

New species of the pseudoscorpion genus *Synsphyronus* (Pseudoscorpiones: Garypidae) from Australia

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ABSTRACT – The pseudoscorpion genus *Synsphyronus* is endemic to the Australasian region with 30 species from Australia, two from New Zealand, and one from New Caledonia. Seven new species are described from Australia mostly based on specimens collected on various BushBlitz expeditions: *S. codyi* sp. nov., *S. patricki* sp. nov., *S. pharangites* sp. nov., *S. samueli* sp. nov. and *S. xynus* sp. nov. from Western Australia, and *S. marinae* sp. nov. and *S. sertus* sp. nov. from the Northern Territory. Like other species of *Synsphyronus*, all species have reduced trichobothrial numbers on at least one chelal finger, with *S. codyi*, *S. patricki*, *S. samueli* and *S. sertus* having eight trichobothria on the fixed finger and three on the movable finger (denoted as 8/3), *S. marinae* has 8/2, *S. xynus* has 8/1 and *S. pharangites* has 7/1. Five of the new species (*S. codyi*, *S. marinae*, *S. pharangites*, *S. sertus* and *S. xynus*) have fused metatarsi and tarsi, which brings the total number of species with this neotenic feature to 12 of the 40 named species. Certain meristic data for *S. gurdoni* Harvey, Abrams and Burger, 2015 are corrected. Six of the new species have only been found at a single location, despite concentrated searching for additional specimens in adjacent habitats, and may have very small distributions indicative of short-range endemism. The seventh species, *S. xynus*, is widely distributed in the Pilbara region of Western Australia. COI barcode data are provided for *S. marinae*, *S. sertus* and *S. xynus*.

KEYWORDS: taxonomy, morphology, short-range endemics, BushBlitz, COI barcode

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INTRODUCTION

The pseudoscorpion family Garypidae is represented by two subfamilies with dissimilar distributions. Garypinae includes 34 species of *Garypus* L. Koch, 1873 and three species of *Anchigarypus* Harvey, 2020, all from supralittoral habitats mostly in tropical and subtropical regions of the world (e.g. Beier 1963; Chamberlin 1921; Harvey 2021; Harvey et al. 2020; Hummelinck 1948; Lee 1979; Mahnert 1982b). Synsphyroninae includes 57 species in nine genera from Africa, Madagascar, the Arabian Peninsula, Australasia and various islands in the Indian Ocean (Harvey 2013). Seven of these genera are restricted to the Afrotropical region where they are generally found in rocky outcrops and desert habitats: *Ammogarypus* Beier, 1962, *Elattogarypus* Beier, 1964, *Eremogarypus* Beier, 1955, *Meiogarypus* Beier, 1955, *Neogarypus* Vachon, 1937,

Paragarypus Vachon, 1937 and *Thaumastogarypus* Beier, 1947 (e.g. Beier 1947; Beier 1955, 1958, 1962, 1964c, 1973; Mahnert 1982b, 1984b, 2007; Vachon 1937a, b). Two others occur outside of Africa. *Anagarypus* Chamberlin, 1930 has been recorded from northern Australia and several Indian Ocean islands where they occur under rocks or log bark near the seashore (Beier 1981; Chamberlin 1930; Muchmore 1982). The largest synsphyronine genus, *Synsphyronus* Chamberlin, 1930, is endemic to Australasia where there are currently 33 named species (e.g. Beier 1966b, 1971; Chamberlin 1930, 1943; Harvey 1987b, 2011, 2012, 2020; Harvey et al. 2015a). Most species have been described from Australia, including Tasmania, but two are endemic to New Zealand (Beier 1966b; Chamberlin 1930; Harvey 1987b), and another is endemic to New Caledonia (Harvey 2020). Many additional unnamed

species are also known from Australia that mostly occur under rocks or tree bark in semi-arid and arid ecosystems (Harvey, unpublished data).

One of the most interesting aspects of the morphology of *Synsphyronus* species is the lability of two features that are relatively well conserved in other pseudoscorpion genera. The first is the fusion of the metatarsus and tarsus in the adults of some species. This feature was used by Chamberlin (1930) to distinguish *Synsphyronus* from Australia from the morphologically similar *Maorigarypus* Chamberlin, 1930 from New Zealand which retained the non-fused condition found in other garypids. After discovering two morphologically similar species that had either condition, Chamberlin (1943) synonymized *Maorigarypus* with *Synsphyronus*.

The second feature comprises differences in the number of trichobothria on the chelal fingers. While most adult pseudoscorpions have eight trichobothria on the fixed finger and four on the movable finger, there are numerous alternative states (Harvey 1992). For example, all species of the neobisioid family Ideoroncidae have supernumerary trichobothria on both fingers (e.g. Harvey 1992; Harvey 2016; Harvey and Du Preez 2014; Harvey and Muchmore 2013; Mahnert 1981, 1984a) ranging from 17 to 32 in number and all Menthidae have 11 trichobothria on the fixed finger (e.g. Harvey 1992; Harvey and Muchmore 1990). Reductions in trichobothrial number are far more common, occur independently in several different families, and most likely result from neoteny (Sakayori 1989). Examples include the presence of seven trichobothria on the fixed finger of *Microbisium* Chamberlin, 1930 (family Neobisiidae) (e.g. Beier 1963; Nelson 1984; Sakayori 1989), *Microlothrus* Mahnert, 1985 (Syrinidae) (Mahnert 1985), *Anagarypus* Chamberlin, 1930 (Garypidae) (Muchmore 1982), several genera of Garypinidae (*Aldabrinus* Chamberlin, 1930, *Galapagodinus* Beier, 1978, *Nelsoninus* Beier, 1967 and *Paraldabrinus* Beier, 1966) (Beier 1966a, 1967, 1976, 1978; Mahnert 2014; Muchmore 1974), two species of *Geogarypus* (Geogarypidae) (Harvey 1986, 1987a), most genera of Cheiridiidae (but occasionally with five or six) (e.g. Beier 1963; Benedict 1978; Harvey 1992; Mahnert 1982a; Vitali-di Castri 1962), Sternophoridae (e.g. Harvey 1985), *Canarichelifer* Beier, 1965 (Cheliferidae) (Beier 1965), and *Anaperochernes* Beier, 1964 (Chernetidae) (Beier 1964a, b). Some genera have even fewer fixed finger trichobothria including *Paedobisium* Beier, 1939 (Neobisiidae) (Beier 1939, 1963; Cîrdei et al. 1967) with six trichobothria, *Elattogarypus* Beier, 1964 and *Meiogarypus* Beier, 1955 (Garypidae) (Beier 1955, 1964c; Mahnert 1984b, 2007) and *Solinellus* Muchmore, 1979 (Garypinidae) with five trichobothria (Muchmore 1979). The reduction in trichobothria on the movable finger is even more prevalent, with many species in various families having three, two or even only one trichobothrium; however, there are too many instances to mention here.

Although the standard trichobothrial pattern in *Synsphyronus* is 8/3 (i.e. eight trichobothria on the fixed finger and three trichobothria on the movable finger), several other configurations occur, including 8/2, 8/1, 7/2, 7/1 and 6 (or rarely 5)/2 (Harvey 1987b, 2011, 2012, 2020; Harvey et al. 2015a). This lability is unusual for most pseudoscorpion genera and has led to some taxonomic confusion in the past. One of the features cited by Chamberlin (1943) to justify the recognition of the new genus *Idiogarypus* Chamberlin, 1943 for *S. hansenii* (With, 1908) from Tasmania was the purported presence of only seven trichobothria on the fixed finger. Morris (1948) demonstrated that specimens of *S. hansenii* (With, 1908), possessed eight trichobothria on the fixed finger and duly synonymized *Idiogarypus* with *Synsphyronus*.

This paper reports the discovery of seven previously undescribed species of *Synsphyronus* mostly collected from the western half of mainland Australia during several BushBlitz expeditions. BushBlitz is a nature discovery program that seeks to collect and document Australia's biodiversity by organising expeditions to remote locations (see <https://bushblitz.org.au/>).

