



## Oedicerotidae\*

L.E. HUGHES & J.K. LOWRY

Crustacea Section, Australian Museum, 6 College Street, Sydney, New South Wales, 2010, Australia.  
([lauren.hughes@austmus.gov.au](mailto:lauren.hughes@austmus.gov.au), [jim.lowry@austmus.gov.au](mailto:jim.lowry@austmus.gov.au))

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### Abstract

Three genera and three new species of oedicerotid amphipods are reported from the Great Barrier Reef, Queensland, Australia. The third species of southern hemisphere *Monoculodes*, *Monoculodes tropicalis* **sp. nov.**, is the first in the genus with calceoli on the female antenna 2.

**Key words:** Crustacea, Amphipoda, Oedicerotidae, Great Barrier Reef, Australia, taxonomy, new species, *Aborolobatea insidiosa*, *Monoculodes tropicalis*, *Perioculodes talboti*

### Introduction

The Oedicerotidae of Australia are little studied. Lowry & Stoddart (2003) recorded only four genera and seven species for the entire area. Two species have previously been recorded from the Great Barrier Reef, *Oediceroides apicalis* K.H. Barnard, 1931 from deep water outside of Trinity Opening and *Perioculodes aequimanus* (Kossman, 1880) from shallow water at the Low Isles. In this paper we describe three new species: *Aborolobatea insidiosa* **sp. nov.**, *Monoculodes tropicalis* **sp. nov.** and *Perioculodes talboti* **sp. nov.** *Aborolobatea insidiosa* **sp. nov.** is the second species recorded for the tropical genus *Aborolobatea*.

The genus *Monoculodes* (*sensu stricto*) is largely a northern hemisphere and Arctic group. Six species of *Monoculodes* have been recorded from the southern hemisphere (Hendrycks & Conlan 2003; Bousfield & Chevrier 1996) including the new species described here. Only two of these, *M. abacus* J.L. Barnard, 1961, from the Tasman Sea and *M. tropicalis* **sp. nov.** occur outside of the Antarctic.

There are 16 species and subspecies of *Perioculodes* known from shallow-water sand and mud bottoms, mainly in warm temperate and tropical waters. *Perioculodes talboti* **sp. nov.** is the second species of *Perioculodes* recorded from Australia.

### Material and methods

The descriptions were generated from a DELTA database (Dallwitz 2005) to world oedicerotid genera, world *Aborolobatea* species, southern hemisphere *Monoculodes* species and world *Perioculodes* species. Material was hand-collected on scuba and is lodged in the Australian Museum, Sydney (AM). A set of colour pictures, a list of standard abbreviations and detailed station data is available in Lowry & Myers (2009). A CD (*Benthic Amphipoda (Crustacea: Peracarida) of the Great Barrier Reef: Interactive Keys*) is available with the book or the keys can be accessed at the crustacea.net website.

## Oedicerotidae Lilljeborg, 1865

### *Aborolobatea* Ledoyer, 1984

*Aborolobatea* Ledoyer, 1984: 90.

**Type species.** *Aborolobatea paracheliformis* Ledoyer, 1984, original designation.

**Diagnosis.** Mandible molar reduced or vestigial, not triturate. Maxilliped inner plate absent; palp article 2 greatly enlarged. Gnathopods 1–2 carpi without posterior lobes. Pereopods 3–4 dactyli minute. Pereopod 4 coxa without posteroventral lobe. Pereopod 5 coxa as deep as coxa 4. Uropod 1 outer ramus much shorter than inner.

**Included species.** *Aborolobatea paracheliformis* Ledoyer, 1984; *Aborolobatea insidiosa* sp. nov.

**Remarks.** The tropical Australasian genus *Aborolobatea* is very distinctive. It has several autapomorphies, including the absence of inner plates on the maxilliped, the absence of carpal lobes on the gnathopods and the very short outer ramus of uropod 1, which separate it from other genera of the Oedicerotidae. Based on the subchelate gnathopods with long carpi and lobes absent and coxa 5 as deep as coxa 4, *Aborolobatea* is similar to *Cornudilla* Barnard & Karaman, 1991 and *Westwoodilla* Bate, 1857. The later genera however are distinguished by the well developed mandibular molars, well developed dactyli on pereopods 3–4 and well developed rami on uropod 1.

### *Aborolobatea insidiosa* sp. nov.

(Figs 1, 2)

**Type material.** Holotype, female (dissected), 3 slides, 4.0 mm, AM P78121, First Lagoon, One Tree Island, Queensland, Australia (~23°30'S 152°05'E), night plankton tow, low tide, F.H. Talbot, 4 December 1966 (FT 107). Paratypes: 1 male (dissected), 3 slides, 4.0 mm, AM P78122 (FT 107); 25+ unsexed, AM P78196 (FT 107).

