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The genus *Lanocira* Hansen, 1890 (Corallanidae: Isopoda: Crustacea) in tropical Australian waters

NIEL L. BRUCE[1] & CONNI SIDABALOK[2]
Museum of Tropical Queensland, Queensland Museum and School of Marine and Tropical Biology, James Cook University; 70–102 Flinders Street, Townsville, Australia 4810. E-mail: [1]niel.bruce@qm.qld.gov.au; [2] sidabalok_conni@yahoo.com

Abstract

The genus *Lanocira* Hansen, 1890 is recorded from the southwestern Pacific for the first time. *Lanocira grebarree* **sp. nov.** from the Great Barrier Reef is described, and *Lanocira gardineri* Stebbing, 1904 and *Lanocira* sp. cf. *anasicula* Jones, 1982 are recorded from the Great Barrier Reef and Hibernia Reef, in the Timor Sea off Western Australia, respectively. *Lanocira grebarree* **sp. nov.** can be identified by the anteriorly rounded, upturned and short rostral process in males in combination with the lack of stiff setae on the dorsal surface of the pleotelson. The similar *L. gardineri* Stebbing, 1904 is distinguished from *L. grebarree* **sp. nov.** by the presence of stiff hyaline setae on the dorsal surface of the pleotelson. A key is provided to the Australian species of *Lanocira*.

Key words: Isopoda, Corallanidae, *Lanocira*, coral reefs, Great Barrier Reef, Western Australia, Timor Sea

Introduction

The Corallanidae have most recently been revised and reviewed by Delaney (1989). Corallanids are not well known in Australia waters, the major contributions being those of Hale (1925, 1926, 1940), Bruce (1982b, 1982c) and Jones *et al*. (1983) and it not surprising that the genus *Lanocira* had not been reported.

Critically, the advent of SCUBA in making collections from coral-reef habitats has resulted in far more corallanids being obtained, principally belonging to the genera *Alcirona* Hansen,1890, *Argathona* Stebbing, 1905 and *Lanocira* Hansen, 1890. The Australian genera and species of the family have been listed by Bruce *et al*. (2002). Delaney (1989) offered a revised diagnosis to the genus *Lanocira*, and listed the nine species known to date. *Lanocira* is widely distributed in tropical and subtropical regions, particularly in shallow-water marine habitats and is commonly collected in coral-reef habitats (personal observation and museum records).

Material and methods

Recently collected material was obtained from NSF-funded field work (specimens held at LACM) and the CoML CReefs project at Heron Island and Lizard Island research stations (see acknowledgements).

Abbreviations: RS—robust setae; PMS—plumose marginal setae; CoML–Census of Marine Life; MTQ—Museum of Tropical Queensland, Townsville; LACM—Natural History Museum of Los Angeles County, USA; NSF—National Science Foundation, USA; TNH–The Natural History Museum, London, UK.

Taxonomy

Suborder Cymothoida Wägele, 1989

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Family Corallanidae Hansen, 1890

Remarks. Delaney (1989) has given the most recent comprehensive revision of the family, together with a key to the genera of the family, and that work remains the primary source reference. The family is identified primarily by mouthpart characters (see for example Kensley & Schotte 1989; Bruce *et al*. 2002) and the genera may be identified using the key given by Delaney (1989).

All genera are distributed within the tropics and subtropics, with few exceptions. The genus *Excorallana* Stebbing, 1904a is restricted to the Americas and one record of West Africa (Delaney 1989); the records of Nunomura (1988, 1994) are misidentifications of species of *Tachaea* Schioedte & Meinert, 1879 and *Argathona* Stebbing, 1905, respectively.

Lanocira Hansen, 1890

Lanocira Hansen, 1890: 395.—Stebbing 1893: 346, 1904b: 706; 1905: 19.—Barnard 1914: 359; 1920: 354; 1955: 59.—Nierstrasz 1917: 102; 1931: 167.—Pillai 1967: 274; Kensley 1978: 75.—Delaney 1989: 41.—Javed & Yasmeen 1992: 11.
Nalicora Moore, 1902: 169.—Richardson 1905: 163.—Menzies & Kruczynski 1983: 77.—Kensley & Schotte 1989: 168.

Type species. *Lanocira kroyeri* Hansen, 1890; by monotypy.

Remarks. Identification of species of *Lanocira* is problematic. Mature males of most species have a distinctive, possibly uniquely shaped rostral process. Females and immature males lack a rostral process, or it may be less developed. There is little difference in appendage morphology between species and perhaps consequently species have been moved in and out of synonymy as is the case for *Lanocira gardineri*. Furthermore some supposedly diagnostic characters, such as the rostrum and dorsal setae on the pleotelson, are apparently inconsistently present in the one species at one location.

Within Australian waters there are at least two ‘known undescribed’ species. A single specimen of *Lanocira* sp., closely similar to *Lanocira anasicula* Jones, 1982 (from Kenya) is here recorded from Western Australia (Hibernia Reef: MTQ W17820). A series of specimens from the Australian Coral Sea Territory (Marion Reef: MTQ W10787, W10789; also Chesterfield Reefs: MTQ W10795, W10796) are similar to *Lanocira gardineri*, but lack a rostrum, have a more elongate body and some specimens have a sub-truncate pleotelson; these could not be confidently identified to species.

Corilana Kossmann, 1880 has sometimes been placed in synonymy with *Lanocira* (e.g. Delaney 1989), but Kossmann’s description and figures provide no conclusive evidence that *Corilana* is a junior synonym of *Lanocira* as opposed to *Argathona* Stebbing, 1905. As the whereabouts of the type material are unknown (personal communication, see acknowledgements) and can reasonably be assumed to be lost, the genus and type species (*Corilana erythraea* Kossmann, 1880: 115, plate IX, figs 6–11) are here regarded as **nomina dubia**.

