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On new or poorly known Australian Filistatidae spiders (Araneae: Araneomorphae), including a study on the fine morphology of *Wandella*

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ABSTRACT

I present an update on the taxonomy of the filistatid genera *Wandella* Gray and *Yardiella* Gray, both endemic to Australia. Two new species are described: *Wandella grayi* sp. nov., known from Queensland, and *Wandella infernalis* sp. nov., known from a single cave in Western Australia. The male of *Wandella australiensis* (L. Koch) and the females of *Wandella stuartensis* Gray and *Wandella waldockae* Gray are described and illustrated for the first time. New records are given for these and other species of Australian filistatids, including the first epigean records of *Yardiella humphreysi* Gray, a species so far known only from caves. Updated distribution maps are presented. Additionally, I present novel morphological data for *Wandella* using light and scanning electron microscopy. The cephalothorax, spinning organs, genitalia and appendages of some species are illustrated in detail. I report the presence of a putative claw extensor muscle in the male palpal cymbium, and describe interesting modifications in the clypeal region of adult males. The phylogenetic significance of these characters is briefly discussed.

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Prithinae; taxonomy;
Wandella; *Yardiella*

Introduction

The Filistatidae are a small family of cribellate spiders, containing some 121 species in 18 genera, distributed in every continent except Antarctica (WSC 2015). All species known so far weave small, irregular, cribellate webs in crevices, small holes, under rocks, in the leaf litter, under bark, or in caves. Most species are also fond of dry habitats, and are found in arid or semi-arid regions (Gray 1994; Ramírez and Grismado 1997). Their lifestyle and distribution make them very cryptic, and they are generally not well-represented in collections.

The taxonomy of the family is still incipient for the most part. The only generic revision was undertaken by Lehtinen (1967), but it was not meant to be an in-depth taxonomic study. In the last two decades, there has been a growing number of papers dealing with the family, including comprehensive regional revisions (Gray

1994; Ramírez and Grismado 1997; Marusik and Zamani 2015), redescription of poorly known taxa (Zonstein 2009; Brescovit and Santos 2013; Zonstein et al. 2013), descriptions of isolate species (Jiménez and Palacios-Cardiel 2012; Marusik and Zonstein 2014), and, more recently, exhaustive generic monographs (Zonstein and Marusik forthcoming).

Australia is one of the regions for which a good revision is available. Gray (1994) redescribed the sole species known from the region, *Pritha australiensis* (L. Koch 1873), and placed it and 11 new species in the two genera that he erected: *Wandella* Gray and *Yardiella* Gray. Both genera belong to the Prithinae, and are considered close relatives of *Pritha* Lehtinen and *Tricalamus* Wang on the basis of several characters (Gray 1995), the most notable being a horseshoe-shaped cymbium. However, some of the Australian species treated in his work were then only known by one of the sexes, or from one or a few localities.

As part of a wide study on filistatid morphology and phylogeny, I have been able to examine a large collection of Australian specimens. Among them, I have identified some interesting spiders that had not been treated in Gray's (1994) work. Here, they are described as two new species, along with the first description of the male and females of some species known only by one sex. I also provide new distribution records for most previously known species.

Filistatids play a lead role in the phylogenetic conundrum at the base of the spider tree of life. Their peculiar combination of ancestral and derived characters lead to several competing hypotheses regarding their phylogenetic position. They have been suggested as sister to a clade containing all other Haplogynae families (named Synspermiata by Michalik and Ramírez 2014) (Platnick et al. 1991), to Mygalomorphae (Eskov and Zonhstein 1990), to Pholcidae (Lehtinen 1986), or to Hypochilidae (Bond et al. 2014). In an attempt to improve the knowledge on the morphology of the family, I here present fine morphological observations on *Wandella* and describe some interesting new characters. I hope these data might eventually help with understanding the internal relationships within Filistatidae, and among this and other spider families.

Material and methods

Measurements were taken on a Leica M165C stereoscopic microscope using Leica Application Suite 3.6, preferentially on the left side of specimens, and are expressed in millimetres (with a precision of 0.01). Variation in measurements is expressed as minimum–maximum (mean). Female genitalia were cleared using a pancreatin solution as described by Álvarez-Padilla and Hormiga (2007). For examination under the compound microscope, genitalia were mounted on temporary slides with clove oil (male palps) or lactic acid (female spermathecae). Specimens were photographed using a Leica M165C stereoscopic microscope or an Olympus BH–2 compound microscope; single, multi-focal images were mounted using Helicon Focus 6 (www.heliconsoft.com). Drawings were made on the compound microscope with the aid of a *camera lucida*. Specimens without geographical coordinates in the original labels were georeferenced using Google Earth (<http://www.google.com/earth/index.html>) and have them between square brackets. Coordinates are given as (longitude, latitude) in decimal format.

For scanning electron microscopy (SEM), specimens were dissected and dehydrated through a series of ethanol solutions of increasing concentration (75–100%) with a final step of immersion in absolute hexamethyldisilazane (see Brown 1993), then air-dried. Each part was mounted on individual stubs using adhesive copper tape, sputter-coated with gold–palladium and examined under an FEI XL 30 TMP scanning electron microscope.

Material which had been examined by Gray (1994) and was re-examined during the course of this work is marked with an asterisk (*) after the collection number. The material examined belongs to the following collections: AM, Australian Museum, Sydney, Australia; CAS, California Academy of Sciences, San Francisco, USA; QM, Queensland Museum, South Brisbane, Australia; SAM, South Australian Museum, Adelaide, Australia; WAM, Western Australian Museum, Perth, Australia.

The following abbreviations have been used in the descriptions: ALE, anterior lateral eyes; AME, anterior median eyes; PLE, posterior lateral eyes; PME, posterior median eyes. Abbreviations used in the figures are listed in the respective legends.

Results and discussion

The morphological observations presented here complement the detailed study on Australian filistatids by Gray (1994). In live specimens (Figure 1), it is clear that both males and females have setae of contrasting coloration on the abdomen; this is not so readily observable in preserved specimens. On first sight, apart from general size and proportions of the legs, there is no obvious sexual dimorphism (Figure 1A, B, E). However, a closer look reveals some interesting specializations in males, as described below. Photos of live specimens also allow observation of some aspects of natural history, such as the shape of the egg sacs (Figure 1C) and the combing of cribellar silk using the contralateral leg III to support the combing leg (Figure 1D), as already described for other prithines by Lopardo and Ramírez (2007).

Cephalothorax and clypeus

The carapace of *Wandella*, as in all filistatids, is pronounced anteriorly; the tip serves as an attachment site for muscles, which apparently connect to the sucking stomach or to the base of the chelicerae (Figures 2A, 3A, 4A, D). Interestingly, the clypeus of males has a distinct step between the eye region and the anterior border (Figures 2B, C, 3B, C). In dorsal view, this clypeal step sometimes corresponds to an anterior straight margin in the carapace (figure 2B), easily observed in some species (e.g. *Wandella waldockae* Gray); other species have this region subrounded, being more similar in morphology to females (e.g. *Wandella stuartensis* Gray; Figure 3B). The clypeal step is not present in females (Figure 4A, B), and also seems to be absent in Prithinae other than *Wandella* and *Yardiella*. It might eventually prove to be a synapomorphy uniting these two genera. Another modification in males is the tip of the clypeus, which is unsclerotized. Examination of this region using SEM revealed several tiny projections ventrally directed (Figures 2D, E, G, 3C–E). Again, this modification is absent in females – they have the tip normally sclerotized (Figure 4D). However, this character is shared with at least some species of *Pritha* and *Tricalamus*, which are considered closely

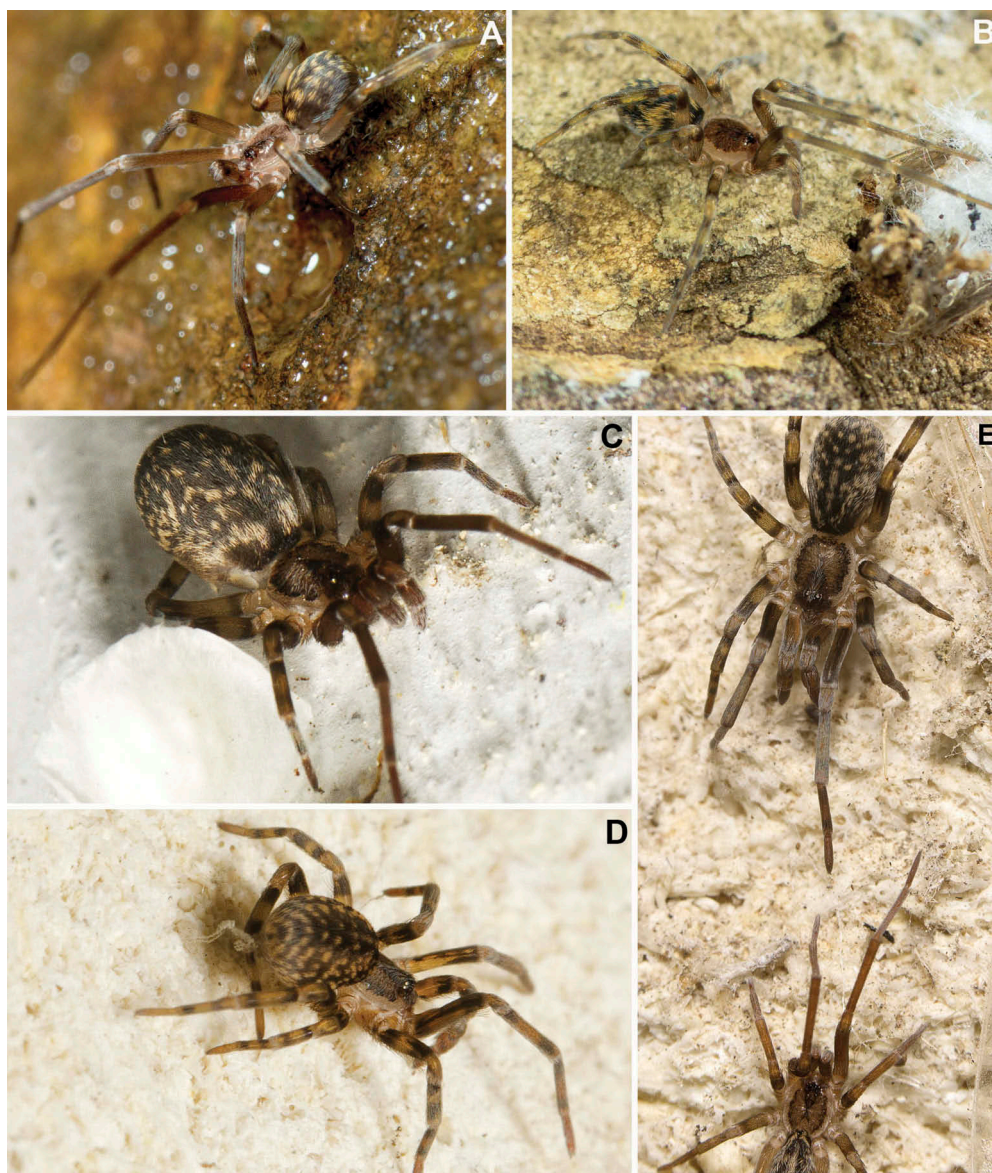


Figure 1. *Wandella*, live specimens. (A) *Wandella parnabyi* Gray, male from Durack River Station (WAM T132982). (B) Female from the same locality (WAM T132984). (C–E) *Wandella murrayensis* from Adelaide, South Australia. (C) Female with egg-sac. (D) Female spinning a cribellate thread. (E) Female on top, male on bottom. Photos (A), (B) by Robert Whyte, courtesy of Bush Blitz, (C–E) by Allan Lance.

related to *Wandella* on the basis of other characters (see Gray 1995). These genera should be further investigated regarding the fine structure of the clypeus of males. Apart from these sexually dimorphic features, I have also observed a pair of apodemes just lateral to the eye region (Figure 2B, 3B), in both males and females. Although absent in the female *W. stuartensis* I scanned (Figure 4A), it is present in females of other species (e.g. *Wandella*

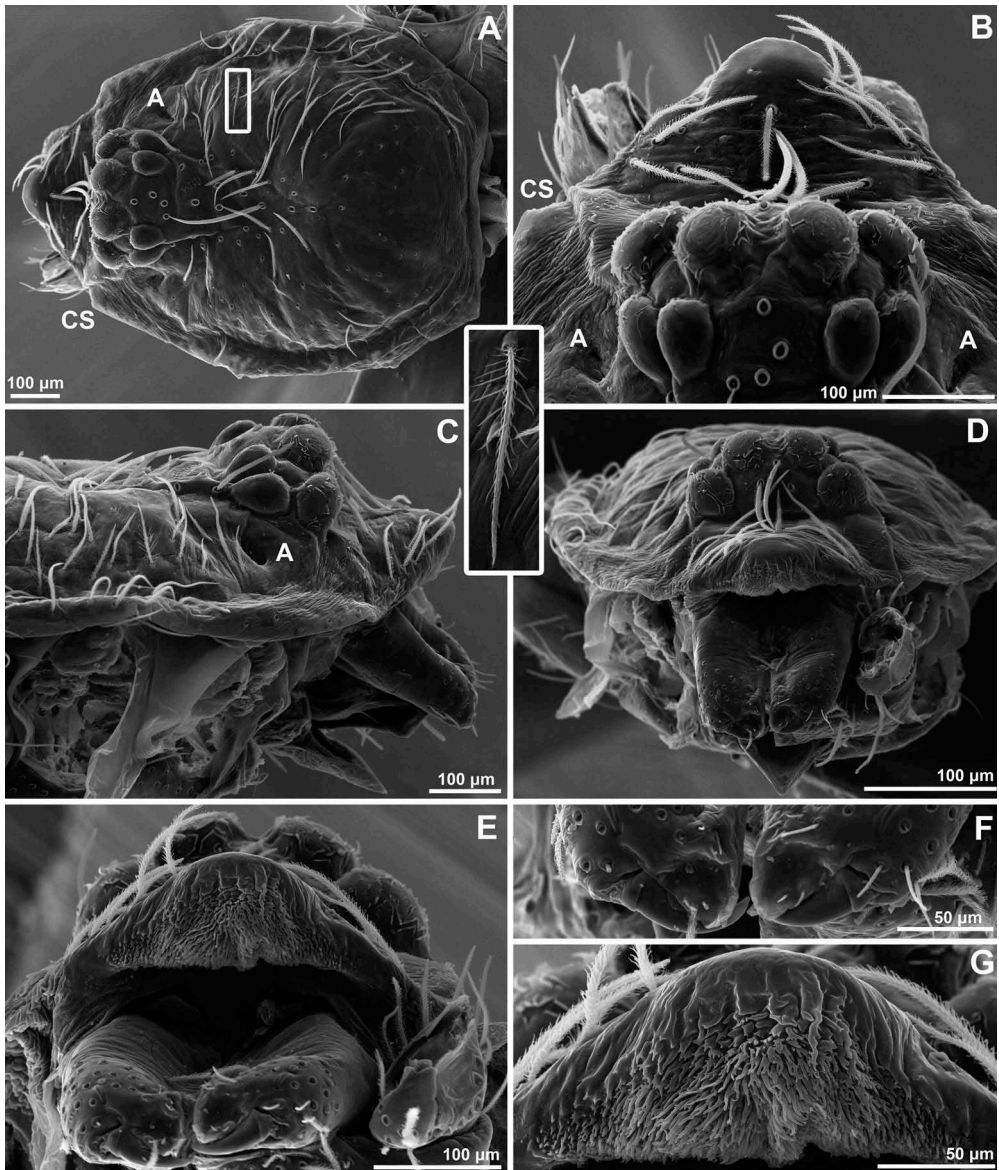


Figure 2. Scanning electron microscopy, *Wandella australiensis* (L. Koch 1873), male from Dotswood, Queensland (QM 578596). (A) Cephalothorax, dorsal. Inset showing a feathery seta. (B) Eyes and clypeus, dorsal. (C) Same, lateral. (D) Same, anterior. (E) Unsclerotized region of the clypeus, subventral. (F) Chelicerae apex, subventral. (G) Unsclerotized region of the clypeus, subventral, detail of projections. Abbreviations: A, apodeme; CS, clypeal step.

murrayensis Gray), and also occurs in species of other prithine genera. The thoracic fovea is absent (Figures 2A, 3A, 4A), and I have observed sternal sigillae only in females; in *W. stuartensis* they are very faint and vestigial (Figure 4C), but in *W. murrayensis* they are larger and well-marked. Usually, the carapace is only covered by normal, ciliate setae; in *Wandella australiensis*, however, feathery setae are also present (Figure 2A, inset).

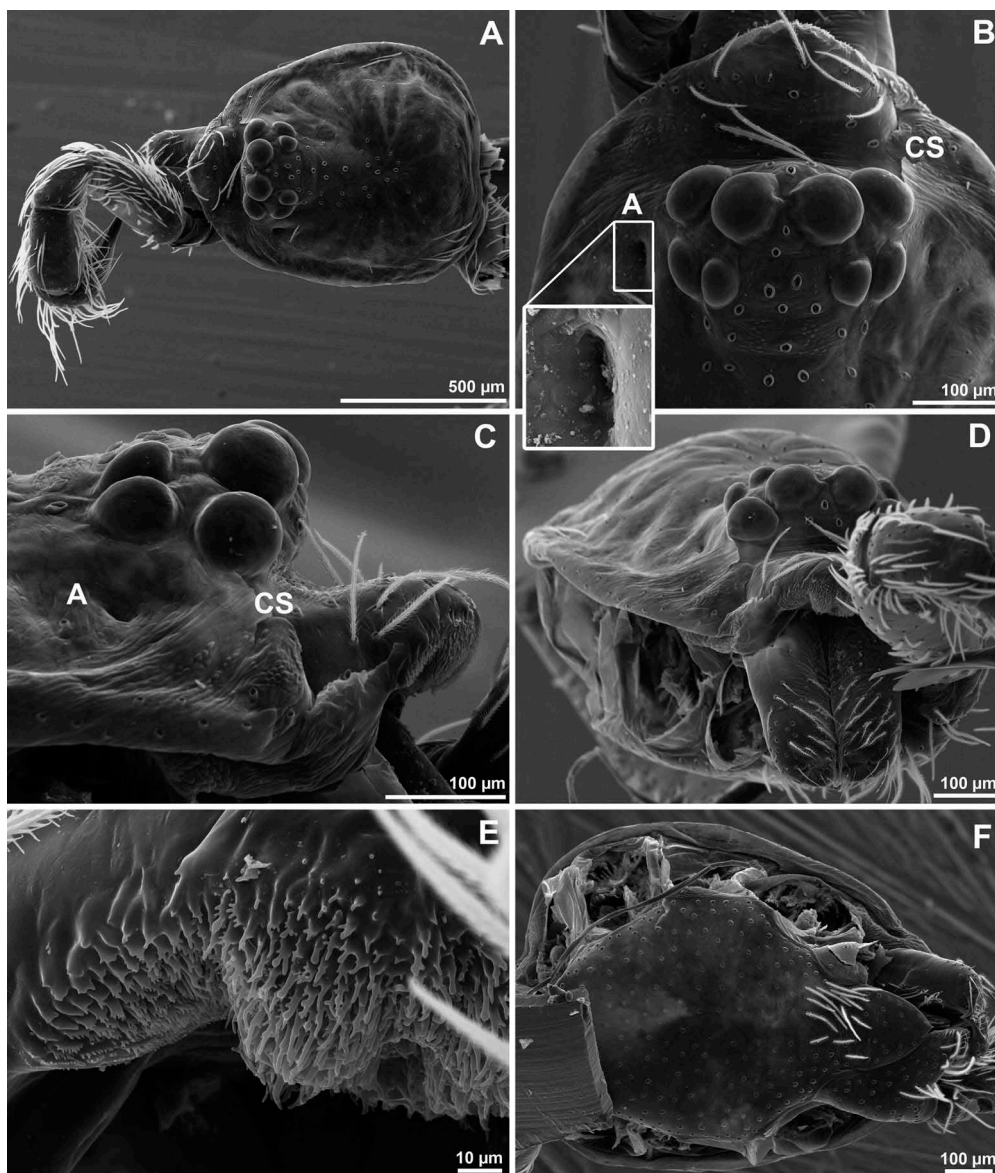


Figure 3. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, male from Mallara Station, New South Wales (AM KS.91534). (A) Cephalothorax, dorsal. (B) Eyes and clypeus, dorsal. Inset showing apodeme. (C) Same, lateral. (D) Cephalothorax, anterior. (E) Unsclerotized region of the clypeus, anterior, detail of projections. (F) Cephalothorax, ventral. Abbreviations: A, apodeme; CS, clypeal step.

