Australian Journal of Taxonomy
Open-access, online, rapid taxonomy
https://doi.org/10.54102/ajt

A new species and record of *Opalimosina* Roháček (Diptera, Sphaeroceridae, Limosininae) from Australia

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Abstract

A new species of Western Australian *Opalimosina* Roháček, 1983, *O. acutistylus* sp. nov. is described and the species *O. australis* Hayashi, 2009 is newly recorded from Australia and New Caledonia.

Cite this paper as: Kuwahara GK & Marshall SA (2024). A new species and record of *Opalimosina* Roháček (Diptera, Sphaeroceridae, Limosininae) from Australia. *Australian Journal of Taxonomy* 83: 1–10. doi: https://doi.org/10.54102/ajt.7pl5e
urn:lsid:zoobank.org:pub:75FD7DEA-1518-4343-A4D0-A9CFBC10CFDD

Introduction

The genus *Opalimosina* Roháček, 1983 (Diptera: Sphaeroceridae: Limosininae) contains 16 species and is found throughout the Palaearctic, Oriental, and Australasian Regions, with two species introduced to the Nearctic and Neotropical Regions (Roháček, 1983; Papp, 1991; Hayashi, 1989, 2009, 2010; Su et al., 2013; Deng et al., 2019). In Australia, only the cosmopolitan *Opalimosina mirabilis* (Collin, 1902) has been recorded (Marshall et al., 2011). In this paper, we describe a new Western Australian species, *O. acutistylus* sp. nov. and record *O. australis* Hayashi, 2009 from Australia and New Caledonia for the first time. *Opalimosina* can be identified by the following combination of characters: heavily microtomentose but somewhat opalescent thorax; mid tibia with 1--3 proximal (1--2 anterodorsal usually, a posterodorsal in *O. acutistylus* sp. nov.) and 3--5 distal (1--2 anterodorsal, 1--2 dorsal, one posterodorsal) dorsal bristles, and a distinct midventral bristle in both sexes; hind tibia with a large, curved preapical spur in most species; basiphallus with a large epiphallus.

The genus was divided into four subgenera by Roháček (1983), with most species in the nominate subgenus and three species placed in monobasic subgenera, in part diagnosed by the absence of the large hind tibial spur that characterizes *Opalimosina* s.s., and in part diagnosed by characters apparently unique to the single species included. Due to the possession of basal scutellar setulae, *Opalimosina acutistylus* sp. nov., described here, would fall into the subgenus *Dentilimosina* Roháček, 1983. *Opalimosina acutistylus*, however, has several characters of both subgenera *Opalimosina* and *Dentilimosina*, as noted below, and is probably more closely related to *Opalimosina* s.s. than to *Dentilimosina*. Despite the support for inclusion of the new species in the subgenus *Opalimosina*, we prefer to discontinue the use of subgenera in the genus *Opalimosina*. Separate subgenera for each autapomorphic species do not seem justified.

This paper was submitted on 4 July 2024 and published on 16 December 2024 (2024-12-15T22:00:29.367Z). It was reviewed by Joel Kits and Jindřich Roháček, and edited by Subject Editor Shaun Winterton under the guidance of Associate Editor Mark Harvey. Australian Journal of Taxonomy. ISSN: 2653-4649 (Online).

Methods

Terminology and techniques, including specimen preparation, illustration, and measurements are as in Kuwahara & Marshall (2022). The phallus is described and illustrated in the anteriorly directed position (i.e. as when everted and held parallel to the body's long axis).

Abbreviations include ACT (Australian Capital Territory), NSW (New South Wales), QLD (Queensland), TAS (Tasmania), USA (United States of America), WA (Western Australia).

Specimen Deposition

Specimens are deposited in the following institutions:

DEBU – School of Environmental Sciences, University of Guelph, Guelph, Ontario, Canada

QMBA – Queensland Museum, South Brisbane, Queensland, Australia

WAM – Western Australian Museum, Perth, Western Australia, Australia

Discussion

Opalimosina acutistylus sp. nov. is the only species of *Opalimosina* currently treated as endemic to Australia, and one of four species of Sphaeroceridae known only from Western Australia (the other species being *Howickia flavithorax* (Papp, 2021), *Howickia regalis* (Richards, 1973), and *Pleuroseta occidentalis* Kuwahara & Marshall, 2023). *Opalimosina* is represented by three species in Australia: *O. acutistylus* sp. nov., the newly recorded eastern Palaearctic/Oriental/Pacific species *O. australis*, and the cosmopolitan *O. mirabilis*, bringing the total number of described Australian sphaerocerids to 106 species, of which 62 are currently interpreted as endemic (Kuwahara & Marshall, 2023).

Taxonomy

Class Insecta Linnaeus, 1758

Order Diptera Linnaeus, 1758

Superfamily Sphaeroceroidea Macquart, 1835

Family Sphaeroceridae Macquart, 1835

Subfamily Limosininae Macquart, 1835

Genus ***Opalimosina*** Roháček, 1983

Opalimosina acutistylus Kuwahara & Marshall, sp. nov.

Figs 1–4

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Diagnosis

Opalimosina acutistylus sp. nov. differs from *O. mirabilis* and *O. australis*, the only other Australian *Opalimosina* and the only other Australian limosinines with a large hind tibial spur, in having basal marginal setulae on the scutellum in addition to the usual marginal setae, an additional proximal posterodorsal seta on the mid tibia, and strong apical and dorsal preapical setae on the hind tibia (in addition to the ventral spur). *Opalimosina acutistylus* can be further differentiated from other species of *Opalimosina* by the large body size (1.8–2.6 mm), proximal posterodorsal bristle on the mid tibia, distinctly sinuate R4+5, broad alula, broad discal cell, and female cercus with long, fine setae.

Description

BODY (Fig. 1). General colour dark brown. Length 1.8–2.6 mm.

