

A New Species of *Metaprotella* (Crustacea: Amphipoda: Caprellidae) from One Tree Island, Southern Great Barrier Reef, Queensland, Australia

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ABSTRACT. *Metaprotella sandalensis* Mayer, 1898 (Caprellidae: Amphipoda: Crustacea) and related congeners are widely distributed in the Indo-West Pacific. As a first step in elucidating the species diversity of *Metaprotella* from the Great Barrier Reef, a new species, *Metaprotella lowryi* sp. nov. collected from One Tree Island in southern Great Barrier Reef is described and figured. *Metaprotella lowryi* sp. nov. differs from *M. sandalensis* [sensu stricto] by shorter antenna 1 relative to body length and shorter antenna 1 peduncle article 3. The new species of *Metaprotella* is also closely related to *M. solitaria* Takeuchi & Lowry, 2017, reported from the Solitary Islands off the northern coast of New South Wales, but differs by the characters of the head, the propodus of gnathopod 2 and the dorsodistal projections of pereonite 3.

Introduction

The taxonomy of the Caprellidae (Crustacea: Amphipoda) including the genus *Metaprotella* is particularly fluid, with a legacy of “variants” listed in the taxonomic literature until the 1940s (Mayer, 1890, 1903; Schellenberg, 1938; Utinomi, 1947). With increasingly detailed study of caprellid and phtisicid morphological microstructures and application of molecular tools, many seemingly widespread species are now understood to represent species complexes (Takeuchi & Lowry, 2007b, 2015[2016], 2019; Cabezas *et al.*, 2013; Takeuchi & Oyamada, 2013; Hughes & Takeuchi, 2016; Takeuchi *et al.*, 2022).

The genus *Metaprotella* Mayer, 1890, currently composed of 13 species, is one of the common caprellid genera in

tropical to subtropical regions of the northern Hemisphere and in tropical to temperate regions of the southern Hemisphere (McCain & Steinberg, 1960; McCain, 1968; Larsen, 1997; Guerra-Garcia, 2002, 2003a, b; Momtazi & Sari, 2013; Takeuchi & Lowry, 2007a, 2019). Of these, *Metaprotella sandalensis* Mayer, 1898 (type locality: Sandal Bay, Lifou Island, New Caledonia) is reportedly widespread in shallow waters of the tropical Indo-west Pacific (Lim & Takeuchi, 2012). *Metaprotella sandalensis* was first reported in Australia by Mayer (1913) from Western Australian and from the Great Barrier Reef by Guerra-Garcia (2006). Both studies relied on the limited original description of the species (Mayer, 1898) and the first review (Mayer, 1903), which documented *M. sandalensis* throughout the Indonesian archipelago owing to the extensive sampling by the *Siboga*

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Expedition. Following the redescription of *Metaprotella sandalensis* from the type locality by Lim & Takeuchi (2012), it is now possible to more reliably assess taxonomic status of *M. sandalensis* and its congeners.

As a first step in elucidating the species diversity of *Metaprotella* from the Great Barrier Reef, a new species of *Metaprotella* from One Tree Island in the southern Great Barrier Reef is described in this paper.

Materials and methods

The material examined for this study was collected at One Tree Island as part of the Circum-Australian Amphipod Project funded by the Department of Environment, Water, Heritage and the Arts (Coleman & Lowry, 2012; Hughes & Bopiah, 2013). One Tree Island is a coral cay in the southern Great Barrier Reef, surrounded by a mature lagoonal shelf reef (Harris *et al.*, 2011). The lagoonal shelf reef is located 70 km east of the Queensland coast, 20 km from the shelf edge, and surrounded by waters approximately 60 m in depth (Harris *et al.*, 2011). The mouth parts and appendages were dissected in 80% ethanol. Temporary slides were made using 100% glycerol. Permanent slides were made using either Polyvinyl lactophenol or Aquatex™ (Merck, Darmstadt, Germany) mounting agent. Illustrations were made with a Laborlux K (Leitz Wetzlar, Germany) Heerbrugg stereomicroscopes (Wilde, Switzerland) or Olympus BX60 (Olympus Corporation, Japan) fitted with camera lucida. Family classification follows Takeuchi & Lowry (2019).