Delany (1989) has given the most recent overview of the genus, listing eight species. Only one further species has been described to date (Yasmeen & Javed 2000), and that species is here placed in synonymy with *Lanocira gardineri*. With the species recorded herein there are ten species of *Lanocira* including *Lanocira* sp. recorded here. All species occur within the tropics with the exception of one record from Juan Fernandez Islands, southern Chile (cited in Delany 1989).

Key to the Australian species of *Lanocira*

1. Pleotelson dorsal surface setose 2
– Pleotelson dorsal surface without dorsal setae . . . . . *Lanocira grebarree* **sp. nov.**
2. Cephalon in male with narrowly rounded and upturned rostrum . . . . . *Lanocira gardineri* Stebbing, 1904
– Cephalon in male with rectangular upturned rostrum . . . . . .*Lanocira* sp. (cf. *L. anasicula* Jones, 1982)

***Lanocira gardineri* Stebbing, 1904**
(Fig. 1)

Lanocira gardineri Stebbing, 1904b: 706, plate LIA; 1905:19.—Richardson 1910: 9.—Barnard 1940: 491 (list).—Nierstrasz 1931: 169.—Pillai 1954: 7; 1967: 274, fig 4I–O, pl. 1.3.—Kensley 1975: 39 (list); 1978: 75, figs 31C–D.—Jones 1982: 72.—Delaney 1989: 43.—Müller 1992: 45, figs 1–32.
Lanocira capensis Barnard, 1914: 359, plate 31A; 1920: 354.—Nierstrasz 1931: 169.
Lanocira gardinieri.—Bruce 1982a: 316 (*lapsus*).
Lanocira wowine Yasmeen & Javed, 2000: 102, figs 1–3 (**new synonym**).
Non *Lanocira gardineri*.—Javed & Yasmeen 1992: 12, figs 2, 3 (misidentification, probably undescribed species; see 'Remarks').

Type locality. Mahlosmadulu Atoll, North Province, Maldives; 36 metres.
Material examined. Samples from the Lizard Island (LIZ stations) region collected by N.L. Bruce and M. Błażewicz-Paszkowycz in 2009. 1 ♂ (5.6 mm), Day Reef, 14.47119°S, 145.52970°E, 13 February 2009, dead coral on vertical wall, 10–12 m, stn LIZ09-03A (MTQ W30482). 2 ♂ (5.9, 4.5 mm), Day Reef, 14.48539°S, 145.5464°E, 19 February 2009, outer reef front, dead coral on spur, 15 m, stn LIZ09-12B (MTQ W32432). 1 ♂ (4.7 mm; pleotelson and right uropod damaged), Yonge Reef, 14.61383°S, 145.61820°E, 18 February 2009, back reef, small coral rubble on sand, 15 m, stn LIZ09-10F (MTQ W32431). 1 ♀ (5.7 mm, ovig.), from Hicks Reef, 14.44803°S, 145.49920°E, 21 February 2009, outer reef front, dead coral heads on reef edge, 5–7 m, stn LIZ09-16E (MTQ W32433). 1 ♀ (5.5 mm, ovig.), Heron Island, Capricorn Group, 23.45995°S, 151.86712°E, 11 November 2009, back reef, coral rubble, 10 m, stn HI09-002, K. Schnabel (MTQ W32434). 1 ♂ (5.1 mm), Adele Island, Kimberleys, Western Australia, 15.51667°S, 123.18350°E, 14 October 2009, 14 m, on *Lobophylla*, stn 02/K09-T1, coll. L. Patterson (WAM C44393).

