



A review of the Western Australian species of the keeled trapdoor spider genus *Stanwellia* (Araneae: Mygalomorphae: Pycnothelidae)

Mark S. Harvey^{1,2,3}, Peter U. Middelbart¹, Michael G. Rix^{3,1} & Jeremy D. Wilson^{2,1,3}

¹ Collections & Research, Western Australian Museum, 49 Kew Street, Welshpool, Western Australia 6106, Australia.

² School of Biological Sciences, University of Western Australia, Crawley, Western Australia 6009, Australia.

³ Biodiversity and Geosciences Program, Queensland Museum Collections & Research Centre, Hendra, Queensland 4011, Australia.

Corresponding author: mark.harvey@museum.wa.gov.au

Mark Harvey  <https://orcid.org/0000-0003-1482-0109> ; Peter Middelbart  <https://orcid.org/0000-0002-3191-8434> ; Michael Rix  <https://orcid.org/0000-0001-5086-3638> ; Jeremy Wilson  <https://orcid.org/0000-0002-5984-7674>



© Copyright of this paper is retained by its authors, who, unless otherwise indicated, license its content under a CC BY 4.0 license

Abstract

Keeled trapdoor spiders of the genus *Stanwellia* (Pycnothelidae) are found in the mesic forest ecosystems of southern Australia and New Zealand, but they are rarely encountered in south-western Australia. After examining all *Stanwellia* specimens in the Western Australian Museum collection, we provide descriptions of four new species from the high rainfall zone of temperate Western Australia, each of which occupies a narrow distribution: *S. longinqua*, sp. nov., *S. mainae*, sp. nov., *S. oraria*, sp. nov. and *S. pauxilla*, sp. nov. We include three of these species in a multi-gene molecular phylogeny, along with other species of *Stanwellia* from eastern Australia and New Zealand. The phylogeny failed to recover the Western Australian species in a monophyletic clade, with *S. oraria*, sp. nov. and *S. pauxilla*, sp. nov. as sister-taxa, and *S. longinqua*, sp. nov. as sister to all other *Stanwellia* species.

Cite this paper as: Harvey MS, Middelbart PU, Rix MG & Wilson JD (2025). A review of the Western Australian species of the keeled trapdoor spider genus *Stanwellia* (Araneae: Mygalomorphae: Pycnothelidae). *Australian Journal of Taxonomy* 99: 1–20.
doi: <https://doi.org/10.54102/ajt.fsupm>
urn:lsid:zoobank.org:pub:261AE89C-5934-4FF9-9AFC-98072FACDAE7

Introduction

The mygalomorph spider family Pycnothelidae has been recently revalidated and newly diagnosed, and generic relationships within the family confirmed, based on two comprehensive phylogenomic analyses (Opatova et al. 2020; Montes de Oca et al. 2022). The family currently

contains 15 genera that are restricted to the southern continents (World Spider Catalog 2025). Most occur in South America (Montes de Oca et al. 2022) but *Afromygal* Zonstein, 2020 and *Pionothele* Purcell, 1902 occur in southern Africa, and *Stanwellia* Rainbow & Pulleine, 1918 is endemic to Australasia. Traditionally, two separate genera have been recognised in the Australasian

This paper was submitted on 16 May 2025 and published on 9 September 2025 (2025-09-09T06:23:29.559Z). It was reviewed by André do Prado and Cor Vink, and edited by Subject Editor Volker Framenau under the guidance of Associate Editor Kevin Thiele. Mark Harvey and Michael Rix are Editors of the Australian Journal of Taxonomy. They did not at any stage have access to the manuscript while in peer review, and had no influence on its acceptance or handling, as is standard practice for manuscripts submitted by editors. Australian Journal of Taxonomy. ISSN: 2653-4649 (Online).

fauna, with *Stanwellia* in Australia (Main 1972; Raven 1981) and *Aparua* Todd, 1945 in New Zealand (Forster & Wilton 1968; Todd 1945). Recent multi-gene molecular research (Harvey et al. 2018) has been unable to demonstrate reciprocal monophyly for each genus and *Aparua* was considered a synonym of *Stanwellia*, corroborating the synonymy of *Aparua* with *Stanwellia* by Main (1983). The New Zealand fauna was revised by Forster and Wilton (1968) who recognised 10 species of *Aparua*, and molecular data indicates that the common ancestor of the New Zealand fauna likely dispersed from Australia ca. 3.8–11.4 Mya, long after the separation of New Zealand from Gondwana (Harvey et al. 2018). The Australian fauna has been the subject of only one in-depth study in which the type species *S. hoggi* Rainbow & Pulleine, 1918 and several other species were redescribed, and various species-level synonymies and new species were proposed (Main 1972). Two other species have since been transferred to *Stanwellia*: Raven (1981) moved *Aname minor* and Rix et al. (2017) moved *Mygale annulipes* C.L. Koch, 1842. There are now eight recognised species from Australia: *S. annulipes* (C. L. Koch, 1841) and *S. pexa* (Hickman, 1930) from Tasmania; *S. grisea* (Hogg, 1901) and *S. inornata* Main, 1972 from Victoria; *S. hoggi* (Rainbow, 1914) and *S. minor* (Kulczyński, 1908) from New South Wales; and *S. nebulosa* Rainbow & Pulleine, 1918 and *S. occidentalis* Main, 1972 from South Australia.

The first record of *Stanwellia* from Western Australia was by Main (1972) who attributed three juvenile specimens collected from south-western Australia to *S. occidentalis*, a species that was otherwise known from the Eyre Peninsula in South Australia, ca. 1,800 km away. These specimens have been transferred from the University of Western Australia to the Western Australian Museum and the two specimens from the Porongurup Range are here assigned to *S. oraria* sp. nov., and a juvenile from near Mammoth Cave is attributed to *S. pauxilla* sp. nov.

Recent molecular research on the genera previously included in the family Nemesiidae included specimens of *Stanwellia* collected in south-western Australia (Harvey et al. 2018), which has led to the present study. In addition to these molecular exemplars, we studied all specimens of *Stanwellia* lodged in the Western Australian Museum collection (Figure 1) and obtained new sequence data to confirm the status of some of the populations.

Like many other species of *Stanwellia*, the Western Australian populations dig burrows in the soil but do not adorn the entrance with a lid, although they sometimes make small silken ‘turrets’ around the burrow entrance (Figure 2A). They are also strikingly coloured with banded legs and mottled abdomens (Figure 2B).

Here, we provide descriptions of four new species from the high rainfall zone of temperate Western Australia, each of which occupies a narrow distribution: *S. long-*

inqua, sp. nov., *S. mainae*, sp. nov., *S. oraria*, sp. nov. and *S. pauxilla*, sp. nov. Three of these species were first recognised by B.Y. Main in the 1990s. However, her proposed manuscript was never finalised and was not located among her files after her death in 2019 (Harvey 2019). We have chosen to use one of the names she proposed (*Stanwellia oraria*) as it was used by Castalanelli et al. (2014) in a barcoding study of Western Australian mygalomorph spiders.

Methods

The specimens examined in this study are lodged in the Western Australian Museum, Perth (WAM), and are preserved in 75% ethanol. Focus stacked images were taken at different focal planes (ca. 20–30 images) with a Canon 6D camera digital camera attached to a Leica MZ16 stereo microscope, using Helicon Focus 8.2.4 Pro software.

Morphological terminology follows Raven (1985) and Castalanelli et al. (2020). The following abbreviations are used: AME: anterior median eyes; ALE: anterior lateral eyes; PLE: posterior lateral eyes; PME: posterior median eyes. Pedipalp and leg measurements and ratios were calculated using the terminology and reference points defined by Castalanelli et al. (2020).

It was not possible to distinguish the new species from *S. annulipes* from Tasmania or *S. minor* from New South Wales due to the lack of modern descriptions or illustrations of the genital organs, but the chance of these eastern species being conspecific with any of the Western Australian taxa is highly implausible due to the vast distances between the localities. Comparisons of the morphology of each of the new species with the other Western Australian species was a relatively simple task but comparisons with the other six species from eastern Australia was hampered by the lack of high-quality images. Differences in the spermathecae were easier to detect thanks to the line drawings provided by Main (1972), but comparisons of the male palpal organs were rendered difficult by the lack of precision in the drawings.

The bioregions mentioned throughout the manuscript are those adopted in the Interim Biogeographic Regionalisation for Australia version 7.0 (Environment Australia 2000; Thackway & Cresswell 1995).

Taxon coverage for the molecular analysis included three of the four Western Australian species (*S. longinqua* sp. nov., *S. mainae* sp. nov., *S. oraria* sp. nov. and *S. pauxilla*, sp. nov., as well as *S. inornata* Main, 1972 from Victoria and *S. nebulosa* (Rainbow & Pulleine, 1918) from South Australia, *S. kaituna* (Forster, 1968) and *S. media* (Forster, 1968) from New Zealand, and nine species from New South Wales, Tasmania and Victoria that we could not align with any previously named species. These were given unique identifiers using alphanumeric codes commencing with the prefix MYG (Tables 1, 2).

We were unable to include samples from Wollongong, New South Wales, which is the type locality of the type species of *Stanwellia*, *S. decora* Rainbow & Pulleine, 1918, itself a synonym of *S. hoggi* Rainbow, 1918 from North Sydney, New South Wales.

The molecular analysis used fragments of three mitochondrial [cytochrome *c* oxidase subunit I (*COI*), 12S rRNA (12S) and 16S rRNA (16S)] and four nuclear genes [18S ribosomal RNA (18S), 28S ribosomal RNA (28S), Histone H3 (*H3*) and elongation factor 1- γ (*EF-1 γ*)], all obtained using standard Sanger methodology following the methods outlined by Harvey et al. (2018). Chromatograms were edited using the Geneious software package (ver. 2021.2, Biomatters Ltd, see <https://www.geneious.com/>; Kearse et al. (2012)) and resulting nucleotide sequences for all taxa are deposited in GenBank (Table 2). Sequences were aligned using the MAFFT [ver. 7.490, see <https://mafft.cbrc.jp/alignment/software/>; Katoh et al. 2002; Katoh et al. (2002); Katoh and Standley (2013)] plug-in within Geneious, using the 'Auto' algorithm, which chooses the most appropriate option from the FFT-NS-2, FFT-NS-i and L-INS-i alignment strategies (Katoh and Standley, 2013). The concatenated alignment (of 5,245 bp) was analysed using maximum likelihood (ML) in the web version of IQ-TREE (ver. 3.3.0, see <http://www.iqtree.org/>; Minh et al. 2020; Trifinopoulos et al. 2016) with each gene representing a separate partition. Substitution models were chosen using ModelFinder (Kalyaanamoorthy et al. 2017), and resulted in the following substitution models per partition: *COI* = GTR+F+I+G4; 12S = TIM2+F+G4; 16S = TIM2+F+I+G4; 18S = TNe+I; 28S = TIM+F+G4; *H3* = TVMe+I+G4; *EF-1 γ* = HKY+F+G4. Branch support was assessed using 5,000 ultrafast bootstrap replicates (UFBoot).

Discussion

The consensus ML tree derived from the molecular analysis (Fig. 3) recovered *Stanwellia* as monophyletic, albeit without adequate coverage of the diverse South American or African faunas, which contain the bulk of the diversity of Pycnothelidae with 14 genera (World Spider Catalog 2025).

The inclusion of three of the four named Western Australian species of *Stanwellia* in the molecular analysis (Fig. 3) was augmented with two species from New Zealand and 11 species from southeastern Australia (Tables 1, 2). Even based on our limited sampling it is apparent that there is high taxonomic diversity in south-eastern Australia that is not reflected in the current taxonomic framework. For example, we found three species in the Grampians Mountains (*S. inornata*, *S. MYG430* and *S. MYG431*) and two species at Mount Macedon (*S. MYG417* and *S. MYG418*), one of which, *S. MYG417*, also occurs in the Otway Ranges (Table 1).

Within *Stanwellia*, *S. longinqua*, sp. nov. from Cape Arid was found to be sister to all other taxa, including species

from eastern Australia, New Zealand and other regions of Western Australia (though with relatively low reciprocal branch support, UFBoot=64). While the New Zealand species were recovered in a strongly supported clade (UFBoot=99), sister to the bulk of the eastern Australian fauna (consistent with the hypothesis of dispersal from Australia, see Harvey et al. (2018)), the relationships within and among clades were in general poorly supported. Both the Western Australian and eastern Australian faunas were recovered as polyphyletic, indicating a possibly complex history of vicariance, dispersal or a combination of speciation patterns in temperate Australian *Stanwellia*. Further sampling of eastern Australian and New Zealand species will be required to better understand the biogeographic history of this genus, particularly in south-eastern Australia.

Taxonomy

Family Pycnothelidae Chamberlin, 1917

Subfamily Diplothelopsinae Schiapelli & Gerschman, 1967

Stanwellia Rainbow & Pulleine, 1918

urn:lsid:zoobank.org:act:EAADF806-D756-4407-8A87-94B79F814999

Stanwellia Rainbow & Pulleine, 1918: 164.

Aparua Todd, 1945: 390. Synonymised by Main (1983).

Type species

Stanwellia: *Stanwellia decora* Rainbow & Pulleine, 1918 (junior synonym of *Chenistonia hoggi* Rainbow, 1914), by monotypy.