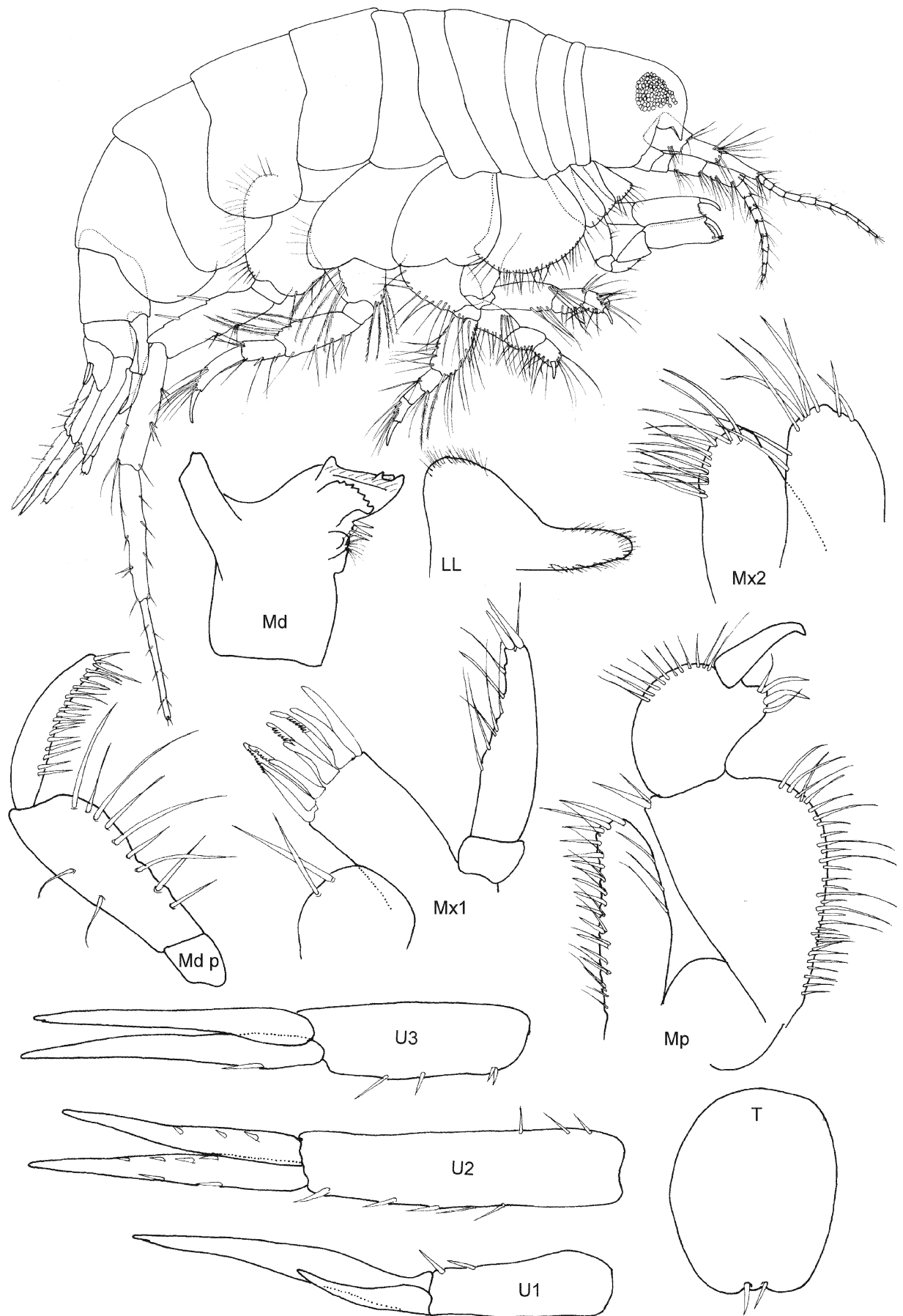
**Additional material examined.** 5 unsexed, AM P78123 (JDT/OPH 11b); 3 unsexed, AM P78124 (JDT/OPH 11); 1 unsexed, AM P78125 (JDT/OPH 11); 3 unsexed, AM P78126 (JDT/OPH 13); 4 unsexed, AM P78127 (QLD 46); 1 unsexed, AM P28489; 3 unsexed, AM P78128 (QLD 1935); 6 unsexed, AM P78129 (QLD 1936); 25+ unsexed, AM P78130 (QLD 1948); 5 unsexed, AM P78131 (QLD 1955); 13 unsexed, AM P78132 (QLD 1964); 15+ unsexed, AM P78133 (QLD 1979).