Systematics

Family Caprellidae Leach, 1814

Genus *Metaprotella* Mayer, 1890

Type species. *Metaprotella haswelliana* (Mayer, 1882).

Metaprotella lowryi sp. nov.

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Figs 1–3

Holotype: Male, 7.08 mm, AM P.100147, outer reef of north of Third Lagoon, One Tree Island, 23°29'05"S 152°04'07"E, 18 m depth, *Halimeda* sp., QLD 1983, coll. I. Takeuchi & J. K. Lowry, 27 October 2006. **Paratypes:** Male, 8.59 mm, AM P.100148, outer reef north of Third Lagoon, One Tree Island, 23°29'05"S 152°04'07"E, 12 m depth, white hydroids, QLD 1984, coll. I. Takeuchi & J. K. Lowry, 27 October 2006, coll. I. Takeuchi & J. K. Lowry; 1 mature female, 6.02 mm, AM P.100149, outer reef north of Third Lagoon, One Tree Island, 23°29'05"S 152°04'07"E, 12 m depth, white hydroids, QLD 1984, coll. I. Takeuchi & J. K. Lowry, 27 October 2006.

Type locality. Outer reef north of Third Lagoon, One Tree Island, southern Great Barrier Reef, Queensland, Australia, 23°29'05"S 152°04'07"E.

Etymology. Named for the late Dr J. K. Lowry in recognition of his contribution to Amphipodology.

