreux (1907) and Pirlot (1936). But the third uropod of *E. minimus* has the inner ramus "beaucoup plus courte" than the outer ramus (Chevreux, 1907), and *E. pseudaffinis* has subequal rami of uropod 3.

J.L. Barnard (1965) identified the females in his collection as *E. pseudaffinis* because they were always found in conjunction with males with the second gnathopodal configuration of *E. pseudaffinis*. This was the case in the material examined but the identification of the females was confirmed by the rami of uropod 3.

Ledoyer (1978) described two forms of *E. pseudaffinis* based on coxa 1. Form A has a smoothly rounded anteroventral corner and Form B has a sharp anteroventral corner. Ledoyer (1978) also noted that Form A from Madagascar and Form B from Mauritius have a strong spine on the posteroventral corner of

coxae 1-3. The material examined fits Form A from Mauritius since the anteroventral corner of coxa 1 is smoothly rounded and it lacks a spine on the posteroventral corner of coxae 1-3.

Elasmopus pseudaffinis was found in algal samples from shallow water at Lizard island and Eagle Reef.

Distribution. Micronesia (type locality, Gilbert Islands); Madagascar; Mauritius; Lizard Island; Eagle Reef.

Elasmopus spinicarpus n.sp.

Figs 17, 18, 19

Type material. HOLOTYPE, male, 8.5 mm, AM P30212; ALLOTYPE, 5.4 mm, AM P30213; 33 PARATYPES, AM P30214; Casuarina Beach, Lizard Island (14°40.5'S, 145°26.6'E) under stones at low tide mark, J.K. Lowry, A.R. Jones and P.C. Terrill, 11 October 1978, L1-39.

Diagnosis. Accessory flagellum 3-articulate; coxae 1-4 large; article 5 of male gnathopod 2 with long setae arising medially, 5 spines anteroventrally; article 6 of male gnathopod 2 tapering distally, oblique palm confluent with posterior margin, defined by 2 stout spines, palmar margin with spines, setae and submarginal spines; article 6 of peraeopods 3 and 4 with distal pair of unstriated locking spines comprising one chisel spine and one simple curved spine; article 6 of peraeopods 5-7 with distal pair of locking spines simple, comprising one stout spine and a smaller curved spine; third pleonal epimeron with posteroventral cusp, posterior margin entire; telson wider than long, deeply cleft, outer margins of lobes extended to form apical points, each with 3 apical spines.

Description. Holotype, male, 8.5 mm. *Head* 0.7 times as long as first two peraeonites, eye not filling lobe, ommatidia close-packed, cheek notch narrow. *Antenna 1* twice as long as antenna 2; peduncle equal to flagellum, article 1 subequal to article 2, with distal spine, article 3, 0.6 times as long as article 2; flagellum 17-articulate; accessory flagellum 0.8 times as long as first article of primary flagellum, 3-articulate, article 3 small. *Antenna 2*: peduncle longer than flagellum, article 4 longest, article 3 subequal to article 4; flagellum 8-articulate.

Mandible with incisor and 3 accessory blades; lacinia mobilis with 4 teeth; molar triturating; palp 3-articulate, article 2 twice as long as article 1, article 3 falcate with comb-like row of medial setae. *Maxilla 1*: inner plate with 2 terminal plumose setae and fine marginal setae; outer plate broad, armed with 7 barbed spine teeth; palp 2-articulate, distally setose. *Maxilla 2*: inner and outer plate with distal setae, outer plate with fine median and marginal setae. *Maxillipeds*: inner and outer plates with plumose apical and inner marginal setae; palp 4-articulate, article 2 twice as long as articles 1, 3 and 4, pincushion lobe at articulation of article 3 and dactylus.

Gnathopod 1: coxa 0.8 times as wide as long, ventral margin sparsely setose; article 5, anterior margin twice

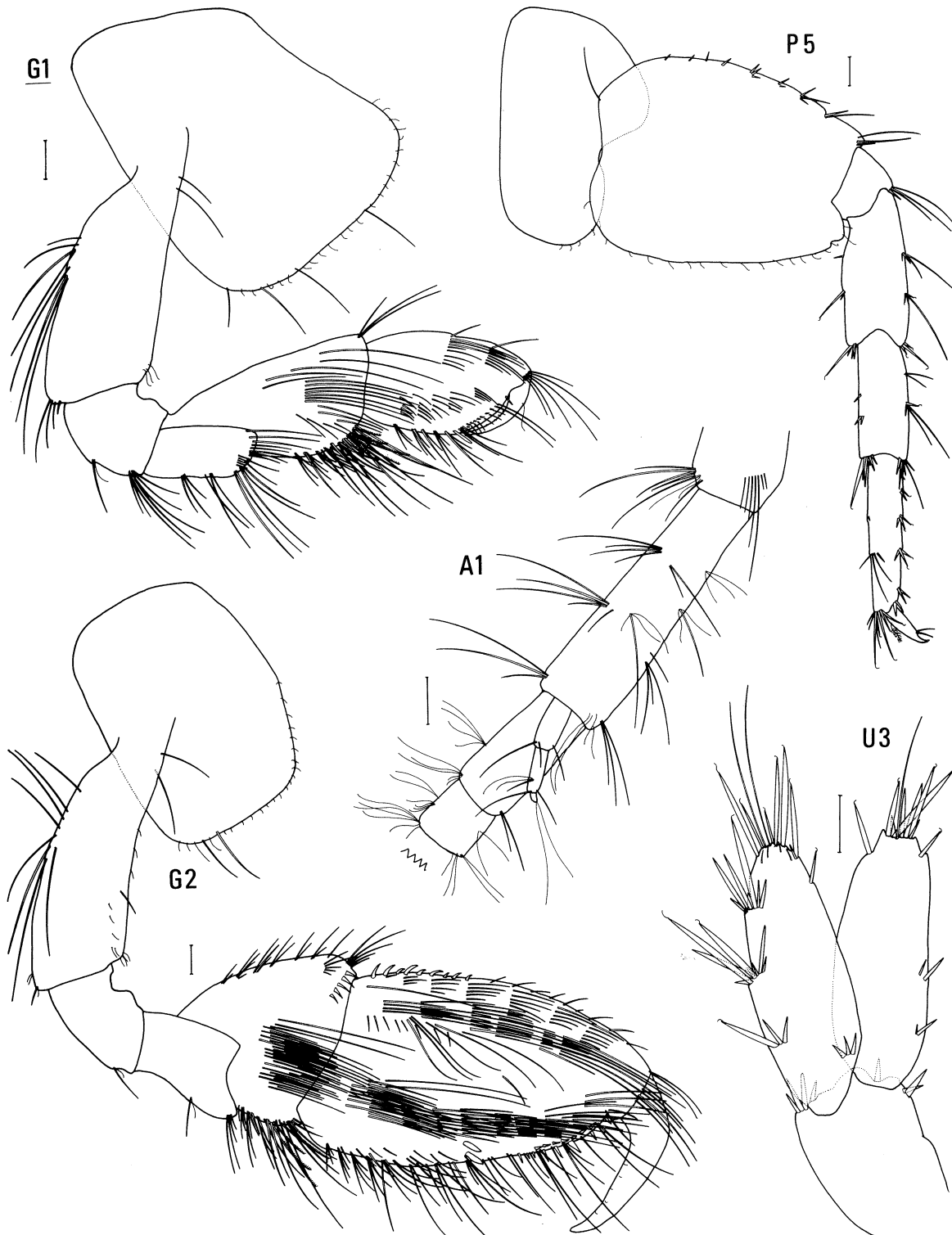


Fig. 17. *Elasmopus spinicarpus* n.sp., holotype, male 8.5 mm, LI-39. Scale lines represent 0.1 mm.

as long as posterior margin, posterior margin densely setose with some pectinate setae, long setae arising medially; article 6 ovate, 1.6 times as long as wide, posterior margin with tufts of setae, 2 rows superior medial setae, 5 rows inferior medial setae, oblique palm

defined by stout spine, palm with short setae, submarginal spines and one distal spine; dactylus extending almost length of palm. *Gnathopod 2* larger, more robust than gnathopod 1; coxa rectangular, 0.7 times as wide as long, ventral margin and distal half of

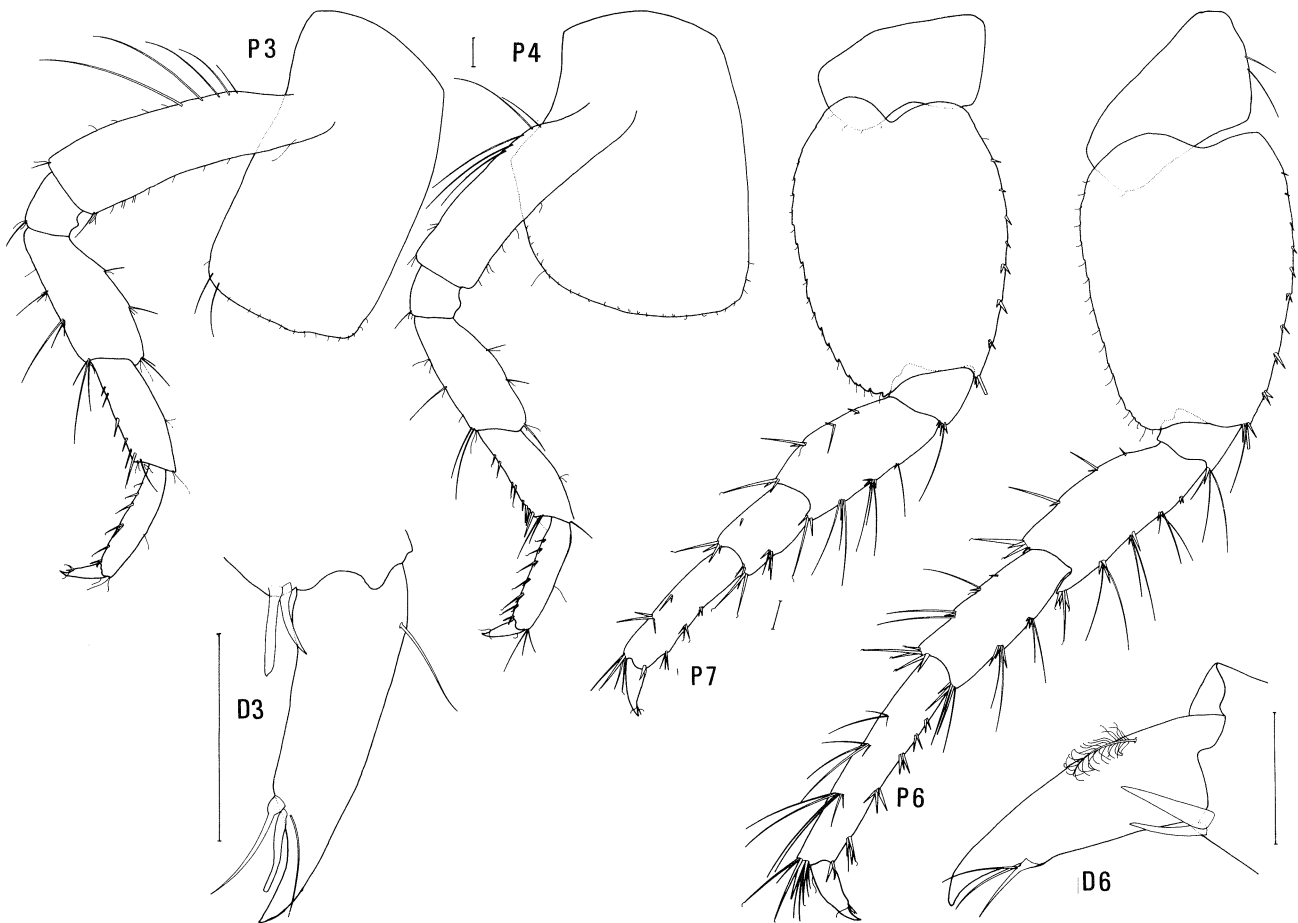


Fig. 18. *Elasmopus spinicarpus* n.sp., holotype, male 8.5 mm, L1-39. Scale lines represent 0.1 mm.

anterior margin sparsely setose; article 2 equal in length to coxa; article 5 posterior margin 0.4 times as long as anterior margin, anterior margin with tufts of setae, 5 spines anteroventrally, posterior margin densely setose, long setae arising medially; article 6 tapering distally, anterior margin proximally spinous, posterior margin setose, superior medial setae and inferior medial setae long and fine, oblique palm confluent with posterior margin, defined by 2 stout spines, palmar margin with spines, setae and submarginal spines; dactylus slender, inner margin sparsely setose.

Peraeopod 3: coxa large, rectangular, 1.7 times as long as wide; article 2, 0.8 times as long as coxa; article 5 posterior margin spinous; article 6 posterior margin spinous, distal pair of unstriated locking spines comprising one chisel spine and one curved spine; dactylus apically constricted, inner margin bearing seta and two setules at constriction. *Peraeopod 4* very similar in size and proportions to peraeopod 3 except in following ways: coxa wider than coxa 3, 1.3 times as long as wide, posterior margin produced posteriorly to form cusp; articles 5 and 6 more spinous. *Peraeopod 5*: coxa, 1.5 times as wide as long, bilobed ventrally; article 2 anterior margin spinous, posterior margin entire, sparsely setose and lacking long setae; articles

4, 5 and 6 rectangular, anterior and posterior margins spinous, article 5 subequal to articles 4 and 6; article 6, distal pair of locking spines simple, comprising one stout spine and a smaller curved spine; dactylus apically constricted, inner margin bearing seta and 2 setules at constriction. *Peraeopod 6*: similar proportions to peraeopod 5 but 1.2 times as long; coxa not bilobed ventrally; article 2 posterior margin weakly serrate; article 4 anterior and posterior margins produced downwards; articles 4, 5 and 6 more setose and spinous. *Peraeopod 7*: similar proportions to peraeopod 6 but same size as peraeopod 5; article 2 more strongly serrate; articles 4, 5 and 6 less setose and spinous.