Cephalothorax appendages

The chelicerae are short, partially fused at the base, and lack true teeth. There is a promarginal cheliceral lamina ending in an acute apex, just next to a wide, rounded promarginal lobe (Figure 5A, CL, PrL). The anterior face has some chemosensory setae (Figure 5B, Ch), some of them grouped in a line along the cheliceral lamina. Slit sensilla are present in both the anterior and the posterior faces. The fang is short and bears a small fang

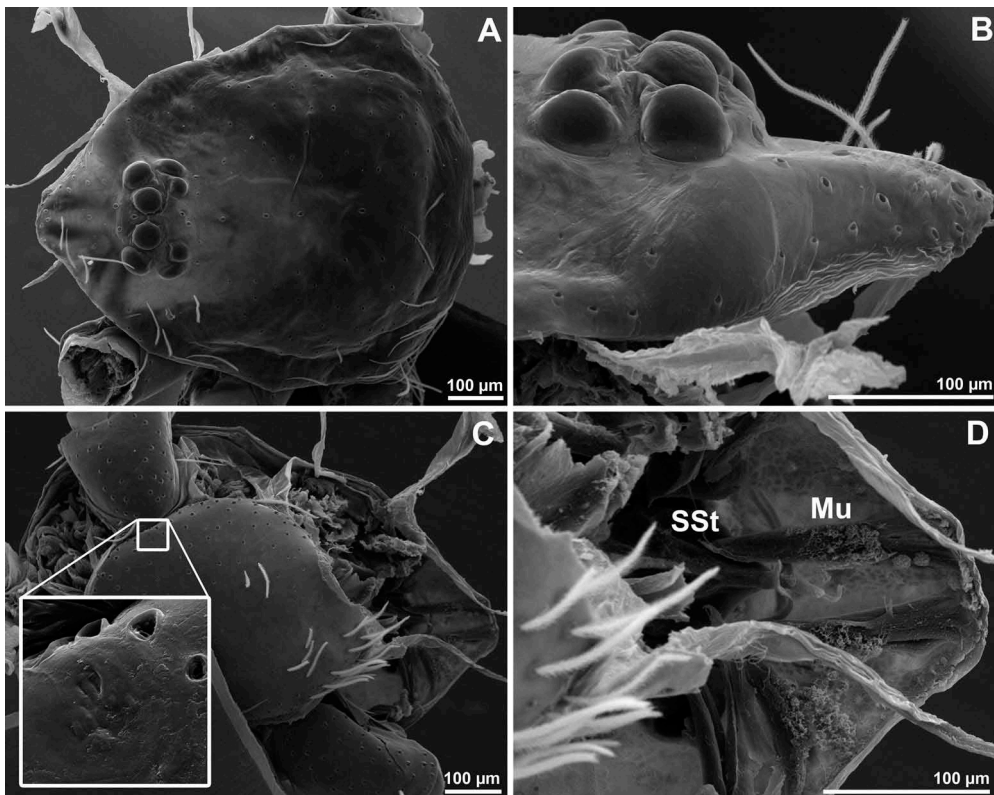


Figure 4. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, female from Sturt National Park, New South Wales (AM KS.78864), cephalothorax. (A) Dorsal view. (B) Eye region, lateral view. (C) Ventral view. Inset showing vestigial sigilla. (D) Mouth region, ventral view. Abbreviations: Mu, muscles; SSt, sucking stomach.

serrula (Figure 5A, FS). The female palp is unusually long and thick in comparison with other spider families (Figure 1), and bears a strong claw (Figure 5C). The tactile setae are all of the simple, ciliate type. The legs bear three claws, all with smaller teeth implanted ventrally. The tarsal organs are capsulate and open retrolaterally in the legs and palps (Figure 5D, inset). The calamistrum is three-rowed (Figure 5E), with the middle row usually shorter than the laterals. The setae bear combing teeth (Figure 5F), which are fewer and more spaced in the more ventral row. The trichobothria have a rounded socket delimited by a well-marked ring (Figure 5G, 6D, Tr), a ciliate and relatively short seta (Figure 6A, arrows) and are restricted to the tibiae and metatarsi (Figure 6A, arrows). The metatarsal stopper has a very narrow socket associated to the lyriform organ (Figure 5G, 6D, MeS). In most species, the legs are completely free of macrosetae (Figure 6A, b), but at least *W. murrayensis* males have a strong apical macroseta in the retrolateral face of metatarsus I.

Spinning organs

Data on the spinnerets of *Wandella* had already been presented by Gray (1994). I here present data on the spinning organs of males (*W. australiensis*, *W. stuartensis*) for the first time, as well as on the female of *W. stuartensis*. As it turns out, there seems to be little difference between

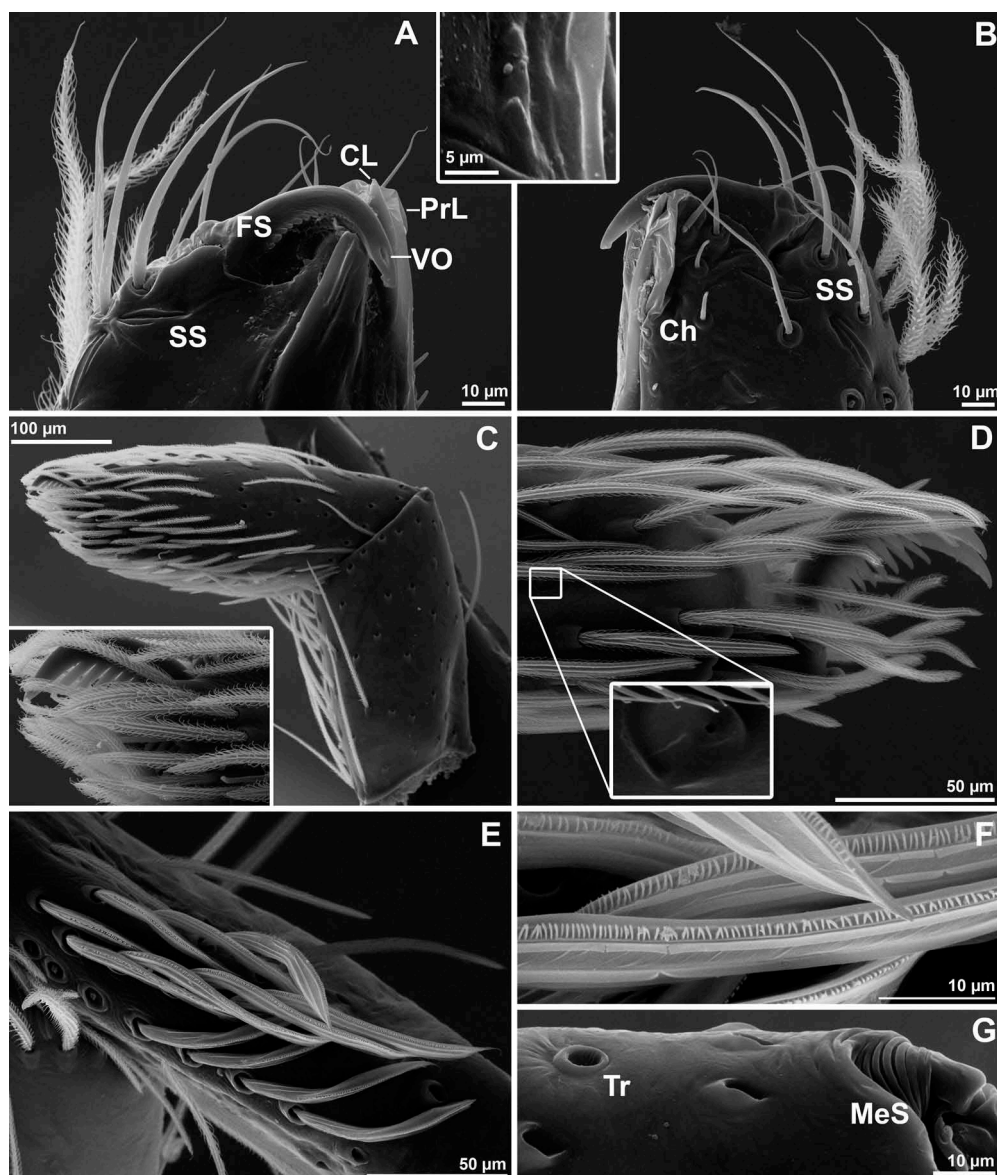


Figure 5. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, female from Sturt National Park, New South Wales (AM KS.78864), appendages. (A) Right chelicerae, retromargin. (B) Same, promargin. Inset showing detail of cheliceral glands. (C) Right palpal tarsus and tibia, prolateral. Inset showing detail of the claw. (D) Right leg IV, tarsus, retrolateral. Inset showing tarsal organ. (E) Right leg IV, calamistrum. (F) Same, detail of calamistrum setae. (G) Right metatarsus IV, dorsolateral. Abbreviations: Ch, chemosensory seta; CL, apex of the chelicera lamina; FS, fang serrula; PrL, promarginal lobe; MeS, metatarsal stopper; SS, slit sensilla; Tr, trichobothrial socket; VO, venom outlet.

males (Figures 7, 9) and females (Figure 8). The male epiandrium is composed of a few spigots joined into a single group (Figures 7B, 9C). As in most cribellate spiders, males lack cribellum spigots (Figures 7D, 9B). Females have a cribellum with spigots distributed in two groups (Figure 8B). These are annulated and very faintly clavate (Figure 8B). The other spinnerets are

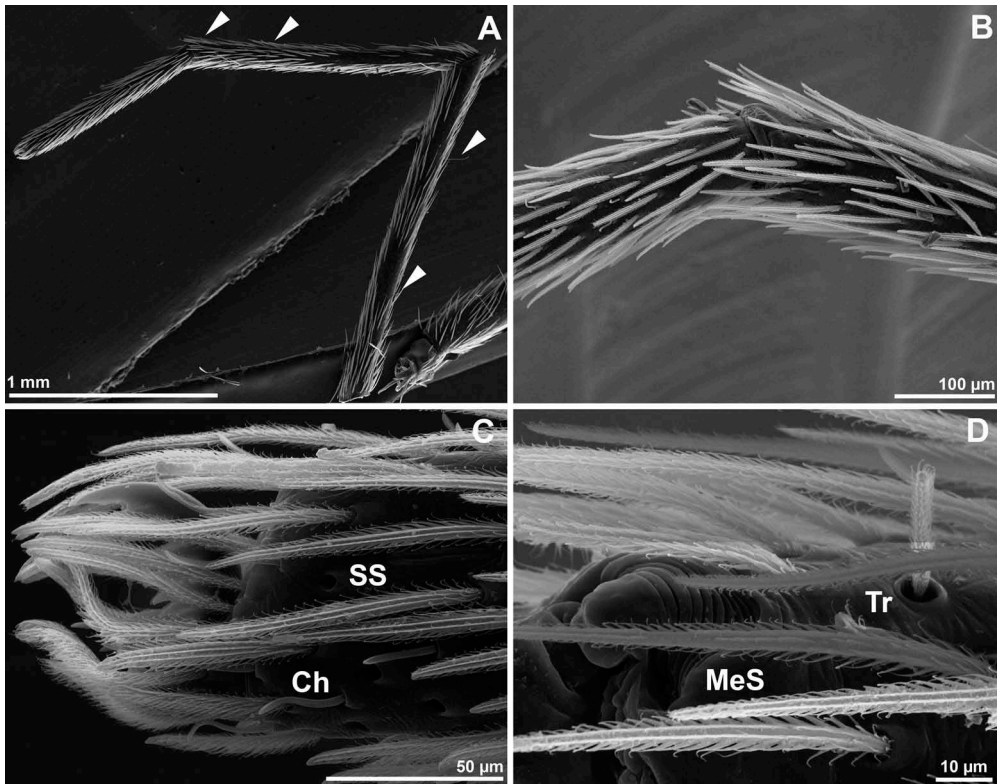


Figure 6. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, male from Mallara Station, New South Wales (AM KS.91534). (A) Left leg I, retrolateral. (B) Same, apex of metatarsus. Notice absence of a distal macroseta. (C) Tarsus tip. (D) Apex of metatarsus, dorsolateral. Abbreviations: Ch, chemosensory seta; MeS, metatarsal stopper; SS, slit sensilla; Tr, trichobothrial socket. Arrows to the position of some trichobothria.

identical in structure in males and females, although males might have fewer piriform gland spigots. The anterior lateral spinnerets have a single major ampullate gland spigot on the anterior margin of the spinning field, and ~ 10–12 piriform gland spigots, some of which are grouped in a lateral raised area (Figures 7E, 8C, 9D). The posterior median spinnerets bear some clavate setae, typical of Prithinae spiders, a paracribellar gland spigot, and a minor ampullate gland spigot placed in an anterior pit (Figures 7F, 8D, E, 9E). The posterior lateral spinnerets have a single spigot each, which I interpret as being the paracribellar gland spigot (Figures 7F, 8F, 9E). Gray (1994, p. 47, fig. 29); reported two spigots in the PLS of *W. murrayensis*, but one of those appears to be a chemosensory seta instead.

Posterior respiratory system

The posterior tracheae of *Wandella orana* had already been depicted by Gray (1994, fig. 44) and consist of two simple tubes, as in other Prithinae (see Ramírez and Grismado 1997). The SEM images of male abdomens show two small spiracles midway between the spinnerets and the epigastric furrow (Figures 7A, 9A), supporting these observations.

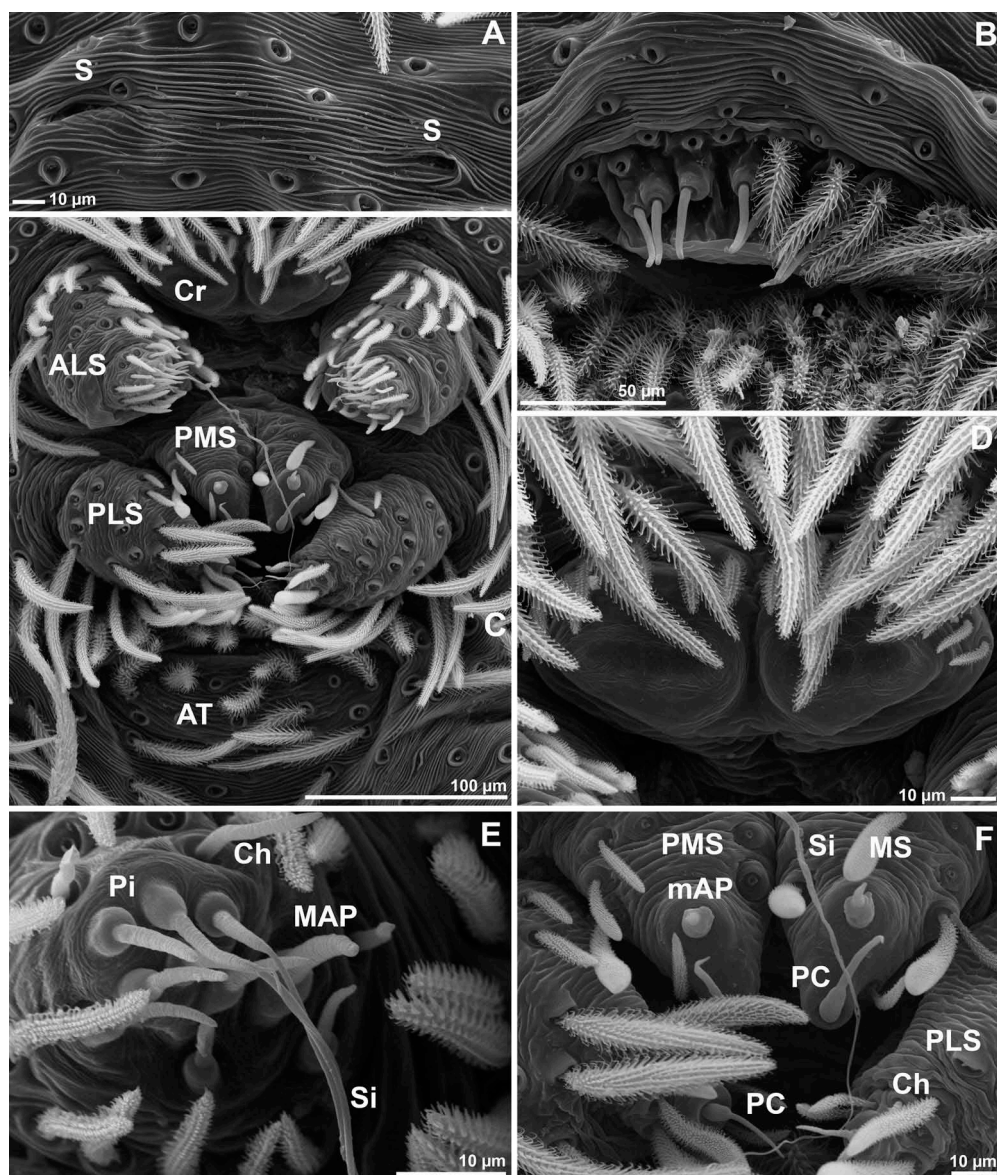


Figure 7. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, male from Mallara Station, New South Wales (AM KS.91534). (A) Posterior tracheal spiracles, ventral. (B) Epiandrium, ventral. (C) Spinnerets, ventral. (D) Cribellum, ventral. (E) Right ALS, subventral. Notice strand of silk. (F) PMS and PLS, ventral. Abbreviations: ALS, anterior lateral spinnerets; Ch, chemosensory seta; Cr, cribellum; MAP, major ampullate gland spigot; mAP, minor ampullate gland spigot; MS, modified seta; PC, paracribellar gland spigot; Pi, piriform gland spigot; PLS, posterior lateral spinnerets; PMS, posterior median spinnerets; S, tracheal spiracle; Si, strand of silk.

Genitalia

The palp of *Wandella* and *Yardiella* males has a typical horseshoe-shaped cymbium (Figures 10C, 11C, G, 12D), as well as a distinct dorsal paraembolic lamina

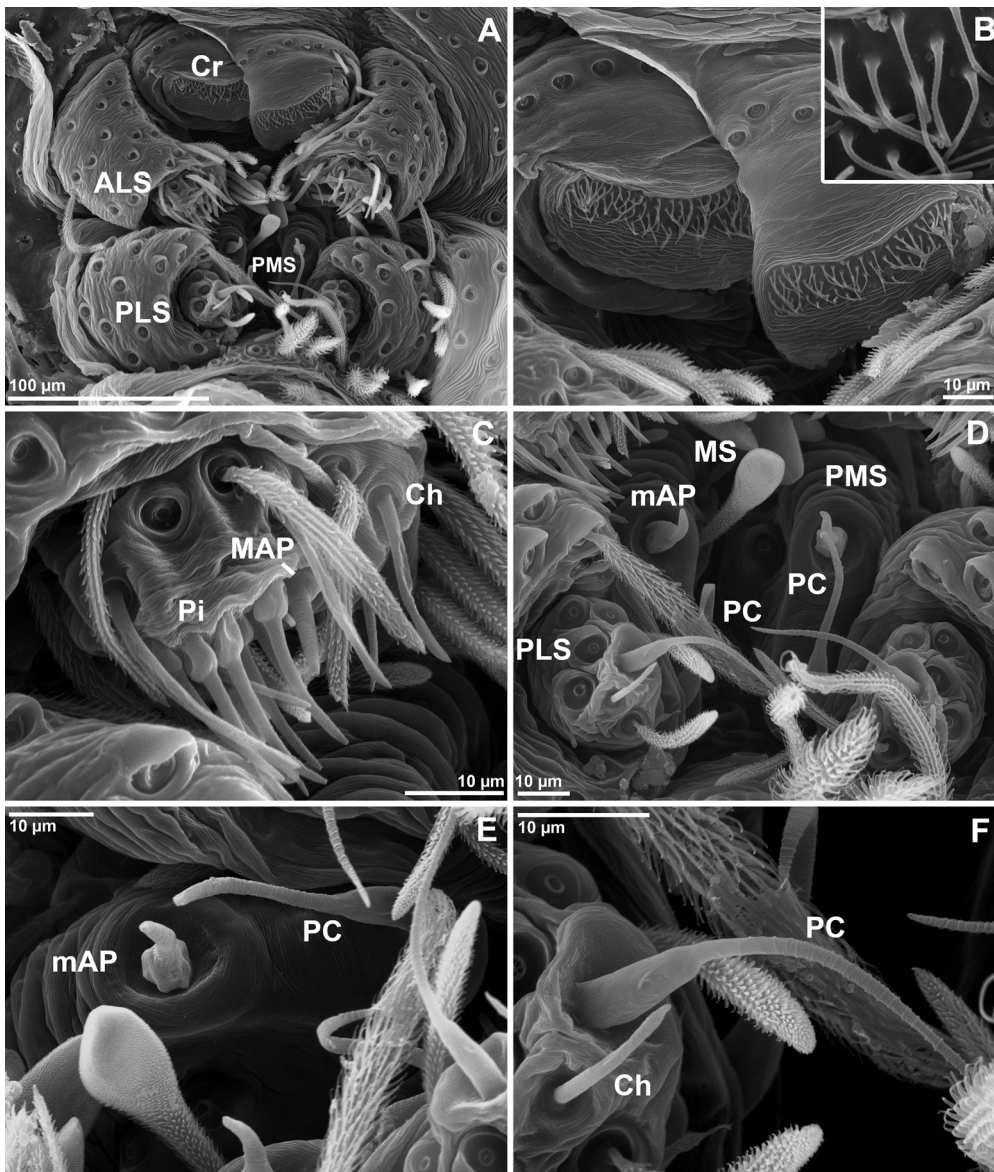


Figure 8. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, female from Sturt National Park, New South Wales (AM KS.78864). (A) Spinnerets, ventral view. (B) Cribellum, ventral view. Inset showing cribellar spigots. (C) Right ALS, ventral view. (D) PMS and PLS, ventral view. (E) Right PMS, subventral view. (F) Right PLS, ventral view. Abbreviations: ALS, anterior lateral spinnerets; Ch, chemosensory seta; Cr, cribellum; MAP, major ampullate gland spigot; mAP, minor ampullate gland spigot; MS, modified seta; PC, paracribellar gland spigot; Pi, piriform gland spigot; PLS, posterior lateral spinnerets; PMS, posterior median spinnerets.