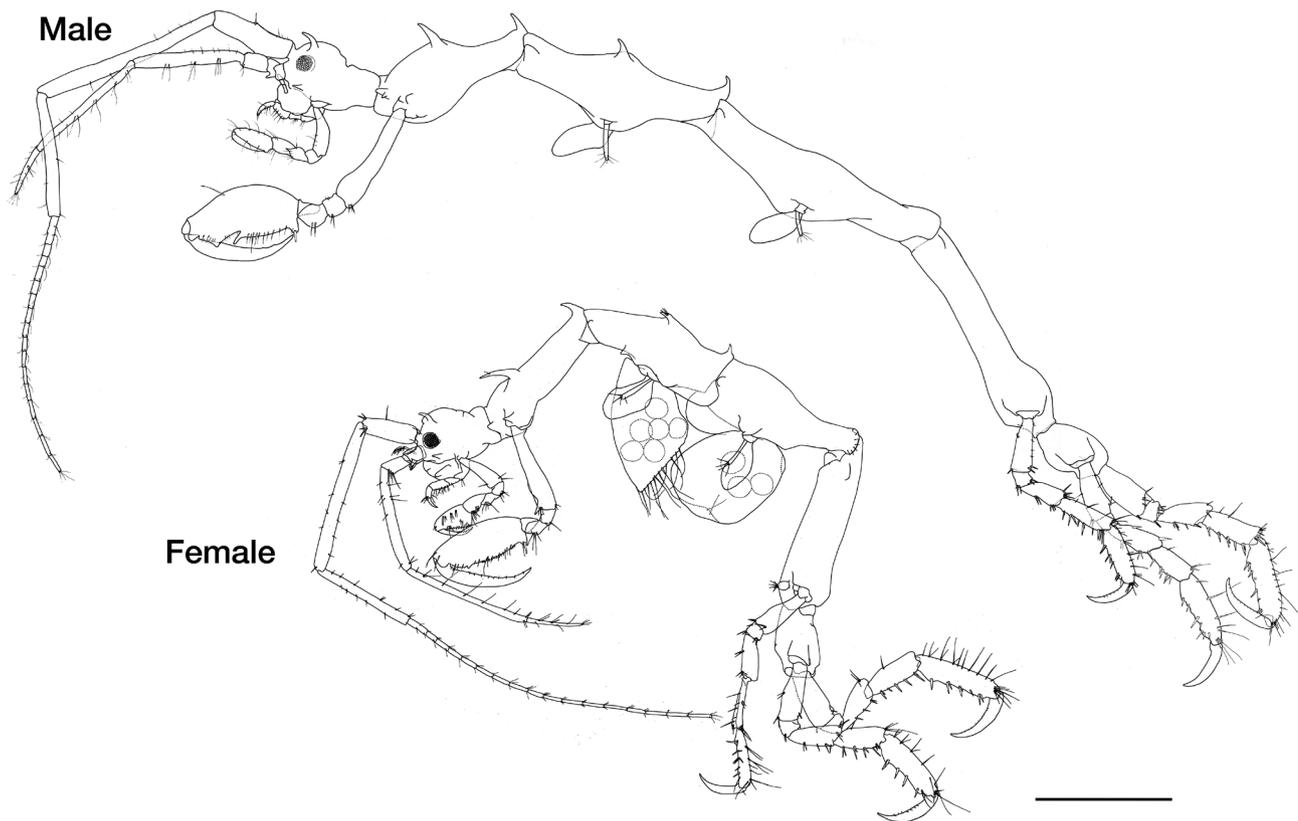


Figure 1. *Metaprotella lowryi* sp. nov., holotype male, 7.08 mm, AM P.100147, and paratype female, 6.02 mm, AM P.100149, One Tree Island, Great Barrier Reef, Queensland, Australia, 23°29'05"S 152°04'07"E. Scale 1.0 mm.