MATERIAL AND METHODS

The material utilized in the present study is lodged in the Australian Museum, Sydney (AM), Museum and Art Gallery of the Northern Territory, Darwin (NTM), Queensland Museum, Brisbane (QM) and the Western Australian Museum, Perth (WAM). The specimens were examined by preparing temporary slide mounts by immersing the specimen in 75% lactic acid at room temperature for one to several days, and mounting them on microscope slides with 10 or 12 mm coverslips supported by small sections of nylon fishing line. Specimens were examined with a Leica MZ16 dissecting microscope, a Leica DM2500 or Olympus BH-2 compound microscopes, and illustrated with the aid of a drawing tube. Measurements (in mm) were taken at the highest possible magnification using an ocular graticule. After study the specimens were rinsed in water and returned to 75% ethanol with the dissected portions placed in 12 × 3 mm glass genitalia microvials (BioQuip Products, Inc.).

Terminology and mensuration largely follow Chamberlin (1931), with the exception of the nomenclature of the pedipalps, legs and with some minor modifications to the terminology of the trichobothria (Harvey 1992), chelicera (Harvey and Edward 2007; Judson 2007) and faces of the appendages (Harvey et al. 2012).

Molecular sequence data were obtained from three of the nine species of *Synsphyronus* described here (Table 1). The techniques used to obtain the Cytochrome Oxidase 1 sequence data are outlined in Harvey et al. (2015b) and Harvey et al. (2020).

TABLE 1 Specimens used to generate COI barcodes of three species of *Synsphyronus*.

Species	Registration No.	Sex and type status	Locality	GenBank No.
<i>Synsphyronus marinae</i> sp. nov.	WAM T124420	Female paratype	NT, Wongalara Wildlife Sanctuary, Herbert Bluff	MZ920049
<i>Synsphyronus servus</i> sp. nov.	WAM T131645	Male paratype	NT, Henbury Station, James Range, c. 7 km WNW. of Mt Keartland	MZ934365
<i>Synsphyronus xyurus</i> sp. nov.	WAM T135584	Male holotype	WA, Karijini National Park, c. 20 km SW. of Hancock Gorge	OK489973
	WAM T135549	Female paratype	WA, Karijini National Park, c. 20 km SW. of Hancock Gorge	OK489972
	WAM T82355	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK255296
	WAM T82356	Male	WA, Mesa K, 10 km SW. of Pannawonica	OK255297
	WAM T107400	Female	WA, Hope Downs, 74 km NW. of Newman	OK272544
	WAM T108727	Male	WA, Area C, 27.2 km NE. of Tom Price	OK272545
	WAM T108732	Male	WA, Area C, 27.2 km NE. of Tom Price	OK272546
	WAM T111892	Female	WA, Southern Flank to Jinidi, 68.1 km NW. of Newman	OK489974
	WAM T127500	Deutonymph	WA, BlueSpec, 18 km NE. of Nullagine	OK489975
	WAM T133100	Tritonymph	WA, Sulphur Springs	OK272547
	WAM T133101	Male	WA, Sulphur Springs	OK272548
	WAM T133102	Male	WA, Sulphur Springs	OK489976
	WAM T133103	Female	WA, Sulphur Springs	OK272549
	WAM T133104	Female	WA, Sulphur Springs	OK272550
	WAM T133105	Male	WA, Sulphur Springs	OK272551
	WAM T133106	Male	WA, Sulphur Springs	OK489977
	WAM T133107	Male	WA, Sulphur Springs	OK489978
	WAM T133108	Male	WA, Sulphur Springs	OK489979
	WAM T133109	Female	WA, Sulphur Springs	OK489980
	WAM T133110	Male	WA, Sulphur Springs	OK489981
	WAM T133112	Male	WA, Sulphur Springs mine	OK489982
	WAM T133113	Male	WA, Sulphur Springs mine	OK489983

Species	Registration No.	Sex and type status	Locality	GenBank No.
	WAM T133114	Male	WA, Sulphur Springs mine	OK489984
	WAM T133115	Male	WA, Sulphur Springs mine	OK489985
	WAM T133116	Male	WA, Sulphur Springs mine	OK489986
	WAM T133117	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489987
	WAM T133118	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489988
	WAM T133119	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489989
	WAM T133120	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489990
	WAM T133121	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489991
	WAM T133122	Female	WA, Mesa K, 10 km SW. of Pannawonica	OK489992
	WAM T133123	Male	WA, Mesa K, 10 km SW. of Pannawonica	OK489993
	WAM T133124	Tritonymph	WA, Mesa K, 10 km SW. of Pannawonica	OK272552
	WAM T133125	Male	WA, Mesa K, 10 km SW. of Pannawonica	OK272553
	WAM T133126	Female	WA, Tom Price Powerline, 1 km WSW. of Tom Price	OK272554
	WAM T133129	Female	WA, near Sulphur Springs	MN058679
	WAM T133130	Male	WA, near Sulphur Springs	OK489994
	WAM T133131	Male	WA, West Turner Syncline, 18 km W. of Tom Price	OK272555
	WAM T133132	Male	WA, West Turner Syncline, 18 km W. of Tom Price	OK272556
	WAM T133133	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK489995
	WAM T133135	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK272557
	WAM T133137	Female	WA, 64 km NW. of Newman	OK272558
	WAM T133138	Male	WA, West Turner Syncline, 28 km W. of Tom Price	OK272559
	WAM T133139	Female	WA, West Turner Syncline, 28 km W. of Tom Price	OK272560
	WAM T133140	Male	WA, West Turner Syncline, 28 km W. of Tom Price	OK272561
	WAM T133142	Female	WA, West Turner Syncline, 28 km W. of Tom Price	OK272562
	WAM T133143	Male	WA, West Turner Syncline, 28 km W. of Tom Price	OK272563
	WAM T133144	Male	WA, West Turner Syncline, 28 km W. of Tom Price	OK272564

Species	Registration No.	Sex and type status	Locality	GenBank No.
	WAM T133145	Male	WA, 114.4 km NW. of Newman	OK272565
	WAM T133146	Tritonymph	WA, 114.4 km NW. of Newman	OK272566
	WAM T133147	Tritonymph	WA, 114.4 km NW. of Newman	OK272567
	WAM T133154	Male	WA, BlueSpec, 18 km NE. of Nullagine	OK272568
	WAM T133155	Male	WA, BlueSpec, 18 km NE. of Nullagine	OK489996
	WAM T133156	Male	WA, BlueSpec, 18 km NE. of Nullagine	OK489997
	WAM T133157	Protonymph	WA, Nammundi-Silvergrass, 53.6 km NW. of Tom Price	OK489998
	WAM T133158	Male	WA, 52.4 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK489999
	WAM T133170	Female	WA, Area C, 27.2 km NE. of Tom Price	OK272569
	WAM T133172	Male	WA, Area C, 86.2 km NW. of Newman	OK272570
	WAM T133173	Male	WA, West Turner Syncline, 18 km W. of Tom Price	OK272571
	WAM T133174	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK272572
	WAM T133175	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK272573
	WAM T133176	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK272574
	WAM T133177	Female	WA, West Turner Syncline, 18 km W. of Tom Price	OK490000
	WAM T133178	Male	WA, West Turner Syncline, 31 km WSW. of Tom Price	OK272575
	WAM T133179	Male	WA, West Turner Syncline, 31 km WSW. of Tom Price	OK272576
	WAM T133182	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK490001
	WAM T133183	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272577
	WAM T133184	Deutonymph	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272578
	WAM T133185	Deutonymph	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272579
	WAM T133186	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272580
	WAM T133187	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272581
	WAM T133188	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272582
	WAM T133189	Female	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272583
	WAM T133190	Male	WA, Nammundi-Silvergrass, 52.1 km NW. of Tom Price	OK272584