Third pleonal epimeron with posteroventral cusp and single spines along ventral margin, posterior margin entire.

Uropod 3: peduncle 0.6 times as long as outer ramus, distal margin spinous; outer ramus ovate, apically spinous with 2 setae, outer margin armed with groups of spines, 3 medial spines at M19; inner ramus ovate, subequal to outer ramus, apically spinous with a seta, inner margin spinous. *Telson* deeply cleft, wider than long, outer margins of lobes extended to form apical points each with 3 small spines.

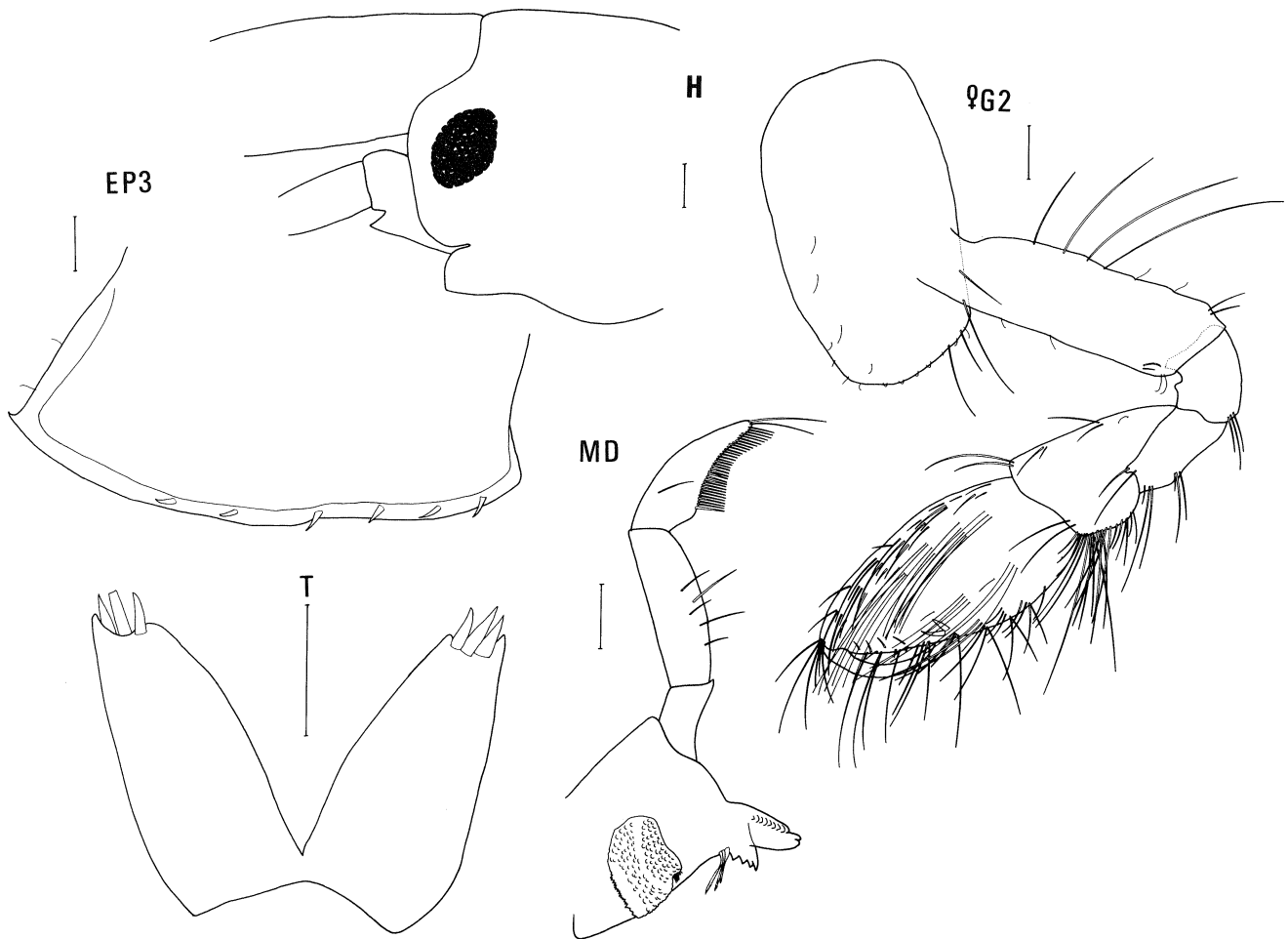


Fig. 19. *Elasmopus spinicarpus* n.sp., holotype, male 8.5 mm, LI-39; female = allotype, 5.4 mm, LI-39. Scale lines represent 0.1 mm.

Allotype female, 5.4 mm. Similar to holotype except in following ways: *Gnathopod 1*: article 6, fewer superior and inferior medial setae. *Gnathopod 2* smaller and less robust, coxa 0.6 times as wide as long; article 2, 0.8 times as long as coxa; article 5 posterior margin 0.3 times as long as anterior margin, lacking long medial setae and anteroventral spines; article 6 lacking spines on anterior margin, palmar margin less spinous, lacking submarginal spines. *Peraeopods 3 and 4*: article 6 less spinous. *Peraeopod 6* less setose. *Telson*: middle apical spine more than twice as long as others.

Remarks. The specific epithet *spinicarpus* (*L. spina* = a spine; *carpus* = article 5) refers to the spines along the ventral margin of article 5 of the male second gnathopod.

Elasmopus spinicarpus resembles *E. brasiliensis* (Dana) in the plain but setose article 6 of the male second gnathopod figured by Chevreux (1910). The anterior margin of article 5 of the second gnathopod of *E. spinicarpus* is more setose than *E. brasiliensis*, and *E. brasiliensis* lacks spines along the ventral margin. J.L. Barnard (1965) recorded *E. brasiliensis* from Micronesia, and noted that the palm of the male second

gnathopod has a distal pair of spines and a chitinous ridge on the medial face. These features are not present on *E. spinicarpus*.

The telson of *E. brasiliensis* was not figured by Chevreux (1910) but he stated that it is wider than long, almost entirely cleft, with excavate apices armed with 3 unequal spines. From this description, the telsons of *E. spinicarpus* and *E. brasiliensis* appear similar.

Elasmopus spinicarpus has rami of uropod 3 equal, which is similar to the third uropod of *E. bampo* Barnard, from Hawaii and California (J.L. Barnard 1979). *E. bampo*, however, has the posterior margin of the third pleonal epimeron serrate, whereas *E. spinicarpus* has the posterior margin entire.

Elasmopus spinicarpus occurred in one sample which was taken from under stones at low tide. Of the 35 specimens collected, 16 were ovigerous females.

Distribution. Lizard Island (type locality).

Genus *Maera* Leach

Six species of *Maera* have previously been recorded in Australia. Sheard (1937) listed four species from

temperate Australia—*M. inaequipes* (Costa), *M. hamigera* (Haswell), *M. mastersi* (Haswell), and *M. tenella* (Dana). *Maera tenella* was reported from the Abrolhos Islands by Tattersall (1922) but according to Schellenberg (1938) the species was *M. serrata*.

Maera viridis (Haswell) is described by Haswell (1880b) from Port Jackson and also recorded by J.L. Barnard (1972) from a number of localities in southern Australia. *Maera boeckii* was described by Haswell (1879) from Port Jackson. Sheard (1937) listed *M. viridis* and *M. boeckii* in the genus *Elasmopus*.

Five species of *Maera* are found in the material from Lizard Island and adjacent reefs. *Maera quadrimana* (Dana), *M. octodens* Sivaprakasam and *M. reishi* Barnard are new records for Australia. *Maera serrata* is recorded from the east coast for the first time. However, on examination of the Melitidae in the British Museum (Natural History) from the Great Barrier Reef Expedition, it was found that *M. serrata* was collected at Low Isles. This record was published as *Maera* sp. by K.H. Barnard (1931). One new species, *M. griffini*, is described.

The five species fall into two groups. *Maera quadrimana*, *M. serrata* and *M. reishi* are in the “*quadrimana* complex” discussed by J.L. Barnard (1972b). They are characterized by the transverse palm on gnathopod 2, an accessory tooth on the dactylus of peraeopods, and by a sharp cusp at the anteroventral cephalic corner. *Maera griffini* and *M. octodens* have an oblique palm on gnathopod 2, lack an accessory tooth on the dactylus of peraeopods, and lack the sharp cusp at the anteroventral cephalic corner.

Maera griffini n.sp.

Figs 20, 21

Type material. HOLOTYPE, male, 8.6 mm, AM P30205; 5 PARATYPES, AM P30206, fringing reef, between Bird Islet and South Island, Lizard Island (14°42'S, 145°28'E), air lifted sediment, 12 m depth, P.B. Berents and P.M. Berents, 14 April 1978, 78 LIZ-PBW-2.

Additional material. AM P30207 and L1-59 (1).

Diagnosis. Head with anteroventral cephalic corner quadrate, lacking cheek notch; coxa 1 anteroventral corner drawn to subacute point, posteroventral corner notched; gnathopods 2 symmetrical; male gnathopod 2 palm oblique defined by sharp tooth, incision adjacent to defining tooth, shallow sinus midway along palm, palmar margin with large stout spines and small spines; dactylus of peraeopods lacking accessory tooth; third pleonal epimeron posterior margin entire; uropod 3 rami lanceolate, equal, 1.6 times as long as peduncle; telson wider than long, deeply cleft, apices notched bearing 2 setae longer than telson, inner margins with notch bearing 2 setae.

Description. Holotype male, 8.6 mm. *Head* as long as first 2 peraeonites, lateral cephalic lobe strongly produced anteriorly, eye tear-drop shape, not filling lobe, ommatidia close-packed, anteroventral cephalic

corner quadrate, lacking cheek notch. *Antenna 1*: flagellum longer than peduncle, peduncular article 2 subequal to article 1, distal border with stout spine, article 3 small; flagellum 24-articulate; accessory flagellum 4-articulate, article 4 small. *Antenna 2*: peduncle longer than flagellum, article 2 gland cone extending length of article 3; flagellum 17-articulate.

Mandible with well developed incisor and 8 accessory blades comprising 4 serrated spines and 4 plumose setae; lacinia mobilis with 4 teeth; ragged seta and 4 short setae extending from triturating molar; palp slender, 3-articulate, article 3 with 8 apical setae. *Maxilla 1*: inner plate with 3 terminal plumose setae and fine marginal setae; outer plate armed with 4 serrate and 5 bifid spine teeth; palp 2-articulate, distally setose. *Maxilla 2*: inner and outer plates with distal setae; outer plate with fine marginal setae. *Maxillipeds*: inner plate quadrate with plumose apical setae; outer plate ovate with apical spine teeth extending along inner margin; palp 4-articulate, inner margin article 2 setose, article 3 with inner marginal and apical setae.

Gnathopod 1: coxa as wide as long, strongly produced anteriorly, anteroventral corner drawn to subacute point, setae spaced along ventral margin, posteroventral corner notched; article 4 distally setose, tapering to a point, posterior margin armed with row of sharp spines; article 5 posterior margin densely setose, medial face covered with comb rows of long setae including distal row of pectinate setae; article 6 elongate, tapering distally, subequal to article 5, posterior margin setose with submarginal spines, oblique palm confluent with posterior margin, palmar margin bearing setae and spines, superior medial setae long, inferior lateral setae short; dactylus slender, inner margin setose. *Gnathopod 2*: larger and more robust than gnathopod 1; coxa as wide as long; ventral margin sparsely setose; article 2, 0.4 times as wide as long, anterior margin sparsely setose, posterior margin bearing long setae; article 4 posteroventral corner acute; article 5 compressed, anteroventral corner bearing 2 spines, posteroventral margin densely setose with some pectinate setae, row of setae along mid-ventral margin; article 6 robust, widening distally, tufts of setae spaced along ventral margin, oblique palm defined by sharp tooth, incision adjacent to defining tooth, shallow sinus midway along palm, palmar margin armed with large stout spines and small spines; dactylus curved, inner margin setose.