(Figures 10, 11, 12; see also Gray 1994). This paraembolic lamina is connected with a deep prolateral excavation in the tegulum (Figures 10B, 11B, F), which is absent in at least some species (Figure 12A). The tegular excavation might be ornamented with micro-teeth (Figures 10G, 11B, F, 12B), larger tegular spines (Figure 10G) or tegular

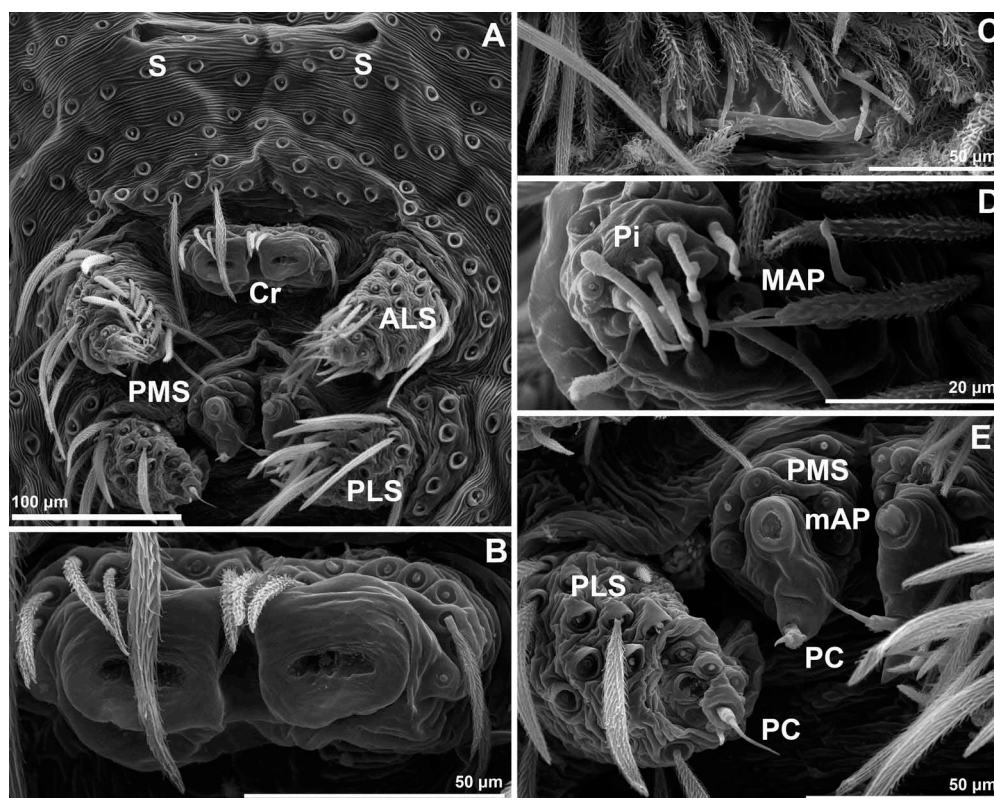


Figure 9. Scanning electron microscopy, *Wandella australiensis* (L. Koch 1873), male from Dotswood, Queensland (QM S78596). (A) Spinnerets and tracheal spiracles, ventral. (B) Cribellum, ventral. (C) Epiandrium spigots, ventral. (D) Right ALS, ventral. (E) PMS and right PLS. Notice broken shaft of mAP. Abbreviations: ALS, anterior lateral spinnerets; Cr, cribellum; MAP, major ampullate gland spigot; mAP, minor ampullate gland spigot; PC, paracribellar gland spigot; PLS, posterior lateral spinnerets; PMS, posterior median spinnerets; S, tracheal spiracle.

wrinkles (Figure 11B, F). The embolus has a deep and long prolateral slit (Figures 10D, 11D, G, 12B). In turn, the opening of the spermophore is retrolateral and disconnected from this prolateral slit (Figures 10E, 11E, 12F). Interestingly, the male of *W. australiensis* has a large, scaliform structure in the dorsum of the paraembolic lamina (Figure 10E, F). Such structure has so far only been reported in *Yardiella* and related Indian species (see Gray 1994). Together with the possession of feathery setae (Figure 10A, inset), this might indicate a close relationship between *W. australiensis* and *Yardiella*, blurring the limits between the two genera. A quantitative phylogenetic analysis of Australasian prithines will certainly be of help to clarify this question.

Externally, adult females do not present any modification, although the genital region is more pubescent (Figure 13B). The female spermathecae consist of two pairs, here termed outer and inner (Figure 13A, D, G). Both are lobe-shaped; the inner pair connects directly to the uterus externus, and the outer pair has a short, usually annulated, stalk. Dorsally to the uterus externus there is a large interpulmonary fold (Figure 13C, F). Apparently, the inner spermatheca pair bears more glandular pores than the outer pair

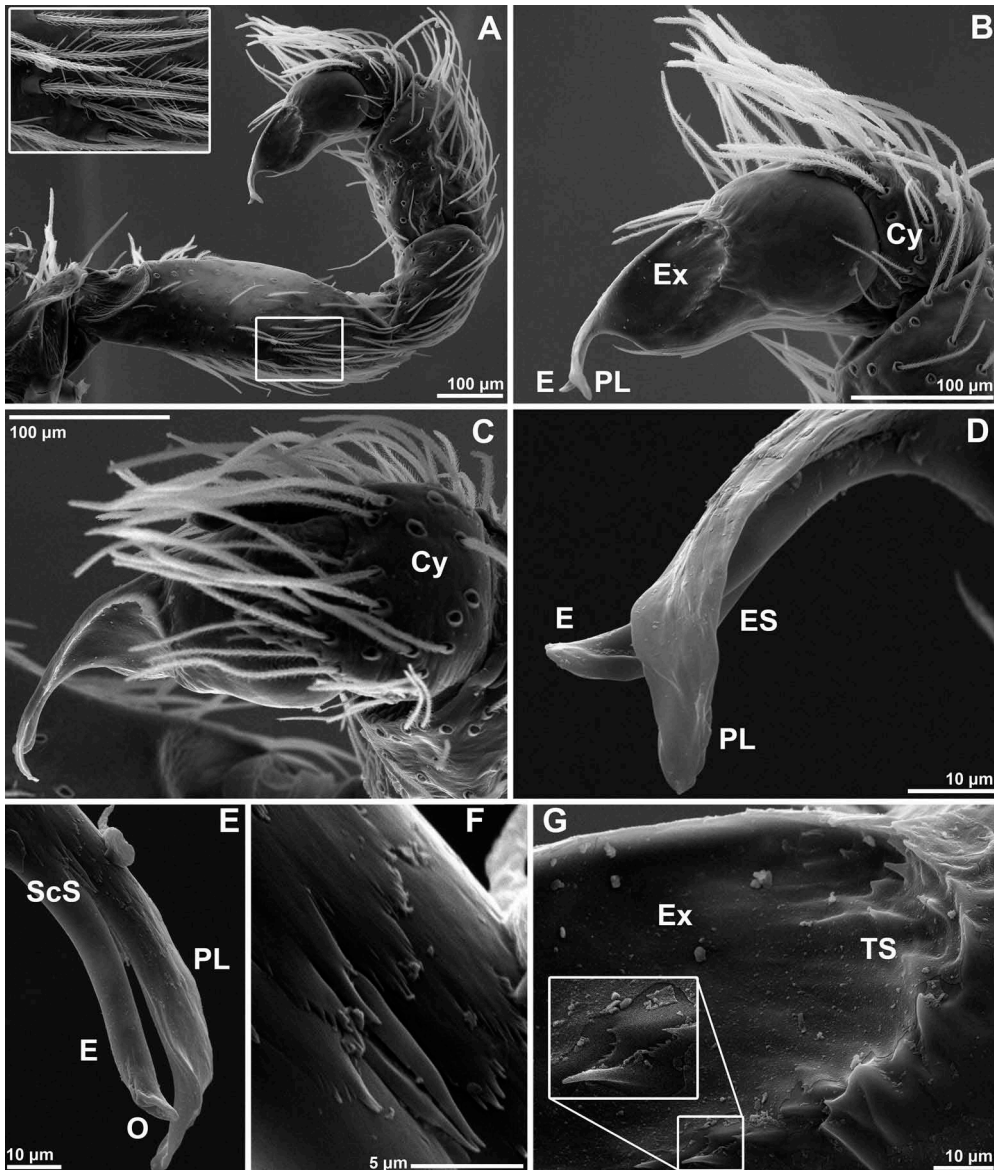


Figure 10. Scanning electron microscopy, *Wandella australiensis* (L. Koch 1873), male from Dotswood, Queensland (QM 578596), right palp. (A) Prolateral. Inset showing feathery and ciliate setae. (B) Bulb and cymbium, prolateral. (C) Bulb and cymbium, subdorsal. (D) Embolus, prolateral. (E) Embolus, retrolateral. (F) Scaliform structure, retrolateral. (G) Tegular excavation, prolateral. Inset showing micro-teeth along larger tegular spines. Abbreviations: Cy, cymbium; E, embolus; ES, embolus slit; Ex, tegular excavation; O, embolus opening; PL, paraembolic lamina; ScS, scaliform structure; TS, tegular spines.

(Figure 13D), appearing more sclerotized under light microscopy (Figure 13A). At least in *W. murrayensis*, the pores of the inner spermathecae are joined into groups placed on the top of small mounds (Figure 13E); in *W. stuartensis* the pores are isolated from each other (Figure 13H).

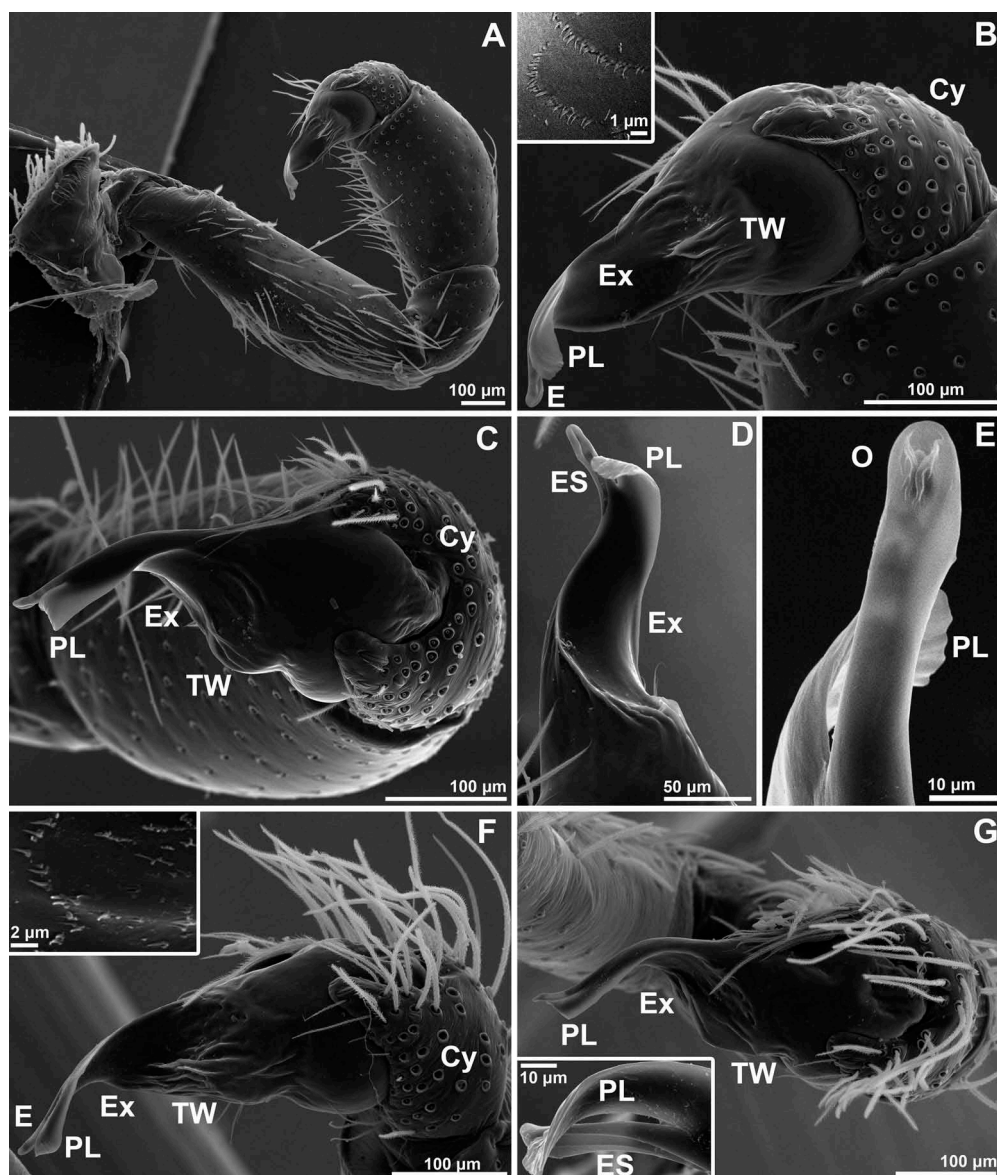


Figure 11. Scanning electron microscopy, right male palps. (A–E) *Wandella murrayensis* Gray 1994 from Lower Murray-Darling Region, New South Wales (AM KS.71427). (A) Prolateral. (B) Bulb and cymbium, prolateral. Inset showing tegular micro-teeth. (C) Bulb and cymbium, dorsal. (D) Embolus, ventrolateral. (E) Embolus, retrolateral. (F, G) *Wandella orana* Gray 1994 from Upper Hunter River, New South Wales (AM KS.92378). (F) Bulb and cymbium, prolateral. Inset showing tegular micro-teeth. (G) Bulb and cymbium, dorsal. Inset showing embolus, ventrolateral. Abbreviations: Cy, cymbium; E, embolus; ES, embolus slit; Ex, tegular excavation; O, embolus opening; PL, paraembolic lamina; TW, tegular wrinkles.

Huber (2004) studied palpal morphology in several spider families by means of detailed sectioning studies. He concluded that the claw extensor muscle (also called m30), usually present in non-Entelegynae spiders, is absent in the Filistatinae spiders he

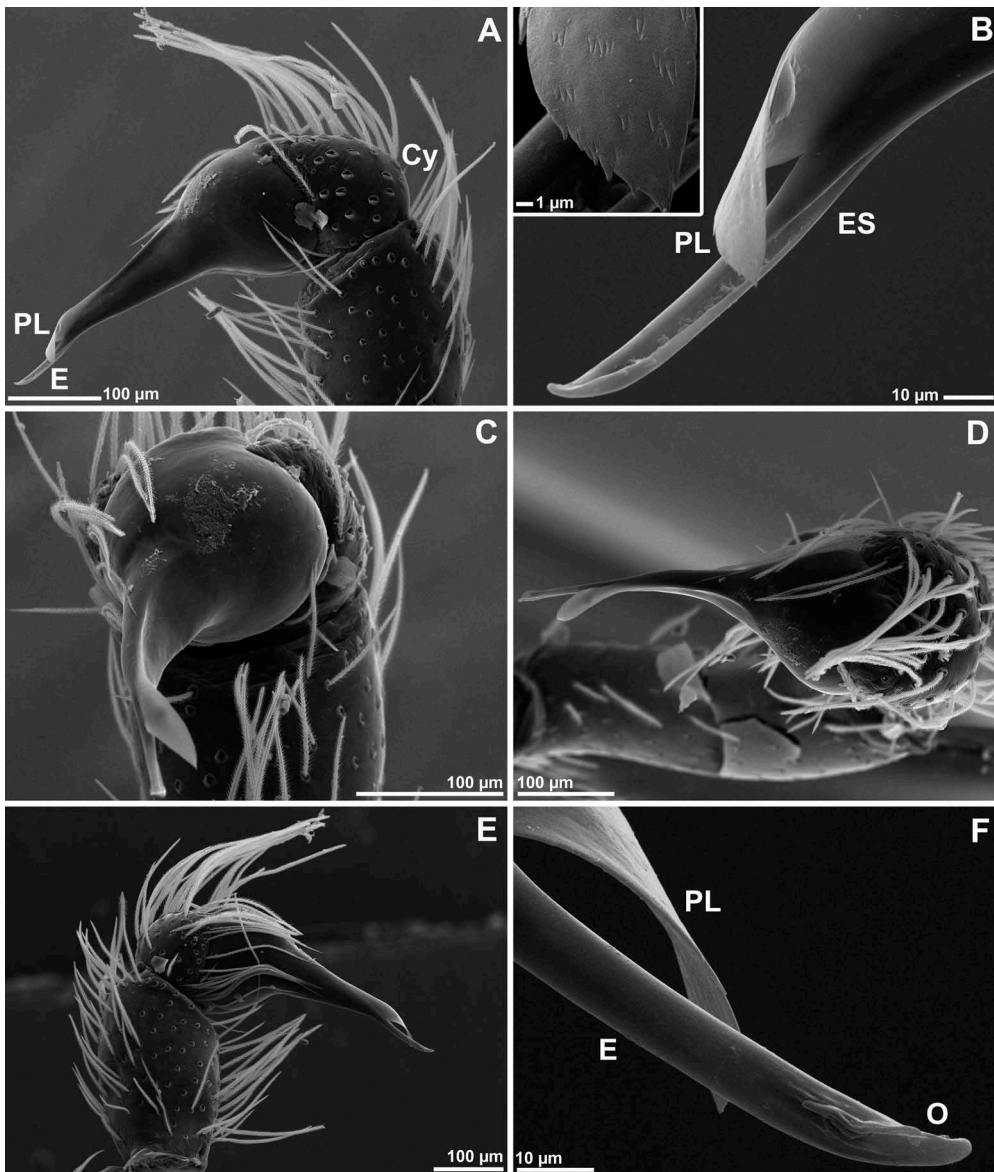


Figure 12. Scanning electron microscopy, *Wandella stuartensis* Gray 1994, male from Mallara Station, New South Wales (AM KS.91534), right palp. (A) Bulb and cymbium, prolateral. (B) Embolus and paraembolic lamina, prolateral. Inset showing apex of paraembolic lamina. (C) Bulb and cymbium, apical. (D) Bulb and cymbium, dorsal. (E) Bulb and cymbium, retrolateral. (F) Embolus and paraembolic lamina, retrolateral. Abbreviations: Cy, cymbium; E, embolus; ES, embolus slit; O, embolus opening; PL, paraembolic lamina.