Aparua: *Aparua bipectinata* Todd, 1945, by original designation.

Diagnosis

Stanwellia is the only genus of the family Pycnothelidae known to occur in Australia (Montes De Oca et al. 2022). Members of the genus can be diagnosed from other mygalomorph genera in Australia by the presence of two rows of teeth on the paired tarsal claws, maxillae with cuspule patches that are confined to a thin antero-medial band (not extending laterally or onto the postero-medial corner of the maxillae) (e.g. see Fig. 4B, I; Main, 1972; Raven, 1985; Harvey et al. 2018). Males can be further diagnosed by the presence of keels on the embolus (e.g. Fig. 5L–N), and pseudosegmented tarsi on all legs (e.g. Fig. 5O). Females generally have smudges or bands on the legs in life (Fig. 2B).

Remarks

The common name “keeled trapdoor spider” is applied to species of *Stanwellia* due to the presence of ridges and keels on the male palpal bulb (Figures 5L–N, 6 L–N, 7L–N, 8C–D, H–J).

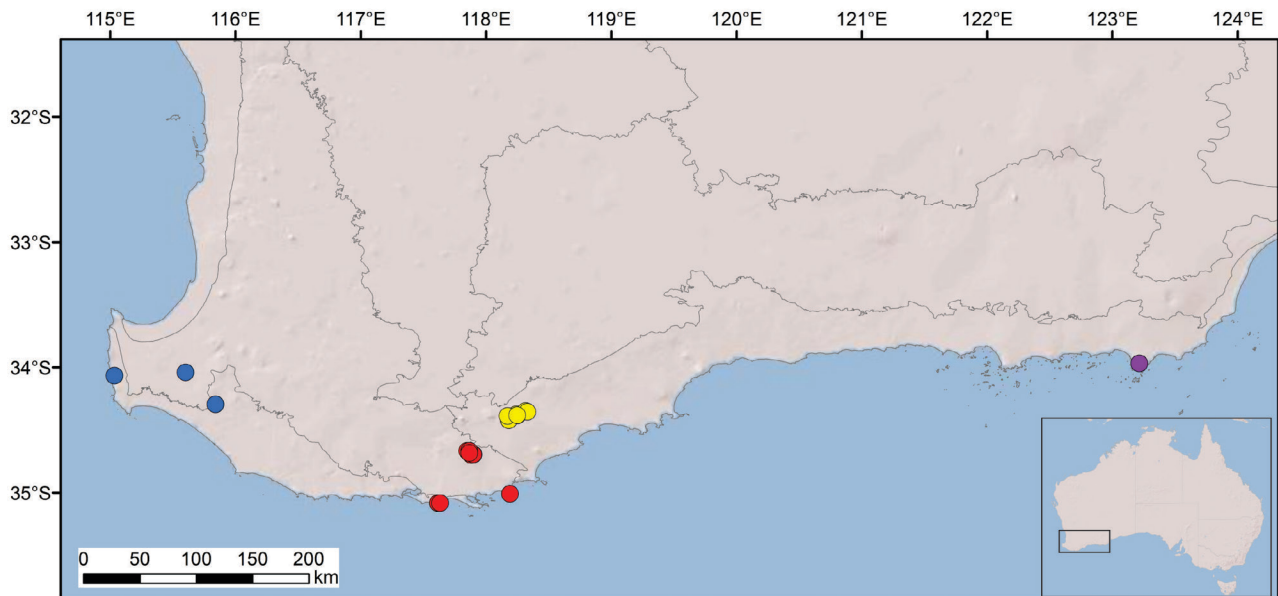


Figure 1. Map of south-western Australia showing known distribution of *Stanwellia* species: *S. longinqua*, sp. nov. (purple); *S. mainae*, sp. nov. (yellow); *S. oraria*, sp. nov. (red); *S. pauxilla*, sp. nov. (blue).

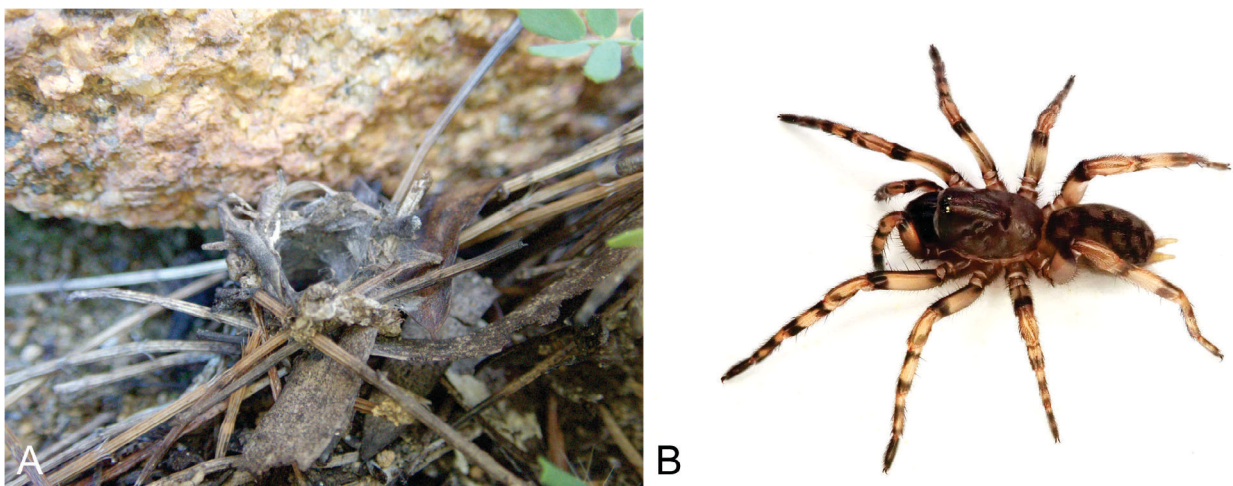


Figure 2. *Stanwellia longinqua*, sp. nov., specimen WAM T160675: A, burrow entrance; B, living female. Images by J.D. Wilson.

Stanwellia longinqua, sp. nov.

Figures 2, 4

urn:lsid:zoobank.org:act:13F5D209-F139-415E-A7E2-7CA7C6BC1B3C

Stanwellia sp. 'MYG360': Castalanelli et al., 2014: figure 3.

Holotype

AUSTRALIA: *Western Australia*: ♀, Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'09.19"S, 123°12'54.79"E, 148 m, 3 April 2023, J.D. Wilson, M. Hughes, C. Etherington, R. Howe (WAM T160666).

Paratypes

AUSTRALIA: *Western Australia*: 1 ♀, Cape Arid National Park, Mt Arid, high in gully, 33°58'09"S, 123°12'52"E, 16 November 2006, in burrow, M.L. Moir, O. Massenbaur (WAM T78538); 1

♀, Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'09.19"S, 123°12'54.79"E, 148 m, 3 April 2023, J.D. Wilson, M. Hughes, C. Etherington, R. Howe (WAM T160667); 1 ♀, Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'08.0"S, 123°12'53.3"E, 165 m, 3 April 2023, J.D. Wilson, M. Hughes, C. Etherington, R. Howe (WAM T160675).

Diagnosis

Females of *Stanwellia longinqua* differ from all other species of *Stanwellia* by the medially inclined spermathecal ducts (Figure 4L) (anteriorly or laterally directed in the others).

Males are unknown.

Description

Female (based on holotype, WAM T160666)

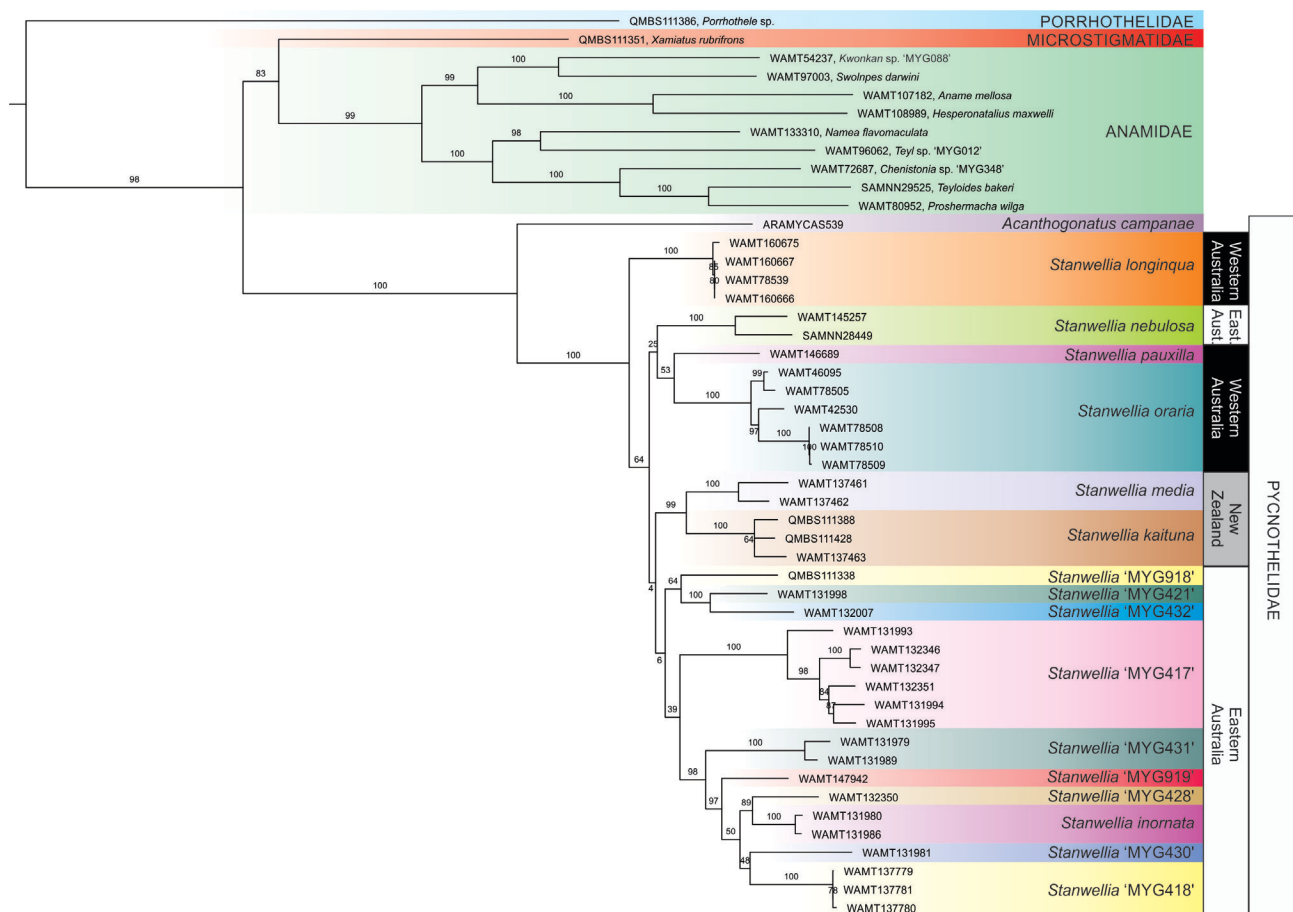


Figure 3. Maximum likelihood phylogeny of *Stanwellia*, based on alignment of concatenated sequence data (*COI*, 12S, 16S, 18S, 28S, *H3* and *EF-1 γ*). Ultrafast Bootstrap values are presented for each node. For clarity, the outgroup *Cethegus fugax* (Simon, 1908) was omitted.

Colour (in alcohol) (Figures 4A, 4B): carapace yellow-brown but slightly darker in pars cephalica region, and with lines radiating from fovea; legs distinctly banded, mostly yellow-brown, but with darker markings on distal end of femur, medial regions of patella, basal and distal ends of tibia, and distal end of metatarsus. Chelicerae uniformly red-brown. Abdomen dorsally grey-brown with darker markings including a median stripe and lateral chevrons, and ventrally mostly grey-brown with darker markings in posterior half and near epigastric region.

Cephalothorax: carapace (Figure 4A) $1.48 \times$ longer than broad; sparsely pilose; clypeal edge slightly convex. Fovea (Figure 4D) procurved. Eyes (Figure 4C): on distinct mound; from above, anterior eye row straight, posterior eye row slightly recurved; ALE broader than AME; PLE larger than PME; ALE largest, PME smallest; eye group length 0.42, width 0.93. Chelicerae (Figure 4A, 4B) densely setose with setae arranged in thick bands; rastellum absent; promargin of tooth row with 8 teeth, retromargin without teeth. Labium (Figure 4E) fused to sternum, with 2 cuspules. Maxillae (Figure 4I) with 18 (left, right) cuspules, clustered near medial edge. Sternum (Figure 4E): oval, posteriorly pointed; $1.42 \times$ longer than broad; uniformly setose, setae on lateral and pos-

terior margins longer than others; with 3 pairs of sigilla (Figure 4H), posterior pair larger than others.

Pedipalp: with sparse scopula on tarsus.

Legs (Figures 4J, 4K): coxal cuspules absent; sparse scopula present on tarsi of legs I and II, absent from legs III and IV; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 4F, 4G): $1.71 \times$ longer than broad, sparsely setose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spinneret; PLS 3-segmented, apical segment elongate, digitiform.