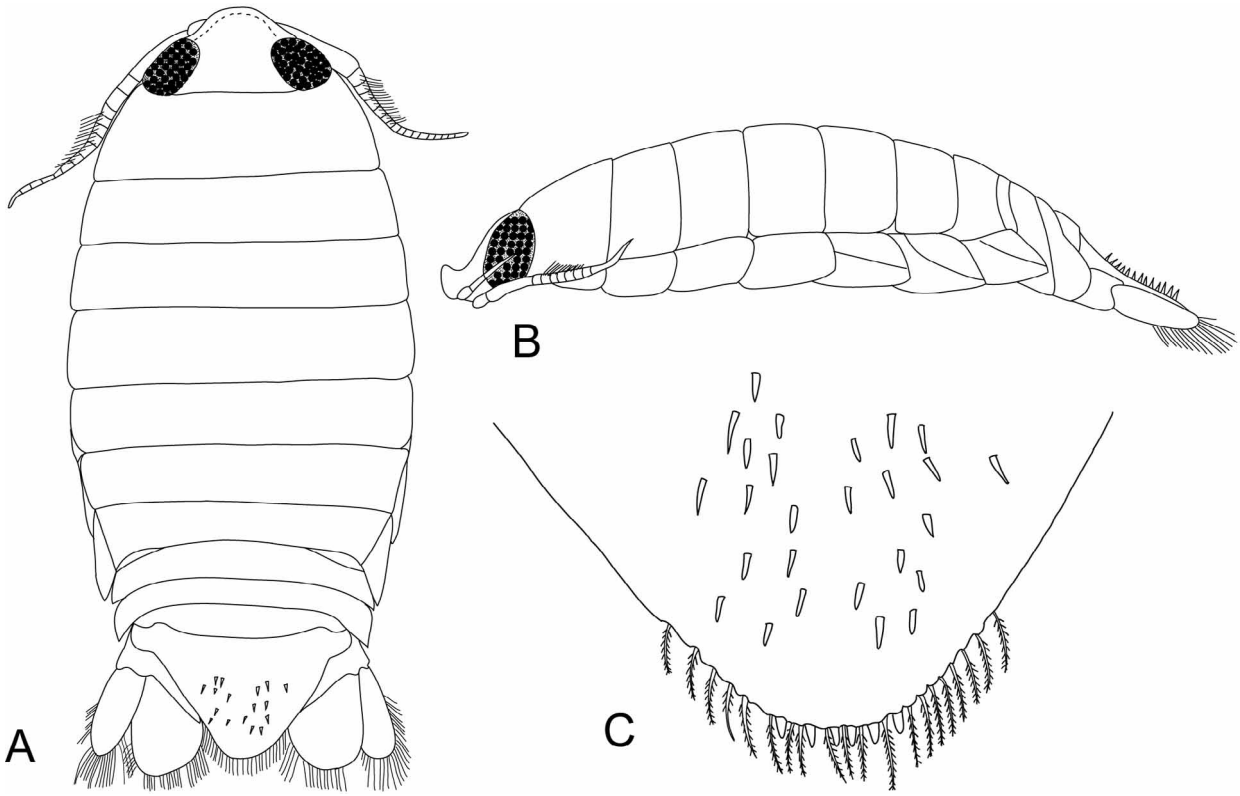

FIGURE 1. *Lanocira gardineri* Stebbing, 1904. Male, 5.9 mm (MTQ W32432). A, dorsal view; B, lateral view; C, pleotelson.

Remarks. *Lanocira gardineri* is widely distributed in the tropical and subtropical Indian Ocean (Delaney 1989). Müller (1992) suggested the possibility that not all the records belong to the one species, an opinion with which we agree. Most records of this species have not been accompanied by illustrations, and given that several species are primarily separated by the shape of the rostrum in mature males, a character that presumable develops incrementally with successive moults, it is not possible to confirm or reject most previous identifications. Furthermore as the type material for *Lanocira gardineri* is apparently lost, all attempts to locate this material having been

unsuccessful, resolution of the identity of the species will necessitate a redescription and neotype designation. Identification of the present material is based on agreement with both Stebbing's original description and Müller's (1992) redescription.

The recently described *Lanocira wowine* Yasmeen & Javed, 2000 seems not to differ from *Lanocira gardineri* and is here placed in synonymy. The record of *Lanocira gardineri* from the Karachi (Javed & Yasmeen 1992) is excluded from the synonymy as there are several points of difference between their figures and description, most notably in the relative length of the uropodal rami and in having an anteriorly acute rostrum.

Distribution. Maldives, South Africa, Philippines, India, Sri Lanka, Hong Kong, Persian Gulf, Mozambique, Madagascar, Eniwetok Atoll and Kenya (summarised by Delaney 1989); here recorded from the Kimberley coast, Western Australia, and both the southern and northern Great Barrier Reef.

Lanocira sp. (cf. *anasicula* Jones, 1982)

(Fig. 2A–D)

Material examined. 1 ♂ (6.1 mm), Hibernia Reef, WA (Timor Sea), 11º58.116'S, 123º22.133'E, 12 May 1992, 6 m, patch reef, symbiotic with *Acropora*, coll. J.W. Short (MTQ W17820).

Holotype of *Lanocira anasicula* Jones, 1982 (♂, 6.9 mm; TNH 1979.217.1) and paratypes (2 ♂, 6.5, 4.6 mm; TNH 1979.218.2)—Watamu, Kenya, 18 August 1969, coll. D.A. Jones. All specimens previously destructively dissected and dissected appendages not deposited with the specimens.

Remarks. The single specimen bears a remarkable similarity to *Lanocira anasicula* Jones, 1982 (Fig. 2E–H), notably in having a clearly quadrate anterior margin to the rostrum. The specimen from Hibernia Reef differs in a number of characters: the body is broader (2.1 as long as greatest width, vs 2.6 for *L. anasicula*), the uropods extend well beyond the pleotelson apex (only sightly beyond), the dorsum of the pleotelson has numerous stiff setae (without setae in mature males of *L. anasicula*, but present in the immature male paratype which also has setae on the pleonites), and the cephalic ridges above the eye are distally acute (Fig. 2C) (distally truncate in *L. anasicula*, Fig. 2E).

Lanocira grebarree sp. nov.

(Figs 3–6)

Material examined. All material from Great Barrier Reef, Australia.

Holotype. ♂ (5.9 mm), Bird Islet, Lizard Island Group, 14.69664°S, 145.4642°E, 13 February 2009, outer fore reef, stn CWLI 003, coll. C. Watson (MTQ W31113; + 1 microslide).

Paratypes. 1 ♂ (4.8 mm, dissected), Lizard Island, North Point reef, 13 December 1980, 11 m, coll. N.L. Bruce **(**MTQ W10788 + microslides). 1 ♂ (4.0 mm), Lionet Reef, 14.78058°S, 145.34940°E, 16 February 2009, back reef, fragment of *Acropora* on stalk, 5 m, stn LIZ09-08C, coll. M. Błażewicz-Paszkowycz **(**MTQ W32428). 1 ♂ (4.4 mm), Heron Island, 23.436°S 151.926°E, northern side, reef flat, 100 m back from reef edge, 14 April 2003, from large boulder, RW03.155, coll. N.L. Bruce **(**LACM CR2003-55**)**. 1 ♀ (6.7 mm, non-ovig.), south of Wistari Reef, Capricorn Group, 23.488°S 151.883°E, 13 April 2003, mixed dead coral, 5 m, RW03.138, coll. R. Wetzer, N.L. Bruce and D. Pentcheff (LACM CR2003-53). 1 ♂ (4.8 mm), Wistari Reef, northern side, 23°27.257'S, 151°52.840'E, 23 November 2009, dead coral on side of bommie, 3–5 m, stn HI09-084D, coll. N.L. Bruce & K. Schnabel **(**MTQ W32429).