studied. I have clarified *Wandella* male palps using clove oil and observed a tissue, apparently connecting the bulb to the cymbium, in a position consistent with the m30 (Figure 14). Although more detailed observations would be desirable, this suggests that the loss of the m30 may be synapomorphic for the Filistatinae, and not for the entire

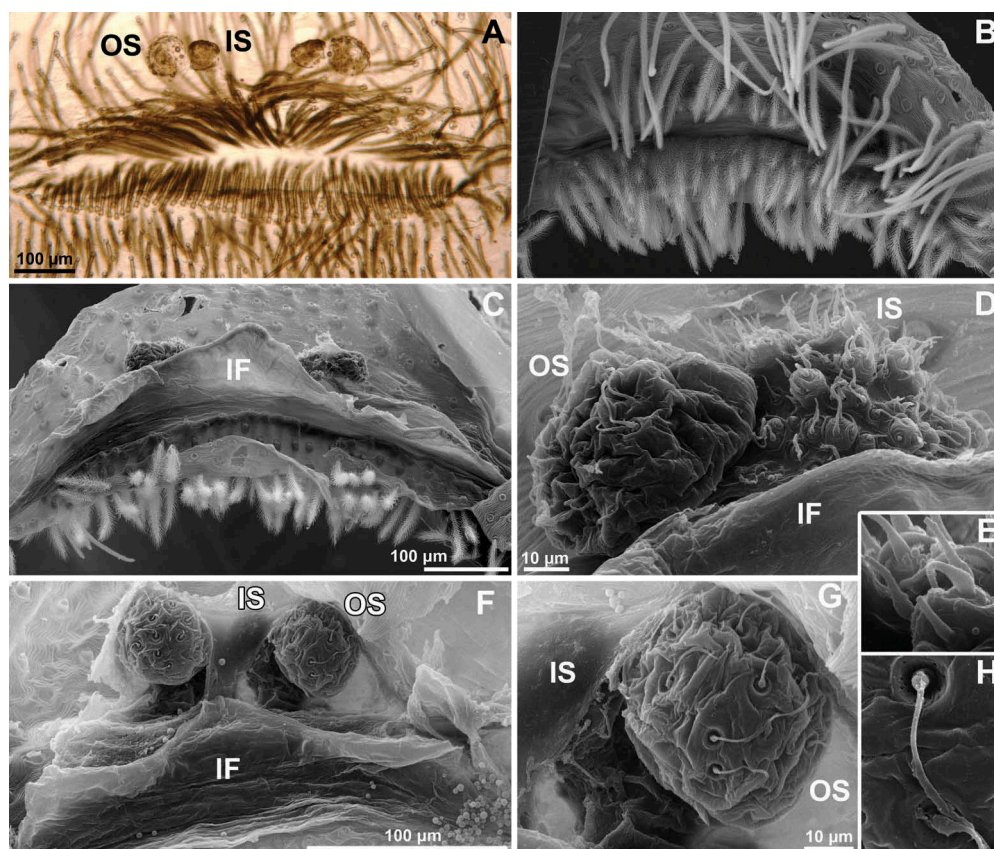


Figure 13. Female genitalia, pancreatin digested. (A) Light microscopy, (B–H) scanning electron microscopy. (A) *Wandella murrayensis* Gray 1994 from Karunjie Station, Western Australia (WAM T132986), lactic acid cleared, dorsal. (B–E) Same species, from Roachdale National Trust Reserve, South Australia (SAM NN28356). (B) Genital region, ventral. (C) Spermathecae, dorsal. (D) Left spermathecae, dorsal. (E) Detail of pores of the inner spermatheca. (F–H) *Wandella stuartensis* Gray 1994 from Sturt National Park, New South Wales (AM KS.78864). (F) Spermathecae, dorsal. (G) Right spermathecae, dorsal. Inner spermathecae partially covered during preparation of the piece. (h) Detail of pores of the outer spermatheca. Abbreviations: IF, interpulmonary fold; IS, inner spermathecae; OS, outer spermathecae.

Filistatidae. Alternatively, Griswold et al. (2005) have suggested that even filistatines may have a small m30, as reported here for *Wandella* (their fig. 167D, labelled as apM29).

Taxonomy

Family FILISTATIDAE Ausserer, 1867

Subfamily PRITHINAE Gray 1995

Genus *Wandella* Gray 1994

W. Gray 1994: 41. Type species *W. barbarella* Gray 1994 by original designation.

Wandella grayi sp. nov.

(Figures 15–18)



Figure 14. Light microscopy, cymbium, prolateral, clove oil cleared. (A) *Wandella australiensis* (Koch 1873), male from Undara National Park, Queensland (QM S98401), cleared. (B) *Wandella barbarella* Gray 1994, male from Gardner Reserve Road, Western Australia (WAM T133473). Abbreviations: BSB, basal sclerite of the bulb; F, fundus; M30, claw extensor muscle; tM29, tendon of the claw flexor muscle.

Type material

Holotype. Male from AUSTRALIA: Queensland, Burke Developmental Road, grazed open woodland, pitfall trap (141.65, -17.2), J. Thompson, S. Cowan & M. Tio, 28/VII/1995 (AM KS.53183).

Paratypes. one male and two females from AUSTRALIA: Queensland, 62 km W of Chillagoe, pitfall trap (144.0442, -16.6969), J. Thompson, S. Cowan & M. Tio, 26/VII/1995 (AM KS.43936).

Etymology

This species is named after the Australian arachnologist Dr Michael Gray, in recognition of his contributions to the study of spiders in general, and Australian filistatids in particular.

Diagnosis

Males can be distinguished from all other *Wandella*, except *Wandella alinjarra* Gray, by the long, slender and sinuous embolus; they differ from those of *W. alinjarra* by having a clearly longer than wide palpal tibia and by the higher paraembolic lamina (Figure 16D–F). Females differ from all known *Wandella* by the very long stalks of the outer spermathecae (Figure 17D, E).

Description

Holotype male from Burke Developmental Road, Queensland, Australia (AM KS.53183) (Figures 16, 18A). Coloration: carapace cream, with dark brown median pattern and clypeal markings, and submarginal bands present as diffuse, light brown patches; chelicerae cream with an anterior brown patch; labium and endites cream; sternum cream with barely visible light brown patches along the anterior border; legs cream, with incomplete light brown rings in the base and apex of the

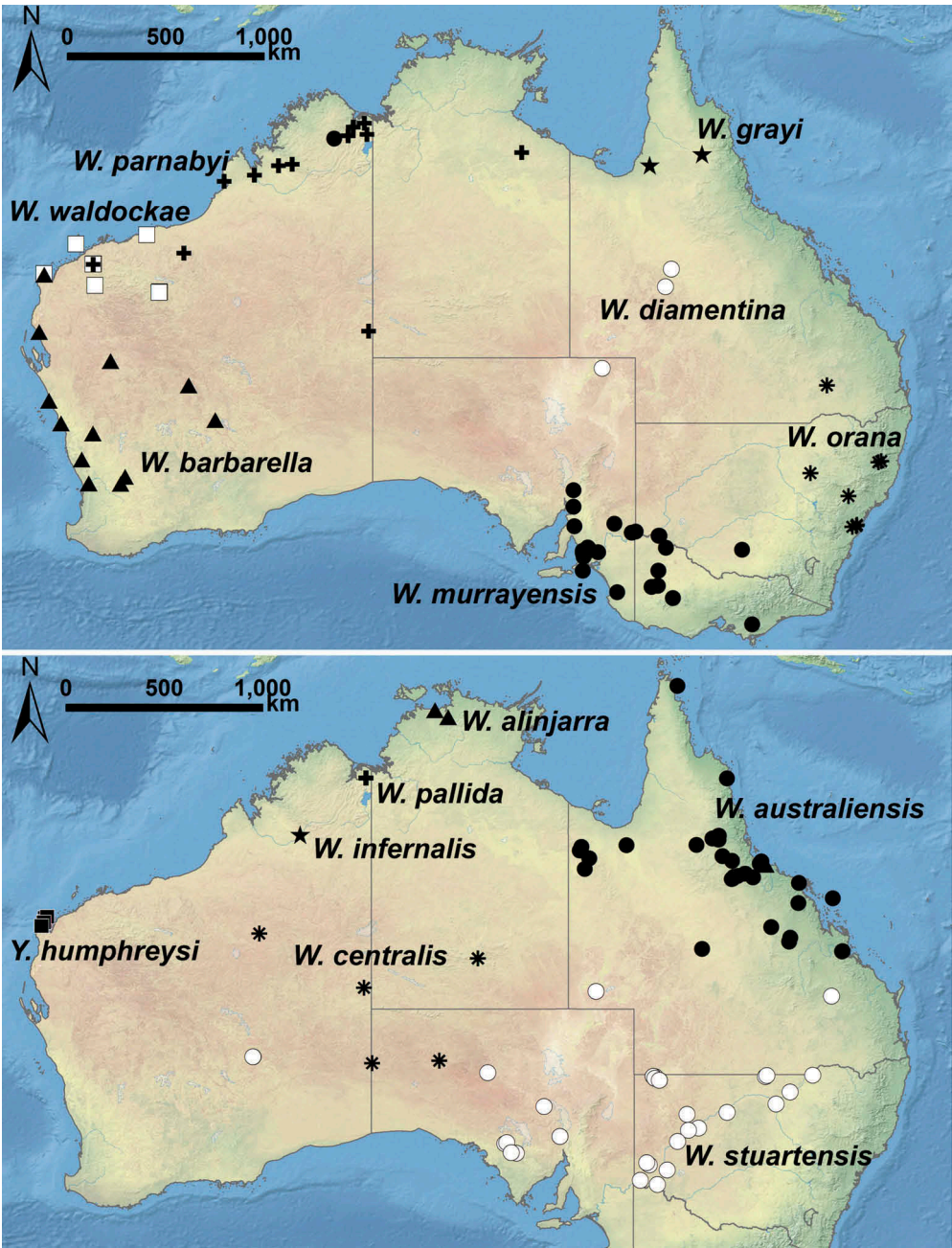


Figure 15. Distribution maps for Australian filistatids (including records by Gray 1994). Above: triangles = *Wandella barbarella*, white circles = *Wandella diamentina*, stars = *Wandella grayi*, black circles = *Wandella murrayensis*, asterisks = *Wandella orana*, crosses = *Wandella parnabyi*, white squares = *Wandella waldockae*. Below: triangles = *Wandella alinjarra*, black circles = *Wandella australiensis*, asterisks = *Wandella centralis*, star = *Wandella infernalis*, cross = *Wandella pallida*, white circles = *Wandella stuartensis*, squares = *Yardiella humphreysi*.

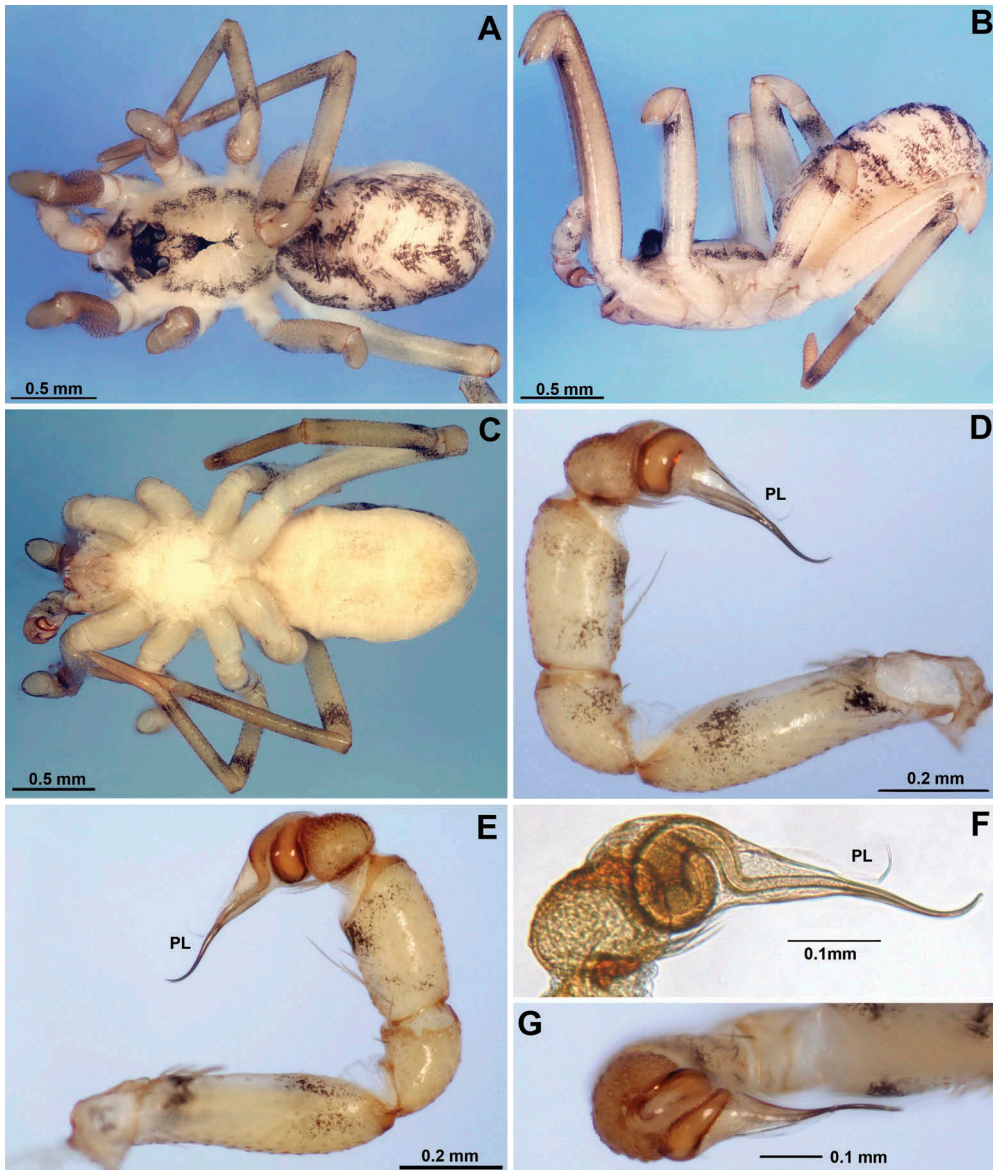


Figure 16. *Wandella grayi* sp. nov., holotype male (AM KS.53183). (A) Habitus, dorsal. (B) Habitus, lateral. (C) Habitus, ventral. (D) Left palp, prolateral. (E) Left palp, retrolateral. (F) Bulb, prolateral, cleared. (G) Bulb, dorsal. Abbreviation: PL, paraembolic lamina.

femora, tibiae and metatarsi and a prolateral light brown patch on the patellae; abdomen dorsum light brown, with a dark brown triangular marking anteriorly and dark brown transverse patches in the posterior median area; abdomen venter cream. Anterior margin of the carapace unmodified. Sternum subrounded, sigillae not visible. Total length 2.24. Carapace length 1.04, width 0.79. Clypeus length 0.20. Eye diameters and interdistances: AME 0.09, PME 0.09, ALE 0.11, PLE 0.09, AME–AME 0.02, PME–PME 0.09. Right palp: femur length 0.46, width 0.17, tibia length

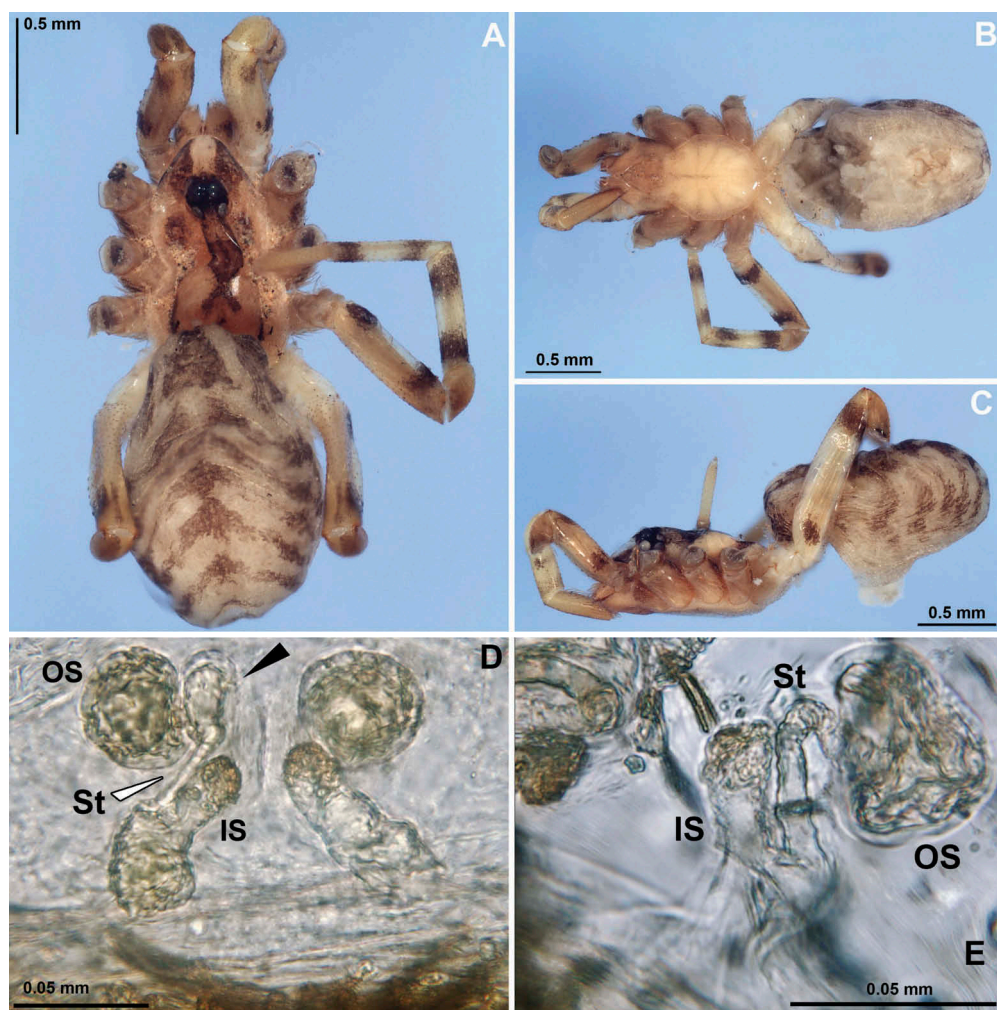


Figure 17. *Wandella grayi* sp. nov., paratype females (AM KS.43936). (A) Habitus, dorsal. (B) Habitus, ventral. (C) Habitus, lateral. (D) Spermathecae, dorsal, cleared (preparation IFM-0718). Black arrow to abnormal incrassation of the stalk. (E) Another female, right spermathecae, dorsal, cleared (preparation IFM-0699). Abbreviations: IS, inner spermathecae; OS, outer spermathecae; St, stalk.

0.30, width 0.17. Leg I: femur 1.55, patella 0.39, missing from tibia. II: fe 1.02, pa 0.31, ti missing. Right III: fe 0.87, pa 0.28, ti 0.79. IV: fe 1.20, pa 0.35, ti 1.19, mt 1.13, ta 0.63. Abdomen: length 1.29, width 0.78. Leg macrosetae: absent in legs III and IV (legs I and II missing from tibia). Palp: cymbium horseshoe-shaped, prolateral excavation small, near the base of the paraembolic process (Figure 18A, Ex), paraembolic process long, distally detached and erect, forming a hook, embolus long, gently curved. State of the specimen: has lost most of the setae, all legs missing from tibia (except right legs III and IV), left palp dissected, right palp with broken embolus.

