

REDESCRIPTION OF THE TROPICAL AUSTRALIAN ISOPOD, *LYIDOTEA*  
*NODATA* HALE, 1929 (CRUSTACEA: IDOTEIDAE)

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**Abstract**

King, R. and Poore, G.C.B., 2001. Redescription of the tropical Australian isopod, *Lyidotea nodata* Hale, 1929 (Crustacea: Idoteidae). *Memoirs of Museum Victoria* 58(2): 365–371.

*Lyidotea* Hale, 1929 is rediagnosed and its only species, *L. nodata* Hale, 1929 redescribed. Membership of Idoteidae is confirmed but its relationship to other genera remains unresolved.

**Introduction**

*Lyidotea nodata* was described by Hale (1929) from a mature female (SAM C1699) and several smaller (possibly immature) specimens from Flinders I., northern Queensland. He placed the species in the valviferan isopod family Idoteidae Samouelle and believed the distinctive flagella of both pairs of antennae and the fusion of pereonite 7 with the pleotelson justified a new genus. Poore and Lew Ton (1990, 1993) omitted the genus *Lyidotea* from their reviews of the related families Holognathidae Thomson and Idoteidae of Australia and New Zealand and in the latter paper explicitly removed it from Idoteidae. They believed the species' "habitus, fusion of body segments, pereopod 1, antenna 2 and oostegite 5 are all arcturid-like." They could not decide on its family placement but their error has since been realised (Poore, 2001).

In Australia the Idoteidae are most diverse in southern latitudes with 22 species recorded south of 30°S. The only taxa recorded north of this latitude are rare: *Euidotea bakeri* (Collinge) and *Paridotea miersi* Poore and Lew Ton extending from the southern coast as far north as 22°S in WA, *Idotea brevicornis* Milne Edwards in Shark Bay, WA, and Indonesia, and *Lyidotea nodata*. Only the last two of these are essentially tropical.

Here, this rather arcturid-like valviferan is redescribed from new material in the collections of Museum Victoria and Hale's (1929) family placement confirmed. The rediagnosis is necessary as part of a wider phylogenetic study on the Arcturidae Dana (where the genus is used as an outgroup in the analysis) and to correct inaccuracies in Hale's original description. The generic diagnosis uses the characters and follows the format used by Poore and Lew Ton (1993) for other genera of Idoteidae.

The new material was collected by CSIRO and Museum Victoria on the North-west Australian shelf between Dampier and Port Hedland in 1982 and 1983 and from as far south as Rottnest I. No new material from Queensland was available. The taxonomic drawings were prepared with a camera lucida. The limbs are drawn to the same scale. The following abbreviations are used: NMV, Museum Victoria, Melbourne; WAM, Western Australian Museum, Perth; SAM, South Australian Museum, Adelaide.

***Lyidotea* Hale**

*Lyidotea* Hale, 1929: 35–36.

*Type species.* *Lyidotea nodata* Hale, 1929 by original designation.

*Diagnosis.* Body semicylindrical; all pereonites with paired dorsal elevations; Head as wide as pereonite 1; pereonite 1 fused to head with fusion indicated by a groove; pereonites 1 to 7 parallel-sided; pereonite 7 fused to pleon with no distinct suture indicated. Pleon with all pleonites fused; pleotelson apically blunt. Antenna 1 with single short flagellar article. Antenna 2 flagellum of 2 articles plus claw. Mandible with well developed truncate molar process, spine row, lacinia mobilis and toothed incisor. Maxilla 1 with 2 typical lobes. Maxilla 2 with 3 typical lobes. Maxillipedal endite with distal setae; palp with articles 2+3 and 4+5 fused. Coxa completely fused to pereonal tergites. Pereopod 1 reduced; pereopods 2 to 7 with few spiniform setae; dactylus with secondary unguis almost as large as primary unguis. Penes separate, simple and straight. Oostegites on maxilliped and pereopods 1 to 5; not thickened, oostegites 2 to 4 forming the majority of the marsupium, on fully mature female with supportive extensions on coxae 2, 3 and 4.