Additional material. 1 ♂ (5.5 mm), 2 ♀ (6.0, 4.8 mm, non-ovig.), 4 mancas (2.2, 2.6, 2.9, 3.2 mm), Lizard Island, 11 December 1980, central lagoon, 1–2 m, coll. N.L. Bruce (MTQ W10798). 1 ♂ (4.5 mm), 2 ♀ (5.1, 4.5 mm, non-ovig.), manca (2.5 mm), between Palfrey Island and South Island, Lizard Island Group, 11 December 1980, 2 m, coll. N.L. Bruce (MTQ W10782). 1 ♂, 1 ♀, 1 inter-moult, 2 mancas (not measured), North Point, Lizard Island, 12 December 1980, 10–12 m, coll. N.L. Bruce (QM W10793). 14 (1 adult, 13 mancas, not measured), Lionet Reef, 14.78058°S, 145.34940°E, 16 February 2009, back reef, fragment of *Acropora* on stalk, 5 m, stn LIZ09-08C, coll. M. Błażewicz-Paszkowycz **(**MTQ W30484). 2 ♂ (6.2, 6.0 mm), south of Wistari Reef, 23.488°S 151.883°E, 13 April 2003, coral rubble from side of bommie, 16.1 m, RW03.143, coll. N.L. Bruce, R. Wetzer and D. Pentcheff (LACM CR2003-54). 1 ♀ (5.2 mm, non-ovig.), southwest corner of Wistari Reef, Capricorn Group, 4 December 1979, 11 m, coll. N.L. Bruce (MTQ W10779).

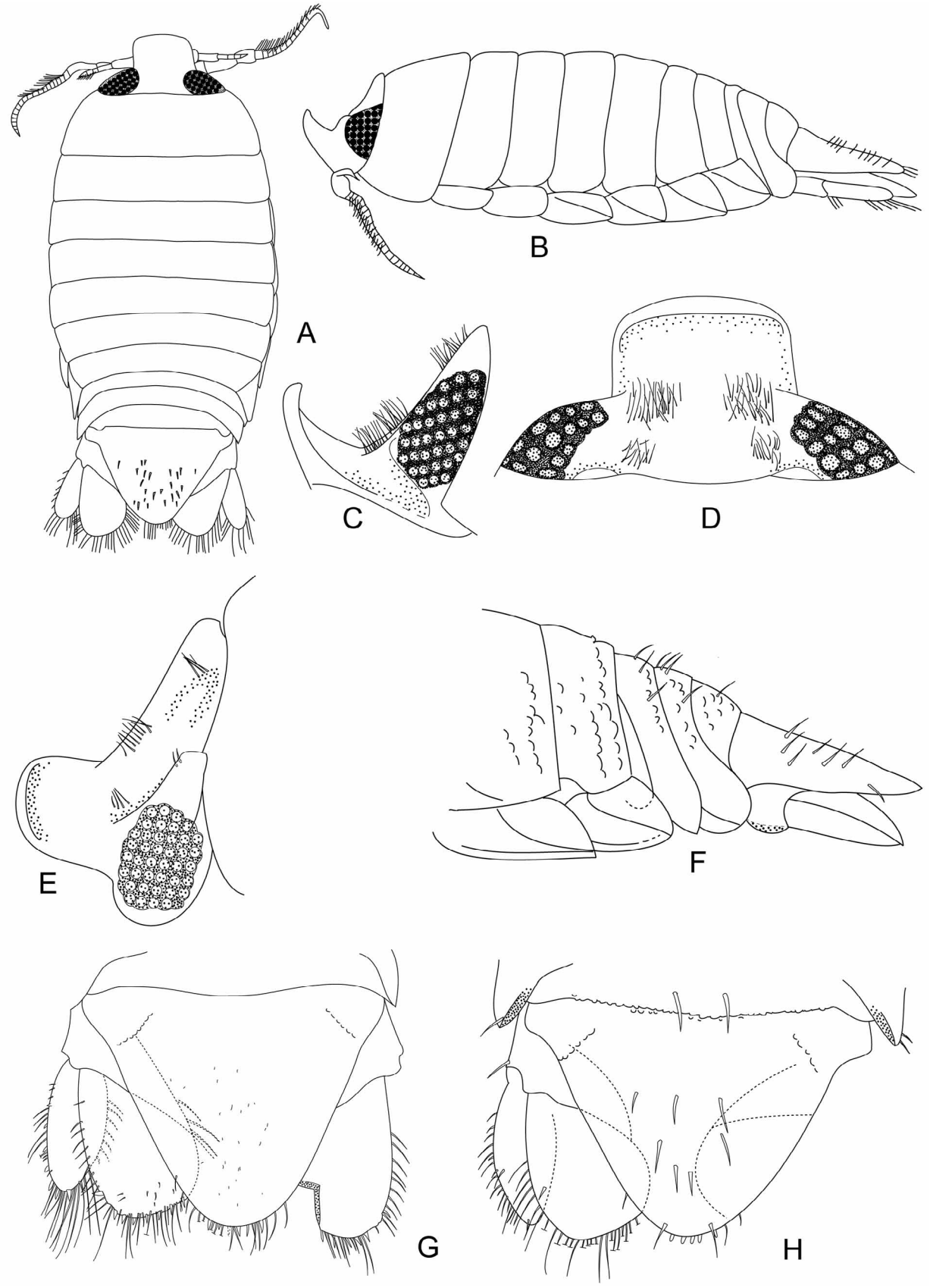

FIGURE 2. *Lanocira* sp. Male (MTQ W17820). A, dorsal view; B, lateral view; C, head, showing narrow boss; D, head showing four groups of setae. *Lanocira anasicula* Jones, 1982, E, head, paratype ♂, 6.5 mm; F, pleon and pleotelson, paratype 6.5 mm; G, pleotelson and uropods, holotype 6.9 mm; H, pleotelson and uropods, paratype 4.6 mm

Description. Adult male. *Body* 2.5 times as long as greatest width, dorsal surfaces smooth, widest at pereonite 4, lateral margins weakly ovate. *Rostrum* present, anteriorly upturned and rounded. *Eyes* separated by about 33% width of head, each eye made up of ~8 transverse rows of ommatidia, each row with ~6 ommatidia, eye colour black. Pereonites without transverse impressed line (absent on all pereonites); *pereonite 1 and coxae* 2–3 each with posteroventral angle rounded; coxae 5–7 with incomplete oblique carina; posterior margins of pereonites 5–7 smooth, without nodules or setae.