Genitalia (Figure 4L): with 1 pair of widely spaced spermathecae, each with short stalks and bulbous spermathecal head directed anteromedially, on a broad triangular base.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 11.45, total body length (excluding chelicerae and spinnerets) 9.64; carapace length 3.01, width 1.48; sternum length 2.29, width 1.61. Femur I length 2.97, depth 0.93, L/D 3.18; femur II 2.71, depth 0.85, L/D 3.20; femur III 2.12, depth 0.85, L/D 2.50; femur IV length 2.88, depth 1.02, L/D 2.83. Abdomen length 4.92, width 2.88.

Table 1. Specimens used in the molecular analysis.

Species	Locality	Repository and number
Family Euagridae		
<i>Cethegus fugax</i> (Simon, 1908)		WAM T129260
Family Porrhothelidae		
<i>Porrhothele</i> sp.		QMB S111386
Family Anamidae		
<i>Aname mellosa</i> Harvey, Framenau, Wojcieszek, Rix & Harvey, 2012		WAM T107182
<i>Chenistonia</i> sp. 'MYG348'		
<i>Hesperonatalius maxwelli</i> Castalanelli, Huey, Hillyer & Harvey, 2017		WAM T72687
<i>Kwonkan</i> sp. 'MYG088'		WAM T54237
<i>Namea flavomaculata</i> (Rainbow & Pulleine, 1918)		WAM T133310
<i>Proshermacha wilga</i> Leenders, Beach & Harvey, 2023		WAM T80952
<i>Swolnpes darwini</i> Main & Framenau, 2009		WAM T97003
<i>Teyl</i> sp. 'MYG012'		WAM T96062
<i>Teyloides bakeri</i> Main, 1985		SAM NN29525
Family Microstigmatidae		
<i>Xamiatus rubrifrons</i> Raven, 1981		QMB S111351
Family Pycnothelidae		
<i>Acanthogonatus campanae</i> (Legendre & Calderón, 1984)		ARAMYCAS539
<i>Stanwellia inornata</i> Main, 1972	AUSTRALIA: Victoria: Grampians National Park, off Redman Track, 37°13'17"S, 142°34'36"E	WAM T131980
<i>Stanwellia inornata</i> Main, 1972	AUSTRALIA: Victoria: Grampians National Park, off Mafeking Road, 37°21'18"S, 142°35'05"E	WAM T131986
<i>Stanwellia media</i> (Forster, 1968)	NEW ZEALAND: BP, Katikati, Lindemann track, 37°32.68'S, 175°52.32'E	WAM T137461
<i>Stanwellia media</i> (Forster, 1968)	NEW ZEALAND: GB, East Cape, 37°41'27"S, 178°32'46"E	WAM T137462
<i>Stanwellia kaituna</i> (Forster, 1968)	NEW ZEALAND: Mid Canterbury, Prices Valley, "Wongan Hills", 43.766°S, 172.715°E	WAM T137463
<i>Stanwellia kaituna</i> (Forster, 1968)	NEW ZEALAND: Canterbury: Hinewai Reserve, Banks Peninsula, 43°48'41"S, 173°01'53"E	QMB S111428
<i>Stanwellia kaituna</i> (Forster, 1968)	NEW ZEALAND: Canterbury: Jollies Bush Scenic Reserve, Sumner, 43°35'15"S, 172°44'19"E	QMB S111388
<i>Stanwellia nebulosa</i> (Rainbow & Pulleine, 1918)	& AUSTRALIA: South Australia: Bridgewater, Mount Lofty Ranges, 35°00'S, 138°46'E	SAM NN28449
<i>Stanwellia nebulosa</i> (Rainbow & Pulleine, 1918)	& AUSTRALIA: South Australia: 15.9 km N. of Cleve, on Kimba-Cleve Road, 33°33'40"S, 136°29'51"E	WAM T145257
<i>Stanwellia longinqua</i> , sp. nov.	AUSTRALIA: Western Australia: Cape Arid National Park, Mt Arid, high in gully, 33°58'09"S, 123°12'52"E	WAM T78539
<i>Stanwellia longinqua</i> , sp. nov.	AUSTRALIA: Western Australia: Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'09"S, 123°12'55"E	WAM T160666
<i>Stanwellia longinqua</i> , sp. nov.	AUSTRALIA: Western Australia: Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'09"S, 123°12'55"E	WAM T160667
<i>Stanwellia longinqua</i> , sp. nov.	AUSTRALIA: Western Australia: Cape Arid National Park, gorge c. 1 km NNE. of Mt Arid, 33°58'09"S, 123°12'55"E	WAM T160675
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Porongurup National Park, Hayward Peak, 34°40'55.8"S, 117°51'58.6"E	WAM T42530
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Porongurup National Park, S. end of Millinup Pass, 34°41'43"S, 117°53'51"E	WAM T46095
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Porongurup National Park, Millinup Pass, 34°41'45"S, 117°54'00"E	WAM T78505
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Two Peoples Bay Nature Reserve, Fishermans Gully, 34°41'45"S, 117°54'00"E	WAM T78508

	35°00'37"S, 118°11'30"E	
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Two Peoples Bay Nature Reserve, Fishermans Gully, WAM T78509	
	35°00'37"S, 118°11'30"E	
<i>Stanwellia oraria</i> , sp. nov.	AUSTRALIA: Western Australia: Two Peoples Bay Nature Reserve, Fishermans Gully, WAM T78510	
	35°00'37"S, 118°11'30"E	
<i>Stanwellia pauxilla</i> , sp. nov.	AUSTRALIA: Western Australia: near Blackwood River, at Jalbarragup Road, WAM T146689	
	34°02'28"S, 115°36'06"E	
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: Otway Range, off Binns Road, NW. of Apollo Bay, 38°43'45"S, WAM T131993	
	143°34'50"E	
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: Great Otway National Park, off road to Triplet Falls, 38°40'04"S, WAM T131994	
	143°29'40"E	
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: Great Otway National Park, track to Cora Lynn Cascades, WAM T131995	
	38°30'58"S, 143°55'45"E	
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: Mount Macedon, Zig Zag Road, 37°24'15"S, 144°36'13"E	WAM T132346
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: Mount Macedon, Zig Zag Road, 37°24'15"S, 144°36'13"E	WAM T132347
<i>Stanwellia</i> sp. 'MYG417'	AUSTRALIA: Victoria: near Moggs Creek, 38°27'39"S, 144°03'48"E	WAM T132351
<i>Stanwellia</i> sp. 'MYG418'	AUSTRALIA: Victoria: Mount Macedon, Taylors Road, "Braeside", 37°24'23"S, WAM T137779	
	144°35'49"E	
<i>Stanwellia</i> sp. 'MYG418'	AUSTRALIA: Victoria: Mount Macedon, Taylors Road, "Braeside", 37°24'23"S, WAM T137780	
	144°35'49"E	
<i>Stanwellia</i> sp. 'MYG418'	AUSTRALIA: Victoria: Mount Macedon, Taylors Road, "Braeside", 37°24'23"S, WAM T137781	
	144°35'49"E	
<i>Stanwellia</i> sp. 'MYG421'	AUSTRALIA: Victoria: off Tamboon Road, S. of Cann River, N. of Croajingolong National WAM T131998	
	Park, 37°35'30"S, 149°08'53"E	
<i>Stanwellia</i> sp. 'MYG428'	AUSTRALIA: Victoria: near Moggs Creek, 38°27'39"S, 144°03'48"E	WAM T132350
<i>Stanwellia</i> sp. 'MYG430'	AUSTRALIA: Victoria: Grampians National Park, off Grampians Tourist Road, WAM T131981	
	37°13'18"S, 142°32'29"E	
<i>Stanwellia</i> sp. 'MYG431'	AUSTRALIA: Victoria: Grampians National Park, Barney's Creek, off Redman Track, WAM T131979	
	37°13'24"S, 142°35'08"E	
<i>Stanwellia</i> sp. 'MYG431'	AUSTRALIA: Victoria: Grampians National Park, off Glenelg River Road, 37°09'10"S, WAM T131989	
	142°27'22"E	
<i>Stanwellia</i> sp. 'MYG432'	AUSTRALIA: New South Wales: Budderoo National Park, Minnamurra Falls Rainforest, WAM T132007	
	34°38'04"S, 150°43'40"E	
<i>Stanwellia</i> sp. 'MYG918'	AUSTRALIA: Tasmania: Flinders Island, Cameron Inlet area, 40°06'S, 148°14'E	QMB S111338
<i>Stanwellia</i> sp. 'MYG919'	AUSTRALIA: New South Wales: Ku-ring-gai Wildflower Garden, Mueller Track, WAM T147942	
	33°42'19"S, 151°10'41"E	

Variation ($n = 3$): carapace length 3.56–4.70, width 2.46–3.25; L/W 1.44–1.46. Legs: femur I length 2.54–3.31; femur II length 2.20–2.97; femur III length 1.78–2.37; femur IV length 2.46–3.22.

Other material

AUSTRALIA: *Western Australia*: 1 juvenile, Cape Arid National Park, Mt Arid, high in gully, 33°58'09"S, 123°12'52"E, 16 November 2006, in burrow, M.L. Moir, O. Massenbaur (WAM T78539).

Remarks

This species was known as 'MYG359' and 'MYG360' in the Western Australian Museum database. The use of two codes was initially based on divergent COI barcodes, but one was later found to be erroneous.

Distribution

Stanwellia longinqua has only been collected from sheltered gullies near the summit of Mount Arid, which is situated in Cape Arid National Park (Figure 1).

Etymology

The species epithet is an adjective referring to the isolated occurrence of this species (*longinquus*, Latin, far, remote, prolonged) (Brown 1956).

Stanwellia mainae, sp. nov.

Figures 5, 6

urn:lsid:zoobank.org:act:DC160D1C-00C8-4632-92B9-E99E2A9F3613

Holotype

AUSTRALIA: *Western Australia*: ♂, Stirling Range National Park, Bluff Knoll, 34°23'S, 118°15'E, 900–1140 m, 16 March 1996, S. Barrett (WAM T42526).

Paratypes

AUSTRALIA: *Western Australia*: 1 ♀, Stirling Range National Park, The Cascades, 34°22'32"S, 118°14'33"E, 27 November 1991, B.Y. Main (WAM T27150); 4 ♂, Stirling Range National Park, Bluff Knoll, 34°22'57"S, 118°14'55"E, 950 m, 21 March 1995, pitfall trap, S. Barrett (WAM T32559–T32562); 3 ♂, 1 ♀, Stirling Range National Park, Bluff Knoll, 34°22'58"S, 118°14'55"E, 950 m, 16 March 1996, wet pitfall trap, S. Barrett

Table 2. GenBank codes for specimens used in the molecular analysis.