HEAD. Dark brown, orbital plates slightly paler brown. Frontal width 2.1–2.2 × frontal height. Interfrontal bristles in three subequal pairs; two strong lateroclinate orbital bristles, anterior orbital smaller (0.5–0.6 ×) than posterior; ocellar bristles large and diverging; inner and outer vertical bristles large; inner and outer occipital bristles strong; postocellar bristles small. Vibrissa large, vibrissal angle with one subvibrissal seta; gena with a relatively short, upcurved anterior seta and 8–10 smaller setulae. Lunule triangular; face shiny; palpus clavate, thin, with 3–4 ventral setae. Antenna divergent; pedicel large, slightly smaller than postpedicel; postpedicel slightly flattened and rounded; arista short pubescent. Eye with a slight notch at about level of anterior edge of frons; eye large compared to those of most congeners, greatest eye diameter 3.5–3.7 × shortest genal height.

THORAX. Dark brown, lateral edges of scutum slightly lighter, scutum and scutellum with very fine greyish brown microtrichia. Two pairs of postsutural dorsocentral bristles, anterior pair large, 0.6–0.7 × length of posterior pair, separated by 9–10 rows of fine acrostichal setulae. One postpronotal bristle; two notopleural bristles, anterior notopleural larger than posterior; two stout supra-alar bristles; postalar bristle large; intrapostalar bristle stout. Katepisternum with a fine anterior seta and a large posterior seta. Scutellum (Fig. 2B) large, subtriangular, length 0.7–0.8× its width, with small basal setulae in addition to four large marginal bristles.

LEGS. Dark brown, tibiae slightly paler apically. Dorsal surface of the mid tibia (see Fig. 1) with three proximal (one small and one large anterodorsal, one small posterodorsal) and five distal (one small and one large anterodorsal, one small and one large dorsal, one large posterodorsal) bristles; ventral surface of mid tibia with a strong mid ventral bristle and a large apical bristle in both sexes. Mid basitarsus with a slightly enlarged ventral setula. Hind tibia (Fig. 2C) with a very large (~ 0.3 × tibial length), thick, curved, preapical ventral spur.

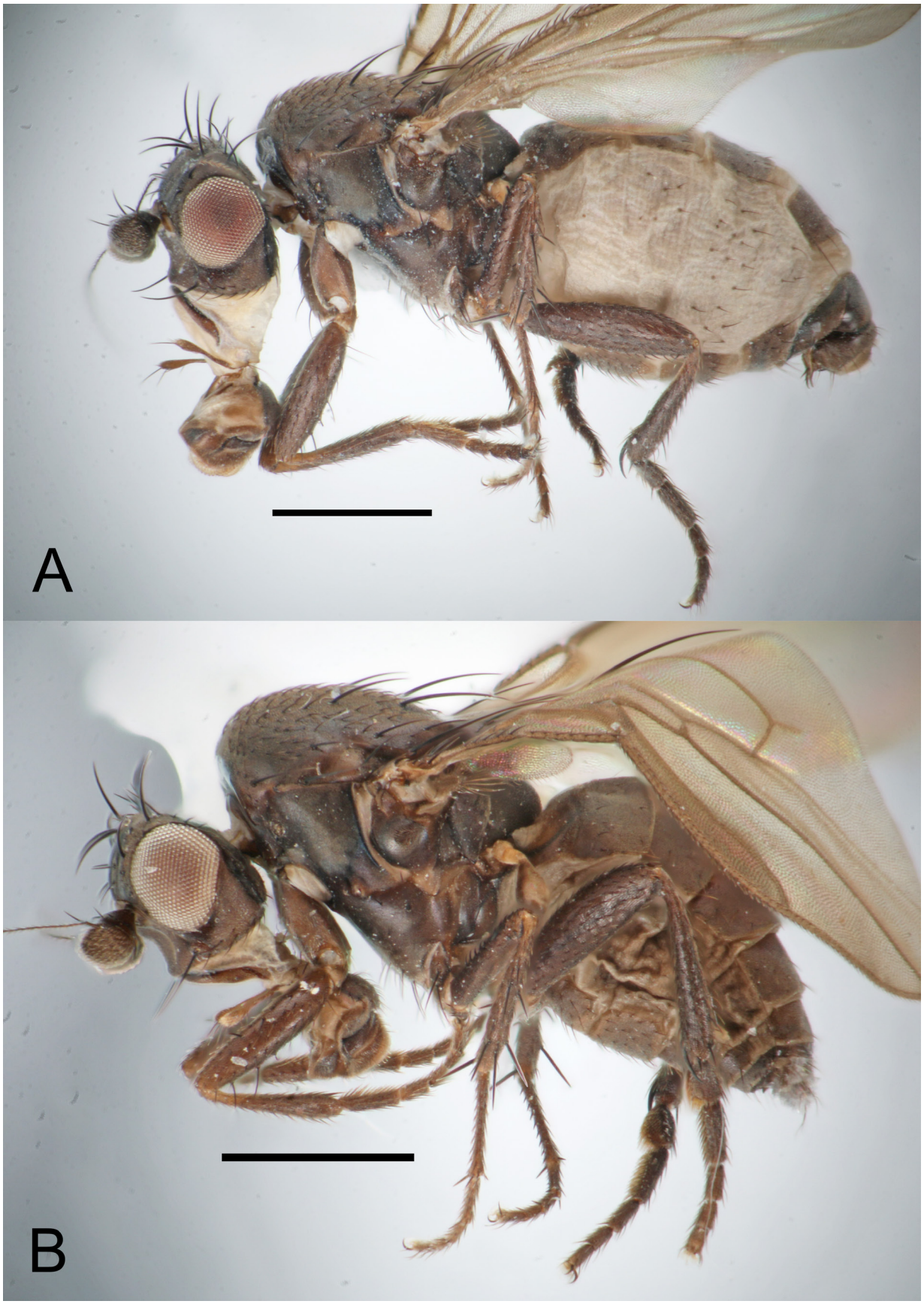

Figure 1. *Opalimosina acutistylus* sp. nov. paratypes. **A.** Male habitus, lateral view (debu00244247). **B.** Female habitus, lateral view (debu00244100). Scale bar: A–B = 0.50 mm.