Pleon with pleonite 1 entirely concealed and pleonite 2 largely concealed by pereonite 7; pleonites 3–5 posterior margin smooth; posterolateral angles of pleonite 2 not visible; pleonite 3 with posterolateral margins rounded, not extending to posterior margin of pleonite 4; posterolateral margins of pleonite 4 broadly rounded, extending beyond posterior margin of pleonite 5; pleonite 5 posterolateral angles entirely overlapped by lateral margins of pleonite 4. *Pleotelson* 0.8 as long as anterior width, with paired sub-marginal lateral anterolateral depressions; lateral margins weakly convex, converging to sub-truncate posterior margin without median point; posterior margin with 6 RS and ~26 PMS.

Antennule peduncle articles 1 and 2 fused; articles 3 and 4 0.7 times as long as combined lengths of articles 1 and 2; article 3 2.8 times as long as wide; flagellum with 6 articles, extending to posterior margin of eye. *Antenna* peduncle article 4 2.4 times as long as wide, 3.0 times as long as article 3, anterodistal angle with 1 pectinate seta, and 2 simple setae; article 5 0.9 times as long as article 4, 2.0 times as long as wide, anterodistal angle with cluster of 2 pectinate and 2 simple setae; flagellum with 14 articles, extending to posterior of pereonite 2.

Frontal lamina pentagonal, 1.2 times wider than long, lateral margins weakly concave, diverging slightly towards anterior; anterior margins concave with distinct median point. *Mandible* incisor unicuspid, anterodistal margin with 6 prominent keratinized spines; molar process reduced, lobe-like, with 2 small scales; palp article 2 with 7 distolateral plumose setae, article 3 with 10, distal 3 longest. *Maxillule* as for genus. *Maxilla* article 2 with 3 mesial simple setae, article 3 with 2 long simple setae. *Maxilliped palp* article 2 mesial margin with 1 slender setae, lateral margin distally without slender setae, article 3 mesial margin with 2 slender setae, lateral margin without slender setae, article 4 mesial margin with 1 short and 1 long slender setae, lateral margin with 1 slender setae, article 5 distomesial margin with 4 setae, lateral margin with 2 setae; without endite.

Pereopod 1 basis 3.2 times as long as greatest width, inferior distal angle with cluster of 1 acute simple setae; ischium 0.4 as long as basis, inferior margin with 3 setae, superior distal margin with acute 1 RS; merus inferior margin with 4 molariform RS, set as single row, superior distal angle with 3 short setae; carpus inferior margin with 1 slender seta; propodus 2.5 times as long as wide, inferior margin without RS, 2 long simple setae and 1 RS opposing dactylus; dactylus 0.9 as long as propodus, strongly curved. *Pereopod 2* ischium inferior margin with 2 stout RS, superior distal margin with 2 acute RS, one short one long; merus inferior margin with 4 molariform RS, 1 acute RS and 1 simples seta, superior distal margin with 3 slender setae; carpus inferodistal angle without RS. *Pereopod 3* similar to pereopod 2. *Pereopod 6* similar to pereopod 7. *Pereopod 7* basis 2.1 times as long as greatest width, inferior margin weakly convex with 5 simple setae, proximal superior margin with 6 palmate setae; ischium 0.5 as long as basis, inferior margin with 2 RS (set as 1 and 1), superior distal angle with 6 RS, inferior distal angle with 3 RS; merus 0.8 as long as ischium, 1.4 times as long as wide, inferior margin with 1 RS, superior distal angle with 5 RS, inferior distal angle with 6 RS; carpus 0.8 as long as ischium, 1.6 times as long as wide, inferior margin with 1 RS, superior distal angle with ~20 RS, inferior distal angle with 6 RS; propodus 0.7 times as long as ischium, 2.3 times as long as wide, inferior margin with 1 RS, superior distal angle with 2 RS and 1 slender setae, inferior distal angle with 1 RS.

Penes opening flush with surface of sternite 7, narrowly separated (by <1% sternal width).

Pleopod 1 exopod 1.7 times as long as wide, lateral margin straight, mesial margin convex; distally broadly rounded; endopod 2.5 times as long as wide, distally subtruncate, lateral margin straight, with PMS on distal margin only, mesial margin with PMS from distal one-third; peduncle 2.2 times as wide as long; mesial margin with 4 coupling hooks. *Pleopod 2 appendix masculina* with parallel margins, 0.8 times as long as endopod, distally narrowly rounded. Pleopods 1–4 peduncle distolateral margin with small acute RS; pleopods 3–5 exopods without complete transverse suture.