Species	Registration No.	Sex and type status	Locality	GenBank No.
	WAM T133191	Male	WA, Nammuldi-Silvergrass, 52.1 km NW. of Tom Price	OK272585
	WAM T133192	Female	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK272586
	WAM T133193	Male	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK272587
	WAM T133194	Female	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK490002
	WAM T133408	Female	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK272588
	WAM T133409	Male	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK490003
	WAM T133410	Male	WA, Nammuldi-Silvergrass, 52.3 km NW. of Tom Price	OK272589
	WAM T133411	Male	WA, Nammuldi-Silvergrass, 53.6 km NW. of Tom Price	OK272590
	WAM T133413	Male	WA, Area C, 86.2 km NW. of Newman	OK272591
	WAM T133414	Female	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK272592
	WAM T133415	Male	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK272593
	WAM T133416	Tritonymph	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK272594
	WAM T133418	Female	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK272595
	WAM T133419	Female	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK255295
	WAM T133420	Female	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235424
	WAM T133421	Female	WA, 52.2 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235425
	WAM T133423	Male	WA, 52.4 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235426
	WAM T133424	Male	WA, 52.4 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235427
	WAM T133425	Male	WA, 52.4 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235428
	WAM T133426	Male	WA, 50.7 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235429
	WAM T133429	Protonymph	WA, 50.7 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235430
	WAM T133430	Female	WA, 50.7 km W. of Pannawonica, Mesa G (Warramboo Lease)	OK235431
	WAM T133432	Male	WA, Area C, 22.7 km NE. of Tom Price	OK235432
	WAM T133433	Female	WA, Hope Downs, 74 km NW. of Newman	OK235433

Family Garyidae Simon, 1879

Subfamily Synsphyroninae Beier, 1932

Genus *Synsphyronus* Chamberlin, 1930

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Synsphyronus Chamberlin 1930: 616.

Maorigarypus Chamberlin 1930: 617 (synonymised by Chamberlin 1943: 488).

Idiogarypus Chamberlin 1943: 499 (synonymised by Morris 1948: 37).

TYPE SPECIES

Synsphyronus: *Synsphyronus paradoxus* Chamberlin, 1930, by original designation.

Maorigarypus: *Maorigarypus melanochelatus* Chamberlin, 1930, by original designation.

Idiogarypus: *Garypus hansenii* With, 1908, by original designation.

REMARKS

Harvey et al. (2020) have recently treated a variety of garypid genera, including *Synsphyronus*, as members of the subfamily Synsphyroninae. The majority of the synsphyronine genera occur in Africa and Madagascar, although *Anagarypus* Chamberlin, 1930 also occurs in northern Australia and various regions adjacent to the Indian Ocean. *Synsphyronus* is endemic to Australia, New Zealand and New Caledonia.

Most of the new species described below have only ever been collected at a single location, despite considerable collecting effort during each of the BushBlitz expeditions. Due to their extremely small distributions, usually single outcrops or rock formations, they are short-range endemic species sensu (Harvey 2002) and may require conservation management. We note though that sampling bias may affect this assessment to some degree.

Synsphyronus codyi sp. nov.

Figures 1–10

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MATERIAL EXAMINED

Holotype

Australia: Western Australia: ♀, Cane River Conservation Park, Cattle Pool, site CR13, 21°59'19.3"S, 115°34'13.5"E, 24 June 2011, under bark of *Melaleuca argentea*, J.M. Waldock (WAM T115044).

Paratypes

Australia: Western Australia: 3 ♀, collected with holotype (WAM T140359, T140360, T140361); 2 tritonymphs, 1 deutonymph, collected with holotype (WAM T140362–T140364).

DIAGNOSIS

Synsphyronus codyi differs from most other species of the genus by the combined presence of fused metatarsi and tarsi (Figure 9), and eight trichobothria on the fixed chelal finger and three trichobothria on the movable finger (Figure 4). The other species of *Synsphyronus* with this character combination are *S. ejuncidus* Harvey 1987, from Western Australia and South Australia, *S. hadronennus* Harvey, 1987 and *S. sertus* sp. nov. from the Northern Territory, and *S. meganennus* Harvey, 1987 from New South Wales from which it differs by the broad anterior eye (constricted in *S. hadronennus* and *S. meganennus*), *st* slightly closer to *b* than to *t* (much closer to *b* than *t* in *S. ejuncidus*) and the chelal hand (without pedicel) 1.72–1.83 × (♀) longer than broad (2.41–2.73 (♂), 2.09–2.53 (♀) × longer than broad in *S. sertus*).

DESCRIPTION

Adults

Female only. Colour (Figures 1–3) of sclerotised portions generally yellow-brown; tergites II–X with paired darker patches. Epicuticle waxy. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea unbranched; rallum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 17 blades; lamina exterior present.

Pedipalp (Figure 8): trochanter 1.64, femur 3.67–4.70, patella 2.46–3.00, chela (with pedicel) 3.53–3.70, chela (without pedicel) 3.34–3.51, hand (without pedicel) 1.72–1.83 × longer than broad, movable finger 0.85–0.97 × longer than hand (without pedicel). Fixed chelal finger with 8 trichobothria, movable chelal finger with 3 trichobothria (Figure 4): *eb*, *esb* and *isb* situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* subdistally, well posterior to *et*; *st* situated slightly closer to *b* than *t*; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 5); fixed finger with 37 teeth; movable finger with 31 teeth; accessory teeth absent.

Carapace (Figure 3): 0.91 × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of rounded corneate eyes (Figure 10) situated c. one-third carapace length from anterior margin; anterior eye broad; with 4 setae near anterior margin and 5 near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 3 apical acuminate setae, plus 5 additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: 4: 4: 5: 11.

Legs (Figure 9): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.74 × longer than broad; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–X and sternites V–X with median suture line (Figures 1, 2). Tergal chaetotaxy: 4: 4: 6: 6: 8: 6: 6: 6: 4: 2: 2; uniserial; all setae quadricarinate. Sternal chaetotaxy: 6: (0) 7 (0): (0) 8 (0): 8: 8: 9: 10: 9: 7: 4: 2; uniserial; all setae quadricarinate except for setae on sternites II–IV and medial setae on sternites V–VI, which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia: with one pair of lateral cribiform plates and 2 pairs of median cribiform plates.

Dimensions: holotype (WAM T115044) followed by 3 other females (when measured): Body length

4.09 (2.98–3.21). Pedipalps: trochanter 0.475/0.290, femur 1.060/0.250 (0.770–1.080/0.210–0.230), patella 0.770/0.285 (0.590–0.780/0.240–0.260), chela (with pedicel) 1.500/0.420 (1.200–1.500/0.340–0.405), chela (without pedicel) 1.410 (1.160–1.420), hand (without pedicel) length 0.770 (0.590–0.740), movable finger length 0.655 (0.575–0.680). Carapace 0.930/1.02; eye diameter, anterior 0.050, posterior 0.075. Leg IV: femur + patella 0.785/0.21, tibia 0.540/0.120, tarsus 0.360/0.095.

Tritonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

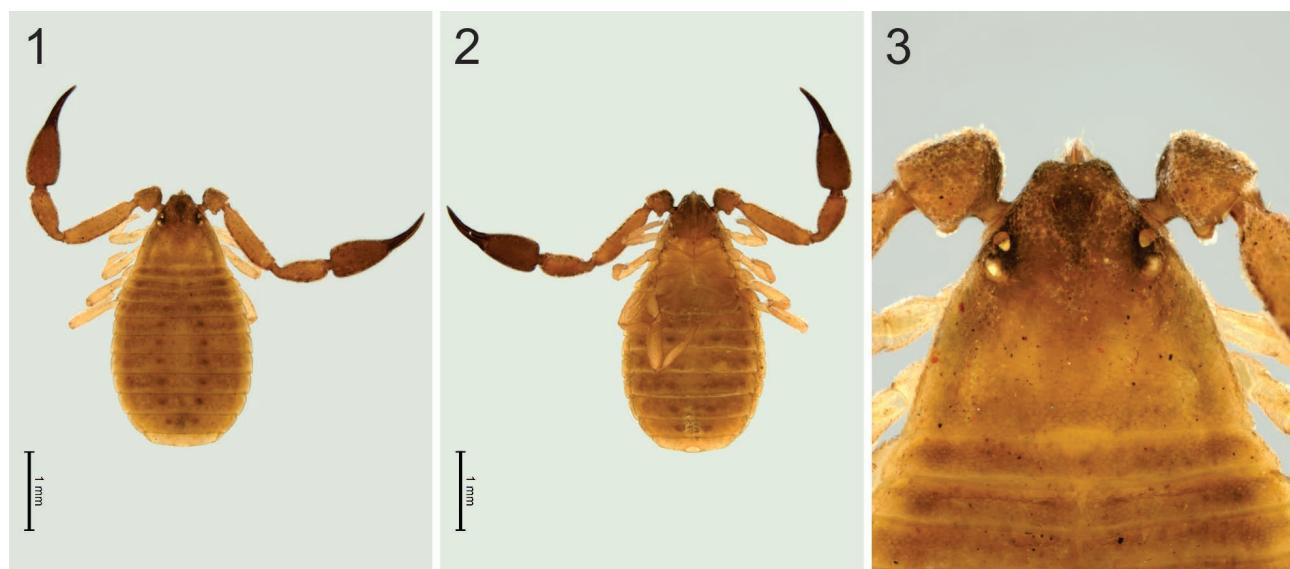
Pedipalp: trochanter 1.38, femur 4.10, patella 2.40, chela (with pedicel) 3.54, chela (without pedicel) 3.34, hand (without pedicel) 1.77 × longer than broad, and movable finger 0.94 × longer than hand (without pedicel). Fixed chelal finger with 7 trichobothria, movable chelal finger with 2 trichobothria (Figure 6): eb, esb, ist and ib situated basally; est situated medially; et distally; it subdistally; b subbasally; t subdistally.

Carapace: 0.82 × longer than broad; with 4 setae near posterior margin.

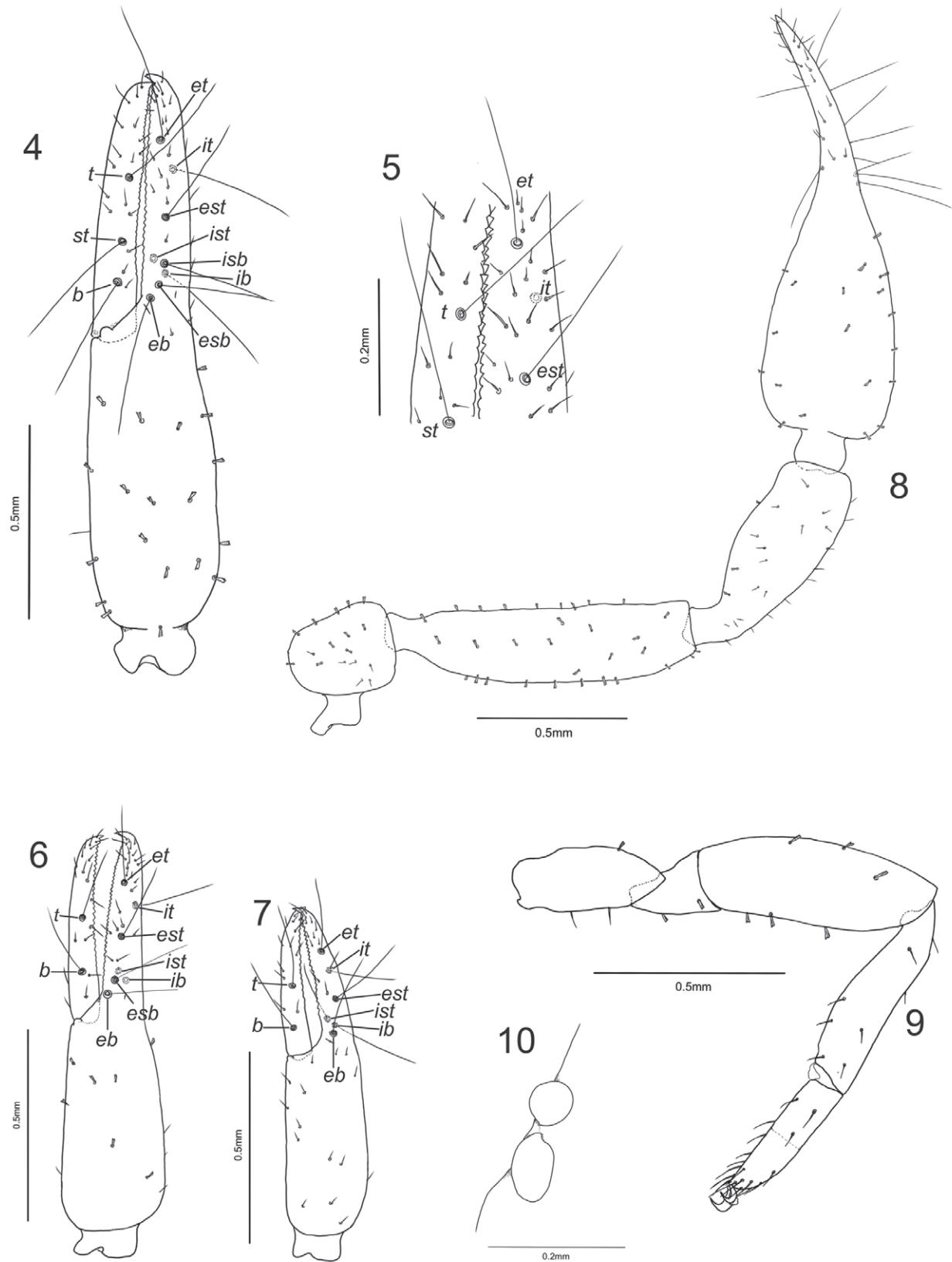
Legs: much as in adults.

Abdomen: tergal chaetotaxy: 4: 4: 4: 6: 6: 7: 7: 8: 8: 6: 4: 2. Sternal chaetotaxy: 2: (0) 4 (0): (0) 4 (0): 6: 6: 6: 6: 4: 2: 2.

Dimensions: WAM T140362: Body length 2.62. Pedipalps: trochanter 0.360/0.260, femur 0.800/0.195, patella 0.540/0.225, chela (with pedicel) 1.080/0.305, chela (without pedicel) 1.020, hand (without pedicel) length 0.540, movable finger length 0.510. Carapace 0.735/0.900.



FIGURES 1–3 *Synsphyronus codyi* sp. nov., holotype ♀ (WAM T115044): 1) body, dorsal; 2) body, ventral; 3) cephalothorax, dorsal.



FIGURES 4–10 *Synsphyronus codyi* sp. nov., holotype ♀ (WAM T115044), unless stated otherwise: 4) left chela, retrolateral; 5) detail of chelal teeth, retrolateral; 6) left chela, retrolateral, tritonymph paratype (WAM T140362); 7) left chela, retrolateral, deutonymph paratype (WAM T140364); 8) right pedipalp, dorsal; 9) left leg IV, retrolateral; 10) left eyes, dorsal.

Deutonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.55, femur 3.73, patella 2.00, chela (with pedicel) 3.45, chela (without pedicel) 3.26, hand (without pedicel) 1.65 × longer than broad, and movable finger 0.95 × longer than hand (without pedicel). Fixed chelal finger with 6 trichobothria, movable chelal finger with 2 trichobothria (Figure 7): *eb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *b* subbasally; *t* subdistally.

Carapace: 0.82 × longer than broad; with 4 setae near posterior margin.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 4: 4: 4: 6: 6: 6: 6: 4: 2. Sternal chaetotaxy: 2: (0) 2 (0): (0) 2 (0): 2: 2: 4: 6: 6: 4: 2: 2.