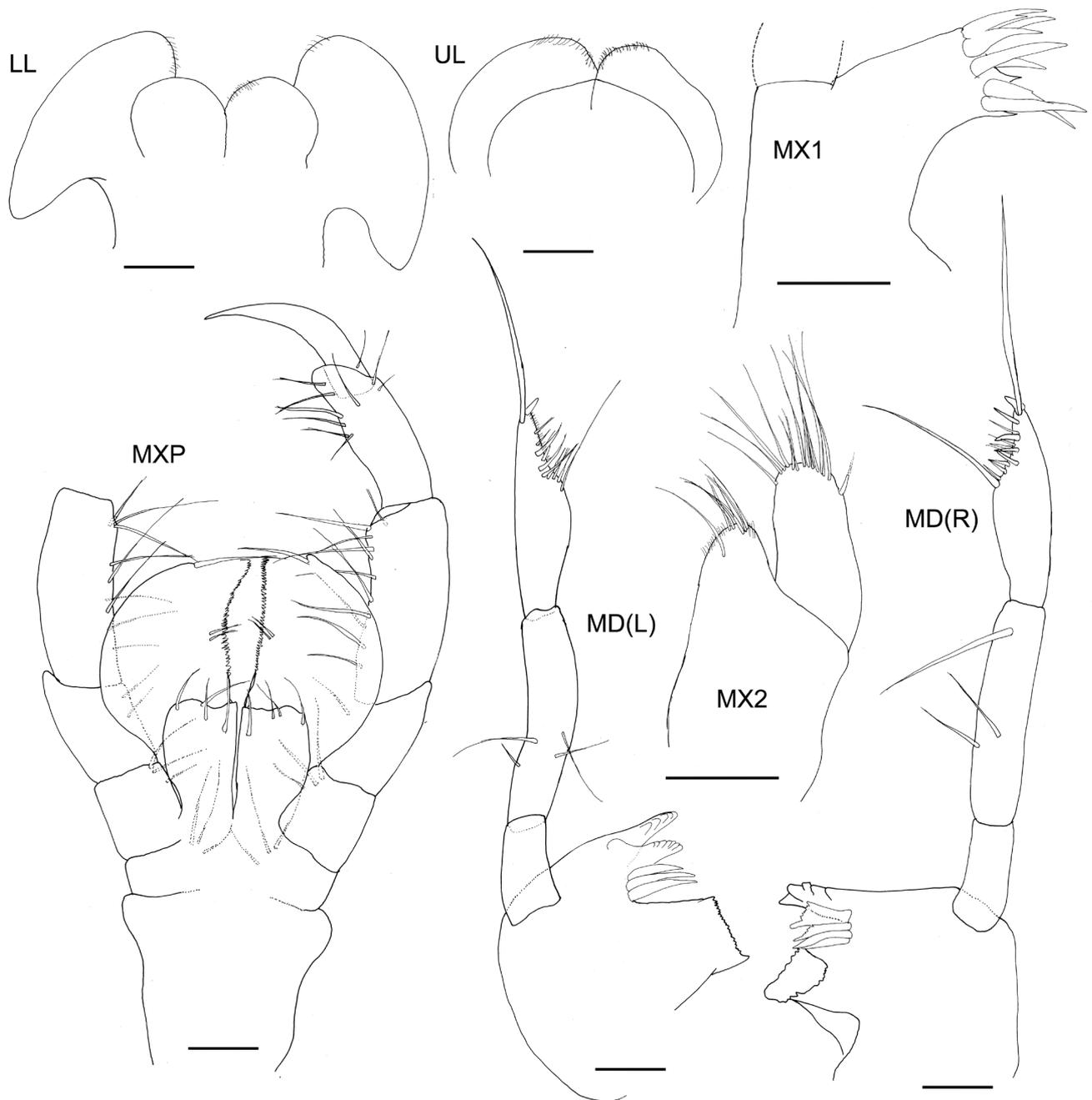


Figure 2. *Metaprotella lowryi* sp. nov., holotype male, 7.08 mm, AMP.100147, One Tree Island, southern Great Barrier Reef, Queensland, Australia, 23°29'05"S 152°04'07"E. L, left; LL, lower lip; MD, mandible; MX, maxilla, MXP, maxilliped; R, right, and UL, upper lip. Scale = 0.05 mm.

Description. Male (based on holotype, 7.08 mm, AM P.100147). Head and pereonites slender.

Head. With paired anteriorly curved dorsal projections and small subocular projection (i.e. projection just below the eye). Eyes large, distinctive. Antenna 1 slender, 0.60 times body length; peduncle article 2 longest; peduncular article 3 0.70 times peduncle article 2 length; flagellum 0.70 times peduncular length, with 16 articles. Antenna 2 slender; 0.5 times antenna 1 length; peduncle not strongly setose.

Upper lip notched, forming rounded quadrilateral projections. Mandible right incisor with 5 teeth; lacinia mobilis with 1 plate and 2 teeth, with 2 bundled setal rows; palp 3-articulate, article 3 setal formula 1-8-3-1; molar well developed, with flake. Mandible left incisor with 5 teeth; lacinia mobilis with 5 teeth, 3 bundled setal rows;

palp 3-articulate; article 3 setal formula 1-9-3-1; molar well developed. Lower lip finely setose on inner and outer lobes. Maxilla 1 outer plate with 7 stout apical setal-teeth (palp lacking during dissection). Maxilla 2 inner plate triangular, with 7 setae; outer plate elongate, with approximately 15 apical setae. Maxilliped basal endite (inner plate) subquadrate, with 1 small nodular setae, with 4 setae near distal margin; ischial endite (outer plate) oval, 2.5 times length of inner plate, inner margin blade-like, with many fine setae, with 1 large seta on apical lateral margin, with 2 setae on middle lateral margin; palp article 2 setose on inner margin; palp article 3 expanded, with moderately dense distal setae; palp article 4 (dactylus) weakly falcate.

Pereon. Pereonite 2 with small anterolateral projection, with small midlateral projection, with paired anteriorly