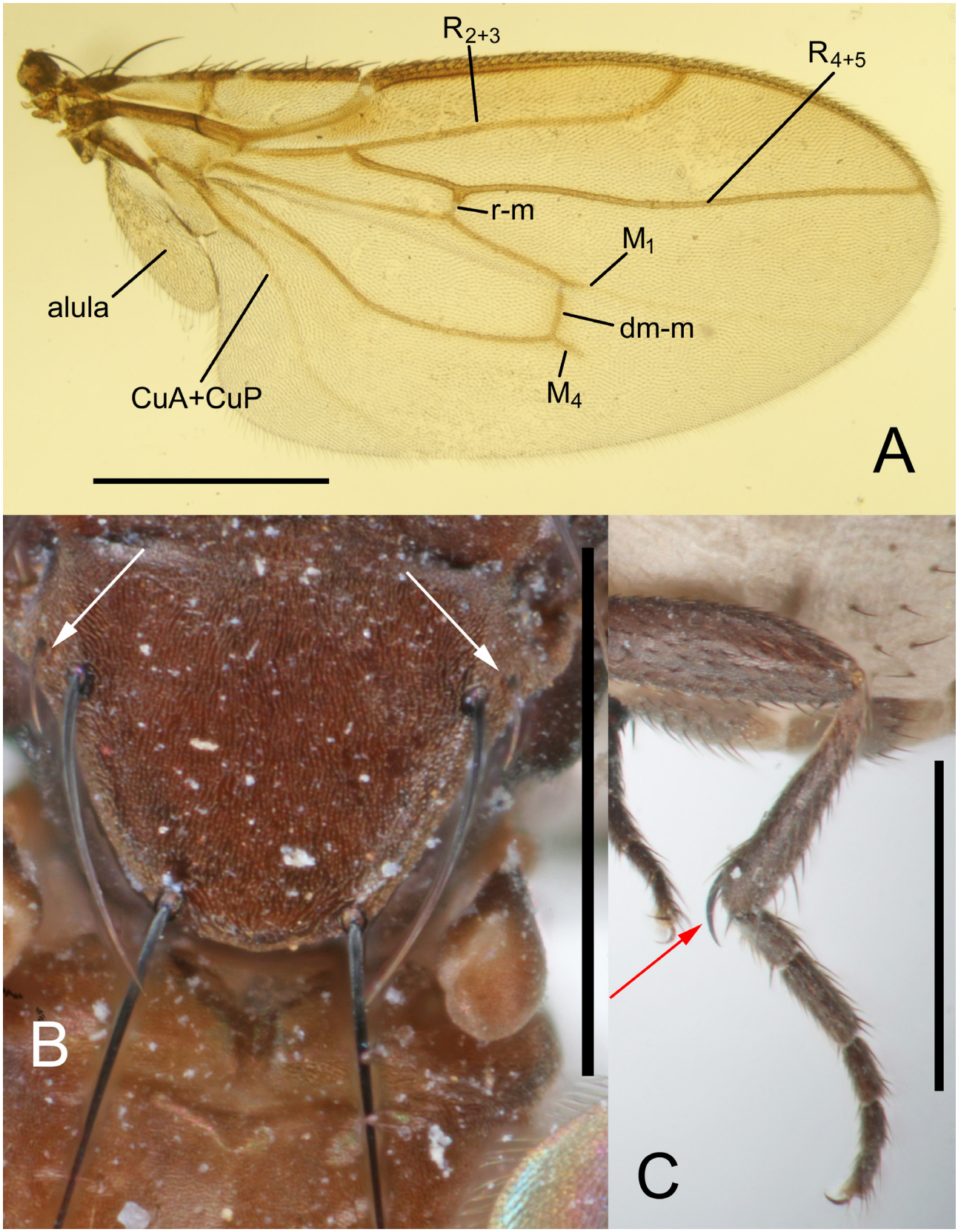

Figure 2. *Opalimosina acutistylus* sp. nov. paratypes. **A.** Left wing, ventral view (debu00245753). **B.** Scutellum, dorsal view. **C.** Male hind leg, lateral view (debu00244247). Scale bar: A–C = 0.50 mm. White arrows (B) indicate small basal scutellar setulae, red arrow (C) highlights large hind tibial spur.

WING (Fig. 2A). Slightly infuscate with a slightly darker spot at base of cell r1. CS2 subequal to CS3. Vein R2+3 very slightly sinuate for most of its length, apex curved to costa; R4+5 distinctly sinuate, meeting costa almost at wing tip; costa extending slightly (1–2 × costal width) past apex of R4+5. M1 extending beyond dm-m almost