Dimensions: WAM T140364: Body length 1.73. Pedipalps: trochanter 0.295/0.190, femur 0.560/0.150, patella 0.360/0.180, chela (with pedicel) 0.880/0.255, chela (without pedicel) 0.830, hand (without pedicel) length 0.420, movable finger length 0.400. Carapace 0.590/0.720.

REMARKS

Synsphyronus codyi has been collected from under bark of the silver cajuput, *Melaleuca argentea*, in Cane River Conservation Park, in the southwestern Pilbara region of Western Australia. This tree species occurs in northern Australia and most commonly found along river courses or near swamps (Western Australian Herbarium 1998–2021).

ETYMOLOGY

This species is named for the senior authors' son Cody Cullen.

Synsphyronus marinae sp. nov.

Figures 11–22

urn:lsid:zoobank.org:act:837F3243-D7B5-4C4D-9906-40F387BFD602

MATERIAL EXAMINED

Holotype

Australia: Northern Territory: ♂, Wongalara Wildlife Sanctuary, Herbert Bluff, 14°04'12"S, 134°26'29"E, 103 m, 28 May 2012, under sandstone rocks, M.S. Harvey (NTM A005320).

Paratypes

Australia: Northern Territory: 3 ♂, 3 ♀, 1 deutonymph, collected with holotype (NTM A005321–A005327); 2 ♂, 2 ♀, collected with holotype (WAM T124416, T124420, T140373–140374).

DIAGNOSIS

Synsphyronus marinae differs from all but one species of the genus by the combined presence of fused metatarsi and tarsi (Figure 21), eight trichobothria on the fixed chelal finger, and two trichobothria on the movable finger (Figure 17). The only other species of *Synsphyronus* with this character combination is *S. heptatrichus* Harvey, 1987, from the Northern Territory which it differs by the broad anterior eye (Figure 22) (constricted in *S. heptatrichus*), the long cylindrical chelal hand (Figure 17) (shorter and basally broadened in *S. heptatrichus*), and the larger size, e.g. pedipalpal chela (with pedicel) 1.40 (♂), 1.60 (♀) in *S. marinae*, but 1.10–1.165 (♂), 1.23 (♀) in *S. heptatrichus*.

DESCRIPTION

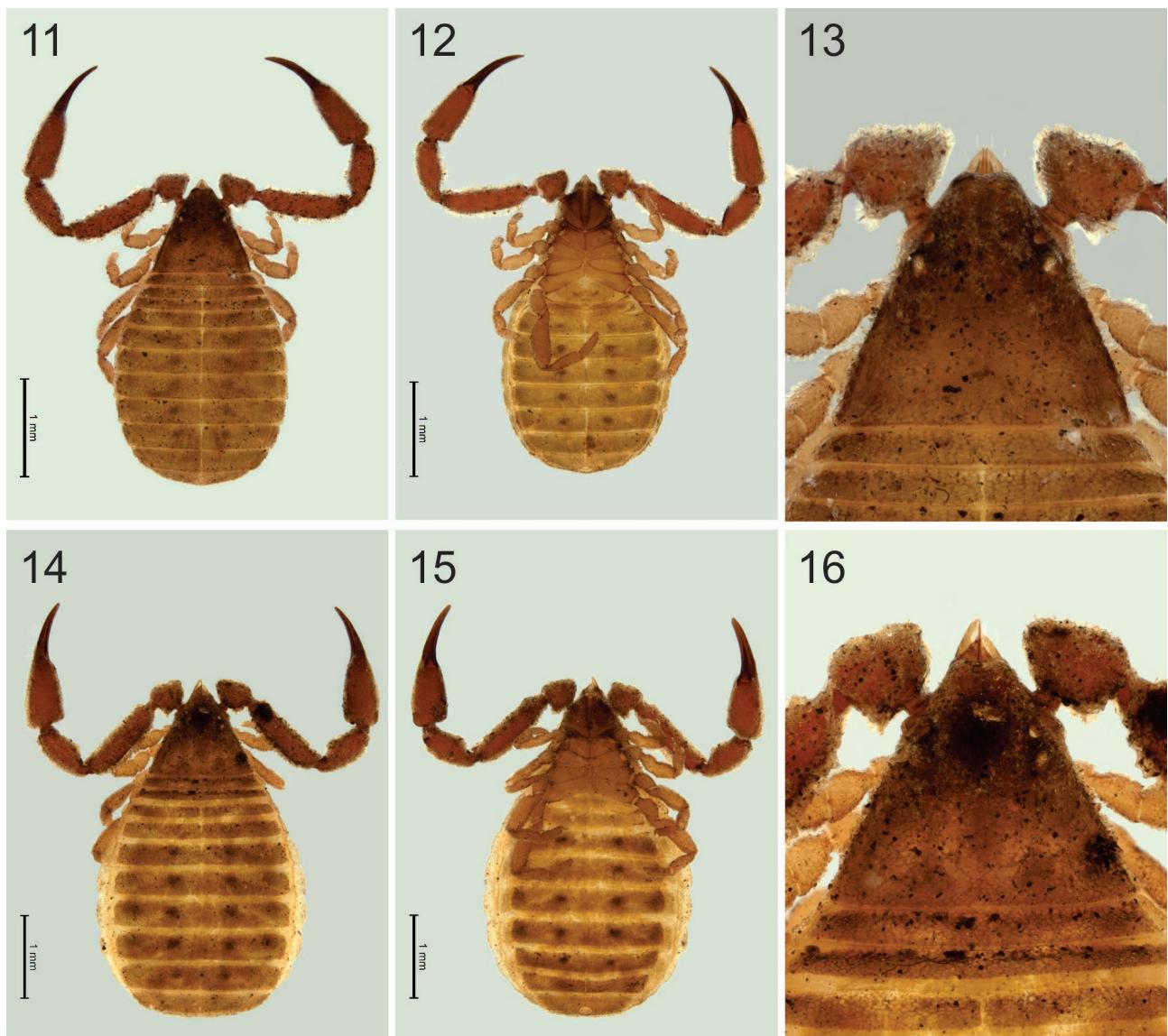
Adults

Colour (Figures 11–16) of sclerotised portions generally red-brown; tergites IV–X with paired darker patches. Epicuticle waxy. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea unbranched; rullum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 20 (♂), 21 (♀) blades; lamina exterior present.

Pedipalp (Figure 20): trochanter 1.23 (♂), 1.06 (♀), femur 4.08–4.55 (♂), 3.93–4.33 (♀), patella 2.73–3.17 (♂), 2.70–3.00 (♀), chela (with pedicel) 4.35–4.67 (♂), 4.05–4.11 (♀), chela (without pedicel) 4.13–4.40 (♂), 3.80–3.97 (♀), hand (without pedicel) 2.05–2.22 (♂), 1.96–2.00 (♀) × longer than broad, movable finger 0.97–1.03 (♂), 1.00 (♀) × longer than hand (without pedicel). Fixed chelal finger with 8 trichobothria, movable chelal finger with 2 trichobothria (Figure 17): *eb*, *esb* and *isb* situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* subdistally, well posterior to *et*; *st* absent; *b* situated subbasally; *t* situated subdistally; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 18); fixed finger with 38 (♂), 42 (♀) teeth; movable finger with 30 (♂), 32 (♀) teeth; accessory teeth absent.

Carapace (Figures 13, 16): 0.85 (♂), 0.76 (♀) × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of rounded corneate eyes (Figure 22) situated c. one-third carapace length from anterior margin; anterior eye broad; with 4 setae near anterior margin and 4 near posterior margin; with numerous lyrifissures; without furrows.



FIGURES 11–16 *Synsphyronus marinae* sp. nov., holotype ♂ (NTM A005320): 11) body, dorsal; 12) body, ventral; 13) cephalothorax, dorsal. Paratype ♀ (NTM A005324): 14) body, dorsal; 15) body, ventral; 16) cephalothorax, dorsal.

Coxal region: manducatory process rounded, with 3 apical acuminate setae, plus 5 (♂, ♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: ♂, 2: 2: 3: 3; ♀, 3: 3: 3: 5.