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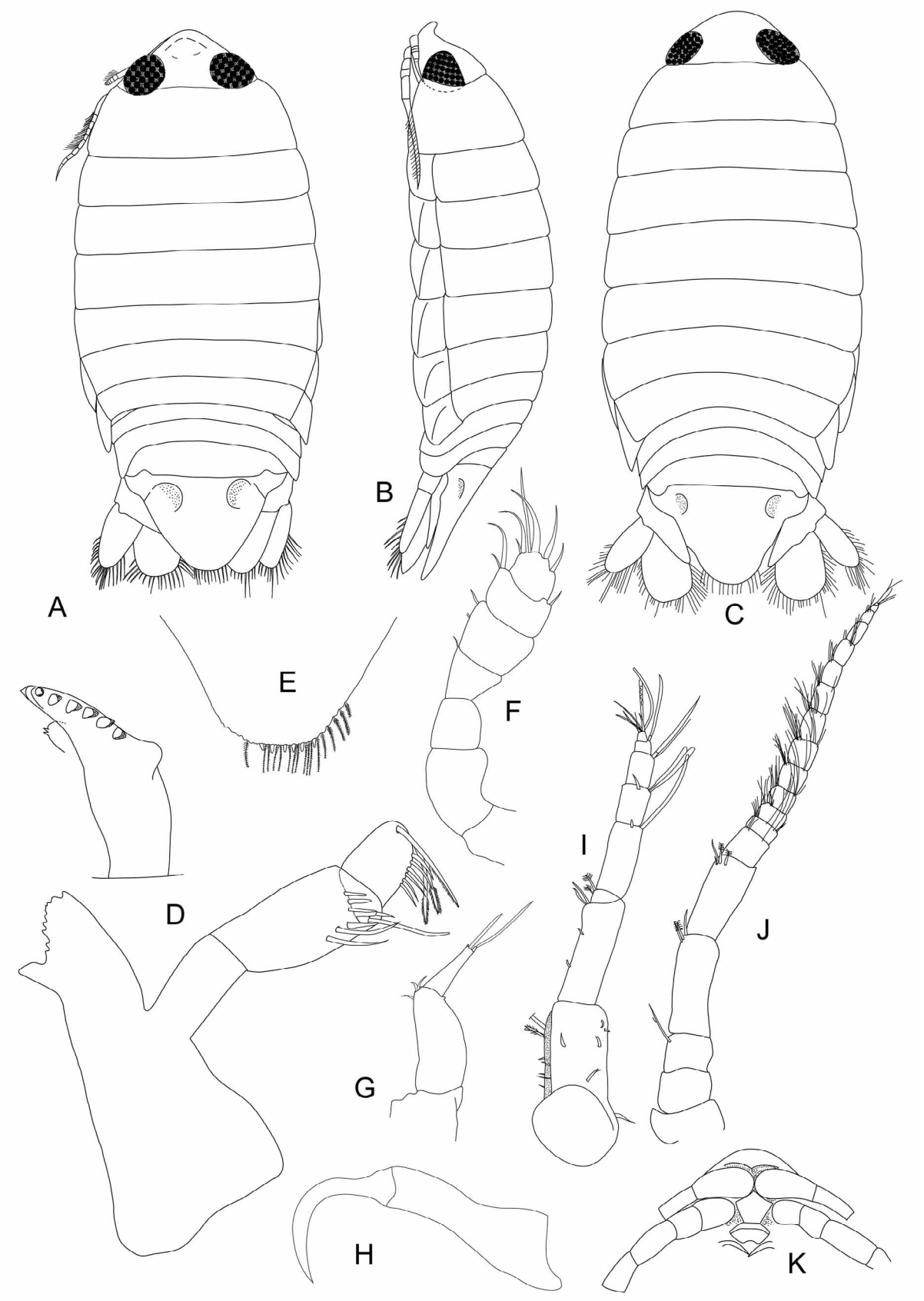

FIGURE 3. *Lanocira grebarree* **sp. nov.** A, B, holotype, C, female paratype LACM CR2003-53; remainder male paratype (MTQ W10788). A, dorsal view; B, lateral view; C, dorsal view; D, mandible (in two parts); E, pleotelson posterior margin; F, maxilliped; G, maxilla; H, maxillule; I, antennule; J, antenna; K, frons.