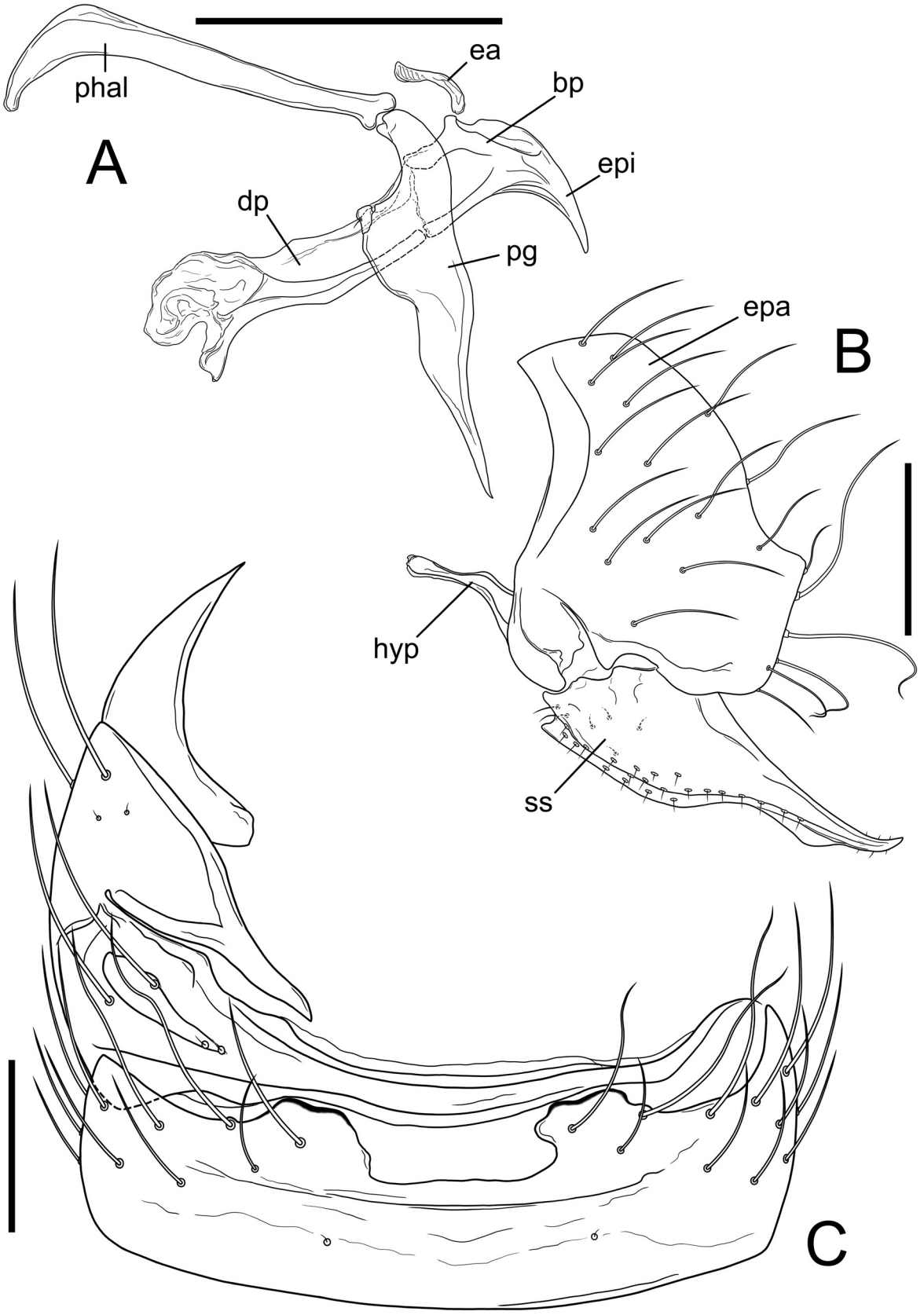

Figure 3. *Opalimosina acutistylus* sp. nov. paratype (debu0245753). **A.** Aedeagus and associated structures, lateral view. **B.** Male terminalia, lateral view. **C.** Male S5–8, ventral view. Abbreviations: bp = basiphallus; dp = distiphallus; ea = ejaculatory apodeme; epa = epandrium; epi = epiphallus; hyp = hypandrium; pg = postgonite; phal = phallapodeme; ss = surstylus. Scale bar: A–C = 0.10 mm.