Peraeopod 3: coxa 0.8 times as wide as long, ventral margin setose, posteroventral corner with small sharp tooth; article 4 anteroventral corner broad; article 6 subequal to article 5, posterior margin spinous with distal pair of simple locking spines; dactylus apically constricted, constriction marked by 2 setules and notched protrusion, plumose seta medial to outer margin. *Peraeopod 4* similar proportions to peraeopod 3 but shorter; coxa has shallow excavation of posterior margin. *Peraeopod 5*: coxa 1.5 times as wide as long; article 2 ovate, 0.7 times as wide as long, proximal anterior margin spinous, distal anterior margin setose, proximal posterior margin setose, posteroventral corner

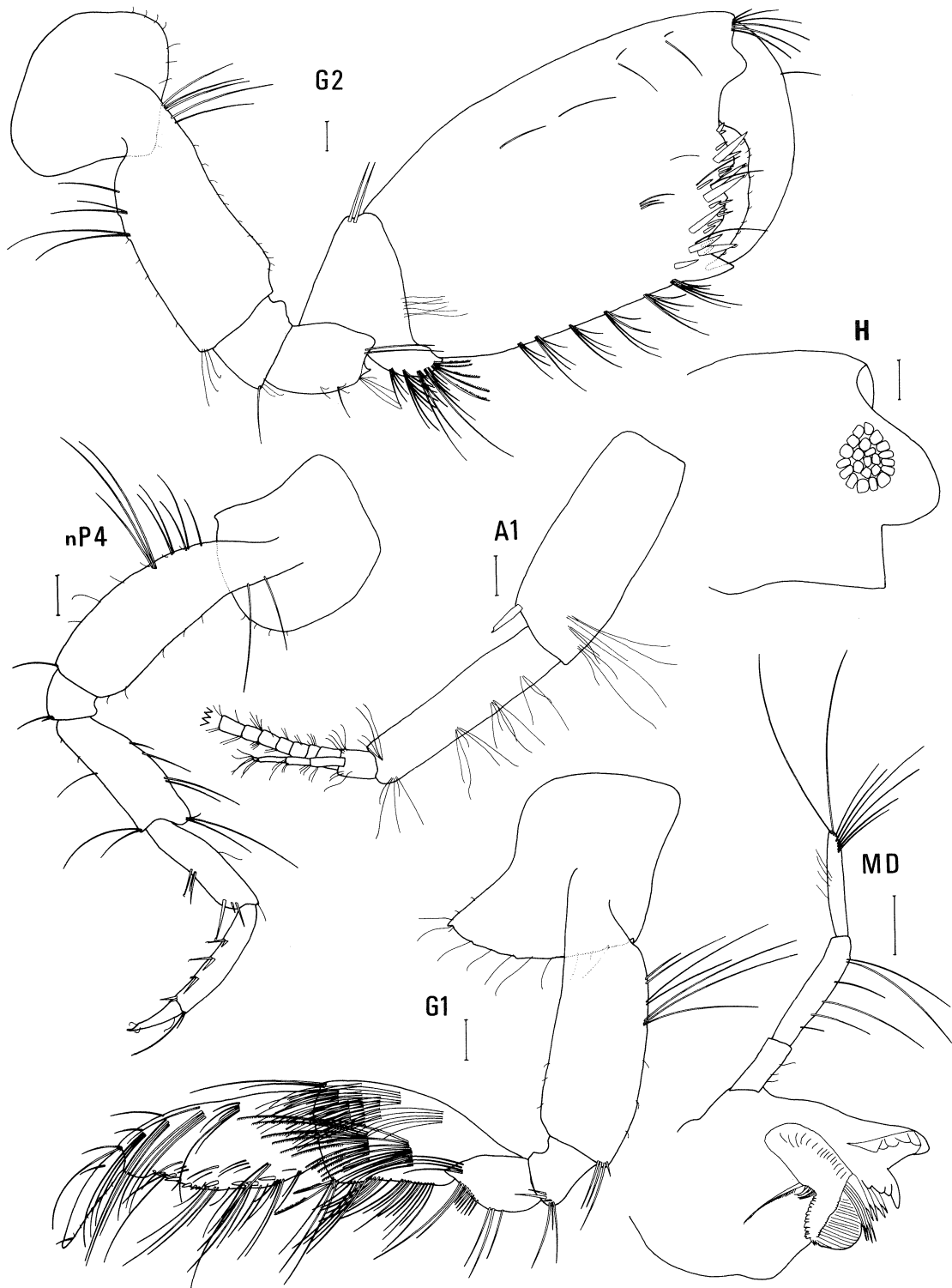


Fig. 20. *Maera griffini* n.sp., holotype, male, 8.6 mm, 78 LIZ-PBW-2; n = male, 7.2 mm, 78 LIZ-PBW-2. Scale lines represent 0.1 mm.

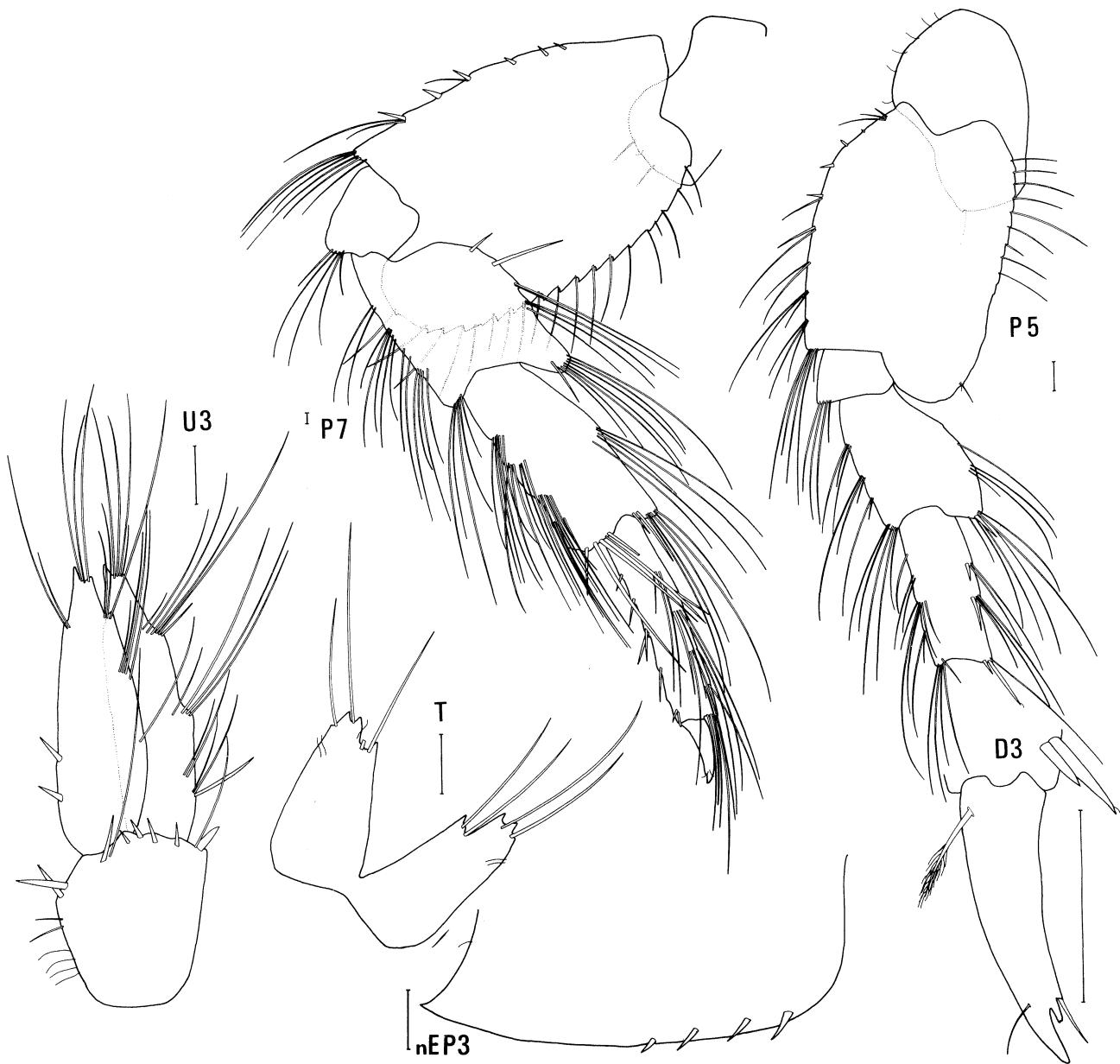


Fig. 21. *Maera griffini* n.sp., holotype, male, 8.6 mm, 78 LIZ-PBW-2; n = male, 7.2 mm, 78 LIZ-PBW-2. Scale lines represent 0.1 mm.

broadly expanded; article 4 posteroventral corner broad, anterior and posterior margins setose; article 5 rectangular, equal to article 4, anterior margin setose, posterior margin with tufts of setae and stout spines; article 6 subequal to article 5; dactylus apically constricted, constriction marked by 2 setules and notched protrusion, plumose seta medial to outer margin. *Peraeopod 6* very similar proportions to peraeopod 5 but larger and more setose; article 2, posterior margin serrate and setose; article 4 stout spine from proximal posterior margin. *Peraeopod 7* very similar size and proportions to peraeopod 6 except more setose; article 4, 2 stout spines on proximal posterior margin.

Third pleonal epimeron with posteroventral cusp, 4 spines projecting from ventral margin, anteroventral corner smoothly rounded, posterior margin entire.

Uropod 3 extending beyond uropods 1 and 2; peduncle 0.6 times as long as outer ramus, distal and inner margins spinous; both rami taper distally; outer ramus with apical setae, setae spaced along outer margin, apex acute; inner ramus equal to outer ramus with apical setae, setae along outer margin, apex acute, spines on proximal inner margin. *Telson* wider than long, deeply cleft, apex notched, sharp notch on inner margin proximal to apex, 2 apical setae longer than telson, 2 setae at proximal notch.

Female not known.

Variation. Smaller males show variation from the holotype in the following ways: palm of gnathopod 2 has less prominent defining tooth and shallower mid-palmar sinus; peraeopods 5-7 and uropod 3 less setose; telson has only 1 apical seta and 1 seta at the notch on inner margin.

Remarks. *Maera griffini* is named after Dr D.J.G. Griffin, Director of the Australian Museum.

Maera griffini shows some similarities with *M. othonopsis* Schellenberg from the Gilbert Islands, in the serrate article 2 of peraeopod 7 and in coxa 1 which is strongly produced anteriorly. However, article 2 of peraeopod 7 is not broadly expanded at the posteroventral corner, the posterior margin of the third pleonal epimeron is notched and the apices of the telson are blunt.

The profile of the head shows some variation within the genus *Maera* and *M. griffini* is similar to the European species *M. othonis* Milne Edwards, although the eye of *M. othonis* is shown by Chevreux and Fage (1925) to be reniform.

Another species that has some similar characters to *M. griffini* is *M. grossimana* (Montagu). This species has the anteroventral corner of coxa 1 extended anteriorly, notched apices of the telson and the posterior margin of the third pleonal epimeron entire; however, peraeopods 5-7 are more slender and the posterior margin of article 2 is not serrate.

Maera griffini was collected in air-lifted sediment from coral fans, rubble, dead coral and reef rock on the reef face and bommies at Lizard Island and Eagle Reef.

Distribution. Lizard Island (type locality); Eagle Reef.

Maera octodens Sivaprakasam, 1968

Fig. 22 in part

Maera octodens Sivaprakasam, 1968:36-38, fig. 2.—Surya Rao, 1972:196; Ledoyer, 1978:278, fig. 31; 1979:80, fig. 45.

Material. AM P30116 from L1-59(1).

Diagnosis. Head with anteroventral cephalic corner smoothly rounded, cheek notch present; coxa 1 anteroventral corner drawn to acute point, posteroventral corner notched; gnathopods 2 asymmetrical; male right second gnathopod palm oblique, 8 teeth form palmar margin; dactylus of peraeopods lacking accessory tooth; third pleonal epimeron posterior margin bearing 3 notches; uropod 3 rami elongate, subequal, 1.7 times as long as peduncle; telson longer than wide, deeply cleft, apices notched bearing long spine, inner margins with notch bearing spine.

Remarks. A single male of 4.8 mm was found in sediment from coral fans, rubble and dead coral at Eagle Reef. Although the specimen is damaged and lacking peraeopods 5-7, it is very similar to Sivaprakasam's (1968) description of a single male *M. octodens*.

The specimen varies from Sivaprakasam's (1968) description in the following ways: *Antenna 1*: the length of the peduncular joints in Sivaprakasam's specimen is in the ratio 2.8:3.2:1 whereas in this specimen it is in the ratio 4.2:4.5:1. The 4-articulate accessory flagellum extends to the fourth article of the primary flagellum compared with Sivaprakasam's (1968) specimen where it reaches the second article. *Right gnathopod 2*: article 6 is 1.5 times as long as wide whereas Sivaprakasam's (1968) specimen is twice as long as wide. Sivaprakasam (1968), however, does not define the parameters used in measuring the relative length of articles and different measurements may have been used in this comparison. In both specimens the right second gnathopod is large and well developed and the left underdeveloped.

Distribution. East coast of India (type locality, Appa Island); Mauritius; Madagascar; Eagle Reef.

Maera quadrimana (Dana, 1852)

Fig. 22 in part

Gammarus quadrimanus Dana, 1852:955-956, pl. 65, fig. 9. *Moera quadrimanus*.—Bate, 1862:194-195, pl. 35, fig. 5.

Not *Moera quadrimanus*.—Thomson, 1882:235, pl. 17, fig. 4 (*vide* Schellenberg, 1938).

Maera quadrimana part.—Stebbing, 1906:434-435 (*vide* Schellenberg, 1938)

Maera quadrimana—Schellenberg, 1938:45-48, figs 21, 22; J.L. Barnard, 1955:13; 1962:99; 1965:511-512, fig. 17; 1970:152-153, figs 94, 95; 1971:77, 84, figs 38, 40; 1972b:107; Sivaprakasam, 1966:101-102; 1968:35; Ledoyer, 1972:229, pl. 45; 1978:279; 1979:80; Surya Rao, 1972:196; Ortiz, 1978:8.

Material. AM P30117 to AM P30122 from the following stations: 75 LIZ 1-5 (3), 76 LIZ A (13), 76 LIZ B (10), 76 LIZ 16 (2), L1-16 (3), L1-48 (1).

Diagnosis. Head with anteroventral cephalic corner produced as sharp cusp, lacking cheek notch; coxa 1 anteroventral corner smoothly rounded, posteroventral corner notched; gnathopods 2 symmetrical; gnathopod 2 palm transverse with defining tooth projecting beyond palmar margin, palmar margin spinous with 2 distal sinuses; dactylus of peraeopods with accessory tooth; third pleonal epimeron posterior margin entire; uropod 3 rami subequal, truncate, 1.2 times as long as peduncle; telson wider than long, deeply cleft, apices truncate bearing 4-5 spines.

Remarks. The fully developed palm of gnathopod 2 in both male and female *M. quadrimana* is transverse with 2 sinuses and 3 truncate processes, plus a sinus adjacent to the defining tooth. The 2 distal sinuses on the palm (i.e. not the sinus adjacent to the defining tooth) show considerable variation in development. Sivaprakasam (1966) found specimens of 3-4 mm with an evenly convex palm although J.L. Barnard (1970) figured a 3.3 mm male with the sinuses of the fully developed palm. J.L. Barnard (1970) also figured a 5.0 mm female lacking sinuses with an evenly convex palm.