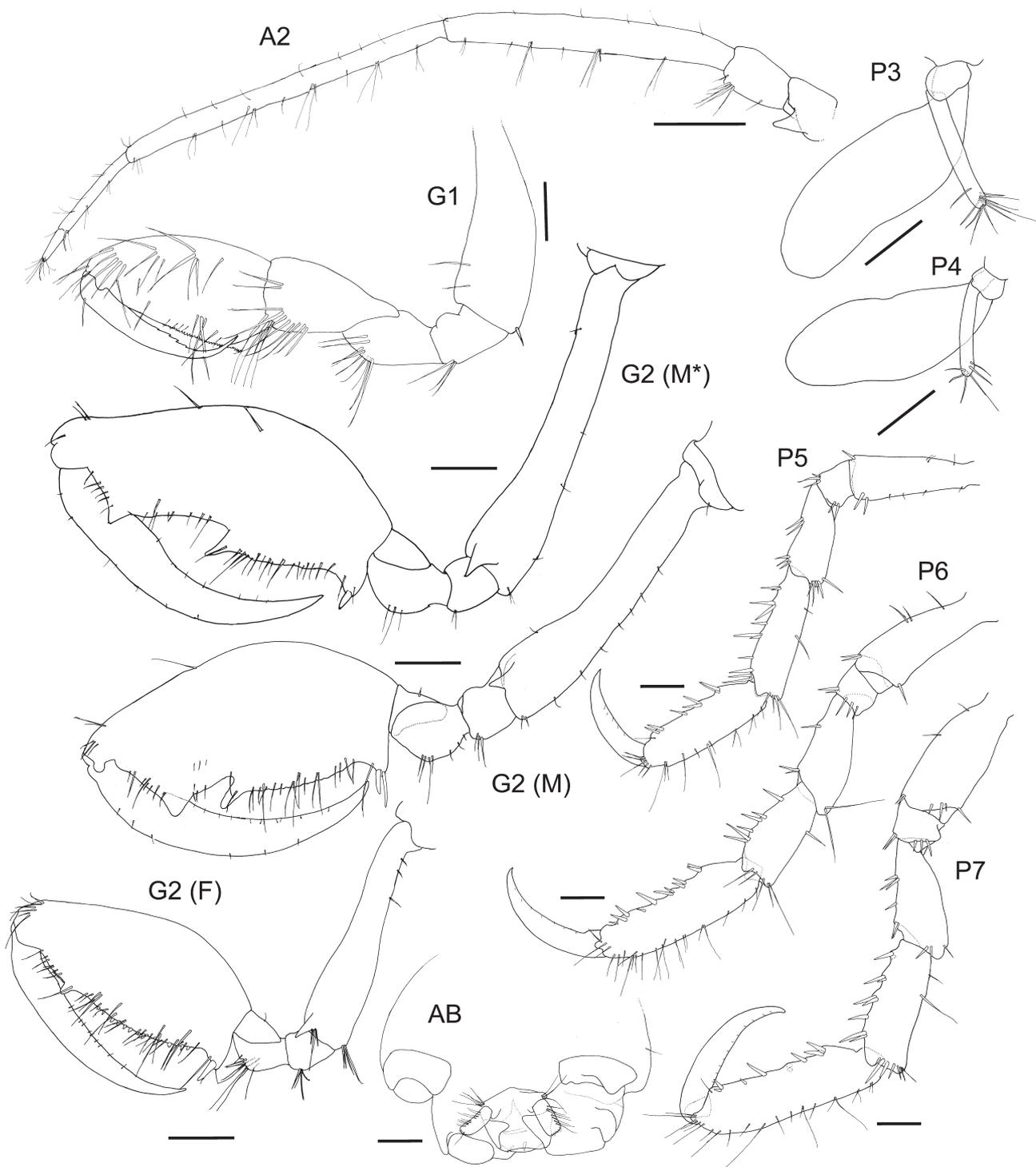


Figure 3. *Metaprotella lowryi* sp. nov.: One Tree Island, southern Great Barrier Reef, Queensland, Australia, 23°29'05"S 152°04'07"E: A2, G1, G2 (M), P3–P7, holotype male, 7.08 mm, AM P.100147; G2 (M*), AB, paratype male, 8.59 mm, AM P.100148; G2 (F), paratype female, 6.02 mm, AM P.100149. A2, antenna 2; AB, abdomen; F, female; G1, gnathopod 1; G2, gnathopod 2; M, male; P3–P7, pereopod 1 to pereopod 7, respectively. Scale: G1, P3, P4, and AB = 0.1 mm; 0.2 mm for all others.

curved mid-dorsal projections, with curved dorsodistal projection. Pereonite 3 with anterolateral projection, with paired anteriorly curved mid-dorsal projections, with anteriorly curved dorsodistal projection. Pereonite 4, longest, with anterolateral projection. Pereonite 5, next to pereonite 4 length, with anterolateral projection. Pereonites 6 and 7 not articulated obliquely.