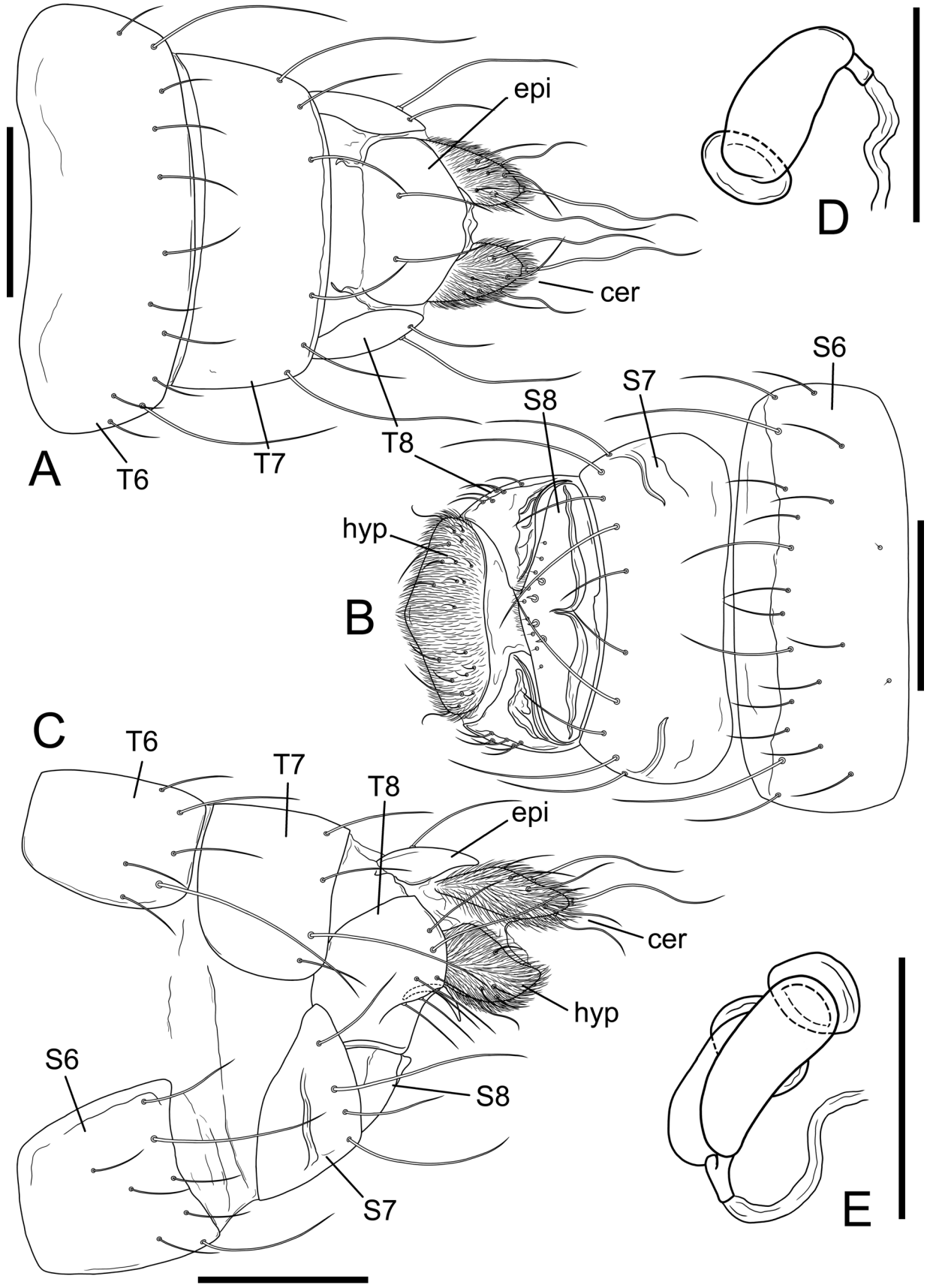

Figure 4. *Opalimosina acutistylus* sp. nov. paratype (debu00244186). **A.** Female terminalia, dorsal view. **B.** Female terminalia, ventral view. **C.** Female terminalia, lateral view. **D.** Single spermatheca. **E.** Paired spermathecae. Abbreviations: cer = cercus; epi = epiproct; hyp = hypoproct. Scale bar: A–C = 0.10 mm, D–E = 0.05 mm.

to margin as a colourless sinuate crease; M4 extending beyond dm-m by about 0.5 × length of dm-m. CuA+CuP long and sinuate but non-tubular (except basally), almost reaching wing margin. Alula slightly broadened but convex. Halter with dark brown to black knob.

MALE ABDOMEN (Fig. 3). Preabdomen dark brown. T2–5 broad and S2–4 narrower, outer margins desclerotized, tergites with longer posterolateral setae. S5 broad, long setose posterolaterally, desclerotized posteromedially and flanked by apically darkened lobes. Synsternite 6+7 simple, S6 extending far to the right. Epandrium round, uniformly setose, anal opening ovoid; cercus fused to epandrium and each other, forming narrow but complete subanal plate, with several long setae. Hypandrium slightly reduced, anterior apodeme small and weakly sclerotized, lateral arms well-developed and fused to epandrium. Surstylus elongate, subtriangular (relatively broad basally), strongly tapered and slightly curved in apical half with small preapical inner lobe, entire ventral surface with rows of minute setulae and a thin ventral keel. Postgonite elongate, tapered to a very fine point, and sinuate. Phallapodeme elongate, apically broadened and bent forwards. Basiphallus stout and slightly fused to distiphallus with a large, curved, beak-like epiphallus; distiphallus elongate, tubular, with a broad, sinuate, U-shaped lower sclerite and a pair of curled apical sclerites supporting a membranous apex.

FEMALE ABDOMEN (Fig. 4). Preabdomen dark brown. T2–5 and S2–5 broad, outer margins slightly desclerotized, uniformly long-setose along entire surface. T6 and T7 broad, rectangular, well sclerotized with a row of posterior setae. T8 widely desclerotized dorsally, sclerotized laterally and with a patch of long setae, ventrolaterally with dark, finger-like projections bent inwards and upwards. Epiproct pentagonal, finely microtomentose with a pair of dorsal setae. Cercus stout, rounded, and weakly fused to epiproct, with long apical, dorsal, and lateral setae. S6 broad, rectangular, posteriorly desclerotized with many posterior setae; S7 broad, slightly concave posteriorly with long posterior setae. S8 broad, slightly triangular, positioned more-or-less vertically, anterior half with a pair of long, dark, transverse ridges which meet medially and extend posteriorly as a short central ridge, posterior half concave with several stout medial setae. Hypoproct broad, well sclerotized, densely microtomentose with many small, scattered setulae. Spermathecae (2+1) small and elongate; bulb mushroom-shaped, basal section elongate and slightly curved, apical section bulbous and rounded with a shallow apical depression, stem (sclerotized terminal part of duct) short, inserted laterobasally, and slightly recurved; ducts elongate and membranous.

Holotype: AUSTRALIA: **Western Australia:** Fernhook Falls, ~ 30 km N of Walpole, Deep River shoreline, dung pans, 26–27 Nov. 2003, S.A. Marshall, debu00244247 (♂, WAM).

Paratypes: AUSTRALIA: **Western Australia:** same data as holotype (2 ♀, WAM); Boranup Forest, ~ 25 km N of Augusta, 34˚09'52" S 115˚04'34" E, karri forest, 19–20 Nov. 2003, S.A. Marshall (1 ♀, WAM); Peaceful Bay, Ficifolia Road & Nut Road, dry heath, pans, 28–30 Nov. 2003, S.A. Marshall (2 ♀, DEBU); Pemberton, The Cascades, jarrah forest, dung cup traps, 7–13 Jul. 1980, S. & J. Peck (1 ♂, 1 ♀, WAM); Porongurup National Park, Bolganup Creek, karri, dung trap, 8–16 Jun. 1980, S. & J. Peck (1 ♂, DEBU); Stirling Range National Park, trail to Bluff Knoll, 900 m, wet area, dung/carrion pans, 3 Dec. 2003, S.A. Marshall (1 ♀, DEBU); Walpole National Park, Collier Road, forest, dung cup traps, 19 Jun.–4 Jul. 1980, S. & J. Peck (1 ♀, DEBU); Walpole National Park, Peaceful Bay, coastal sand heath, Malaise trap, 17–26 Jun. 1980, S. & J. Peck (1 ♂, WAM); Walpole National Park, Tingle Tree, forest, dung cup traps, 18 Jun.–29 Jul. 1980, S. & J. Peck (1 ♂, WAM); same data as preceding, 21 Jun. 1980 (2 ♂, DEBU); Wrenwood Cottages, 10 km N of Augusta, 34˚15' S 115˚01' E, paperbark forest, 20 Nov. 2003, S.A. Marshall (1 ♂, DEBU); Yalgorup Ecological Park, campground, wrack, pans, 16 Nov. 2003, S.A. Marshall (1 ♂, WAM).