In the material examined a male of 3.7 mm showed the sinuses beginning to develop and a 4.5 mm male

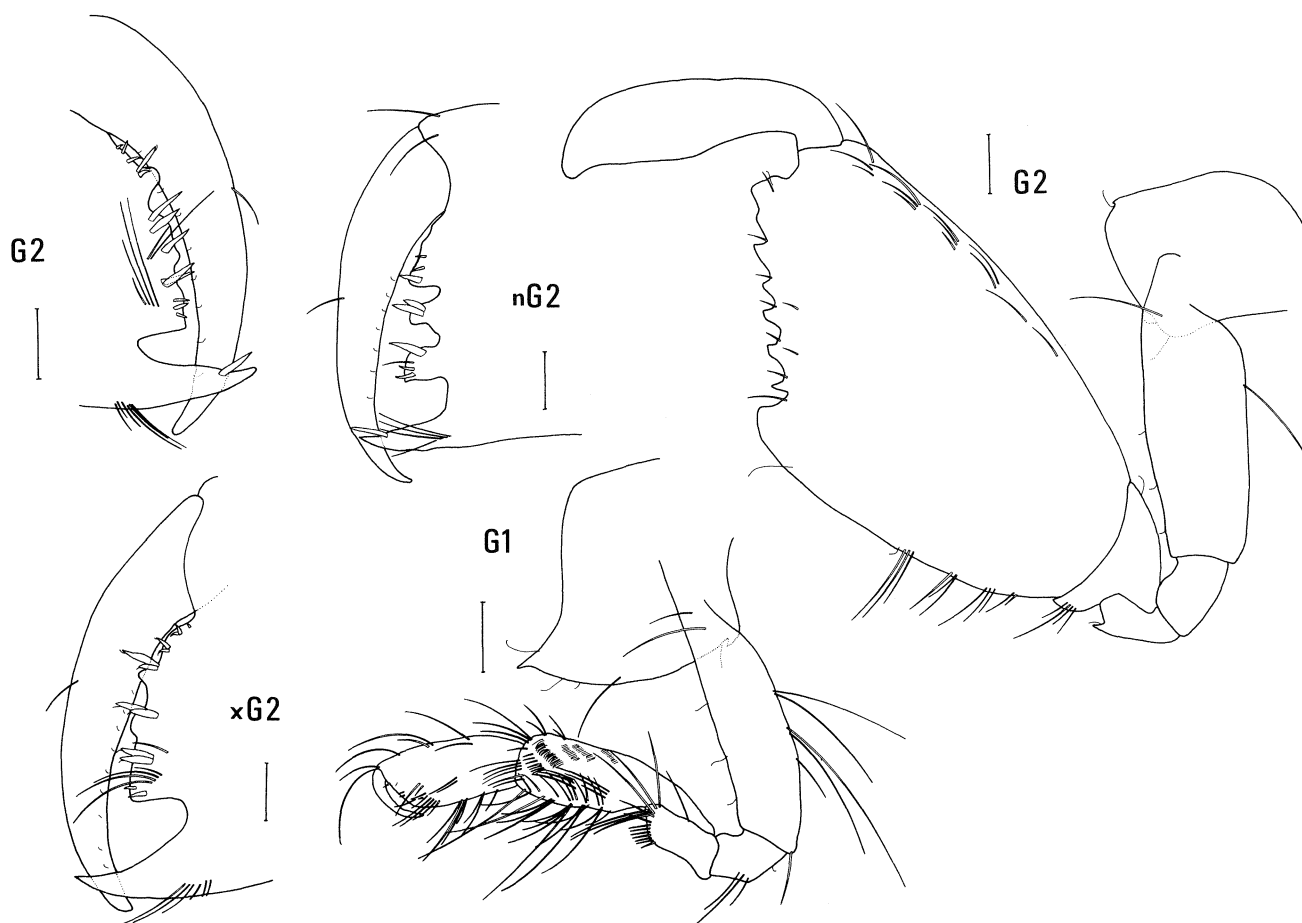


Fig. 22. Three illustrations at left: detail of palm of 2nd gnathopod, *Maera quadrimana* (Dana), female, 3.9 mm, 76 LIZ B; n = female, 5.4 mm, 76 LIZ B; x = female, 4.3 mm, 76 LIZ B. Two illustrations at right: *Maera octodens* Sivaprakasam, male, 4.8 mm, LI-59.

showed the fully developed palm. A female of 3.9 mm had a fully developed palm but females of 4.3 mm and 5.4 mm had palms with very shallow sinuses.

Maera quadrimana was collected in samples of reef rock, dead coral *Pocillopora*, algae including brown algae, *Dictyota* and green algae *Chlorodesmis*, coral rubble and silt from Lizard Island in depths up to 12 metres.

Distribution. Fiji (type locality); Micronesia; Gilbert Islands; Hawaii; Madagascar; Mauritius; Bay of Bengal; Cuba; Lizard Island.

***Maera reishi* Barnard, 1979**

Fig. 23

Maera reishi J.L. Barnard, 1979:83-86, figs 45-47.

Material. AM P30094, AM P30159 and AM P30160 from the following stations: 75 LIZ 4-3 (1), 76 LIZ A (8), 76 LIZ B (16).

Diagnosis. Head with anteroventral cephalic corner produced as sharp cusp, lacking cheek notch; coxa 1 anteroventral corner smoothly rounded, posteroventral corner notched; gnathopods 2 symmetrical; gnathopod

2 palm transverse with defining tooth projecting beyond palmar margin, palmar margin spinous with sinus midway; dactylus of peraeopods with accessory tooth; third pleonal epimeron posterior margin entire; uropod 3 rami subequal, truncate, 1.2 times as long as peduncle; telson wider than long, cleft 70%, inner margins produced to apical tooth, apices armed with 3-5 spines of varying lengths, longest spines longer than telson.

Remarks. The species within the “*quadrimana* complex” (J.L. Barnard, 1972b) of *Maera* usually show considerable variation in the palm of gnathopod 2 and this is true of *M. reishi* from the Lizard Island material. The undeveloped gnathopod has an evenly convex palm with an incision adjacent to the defining tooth, and the dactylus lacks the inner acclivity. The developed palm exhibits two forms; the deep sinus midway along the palm may be either quadrate or concave. Both forms have a strong inner dactylar acclivity and both forms are found amongst males and females. The material illustrated by J.L. Barnard (1979) showed only the concave form in the developed palm of gnathopod 2, and the sinus appears shallower.

A 3.9 mm male was found with unequal second gnathopods. The left second gnathopod was smaller

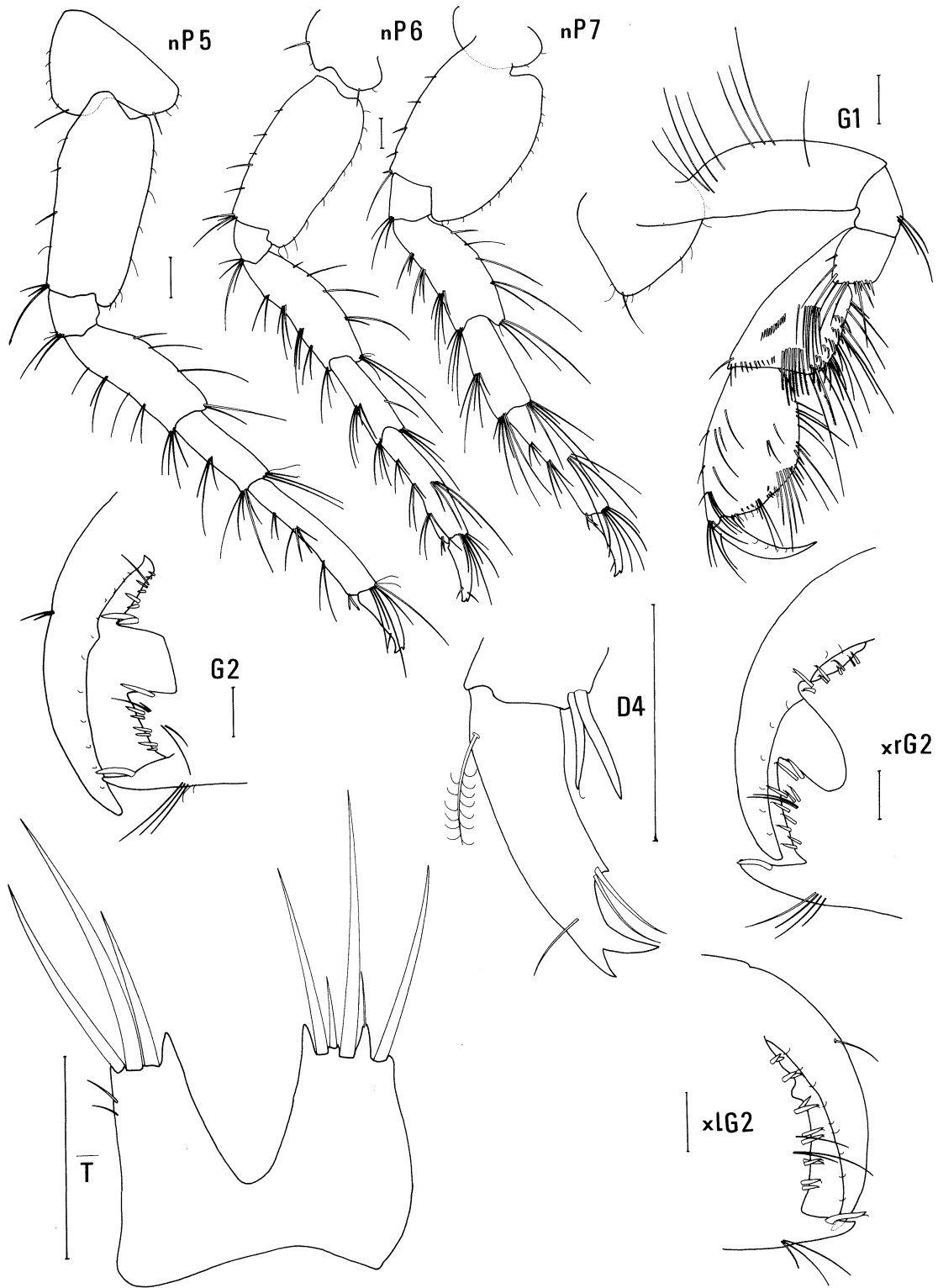


Fig. 23. *Maera reishi* Barnard, female, 4.8 mm, 76 LIZ B; n = male, 4.8 mm, 76 LIZ B; x = male, 3.9 mm, 76 LIZ B. Scale lines represent 0.1 mm.

than the right and had a poorly developed palm, suggesting that it was undergoing regeneration. The mid-sinus of the palm was small, concave and shallow, and the dactylus lacked an inner acclivity. The palm of the right gnathopod had a deep sinus of the concave form and the dactylus had a strong inner acclivity. J.L. Barnard (1970) observed a similar phenomenon in a small male *M. quadrimana* from Hawaii.

J.L. Barnard (1979) found that *M. reishi* at the northern limit of its range in California reached a length just less than 7 mm, and to the south in Mexican waters the species was less than 5 mm in length. In the material examined from Lizard Island and adjacent reefs, *M. reishi* reached 5.6 mm in length.

In the material at hand *M. reishi* has a narrow article 2 on pereopods 5 and 6 (0.4 times as wide as long), but a wider ovate article 2 on pereopod 7 (0.7 times as wide as long). This character was used to separate *M. reishi* from *M. quadrimana* for those specimens with an undeveloped palm. *Maera quadrimana* has article 2 of pereopods 5-7 narrow. Schellenberg (1938) used the differences of article 2 of pereopods 5-7 to separate *M. quadrimana* from *M. pacifica*, which has article 2 of pereopods 5-7 ovate.

Maera reishi was found in reef rock samples covered with algae including green algae *Chlorodesmis* from Lizard Island in depths to 18 metres.

Distribution. Gulf of California (type locality, Isla Espiritu Santo); Galapagos Islands; California; Lizard Island.

Maera serrata Schellenberg, 1938

Fig. 24

Maera tenella. Walker, 1904:272, pl. 5, fig. 31; Tattersall, 1922:8; Pirlot, 1936:309 (*vide* Sivaprakasam, 1966).

Maera sp.—K.H. Barnard, 1931:124.

Maera inaequipes serrata Schellenberg, 1938:41-42, fig. 18.—J.L. Barnard, 1962:99, 1965:510; Sivaprakasam, 1966:100-101, 1968:35; Surya Rao, 1972:194.

Maera serrata.—J.L. Barnard, 1970:155-156, figs 96, 97; 1971:77, 84, figs 38, 40, 41; 1972b:107; Ledoyer, 1972:229, 231, pl. 46; 1978:279; Griffiths, 1973:286; Ortiz, 1978:8.

Material. AM P30127 to AM P30132 from the following stations: 75 LIZ 3-3 (1), 76 LIZ A (1), 87 LIZ B (3), L1-1 (8), L1-11 (1), L1-50 (1).