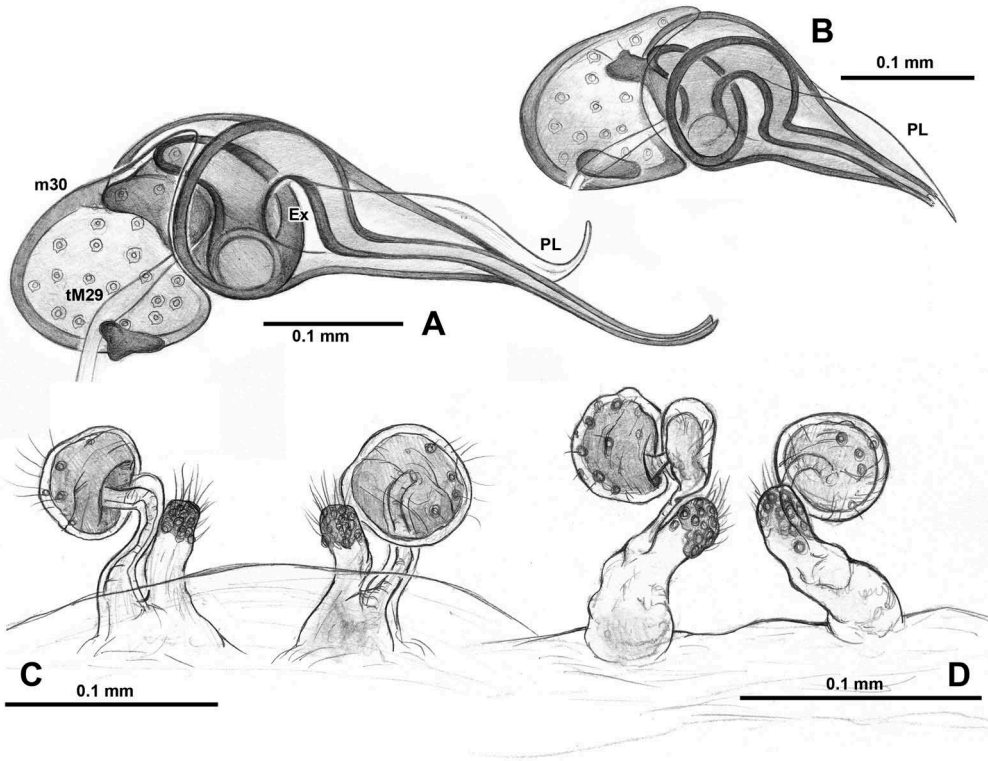


Figure 18. *Wandella grayi* sp. nov. (A) Holotype male (AM KS.53183), bulb, prolateral, cleared. (B) Paratype male (AM KS.43936), bulb, prolateral, cleared. Notice broken tip of embolus. (C, D) Paratype females, spermathecae, dorsal, cleared. Abbreviations: Ex, prolateral excavation; M30, claw extensor muscle; PL, paraembolic lamina; tM29, tendon of the claw flexor muscle.

Paratype female from 62 km west of Chillagoe, Queensland, Australia (AM KS.43936) (Figure 17A–D, 18B). Coloration as in male. Sternum as in male. Total length 2.46. Carapace length 1.02, width 0.60. Clypeus length 0.20. Eye diameters and interdistances: AME 0.08, PME 0.07, ALE 0.09, PLE 0.06, AME–AME 0.01, PME–PME 0.07. Palp: femur length 0.60, width 0.20, tibia length 0.17, width 0.34. Leg I: missing from femur. II: missing from femur. III: fe 0.76, pa 0.28, ti 0.60. IV: fe 1.15, pa 0.35, missing from tibia. Abdomen: length 1.42, width 0.85. Leg macrosetae: absent in leg III (other legs missing). Calamistrum missing. Epigastric furrow adorned with thick setae. Spermathecae: inner spermathecae digitiform, with pores in the apex, outer spermathecae rounded, with very long and slightly convoluted stalks. State of the specimen: with deformed carapace, spermathecae dissected, all legs missing from tibia (except right leg III).

Variation

Males ($n = 2$): total length 1.88–2.24 (2.06), carapace length 0.9–1.04 (0.97), femur I length 1.35–1.55 (1.45). Females ($n = 2$): total length 2.46–2.46 (2.46), carapace length 0.95–1.02 (0.99). The paratype male does not have the paraembolic lamina as erect as that of the holotype. One of the females has one of the lateral stalks in the spermathecae medially incrassated, probably an abnormality.

Note

Males and females have been matched because the paratypes (one male and two females) have been collected from the same locality. Both examined females are in a very bad state of conservation, having the carapace deformed and most of the legs missing; the male paratype has the embolus of both palps broken off.

Distribution

Known from northern Queensland, Australia (Figure 15).

Material examined

Only the types.

Wandella infernalis sp. nov.
(Figures 15, 19–21)

Type material

Holotype. Male from AUSTRALIA: Western Australia, 25 km northeast of Fitzroy Crossing, Geikie Range, cave KG-47 (125.7416, –18.04027), S. Eberhard & G. Forte, 1/VII/1998 (WAM T132988).

Paratypes. Two females in the same vial.

Etymology

The specific name is an adjective referring to the subterranean habitat of this species, and is also a tribute to the notorious Australian rock band AC/DC, whose members have written several songs about hell.

Diagnosis

Males are most similar to those of *Wandella centralis* Gray and *Wandella pallida* Gray in having a long and slender palp; they can be distinguished from these and all other *Wandella* species by having a strong ventral bump in the bulb just basal to the embolus (*W. pallida* Gray has a similar, but much more tenuous bump: see his fig. 114), and by the subtriangular paraembolic lamina ending close to the embolus (Figure 19G). Females can be distinguished from other species by the subtriangular inner spermathecae, which point laterad (Figure 20E).

Description

Holotype male from Cave KG-47, Geikie Range, Western Australia, Australia (WAM T132988) (Figures 19, 21A). Coloration: carapace cream, with brown median pattern and incomplete clypeal markings, and light brown median area, with slightly dark submarginal bands; chelicerae cream; labium and endites light cream; sternum light cream, with a pair of brown markings anteriorly; legs light cream, with incomplete light brown rings in the base and apex of the femora, tibiae and metatarsi; abdomen dorsum cream, with five light brown subtriangular markings; abdomen venter cream. Anterior margin of the carapace nearly straight. Sternum subrounded, sigillae not visible. Total length 2.74. Carapace length

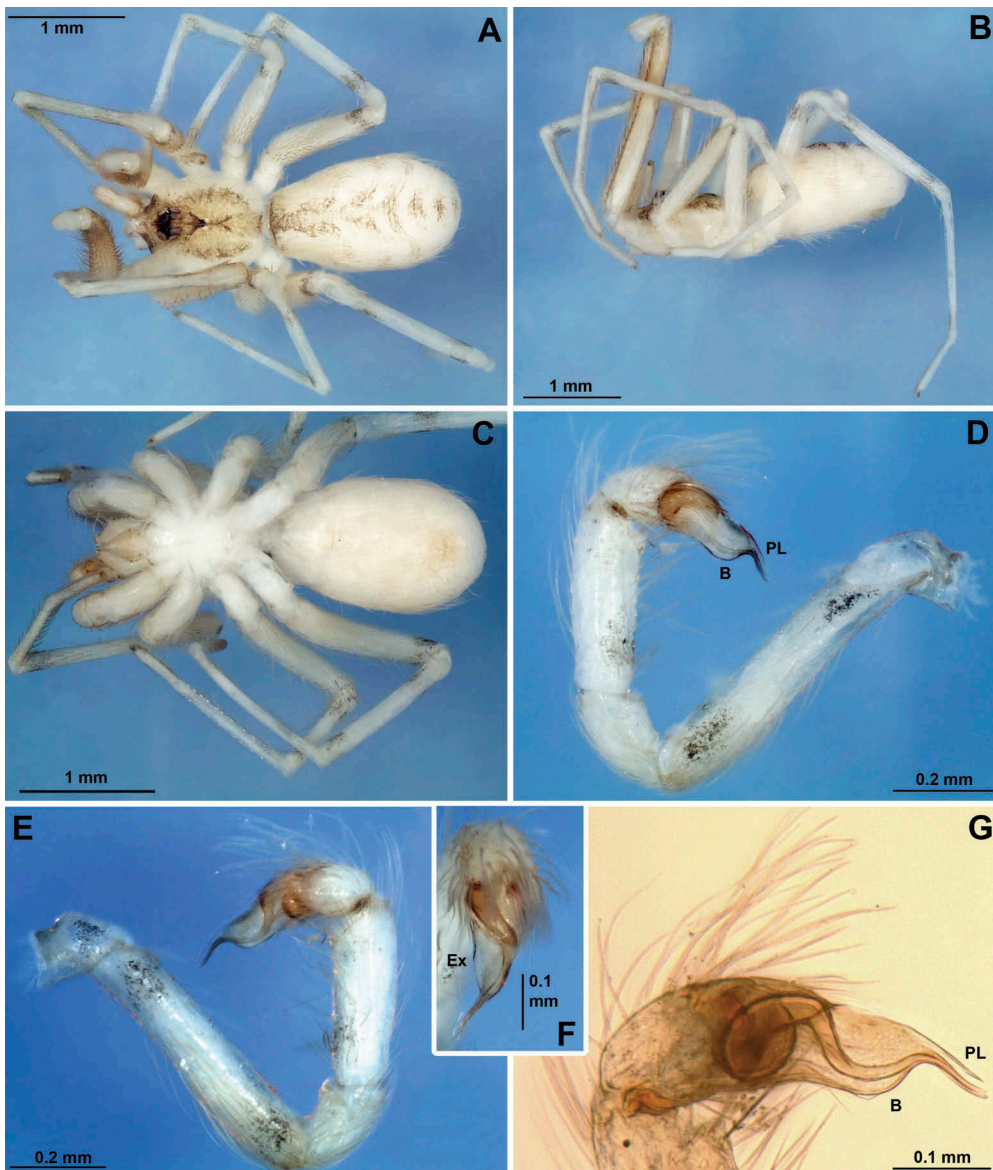


Figure 19. *Wandella infernalis* sp. nov., holotype male (WAM T132988). (A) Habitus, dorsal. (B) Habitus, lateral. (C) Habitus, ventral. (D) Left palp, prolateral. (E) Left palp, retrolateral. (F) Bulb, subdorsal. Notice deep prolateral excavation. (G) Bulb, prolateral, cleared. Abbreviations: B, bump; Ex, prolateral excavation; PL, paraembolic lamina.

1.16, width 0.90. Clypeus length 0.25. Eye diameters and interdistances: AME 0.06, PME 0.09, ALE 0.11, PLE 0.1, AME–AME 0.01, PME–PME 0.08. Palp: femur length 0.67, width 0.13, tibia length 0.36, width 0.14. Leg I: femur 2.11, patella 0.41, missing from tibia. II: fe 1.31, pa 0.37, ti 1.24. III: fe 1.18, pa 0.31, ti 1.04. IV: fe 1.56, pa 0.42, ti 1.45, mt 1.55, ta 0.69. Abdomen: length 1.65, width 1.01. Leg macrosetae: absent (leg I missing from tibia). Palp: cymbium horseshoe-shaped, prolateral excavation very large, occupying most of the prolateral face

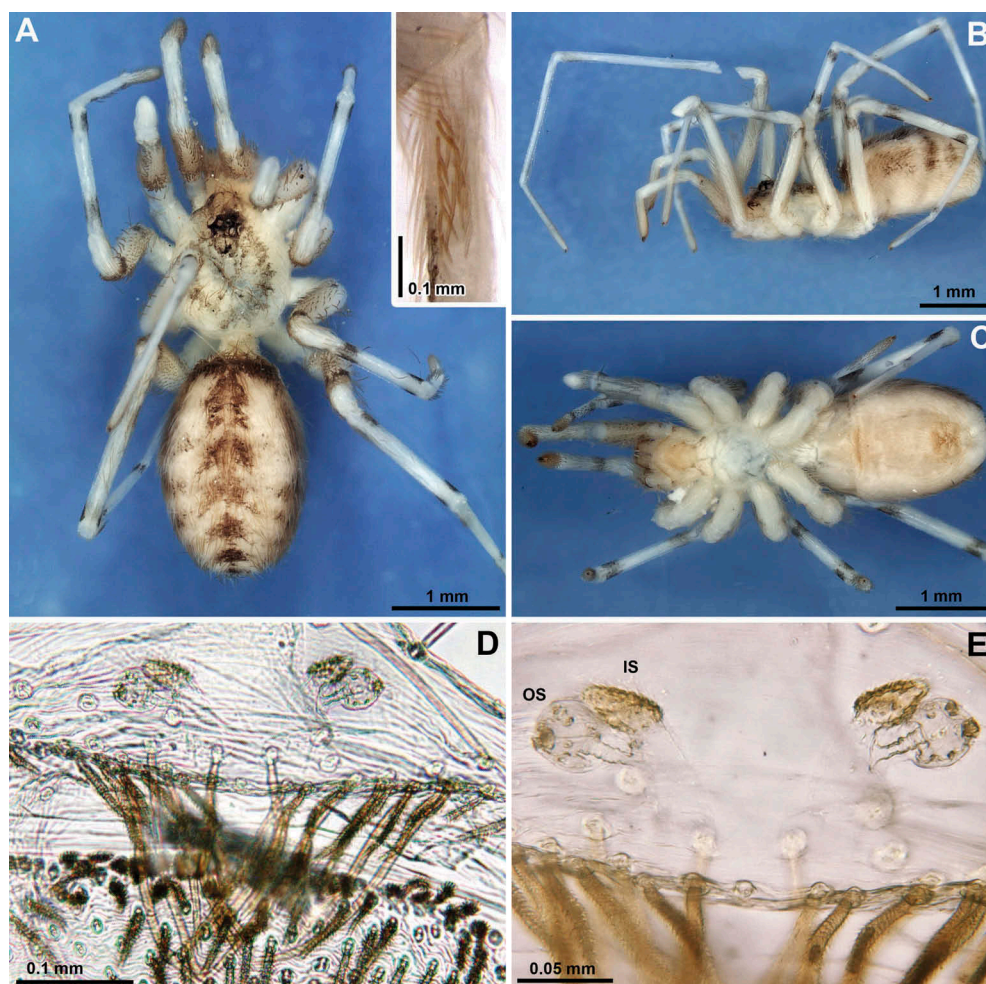


Figure 20. *Wandella infernalis* sp. nov., paratype females (WAM T132988). (A) Habitus, dorsal. Inset: right calamistrum, retrolateral. (B) Habitus, lateral. (C) Habitus, ventral. (D) Spermathecae and genital aperture, dorsal, cleared (preparation IFM-0651). (E) Spermathecae, dorsal, cleared (preparation IFM-0651). Abbreviations: IS, inner spermathecae; OS, outer spermathecae.

of the tegulum (Figure 19F, Ex), paraembolic process subtriangular, distally detached, pointy, embolus short and nearly straight.

Paratype female from Cave KG-47, Geikie Range, Western Australia, Australia (WAM T132988, preparation IFM-0824) (Figure 20A–C). Coloration as in male. Sternum as in male. Total length 3.53. Carapace length 1.37, width 1.08. Clypeus length 0.24. Eye diameters and interdistances: AME 0.07, PME 0.09, ALE 0.11, PLE 0.09, AME–AME 0.02, PME–PME 0.07. Sternum length 0.86, width 0.62. Palp: femur length 0.96, width 0.23, tibia length 0.61, width 0.18. Leg I: femur 2.05, patella 0.41, tibia 2.5, metatarsus 2.02, tarsus 1.22. II: fe 1.43, pa 0.47, ti 1.26. III: fe 1.25, pa 0.43, ti 1.10. IV: fe 1.77, pa 0.42, ti 1.52, mt 1.45, ta 0.86. Abdomen: length 2.07, width 1.39. Leg macrosetae: absent. Calamistrum with three rows with 7–4?–7 setae (inner to outer row). State of the specimen: left leg I missing from tibia, not dissected, carapace cuticle somewhat displaced beneath.

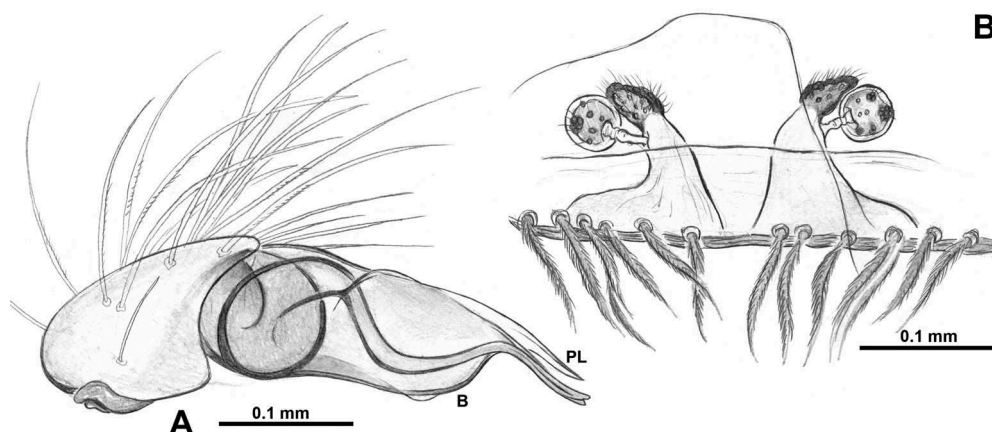


Figure 21. *Wandella infernalis* sp. nov. (A) Holotype male (WAM T132988), left bulb, prolateral, cleared. (B) Paratype female (WAM T132988), spermathecae, dorsal, cleared (preparation IFM-0651). Abbreviations: B, bump; PL, paraembolic lamina.

Paratype female from the same locality (WAM T132988, preparation IFM-0651) (Figures 20D, E, 21B). Epigastric furrow adorned with thick setae posteriorly, and a row of long setae anteriorly. Spermathecae: inner spermathecae subtriangular, more sclerotized than the laterals, pointing laterad, outer spermathecae rounded, on the top of a short annulated stalk.

Variation

Females ($n = 2$): total length 3.53–4.52 (4.03), carapace length 1.37–1.71 (1.54), femur I length 2.05–2.56 (2.31).

Note

Males and females have been matched because they have been collected in the same cave.

Distribution

Known from a single cave in Western Australia (Figure 15).

Material examined

Only the types.

Wandella waldockae Gray 1994 (Figures 15, 22–24)

Wandella waldockae

Gray 1994, p. 57, figs. 7, 92–94.

Male holotype from near Cave C118, North West Cape, WA, 22°09' S, 113°59' E, 12/IX/1989, B. Jones, W.F. Humphreys & A. Humphreys (ref.278), from surface pitfall trap near cave entrance, deposited in WAM 90/1909, not examined.

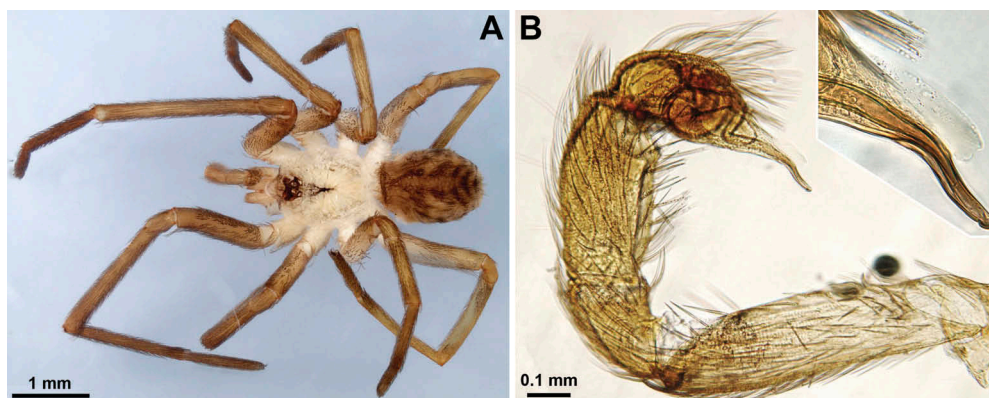


Figure 22. *Wandella waldockae* Gray 1994, male from Nanutarra-Wittenoom Rd, Western Australia (AM KS.100199). (A) Habitus, dorsal. (B) Left palp, prolateral, cleared. Inset showing detail of paraembolic lamina.

Diagnosis

Male (Figure 22) diagnosed by Gray (1994). Females can be distinguished by the combination of widened and triangular bases of the spermathecae and inner spermathecae positioned laterally (rather than anteriorly) to the outer spermathecae (Figures 23C–E, 24B, C).

Description

Male (Figure 22) described by Gray (1994).