Etymology

The species name (from the Latin *acutus*, 'sharpened, sharp') refers to the strongly tapered and sharp-edged surstylus.

Biology

Opalimosina acutistylus sp. nov. has been collected in karri, jarrah, and paperbark forests, and coastal and dry heaths. Most specimens were collected in pan traps baited with dung. Adults have been collected from early June to early December (based on material examined).

Distribution

Australasian/Oceanian: Australia (WA).

Remarks

The extra basal scutellar setulae, the elongate tapered surstylus, and the elongate postgonite of *O. acutistylus* sp. nov. are similar to those of *O.* (*Dentilimosina*) *denticulata* (Duda, 1924) but *O. acutistylus* has the large hind tibial spur characteristic of the subgenus *Opalimosina* Roháček, 1983, and the female terminalia of *O. acutistylus* do not share any of the putative apomorphies of *Dentilimosina* listed by Roháček (1983). Other characters shared with *Opalimosina* s.s. include a heavily sclerotized distiphallus, slender finger-like posteroventral projections of the female T8, and slightly recurved spermathecal ducts. Each of these characters was treated by Roháček (1983) as apomorphic for the subgenus *Opalimosina*. Additionally, the male S5 of *O. acutistylus* has darkened posterior lobes surrounding a posteromedial emargination, possibly homologous with those found in all *Opalimosina* s.s., although the lobes in *O. acutistylus* are simple and lack thick setae or spines. This, along with the strongly sinuate R4+5, broad female

S8, well-developed epiproct and hypoproct, and long female cercal setae, differ markedly from all other species in *Opalimosina* s.s., suggesting that *O. acutistylus* may be the sister group to all other species in *Opalimosina* sensu stricto.

Opalimosina australis Hayashi, 2009

Holotype: FIJI: **Viti Levu:** Sigatoka, 17–19 Dec. 1994, T. Hayashi (♂, NIID).

Paratypes: FIJI: **Viti Levu:** same data as holotype (10 ♂, 9 ♀, NIID). INDONESIA: **West Papua:** Waigeo Island, Arabia, human dung trap, 3–5 Jun. 2007 (LIPI). PAKISTAN: **Khyber Pakhtunkhwa:**Balakot, 2 Aug. 1988, T. Hayashi (2 ♂, NIID). PAPUA NEW GUINEA: **Morobe:**Mount Kaindi, 1600 m, 19 Apr. 1995, H. Kurahashi (2 ♂, 1 ♀, NIID); same data as preceding, 2000 m, 18 Jul. 1982, S. Shinonaga (1 ♂, NIID); Wau, Regina Creek, 25 Dec. 1981, S. Shinonaga (2 ♂, NIID); **Western Highlands:** Mount Hagen, Baiyer River, 1200 m, 4–8 Aug. 1982, S. Shinonaga (1 ♂, NIID).

Diagnosis

Opalimosina australis can be distinguished from the other two Australian *Opalimosina* species by the slightly smaller eye (height 2.5–3.0 × genal height, < 2.0 × in *O. mirabilis*), smaller hind tibial spur (< 0.3 × length of tibia), mid tibia with four dorsal bristles (one proximal, three distal), lack of small basal scutellar setulae (present in *O. acutistylus* sp. nov.), male S5 with two medially divided patches of thickened posterior setae, and female cercus with a small but thick apical spine.