**Type locality.** First Lagoon, One Tree Island (~23°30.2'S 152°5.3'E).

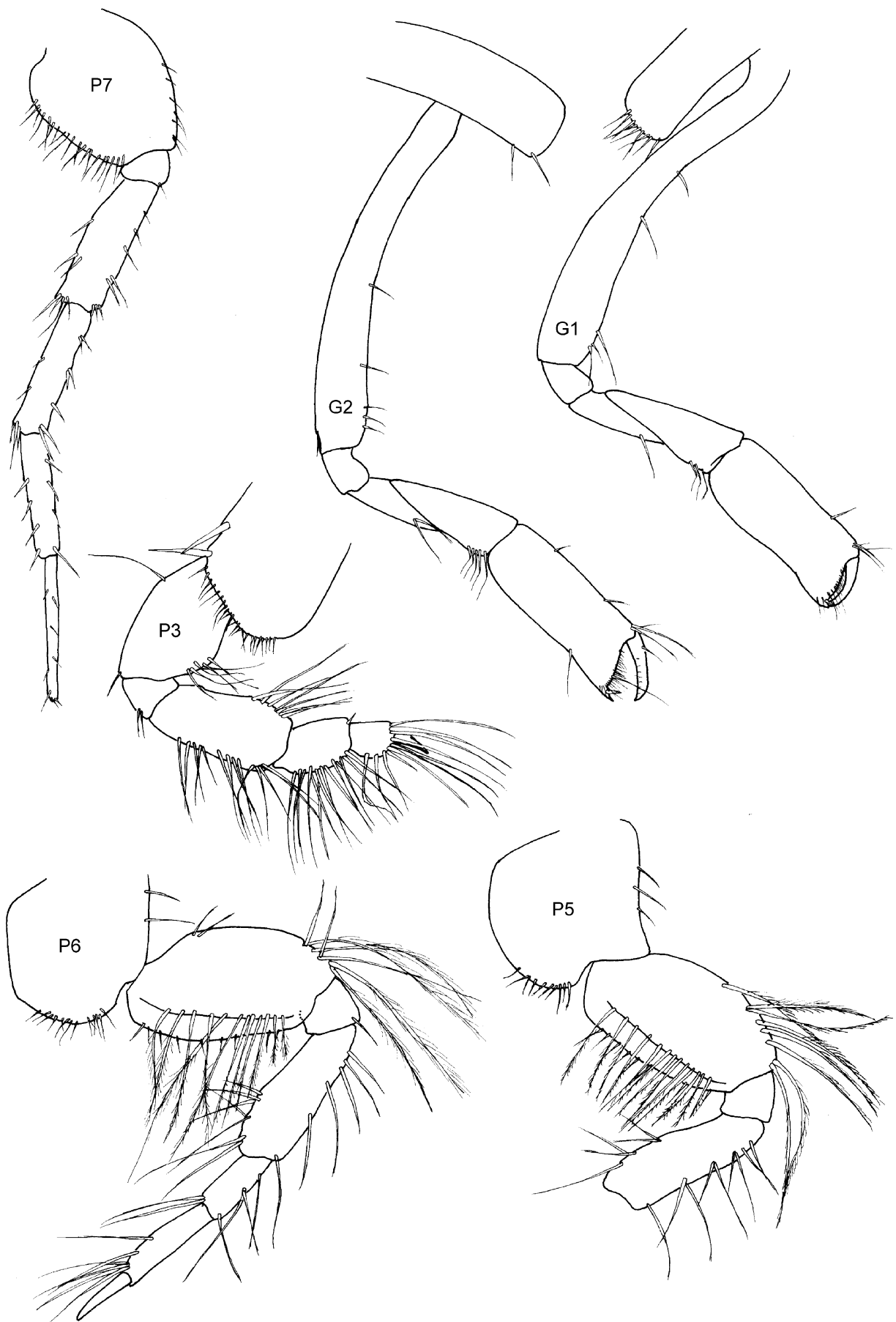
**Etymology.** From the Latin 'insidiosum' meaning 'lying in wait' and alluding to the oedicerotid behaviour as an ambush predator.

**Description.** Based on holotype, female, 4.0 mm, AM P78121.

**Head.** Head rostrum well developed, broad, strongly deflexed, apically acute; eyes subovate, not coalesced, situated fully within head; lateral cephalic lobe absent. *Antenna 1* long, exceeding article 5 on antennae 2; peduncle sparsely setose; peduncular articles 1–2 shorter than peduncle of antenna 2; peduncular article 1 without tooth, subequal in length to article 2, shorter than article 3; peduncular article 3 elongate, subequal to article 2; flagellum without calynophore; without calceoli. *Antenna 2* peduncle sparsely setose, not greatly enlarged; flagellum without calceoli. *Mandible* molar reduced, not triturate, with tuft of setae; incisor left and right a straight, smooth blade; palp stout; article 2 straight, distally expanded with 9 slender setae; article 3 slightly shorter than article 2, falcate with many marginal setae. *Lower lip* inner lobes unknown; mandibular lobes slender, twice as long as broad directed axially. *Maxilla 1* outer plate with 9 setal-teeth; inner plate with 2 apical setae. *Maxilla 2* inner plate without oblique setal row. *Maxilliped* inner plate absent; palp article 2 greatly enlarged distal end, article 3 expanded distally, dactylus recurved at tip.



**FIGURE 1.** *Aborolobatea insidiosa* sp. nov., holotype, female, 4.0 mm, AM P78121, First Lagoon, One Tree Island, Great Barrier Reef.



**FIGURE 2.** *Aborolobatea insidiosa* sp. nov., holotype, female, 4.0 mm, AM P78121, First Lagoon, One Tree Island, Great Barrier Reef.

**Pereon.** *Gnathopods* 1–2 well developed; propodi similar in shape. *Gnathopod* 1 subequal in size to gnathopod 2; weakly chelate; carpal lobes absent; propodus subrectangular (about 2 x as long as broad), propodus posterodistal margin smooth, palm slightly obtuse margin smooth. *Gnathopod* 2 weakly chelate; carpus extremely elongate, 2.6 x longer than broad, carpal lobes absent; propodus subrectangular (about 3 x as long as broad), posterodistal margin smooth, palm obtuse. *Pereopods* 3–4 carpi and propodi subequal in length; propodi posterior margins setose, dactyli minute, shorter than propodi, without apical setae. *Pereopod* 3 coxa anterior margin straight, anteroventral corner not produced, ventral margin convex. *Pereopod* 4 coxa ventral margin convex, with small posteroventral lobe. *Pereopods* 5–6 similar in form; propodi posterior margins sparsely setose; dactyli shorter than propodi, slender, tapering, without ungues. *Pereopod* 5 coxa small, depth distinctly less than coxa 4; merus not enveloping carpus. *Pereopod* 7 basis with tapering margins, posterodistal lobe absent.

**Pleon.** *Epimeron* 3 posterior distal corner rounded. *Uropod* 1 rami without setae; outer ramus shorter, about half length of inner; inner ramus smooth. *Uropod* 2 rami with small robust setae; rami subequal. *Uropod* 3 not greatly enlarged; rami with small robust setae; rami subequal in length. *Telson* apically truncate and slightly emarginate, with 2 apical robust setae.