Diagnosis. Head with anteroventral cephalic corner produced as sharp cusp, lacking cheek notch; coxa 1

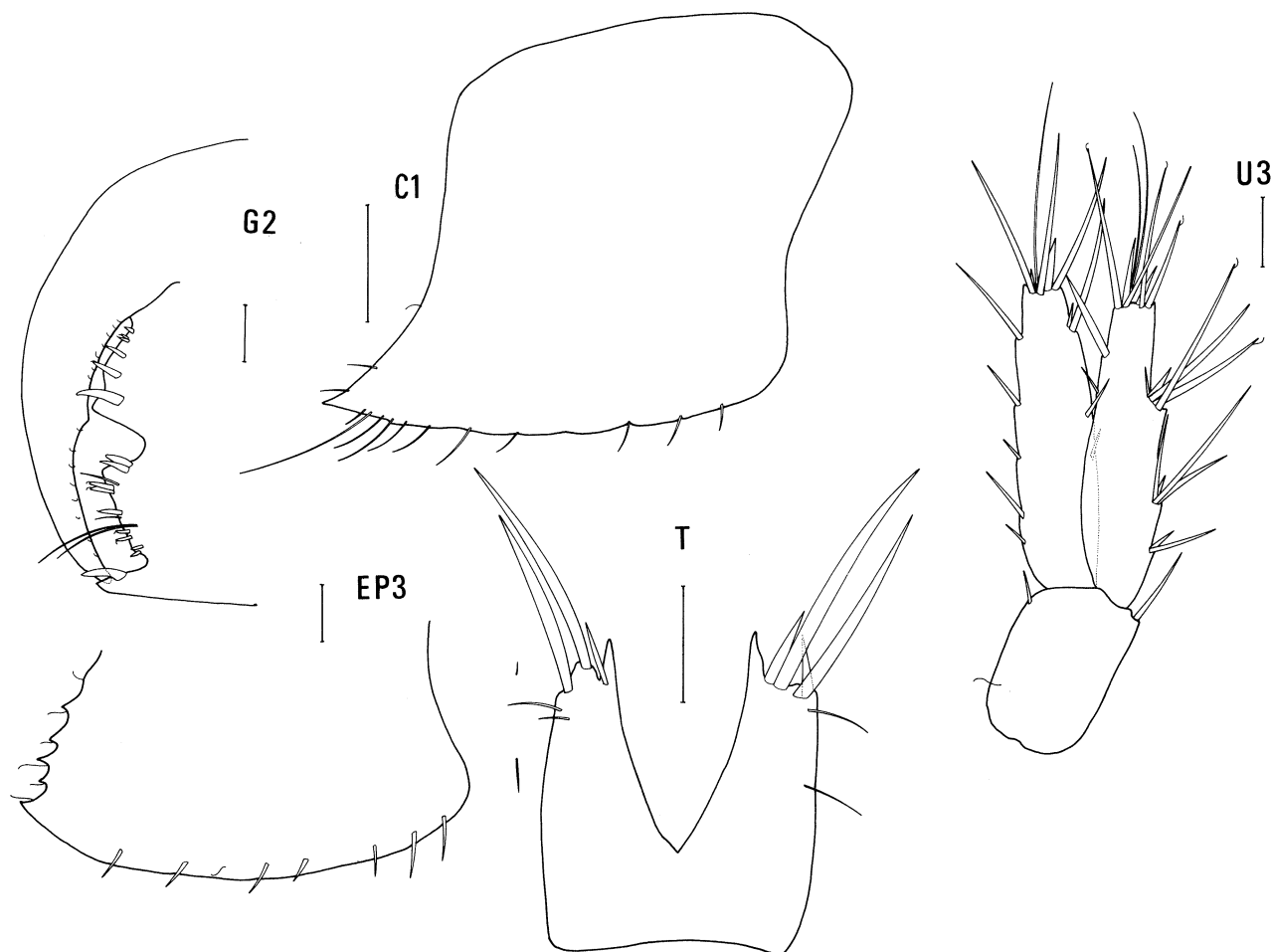


Fig. 24. *Maera serrata* Schellenberg, female, 4.8 mm, 76 LIZ A. Scale lines represent 0.1 mm.

anteroventral corner drawn to acute point, lacking posteroventral notch; gnathopods 2 symmetrical; gnathopod 2 palm transverse with defining tooth projecting beyond palmar margin, palmar margin spinous with sinus midway; dactylus of peraeopods with accessory tooth; third pleonal epimeron posterior margin serrate; uropod 3 rami equal, 1.6 times as long as peduncle; telson longer than wide, cleft 70%, inner margins produced to apical tooth, apices armed with 2-3 spines.

Remarks. The palm of gnathopod 2 in *M. serrata* may show considerable variation in its development. In the original description Schellenberg (1938) figured a 5 mm male with a rounded sinus opposite the dactylar acclivity, plus a sinus adjacent to the defining tooth. He noted that a 5 mm ovigerous female had the rounded sinus but it was slightly smaller than that of the male. J.L. Barnard (1970) figured a 5.4 mm female with an evenly convex palm lacking any sinuses. He noted that the males in his collection also had shallower sinuses in the middle of the palm than those in Schellenberg's material. Sivaprakasam (1966) found specimens up to 6 mm in length with only a small sinus in the mid-palm.

In the material I examined the palm is well developed. Females of 4.6 mm and 4.8 mm have a palm similar to that figured by Schellenberg (1938) for the male.

In the material at hand coxa 1 is more strongly produced anteriorly than shown by J.L. Barnard (1970). The posterior border of the third pleonal epimeron is more strongly serrate than that figured by Schellenberg (1938) and resembles J.L. Barnard's (1970) figure.

Maera serrata was found in reef rock, dead coral and algal samples from Lizard Island in depths to 12 metres.

Distribution. Micronesia (type locality, Gilbert Islands); Hawaii; Madagascar; Mauritius; Bay of Bengal; east coast of South Africa; Cuba; Abrolhos Islands; Lizard Island.

Genera *Mallacoota* Barnard and *Pareiasmopus* Stebbing

The genus *Pareiasmopus* erected by Stebbing (1888) includes those species with dorsal carinae on urosomite 1, with a short article 2 of the mandibular palp and the ventroposterior margin of epimeron 3 serrate.

Another flock of species with bicarinate urosomite 1 was contained within the genus *Maera*, and, in keeping with the diagnosis of that genus, has article 2 of the mandibular palp longer than article 1 and the ventral margin of epimeron 3 entire. J.L. Barnard (1972a) argued that the bicarinate "maeras" warranted generic segregation and so erected the genus *Mallacoota*, which includes *M. diemenensis* (Haswell), *M. subcarinata* (Haswell), *M. insignis* (Chevreux), *M. latibrachium* (Walker), *M. odontoplax* (Pirlot), *M. carausui* Ortiz and *M. subinsignis* Ledoyer.

A bicarinate species was found in the material from Lizard Island and adjacent reefs that would not be placed in either *Mallacoota* or *Pareiasmopus* as defined by Barnard and Stebbing. The species has article 2 of the mandibular palp shorter than article 1, and the

ventral margin of the third pleonal epimeron entire. It is here placed in *Mallacoota* (*M. balara* n.sp.) because the mandibular palp is of the *Mallacoota* form despite the fact that article 2 is shorter than article 1. The 3-articulate mandibular palp in *Mallacoota* has a form which is distinct from that of *Pareiasmopus*.

The *Pareiasmopus* palp is described as follows: article 1 curves around the upper lip, widens distally, and is longer than article 2; article 2 is geniculate; article 3 is linear and does not have a medial comb row of setae.

The *Mallacoota* palp has article 1 linear and not curved around the upper lip; article 2 is not geniculate; article 3 is linear and does not have a medial comb row of setae. J.L. Barnard's (1972a) original diagnosis of the genus *Mallacoota* stated "article 2 never shorter than 1 but article 1 occasionally as long as article 2". However, because *Mallacoota balara* has a palp of the *Mallacoota* form, and has the ventral margin of epimeron 3 entire, it is proposed that the diagnosis of the mandibular palp for the genus should be: *article 2 may be shorter, equal to, or longer than article 1*.

Although the genus *Mallacoota* was erected for the bicarinate maeras, J.L. Barnard's diagnosis for the genus allowed the mandibular palp to be either absent, 1-articulate, or 3-articulate. Lowry and Fenwick (1983) are erecting a new genus to include the species of *Mallacoota* that have a 1-articulate mandibular palp.

The species of *Mallacoota* recorded from Australia are *M. diemenensis* and *M. subcarinata* from south-eastern Australia (J.L. Barnard, 1972a) and *M. balara* n.sp. from the Lizard Island material.

Sheard (1937) listed *Pareiasmopus suluensis* (Dana) as the only species of *Pareiasmopus* recorded in Australia. Stebbing (1888) recorded *P. suluensis* from Torres Strait near Cape York (10°30'S, 142°18'E) and Chilton (1922) recorded *P. suluensis* from north-western Australia. Stebbing (1888), however, stated that his species had dorsal teeth on peraeonite 7, and therefore incorrectly attributed it to *P. suluensis*. Chilton (1922) made the same error, so there is no valid record of *P. suluensis* from Australia.

J.L. Barnard (1972a) recorded three species of *Pareiasmopus* from Australia: *P. setiger* Chevreux from Torres Strait, *P. echo* Barnard from off Bunbury and *P. ya* Barnard from Cockburn Sound. *Pareiasmopus setiger* was described by Chevreux (1901) from the Seychelle Islands and Barnard (1972a) synonymized *Megamoera suensis* Haswell, 1880b with *P. setiger*. Barnard used the junior synonym because he regarded Haswell's original description as "too sparse for positive identification". *Megamoera suensis* was described from the Sue Islands in Torres Strait.

Later, J.L. Barnard (1974) reported differences between *P. setiger* and *P. suensis* and so revived Haswell's species. An examination of Chevreux's type material confirmed that *P. setiger* differs from *P. suensis*.

The material from Lizard Island and adjacent reefs included *P. echo* Barnard and *P. suensis* (Haswell). This

is the first record of *P. echo* from the east coast of Australia.

Mallacoota balara n.sp.

Figs 25, 26

Type material. HOLOTYPE, male, 6.4 mm, AM P30133; ALLOTYPE, 6.8 mm, AM P30134; 2 PARATYPES AM P30135; fringing reef, between Bird Islet and South Island, Lizard Island (14°42'S, 145°28'E), from reef rock, 12 m depth, P.A. Hutchings, 1 August 1977, 76 LIZ A; 1 PARATYPE, male, AM P30136, reef back, Yonge Reef (14°36'S, 145°37'E), from dead *Acropora*, 5 m depth, P.B. Berents and P.A. Hutchings, 7 January 1975, 75 LIZ C-1; 4 PARATYPES, AM P30137; 1 PARATYPE, USNM 190701, off Mangrove Beach, Lizard Island (14°41'S, 145°27.6'E) from mixed algae, 2 m depth, J.K. Lowry, 28 September 1978, LI-1; 2 PARATYPES, AM P30138, type locality, P.A. Hutchings, 6 November 1976, 76 LIZ A; 1 PARATYPE, USNM 190700, off Chinaman's Head, Watson's Bay, Lizard Island (14°40'S, 145°27'E), from reef rock, 7 m depth, P.A. Hutchings, 7 November 1976, 76 LIZ B.

Additional material. AM P30139 to AM P30153 from the following stations: 75 LIZ 5-1 (1), 75 LIZ 7-3 (1), 75 LIZ 13-2 (2), 75 LIZ C-1 (2), 75 LIZ 0-3 (1), 75 LIZ S-2 (5), 76 LIZ A(36), 76 LIZ B(24), 76 LIZ 16(5), LI-1(9), LI-16(1), LI-48 (4), LI-50 (5), LI-61 (10), LI-62 (9).

Diagnosis. Article 2 of mandibular palp 0.8 times as long as article 1; coxae 1-4 with ventral margin notched posteriorly; article 2 of male gnathopod 2 wide; article 6 of male gnathopod 2 with oblique palm defined by cusp bearing setae, palmar margin with proximal and distal shallow sinuses; pleonites 1-3 lack dorsal teeth; posteroventral corner third pleonal epimeron produced to form a cusp, posterior and ventral margins entire; outer and inner rami of uropod 3 equal, 1.2 times as long as peduncle; telson cleft midway, notched apices bearing 3 spines.

Description. Holotype male, 6.4 mm. *Head* as long as first two peraeonites, anteroventral corner notched, eye almost filling lobe, dark brown in alcohol. *Antenna 1* twice as long as antenna 2; article 1 with distal spine, article 2 subequal to article 1, article 3, 0.3 times as long as article 1; flagellum 1.5 times as long as peduncle, 21-articulate; accessory flagellum 3-articulate, article 3 small, almost extending to end of article 2 of primary flagellum. *Antenna 2* peduncle longer than flagellum, article 3 longest; flagellum 8-articulate.

Mandible with incisor and 4 accessory blades; lacinia mobilis with 5 teeth; molar triturating; mandibular palp 3-articulate, article 2, 0.8 times as long as article 1, article 3 equal to article 1. *Maxilla 1*: inner plate with 2 plumose apical setae and fine marginal setae; outer plate armed with 3 bifid and 4 serrate spine teeth; palp 2-articulate, article 2 with apical and distal inner marginal setae. *Maxilla 2*: inner and outer plates with distal setae. *Maxillipeds*: inner plate with fine plumose apical and inner marginal setae; outer plate with stout plumose apical setae; palp 4-articulate, articles 2 and 3 sparsely setose.

Gnathopod 1: coxa 1.3 times as long as wide, posteroventral notch bearing seta, ventral margin

sparsely setose; article 5, posterior margin densely setose, two medial groups of setae; article 6 equal to article 5, tufts of setae spaced along posterior margin, medial comb row of setae, oblique palm defined by stout spine, palmar margin bearing setae and small spines; dactylus slender, extends beyond palm. *Gnathopod 2* stouter, more robust than gnathopod 1; coxa 1.3 times as long as wide, posteroventral notch bearing seta, ventral margin sparsely setose; article 2 wide, 0.5 times as wide as long; article 3 bearing two prominent carinae on dorsal surface; article 5 compressed, stout anteroventral spine, smaller proximal spine, posterior margin densely setose, some pectinate setae; article 6, 1.8 times as long as wide with 5 superior medial spines, posterior margin bearing tufts of setae, oblique palm defined by cusp bearing setae, palmar margin with proximal and distal shallow sinuses, protrusion bearing spine and setae separating sinuses, distal palmar margin bearing 3 stout spines and setae; dactylus extending beyond defining cusp.