Material examined

AUSTRALIA: **New South Wales:** Ulong, Ashton's Eco Retreat, 30˚13'47" S 152˚55'12" E, dung, 22 Mar. 2019, S.A. Marshall (1 ♂, DEBU); Warrumbungle National Park, 500 m, near creek, dung traps, 26–27 Mar. 1999, S.A. Marshall (1 ♂, DEBU); **Queensland:** 1 km NW of Buchan Point, 16˚44' S 145˚39' E, 10 m, open forest, dung pitfall, 3–11 Feb. 1999, Monteith & Cook (1 ♂, QMBA); same data as preceding, fish pitfall (1 ♂, QMBA); 16 km NE of Yungaburra, on Gillies Road, NE of Atherton, 800 m, rainforest, flight-intercept trap, 24 Jun.–3 Aug. 1982, S. & J. Peck (1 ♀, DEBU); 18 km E of Prosperpine, Brandy Creek, 100 m, rainforest, flight-intercept trap, 21 Jun.–10 Aug. 1982, S. & J. Peck (1 ♂, 1 ♀, DEBU); 2 km SSE of Wondecla, 17˚26' S 145˚24' E, 910 m, open forest, dung pitfall, 3–6 Feb. 1999, Monteith & Cook (5 ♂, 8 ♀, QMBA); same data as preceding, fungus pitfall (1 ♀, QMBA); 2 km SW of Ravenshoe, 17˚37' S 145˚28' E, 880 m, open forest, automatic dung trap (day), 8–9 Feb. 1999, G.B. Monteith (3 ♂, 10 ♀, QMBA); same data as preceding, automatic dung trap (dusk) (2 ♂, QMBA); 2.5 km NW of Tumoulin, 17˚33' S 145˚26' E, 980 m, open forest, dung trap, 15–17 Apr. 1999, G.B. & S.R. Monteith (3 ♀, QMBA); same data as preceding, fungus pitfall (1 ♂, QMBA); 3 km NW of Ravenshoe, 17˚35' S 145˚28' E, 920 m, open forest, dung trap, 15–17 Apr. 1999, G.B. & S.R. Monteith (1 ♂, QMBA); 3 km SE of Ravenshoe, 17˚38' S 145˚30' E, 960 m, open forest, dung pitfall, 4–6 Feb. 1999, Monteith & Cook (2 ♂, 5 ♀, QMBA); same data as preceding, fish pitfall (2 ♂, 1 ♀, QMBA); same data as preceding, fungus pitfall (1 ♀, QMBA); 3 km SW of Ravenshoe, 17˚38' S 145˚28' E, 860 m, open forest, dung pitfall, 3–5 Feb. 1999, Monteith & Cook (2 ♂, QMBA); same data as preceding, automatic dung trap (day), 7–8 Feb. 1999 (1 ♀, QMBA); 4 km SSE of Ravenshoe, 17˚39' S 145˚30' E, 930 m, open forest, dung pitfall, 4–6 Feb. 1999, Monteith & Cook (14 ♂, 15 ♀, QMBA); same data as preceding, fish pitfall (3 ♂, 4 ♀, QMBA); 5 km E of Shute Harbour, 2 m, vine-thicket, carrion, 11 Aug. 1982, S. Peck (1 ♀, DEBU); 9.5 km N of Ravenshoe, 17˚32' S 145˚29' E, 1060 m, wet sclerophyll, fungus trap, 14–17 Apr. 1999, G.B. & S.R. Monteith (1 ♀, QMBA); Atherton Tablelands, Lake Eacham, Chambers Lodge, dung, 6–8 Apr. 1999, S.A. Marshall (1 ♂, DEBU); Baldy Mountain Road, start, 17˚21' S 145˚25' E, 860 m, open forest, dung pitfall, 3–6 Feb. 1999, Monteith & Cook (6 ♂, 13 ♀, QMBA); same data as preceding, fish pitfall (2 ♂, 2 ♀, QMBA); same data as preceding, fungus pitfall (2 ♂, 2 ♀, QMBA); Bartle Frere, top camp, 17˚24' S 145˚49' E, 1500 m, dung trap (2–5:30 pm), 29 Nov. 1998, G.B. Monteith (3 ♂, 4 ♀, QMBA); Charmillin Creek, 17˚42' S 145˚31' E, 900 m, automatic dung trap (5:30 am–6:15 pm), 2–5 Dec. 1998, Monteith & Cook (1 ♀, QMBA); Eungella National Park, dung raised emergence trap, 20–24 Apr. 1999, S.A. Marshall (3 ♂, 1 ♀, DEBU); Eungella National Park, Fern Flat Campground, dung pans, 20–23 Apr. 1999, S.A. Marshall (1 ♂, DEBU); Hann Tableland Radar Station, 16˚55' S 145˚15' E, 950 m, dung trap (2–6 pm), 26 Nov. 1998, G.B. Monteith (19 ♂, 12 ♀, QMBA); Kjellberg Road turnoff, 17˚32' S 145˚36' E, 740 m, rainforest, fungus pitfall, 6–9 Feb. 1999, Monteith & Cook (1 ♀, QMBA); Kjellberg Road, State Forest boundary, 17˚32' S 145˚35' E, 920 m, rainforest, fungus pitfall, 6–9 Feb. 1999, Monteith & Cook (1 ♀, QMBA); Kuranda, Kuranda State Forest, 360 m, rainforest, carrion trap, 27–31 Jul. 1982, S. & J. Peck (1 ♂, 2 ♀, DEBU); Longlands Gap, three-ways road junction, 17˚28' S 145˚29' E, 1060 m, wet sclerophyll, dung trap, 3–6 Feb. 1999, Monteith & Cook (1 ♀, QMBA); Mill Creek, 17˚30' S 145˚27' E, 940 m, open forest, dung pitfall, 5–9 Feb. 1999, Monteith & Cook (17 ♂, 14 ♀, QMBA); same data as preceding, fungus pitfall (10 ♂, 2 ♀, QMBA); Mill Creek, above, 17˚30' S 145˚27' E, 1030 m, open forest, dung pitfall, 5–9 Feb. 1999, Monteith & Cook (1 ♂, 3 ♀, QMBA); same data as preceding, fungus pitfall (17 ♂, 16 ♀, QMBA); same data as preceding, rotten bait (1 ♂, 1 ♀, QMBA); Millstream Conservation Park, 17˚32' S 145˚29' E, 1040 m, wet sclerophyll, dung trap, 3–5 Feb. 1999, Monteith & Cook (2 ♂, 3 ♀, QMBA); same data as preceding, fish pitfall (3 ♂, 1 ♀, QMBA); same data as preceding, open forest, automatic dung trap (day), 4–5 Feb. 1999, G.B. Monteith (1 ♂, 1 ♀, QMBA); Mount Glorious, 27˚19'54" S 152˚45'29" E, Malaise trap, 24–30 Jan. 1998, T. Hiller (1 ♂, DEBU); Oak Beach, 16˚36' S 145˚31' E, 5 m, rainforest, fish pitfall, 3–11 Feb. 1999, Monteith & Cook (1 ♀, QMBA); Shipton's Flat, 15˚48' S 145˚14' E, 220 m, rain-

forest, automatic dung trap (day), 19–22 Nov. 1998, G.B. Monteith (1 ♂, QMBA); Sluice Creek, 17˚32′ S 145˚32′ E, 1100 m, rainforest, dung trap, 14–17 Apr. 1999, G.B. & S.R. Monteith (1 ♂, QMBA); The Millstream, 10 km NNE of Ravenshoe, 17˚32′ S 145˚31′ E, 1040 m, rainforest, fish pitfall, 3–5 Feb. 1999, Monteith & Cook (3 ♂, 1 ♀, QMBA); Tolga Scrub, 17˚15′ S 145˚29′ E, 760 m, rainforest, fish pitfall, 3–6 Feb. 1999, Monteith & Cook (2 ♂, 1 ♀, QMBA); Vine Creek, Majors Mountain, 17˚41′ S 145˚32′ E, 1060 m, rainforest, fungus pitfall, 4–6 Feb. 1999, Monteith & Cook (1 ♂, QMBA).