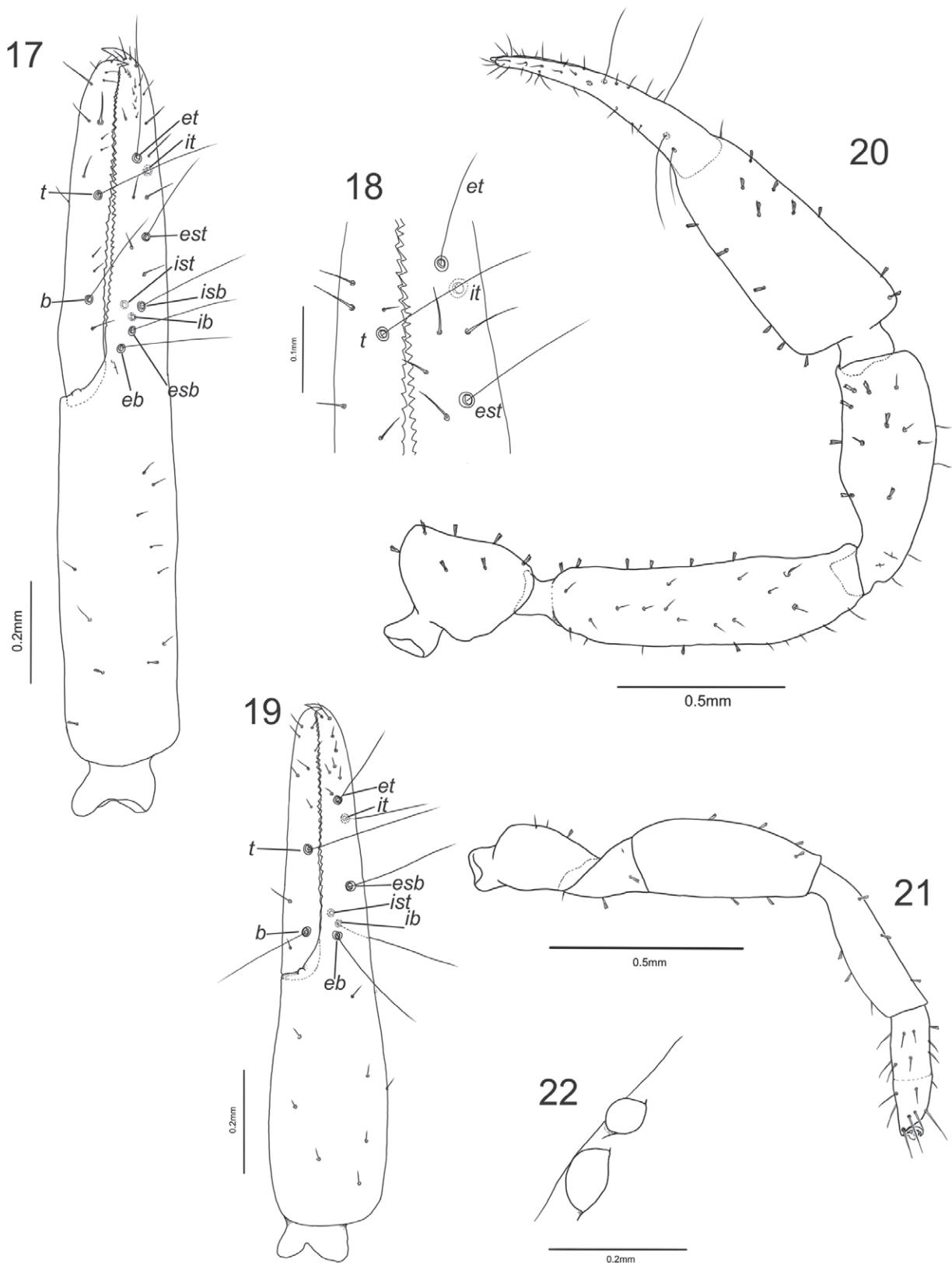
Legs (Figure 21): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.43 (♂), 3.59 (♀) × longer than deep; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–XI (♂), III–V (♀) and sternites V–X with median suture line, some only partially divided (Figures 11, 12, 14, 15). Tergal chaetotaxy: ♂, 4: 4: 4: 4: 5: 4: 4: 4: 2; ♀, 4: 5: 5: 4: 5: 6: 6: 6:

6: 4: 2: 2; uniserrate; all setae quadricarinate. Sternal chaetotaxy: ♂, 5: (0) 5 [2 + 2] (0): (0) 4 (0): 4: 4: 4: 4: 4: 4: 3; ♀, 8: (0) 6 (0): (0) 6 (0): 8: 8: 7: 6: 6: 4: 4: 2; uniserrate; all setae quadricarinate except for medial setae on sternites II–III (♂) and setae on sternites II–IV (♀), which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia ♂: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Genitalia ♀: with one pair of lateral cribiform plates and 2 pairs of median cribiform plates.



FIGURES 17–22 *Synsphyronus marinae* sp. nov., holotype ♂ (NTM A005320), unless stated otherwise: 17) left chela, retrolateral; 18) detail of chelal teeth, retrolateral; 19) left chela, retrolateral, deutonymph paratype (NTM A005326); 20) right pedipalp, dorsal; 21) left leg IV, retrolateral; 22) left eyes, dorsal.

Dimensions ♂: holotype (NTM A005320) followed by 5 other males (when measured): Body length 3.30 (2.89–3.23). Pedipalps: trochanter 0.450/0.365, femur 1.020/0.235 (0.980–1.040/0.220–0.240), patella 0.710/0.240 (0.710–0.730/0.230–0.240), chela (with pedicel) 1.400/0.320 (1.370–1.460/0.300–0.320), chela (without pedicel) 1.320 (1.300–1.400), hand (without pedicel) length 0.665 (0.645–0.710), movable finger length 0.685 (0.650–0.690). Carapace 0.870/1.020; eye diameter, anterior 0.060, posterior 0.080. Leg IV: femur + patella 0.685/0.200, tibia 0.450/0.110, tarsus 0.300/0.090.

Dimensions ♀: paratype (NTM A005324) followed by 2 other females (when measured): Body length 4.36 (3.76–3.94). Pedipalps: trochanter 0.350/0.330, femur 1.060/0.270 (1.040–1.060/0.240–0.250), patella 0.770/0.285 (0.750–0.780/0.260–0.265), chela (with pedicel) 1.600/0.395 (1.500–1.520/0.365–0.370), chela (without pedicel) 1.500 (1.45–1.46), hand (without pedicel) length 0.780 (0.725–0.730), movable finger length 0.780 (0.730). Carapace 0.980/1.290; eye diameter, anterior 0.070, posterior 0.090. Leg IV: femur + patella 0.790/0.220, tibia 0.505/0.130, tarsus 0.340/0.100.

Deutonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.30, femur 3.78, patella 2.24, chela (with pedicel) 4.07, chela (without pedicel) 3.81, hand (without pedicel) 1.85 × longer than broad, and movable finger 1.11 × longer than hand (without pedicel). Fixed chelal finger with 6 trichobothria, movable chelal finger with 2 trichobothria (Figure 19): *eb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *b* subbasally; *t* submedially.

Carapace: 0.77 × longer than broad; with 4 setae near anterior margin and 4 near posterior margin.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 4: 4: 4: 4: 4: 4: 6: 6: 6: 2: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 2: 2: 4: 5: 4: 2: 2.

Dimensions: NTM A005326: Body length 2.52. Pedipalps: trochanter 0.300/0.230, femur 0.680/0.180, patella 0.460/0.205, chela (with pedicel) 1.080/0.265, chela (without pedicel) 1.01, hand (without pedicel) length 0.490, movable finger length 0.545. Carapace 0.675/0.880.

MOLECULAR DATA

A single specimen of this species (WAM T124420) was successfully sequenced for COI, and accessioned in GenBank under Accession No. MZ920049 (Table 1).