Female from Pilbara, Western Australia, Australia (AM KS.100200) (Figures 23, 24B, C). Coloration: carapace cream, with brown median pattern and clypeal markings, and sub-marginal bands present as diffuse, light brown patches; chelicerae, labium and endites cream; sternum cream with diffuse light brown patches along the anterior border; legs cream, with incomplete light brown rings in the base and apex of the femora, tibiae and metatarsi, less well-marked in the first leg, and a prolateral light brown patch on the patellae; abdomen dorsum light brown, with dark brown transverse patches in the posterior median area and clothed with black or white setae arranged in small groups; abdomen venter cream. Sternum suboval, with a well-marked pair of posterior sigillae. Total length 3.90. Carapace length 1.42, width 1.02. Clypeus length 0.28. Eye diameters and interdistances: AME 0.07, PME 0.07, ALE 0.12, PLE 0.11, AME–AME 0.03, PME–PME 0.12. Palp: femur length 0.81, width 0.29, tibia length 0.47, width 0.27. Leg I: femur 1.45, patella 0.42, tibia 1.55, metatarsus 1.28, tarsus 0.92. II: fe 1.11, pa 0.35, ti 0.88. III: fe 1.00, pa 0.43, ti 0.73. IV: fe 1.51, pa 0.47, ti 1.28, mt 1.12, ta 0.67. Abdomen: length 2.47, width 1.64. Leg macrosetae: absent, but two strong, curved setae are present in the ventral apex of tibia I. Calamistrum with three rows with 5–4–6 setae (inner to outer row). Epigastric furrow adorned with thick setae, slightly longer towards the laterals. Spermathecae: inner spermathecae elongate, small, connected to a widened triangular base leading to the uterus externus, outer spermathecae larger than inner spermathecae, oval, on a short stalk.



Figure 23. *Wandella waldockae* Gray 1994, females. (A–E) Female from Nanutarra-Wittenoom Rd, Western Australia (AM KS.100200). (A) Habitus, dorsal. (B) Habitus, lateral. (C) Habitus, ventral. (D) Spermathecae and genital aperture, dorsal, cleared. (E) Right spermathecae, ventral, cleared. (F) Female (subadult?) from Port Hedland Salt, Western Australia (WAM T76810), spermathecae, dorsal, cleared. Abbreviations: Bs, base of the spermathecae; IS, inner spermathecae; OS, outer spermathecae.

Variation

Females ($n = 2$): total length 3.78–3.9 (3.84), carapace length 1.23–1.42 (1.33), femur I length 1.34–1.45 (1.40), tibia I length 1.21–1.55 (1.38), tibia/carapace ratio 0.98–1.09 (1.04). The female WAM T76810 is smaller and has a different genital morphology than the one collected with males (AM KS.100200); it might be not fully mature, or may represent another species.

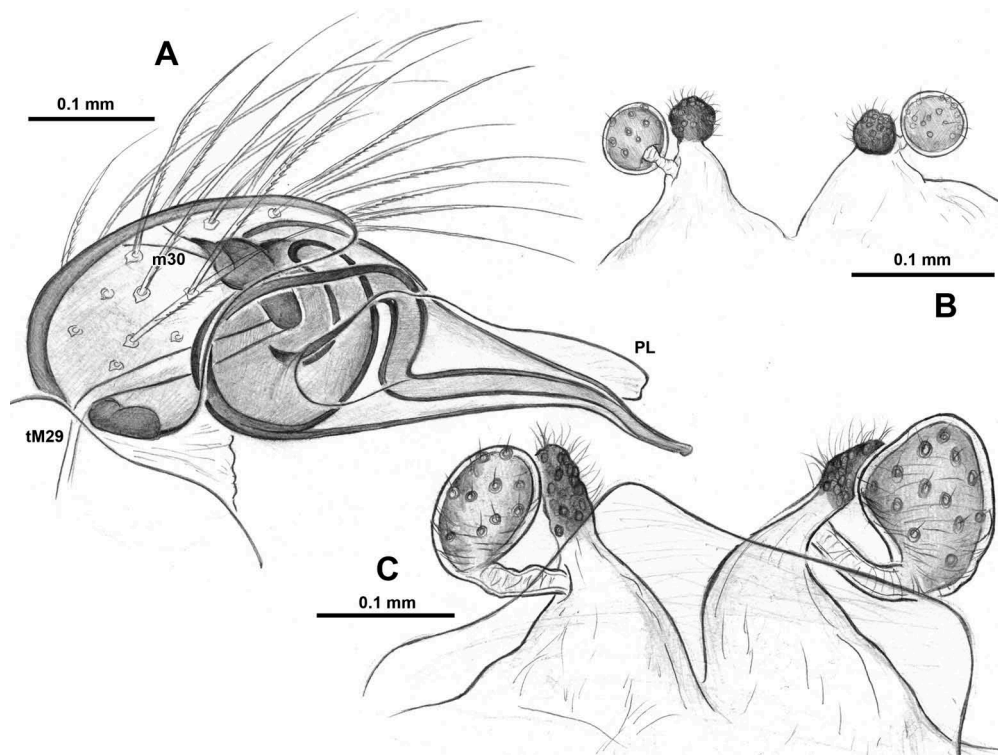


Figure 24. *Wandella waldockae* Gray 1994. (A) Male from Nanutarra-Wittenoom Rd, Western Australia (AM KS.100199), left bulb, prolateral, cleared. (B, C) Spermathecae, dorsal, cleared. (B) Female (subadult?) from Port Hedland Salt, Western Australia (WAM T76810). (C) Female from Nanutarra-Wittenoom Rd, Western Australia (AM KS.100200). Abbreviations: M30, claw extensor muscle; PL, paraembolic lamina; tM29, tendon of the claw flexor muscle.

Note

Males and females have been matched because three males and two females have been collected from the same locality.

Distribution

Restricted to northwestern Western Australia (Figure 15).

Material examined

Australia. Western Australia: Barrow Island, Gorgon Project footprint plot GP7, limestone ridge to drainage line, pitfall trap (115.44083°, -20.7975°), S. Callan & R. Graham, 20–25/IX/2006, 1 ♂ (WAM T88836); Gorgon Project footprint plot GP8, valley flats (115.44028°, -20.79972°), 1 ♂ (WAM T88792); c. 60 km northwest of Newman (119.2372°, -23.0133°), J. Gollan, N. Sullivan, M. Beatson, S. Luccitti, 24/VIII/2008, 1 ♂ (AM KS.105479); (119.2361°, -23.0106°), 25/VIII/2008, 1 ♂ (AM KS.105475); (119.2672°, -22.9844°), 1 ♂ (AM KS.105467); (119.2356°, -23.0111°), 1 ♂ (AM KS.105474); 10.9 km southwest of Pannawonica, Mesa A, site MAT01 (116.24806°, -21.7075°), R. Teale, 6–12/VIII/2005, 1 ♂ (WAM T77173); 14.4 km southwest of Pannawonica, Mesa A, site

MAT05, pitfall trap (116.21472°, -21.72°), 1 ♂ (WAM T77172); 1 ♂ (WAM T77516); Nanutarra-Wittenoom Rd, 119.6 km west of Paraburdoo-Tom Price Rd junction, pitfall trap (116.3136°, -22.6914°), M. Bulbert, J. Gollan, S.G. Ginn, G. Brown, 22/V-1/VI/2006, 1 ♂ (AM KS.100198); 22/V-1/VI/2007, 2 ♂ (AM KS.100199); 22/V-1/VI/2008, 2 ♂ (AM KS.100200); Port Hedland Salt, 9.6 km southeast of Port Hedland, site PHS02 (118.67389°, -20.37056°), R. Teale, 19-25/IX/2005, 1 ♂ (WAM T76810).

Wandella stuartensis Gray 1994
(Figures 3–8, 12, 13F–H, 15, 25–27)

Wandella stuartensis

Gray 1994, p. 54, figs 8, 65–70, 80.

Male holotype from Lagoon Waterhole, Mabel Creek Station, SA, 28°56' S, 134°19' E, 26/X/1984, P. Greenslade, in pitfall trap, deposited in SAM ARA5311(2), not examined.

Diagnosis

Male (Figure 25) diagnosed by Gray (1994). Females can be distinguished by the combination of the following: the enlarged, usually longer than wide, bases of the spermathecae; the lack of a clear distinction between the base and the inner spermathecae; and the rounded outer spermathecae, on the top of a short, laterally directed stalk (Figure 26E–H).

Description

Male (Figure 25) described by Gray (1994).

Female from Paroo-Darling National Park, New South Wales, Australia (AM KS.114345) (Figure 26A–E). Coloration: carapace cream, with dark brown median pattern and clypeal markings, and light brown median area, with slightly dark submarginal bands; chelicerae cream with an anterior brown patch; labium and endites light yellow; sternum cream with diffuse light brown patches along the anterior border; legs light yellow, with incomplete light brown rings in the base and apex of the femora, tibiae and metatarsi and a prolateral light brown patch on the patellae; abdomen dorsum light brown, clothed with whitish setae, with dark brown chevron with five markings posteriorly; abdomen venter cream, darker posteriorly. Sternum subrounded, with a well-marked pair of posterior sigillae. Total length 3.65. Carapace length 1.47, width 1.16. Clypeus length 0.27. Eye diameters and interdistances: AME 0.08, PME 0.07, ALE 0.11, PLE 0.78, AME–AME 0.03, PME–PME 0.14. Palp: femur length 0.8, width 0.26, tibia length 0.54, width 0.26. Right leg I: femur 1.68, patella 0.39, tibia 1.83, metatarsus 1.49, tarsus 1.06. II: fe 1.16, pa 0.39, ti 1.01. III: fe 1.05, pa 0.38, ti 0.85. IV: fe 1.45, pa 0.39, ti 1.36, mt 1.19, ta 0.75. Abdomen: length 2.04, width 1.24. Leg macrosetae: absent. Calamistrum with three rows, the middle one slightly reduced (~ 5 setae, others ~ 6–7). Epigastric furrow adorned with thick setae, slightly longer towards the laterals. Spermathecae: inner spermathecae rounded, somewhat sclerotized, outer spermathecae about the same size as inner, not so sclerotized, on a short stalk. State of the specimen: missing left leg I from the tibia.

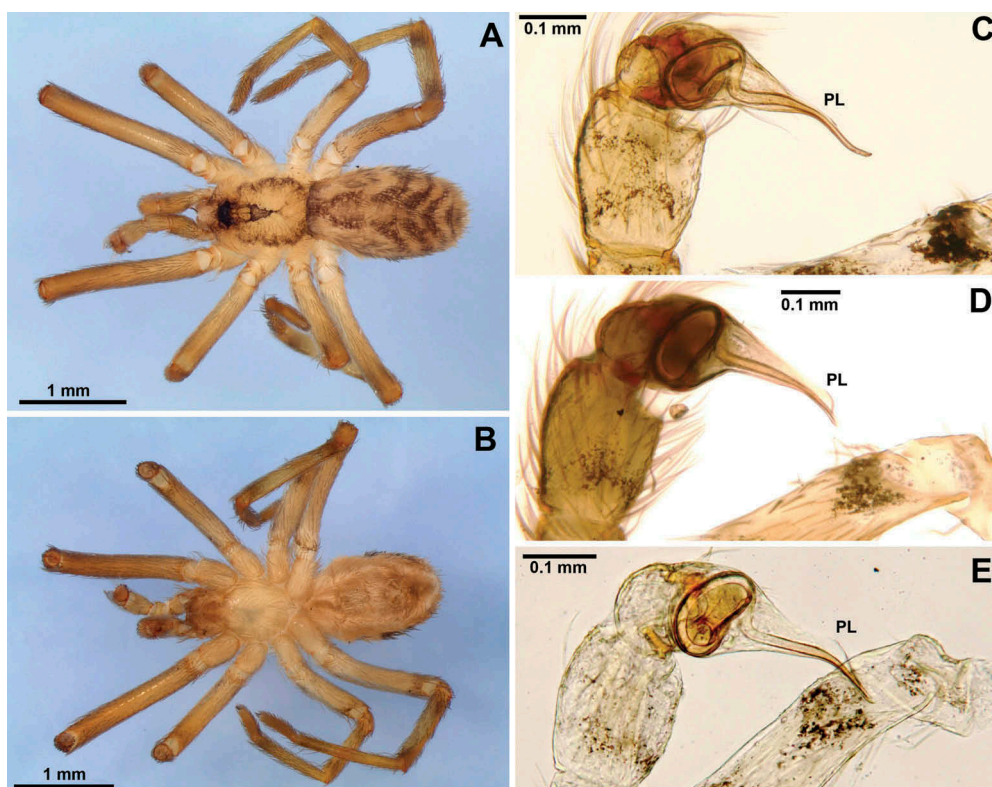


Figure 25. *Wandella stuartensis* Gray 1994, males. (A, B) Habitus, male from Paroo-Darling National Park, New South Wales (AM KS.114191). (A) Dorsal. (B) Ventral. (C–E) Left palps, prolateral, cleared. (C) Beda Hill, South Australia (SAM NN28352). (D) Kolay Hut, South Australia (SAM NN28362). (E) Taroom district, Queensland (QM S36634). Abbreviation: PL, paraembolic lamina.

Variation

Females ($n = 4$): total length 2.75–3.65 (3.31), carapace length 1.03–1.47 (1.21), femur I length 1.21–1.68 (1.39), tibia I length 1.23–1.83 (1.46), tibia/carapace ratio 1.13–1.24 (1.19). The morphology of the spermathecae is variable, especially in the base: some specimens have it short and wider, while others have it longer and narrower (Figures 26, 27). The morphology of the male palp is variable as well (Figure 25), although all specimens fit to Gray's (1994) original diagnosis. This is a small, widely distributed species that might have to be split after a more careful revision.

Note

Males and females have been matched because they have been collected several times from the same localities.

Distribution

Arid regions of Western Australia, South Australia, New South Wales and southwestern Queensland (Figure 15).

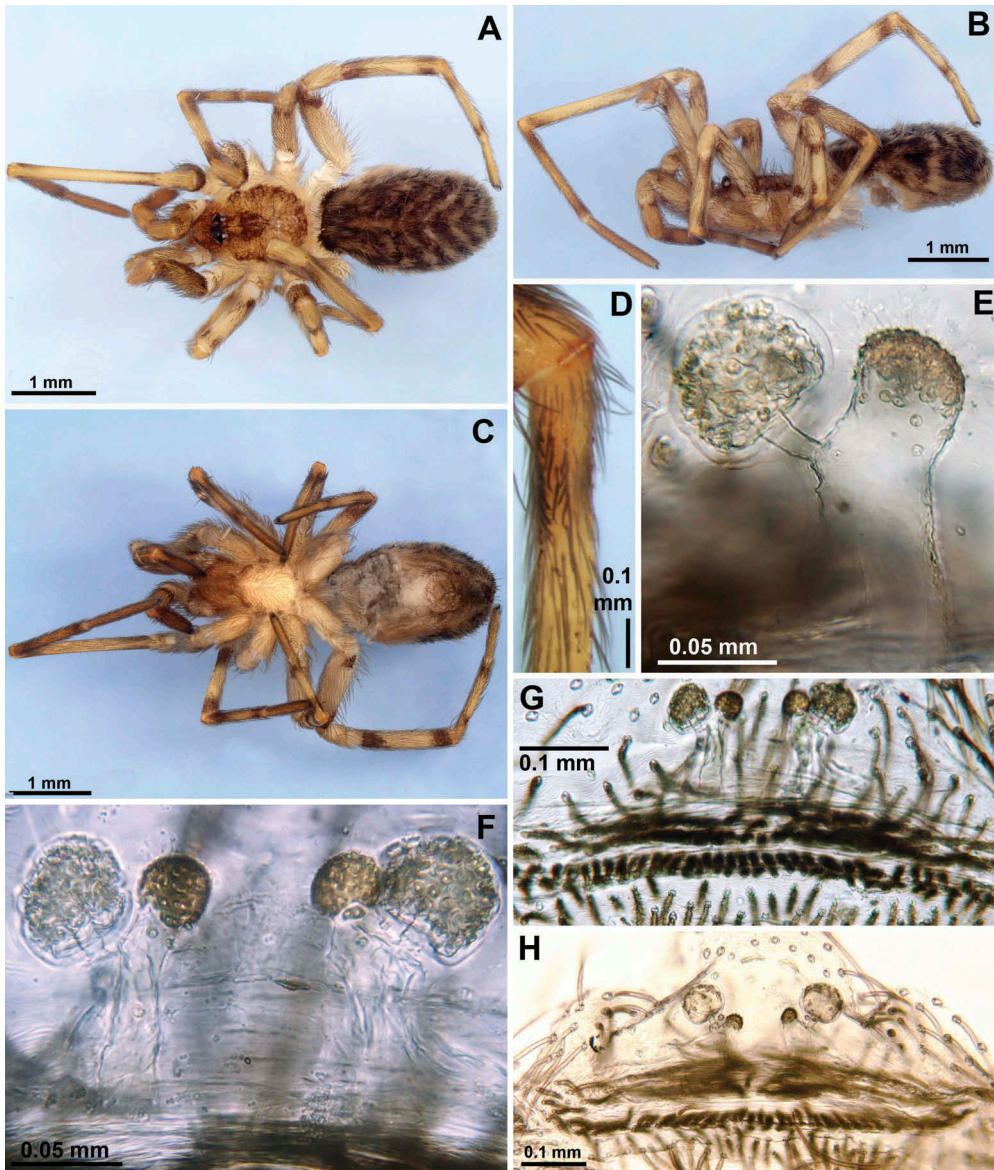


Figure 26. *Wandella stuartensis* Gray 1994, females. (A, B) Habitus and calamistrum, female from Paroo-Darling National Park, New South Wales (AM KS. 114345). (A) Dorsal. (B) Lateral. (C) Ventral. (D) Right calamistrum, retrolateral. (E–H) Spermathecae, dorsal, cleared. (E) Paroo-Darling National Park, New South Wales (AM KS. 114345). (F, G) Chillunie Well, South Australia (SAM NN28366). (h) Beda Hill, South Australia (SAM NN28351).

Material examined

Australia. New South Wales: 'Eumenbah' Station, 500 m east of Castlereagh Highway, 12 km north of junction with Gwydir Highway, *C. cristata* patch (as shown in label), pitfall trap (148.13208°, –29.81491°), F. Christie, P. Flemons & M. Elliott, 13/XII/1999, 1 ♂ (AM

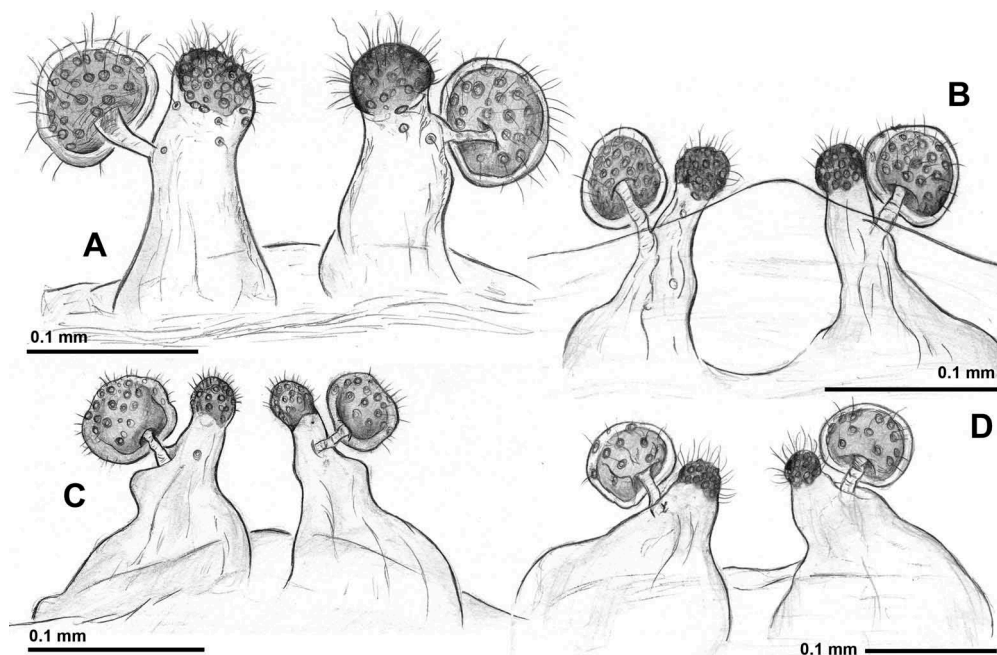


Figure 27. *Wandella stuartensis* Gray 1994, female spermathecae, dorsal, cleared. (A) Paroo-Darling National Park, New South Wales (AM KS. 114345). (B) Chillunie Well, South Australia (SAM NN28366). (C) Kolay Hut, South Australia (SAM NN28373). (D) Beda Hill, South Australia (SAM NN28351).