Peraeopod 3: coxa 1.5 times as long as wide, posteroventral corner notched, ventral margin sparsely setose; article 4 widening distally, anterior margin with 2 spines, posterior margin sparsely setose; article 5 subequal to article 4, posterior margin spinous; article 6, 1.4 times as long as article 5, posterior margin spinous, distal pair of striate locking spines; dactylus apically constricted, bearing a seta and setule at constriction, a seta and plumose seta on anterior margin. *Peraeopod 4*: very similar in size and proportion to peraeopod 3 except coxa not posteroventrally notched but posteriorly produced. *Peraeopod 5*: coxa bilobed ventrally, 0.7 times as wide as long; article 2 ovate, 0.8 times as wide as long, distal anterior margin spinous, posterior margin sparsely setose; article 4, posterior and anterior margins extended ventrally, margins spinous; article 5, 0.8 times as long as article 4; article 6, 1.5 times as long as article 4, anterior margin spinous, posteroventral corner bearing spines and setae; dactylus stout, apically constricted, bearing seta and setules at apical constriction. *Peraeopod 6* similar to peraeopod 5 but longer, stouter and more setose; coxa not bilobed ventrally; articles 4, 5 and 6 wider. *Peraeopod 7* same size and proportions as peraeopod 6.

Third pleonal epimeron: posteroventral corner produced to form a cusp, posterior and ventral margins entire, ventral margin bearing 3 spines.

Urosomite 1 dorsally bicarinate. *Uropod 3*: distal margin of peduncle spinous; outer ramus 1.2 times as long as peduncle with apical spines, spines along inner and outer margins; inner ramus equal to outer ramus, apical spines and a seta, outer margins spinous. *Telson* cleft midway, apices notched, bearing 3 spines.

Allotype female, 6.8 mm. Similar to male except in following ways: *Gnathopod 2* more slender; coxa 1.7 times longer than wide; article 2 not broad, 0.3 times as wide as long; article 5 not compressed, 0.8 times as long as article 6, spines on anterior margin absent; article 6, 2.2 times as long as wide with superior and inferior medial setae, oblique palm defined by two

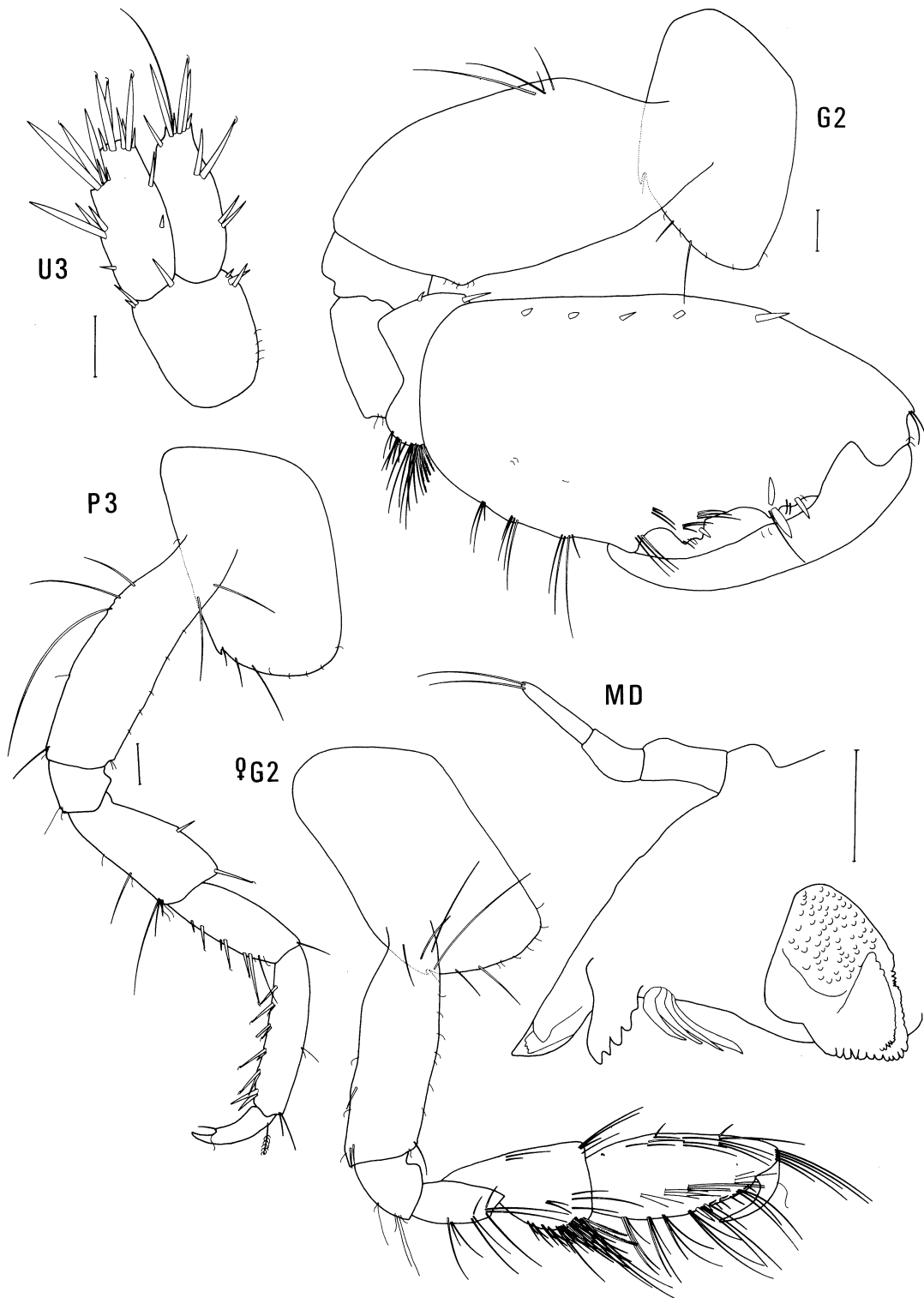


Fig. 25. *Mallacoota balara* n.sp., holotype, male, 6.4 mm, 76 LIZ A; female = allotype, 6.8 mm, 76 LIZ A. Scale lines represent 0.1 mm.

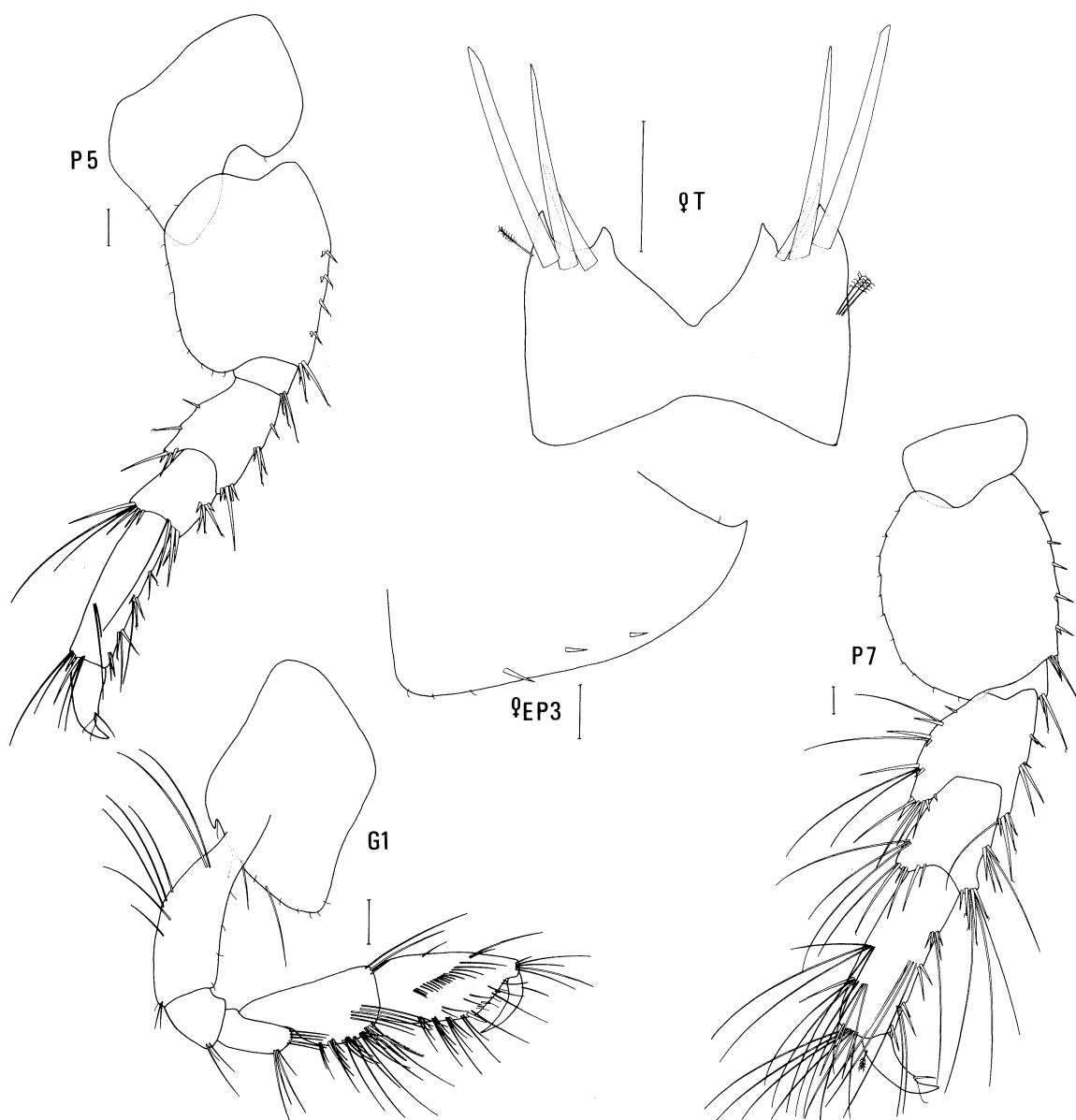


Fig. 26. *Mallacoota balara* n.sp., holotype, male, 6.4 mm, 76 LIZ A; female = allotype, 6.8 mm, 76 LIZ A. Scale lines represent 0.1 mm.

unequal spines, palm lacks sinuses, bears short setae; dactylus slender, reaches defining spines. *Peraeopods 6 and 7*: similar size to male except more slender and less setose.

Variation. The number of articles in the accessory flagellum of antenna 1 is constant, but the accessory flagellum varies in length relative to the primary flagellum, from as long as first article of the primary flagellum to as long as the first three articles of the primary flagellum. The palm of gnathopod 2 of smaller males has shallower sinuses. *Peraeopods 6 and 7* of males greater than 4.9 mm in length are much more setose than in smaller males. Some specimens have a terminal seta from both outer and inner rami of uropod

3 suggesting that this may be broken in the holotype. Article 2 of the mandibular palp varies from 0.6 times as long as article 1, to 0.8 times as long as article 1.

Remarks. The specific epithet *balara* is the name of one of the Aboriginal tribes in the Cape Flattery area.

Mallacoota balara is closely related to *Mallacoota latibrachium* (Walker), described from the Maldive and Laccadive Archipelagoes. The mandibular palp of *M. latibrachium* has article 1 "scarcely shorter than" article 2 (Walker, 1906). Both *M. latibrachium* and *M. balara* have poorly setose male second gnathopods. The male second gnathopod of *M. latibrachium* has a wide article 2 as seen in *M. balara*, but article 6 has small tubercles over the distal surface. The palm is oblique but lacks

sinuses. Walker's description (1906) of peraeopods 5-7 of a 5 mm specimen, suggests that they are less setose than peraeopods 5-7 of *M. balara*. The uropods of both species have subequal rami longer than the peduncle. The telson of *M. latibrachium* is cleft to the base but *M. balara* has the telson cleft midway.

Mallacoota balara was found in dead coral *Acropora* and reef rock covered with coralline algae

Lithothamnion from the reef back at Yonge Reef in depths from 2 to 5 metres. At Lizard Island *M. balara* was found in dead coral *Acropora* and reef rock covered with coralline algae *Lithothamnion* and green algae *Chlorodesmis*, in samples of brown algae *Dictyota* and coral rubble from subtidal to 15 metres.

Distribution. Lizard Island (type locality); Yonge Reef.

Key to the Genus *Mallacoota*

1. Posterior margin of pleonites 1-3 bearing 2 mid-dorsal teeth 2
— Posterior margin of pleonites 1-3 dorsally smooth 3
2. Article 6 of male second gnathopod densely setose; article 2 of peraeopod 7 has posterior margin crenulate *M. diemenensis* (Haswell, 1880a)
— Article 6 of male second gnathopod poorly setose; article 2 of peraeopod 7 has posterior margin smooth *M. carausui* Ortiz, 1976
3. Article 6 of male second gnathopod densely setose 4
— Article 6 of male second gnathopod poorly setose 5
4. Articles 4 and 5 of male peraeopods 6 and 7 wider than long; palm of gnathopod 2 not distinct *M. insignis* (Chevreux, 1901)
— Articles 4 and 5 of male peraeopods 6 and 7 longer than wide; palm of gnathopod 2 distinct *M. subcarinata* (Haswell, 1880a)
5. Articles 4 and 5 of male peraeopods 6 and 7 wider than long
..... *M. subinsignis* Ledoyer, 1979
— Articles 4 and 5 of male peraeopods 6 and 7 longer than wide 6
6. Male second gnathopods medial face with small tubercles increasing in size distally *M. latibrachium* (Walker, 1906)
— Male second gnathopods medial face without small tubercles 7
7. Male second gnathopods medial face shallowly excavate
..... *M. odontoplax* (Pirlot, 1936)
— Male second gnathopods medial face not shallowly excavate, palmar margin with 2 shallow sinuses *M. balara* n.sp.

Pareiasmopus echo Barnard, 1972

Fig. 27

Pareiasmopus echo J.L. Barnard, 1972a:242, 255-258, figs 148, 149.

Material. AM P30154 to AM 30158 from the following stations: 76 LIZ B (1), LI-28 (2), LI-30 (1), LI-50 (4), LI-52 (2).

Diagnosis. Article 2 of peraeopods 5-7 with acute posteroventral lobe, posterior margin deeply serrate; pleonite 3 posterior margin with 2 weak dorsal teeth.

Remarks. J.L. Barnard (1972a) described *P. echo* from 3 specimens collected in south-western Australia. The material at hand shows some variation from that described by J.L. Barnard (1972a).