**Habitat.** Shallow sand bottoms.

**Remarks.** *Aborolobatea insidiosa* differs from *A. paracheliformis* Ledoyer, 1984, as follows: rostrum sharply deflexed (slightly deflexed in *A. paracheliformis*); mandibular palp article 2 distally broadened (slightly expanded medially in *A. paracheliformis*), article 3 long and slender (short and broad in *A. paracheliformis*); maxilliped palp article 3 broad (slender in *A. paracheliformis*); lower lip mandibular lobes narrow and directed axially (broad and directed down in *A. paracheliformis*); gnathopods 1–2 with obtuse palms (transverse in *A. paracheliformis*); and subequal uropod 2 rami (outer ramus slightly shorter in *A. paracheliformis*).

*Aborolobatea insidiosa* **sp. nov.** is the second species described in the genus and is a common, widespread species on the Great Barrier Reef. It can be distinguished from other oedicerotids on the GBR by the weakly chelate gnathopods 1–2 without carpal lobes; and the uropod 1 outer ramus which is much shorter than the inner ramus.

**Distribution.** *Australia*. Queensland: Lizard Island (current study); Fantome and Orpheus Islands (current study); One Tree Island (current study).

### ***Monoculodes* Stimpson, 1853**

#### ***Monoculodes tropicalis* sp. nov.**

(Figs 3, 4)

**Type material.** Holotype, female (dissected), 4 slides, 6.0 mm, AM P78134, Blue Lagoon, Lizard Island, Queensland, Australia (~14°40'S 145°28'E), plankton tow, night, no moon, 6 m, J.M. Leis, 20 October 1979 (JML 20-10-1). Paratypes: 3 unsexed, AM P78135 (JML 20-10-1).

**Additional material examined.** 1 unsexed, AM P28309 (HI-3); 16 unsexed, AM P28310 (HI-3); 1 unsexed, AM P78136 (78 LIZ PBW-2); 1 unsexed, AM P78137 (78 LIZ PBW-6); 8 unsexed, AM P78138 (JDT/OPH 6c); 1 unsexed, AM P78139 (JML 7-10-1); 1 unsexed, AM P78140 (JML 7-10-2); 1 unsexed, AM P78141 (JML 16-10-7); 1 unsexed, AM P78142 (JML 16-10-8); 1 unsexed, AM P78143 (JML 16-10-9); 2 unsexed, AM P78144 (JML 20-10-2); 2 unsexed, AM P78145 (QLD 33); 3 unsexed, AM P78147 (QLD 63); 1 unsexed, AM P70873 (QLD 1654); 1 unsexed, AM P78148 (QLD 1900); 2 unsexed, AM P78149 (QLD 1922); 3 unsexed, AM P78150.

**Type locality.** Blue Lagoon, Lizard Island, Great Barrier Reef, Queensland, Australia (~14°40'S 145°28'E).

**Etymology.** The name signals the first record of *Monoculodes* from the tropical Indo-West Pacific.

**Description.** Based on holotype, female (dissected), 6.0 mm, AM P78134.

**Head.** *Head* rostrum well developed, broad, strongly deflexed, apically acute; eyes ovate, coalesced at top of head, situated fully within head; lateral cephalic lobe truncate. *Antenna 1* peduncle sparsely setose; peduncular article 1 without tooth, longer than article 2, longer than article 3; peduncular article 3 elongate, subequal to article 2; flagellum without callynophore, without calceoli. *Antenna 2* peduncle sparsely setose; calceoli with separated proximal and distal elements, proximal element convex, turret-shaped, broad lamellar receptacle with two apical cusps. *Mandible* molar well developed, triturative; left incisor a straight weakly serrate blade; palp elongate, article 2 straight, article 3 slightly shorter than article 2, with many marginal setae. *Lower lip* inner lobes separated. *Maxilla 1* outer plate with 9 setal-teeth. *Maxilla 2* inner plate without oblique setal row. *Maxilliped* inner plate present; palp article 2 expanded along midmedial margin.

**Pereon.** *Gnathopods 1–2* well developed; propodi similar in shape, subchelate. *Gnathopod 1* subequal to gnathopod 2; carpal lobe short (extending less than half the length of the propodus), broad (as broad as long), divergent from propodus margin; propodus ovate, posterodistal margin smooth, palm acute, margin smooth. *Gnathopod 2* carpus elongate, longer than broad, carpal lobe short (extending less than half the length of propodus), broad (as broad as long), divergent from propodus margin; propodus ovate (about 2 x as long as broad), posterodistal margin smooth, palm acute margin smooth, setose. *Pereopods 3–4* carpi shorter than propodi; propodi posterior margins without setae, dactyli well developed, shorter than propodi, without apical setae. *Pereopod 3* coxa anterior margin rounded, anteroventral corner not produced, ventral margin convex. *Pereopod 4* coxa posterior margin excavate, with posteroventral lobe. *Pereopods 5–6* similar in form; propodi posterior margins sparsely setose; dactyli slender, tapering, each with circular unguis. *Pereopod 5* coxa small, depth distinctly less than coxa 4; dactylus longer than propodus. *Pereopod 6* dactylus longer than propodus. *Pereopod 7* basis with posteroproximal lobe, posterior margin straight, posterodistal lobe absent.

**Pleon.** *Epimeron 3* posterodistal corner narrowly rounded to subquadrate. *Uropod 1* subequal in length to uropod 2; peduncle, lateral margin with 19 robust setae; rami subequal in length, with small robust setae; inner ramus margins smooth. *Uropod 2* shorter than uropod 3; rami subequal in length, with small robust setae. *Uropod 3* greatly enlarged; rami subequal in length, with small robust setae. *Telson* entire, apically truncate, with apical setae.

**Habitat.** *Monoculodes tropicalis* sp. nov. has been found swimming in the water column at night and on shallow coarse to fine sand bottoms (1 to 17 m) during the day.