KS.77066); Lower Murray-Darling Region, Coombah Station, mallee/spiniflex shrubland (141.57444°, -33.05194°), M. Le Breton, 11-15/XII/1999, 1 ♂ (AM KS.91536); Mallara Station (142.51667°, -33.3825°), 13-17/XII/1999, 5 ♂ (AM KS.91534); Popitah Station, black box woodland (141.69556°, -33.15444°), 11-15/XII/1999, 1 ♂ (AM KS.91514); Tapio Station (142.06861°, -34.04306°), 20-24/III/2000, 1 ♂ 1 ♀ (AM KS.91535); Warrakoo Station, mallee/spiniflex shrubland (141.285°, -33.8544°), 16/X/1998, 1 ♂ (AM KS.71400); Paroo-Darling National Park, Peery section, Arrow Bar addition, 2.3 km south of junction with White Cliffs Rd (143.4256°, -30.8431°), G.A. Milledge & H.M. Smith, 28/X-25/XI/2010, 1 ♂ (AM KS.114191); Track to east of Wilga HS, beat/sweep & hand collecting (143.9492°, -31.4594°), 25/X/2010, 1 ♀ (AM KS.114345); Sturt National Park, site 19-1, SNPORD10331, pitfall trap (141.8675°, -29.0936°), M. Dangerfield, 26/IX/1997, 1 ♂ (AM KS.78571); site 19-1, SNPORD10549, M. Gillings, 26/IX/1997, 1 ♂ (AM KS.78574); site 19-1, SNPORD12446, A. Holmes, 26/IX/1997, 1 ♂ (AM KS.78543); site 19-1, SNPORD17767, M. Dangerfield, 26/IX/1997, 1 ♂ (AM KS.78513); site 19-1, SNPORD17841, M. Gillings, 26/IX/1997, 1 ♂ (AM KS.78562); site 33-1, SNPORD02760 (141.9667°, -29.1119°), M. Dangerfield, 22/IX/1997, 1 imm. (AM KS.78804); site 35-1, SNPORD02121 (141.9564°, -29.1889°), A. Holmes, 25/IX/1997, 1 ♂ (AM KS.78907); site 35-1, SNPORD02420, 1 ♀ (AM KS.78898); site 35-1, SNPORD03644, R. Harris, 25/IX/1997, 1 ♂ (AM KS.78865); site 35-1, SNPORD03789, 1 ♀ (AM KS.78864); site 35-1, SNPORD03994, 1 ♂ (AM KS.78846); site 77-1, SNPORD04169 (142.1553°, -29.2822°), M. Streulens, 25/IX/1997, 4 ♂ 1 ♀ (AM KS.79388); site 80-1, SNPORD03940, A. Holmes, 25/IX/1997, 1 ♂ (AM KS.79451); site 80-1, SNPORD13616, R. Harris, 25/IX/1997, 1 ♂ (AM

KS.79439); site 90–3, SNPORD01693 (142.155°, –29.2822°), M. Henery, 25/IX/1997, 1 ♀ 1 imm. (AM KS.79477); site 90–3, SNPORD01715, 1 ♂ (AM KS.79481); site 90–3, SNPORD01774, 1 ♂ (AM KS.79545); site 90–3, SNPORD03163, 1 ♂ (AM KS.79482); site 90–3, SNPORD03188, M. Streulens, 25/IX/1997, 1 ♂ (AM KS.79486); 1 ♂ (AM KS.79492); site 90–3, SNPORD04346, M. Henery, 25/IX/1997, 2 ♂ (AM KS.79541); Site 90–3, SNPORD03220, 1 ♂ (AM KS.79520); 24.7 km on road to Cawwell Stn from jcnctn with Jobs Gate Rd (146.9986°, –29.1142°), F. Christie, P. Flemons, M. Elliot, 16/XII/1999, 1 ♂ (AM KS.71143); about 1 km along access road to Cawwell Station (147.0674°, –29.0642°), F. Christie, P. Flemons & M. Elliott, 16/XII/1999, 1 ♂ (AM KS.77068); Darling River, 'Kalyanka' approx 11 km east of Wilcannia, *Eucalyptus camaldulensis* patch (143.4869°, –31.5619°), F. Christie, P. Flemons, M. Elliot, 22/XII/1999, 4 ♂ (AM KS.71144); Little Weir 19.5 km west-southwest of Mungindi on road to Collarenebri, Eucalypts beside dry creek bed (149.15795°, –29.04895°), M. Moulds & J. Thompson, 26/IV/1994, 1 ♂ (AM KS.42442); 'Wyninebah' Stn, 0.3 km past stockyards, 300 m east of road, *Acacia pendula* patch, pitfall trap (147.4903°, –30.3639°), L. Wilkie, R. Harris & T. Moulds., 15/XII/1999, 1 ♂ (AM KS.77065). Queensland: Ethabukka, Simpson desert [139.2627°, –25.20494°], R. Raven & B. Baehr, 4–6/III/1999, 1 ♂ (QM S68882); 1 ♂ (QM S52363); Taroom district, Boggomoss, pitfall trap (150.01667°, –25.43333°), P. Lawless, 11/XI/1996–I/1997, 1 ♂ (QM S36634). South Australia: Beda Hill, South Gap Station, Gairdner/Torrens basin (137.61667°, –31.85°), D. Hirst, 4/XII/1989, 1 ♂ (SAM NN28352); 5/XII/1989, 2 ♀ (SAM NN28350); pitfall trap, 4/XII/1989, 1 ♀ (SAM NN28351); Hiltaba Stn, BushBlitz 4, 151 m, Chenopod scrubland (135.1°, –32.18333°), B. Baehr, 12–21/XI/2012, 1 ♂ (SAM NN28239); BushBlitz 7, 233 m (135.18333°, –32.13333°), 12–22/XI/2012, 1 ♂ (SAM NN28240); Chillunie Well, Gawler Ra. (135.61667°, –32.61667°), D. Hirst, 9/XII/1989, 1 ♀ (SAM NN28366); Kolay Hut, Paney Stn. Gawler Ra., pitfall trap (135.38333°, –32.58333°), 8–11/XII/1989, 3 ♂ (SAM NN28362); in leaf litter, 1 ♀ (SAM NN28373); Olympic Dam [136.88775°, –30.47588°], E.G. Watts, 2–5/XI/1987, 1 ♂ 1 ♀ (SAM NN28364).

Wandella australiensis (Koch 1873)
(Figures 2, 9–10, 14A, 15, 28, 29)

Filistata australiensis

L Koch 1873, p. 451, pl. 35, fig. 4. Four syntype females from Rockhampton, Queensland, 23°22' S, 150°32' E, in ZMH Museum Godeffroyi 8098, not examined.

Pritha australiensis

Lehtinen 1967, p. 260.

Wandella australiensis

Gray 1994, p. 50, figs. 8, 52–56.

Diagnosis

Males are similar to those of *W. murrayensis* Gray in having a short, sinuous bulb and a curved, prolaterally directed paraembolic lamina (Figures 10, 28, 29). They differ by the

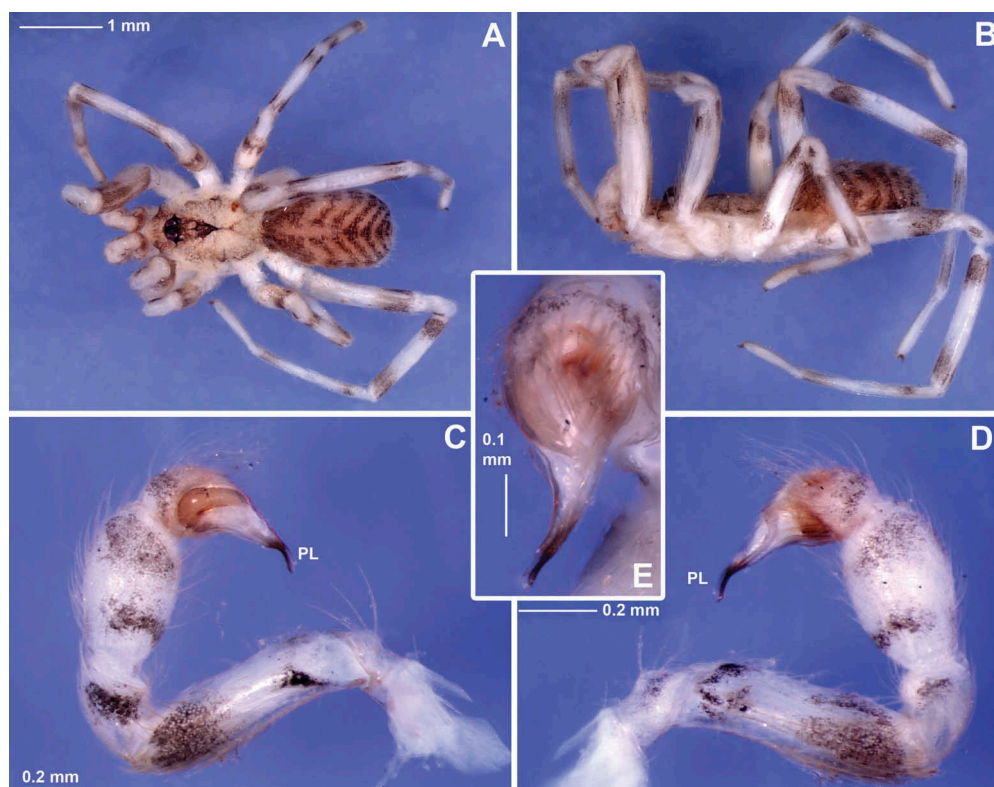


Figure 28. *Wandella australiensis* (L. Koch 1873), male from Meta Park, Queensland (QM 578597). (A) Habitus, dorsal. (B) Habitus, lateral. (C) Left palp, prolateral. (D) Same, retrolateral. (E) Left bulb, dorsal.

shorter, not so incrassated palpal tibia, and by the paraembolic lamina ending closer to the apex of the embolus. Female diagnosed by Gray (1994).

Description

Male from Meta Park, Queensland, Australia (QM 578597) (Figure 28). Coloration: carapace cream, with dark brown median pattern and clypeal markings, and sub-marginal bands present as diffuse, light brown patches; chelicerae cream with a distal dark brown patch; labium and endites cream; sternum cream with anterior border dark brown; legs cream, with incomplete light brown rings in the base and apex of the femora, tibiae and metatarsi and a prolateral light brown patch on the patellae; abdomen dorsum light brown, clothed with whitish setae, with dark brown chevron with six markings posteriorly. Anterior margin of the carapace nearly straight. Sternum suboval, sigillae not visible. Total length 2.98. Carapace length 1.47, width 1.10. Clypeus length 0.29. Eye diameters and interdistances: AME 0.12, PME 0.07, ALE 0.11, PLE 0.08, AME–AME 0.04, PME–PME 0.15. Palp: femur length 0.65, width 0.20, tibia length 0.40, width 0.26. Leg I: femur 1.90, patella 0.47, tibia 2.3, metatarsus 1.96, tarsus 1.02. Right II: fe 1.4, pa 0.46, ti 1.3. III: fe 1.12, pa 0.46, ti 1.06. IV: fe 1.54, pa 0.48, ti 1.66, mt 1.53, ta 0.75. Abdomen: length 1.62, width 0.94. Leg

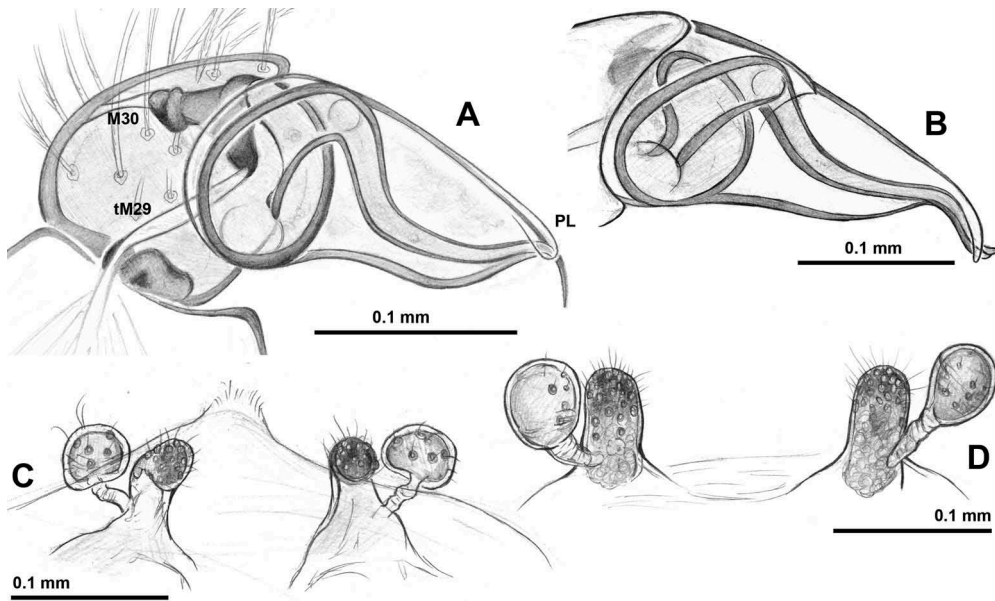


Figure 29. *Wandella australiensis* (L. Koch 1873). (A) Male from Undara National Park, Queensland (QM S98401), left bulb, prolateral, cleared. (B) Male from Gregory Dev. Rd. Queensland (QM S79117), left bulb, prolateral, cleared. (C) Female from Dotswood, Queensland, (QM S78595), spermathecae, dorsal, cleared. (D) Female from Gregory Dev. Rd Queensland (QM S79117), spermathecae, dorsal, cleared. Abbreviations: M30, claw extensor muscle; PL, paraembolic lamina; tM29, tendon of the claw flexor muscle.

macrosetae: absent. Palp: cymbium horseshoe-shaped, prolateral excavation small, near the base of the paraembolic process (see Figure 10B, Ex), paraembolic process free, prolaterally curved, ending close to embolus apex, embolus short, prolaterally bent.

Female (Figure 29C, D) described by Gray (1994).

Variation

Males ($n = 5$): total length 2.40–3.59 (3.05), carapace length 1.10–1.54 (1.37), femur I length 1.37–1.93 (1.70), tibia I length 1.60–2.30 (1.97), tibia/carapace ratio 1.30–1.56 (1.43). Palpal morphology is variable, especially the curvature of the embolus and the shape of the paraembolic lamina (Figures 10, 28C, 29A, B). It might be that *W. australiensis* is not a single species, as already suggested by Gray (1994).

Note

Males and females have been matched because they have been collected several times from the same localities.

Distribution

Northeastern Queensland, Australia (Figure 15).

Material examined

Australia. Queensland: 39km north of Charters Towers, nr. Dalrymple NP, Gregory Developmental Rd (146.0633°, -19.8247°), G. Milledge & H. Smith, 12/V/2000, 1 ♂ (AM KS.67167); Bang Bang jumpup, rocky hillside (140.66331°, -18.52356°, 38 m), R. Raven, B. Baehr & A. Amey, 10/VII-23/IX/2006, 1 ♂ (QM S77168); Broken River, Storm Dam [148.51247°, -21.16293°], P. Lawless, 19/VII/1995, 2 ♂ (QM S78948); Dotswood, Harvey's Range, vertebrate pitfall trap [146.44375°, -19.99839°], T. Churchill, II/1999, 1 ♂ (QM S78593); 1 ♂ (QM S78594); pitfall trap, T. Churchill & Woinarski, II/1999, 1 ♀ (QM S78595); 10 ♂ (QM S78596); Gregory Dev. Rd, 5.5 km southeast Clarke river, open forest (145.47333°, -19.24167°, 420 m), QM Party, 29/IX-17/XII/2006, 4 ♂ (QM S79089); south of Gray Ck. (145.04667°, -19.025°, 440 m), 6 ♂ 2 ♀ 1 imm. (QM S79117); Lolworth National Park, site 2, dry vine scrub (146.09°, -19.82833°, 270 m), 28/XI-12/XII/2006, 1 ♂ (QM S79012); Longreach, 24 km northwest by road (144.11531°, -23.26881°, 231 m), R. Raven, B. Baehr & A. Amey, 28/VI-7/IX/2006, 1 ♂ (QM S77112); Meta Park, tree clearing, collector unknown, 20/X/1998, CSIRO Darwin A2780, 1 ♂ (QM S78597); Mount Stuart, site 10.2b [146.73942°, -19.37172°], D. Hannah, 12/XII/1999, 1 ♂ (QM S78598); Myola, site 1, paddock, pitfall trap (145.50333°, -20.05°, 420 m), QM Party, 29/IX-17/XII/2006, 1 ♂ (QM S79108); site 2, open forest/lancewood (145.46667°, -20.07167°), 1 ♂ (QM S79048); Newcastle Ra, east Georgetown [143.8533°, -18.51049°], J. Hasenpusch, 20/II-29/VI/2002, 4 ♂ (QM S80437); Peak Range NP, between Eastern Peak and Browns Peak, web in bark (148.1342°, -22.7572°), G. Milledge & H. Smith, 11/V/2000, 1 ♀ (AM KS.67165); Red Falls, vine scrub in basalt, pitfall trap (145.73333°, -19.92667°), G.B. Monteith & Cook, 16/XII/2006-15/II/2007, 1 ♂ (QM S76696); Riversleigh, just east of t'off (138.52075°, -18.75981°, 145 m), R. Raven, B. Baehr & A. Amey, 2/VII-11/IX/2006, 4 ♂ (QM S77250); t'off on Gregory Downs-Camooweal Rd, 5 km W (138.95294°, -19.12386°, 182 m), 1/VII-10/IX/2006, 2 ♂ (QM S75463); Taroom district, Boggomoss, pitfall trap (150.01667°, -25.43333°), P. Lawless, 11/XI/2006-I/1997, 1 ♂ (QM S36719); Toomba, site 1, open forest (145.56667°, -19.96667°, 1390 m), QM Party, 29/IX-17/XII/2006, 1 ♂ 1 ♀ (QM S79031); Undara National Park, 12 mile Swamp, *Melaleuca* swamp (144.86667°, -18.26667°), G.B. Monteith, 8/XII/2002-08/II/2003, 1 ♂ (QM S69756); The Arch, vine scrub (144.58333°, -18.21667°), 1 ♂ (QM S98401); Undilla, 4 km northeast on Gregory Downs-Carnooweal Rd (138.74708°, -19.60283°, 255 m), R. Raven, B. Baehr & A. Amey, 30/VI-23/IX/2006, 3 ♂ (QM S77210); Wills Rd, Gregory River gate t'off, 1 km south (138.59342°, -18.60081°, 126 m), 2/VII-11/IX/2006, female not dissected, 6 ♂ 1 ♀ 1 imm. (QM S77237); Forty Mile Scrub National Park, pitfall trap (144.84833°, -18.095°), M. Moulds & J. Thompson, 13-23/IV/1994, 1 ♀ (AM KS.42614); Mazeppa NP, southwest corner nr road (147.2644°, -22.2728°), G. Milledge & H. Smith, 11/V/2000, 1 ♀ (AM KS.67166).

New records

Wandella diamentina Gray 1994
(Figures 15, 30, 31)

Wandella diamentina

Gray 1994, p. 56, figs 7, 87-91, 105, 106. Holotype female from Wyrallah Station, southwest of Winton, Queensland, 22°46' S, 142°22' E, 15/VII/1981, A. Rozefelds, under rock, deposited in QM S6751, not examined.