Species	Repository and number	COI	12S rRNA	16S rRNA	H3	18S rRNA	28S rRNA	EF-1 γ
Family Euagridae								
<i>Cethegus fugax</i> (Simon, 1908)	WAM T129260	KY295227	KY320448	KY320451	KY295101	KY294840	KY294963	–
Family Porrhothelidae								
<i>Porrhothele</i> sp.	QMB S111386	–	MT280964	MT281032	MT281253	MT281107	MT281179	–
Family Anamidae								
<i>Aname mellosa</i> Harvey, Framenau, Wojcieszek, Rix & Harvey, 2012	WAM T107182	KJ745440	KY214184	KY241237	MG800294	KY241253	KY241268	MG800231
<i>Chenistonia</i> sp. 'MYG348'	WAM T72687	KJ745221	KY214180	KY241231	KY241284	KY241247	KY241262	MG800196
<i>Hesperonatalius maxwelli</i> Castalanelli, Huey, Hillyer & Harvey, 2017	WAM T108989	KJ744690	KY214190	KY241244	KY241293	KY241259	KY241275	MG800233
<i>Kwonkan</i> sp. 'MYG088'	WAM T54237	KJ745206	MG799864	MG799923	MG800267	MG799994	MG800071	MG800191
<i>Namea flavomaculata</i> (Rainbow & Pulleine, 1918)	WAM T133310	KY241282	KY214192	KY241246	KY241294	KY241261	KY241277	MG800253
<i>Proshermacha wilga</i> Leenders, Beach & Harvey, 2023	WAM T80952	MG800150	–	MG799939	MG800275	MG800010	MG800087	MG800209
<i>Swolnpes darwini</i> Main & Framenau, 2009	WAM T97003	KY241280	KY214183	KY241236	KY241289	KY241252	KY241267	MG800223
<i>Teyl</i> sp. 'MYG012'	WAM T96062	KJ745412	KY214182	KY241235	KY241288	KY241251	KY241266	MG800221
<i>Teylodes bakeri</i> Main, 1985	SAM NN29525	MG800144	MG799861	–	MG800265	MG799991	MG800068	MG800190
Family Microstigmatidae								
<i>Xamiatus rubrifrons</i> Raven, 1981	QMB S111351	MT656265	–	MT656260	MT656268	MT656262	MT656264	–
Family Pycnothelidae								
<i>Acanthogonatus campanae</i> (Legendre & Calderón, 1984)	ARAMYCAS539	KY017803	–	KY015977	–	DQ639843	DQ639938	JQ358720
<i>Stanwellia inornata</i> Main, 1972	WAM T131980	MG800039	MG800302	MG799898	MG800117	MG799964	MG800167	MG800240
<i>Stanwellia inornata</i> Main, 1972	WAM T131986	KY241260	–	KY214191	KY241276	KY241245	KY241281	MG800243
<i>Stanwellia media</i> (Forster, 1968)	WAM T137461	MG800058	MG800314	MG799913	MG800136	MG799981	MG800184	MG800256
<i>Stanwellia media</i> (Forster, 1968)	WAM T137462	MG800059	MG800315	MG799914	MG800137	MG799982	MG800185	MG800257
<i>Stanwellia kaituna</i> (Forster, 1968)	WAM T137463	MG800060	MG800316	–	MG800138	MG799983	MG800186	MG800258
<i>Stanwellia kaituna</i> (Forster, 1968)	QMB S111428	MT280817	–	MT281029	MT281252	MT281094	MT281176	MT281250
<i>Stanwellia kaituna</i> (Forster, 1968)	QMB S111388	–	–	MT281030	–	MT281095	MT281177	–
<i>Stanwellia nebulosa</i> (Rainbow & Pulleine, 1918)	SAM NN28449	MG799988	–	MG799858	MG800065	MG799919	MG800141	MG800189
<i>Stanwellia nebulosa</i> (Rainbow & Pulleine, 1918)	WAM T145257	PV605363	PV605496	PV605510	PV645391	–	PV605526	–
<i>Stanwellia longinqua</i> , sp. nov.	WAM T78539	PV605352	–	PV605499	–	PV605532	PV605515	–
<i>Stanwellia longinqua</i> , sp. nov.	WAM T160666	PV605366	–	PV605512	–	PV605545	PV605529	PV645393
<i>Stanwellia longinqua</i> , sp. nov.	WAM T160667	PV605367	–	–	–	–	–	–
<i>Stanwellia longinqua</i> , sp. nov.	WAM T160675	PV605368	–	–	–	–	–	–
<i>Stanwellia oraria</i> , sp. nov.	WAM T42530	PV605349	PV605492	–	–	–	–	–
<i>Stanwellia oraria</i> , sp. nov.	WAM T46095	MG799992	–	MG799862	MG800069	MG799922	KJ745202	–
<i>Stanwellia oraria</i> , sp. nov.	WAM T78505	PV605350	–	PV605497	–	PV605530	PV605513	–
<i>Stanwellia oraria</i> , sp. nov.	WAM T78508	MG800003	–	MG799871	MG800080	MG799932	KJ745269	MG800201
<i>Stanwellia oraria</i> , sp. nov.	WAM T78509	PV605351	–	PV605498	–	PV605531	PV605514	–
<i>Stanwellia oraria</i> , sp. nov.	WAM T78510	MG800004	MG800202	MG799872	MG800081	MG799933	KJ745271	–
<i>Stanwellia pauxilla</i> , sp. nov.	WAM T146689	PV605364	–	PV605511	–	PV605543	PV605527	–
<i>Stanwellia</i> sp. 'MYG417'	WAM T131993	PV605355	–	PV605502	–	PV605535	PV605518	–
<i>Stanwellia</i> sp. 'MYG417'	WAM T131994	MG800042	MG800303	MG799899	MG800120	MG799967	MG800170	MG800244
<i>Stanwellia</i> sp. 'MYG417'	WAM T131995	PV605356	PV605488	PV605503	PV645388	PV605536	PV605519	–
<i>Stanwellia</i> sp. 'MYG417'	WAM T132346	MG800044	–	MG799901	MG800122	MG799969	MG800172	MG800246

<i>Stanwellia</i> sp. 'MYG417'	WAM T132347	PV605358	–	PV605505	–	PV605538	PV605521	–
<i>Stanwellia</i> sp. 'MYG417'	WAM T132351	PV605360	PV605489	PV605507	–	PV605540	PV605523	–
<i>Stanwellia</i> sp. 'MYG418'	WAM T137779	MG800063	MG800318	MG799917	MG800139	MG799986	MG800188	MG800261
<i>Stanwellia</i> sp. 'MYG418'	WAM T137780	PV605361	PV605490	PV605508	PV645390	PV605541	PV605524	–
<i>Stanwellia</i> sp. 'MYG418'	WAM T137781	PV605362	PV605491	PV605509	–	PV605542	PV605525	–
<i>Stanwellia</i> sp. 'MYG421'	WAM T131998	MG800043	–	MG799900	MG800121	MG799968	MG800171	MG800245
<i>Stanwellia</i> sp. 'MYG428'	WAM T132350	PV605359	–	PV605506	–	PV605539	PV605522	–
<i>Stanwellia</i> sp. 'MYG430'	WAM T131981	MG800040	–	–	MG800118	MG799965	MG800168	MG800241
<i>Stanwellia</i> sp. 'MYG431'	WAM T131979	PV605353	PV605493	PV605500	–	PV605533	PV605516	–
<i>Stanwellia</i> sp. 'MYG431'	WAM T131989	PV605354	PV605494	PV605501	–	PV605534	PV605517	–
<i>Stanwellia</i> sp. 'MYG432'	WAM T132007	PV605357	PV605495	PV605504	PV645389	PV605537	PV605520	–
<i>Stanwellia</i> sp. 'MYG918'	QMB S111338	MT280818	–	MT281031	–	MT281096	MT281178	MT281251
<i>Stanwellia</i> sp. 'MYG919'	WAM T147942	PV605365	–	–	–	PV605544	PV605528	PV645392

(WAM T132543); 1 ♀, Stirling Range National Park, Bluff Knoll, 34°22'56.1"S, 118°14'54.7"E, 950 m, 19 June 1996, wet pitfall trap, S. Barrett (WAM T42527).

Diagnosis

Males of *Stanwellia mainae* differ from *S. oraria* from Western Australia, *S. grisea* from Victoria, *S. hoggi* from New South Wales, *S. pexa* from Tasmania, and *S. nebulosa* from South Australia by the shape of the palpal embolus, which has highly reduced keels (Figures 5L–N). They also differ from the New Zealand species known from males by the longer and thinner embolus.

Females of *Stanwellia mainae* differ from all other species of *Stanwellia* by the short spermathecal ducts on barely discernible bases (Figure 6L) (ducts longer and the bases broader in the others).

Description

Male (based on holotype, WAM T42526)

Colour (in alcohol) (Figures 5A, 5B): carapace red-brown but darker in pars cephalica and posterior region, and with lines radiating from fovea; legs mostly brown, tarsi with pale transverse medial lines, prolateral face of femur I paler than other segments. Chelicerae uniformly dark red-brown. Abdomen dorsally with indistinct grey mottled markings on a yellow-red background, and ventrally with dark grey mottled marking near spinnerets on a yellow-brown background.

Cephalothorax: carapace (Figure 5A) 1.47 × longer than broad; pilose; with silvery setae, as well as black setae posteriorly; clypeal edge slightly convex. Fovea (Figure 5D) recurved. Eyes (Figure 5C): on distinct mound; from above, anterior eye row straight, posterior eye row slightly recurved; ALE broader than AME; PLE larger than PME; ALE largest, PME smallest; eye group length 0.42, width 0.93. Chelicerae (Figure 5A, 5B) densely setose with setae arranged in thick bands; rastellum absent; promargin of tooth row with 7 teeth, retromargin without teeth. Labium (Figure 5E) fused to sternum, with 3 cuspules. Maxillae (Figure 5I) with 33 (left, right) cuspules, clustered near medial edge. Sternum (Figure 5E): oval, posteriorly pointed; 1.46 × longer than broad; uni-

formly setose, setae on lateral and posterior margins longer than others; with 3 pairs of sigilla (Figure 5H), posterior pair larger than others.

Pedipalp (Figures 5J–N): tibia cylindrical, narrow; tarsus short, densely setose; bulb ovoid; embolus about as long as bulb, tapering to fine point, with subdistal flange.

Legs (Figures 5O–R): coxal cuspules absent; tibia I slender, cylindrical, with several pairs of spines; metatarsus long and slender; scopula absent; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 5F, 5G): 1.89 × longer than broad, densely pilose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spinneret; PLS 3-segmented, apical segment elongate, digitiform.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 13.01, total body length (excluding chelicerae and spinnerets) 11.45; carapace length 5.25, width 3.56; sternum length 2.97, width 2.03. Femur I length 4.32, depth 1.37, L/D 3.40; femur II 4.24, depth 1.36, L/D 3.12; femur III 3.65, depth 1.19, L/D 3.07; femur IV length 4.58, depth 1.27, L/D 3.61. Abdomen length 5.93, width 3.14.

Variation (n = 7): carapace length 4.66–5.34, width 3.39–3.81; L/W 1.38–1.46. Legs: femur I length 3.90–4.32; femur II length 3.47–4.15; femur III length 3.14–3.47; femur IV length 3.81–4.58.

Female (based on paratype, WAM T27150)

Colour (in alcohol) (Figures 6A, 6B): carapace yellow-brown but darker in pars cephalica region, and with lines radiating from fovea; legs mostly brown, but with darker markings on distal end of femur, retrolateral face of patella, basal and distal ends of tibia, and distal end of metatarsus. Chelicerae uniformly red-brown. Abdomen dorsally grey-brown with darker markings including a median stripe and lateral chevrons, and ventrally mostly grey-brown with darker spots near spinnerets.

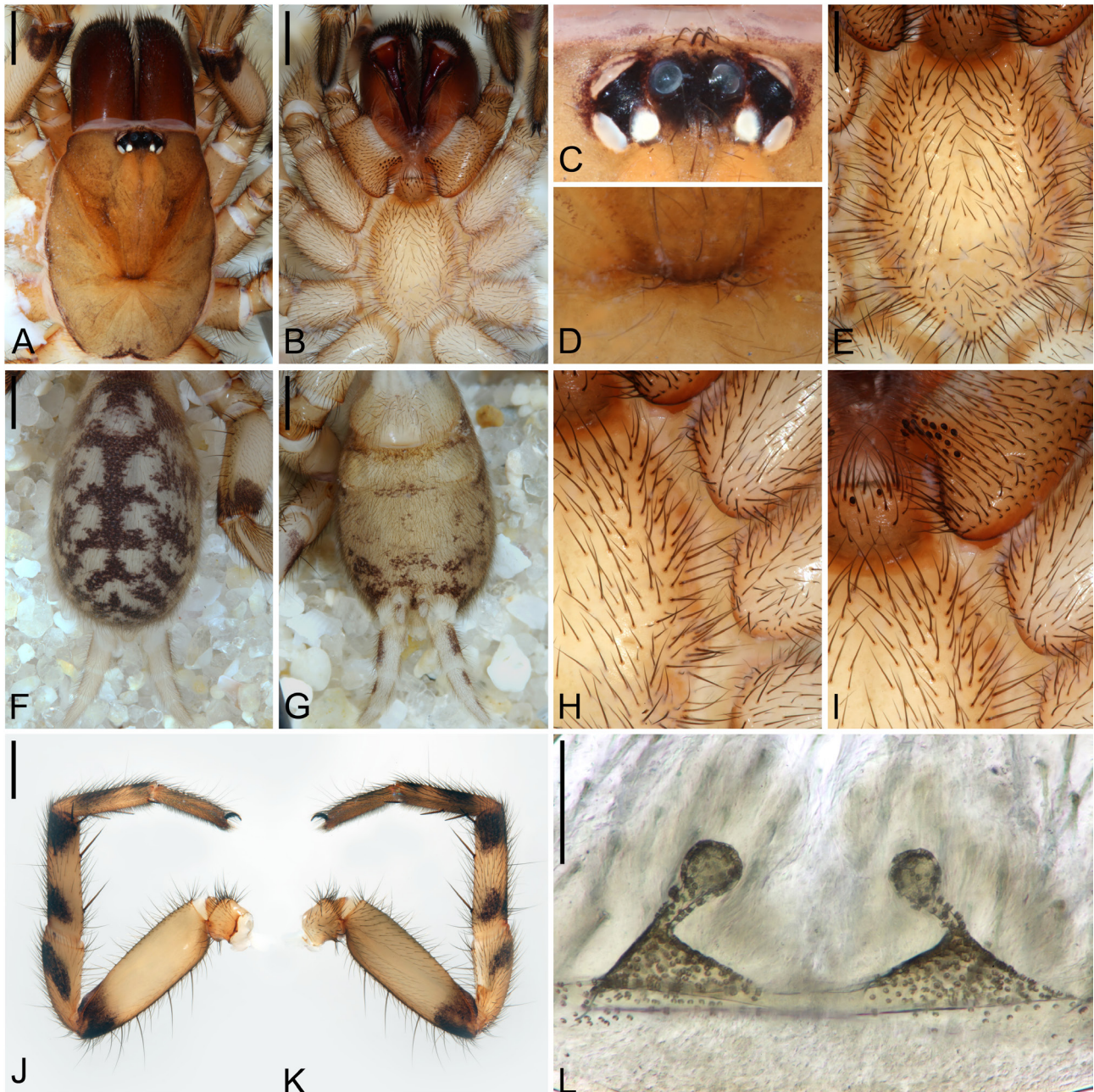


Figure 4. *Stanwellia longinqua*, sp. nov., holotype female (WAM T160666): A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, left sternal sigilla; I, left maxilla and anterior coxae; J, left leg I, prolateral view; K, left leg I, retrolateral view; L, spermathecae, dorsal view. Scale bars: A–B, F–G, J–K = 1.0 mm, E = 0.5 mm, L = 0.2 mm.