NEW CALEDONIA: 13 km NE of Yoya, Grottes d'Adie, 200 m, forest, dung, 6 Aug. 1978, S. & J. Peck (8 ♂, 2 ♀, DEBU); Col d'Amieu, 400 m, rainforest, 31 Jul.–7 Aug. 1978, S. & J. Peck (8 ♂, 8 ♀, DEBU); Col d'Amieu, Mé Ongué, N of La Foa, 700 m, rainforest, 30 Jul.–8 Aug. 1978, S. & J. Peck (12 ♂, 15 ♀, DEBU); Monts Koghis, Auberge, near Noumea, 500 m, rainforest, 26 Jul.–13 Aug. 1978, S. & J. Peck (1 ♂, 3 ♀, DEBU); Near Bourail, Col des Roussettes, 500–600 m, rainforest, dung traps, 31 Jul.–7 Aug. 1978, S. Peck (6 ♂, 6 ♀, DEBU).

Biology

Opalimosina australis has been collected in forested areas from sea level to 2,000 m a.s.l. throughout its known range (in Australia, most records are from rainforests), taken largely in dung-baited traps but also flight-intercept traps and traps baited with carrion, fish, or fungi. Automatic dung traps set by Monteith and Cook in Queensland have collected this species from the early morning (5:30 am) to dusk. Adults have been taken from November to August (based on material examined here and in Hayashi 2009, 2010) with no known records in May, September or October.

Distribution (based on Hayashi (2009) and Hayashi (2010))

Australasian/Oceanian: Australia (NSW, QLD) (**new record**), Fiji, New Caledonia (**new record**), Papua New Guinea; Oriental: Indonesia, Japan (Okinawa), Pakistan.

Opalimosina mirabilis (Collin, 1902)

Lectotype: ENGLAND: **Suffolk Co.:** S.L. Newmarket, Stable, 8 Apr. 1896 (♂, OXUM). Designated by Roháček (1983b).

Paralectotype: ENGLAND: **Suffolk Co.:** same data as lectotype, 3 May 1886 (1 ♀, OXUM); same data as lectotype, 22 Jul. 1894 (1 ♂, OXUM); same data as lectotype, 12 May 1896 (1 ♀, OXUM).

Diagnosis

Opalimosina mirabilis can be distinguished from the other two Australian *Opalimosina* species by the smaller eye (height 1.6–1.8 × genal height), very large hind tibial spur (~ 0.6 × length of tibia), mid tibia with six dorsal bristles (two proximal, four distal), lack of small basal scutellar setulae (present in *O. acutistylus* sp. nov.), male S5 with two widely separated lateromedial stripes of setae (longest posteriorly) and two widely separated posteromedial patches of stout setae, and female cercus with a long, thick apical spine (also present in *O. australis*but smaller).

Material examined

AUSTRALIA: **Australian Capital Territory:** Black Mountain, 700 m, carrion trap, 11–18 Apr. 1978, S. & J. Peck (1 ♂, DEBU); **New South Wales:** Monga State Forest, 19–24 Jan. 1984, L. Masner (1 ♂, DEBU); **Queensland:** Kjellberg Road turnoff, 17˚32′S 145˚36′E, rainforest, fungus pitfall, 6–9 Feb. 1999, Monteith & Cook (1 ♀, QMBA); Mill Creek, 17˚30′S 145˚27′E, 940 m, open forest, dung pitfall, 5–9 Feb. 1999, G.B. Monteith (1 ♀, QMBA); Mount Glorious, Malaise trap, 27 Apr.–26 Oct. 1989, A. Hiller (1 ♂, DEBU); 9.5 km N of Ravenshoe, 17˚32′S 145˚29′E, 1060 m, wet sclerophyll, dung trap, 14–17 Apr. 1999, G.B. & S.R. Monteith (1 ♂, QMBA); **Tasmania:** 8 km SW of Waratah, 41˚29′04″S 145˚27′41″E, rainforest, dung pans, 20–21 Dec. 2003, S.A. Marshall (1 ♀, DEBU); **Western Australia:** 10 km NE of Denmark, pitcher plant heath, pans, 5–6 Dec. 2003, S.A. Marshall (2 ♂, 2 ♀, DEBU); Nannup, Barrabup Pool, marri forest, dung cup traps, 23–26 Jul. 1980, S. & J. Peck (1 ♂, 1 ♀, DEBU).

Biology

Opalimosina mirabilis is the most common species of *Opalimosina*, found worldwide in a wide variety of habitats (in Australia, it has been collected in rainforests, open forests, and even a pitcher plant heath). Many of the specimens in the DEBU collection (largely collected in Canada and the USA) have been collected using dung traps, and Roháček (1983) noted that *O. mirabilis* is predominantly coprophagous, though likely polysaprophagous. Roháček (1983) reports adults of this species occur essentially year-round, and records from Australia reflect this.

Distribution (based on Marshall et al. (2011), Su et al. (2013), and Papp (2017))

Afrotropical: South Africa; Australasian/Oceanian: Australia (ACT, NSW, QLD, TAS, WA), Hawaii (USA), New Zealand; Nearctic: Canada, USA; Neotropical: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico; Oriental: China, Japan (Okinawa), ?Nepal, Pakistan; Palaearctic: Andorra, Austria, Azores (Portugal), Belgium, Bulgaria, Canary Is. (Spain), Cyprus, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Japan, Latvia, Lebanon, Madeira (Portugal), Malta, Mongolia, Morocco, Netherlands, North Korea, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Tunisia, Türkiye.

Disclosures

We are unaware of any conflicts of interest regarding the subject matter of this paper.

Acknowledgments

This work was supported by an NSERC Discovery Grant to SAM and facilitated by research permits provided by the States of New South Wales, Queensland, and Western Australia. We would like to thank Stewart and Jarmila Peck for providing trap samples that yielded many of the specimens studied here.

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