**Remarks.** The ambulatory pereopods, mouthparts with fused maxilliped palp articles, separate penes, and absence of uropodal exopods place *Lyidotea* within the Idoteidae. In Arcturidae and similar families (Poore, 2001) maxillipedal palp articles always number five, and there is a single penial plate. Pereopods are usually differentiated into different functional groups and the uropodal exopod is rarely absent.

The genus is unique among Idoteidae in fusion of all pleonites to pereonite 7. Fusion of the head to pereonite 1 is found elsewhere in this family only in *Crabzyos* Bate (sole species, *C. longicaudatus*; Poore and Lew Ton, 1993). There are many differences in body shape, pereopods and mouthparts between these two genera and the fusion is undoubtedly homoplasious. The short, compact pereopods, almost gnathopod-like pereopod 1, dorsal body sculpture, and fusion of maxillipedal palp articles 2+3 and 4+5 resemble the situation seen in species of *Synidotea* Harger (e.g., Richardson, 1905; Poore and Lew Ton, 1990). Again, profound differences are apparent between *Lyidotea* and *Synidotea*, notably in the possession of a fused penial plate in males and the absence of oostegite 5 in females of *Synidotea*. The flagellum of antenna 2 of most genera of Idoteidae is multiarticulate; the short 'clavate' condition seen in *Lyidotea* is distinct yet similar to that seen in *Parasymmerus*, *Cleantiella* and *Erichsonella* (Brusca, 1984) from America. These genera have only slight similarities to *Lyidotea* in other morphological comparisons. A further unique condition in *Lyidotea* is the presence of coxal supports under oostegites. This is paralleled in Antarcturidae Poore, Holidoteidae Wägele, Austrarcturellidae Poore and Bardsley and Rectarcturidae Poore and may be correlated with cylindrical body shape (Poore, 2001).

Relationships of *Lyidotea* to other idoteid genera remain unresolved.

### *Lyidotea nodata* Hale

Figures 1–4

*Lyidotea nodata* Hale, 1929: 35–36, fig. 1.

**Type material.** Flinders I., Princess Charlotte Bay, Qld, SAM C1699 (female holotype), SAMA C1845 (paratype) — not examined.

**Material examined.** Western Australia, North-west Shelf, between Dampier and Port Hedland, CSIRO Division of Fisheries, RV *Soela*, WHOI epibenthic sled, 31 NWA stations within rectangle defined by 18°56.6'S, 119°2.4'E and 20°1.2'S, 116°57.5'E, 30–142 m, 7 Dec 1982–30 Oct 1983, (93 specimens including males, females, juveniles and manca, 5–13 mm), NMV collections.

NW of Bluff Point (27°28'S, 133°16'E), 97 m, 9 Oct 1963, WAM 636-86 (2 males, 9 mm, 10.5 mm); W of Rottneest I., (32°00'S, 115°08'E), 135 m, 28 Aug 1973, WAM 548-73 (1 female, 13 mm).

**Illustrated specimens.** North-west Shelf, between Dampier and Port Hedland, 19°27.2'S, 118°58.6'E, 36–46 m, 8 Dec 1982 (stn NWA 346), NMV J23702 (1 male, 8 mm); 19°29.0'S, 118°53.5'E, 40–40 m, 12 Feb 1983 (stn NWA 81), NMV J23699 (1 female, 7.5 mm). W of Rottneest I., (32°00'S, 115°08'E), 135 m, 28 Aug 1973, WAM 548-73 (1 female, 13 mm).

**Description.** Male. Head with 2 rounded dorsal elevations between eyes; with setae on elevations, anterolateral margins rounded, rostral point absent. Fusion of head and pereonite 1 indicated by a shallow dorsolateral groove not incised laterally. Pereonite 1 as long as head, with 2 rounded dorsal elevations. Pereonites 2 to 4 progressively longer, each with 2 rounded dorsal elevations at midlength and 2 smaller posterior dorsal elevations. Pleotelson and pereonite 7 fused; pereonite 7 with small dorsal elevations; the whole widest two-thirds along, tapering to bluntly rounded apex.