Cephalothorax: carapace (Figure 6A) $1.42 \times$ longer than broad; sparsely pilose; clypeal edge slightly convex. Fovea (Figure 6D) straight. Eyes (Figure 6C): on distinct mound; from above, anterior eye row straight, posterior eye row slightly recurved; ALE broader than AME; PLE larger than PME; ALE largest, PME smallest; eye group length 0.34, width 0.85. Chelicerae (Figure 6A, 6B) densely setose with setae arranged in thick bands; rastellum absent; promargin of tooth row with 7 teeth, retromargin without teeth. Labium (Figure 6E) fused to sternum, with 2 cusps. Maxillae (Figure 6I) with 30 (left), 32 (right) cusps, clustered near medial edge. Sternum (Figure 6E): oval, posteriorly pointed; $2.00 \times$

longer than broad; uniformly setose, setae on lateral and posterior margins longer than others; with 3 pairs of sigilla (Figure 6H), posterior pair larger than others.

Pedipalp: with thick scopula.

Legs: coxal cusps absent; scopula present on metatarsi and tarsi I and II, but absent from legs III and IV; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 6F, 6G): $1.75 \times$ longer than broad, sparsely setose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spin-

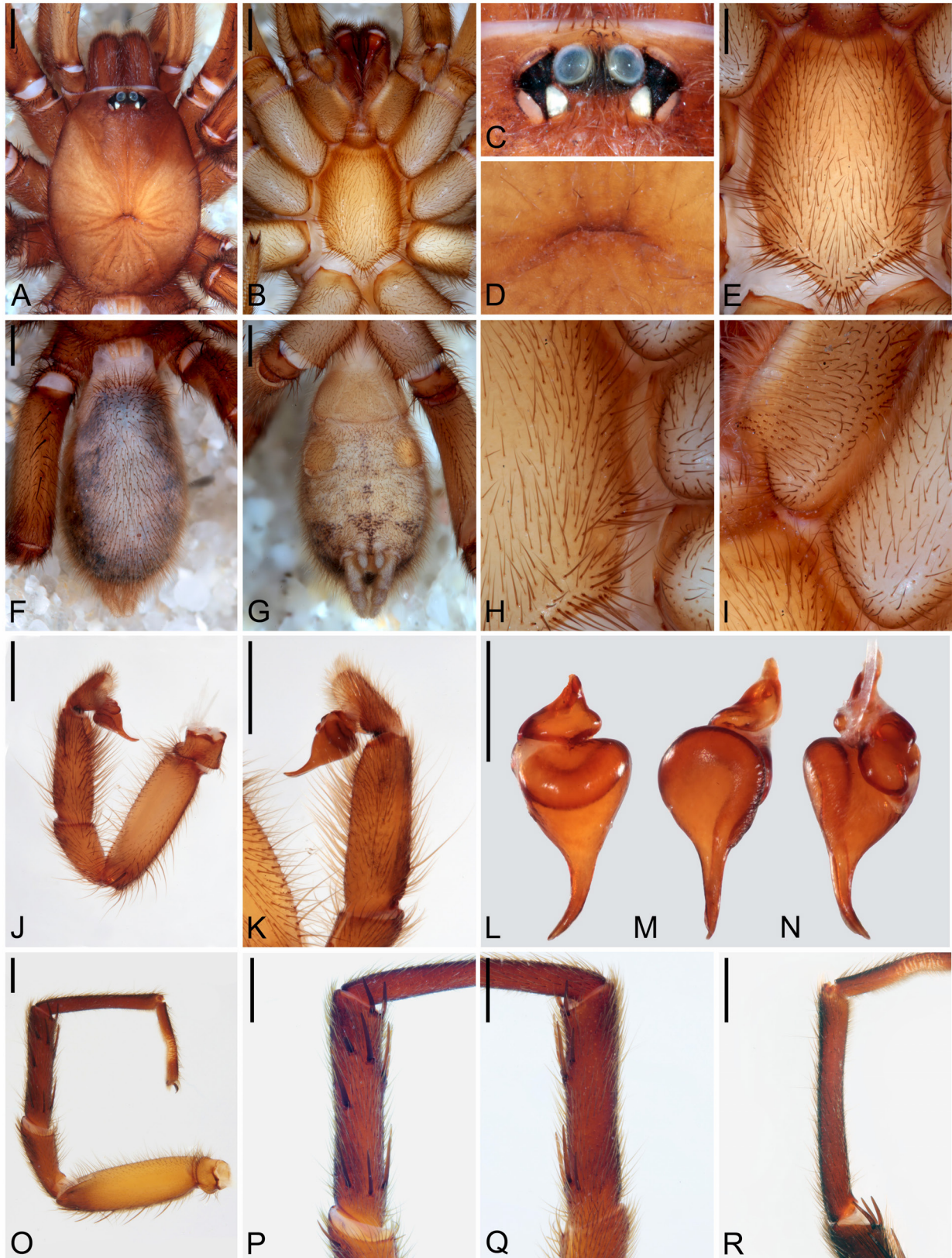


Figure 5. *Stanwellia mainae*, sp. nov., holotype male (WAM T42526): A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, left sternal sigilla; I, left maxilla; J, left pedipalp, prolateral view; K, left pedipalp, tibia and tarsus, retrolateral view; L, left bulb, retrolateral view; M, left bulb, dorsal view; N, left bulb, prolateral view; O, left leg I, prolateral view; P, left tibia I, prolateral view; Q, left tibia I, retrolateral view; R, left metatarsus I, prolateral view. Scale bars: A–B, F–G, J–K, O–R = 1.0 mm, E, L–N = 0.5 mm.

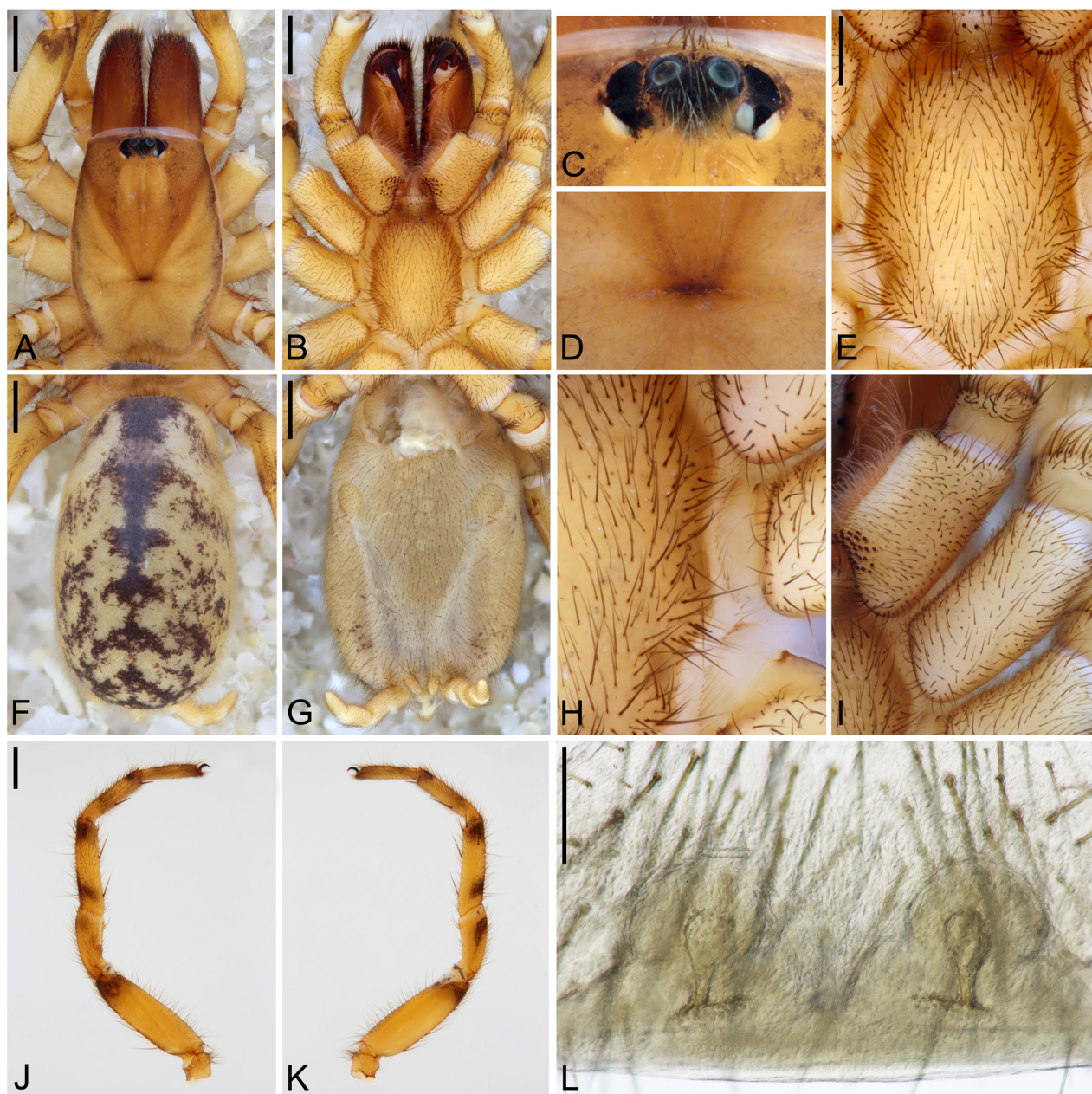


Figure 6. *Stanwellia mainae*, sp. nov., paratype female (WAM T27150): A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, left sternal sigilla; I, left maxilla and anterior coxae; J, right leg I, retrolateral view; K, right leg I, prolateral view; L, spermathecae, dorsal view. Scale bars: A–B, F–G, J = 1.0 mm, E = 0.5 mm, L = 0.2 mm.

neret; PLS 3-segmented, apical segment elongate, digitiform.

Genitalia (Figure 6L): with 1 pair of widely spaced spermathecae, each rather short with bulbous spermathecae head and on a small base.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 12.05, total body length (excluding chelicerae and spinnerets) 10.25; carapace length 3.73, width 2.63; sternum length 3.05, width 1.53. Femur I length 3.05, depth 0.93, L/D 3.27; femur II 2.63, depth 0.85, L/D 3.10; femur III 2.12, depth 0.76, L/D 2.78; femur

IV length 2.97, depth 0.85, L/D 3.50. Abdomen length 5.93, width 3.39.

Variation ($n = 7$): carapace length 4.15–6.61, width 2.80–4.32; L/W 1.40–1.63. Legs: femur I length 3.64–5.00; femur II length 2.54–4.49; femur III length 2.12–3.64; femur IV length 3.05–4.92.

Other material

AUSTRALIA: *Western Australia*: 1 ♀, Stirling Range National Park, Ellen Peak, 34°21'S, 118°19'E, 6 May 1996, S. Barrett (WAM T42528); 1 juvenile, Stirling Range National Park, Ellen Peak, 34°21'20"S, 118°19'45"E, 28 May 1996, wet pitfall trap, S. Barrett (WAM T42529); 3 ♀,

6 juveniles, Stirling Range National Park, Wedge Hill, 34°23'17"S, 118°10'18"E, 2 May–17 December 1996, wet pitfall trap, M.S. Harvey, J.M. Waldock, B.Y. Main (WAM T132542); 1 ♀, Stirling Range National Park, Wedge Hill, 34°25'17"S, 118°10'58"E, 17 December 1996, B.Y. Main (WAM T41624); 1 ♀, Stirling Range National Park, Wedge Hill, 34°25'17"S, 118°10'58"E, 2 May 1996, B.Y. Main (WAM T57431); 1 juvenile, Stirling Range National Park, Wedge Hill, 34°25'17"S, 118°10'58"E, 17 December 1996, B.Y. Main (WAM T41625).

Remarks

This species was known as 'MYG420' in the Western Australian Museum database.

Distribution

Stanwellia mainae has only been collected from the eastern massif of the Stirling Range (Figure 1).

Etymology

This species is named for the late Dr Barbara Main (1929–2019) in honour of her contributions to the study of mygalomorph spiders.

Stanwellia oraria, sp. nov.

Figures 7–9

urn:lsid:zoobank.org:act:250415DA-BDD0-4EA4-A5AF-2D601C6242B2

Stanwellia occidentalis Main: Main, 1972: 109 (in part; misidentification of specimens from Porongurup Range).

Stanwellia 'oraria': Castalanelli et al., 2014: figure 3.

Stanwellia sp. 'MYG419': Harvey et al., 2019: 417, figure 18.

Holotype

AUSTRALIA: *Western Australia*: ♂, Porongurup National Park, S. end of Millinup Pass, 34°41'43"S, 117°53'51"E, 28 April–2 September 1996, wet pitfall trap, M.S. Harvey, J.M. Waldock, B.Y. Main (WAM T165465).

Paratypes

AUSTRALIA: *Western Australia*: 26 ♂, collected with holotype (WAM T32564, T95751, T95753); 40 ♂, same data as holotype except 2 September–16 December 1996 (WAM T40605, T132540, T165861); 2 ♂, 1 ♀, Porongurup National Park, 34°40'56"S, 117°52'30"E, 13 June 1996, wet pitfall trap, S. Barrett (WAM T42531, T165657, T165658).