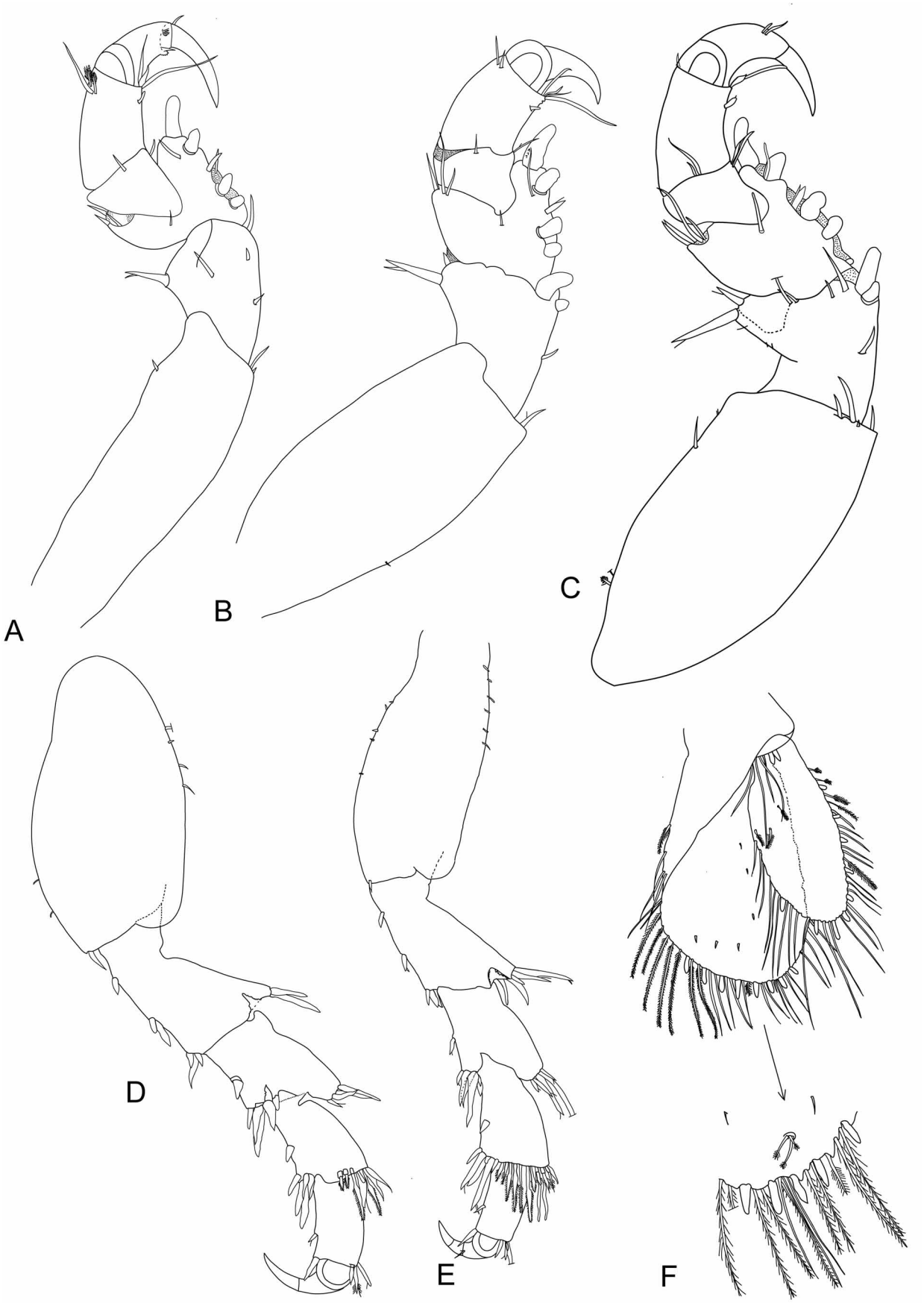

FIGURE 4. *Lanocira grebarree* **sp. nov.** Male paratype (MTQ W10788). A–E, pereopods 1, 2, 3, 6 and 7, respectively; F, uropod.

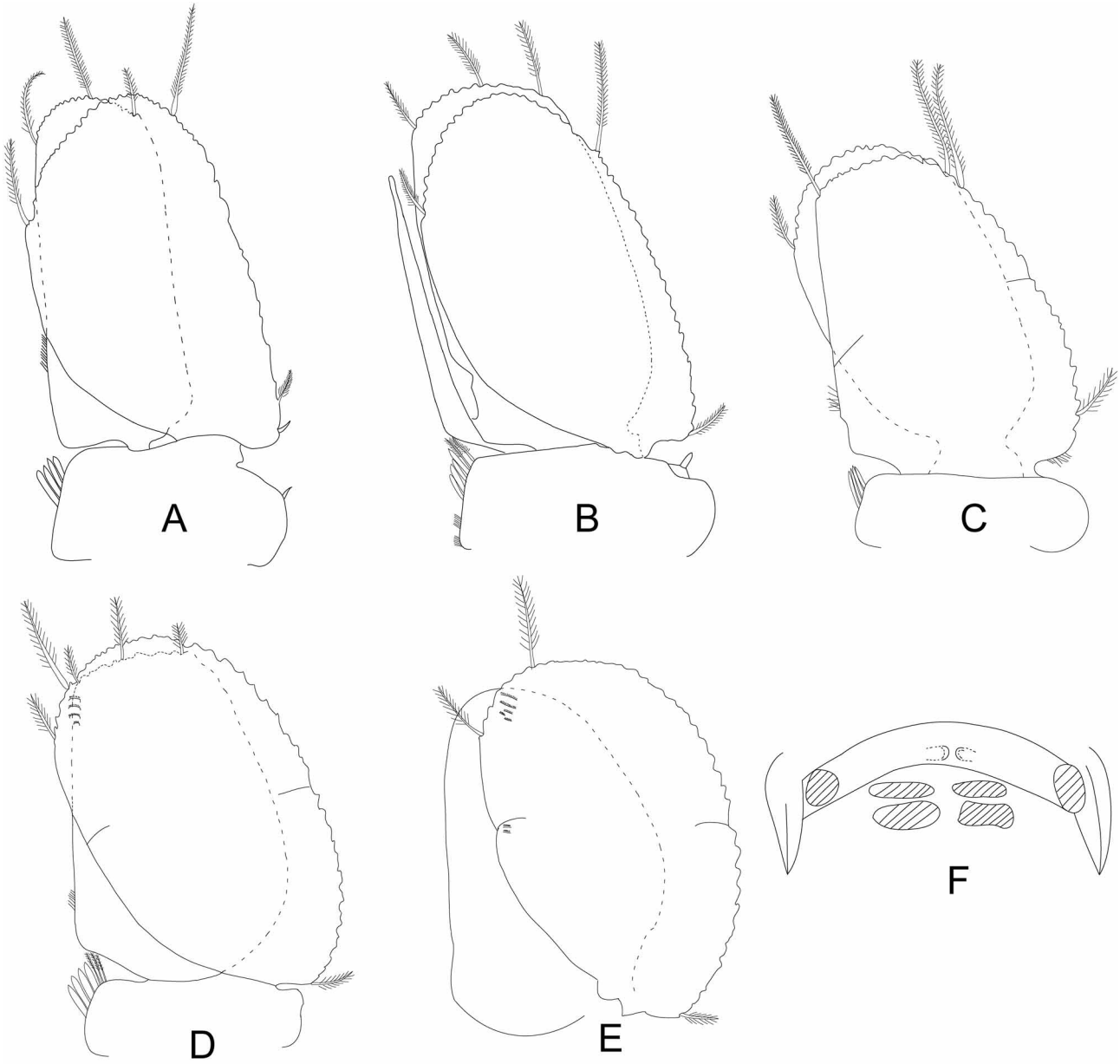

FIGURE 5. *Lanocira grebarree* **sp. nov.** A and B holotype; remainder male paratype (MTQ W10788). A–E, pleopods 1–5 respectively; F, penial openings.

Uropod peduncle ventrolateral margin with 1 RS, lateral margin with medial short acute RS, posterior lobe about 0.7 as long as endopod; rami extending beyond pleotelson, marginal setae in single tier, apices broadly rounded. *Endopod* apically not bifid; lateral margin straight, lateral margin with 1 RS, distolateral margin with 2 RS; mesial margin convex, with 6 RS. *Exopod* extending to 0.7 length of endopod, 2.3 times as long as greatest width, apically not bifid; lateral margin weakly convex, with 6 RS; mesial margin convex, with 3 RS.