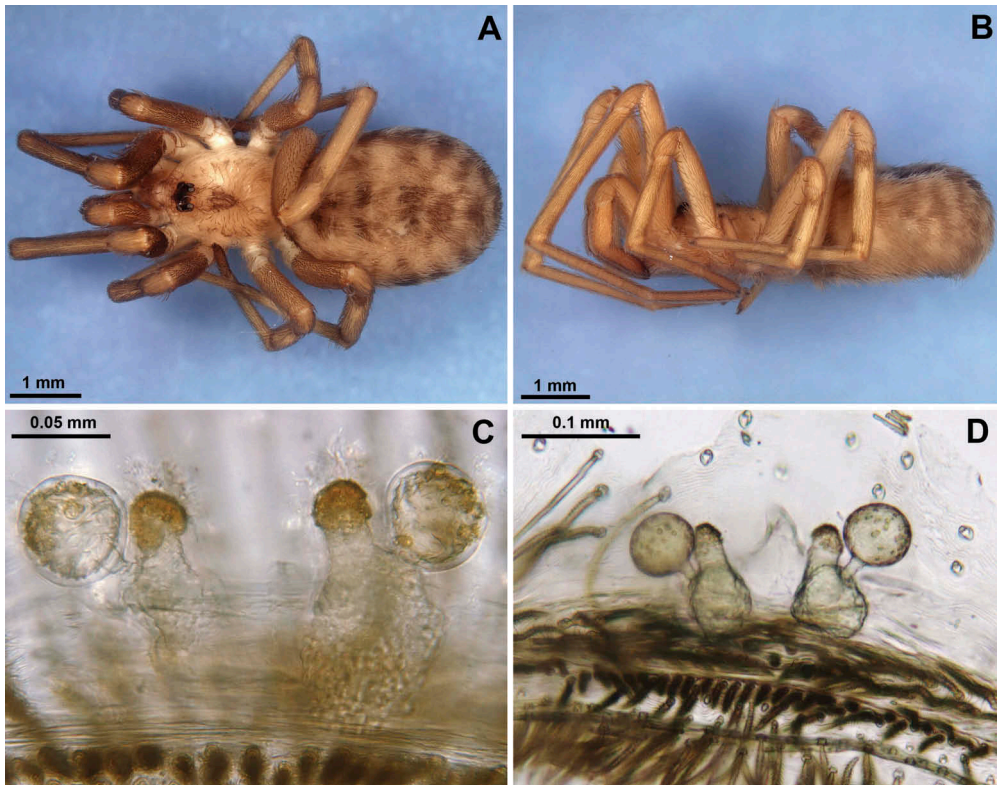


Figure 30. *Wandella diamentina* Gray 1994, females. (a–c) 65 km northwest of Winton, Queensland (AM KS.44204). (A) Habitus, dorsal. (B) Habitus, lateral. (C) Spermathecae, dorsal, cleared. (D) Clifton Hills, South Australia (SAM NN28348).

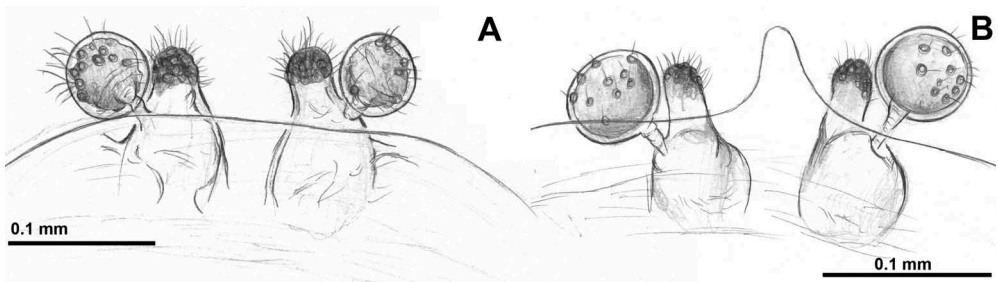


Figure 31. *Wandella diamentina* Gray 1994, females, spermathecae, dorsal, cleared. (A) 65 km northwest of Winton, Queensland (AM KS.44204). (B) Clifton Hills, South Australia (SAM NN28348).

Note

I have examined females from near the type locality with a similar somatic and genital morphology to the holotype, but bearing pores in the outer spermathecae. Judging by Gray's illustrations (1994, figs. 105, 106) and his statement about the lack of glands in the outer spermathecae, it might be that the holotype is a not yet fully adult female. I here illustrate one of these females from near the type locality (Figures 30C, 31A) in the hope

that it might assist in recognizing the species, as it is hitherto known from a single female and two immatures.

Distribution

Southwestern Queensland (Figure 15); newly recorded from northeastern South Australia.

Material examined

Australia. Queensland: 65 km northwest of Winton, sandstone outcrop, in moist lightly sheltered area on top of outcrop, under log and rocks (142.64005°, -21.95847°), J. Thompson, S. Cowan & M. Tio, 10/VII/1995, 2 ♀ 2 imm. (AM KS.44204). South Australia: Clifton Hills, O.S.E. Lake Eyre Basin, dunes under cowpats (139.48333°, -26.5°), D. Hirst, 18-20/XI/1993, 1 ♀ (SAM NN28348).

Wandella barbarella Gray 1994 (Figures 14B, 15)

Wandella barbarella Gray 1994, p. 43, figs. 1, 2, 7, 11, 15, 17-19, 22, 23, 30-37, 57-60, 81, 95. Male holotype from Waylunga National Park, 31°46' S, 116°01' E, Upper Swan, WA, 27/II/1979, M. Gray, small sheet web under bark of *Eucalyptus wandoo* on banks of Swan River, WA, deposited in WAM, not examined. Paratype males and females from the same locality (AM KS.3977), examined.

Distribution

Western Australia (Figure 15); the new records extend the distribution of the species significantly both to the north and to the east.

Material examined

Australia. Western Australia: 46 km east of Leonora, site 2b (121.79581°, -28.86225°), M. Peterson & K. George, 8-16/X/2007, 1 ♂ (WAM T89448); c. 40 km southwest of Ajana, Ogilvie Road, west, site NO11 (114.19444°, -27.99139°), P. Van Heurck et al., IX/15/IX/1998-30/III/1999, 2 ♂ 2 ♀ 1 imm. (WAM T133082); Cape Range, cave C-15 (113.97556°, -22.21278°, m), W.F. Humphreys, R.D. Brooks & R. L'Heureux, 13/VIII/1992, 1 ♀ (WAM T132987); Jack Hills area, Mathew Ridge (117.01072°, -26.16388°), E.S. Volschenk, N. Dight & J. Nolthenous, 28/VII-28/VIII/2008, 1 ♂ (WAM T108314); Mount Keith mine, 39.1 km south-southeast of Lake Way homestead, site M km 01A, pitfall trap (120.57972°, -27.28139°), R. Teale, 15-23/III/2006, 3 ♂ (WAM T75600); Munro's property (MU), c. 12 km east of Carnarvon in River Reserve (113.74889°, -24.84472°), I. Stemp, 23-30/IX/2002, 1 ♂ (WAM T55963); northeast of Quairading, Gardner Reserve Road, north, site QU3, pitfall trap (117.47278°, -31.77917°), E. Ladhams, X/30/X/1997-27/V/1998, 2 ♂ (WAM T133473); West Perenjori Nature Reserve, south, site MO2 (116.21°, -29.47861°), B. Durrant, 15/IX/1998-18/X/1999, 1 ♂ 1 ♀ (WAM T133079); Waylunga National Park, under bark (116.02°, -31.77°), M.R. Gray, 27/II/1979, 1 ♀ (AM KS.14963*); 2 ♂ 9 ♀ (AM KS.3977*).

Wandella centralis Gray 1994

Wandella centralis Gray 1994: Male holotype from Alice Springs, NT, 23°42' S, 133°52' E, 29/X/1962, E.S. Ross & D. Cavagnaro, deposited in CAS, not examined. Paratype females from the same locality, examined.

Distribution

Deserts of central Australia (Figure 15); newly recorded from South Australia.

Material examined

Australia. Northern Territory Alice Springs [133.86667°, -23.7°], E.S. Ross & D. Gavagnaro, 29/X/1962, not dissected, 3 ♀ (CAS 9057619*); not dissected, 1 ♀ (CAS 16852*). South Australia: 1 km northwest Emu, in Myal log on ground (132.1°, -28.38333°), D.C. Lee, 7/X/1976, 1 ♀ (SAM NN28376); Serpentine Lakes, East side, under bark (129.03333°, -28.5°), P. Hudson, 8/IV/1994, 2 ♀ (SAM NN28375).

Wandella murrayensis Gray 1994
(Figures 1C–E, 11A–E, 13A–E, 15)

Wandella murrayensis Gray 1994, p. 52, figs. 7, 9, 21, 27–29, 61–63, 82–86, 96–97. Holotype male from Felixstowe, Adelaide, SA, on bank of Torrens River at junction with Forth Creek, 35°46' S, 138°36' E, 7/IX/1985, D. Hirst, under Eucalyptus bark, deposited in SAM ARA5311(I1), not examined. Male and female paratypes from Parra Wirra NP, Sth Parra River (AM KS.35718*), examined.

Distribution

Southeastern South Australia, southwestern New South Wales and Victoria (Figure 15). Additionally, I have examined a single female from Western Australia (Figure 13A); finding males would be desirable to confirm this record, which might represent an introduced population.

Material examined

Australia. New South Wales: Coleambally, in house, hand collecting (145.88°, -34.8°), H. M. Smith, 10–12/XII/2004, 1 ♀ 1 imm. (AM KS.91124); Lower Murray Darling region, Kulkurna Station, Black Box woodland, pitfall trap (141.0111°, -33.9689°), M. Le Breton, 16/X/1998, 1 ♂ (AM KS.71427). South Australia: Adelaide, River Torrens, under bark of red gum on river bank (138.6°, -34.93333°), D. Underwood, VIII/1972, 1 ♀ (SAM NN28370); Vale Park (138.61806°, -34.88389°), collector unknown, 9/II/1979, 1 ♀ (SAM NN28357); Belair National Park, Mount Lofty Ranges (138.63333°, -35°), G. Gross, 21/IV/1953, 1 ♀ (SAM NN28360); H. Womersly, 9/II/1936, 1 ♀ (SAM NN28359); Cave Cliff National Trust Reserve, Hd Parcoola, Murray Mallee, bluish-white web on wall of cave (140.05°, -33.61667°), J.J. Szent-Ivany & M.L. Szent-Ivany, 25/IV/1982, 1 ♀ (SAM NN28379); Chowilla (140.83333°, -34.01667°), collector unknown, 10/X/1988, 1 ♀ (SAM NN28367); Clarendon, Mount Lofty Ranges, under river-gum bark (138.63333°, -35.11667°), A.F. Lees, 26/XI/1978, 1 ♀ (SAM NN28378); Loftia Park, Adelaide Hills, under bark of

Eucalyptus (138.71667°, –34.98333°), R.V. Southcott, 25/III/1984, 1 ♀ (SAM NN28358); Mannum, River Murray district (139.3°, –34.91667°), G.F. Gross, no date, 1 ♀ (SAM NN28368); Mitcham, Mitcham Shopping Centre, under bark of *Eucalyptus camaldulensis* (138.61667°, –34.98333°), R.V. Southcott, 29/III/1979, 2 ♀ 6 imm. (SAM NN28372); Norton Summit, under bark of Manna Gum (138.73333°, –34.91667°), R. Briggs, 11/III/1967, 1 ♀ (SAM NN28361); Roachdale National Trust Reserve, Mt. Lofty Ra. (138.86667°, –34.75°), J. J. Szent-Ivany & M.L. Szent-Ivany, 9/VIII/1980, 4 ♀ (SAM NN28371); under bark of large stringybark [138.86667°, –34.75°], 17/IV/1980, 1 ♀ (SAM NN28355); collector unknown, 17/IV/1980, 4 ♀ 1 imm. (SAM NN28356); Southern Flinders Ranges (138.18333°, –32.83333°), A.M. Lea, no date, 3 ♀ (SAM NN28377); Walkerville, Adelaide plains (138.61667°, –34.9°), B. Guerin, XI/1982, 1 ♀ (SAM NN28380); Parra Wirra NP, South Parra River (138.83°, –34.7°), D. Hirst, 21/V/1983, palp used for SEM by MR Gray, 2 ♂ 1 ♀ (AM KS.35718*). Victoria: Deep Lead, 1 km southwest (142.71667°, –37.01667°), 21/VI/1989, 1 ♀ (SAM NN28365); Dimboola (142.02806°, –36.455°), 25/V/1988, 2 ♀ (SAM NN28353); 2 ♀ (SAM NN28374); Morwell, 4.2 km west Morwell, under *Eucalyptus*, Berlesse funnel (146.33333°, –38.21667°), J.E. Southcott, 8/V/1989, 1 ♀ (SAM NN28349); Horseshoe Bend 4 km south of Little Desert National Park, under bark of *Eucalyptus camaldulensis* (141.75°, –36.5°), M.S. Harvey & B. Roberts, 6/VII/1982, 1 ♀ (AM KS.12839). Western Australia: Karunjie Station, 33.3 km north-northeast of homestead, Durack River (127.23944°, –15.99222°, m), M.S. Harvey & N. Tartanic, 2/VI/2014, 1 ♀ (WAM T132986).

Wandella orana Gray 1994 (Figures 11F, G, 15)

Wandella orana Gray 1994, p. 45, figs. 3, 4, 5, 7, 13, 14, 16, 24–26, 42–51. Male holotype from Mount Colah, NSW, 33°40' S, 151°07' E, 1/II/1980, M.R. Gray, wandering on shed floor, deposited in AM KS.4659, not examined.

Distribution

Eastern New South Wales; newly recorded from southern Queensland (Figure 15).

Material examined

Australia. New South Wales: Hornsby, Waitara Creek, leaf litter sample (151.0894°, –33.7144°), H.M. Smith, 3/I/2009, with egg sac, 1 ♀ (AM KS.107093); with egg sac, 1 ♀ (AM KS.107094); 1 ♀ (AM KS.107130); with egg sac, 1 ♀ (AM KS.107095); Lalor Park, in garden, behind bags of soil (150.92°, –33.75°), G. Smith, 7/IX/2013, 1 ♂ (AM KS.120894); Lower Creek, west of Armidale – Kempsey Rd, hand collected (152.2375°, –30.7531°), H. M. Smith, S. Crews, B.J. Day, 26/II/2009, 1 ♀ (AM KS.107599); Upper Hunter River, Denman Vineyard at Denman, pitfall trap (150.73833°, –32.34333°), J. Gollan, 23/XI–9/XII/2004, 1 ♂ (AM KS.92378); Warrumbungle NP, Camp Pincham car park, hand collected (149°, –31.3°), H.M. Smith, 19/II/2007, 1 ♀ (AM KS.100973). Queensland: Windermere Station, night collection (149.75°, –27.28333°), R. Raven, 18/XII/1990, 1 ♂ (QM S86304).

Wandella pallida Gray 1994

Wandella pallida Gray 1994, p. 59, figs. 8, 78–79, 101–102, 113–115. Male holotype from Cave KJ-8, Jeremiah Hills, WA, 15°27' S, 128°45' E, 25/VI/1990, P. Drew, on stone/soil floor in dark zone (S43), deposited in WAM 90/1915, not examined.

Distribution

Known only from two caves in northeastern Western Australia (newly recorded from cave KJ-7) (Figure 15).

Material examined

Australia. Western Australia: 36 km north of Kununurra, Jeremiah Hills, cave KJ-7 (128.73333°, –15.45°, m), B. Vine, 5/V/1994, 1 ♀ 1 imm. (WAM T132989); 36 km north of Kununurra, Jeremiah Hills, cave KJ-8 (128.73333°, –15.43333°, m), R.D. Brooks, 17/V/1994, 1 ♂ 3 ♀ (WAM T133002).

Wandella parnabyi Gray 1994
(Figures 1A–B, 15)

Wandella parnabyi Gray 1994, p. 45, figs. 7, 38–41, 103–104. Male holotype from Fitzroy River crossing on Great Northern Highway, about 60 km south of Derby, WA, 17°40' S, 123°35' E, 3/III/1990, H. Parnaby, under loose bark of riverbank eucalypts, deposited in AM KS.30232, not examined.

Distribution

Western Australia; newly recorded from Northern Territory (Figure 15).

Material examined

Australia. Northern Territory: Cape Crawford, 280 sign, big old tree on right (135.79983°, –16.63117°, 79 m), R. Raven, B. Baehr & A. Amey, 7–14/IX/2006, 1 ♂ (QM S76014). Western Australia: 56 km north-northwest of Kununurra, Ningbing Range, cave KNI-9 (128.61667°, –15.28333°, m), B. Vine, 10/V/1994, 1 ♀ (WAM T132996); Broome, Cable Beach, among roots in sand dune (122.20645°, –17.95106°), D. Hirst, 9/VII/1981, laid 19 eggs in captivity, 1 ♀ (SAM NN28354); Durack River Station, 15.1 km south-southeast of Home Valley homestead, Salmond River (127.86556°, –15.85528°, m), M.S. Harvey & N. Tartanic, 28/V/2014, 1 ♂ (WAM T132982); 1 ♀ 4 imm. (WAM T132983); 1 ♀ (WAM T132984); 1 ♀ (WAM T132985); Kununurra, Kona Lakeside Caravan Park (128.72222°, –15.7925°, m), M.S. Harvey, 21/VIII/2002, 3 ♀ (WAM T132991); March Fly Glen, Gibb R Rd, King Leopold Rd east of Mt Bell, under bark (125.3072°, –17.1642°), M. Gray, G. Milledge & H. Smith, 6/VI/1999, 1 ♂ 1 imm. (AM KS.55847); 16 km southwest of Pannawonica, Mesa A, site MAT04, pitfall trap (116.22028°, –21.74639°), R. Teale, 6–12/VIII/2005, 1 ♂ (WAM T77171); Walter James Range, site 11, dry pitfall trap (128.79731°, –24.80078°), J.M. Waldock & K.E.C. Brennan, 20–27/IX/2006, 2 ♂ (WAM T79275); Ripon Hills Rd, 47.6 km east of Nullagine turnoff (Marble Bar Rd), pitfall trap (120.3689°, –21.2264°), M. Bulbert, J.

Gollan, L.M. Kampen, G. Carter, 29/III–26/V/2006, 1 ♂ (AM KS.100201); 1 ♂ (AM KS.100202); Wyndham crocodile farm, Port Wyndham, under bark (128.1°, –15.47°), M. Gray, G. Milledge & H. Smith, 13/VI/1999, 1 ♀ (AM KS.55848).

Genus *Yardiella* Gray 1994

Yardiella Gray 1994, p. 59. Type species *Yardiella humphreysi* Gray 1994 by original designation and monotypy.

Yardiella humphreysi Gray 1994

Yardiella humphreysi Gray 1994, p. 59, figs. 6, 8, 10, 12, 20, 107, 116–124. Male holotype from Cave C94, North-West Cape Peninsula, WA, 21°47' S, 114°10' E, 20/IX/1988, M. Gray & S. Eberhard, deposited in WAM, not examined. Male and female paratypes from the same locality (AM KS.21587, KS.30229, KS.30225, KS.30228, KS.21603), examined.

Note

This species so far has been recorded only from caves (Gray 1994). I have examined a female from leaf litter samples taken from under a fig tree (WAM T48338), representing the first epigeal record of this species.

Distribution

North West Cape, Western Australia (Figure 15).

Material examined

Australia. Western Australia: Cape Range area, Whitecrest Quarry lease, in litter under fig tree, Tullgreen funnel (114.07528°, –21.9975°, m), S.M. Eberhard, 25/VIII/1997, 2 ♀ 2 imm. (WAM T48338); North West Cape Filistatic Cave C94 (114.06667°, –21.83333°), J.M. Waldock, 20/IX/1988, 1 ♀ (WAM 24,043 (91/1793)*); photo by D. Elford, 11/10/1988, 1 ♀ (WAM 24,044 (91/1794)*); (114.01667°, –22.05°, m), 25/V/1990, 1 ♀ (WAM 24,054 (91/1804)*); 1 ♀ (WAM 24,055 (91/1805)*); 1 imm. (WAM 24,056 (91/1806)*); 1 imm. (WAM 24,057 (91/1807)*); 1 imm. (WAM 24,058 (91/1808)*); 1 imm. (WAM 24,059 (91/1809)*); 1 imm. (WAM 24,060 (91/1810)*); 1 imm. (WAM 24,061 (91/1811)*); in webs on rock walls roof and floor boulders especially in entrance cavern (114.17°, –21.78°), S. Eberhard, 20/IX/1988, 3 ♀ (AM KS.21587*); 1 ♀ (AM KS.30229*); 1 ♀ (AM KS.30225*); 1 ♀ (AM KS.30228*); on roots hanging from roof of end chamber dark zone, 1 ♂ 1 imm. (AM KS.21603*).

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