Diagnosis

Males of *Stanwellia oraria* differ from *S. mainae* from Western Australia, *S. grisea* from Victoria, *S. hoggi* from New South Wales, *S. pexa* from Tasmania, and *S. nebulosa* from South Australia by the shape of the palpal bulb, which is pyriform, and the embolus which has a distinctive terminal inflection (Figures 7L–N, 8C–E, H–J). They also differ from the New Zealand species known from males by the longer and thinner embolus.

Females of *S. oraria* differ from all other described species of *Stanwellia* by the short spermathecal ducts on a single broad trapezoidal base (Figure 9L) (ducts longer and the bases rounded in the others).

Description

Male (based on holotype, WAM T165465)

Colour (in alcohol) (Figures 7A, 7B): carapace red-brown but slightly darker with lines radiating from fovea; legs mostly brown, tarsi with pale transverse medial lines, prolateral face of femur I slightly paler than other segments. Chelicerae uniformly dark red-brown. Abdomen dorsally with grey mottled markings on a yellow-red background, and ventrally with dark grey mottled marking near spinnerets on a yellow-brown background.

Cephalothorax: carapace (Figure 7A) 1.29 × longer than broad; pilose; with silvery setae, as well as black setae posteriorly; clypeal edge convex. Fovea (Figure 7D) recurved. Eyes (Figure 7C): on distinct mound; from above, anterior eye row recurved, posterior eye row slightly recurved; ALE broader than AME; PLE about same size as PME; ALE largest, PME and PLE smallest; eye group length 0.42, width 0.76. Chelicerae (Figure 7A, 7B) densely setose with setae arranged in bands; rastellum absent; promargin of tooth row with 9 teeth, retromargin without teeth. Labium (Figure 7E) fused to sternum, with 3 cuspules. Maxillae (Figure 7I) with 35 (left), 32 (right) cuspules, clustered near medial edge. Sternum (Figure 7E): oval, posteriorly pointed; 1.35 × longer than broad; uniformly setose, setae on lateral and posterior margins longer than others; with 3 pairs of sigilla (Figure 7H), posterior pair larger than others.

Pedipalp (Figures 7J–N): tibia cylindrical, narrow; tarsus short, densely setose; bulb pyriform; embolus shorter than bulb, tapering to fine point, with subdistal flange.

Legs (Figures 7O–Q): coxal cuspules absent; tibia I slender, cylindrical, with several pairs of spines; metatarsus long and slender; scopula absent; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 7F, 7G): 1.91 × longer than broad, densely pilose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spinneret; PLS 3-segmented, apical segment elongate, digitiform.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 11.93, total body length (excluding chelicerae and spinnerets) 9.76; carapace length 4.34, width 3.27; sternum length 2.29, width 1.70. Femur I length 3.22, depth 1.02, L/D 3.17; femur II 2.88, depth 1.02, L/D 2.83; femur III 2.46, depth 1.02, L/D 2.42; femur IV length 3.64, depth 1.10, L/D 3.31. Abdomen length 5.32, width 2.80.

Variation (n = 10): carapace length 3.73–4.41, width 2.63–3.05; L/W 1.37–1.58. Legs: femur I length 2.97–3.31;

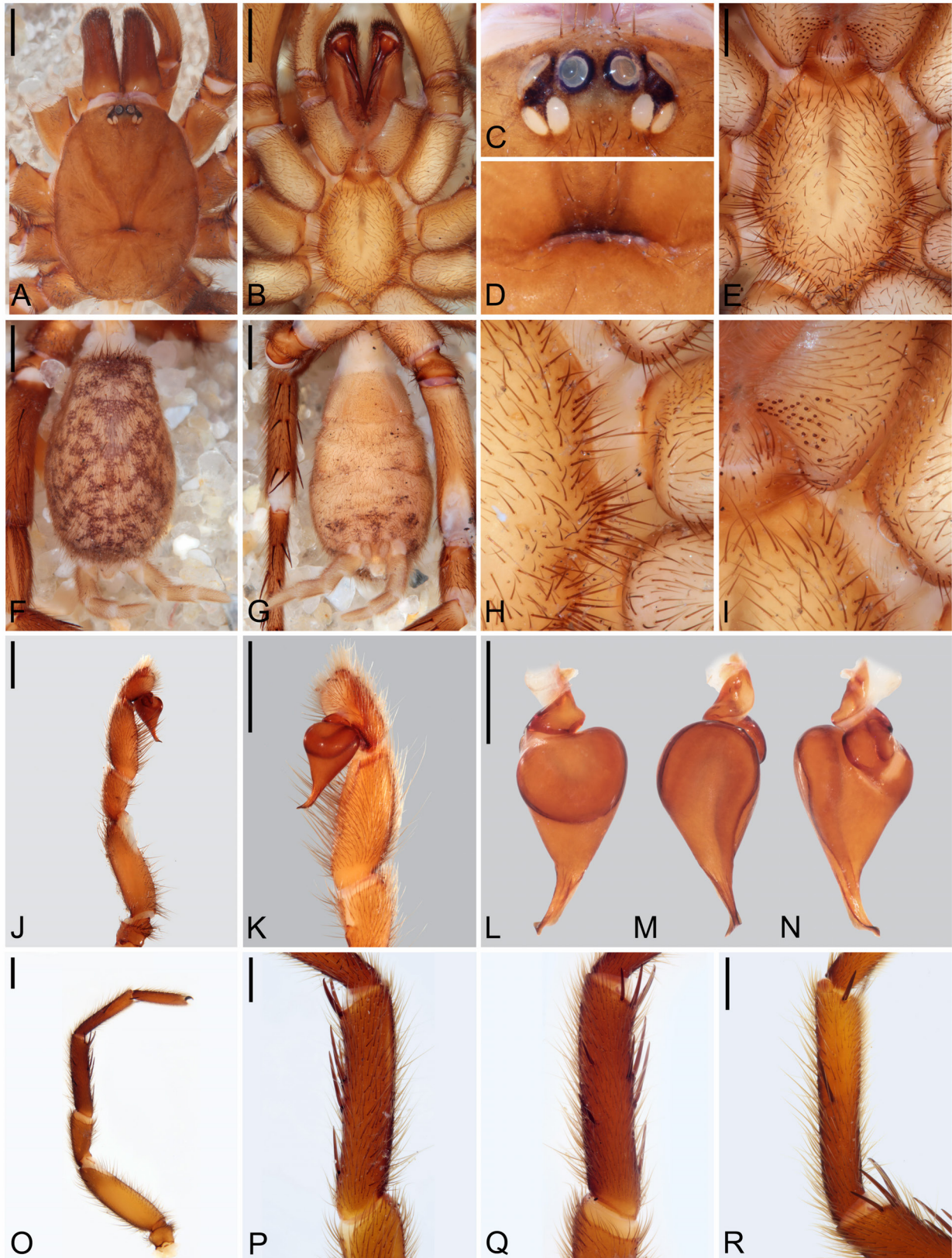


Figure 7. *Stanwellia oraria*, sp. nov., holotype male (WAM T165465) from Porongurup National Park: A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, left sternal sigilla; I, left maxilla; J, left pedipalp, prolateral view; K, left pedipalp, tibia and tarsus, retrolateral view; L, left bulb, retrolateral view; M, left bulb, dorsal view; N, left bulb, prolateral view; O, left leg I, prolateral view; P, left tibia I, retrolateral view; Q, left tibia I, prolateral view; R, left metatarsus I, prolateral view. Scale bars: A–B, F–G, J–K, O = 1.0 mm, E, L–N, P–Q, R = 0.5 mm.

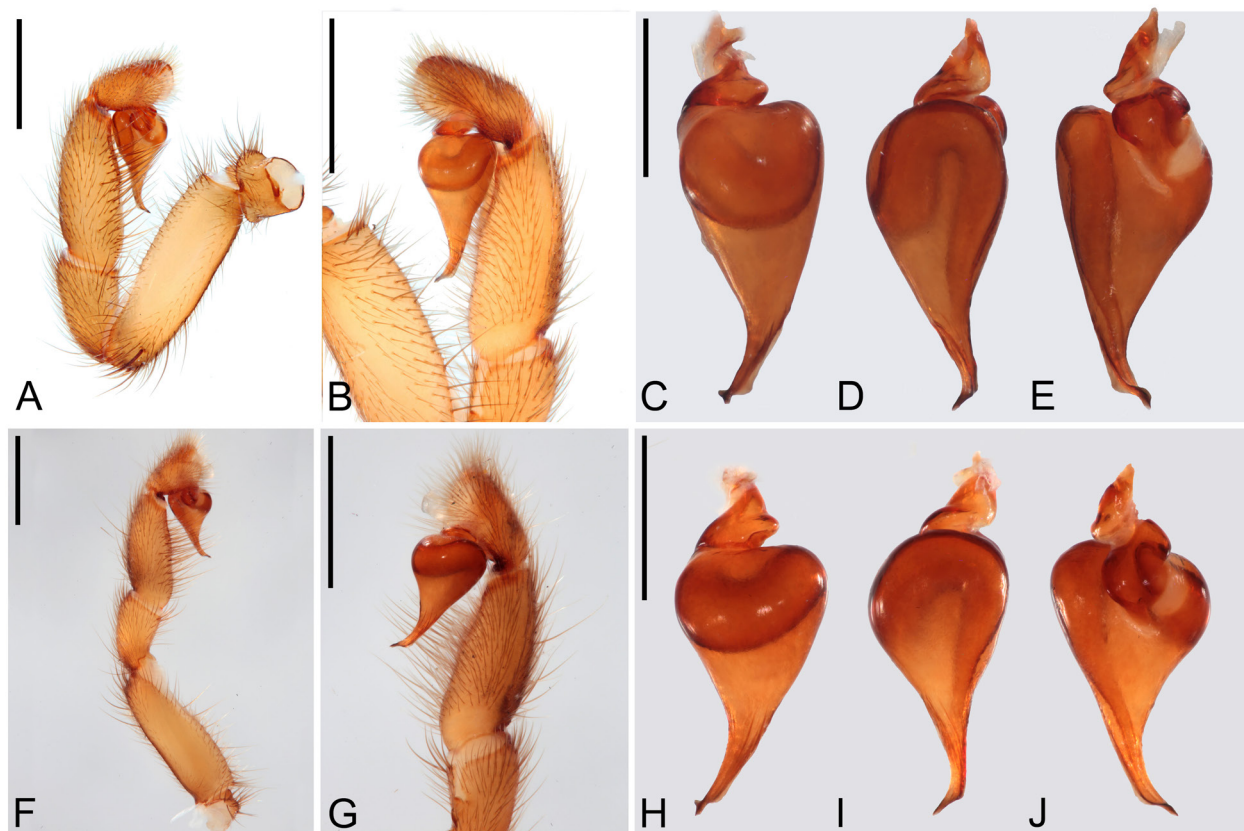


Figure 8. *Stanwellia oraria* sp. nov.: A–E, male (WAM T42530) from Porongurup National Park: A, left pedipalp, prolateral view; B, left pedipalp, tibia and tarsus, retrolateral view; C, right bulb, flipped horizontally, retrolateral view; D, right bulb, flipped horizontally, dorsal view; E, right bulb, flipped horizontally, prolateral view. F–J, male (WAM T47960) from Torbay Head: F, left pedipalp, prolateral view; G, left pedipalp, tibia and tarsus, retrolateral view; H, left bulb, retrolateral view; I, left bulb, dorsal view; J, left bulb, prolateral view. Scale bars: A–B, F–G = 1.0 mm, C–E, H–J = 0.5 mm.

femur II length 2.54–2.97; femur III length 2.20–2.54; femur IV length 2.97–3.31.

Female (based on paratype, WAM T165658)

Colour (in alcohol) (Figures 9A, 9B): carapace red-brown but darker in pars cephalica region, and with lines radiating from fovea; legs mostly brown, but with faint darker markings on femur, patella, tibia, metatarsus and tarsus. Chelicerae uniformly dark red-brown. Abdomen dorsally grey-brown with indistinct darker markings (but specimen poorly preserved), and ventrally mostly grey-brown with darker markings.

Cephalothorax: carapace (Figure 9A) $1.46 \times$ longer than broad; sparsely pilose; clypeal edge slightly convex. Fovea (Figure 9D) slightly procurved. Eyes (Figure 9C): on distinct mound; from above, anterior and posterior eye rows straight; ALE broader than AME; PLE slightly larger than PME; AME largest, PME smallest; eye group length 0.42, width 0.85. Chelicerae (Figure 9A, 10B) densely setose with setae arranged in thick bands; rastellum absent; promargin of tooth row with 9 teeth, retromargin without teeth. Labium (Figure 9E) fused to sternum, with 1 cuspule. Maxillae (Figure 9I) with 34 (left), 35 (right) cuspules, clustered near medial edge. Sternum

(Figure 9E): oval, posteriorly pointed; $1.31 \times$ longer than broad; uniformly setose except for central region, setae on lateral and posterior margins longer than others; with 3 pairs of sigilla (Figure 9H), posterior pair larger than others.

Pedipalp: tarsus with thick scopula.

Legs (Figures 9J, 9K): coxal cuspules absent; scopula present on metatarsi and tarsi I and II, but absent from legs III and IV; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 9F, 9G): $1.57 \times$ longer than broad, sparsely setose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spinneret; PLS 3-segmented, apical segment elongate, digitiform.