Female: Similar to male but for the rostral process, which is weakly developed, and sexual characters.

Variation. The pattern and number of robust setae on the margins of the pleotelson (n = 5) and uropods (n = 11) is highly consistent: uropod exopod lateral margin 5 or 6 (82%) RS, mesial margin 2 or 3 (91%) RS; endopod later margin with 3 RS (100%), lateral margin with 4 (once), 5 (27%) or 6 (64%) RS; pleotelson always with 6 RS.

Size. Adult males 4.0–6.2 mm (mean 4.7 mm; n=9); non-ovigerous females 4.5–6.7 mm (mean 5.4 mm; n=6); mancas 2.2–3.2 mm (mean 2.7 mm; n=5).

Remarks. Males of *Lanocira grebarree* **sp. nov.** can be identified by the combination of short and anteriorly rounded rostrum, lack of stiff setae on the dorsum of the pleotelson and the uropodal rami extending beyond the

pleotelson apex. *Lanocira grebarree* is most similar to *L. gardineri* including having an upturned and anteriorly rounded rostral process, but consistently differs in the lack of setae on the dorsal surface of pleon and pleotelson.

Two male specimens from Wistari Reef (LACM CR2003-54; Fig. 6) are only provisionally identified as *L. grebarree* **sp. nov.** as they are slightly larger than those of the type series, with the smaller male lacking any rostrum development while the larger specimen has a more strongly developed rostrum that males in the type series, and additionally has four distinct clumps of cephalic setae, a character not present in males in the type series.

Distribution. Lizard Island and Heron Island, Great Barrier Reef, Australia; at depths from the intertidal to 11 metres.

Etymology. The epithet is derived from the first three letters of each word of 'Great Barrier Reef'.

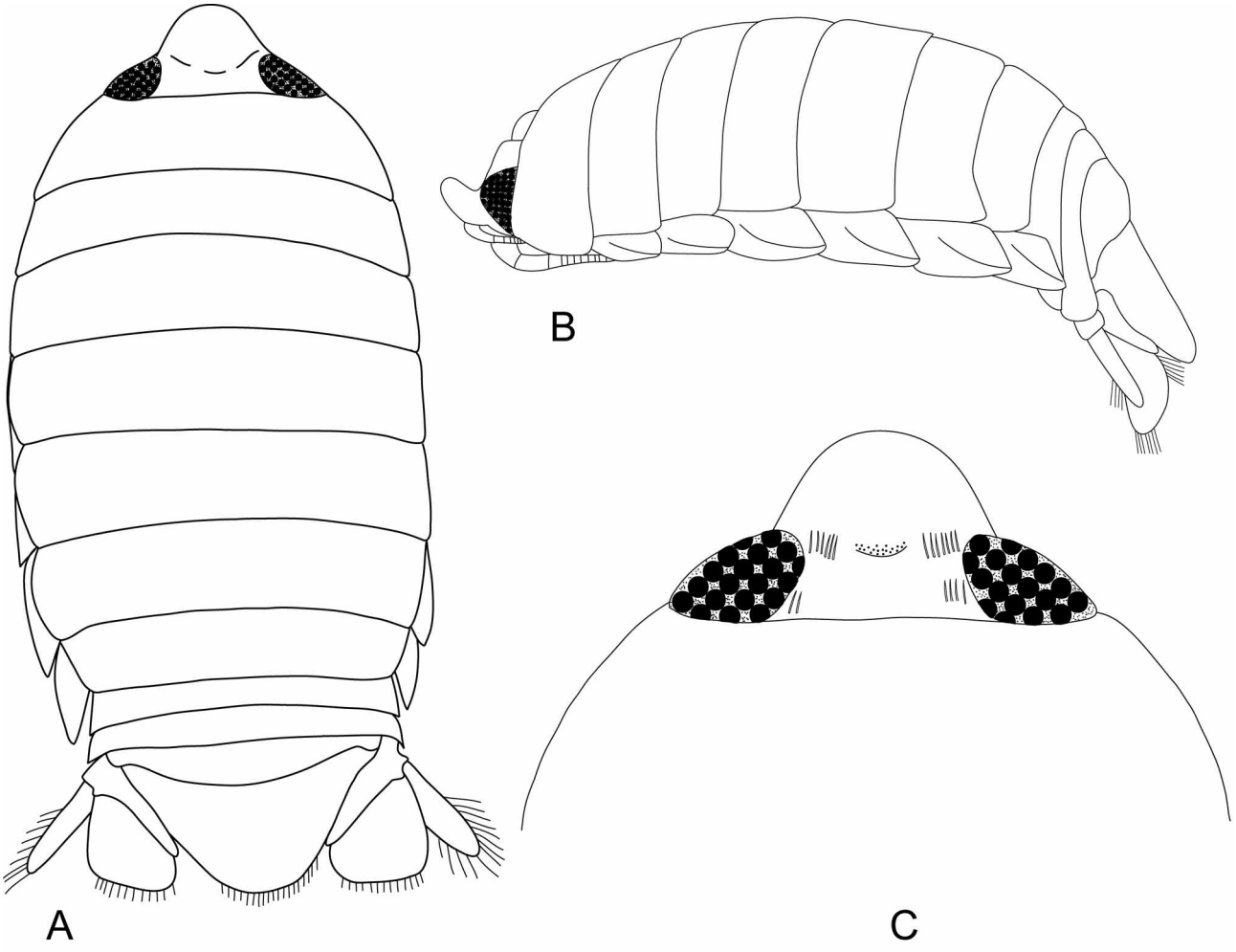

FIGURE 6. *Lanocira grebarree* **sp. nov.** Male 6.2, 6.0 mm (LACM CR2003-54). A, dorsal view; B, lateral view; C, head with four groups of setae.

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