REMARKS

The specimens of *Synsphyronus marinae* were collected from under rocks on a sandstone bluff in Wongalara Wildlife Sanctuary, southern Arnhem Land, Northern Territory.

ETYMOLOGY

This species is named for Marina Cheng in appreciation of her companionship during several BushBlitz expeditions and her research on Hemiptera.

Synsphyronus patricki sp. nov.

Figures 23–35

urn:lsid:zoobank.org:act:BC400993-9AED-488B-8D0D-85EFE162401B

MATERIAL EXAMINED

Holotype

Australia: Western Australia: ♂, Giralia Bay Station, N. of Centipede Well, 22°35'S, 114°17'E, 29 June 2006, under limestone rocks, P. Cullen, K.L. Edward (WAM T147102).

Paratype

Australia: Western Australia: 1 ♀, collected with holotype (WAM T76962).

DIAGNOSIS

Synsphyronus patricki resembles many other species of the genus by having separate metatarsi and tarsi (Figure 33), and eight trichobothria on the fixed chelal finger and three trichobothria on the movable finger (Figure 30). The other species of *Synsphyronus* with

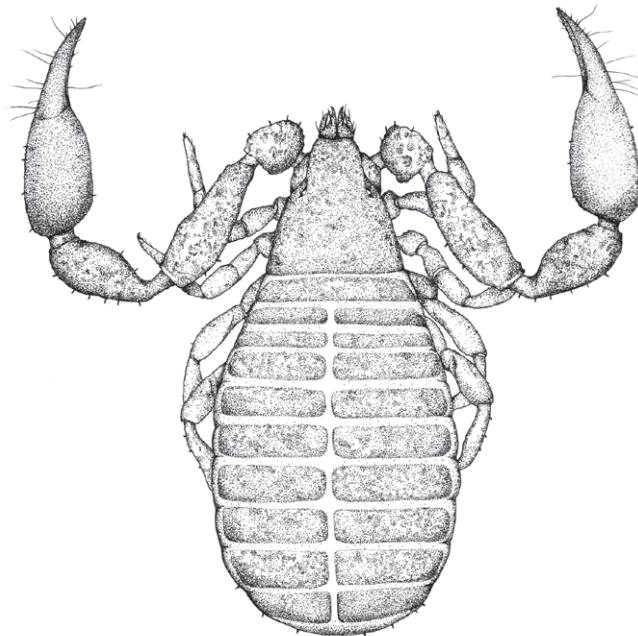
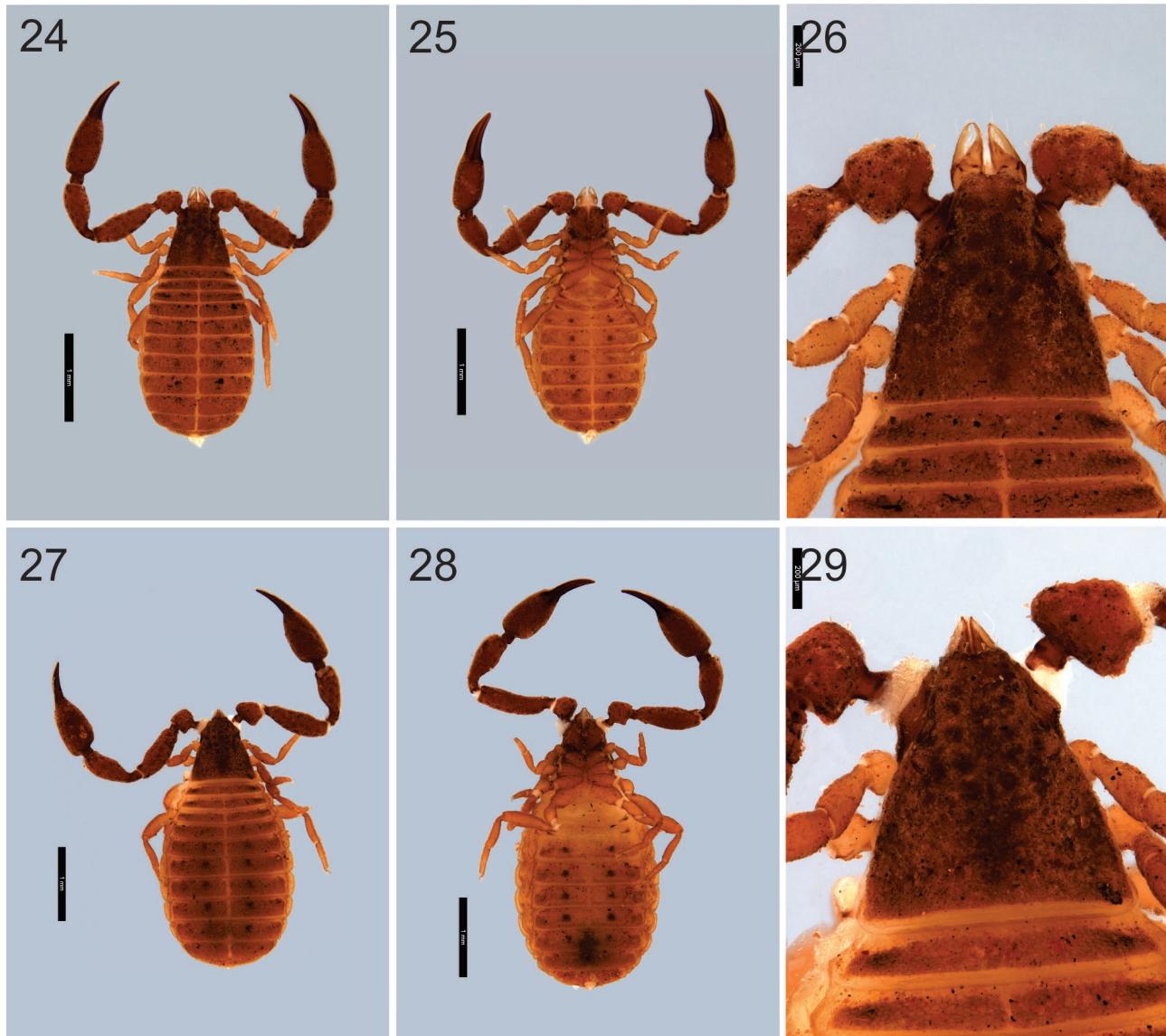


FIGURE 23

Synsphyronus patricki sp. nov., holotype ♂ (WAM T147102).



FIGURES 24–29 *Synsphyronus patricki* sp. nov., holotype ♂ (WAM T147102): 24) body, dorsal; 25) body, ventral; 26) cephalothorax, dorsal. Paratype ♀ (WAM T76962): 27) body, dorsal; 28) body, ventral; 29) cephalothorax, dorsal.

this character combination are *S. absitus* Harvey, 1987, *S. amplissimus* Harvey, 1987, *S. apimelus* Harvey, 1987, *S. attiguus* Harvey, 1987, *S. bounites* Harvey, 1987, *S. christopherdarwini* Harvey, 1987, *S. samueli* sp. nov., *S. dewae* Beier, 1969, *S. dorothyae* Harvey, 1987, *S. gigas* Beier, 1971, *S. gracilis* Harvey, 1987, *S. gurdoni* Harvey, Abrams & Burger, 2015, *S. hansenii* With, 1908, *S. mimulus* Chamberlin, 1943, *S. platnicki* Harvey, 2020, and *S. silveirai* Harvey, 1987. Of these species it most closely resembles *S. gurdoni* from Barrow Island, Western Australia as the rullum of both species has the middle and basal blades highly reduced (Figure 35). It differs from *S. gurdoni* by the position of trichobothrium *st* which is noticeably closer to *b* than to *t* in *S. patricki* (Figure 30), but is midway between *b* and *t* in *S. gurdoni*.