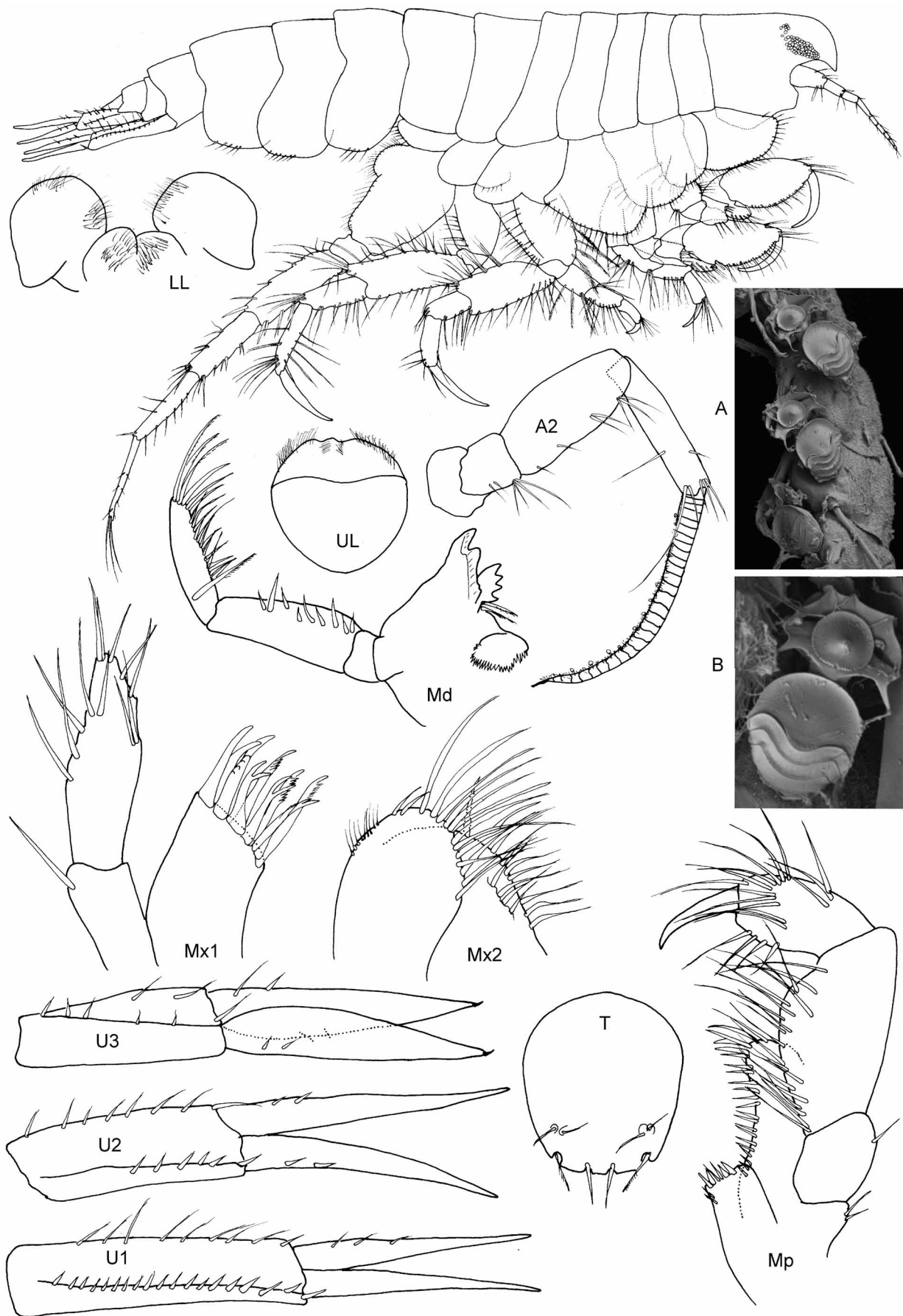
**Remarks.** According to Bousfield & Chevrier (1996) the genus *Monoculodes* is still poorly defined because of the limited description of the type species, *M. demissus* Stimpson, 1853. *Monoculodes tropicalis* sp. nov. is placed in *Monoculodes* (*sensu stricto*) based on the subsimilar gnathopods with short carpal lobes (Bousfield & Chevrier 1996).

*Monoculodes tropicalis* differs significantly from the other Indo-West Pacific species of *Monoculodes* (*M. abacus* J.L. Barnard, 1961, *M. dentimanus* Jo, 1990, *M. koreanus* Jo, 1990, *M. muwoni* Jo, 1990) as follows: gnathopods 1–2 propodi more broadly subovoid in shape, and pereopod 7 basis with posterior proximal lobe and without posterodistal lobe. The presence of calceoli on the flagellum of antenna 2 (Fig. 3 A, B) is apparently the first record of calceoli for the genus *Monoculodes*. The structure of the calceolus conforms to the oedicerotid type seven as described by Lincoln & Hurley (1981) with separated proximal and distal elements. The broad lamellar receptacle around the proximal element has two apical cusps like those noted on *Oediceropsis bicornuta* Bellan-Santini, 2007. This appears to be the first type seven calceolus reported with a convex, turret-shaped proximal element. Previously documented oedicerotid calceoli have a concave cup-shaped proximal element.

*Monoculodes tropicalis* can be separated from other oedicerotids on the GBR by the short, subchelate gnathopods with subovoid propodi and short-lobed carpi.

*Monoculodes tropicalis* is the first tropical species described in the genus. Ledoyer (1984) reported a single specimen of *Monoculodes* sp. from New Caledonia, but did not illustrate or describe the material.