The greatest variation is seen in coxae 1-4. The original description states "coxa 1 extended forward

weakly and ending in a sharp point, coxae 2-4 also with small anteroventral point, posteroventral corners of coxae 1-4 weakly serrate". In the material at hand both males (size range 4.8 mm – 10.5 mm) and females 4.3 mm – 5.6 mm) were examined and the following variation noted. Coxa 1 was found to have an anteroventral point and a strongly serrate posteroventral corner. The anteroventral corner of coxae 2-4 ranged from smoothly rounded to pointed. The posteroventral corner of coxa 2 ranged from smooth to strongly serrate. The posteroventral corner of coxae 3 and 4 ranged from notched to serrate.

The palm of the male second gnathopod also showed some variation from that in the original description. The palm of a 4.8 mm male is very similar to that shown by J.L. Barnard (1972a) for a 14.0 mm male. However, the palm of a 10.5 mm male in the material examined

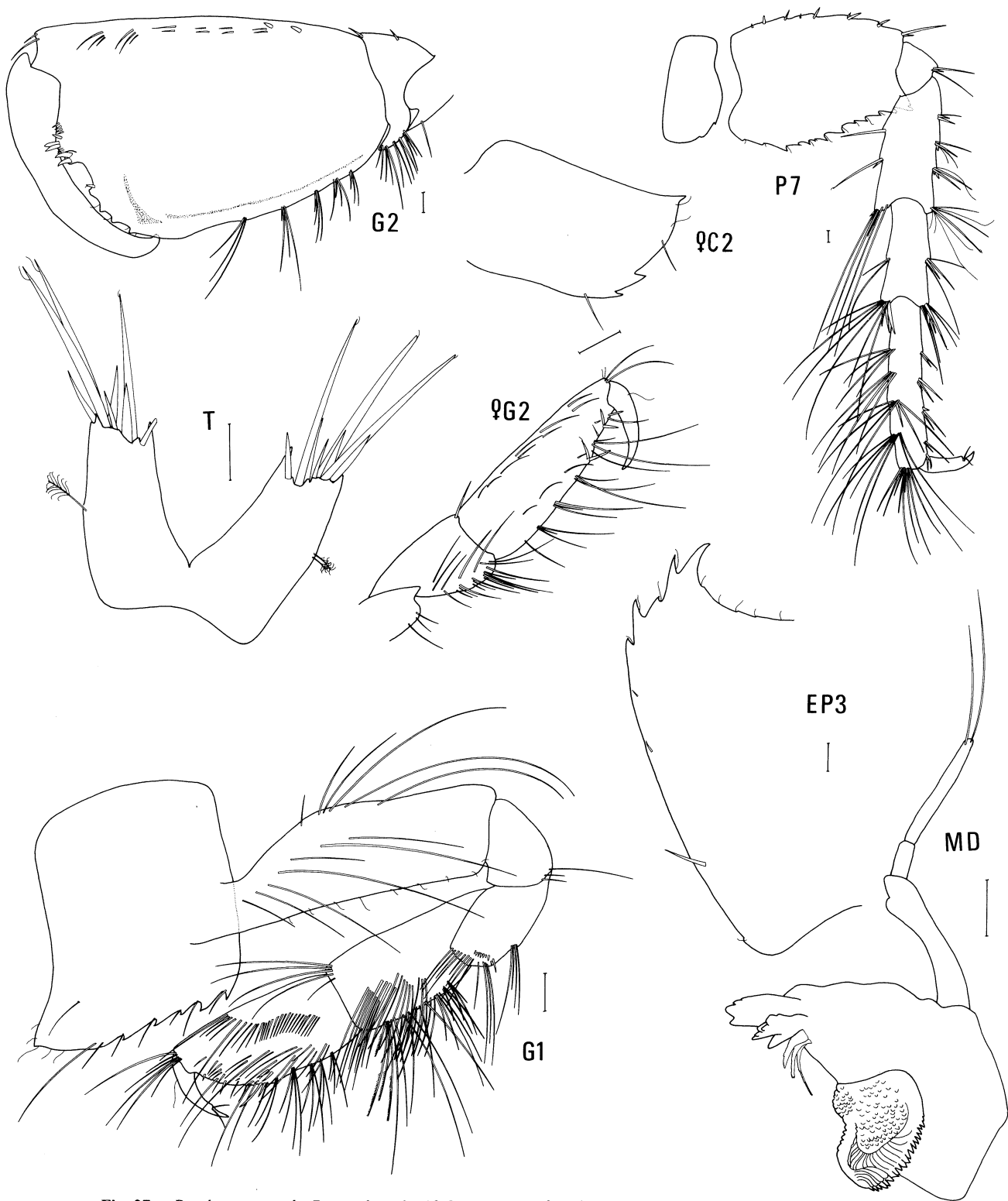


Fig. 27. *Parelasmopus echo* Barnard, male, 10.5 mm, LI-50; female, 5.0 mm, LI-28. Scale lines represent 0.1 mm.

is not strongly oblique and has a quadrate sinus in the middle rather than a "long shallow hollow" (J.L. Barnard, 1972a).

Parelasmopus echo was found in the seagrass

Halophila, algae, including coralline *Halimeda*, sediment and reef rock samples from Lizard Island.

Distribution. South-western Australia (type locality, 11 kilometres SW of Bunbury); Lizard Island.

Pareiasmopus suensis (Haswell, 1880b)

Figs 28, 29

Megamoera suensis Haswell, 1880b:335-336, pl. 21, fig. 5.
Pareiasmopus suensis.—J.L. Barnard, 1974:143.

Type material. When Haswell described *Megamoera suensis* from Sue Island in Torres Strait he did not designate a holotype and he did not state the number of specimens examined. One specimen of *Megamoera suensis* from Haswell's material is now lodged in the Australian Museum and mounted on 7 microscope slides (AM P18499). The specimen is from the Sue Island collection examined by Haswell and is one of the type series. In order to stabilize the name *Pareiasmopus suensis*, the specimen (AM P18499) is herein described and established as a lectotype.

Additional material. AM P30208 to AM P30211 from the following stations: 75 LIZ E-1 (1), 75 LIX F-1 (1), 75 LIZ N-1 (1) and 78 LIZ-PBW-9 (1).

Diagnosis. Article 2 of pereopods 5-7 with obtuse posteroventral lobe, posterior margin weakly serrate; pleonite 3 posterior dorsal margin smooth.

Description. Lectotype male. *Antenna 1*: article 1 of peduncle with 4 ventral spines; accessory flagellum 4-articulate, article 4 small, extending halfway along article 3 of primary flagellum.

Mandible with incisor and 4 accessory blades; lacinia mobilis with 4 teeth; molar triturating. *Maxilla 1*: inner plate with 2 plumose apical setae and fine marginal setae; outer plate armed with 7 spine teeth; palp 2-articulate, distally setose. *Maxilla 2*: inner and outer plates with distal setae.

Gnathopod 1: coxa 0.8 times as wide as long, anteroventral corner slightly produced with subacute point, ventral margin notched; article 4 posteroventral corner subacute; article 5, anterior margin 2.7 times as long as ventral margin, anteroventral corner setose, posterior margin setose, ventral margin with submarginal setae extending across article 6; article 6 elongate with medial comb row of setae. *Gnathopod 2*: larger, more robust than gnathopod 1, coxa with subacute anteroventral corner, ventral margin notched posteriorly; article 4 produced ventrally to sharp point;

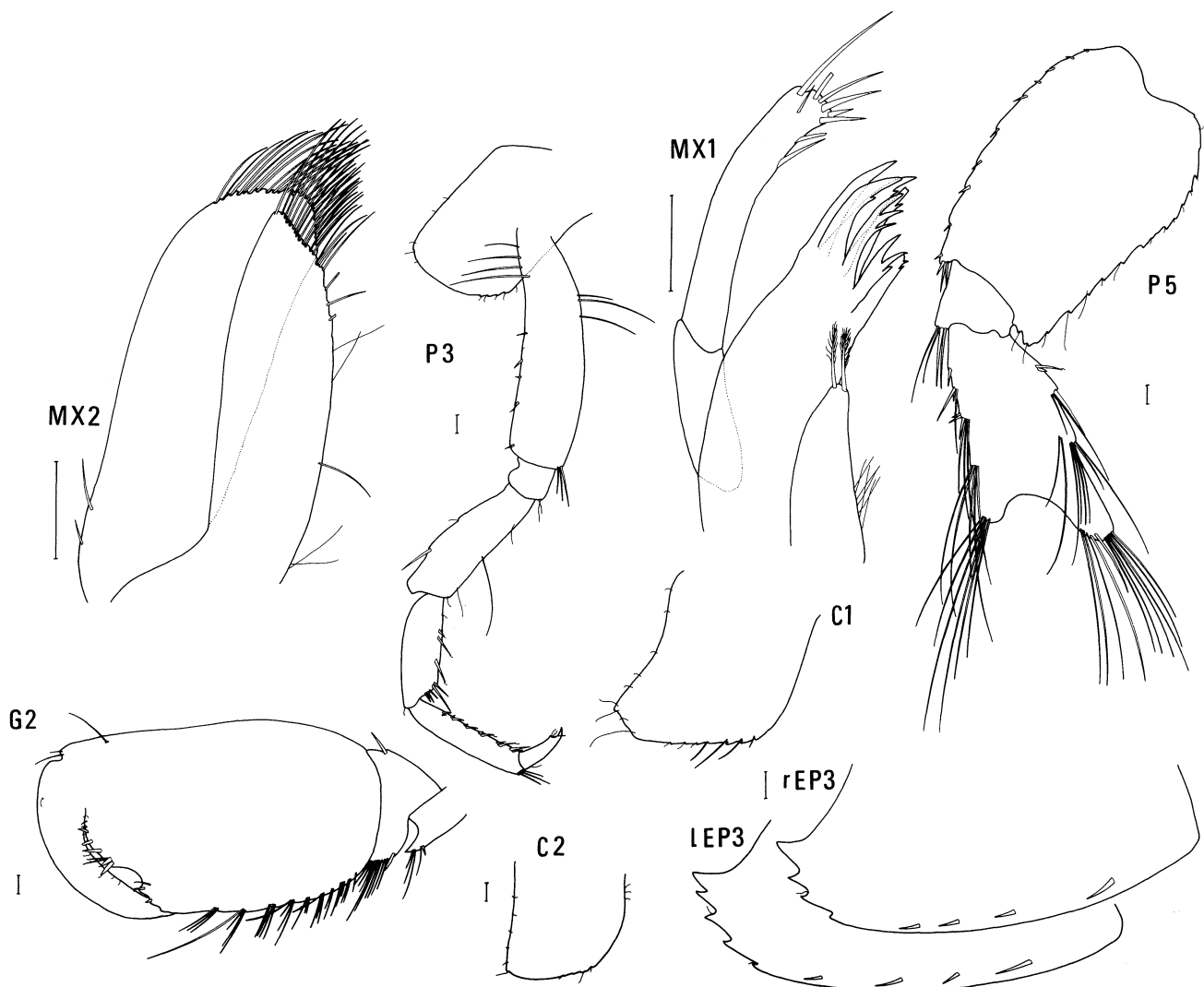


Fig. 28. *Pareiasmopus suensis* (Haswell), lectotype, male, Sue Island, Torres Strait. Scale lines represent 0.1 mm.

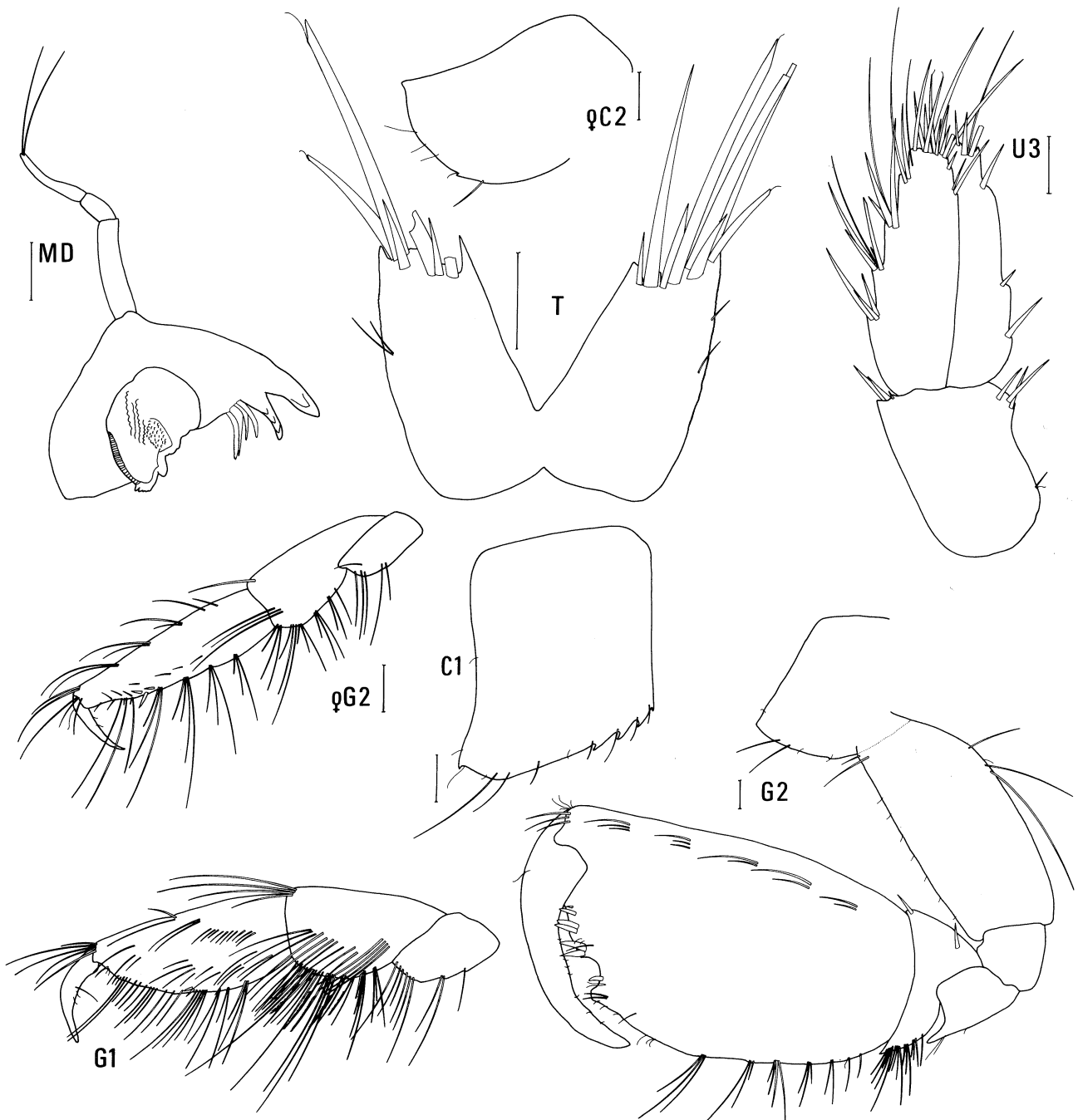


Fig. 29. *Parelasmopus suensis* (Haswell), male, 6.8 mm, 75 LIZ F-1; female, 5.6 mm, 75 LIZ E-1. Scale lines represent 0.1 mm.

article 5 compressed, anterior margin with stout spine, posterior margin densely setose; article 6 stout, posterior margin with tufts of setae, palm oblique with mid-palmar sinus, palmar margin spinous; dactylus inner margin sparsely setose.