Eyes lateral, prominent. Antenna 1 extending midway along peduncular article 3 of antenna 2; flagellum a single hemispherical article with 5 aesthetascs. Antenna 2, 0.46 times body length; flagellum of 2 articles and claw, article 1 with numerous short setae, 1.3 times as long as last peduncular article, article 2 minute, claw longer, almost straight.

Mandible with truncate tritritive molar; spine row of 4 spines; left lacinia mobilis with 2 teeth; incisor 4-toothed. Maxilla 1 inner lobe with 2 terminal setae; outer lobe with 10 distal robust setae. Maxilla 2 inner lobe with 10 plumose setae; middle lobe with 3 setae; outer lobe with 4 setae. Maxillipedal endite with 5 long setae; 1 coupling hook; small oostegite present; palp oval, twice as long as wide, twice as wide as article 1; articles 2 and 3 fused, with distomesial row of 11 setae, with oblique distal suture between this and more distal articles; articles 4 and 5 fused, with mesial row of 9 setae and 5 more scattered setae distally.

Pereopod 1 ambulatory, compact; basis-merus with few setae; carpus cylindrical, with 2 mesial setae near posterior margin; propodus with semi-circular blade produced from palm, mesial face with curved row of 13 barbed setae; dactylus almost as long as propodus, with mesial setae, with primary and secondary unguis. Pereopods 2 to 7 similar, with scattered setae; propodi cylindrical; dactylus tapering, with rounded denticles along posterior margin, setose, with primary and secondary unguis.