**Distribution.** *Australia.* Queensland: Goodes and Hawkesbury Islands, Torres Strait (current study); Eagle and Lizard Islands (current study); Fantome Island (current study); Heron Island (current study).



**FIGURE 3.** *Monoculodes tropicalis* sp. nov., holotype, female, 6.0 mm, AM P78134, Blue Lagoon, Lizard Island, Great Barrier Reef. A - SEM picture length 15  $\mu$ m, B - SEM picture length 180  $\mu$ m.



**FIGURE 4.** *Monoculodes tropicalis* **sp. nov.**, holotype, female, 6.0 mm, AM P78134, Blue Lagoon, Lizard Island, Great Barrier Reef.



*Periocolodes* G.O. Sars, 1895

*Periocolodes talboti* sp. nov.

(Figs 5, 6)

?*Periocolodes aequimanus*. —K.H. Barnard, 1931: 121. —Lowry & Stoddart, 2003: 203 (catalogue).

**Type material.** Holotype, female (dissected), 3 slides, 4.1 mm, AM P78151, First Lagoon, One Tree Island, Queensland, Australia (~23°30.2'S 152°5.3'E), low tide, night, F. Talbot, 4 December 1966 (FT 106). Paratypes: female (dissected mouthparts), AM P78152 (FT 106); 30+ unsexed, AM P78153 (FT 106); 25+ unsexed, AM P78154 (FT106).

**Additional material examined.** 11 unsexed, AM P78155 (FT 107); 3 unsexed, AM P78156 (J&S 1.2); 1 unsexed, AM P78157 (J&S 1.2); 1 unsexed, AM P78158 (J&S 1.2); 1 unsexed, AM P78159 (J&S 1.2); 1 unsexed, AM P78160 (J&S 1.2); 2 unsexed, AM P78161 (J&S 1.4); 1 unsexed, AM P78162 (J&S 1.5); 11 unsexed, AM P78163 (J&S 2.2); 1 unsexed, AM P78164 (J&S 2.2.1); 2 unsexed, AM P78165 (J&S 2.3); 1 unsexed, AM P28488 (J&S 2.3.1); 1 unsexed, AM P78166 (J&S 2.3.3); 2 unsexed, AM P78167 (J&S 2.3.4); 1 unsexed, AM P78168 (J&S B 1.1); 5 unsexed, AM P78169 (J&S B 2.1); 1 unsexed, AM P78170 (J&S B 3.2); 1 unsexed, AM P78171 (J&S B 3.3); 1 unsexed, AM P78172 (J&S B 3.4); 3 unsexed, AM P78173 (J&S C 1.1.4); 1 unsexed, AM P78174 (J&S C 1.1.5); 1 unsexed, AM P78175 (J&S C 1.2.4); 3 unsexed, AM P78176 (JDT/LIZ 18); 4 unsexed, AM P78177 (JML 16.10.7); 2 unsexed, AM P78178 (JML 16-10-8); 3 unsexed, AM P78179 (JML 16-10-9); 1 unsexed, AM P78180 (JML 20-10-2); 4 unsexed, AM P27191 (PS 1); 3 unsexed, AM P27192 (PS 1); 4 unsexed, AM P78181 (QLD 35); 12 unsexed, AM P78182 (QLD 35); 1 unsexed, AM P78183 (QLD 54); 1 unsexed, AM P70985 (QLD 1619); 1 unsexed, AM P70633 (QLD 1621); 1 unsexed, AM P70629 (QLD 1621); 1 unsexed, AM P70566 (QLD 1624) (photo); 2 unsexed, AM P70872 (QLD 1654); 1 unsexed, AM P71025 (QLD 1714); 1 unsexed, AM P71137 (QLD 1742); 1 unsexed, AM P78184 (QLD 1900); 1 unsexed, AM P78185 (QLD 1902); 11 unsexed, AM P78186 (QLD 1922); 5 unsexed, AM P78187 (QLD 1943); 10 unsexed, AM P78188 (QLD 1948); 2 unsexed, AM P78189 (QLD 1955); 1 unsexed, AM P78190 (QLD 1960); 15 unsexed, AM P78191 (QLD 1964); 20+ unsexed, AM P78192 (QLD 1979); 13 unsexed, AM P78193 (QLD 1999); 1 unsexed, AM P78194 (QLD 2000).