Genitalia (Figure 9L): with 1 pair of widely spaced spermathecae, each rather short with bulbous spermathecae head and on a broad base.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 10.84, total body length (excluding chelicerae and spinnerets) 9.40; carapace length 4.58, width 3.13; sternum length 4.66, width 3.56. Femur I length 3.05, depth 1.02, L/D 3.00; femur II 2.71, depth

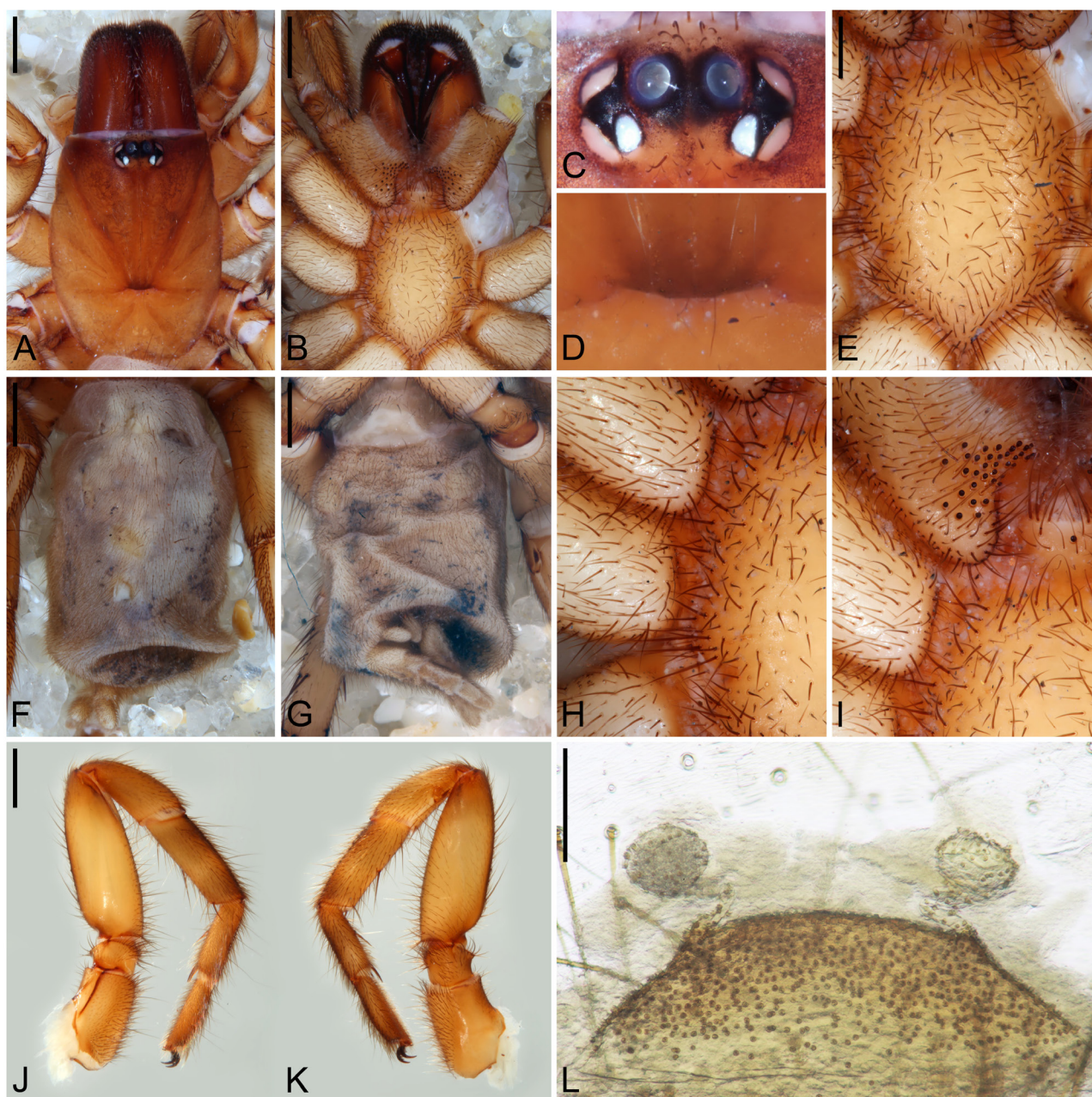


Figure 9. *Stanwellia oraria*, sp. nov., paratype female (WAM T165658): A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, right sternal sigilla; I, right maxilla and anterior coxae; J, left leg I, prolateral view; K, left leg I, retrolateral view; L, spermathecae, dorsal view. Scale bars: A–B, F–G, J–K = 1.0 mm, E = 0.5 mm, L = 0.2 mm.

1.02, L/D 2.67; femur III 2.20, depth 0.93, L/D 2.36; femur IV length 2.97, depth 1.02, L/D 2.92. Abdomen length 4.66, width 2.97.

Variation ($n = 4$): carapace length 3.90–4.66, width 2.71–3.39; L/W 1.30–1.47. Legs: femur I length 2.46–3.05; femur II length 2.37–2.63; femur III length 1.78–2.29; femur IV length 2.54–3.22.

Other material

AUSTRALIA: *Western Australia*: 3 juveniles, Porongurup [National Park], above Bolganup Dam, 34°40'S, 117°52'E, 22 May 1970, pitfall trap, J. Springett (WAM T166013–T166015); 1 juvenile, Porongurup National

Park, Bolganup Creek, 34°40'S, 117°51'E, 8–16 June 1980, mini carrion traps, karri forest, S. & J. Peck (WAM T24161); 1 juvenile, Porongurup National Park, Porongurup Ranges, 34°42'S, 117°53'E, 22 May 1970, J.A. Springett (WAM T28258); 2 ♀, Porongurup Range, ca. 34°41'S, 117°52'E, 8 May 1993, B.Y. Main (WAM T166016, T166017); 1 juvenile, Porongurup National Park, 34°40'55.8"S, 117°51'58.6"E, 450 m, 22 March 1995, pitfall trap, S. Barrett (WAM T32563); 1 juvenile, Porongurup National Park, S. end of Millinup Pass, 34°41'43"S, 117°53'51"E, 31 March 1993, leaf litter, M.S. Harvey, J.M. Waldo (WAM T31405); 4 juveniles, same data except 28 April–2 September 1996, wet pitfall trap, M.S. Harvey,

J.M. Waldock, B.Y. Main (WAM T95752); 7 juveniles, same data except 2 September–16 December 1996 (WAM T40606, T132541); 1 ♀, same data except, 7 June 2002, under logs, M.S. Harvey (WAM T46095); 1 ♀, same data except 34°41'45"S, 117°54'00"E, 15 October 2006, in burrow, M.L. Moir, J.M. Waldock (WAM T78505); 1 ♂, Porongurup National Park, Hayward Peak, 34°40'55.8"S, 117°51'58.6"E, 570 m, 13 June 1996, wet pitfall trap, S. Barrett (WAM T42530); 1 ♂, Torbay Head, Lot 40, 35°05'S, 117°37'E, 3–19 March 1983, pit traps, B.Y. Main (WAM T166025); 1 ♂, same data except 16–31 June 1983 (WAM T166020); 2 ♂, same data except 8 March–26 August 1984 (WAM T166022, T166031); 2 ♂, 1 ♀, same data except 25 April–16 May 1984 (WAM T47958, T47959, T166018); 2 ♂, same data except 16 May–6 September 1984 (WAM T166027, T166029); 1 ♂, same data except 16–23 May 1984 (WAM T166036); 2 ♂, same data except 6 September 1984–7 January 1985 (WAM T166028, T166030); 1 ♂, same data except 23 September–15 October 1984 (WAM T166026); 1 ♂, same data except 15–28 October 1984 (WAM T166035); 2 ♂, same data except 28 October–19 November 1984 (WAM T47960, T47961); 2 ♂, same data except 20 November–15 December 1984 (WAM T166021, T166023); 1 ♂, same data except 15–26 December 1984 (WAM T47962); 2 ♂, same data except 21–26 March 1985 (WAM T166033, T166024); 1 ♂, same data except 10–26 April 1985 (WAM T166034); 1 ♂, same data except 26 April–25 May 1985 (WAM T166037); 1 ♂, same data except 25 May–13 June 1985 (WAM T166019); 1 ♂, same data except 20 July–9 August 1985 (WAM T166032); 1 ♀, same data except 8 October 1987 (WAM T27148); 1 ♂, same data except 6 April 1985, in silk tube (WAM T27149); 1 ♂, Dingo Beach, near Torbay, 35°05'S, 117°38'E, 21 January 1976, pitfall traps, B.Y. Main (WAM T166045); 3 ♀, same data except 25 March 1978 (WAM T166038–166040); 2 ♀, same data except 13 January 1979 (WAM T166044, T166046); 3 ♂, same data except 7 May 1980 (WAM T166041–T166043); 2 ♂, same data except 14 June 1980 (WAM T166047, 166048); 2 ♀, 1 juvenile, Two Peoples Bay Nature Reserve, Fishermans Gully, 35°00'37"S, 118°11'30"E, 19 October 2006, burrow in side of bank, M.L. Moir, J.M. Waldock (WAM T78508–78510).

Remarks

We initially contemplated describing the different populations of *Stanwellia oraria* as different species due to high divergence levels of mitochondrial sequence data, and subtle differences in the morphology of the male palpal bulb. For example, the males have slightly different outlines and terminal keels of the palpal bulb (see Figures 7, 8). However, due to the lack of sequence data for some important specimens including the Torbay population, and the lack of males from the Two Peoples Bay population, we have adopted a cautious approach and included all populations in the same species. More detailed molecular research is required to

fully understand the relationships between the populations.

This species was known as 'MYG419' in the Western Australian Museum database.

Distribution

This species occurs at several mesic sites in southwestern Australia, including Torbay, Two Peoples Bay Nature Reserve, and the Porongurup Range (Figure 1).

Etymology

The species epithet refers to the presence of this species at Torbay Head, where it was first encountered by Dr Barbara Main (*orarius*, Latin, of the coast) (Brown 1956).

Stanwellia pauxilla, sp. nov.

Figure 10

urn:lsid:zoobank.org:act:7507514E-617C-485E-AF76-FAA31F2D2BF1

Stanwellia occidentalis Main: Main, 1972: 109 (in part; misidentification of specimen from Mammoth Cave).

Holotype

AUSTRALIA: *Western Australia*: ♀, Pine Creek on Pine Creek Road, 1 km S. of junction with Scatter Road, 34°17'45"S, 115°50'24"E, 23 June 1991, silk tube in litter and soil, B.Y. Main (WAM T27151).

Paratype

AUSTRALIA: *Western Australia*: 1 ♀, collected with holotype (WAM T166012).

Diagnosis

Females of *Stanwellia pauxilla* differ from all other species of *Stanwellia* for which females are known by the long, ovoid spermathecal heads, each on separate, broad quadrate bases (Figure 10L) (spermathecal heads less elongate in the others).

Males are unknown.

Description

Female (based on holotype, WAM T27151)

Colour (in alcohol) (Figures 10A, 10B): carapace red-brown, and with faint lines radiating from fovea; legs mostly red-brown, but with darker markings on distal end of femur, subdistal regions of patella, and basal and distal ends of tibia, metatarsus without dark markings. Chelicerae uniformly red-brown. Abdomen dorsally grey-brown with darker markings including a median stripe and lateral chevrons, and ventrally mostly grey-brown.