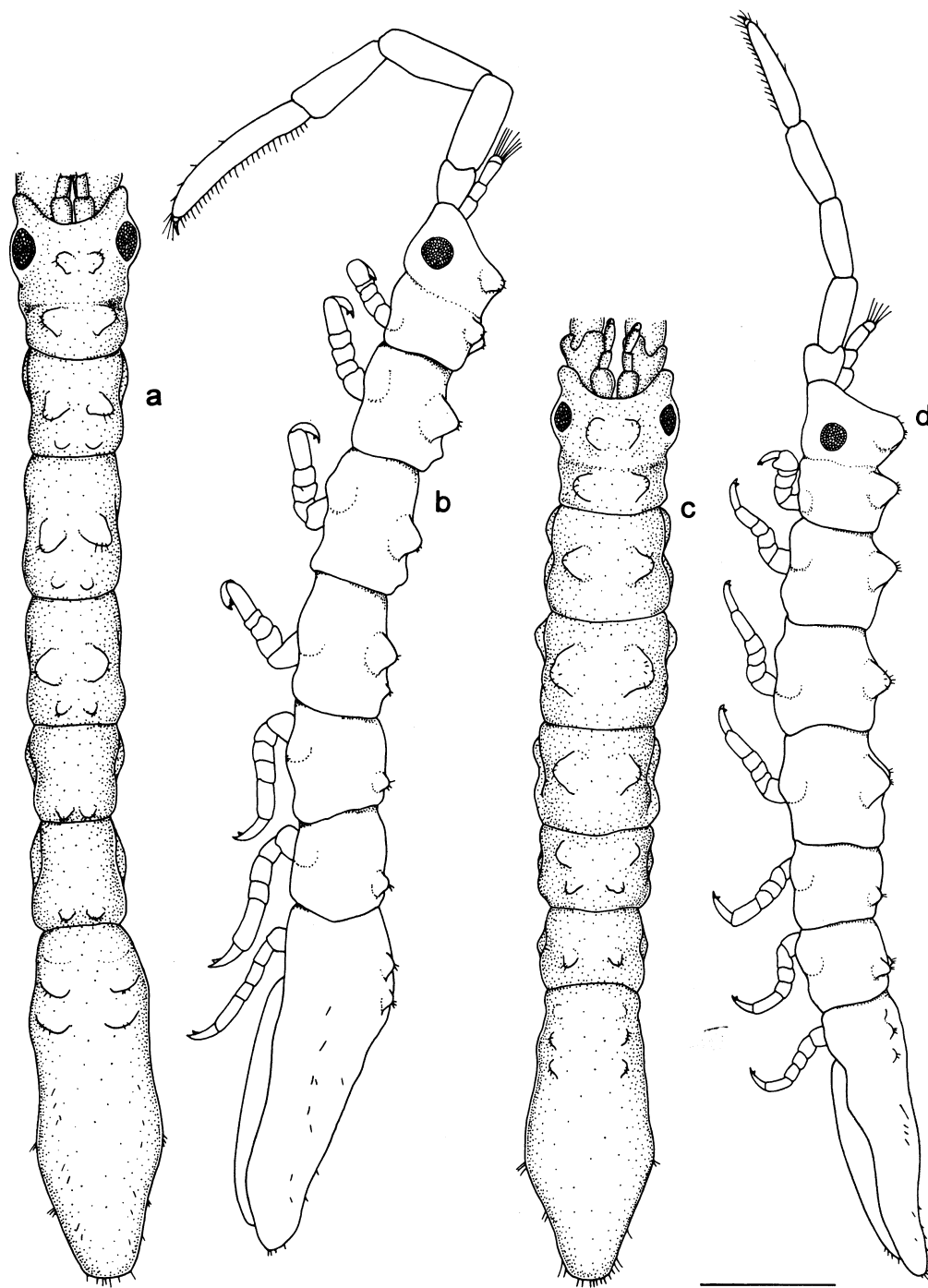


Figure 1. *Lyidotea nodata* male (NMV J23702): a, dorsal view; b, lateral view. Female (NMV J23699): c, dorsal view; d, lateral view. Scale = 1.0 mm.