Gnathopod 1 carpus setose; propodus subtriangular,

palm inserting at 0.1 along posterior margin, minutely serrate, with 1 robust seta near corner of palm, dactylus slightly curved. Gnathopod 2 inserting at 0.20 along anterior margin of corresponding pereonite; coxa vestigial; basis 0.7 times length of pereonite 2, with acute projection near distal margin; propodus subovate, large, length 2 times width palm margin straight, smooth, with grasping projection with 1 grasping spine, setose on palm, with

distal shelf, with sinus, with distal palm projection; dactylus falcate. Gill 3 0.25 times corresponding pereonite length, straight. Pereopod 3 with 1 article, length 8 times width, with 8 distal and 1 lateral setae. Gill 4 0.25 times corresponding pereonite length, straight. Pereopod 4 with 1 article, length 5 times width, with 5 distal setae. Pereopod 5 merus shorter than basis length; carpus equal to basis length; propodus equal to basis length, with 1 pair of grasping spine at ¼ length of posterior margin; dactylus falcate. Pereopod 7 longer than pereopod 6, both longer than pereopod 5.

Pleon (based on male, 8.59 mm, AM P.100148). Uropod 1 bi-articulate; peduncle, length about 0.5 times width, with 3 lateral setae; ramus length about 5 times peduncular length, with 9 or 10 shorter setae. Telson (dorsal lobe) present with paired setae.

Female (based on paratype, 6.02 mm, AM P.100149). Head with paired anteriorly curved dorsal projections, with small subocular projection; eye large, distinctive. Antenna 1 slender, 0.85 times body length; peduncle article 2 longest; flagellum longer than peduncular length, with + 17 articles. Pereonite 2 with 2 small anterolateral projections, with paired anteriorly curved mid-dorsal projections, with curved dorsodistal projection. Pereonite 3 with small anterolateral projection, with midlateral projection, with paired anteriorly curved mid-dorsal projections, with dorsodistal projection. Pereonite 4 small with anterolateral projection, with dorsolateral projection. Pereonite 5 with 2 small anterolateral projections. Pereonites 6 and 7 not articulated obliquely. Gnathopod 2 inserting at anterior margin of corresponding pereonite; coxa vestigial; basis 0.8 times length of pereonite 2, with triangular projection; propodus subovate.

Remarks. During a field survey of One Tree Island, southern Great Barrier Reef in October–November, 2006, Circum-Australian Amphipod Project, *Metaprotella* were collected from the outer reef of One Tree Island lagoon at around 15 m depth. The *Metaprotella* from One Tree Island closely resembles but clearly differs from *M. sandalensis* [sensu stricto] (Lim & Takeuchi, 2012) or other members of the *M. sandalensis* complex, justifying its establishment as a new species, *Metaprotella lowryi* sp. nov. *Metaprotella lowryi* differs from *M. sandalensis* in the following characteristics: (1) antenna 1 is 0.6 times body length (versus 0.8 times body length in *M. sandalensis*); (2) antenna 1 peduncle article 3 is shorter than article 2 (versus longer than article 2 in *M. sandalensis*); (3) the gnathopod 2 propodus palm lacks serratifiform teeth (present in *M. sandalensis*); (4) the dorsodistal projection of both pereonites 2 and 3 is more anteriorly curved in *M. sandalensis* than in *M. lowryi*.

Metaprotella lowryi is also close to *M. solitaria* Takeuchi & Lowry, 2017 (type locality: Solitary Islands, New South Wales). The new species differs from *M. solitaria* by the following characteristics; (1) the paired dorsal projections of the head are anteriorly curved (versus straight in *M. solitaria*); (2) the gnathopod 2 propodus palm has a small distal shelf with sinus and distal palm projection, distinctly developed in the larger male (AM P.100148) (versus two distal palm projections in *M. solitaria*); (3) mid-dorsal projections of pereonite 3 are anteriorly curved (versus straight in *M. solitaria*); (4) dorsodistal projection of pereonite 3 is anteriorly curved (versus dorsally directed in *M. solitaria*); and (5) pereonite 5 is longer than pereonite 4 (versus shorter in *M. solitaria*).

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