Cephalothorax: carapace (Figure 10A) 1.52 × longer than broad; sparsely pilose; clypeal edge slightly convex. Fovea (Figure 10D) straight. Eyes (Figure 10C): on distinct mound; from above, anterior eye row straight, posterior

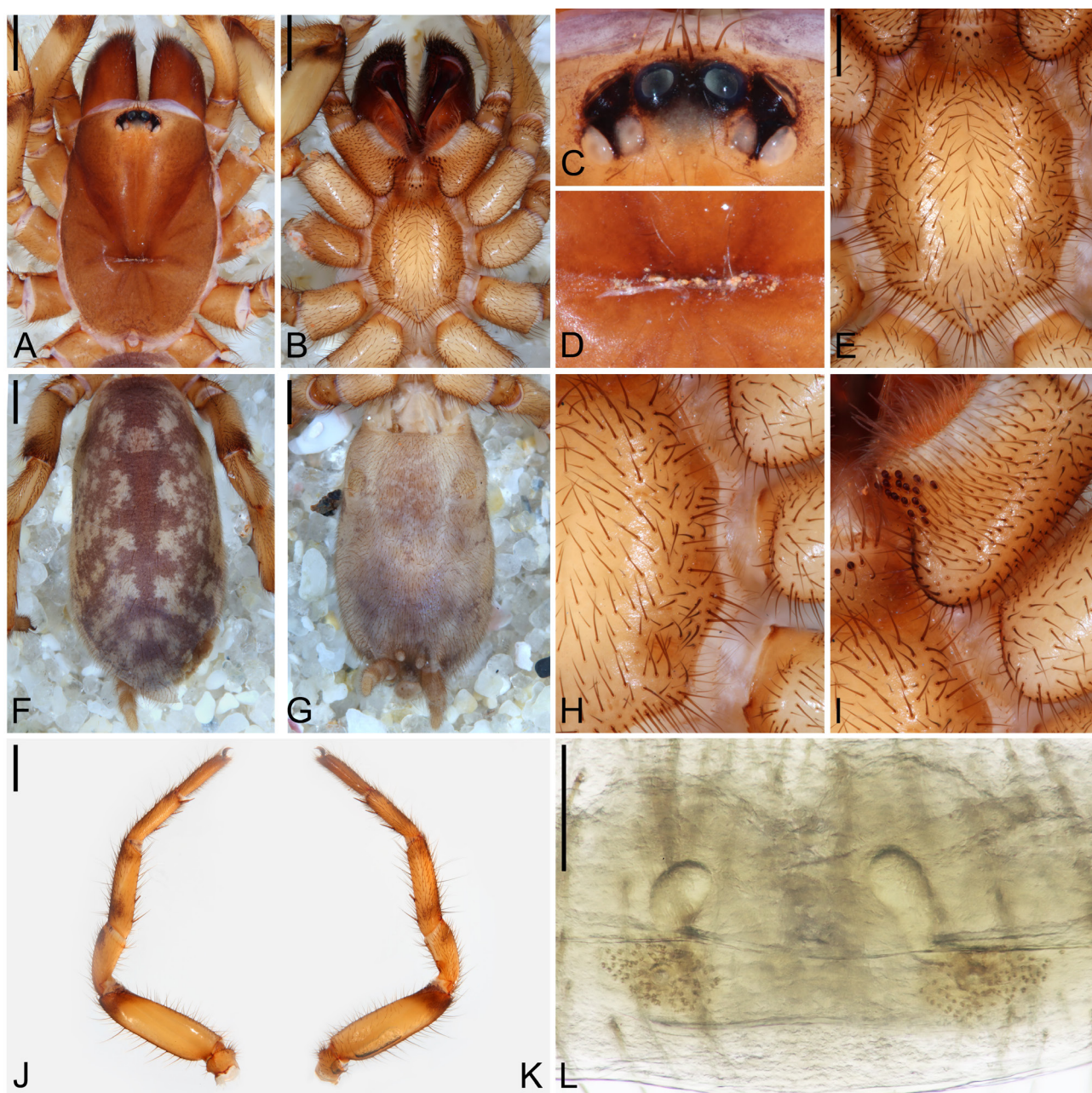


Figure 10. *Stanwellia pauxilla*, sp. nov., holotype female (WAM T27151): A, cephalothorax, dorsal view; B, cephalothorax, ventral view; C, ocular region; D, fovea; E, sternum; F, abdomen, dorsal view; G, abdomen, ventral view; H, left sternal sigilla; I, left maxilla and anterior coxae; J, left leg I, prolateral view; K, left leg I, retrolateral view; L, spermathecae, dorsal view. Scale bars: A–B, F–G, J–K = 1.0 mm, E = 0.5 mm, L = 0.2 mm.

eye row slightly recurved; ALE broader than AME; PLE larger than PME; ALE largest, PME smallest; eye group length 0.42, width 0.93. Chelicerae (Figure 10A, 10B) densely setose with setae arranged in bands; rastellum absent; promargin of tooth row with 10 (left) and 7 (right) teeth, retromargin without teeth. Labium (Figure 10E) fused to sternum, with 3 cuspules. Maxillae (Figure 10I) with 15 (left), 16 (right) cuspules, clustered near medial edge. Sternum (Figure 10E): oval, posteriorly pointed; $1.25 \times$ longer than broad; uniformly setose, setae on lateral and posterior margins longer than others; with 3 pairs of sigilla (Figure 10H), posterior pair larger than others.

Pedipalp: with sparse scopula on distal half of tarsus.

Legs (Figures 10J, 10K): coxal cuspules absent; scopula absent on all legs; claws with 2 rows of teeth; claw tufts absent.

Abdomen (Figures 10F, 10G): $2.05 \times$ longer than broad, sparsely setose. Spinnerets: 2 pairs of spinnerets; PMS unsegmented and separated by about diameter of spinneret; PLS 3-segmented, apical segment elongate, digitiform.

Genitalia (Figure 10L): with 1 pair of widely spaced spermathecae, each with very short stalks and long, ovoid

spermathecal head directed anteromedially, each on separate broad quadrate bases.

Dimensions (mm): total body length (with chelicerae, but excluding spinnerets) 13.13, total body length (excluding chelicerae and spinnerets) 11.81; carapace length 4.22, width 2.77; sternum length 2.12, width 1.70. Femur I length 2.63, depth 0.85, L/D 3.10; femur II 2.46, depth 0.85, L/D 2.90; femur III 1.86, depth 0.85, L/D 2.20; femur IV length 2.88, depth 0.93, L/D 3.09. Abdomen length 7.12, width 3.47.

Remarks

The juveniles from the Blackwood River and Mammoth Cave are matched with the female from Pine Creek due to their proximity in forest ecosystems that were contiguous prior to the onset of land clearing in the 19th century.

This species was known as 'MYG631' in the Western Australian Museum database.

Distribution

Stanwellia pauxilla is known from three sites situated in the Jarrah Forest and Warren bioregions (Figure 1).

Etymology

The specific epithet refers to rarity of specimens in museum collections (*pauxillus*, Latin, paucity) (Brown 1956).

Other material

AUSTRALIA: *Western Australia*: 1 juvenile, collected with holotype (WAM T166010); 1 juvenile, near Blackwood River, at Jalbarragup Road, 34°02'28"S, 115°36'06"E, 21 October 2018, in vertical silk-lined burrow in clay soil, M.S. Harvey, M.E. Blosfelds (WAM T146689); 1 juvenile, about 3 miles from Mammoth Cave, ca. 34°04'S, 115°02'E, 26 October 1953, ex burrow, B.Y. Main (WAM T166011).

Disclosures

This study was funded by a grant from the BHP Social Investment Fund. Some of the specimens included in this study were registered into the Western Australian Museum collection via a grant from the Atlas of Living Australia.

Acknowledgments

We thank the staff from Western Australian Museum's Genetic Resources Unit for supplying the new sequence data. Some of the specimens were collected during a BushBlitz Expedition to Esperance and we are grateful to the Esperance Tjaltjraak Cultural Rangers and the staff of BushBlitz for their assistance. BushBlitz is a program run by the Australian Government in partnership with Broken Hill Proprietary Company Limited (BHP) and Earthwatch Australia to document Australian flora and

fauna. We are grateful to Asher Newton and Julianne Waldock for their assistance with this project.

References

- Brown RW (1956) Composition of scientific words. Revised edition. Smithsonian Institution Press, Washington, D.C.
- Castalanelli MA, Framenau VW, Huey JA, Hillyer MJ & Harvey MS (2020) New species of the open-holed trapdoor spider genus *Aname* (Araneae: Mygalomorphae: Anamidae) from arid Western Australia. *Journal of Arachnology* 48: 169–213. <https://doi.org/10.1636/0161-8202-48.2.169>
- Castalanelli MA, Teale R, Rix MG, Kennington JW & Harvey MS (2014) Barcoding of mygalomorph spiders (Araneae: Mygalomorphae) in the Pilbara bioregion of Western Australia reveals a highly diverse biota. *Invertebrate Systematics* 28: 375–385. <https://doi.org/10.1071/IS13058>
- Environment Australia (2000) Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and Development of Version 5.1. Environment Australia. Online at <https://www.dcceew.gov.au/environment/land/nrs/publications/revision-ibra-development-of-version-5-1-summary-report>, accessed on.
- Forster RR & Wilton CL (1968) The spiders of New Zealand. Part II. *Otago Museum Bulletin* 2: 1–180.
- Harvey MS (2019) Professor Barbara York Main BSc, PhD (UWA), OAM 27th January 1929 – 14th May 2019. *Journal of the Royal Society of Western Australia* 102: 28–29. https://www.rswa.org.au/wp-content/uploads/2023/10/RSWA-102-p28-29_Obituary-Main.pdf
- Harvey MS, Hillyer MJ, Main BY, Moulds TA, Raven RJ, Rix MG, Vink CJ & Huey JA (2018) Phylogenetic relationships of the Australasian open-holed trapdoor spiders (Araneae: Mygalomorphae: Nemesiidae: Anaminae): multi-locus molecular analyses resolve the generic classification of a highly diverse lineage. *Zoological Journal of the Linnean Society* 184: 407–452. <https://doi.org/10.1093/zoolinnean/zlx111>
- Kalyaanamoorthy S, Minh BQ, Wong TK, Von Haeseler, A & Jermini LS (2017) ModelFinder: fast model selection for accurate phylogenetic estimates. *Nature Methods*, 14: 587–589. <https://doi.org/10.1038/nmeth.4285>
- Katoh K, Misawa K, Kuma K-I & Mityata T (2002) MAFFT: a novel method for rapid multiple sequence alignment based on fast Fourier transform. *Nucleic Acids Research* 30: 3059–3066. <https://doi.org/10.1093/nar/gkf436>
- Katoh K & Standley DM (2013) MAFFT multiple sequence alignment software Version 7: improvements in performance and usability. *Molecular Biology and Evolution* 30: 772–780. <http://dx.doi.org/10.1093/molbev/mst010>

- Kearse M, Moir R, Wilson AC, Stones-Havas S, Cheung M, Sturrock S, Buxton S, Cooper A, Markowitz S, Duran C, Thierer T, Ashton B, Meintjes P & Drummond AJ (2012) Geneious Basic: An integrated and extendable desktop software platform for the organization and analysis of sequence data. *Bioinformatics* 28(12): 1647–1649. <https://doi.org/10.1093/bioinformatics/bts199>
- Main BY (1972) The mygalomorph spider genus *Stanwellia* Rainbow and Pulleine (Dipluridae) and its relationship to *Aname* Koch and certain other diplurine genera. *Journal of the Royal Society of Western Australia* 55: 100–114. <https://www.biodiversitylibrary.org/page/51351348#page/6/mode/1up>
- Main BY (1983) Further studies on the systematics of Australian Diplurinae (Chelicerata: Mygalomorphae: Dipluridae): two new genera from southwestern Australia. *Journal of Natural History* 17: 923–949. <https://doi.org/10.1080/00222938300770731>
- Minh BQ, Schmidt HA, Chernomor O, Schrempf D, Woodhams MD, von Haeseler A & Lanfear R (2020) IQ-TREE 2: new models and efficient methods for phylogenetic inference in the genomic era. *Molecular Biology and Evolution* 37: 1530–1534. <https://doi.org/10.1093/molbev/msaa015>
- Montes de Oca L, Indicatti RP, Opatova V, Almeida M, Pérez-Miles F & Bond JE (2022) Phylogenomic analysis, reclassification, and evolution of South American nemesioid burrowing mygalomorph spiders. *Molecular Phylogenetics and Evolution* 168. <https://doi.org/10.1016/j.ympev.2021.107377>
- Opatova V, Hamilton CA, Hedin M, Montes de Oca L, Kral J & Bond JE (2020) Phylogenetic systematics and evolution of the spider infraorder Mygalomorphae using genomic scale data. *Systematic Biology* 69: 671–707. <https://doi.org/10.1093/sysbio/syz064>
- Rainbow WJ & Pulleine RH (1918) Australian trap-door spiders. *Records of the Australian Museum* 12: 81–169. <https://doi.org/10.3853/j.0067-1975.12.1918.882>
- Raven RJ (1981) A review of the Australian genera of the mygalomorph spider subfamily Diplurinae (Dipluridae: Chelicerata). *Australian Journal of Zoology* 29: 321–363. <https://doi.org/10.1071/zo9810321>
- Raven RJ (1985) The spider infraorder Mygalomorphae (Araneae): cladistics and systematics. *Bulletin of the American Museum of Natural History* 182: 1–180. <https://digitallibrary.amnh.org/items/17185b7e-38ca-4ee5-a69f-4b2c4b83bd42>
- Rix MG, Edwards DL, Byrne M, Harvey MS, Joseph L & Roberts JD (2015) Biogeography and speciation of terrestrial fauna in the south-western Australian biodiversity hotspot. *Biological Reviews* 90: 762–793. <https://doi.org/10.1111/brv.12132>
- Rix MG, Raven RJ, Main BY, Harrison SE, Austin AD, Cooper SJB & Harvey MS (2017) The Australasian spiny trapdoor spiders of the family Idiopidae (Mygalomorphae: Arbanitinae): a relimitation and revision at the generic level. *Invertebrate Systematics* 31: 566–634. <https://doi.org/10.1071/IS16065>
- Thackway R & Cresswell ID, eds (1995) An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves. Australian Nature Conservation Agency, Canberra.
- Todd V (1945) Systematic and biological account of the New Zealand Mygalomorphae (Arachnida). *Transactions and Proceedings of the Royal Society of New Zealand* 74: 375–407. <https://paperspast.natlib.govt.nz/periodicals/TPRSNZ1944-74.2.6.27>
- Trifinopoulos J, Nguyen L-T, von Haeseler A & Minh BQ (2016) W-IQ-TREE: a fast online phylogenetic tool for maximum likelihood analysis. *Nucleic Acids Research* 44(W1): W232–W235. <https://doi.org/10.1093/nar/gkw256>
- World Spider Catalog (2025). World Spider Catalog. Version 26. Accessed on 17 June 2025. <http://wsc.nmbe.ch>
- Natural History Museum Bern: Bern.



This paper was typeset using Prince

www.princexml.com