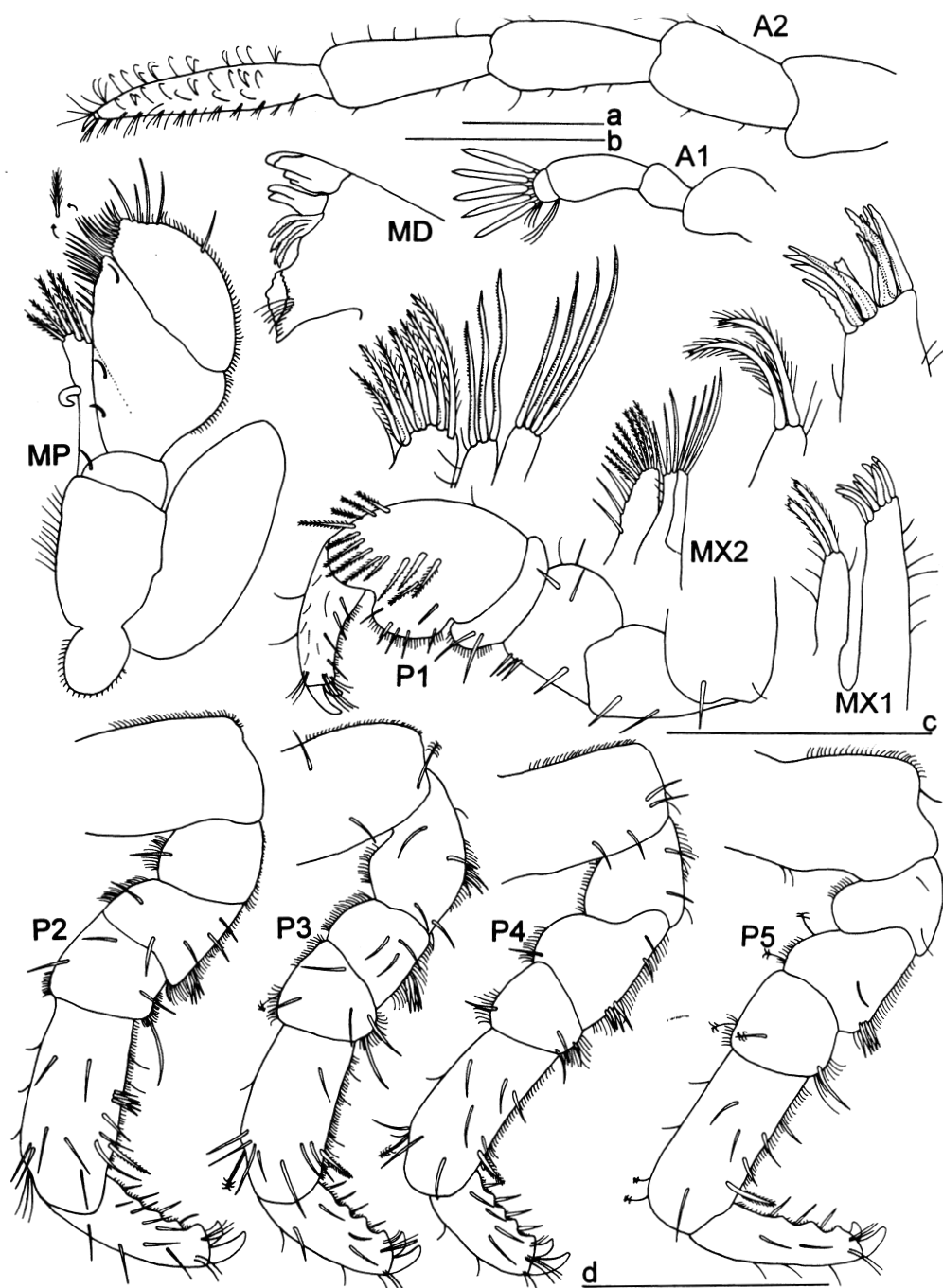


Figure 2. *Lyidotea nodata* female (NMV J23699): antennae 1 and 2, left maxilliped, left mandible, left maxillae 1 and 2, pereopods 1 to 5. Scales = 0.5 mm: a, A2; b, A1; c, MD, MX1, MX2, MP; d, P1–P5.