Peraeopod 3: coxa with anteroventral corner rounded, posteroventral corner weakly notched; article 4 anteroventral corner broadly expanded; articles 5 and 6 posterior margin spinous; dactylus apically constricted with 3 setules at constriction. *Peraeopod 4*: very similar

size and proportions to peraeopod 3 except coxa 4 wider than coxa 3. *Peraeopod 5*: article 2 anterior margin spinous, posterior margin weakly serrate and sparsely setose; article 4 anterior and posterior margins setose and spinous.

Right third pleonal epimeron: ventral margin with 4 spines, posteriorly serrate with 4 teeth. *Left third pleonal epimeron*: ventral margin with 4 spines, posteriorly serrate with 5 teeth.

Male, 6.8 mm. *Head* not quite as long as first two peraeonites, cheek notch slightly gaping, anteroventral corner sharply pointed, almost reaching tangent to ocular lobe. *Antenna 1*: flagellum longer than peduncle, peduncular article 1 bearing 2 ventral spines; accessory flagellum 3-articulate, article 3 small, extending halfway along article 3 of primary flagellum. *Antenna 2*: peduncle longer than flagellum; flagellum 9-articulate.

Mandible: palp 3-articulate, article 2, 0.4 times as long as article 1, article 3, 0.8 times as long as article 1, with 2 apical setae. *Maxillipeds*: inner plate with plumose apical setae; outer plate with apical spine teeth and marginal setae; palp 4-articulate, article 2 inner margin setose.

Gnathopod 1: ventral margin of coxa posteriorly serrate; article 4 posteroventral corner smoothly rounded; article 6 elongate, tapering distally, anteroventral corner setose, posterior margin setose, medial comb row of setae and other setae on medial face, oblique palm defined by pair of spines, confluent with posterior margin, palm setose; dactylus slender, curved. *Gnathopod 2*: anterior margin article 5 with 2 stout spines.

Peraeopod 5: less setose than lectotype; coxa wider than long, anterior half longer and smoothly rounded ventrally, posteroventral corner notched; article 4 anterior margin setose, posterior margin with 2 spines, posteroventral corner spinous and setose; article 6 anterior margin armed with groups of spines and long setae, posterior margin bearing groups of long setae, posteroventral corner with spines and setae; dactylus apically constricted with slight protrusion marking the constriction, a seta and setule at constriction. *Peraeonite 7* posterior margin with a pair of mid-dorsal teeth. *Peraeopod 7*: coxa, articles 5, 6 and dactylus missing; articles 2, 3 and 4 similar proportions to peraeopod 5 but larger.

Pleonites 1 and 2: posterior margin with 2 mid-dorsal teeth. *Pleonite 3*: posterior margin dorsally smooth. *Third pleonal epimeron*: ventral margin with 3 spines, posteriorly serrate with 4 teeth.

Urosomite 1 dorsally bicarinate. *Uropod 3*: distal margin peduncle spinous; outer ramus 1.4 times as long as peduncle, apically spinous, outer margin with groups of spines and setae; inner ramus equal to outer ramus, apically spinous, 3 spines spaced along inner margin. *Telson* cleft 77%, apices blunt, with inner and outer margins extended sharply, 6-8 apical spines with longest spines longer than telson.

Female, 5.6 mm. Similar to male except in following ways: *Gnathopod 1*: article 5 less setose; article 6 with fewer medial setae, palm defined by 3 spines. *Gnathopod 2*: coxa with stronger anteroventral tooth, stronger notch in ventral margin; article 4 posteroventral corner rounded, not produced; article 5 not compressed, dorsal margin twice as long as ventral margin; article 6 elongate, 3.5 times as long as wide, tapering distally, palm confluent with posterior margin defined by a stout

spine; dactylus slender. *Peraeopods 3 and 4*: articles 5 and 6 less spinous. *Peraeopod 5* less setose.

Remarks. *Pareiasmopus suensis* was found in reef rock and coral rubble at Yonge Reef in depths from 12 to 30 metres. Some samples of reef rock and coral rubble were covered with *Halimeda* and other coralline algae and others were devoid of algae.

Distribution. Sue Island, Torres Strait (type locality); Yonge Reef.

DISCUSSION

The Melitidae of the northern Barrier Reef are quite distinct from those of south-eastern Australia. Studies have not been published concerning the Melitidae from the southern portion of the Great Barrier Reef. The few published records of melitids from the east coast do not include any of the species from Lizard Island and adjacent reefs and therefore do not give any indication of the southern limits of the northern Barrier Reef fauna. Two species from south-western Australia were found in the Lizard Island area: *Pareiasmopus echo* and *Maera serrata*. *Maera serrata* has a wide distribution in the tropical and subtropical Indo-Pacific but *P. echo* was previously known only from south-western Australia. J.L. Barnard (1972a) did not record either of these species from southern Australia; this suggests that their distribution is around the north-western coastline to the Great Barrier Reef.

All species in the genus *Elasmopus* were found associated with algae and reef rock except *E. spinicarpus*, which occurred only in one sample taken from under stones at low tide. *Ceradocus oxyodus* and *C. woorree* were found with *E. spinicarpus*. The only Melitidae found in sediment were *C. woorree*, *Maera octodens* and *M. griffini*. The other species of *Maera*, *Pareiasmopus*, *Mallacoota balara*, *Dulichchiella appendiculata* and *Ceradocus yandala* occurred in samples from reef rock, algae and seagrasses.

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Appendix A: Station List

75 LIZ 1-2	Off Station Beach, Lizard Island, 6 January 1975, P.B. Berents and P.A. Hutchings, dead <i>Pocillopora</i> , 3 metres.
75 LIZ 1-5	Off Crystal Beach, Lizard Island, 14 January 1975, P.B. Berents and P.A. Hutchings, reef rock encrusted with sponge, <i>Lithothamnion</i> and brown algae, 11 metres.
75 LIZ 3-3	Off Crystal Beach, Lizard Island, 15 January 1975, P.B. Berents and P.A. Hutchings, reef rock encrusted with brown algae and alcyonarians, 18 metres.
75 LIZ 4-3	Off Coconut Beach, Lizard Island, 17 January 1975, P.B. Berents and P.A. Hutchings, reef rock encrusted with algae, 15 metres.
75 LIZ 5-1	Off NE face Lizard Island, 6 January 1975, P.B. Berents and P.A. Hutchings, dead <i>Acropora</i> heavily encrusted with <i>Lithothamnion</i> and brown algae, 9 metres.
75 LIZ 7-3	Reef back, Yonge Reef, 7 January 1975, P.B. Berents and P.A. Hutchings, flat plates of dead <i>Acropora</i> from bommie, P.B. Berents and P.A. Hutchings, 5 metres.
75 LIZ 13-2	Outer slope, Yonge Reef, 9 January 1975, P.B. Berents and P.A. Hutchings, reef rock with <i>Halimeda</i> and <i>Lithothamnion</i> , 36 metres.
75 LIZ C-1	Outer slope, Yonge Reef, 9 January 1975, P.B. Berents and P.A. Hutchings, reef rock with <i>Halimeda</i> and <i>Lithothamnion</i> , 30 metres.
75 LIZ D-1	
75 LIZ E-1	

75 LIZ F-1	Outer slope, Yonge Reef, 9 January 1975, P.B. Berents and P.A. Hutchings, coral rubble covered with <i>Halimeda</i> and other algae, 18 metres.	LI-21	Fringing reef, between Bird Islet and South Island, Lizard Island, 7 October 1978, J.K. Lowry, <i>Halophila</i> , mixed algae, <i>Caulerpa</i> , <i>Halimeda</i> sample with coral rubble, predominated by platelet forams, 24-28 metres.
75 LIZ N-1	Outer slope, Yonge Reef, 12 January 1975, P.B. Berents and P.A. Hutchings, reef rock with <i>Halimeda</i> from outside a cave, 24 metres.	LI-27	Fringing reef, between Bird Islet and South Island, Lizard Island, 9 October 1978, J.K. Lowry, <i>Halophila</i> , mixed algae and sediment from grassbeds off reef base, 24 metres.
75 LIZ O-3	Reef back, Yonge Reef, 13 January 1975, P.B. Berents and P.A. Hutchings, reef rock with green algae, 3 metres.	LI-28	Fringing reef, between Bird Islet and South Island, Lizard Island, 9 October 1978, P.C. Terrill, <i>Halophila</i> , mixed algae and sediment from grassbeds off reef base, 24 metres.
75 LIZ S-2	Reef back, Yonge Reef, 19 January 1975, P.B. Berents and P.A. Hutchings, dead <i>Acropora</i> , heavily encrusted with <i>Lithothamnion</i> , 2 metres.	LI-30	Fringing reef, between Bird Islet and South Island, Lizard Island, 9 October 1978, P.C. Terrill, <i>Halophila</i> and mixed algae from grassbeds off reef base, 24 metres.
75 LIZ T-1	Reef back, Yonge Reef, 19 January 1975, P.B. Berents and P.A. Hutchings, dead <i>Acropora</i> , 2 metres.	LI-37	Eastern end, Mangrove Beach, Lizard Island, 10 October 1978, A.R. Jones, core sample positioned over body burrow in sand bottom, 1.5 metres.
75 LIZ V-3	Reef back, Yonge Reef, 20 January 1975, P.B. Berents and P.A. Hutchings, reef rock cemented with <i>Lithothamnion</i> and some <i>Halimeda</i> from bommie, 2 metres.	LI-39	Casuarina Beach, Lizard Island, 11 October 1978, J.K. Lowry, A.R. Jones and P.C. Terrill, under stones at low tide mark.
76 LIZ 16	Off western side of Palfrey Island, Lizard Island, 12 January 1976, P.B. Berents and P.A. Hutchings, washing from reef rock, 6 metres.	LI-48	Mermaid Cove, Lizard Island, 14 October 1978, J.K. Lowry, mixed algae, <i>Dictyota</i> and a filamentous green <i>Chlorodesmis</i> , coral rubble and silt, subtidal to 2 metres.
76 LIZ A	Fringing reef, between Bird Islet and South Island, Lizard Island, April, July, November 1976, January, April, July, November 1977, January 1978, P.B. Berents and P.A. Hutchings, reef rock, 12 metres.	LI-49	Off North Point, Lizard Island, 14 October 1978, J.K. Lowry, red algae and coral rubble from subtidal caves, 3 metres.
76 LIZ B	Off Chinaman's Head, Lizard Island, April, July, November 1976, January, April, July, November 1977, January 1978, P.B. Berents and P.A. Hutchings, reef rock, 7 metres.	LI-50	Off North Point, Lizard Island, 14 October 1978, J.K. Lowry, mixed algal samples, 3 metres.
78 LIZ-PBW-2	Fringing reef, between Bird Islet and South Island, Lizard Island, 14 April 1978, P.B. Berents and P.M. Berents, air lifted sediment, 12 metres.	LI-52	Off North Point, Lizard Island, 14 October 1978, P.C. Terrill, <i>Halimeda</i> , 6 metres.
78 LIZ-PBW-9	Outer slope, Yonge Reef, 13 April 1978, P.B. Berents, coral rubble, 12 metres.	LI-59	1.6 kilometres SW of Eagle Island, near Lizard Island, 17 October 1978, J.K. Lowry, air lifted sediment from coral fans, rubble and dead coral on reef face and bommies, 4 metres.
LI-1	Off Mangrove Beach, Lizard Island, 28 September 1978, J.K. Lowry, mixed algae from bommie, 2 metres.	LI-61	1.6 kilometres SW of Eagle Island, near Lizard Island, 17 October 1978, J.K. Lowry, sponge sample, with some algae and coral rubble on and below bommies, 4 metres.
LI-2	Watsons Bay, Lizard Island, 29 September 1978, J.K. Lowry and P.C. Terrill, <i>Halophila</i> , <i>Caulerpa</i> , <i>Udotea</i> and drift algae, 7 metres.	LI-62	1.6 kilometres SW of Eagle Island, near Lizard Island, 17 October 1978, P.C. Terrill, algal sample, predominantly of reds from beneath bommies, with some sponges, 4 metres.
LI-11	Reef at western end of Lagoon, Lizard Island, 5 October 1978, J.K. Lowry, C. Short and P.C. Terrill, mixed algal sample, 0-3 metres.		
LI-16	Fringing reef, between Bird Islet and South Island, Lizard Island, 7 October 1978, C. Short, filamentous algae, 9 metres.		