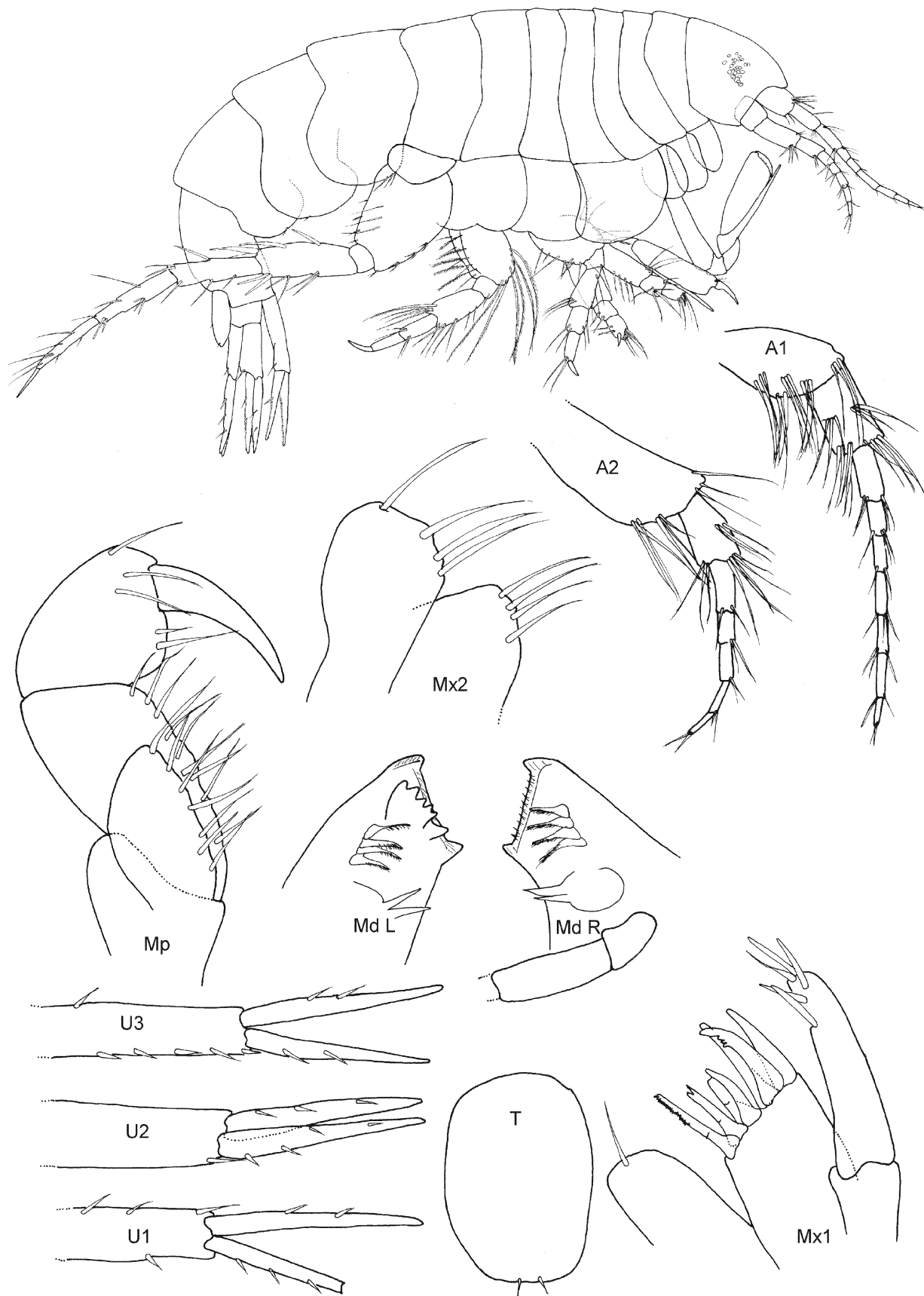
**Type locality.** First Lagoon, One Tree Island, Queensland, Australia (~23°30.2'S 152°5.3'E).

**Etymology.** Named for Frank Talbot, the founder of the Lizard Island Research Station and the collector of this species.

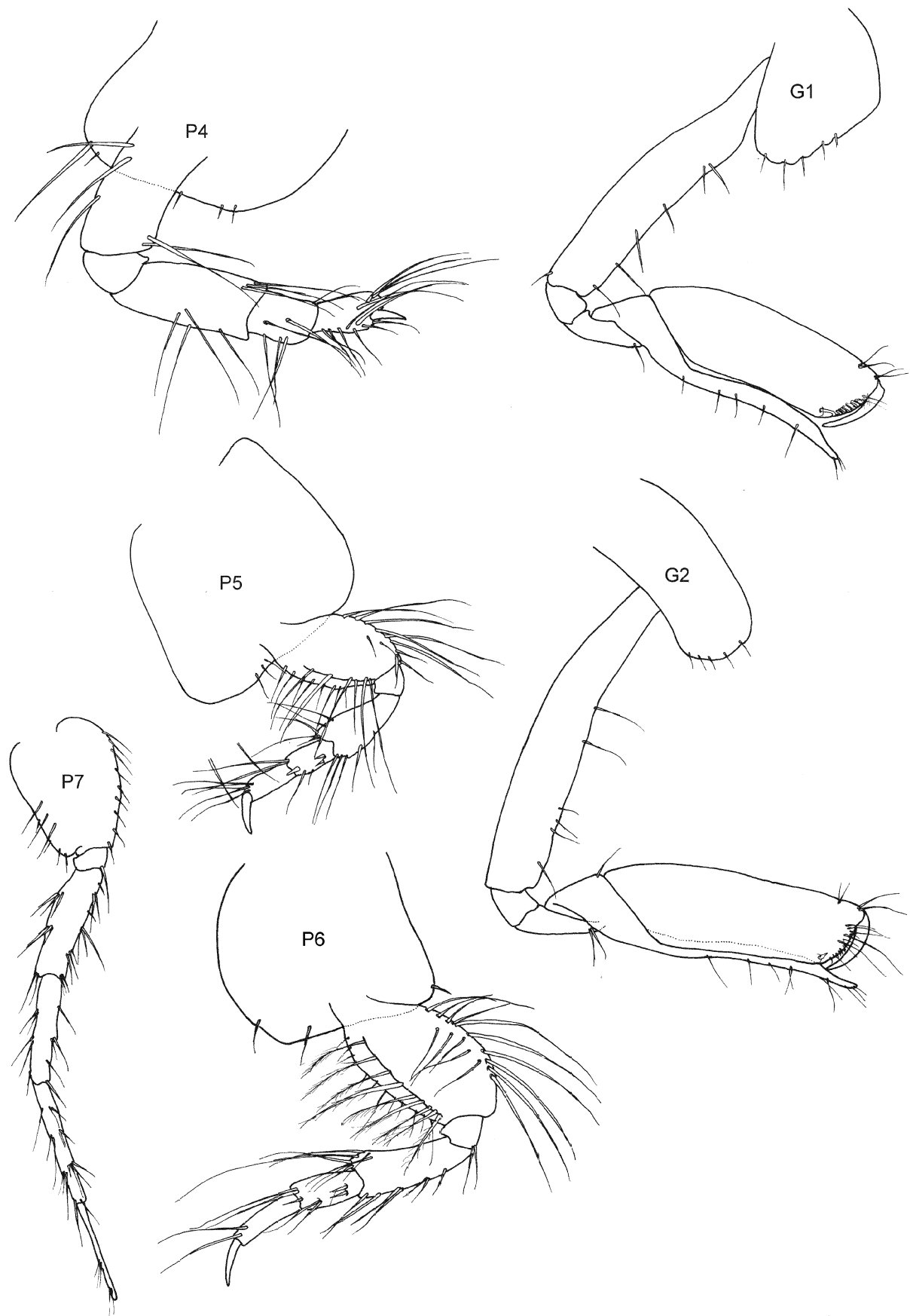
**Description.** Based on holotype, female, 4.1 mm, AM P78151.