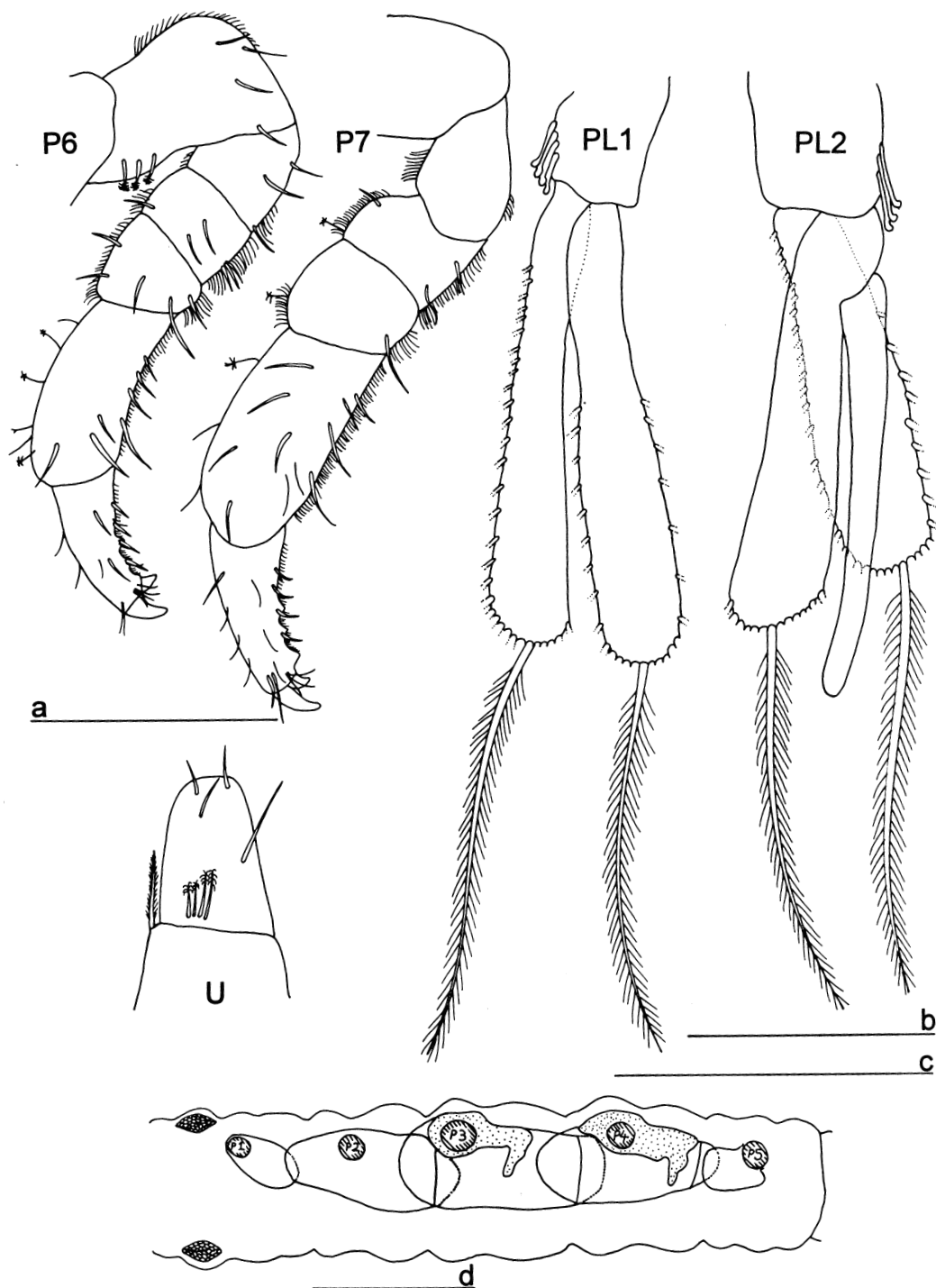


Figure 3. *Lyidotea nodata* female (NMV J23699): pereopods 6 and 7, uropod, ventral view detailing oostegites. Male (NMV J23702): pleopods 1 and 2. Scales = 0.5 mm: a, P6, P7; b, PL1, PL2; c, U. Scale = 1 mm: d, ventral view of female.

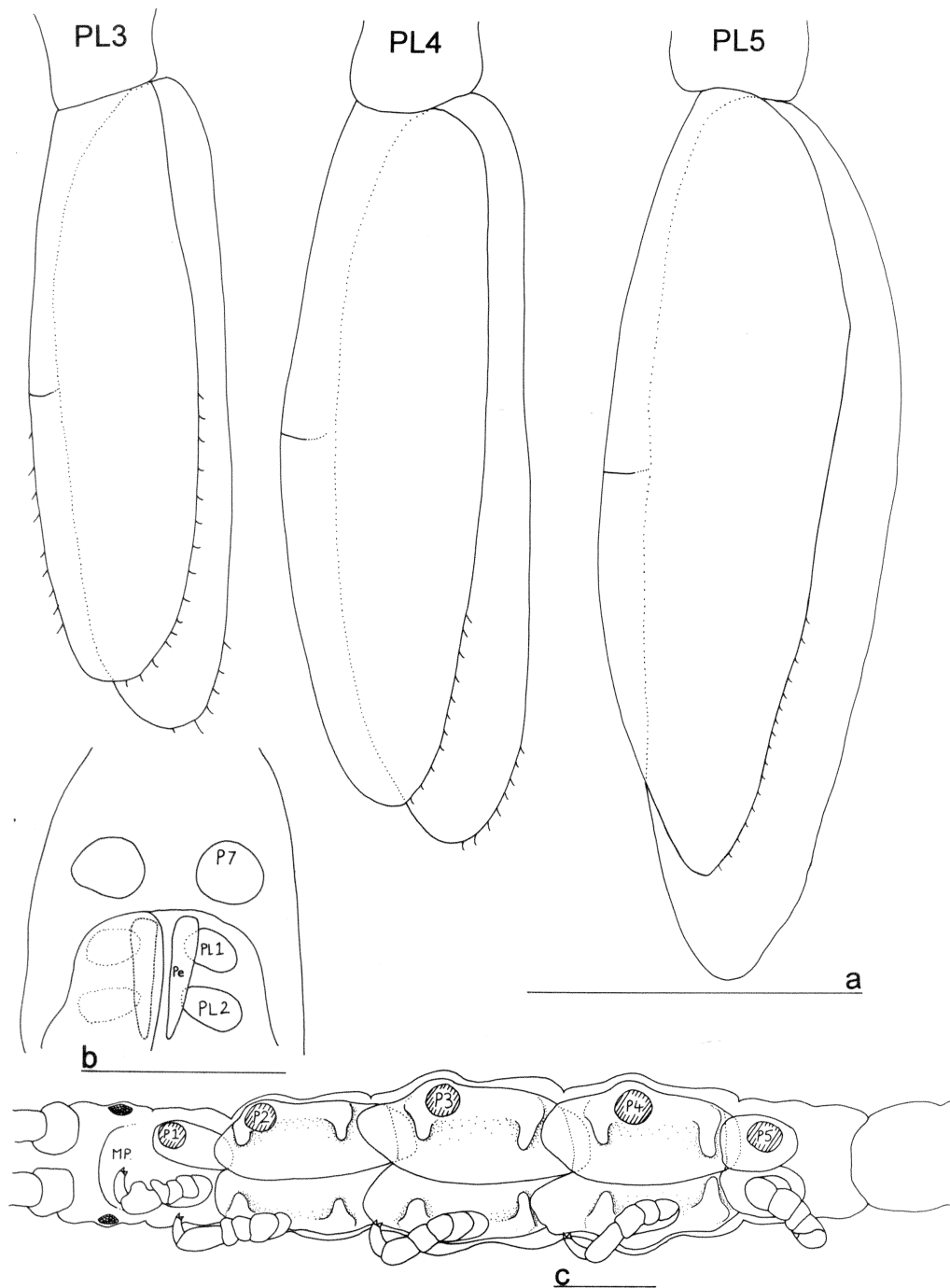


Figure 4. *Lyidotea nodata* male (NMV J23702): pleopods 3, 4 and 5, ventral view of pereonite 7 and pleon showing position of penes in situ. Female (NMV J23699): ventral view of fully mature female detailing oostegites. Female (WAM 548-73): ventral view. Scale = 0.5 mm: a, PL3–PL5. Scales = 1.0 mm; b, ventral views.

Pleopod 1 peduncle longer than wide, with 4 coupling hooks; endopod with 33 mesial and distal long plumose setae, longest as long as endopod; exopod with 27 long plumose setae concentrated distally. Pleopod 2 peduncle little longer than wide; endopod with 15 distal plumose setae, as long as endopod; appendix masculina simple, straight and blunt, reaching beyond the apex of endopod; exopod with 40 marginal plumose setae. Pleopod 3 to 5 progressively larger, without long marginal setae. Uropodal endopod 1.5 times as long as wide at base, tapering to rounded-truncate apex.

Female. Differs from the male in smaller size and wider pereonites. Small oostegite on maxilliped; oostegite on pereopod 1 small, posteriorly directed; oostegites on pereopods 2 to 4 elongated along body, with distal transverse sutures; pereopods 2 to 4 with L-shaped coxal extensions forming thickened lateral edges supporting oostegites, oostegites 5 small, meeting in midline (Fig. 3D, 4C).

*Distribution.* North Queensland, Western Australia; subtidal to 140 m depth.

*Remarks.* This redescription is the first illustration of a male, unavailable to Hale (1929), and also illustrates the oostegites for the first time. A female with slightly more developed oostegites (WAM 548-73) was found after the description of the female (NMV J23699) was completed. Both possess functional oostegites and all other appendages are the same but it was decided that the larger female be illustrated to show the slightly more developed condition. Hale failed to note the second article of the antenna 2 flagellum.

### Acknowledgements

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