**Head.** *Head* rostrum well developed, distinctly exceeding cephalic lobe, slightly deflexed, apically subacute; eyes poorly developed, ommatidia dispersed, not coalesced, situated fully within head; lateral cephalic lobe absent. *Antenna 1* long, exceeding article 5 on antenna 2; peduncular articles 1–2 shorter than peduncle of antenna 2; peduncular article 1 without tooth, subequal in length to article 2 and article 3; peduncular article 3 elongate, subequal to article 2; flagellum long, 6-articulate, exceeding antenna 2 peduncle, without callynophore, without calceoli. *Antenna 2* about 1/5 body length; peduncle sparsely setose, not greatly enlarged, long curved spine absent; flagellum 5-articulate, subequal in length to peduncle, without calceoli. *Mandible* molar weakly developed, with 2 spine-like processes; left and right incisors with straight smooth blade; accessory setal row with 4 setae; palp elongate, article 2 straight. *Maxilla 1* outer plate with 7 setal-teeth; inner plate with apical setae. *Maxilla 2* inner plate without oblique setal row. *Maxilliped* inner plate present; palp article 2 not enlarged.

**Pereon.** *Gnathopods 1–2* well developed; propodi similar in shape, subchelate. *Gnathopod 1* subequal in size to gnathopod 2; carpal lobes strongly elongated and slender, fully guarding posterior margin of propodus extending beyond palm of propodus; propodus subrectangular (about 4 x as long as broad), posterodistal margin smooth, palm slightly acute, margin smooth. *Gnathopod 2* subchelate; carpus extremely elongate, 3 x longer than broad, carpal lobes slender, less than half as broad as long, sitting along propodus margin,



**FIGURE 5.** *Perioculodes talboti* sp. nov., holotype, female, 4.1 mm, AM P78151, First Lagoon, One Tree Island, Great Barrier Reef.



**FIGURE 6.** *Periculodes talboti* sp. nov., holotype, female, 4.1 mm, AM P78151, First Lagoon, One Tree Island, Great Barrier Reef.

extending beyond tip of propodus; propodus subrectangular, about 3 x as long as broad, posterodistal margin smooth, palm slightly acute. *Pereopods* 3–4 carpi and propodi subequal in length; dactyli reduced, shorter than propodi, without apical setae. *Pereopod* 3 coxa anterior margin slightly rounded, anteroventral corner not produced, ventral margin truncate; propodus posterior margins without setae. *Pereopod* 4 coxa ventrally truncate, without posteroventral lobe; propodus posterior margins setose. *Pereopods* 5–6 similar in form; propodi posterior margins sparsely setose; dactyli shorter than propodi, slender, tapering, without unguis. *Pereopod* 7 basis posterodistal lobe vestigial, not reaching ischium.

**Pleon.** *Epimeron* 3 posterodistal corner rounded. *Uropod* 1 slightly shorter than uropod 2; rami with small robust setae; inner ramus smooth margin. *Uropod* 2 reaching end of uropod 3; rami subequal with small robust setae. *Uropod* 3 not greatly enlarged; rami subequal in length, with small robust setae. *Telson* entire, apically truncate, with 2 minute apical setae.

**Habitat.** *Periocolodes talboti* sp. nov. has been found swimming in the water column at night and on shallow coarse to fine sand bottoms (0.5 to 18 m) during the day.

**Remarks.** *Periocolodes talboti* sp. nov. appears to be most similar to *P. pinguis* Hirayama, 1987 in the carpal lobes that extend past the propodi in gnathopods 1–2 and the short dactyli of pereopods 3–4, however the rostrum of *P. talboti* is less deflexed and the ventral margin of coxa 1–2 is convex. Also in gnathopods 1–2 the propodal palms are more acute in *P. pinguis*.

The extension of the carpal lobes beyond the propodi in gnathopods 1–2 also occurs in *P. aequimanus mozambicus* Ledoyer, 1973; *P. longimanus* (Bate & Westwood, 1868), *P. megapleon* (Giles, 1888) and *P. serra* Walker, 1904. *Periocolodes talboti* sp. nov. can be separated from these species by dactyli of pereopods 3–4 that are around one third the length of the propodi and the rami of uropods 1–3 that are subequal in length. *Periocolodes talboti* can be separated from other oedicerotids on the GBR by its long, slender subchelate gnathopods with subrectangular propodi and the long slender carpal lobes guarding the propodi.

**Distribution.** *Australia.* Queensland: Goodes and Hawkesbury Islands, Torres Strait (current study); Palfrey and Lizard Islands (current study); ? Low Isles (K.H. Barnard 1931); One Tree Island (current study).

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