DESCRIPTION

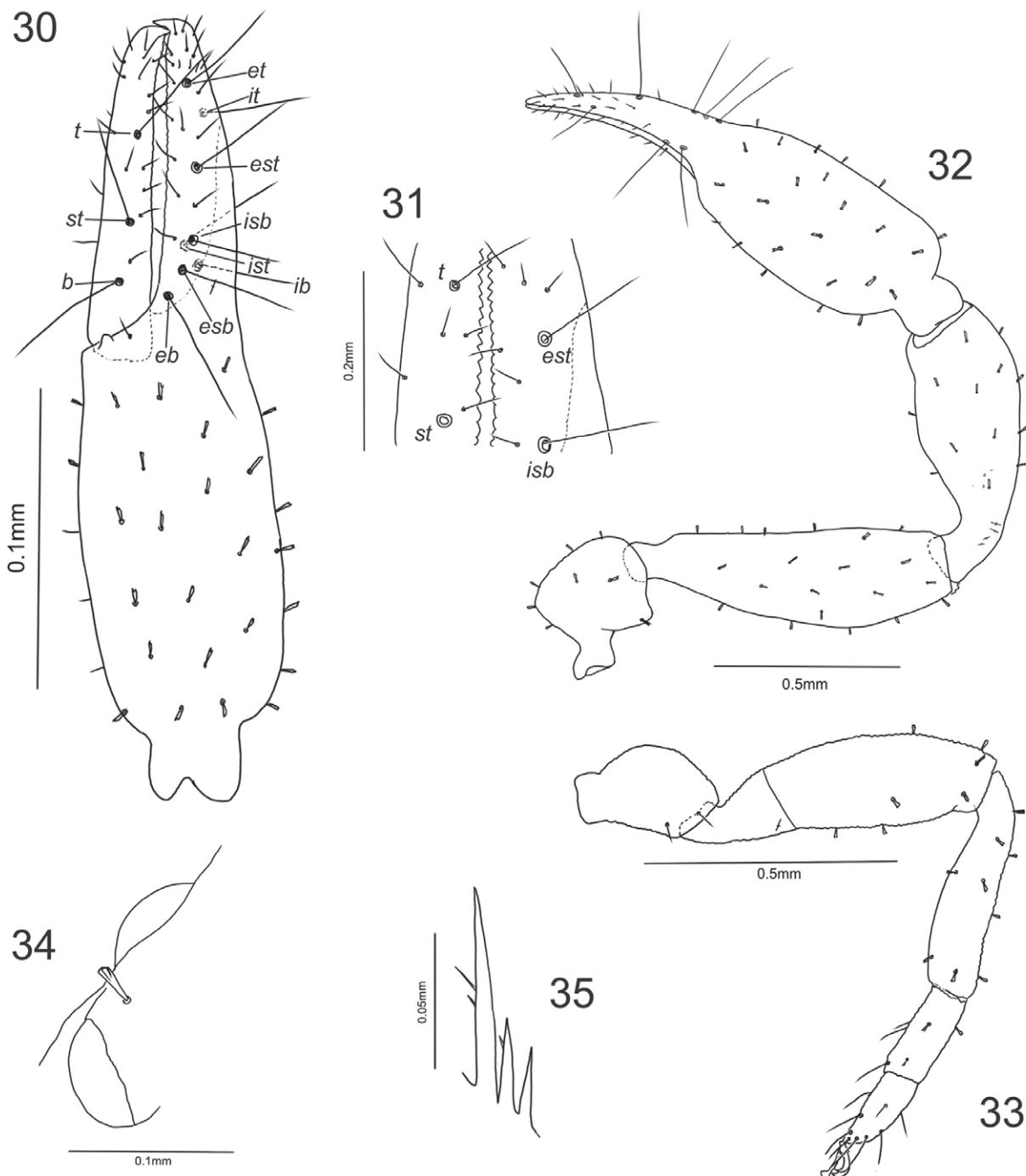
Adults

Colour (Figures 24–29) of sclerotised portions generally red-brown; tergites IV–X with paired darker patches. Epicuticle waxy. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea unbranched; rullum of 3 blades, the most distal blade with 2 spinules on leading edge, middle blade with 1 spinule, basal blade smooth, middle and basal blades very short (Figure 35); serrula exterior with 17 (♂), 19 (♀) blades; lamina exterior present.

Pedipalp (Figure 32): trochanter 1.25 (♂), 1.31 (♀), femur 3.26 (♂), 3.41 (♀), patella 2.39 (♂), 2.75 (♀), chela (with pedicel) 3.74 (♂), 3.43 (♀), chela (without pedicel) 3.43 (♂), 3.20 (♀), hand (without pedicel) 1.87 (♂), 1.71 (♀) × longer than broad, movable finger 0.85 (♂), 0.91 (♀) × longer than hand (without pedicel). Fixed chelal finger with 8 trichobothria, movable chelal finger with 3 trichobothria (Figure 30): *eb*, *esb* and

isb situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* subdistally, well posterior to *et*; *b* situated subbasally; *st* situated submedially, slightly closer to *b* than to *t*; *t* situated subdistally; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in



FIGURES 30–35 *Synsphyronus patricki* sp. nov., holotype ♂ (WAM T147102), unless stated otherwise: 30) left chela, retrolateral; 31) detail of chelal teeth, retrolateral; 32) right pedipalp, dorsal; 33) left leg IV, retrolateral; 34) left eyes, dorsal; 35) left rallum, lateral, paratype ♀ (WAM T76962).

fixed finger and near *t* in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 31); fixed finger with 40 (♂, ♀) teeth; movable finger with 34 (♂, ♀) teeth; accessory teeth absent.

Carapace (Figures 26, 29): 0.85 (♂), 0.89 (♀) × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of large corneate eyes (Figure 34) situated c. one-third carapace length from anterior margin; anterior eye broad; with 5 (♂), 4 (♀) setae near anterior margin and 4 near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 3 apical acuminate setae, plus 5 (♂, ♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: ♂, 2: 2: 2: 4; ♀, 2: 2: 3: 4.

Legs (Figure 33): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.67 (♂), 3.88 (♀) × longer than deep; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–X (♂, ♀) and sternites IV–X (♂), V–X (♀) with median suture line (Figures 24–25, 27–28). Tergal chaetotaxy: ♂, 4: 4: 4: 4: 5: 4: 4: 4: 2: 2; ♀, 4: 4: 5: 4: 4: 4: 4: 4: 4: 2: 2; uniserial; all setae quadricarinate. Sternal chaetotaxy: ♂, 6: (0) 3 [4 + 4] (0): (0) 2 (0): 4: 2: 3: 2: 5: 4: 4: 2; ♀, 4: (0) 7 (0): (0) 5 (0): 4: 3: 5: 6: 6: 4: 2; uniserial; all setae quadricarinate except for setae on sternites II–III, and medial setae on segments V–VI (♂) and setae on sternites II–IV (♀), which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia ♂: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Genitalia ♀: with one pair of lateral cribiform plates and 2 pairs of median cribiform plates.

Dimensions ♂: holotype (WAM T147102): Body length 2.90. Pedipalps: trochanter 0.390/0.315, femur 0.880/0.270, patella 0.740/0.270, chela (with pedicel) 1.31/0.350, chela (without pedicel) 1.20, hand (without pedicel) length 0.655, movable finger length 0.555. Carapace 0.655/0.770; eye diameter, anterior 0.075, posterior 0.070. Leg IV: femur + patella 0.660/0.180, tibia 0.460/0.105, metatarsus 0.190/0.075, tarsus 0.175/0.070.

Dimensions ♀: paratype (WAM T76962): Body length 3.76. Pedipalps: trochanter 0.420/0.320, femur 0.990/0.290, patella 0.825/0.300, chela (with pedicel) 1.440/0.420, chela (without pedicel) 1.345, hand (without pedicel) length 0.720, movable finger length 0.655.

Carapace 0.830/0.930; eye diameter, anterior 0.065, posterior 0.090. Leg IV: femur + patella 0.795/0.205, tibia 0.520/0.115, metatarsus 0.225/0.090, tarsus 0.210/0.075.

REMARKS

The specimens of *Synsphyronus patricki* were collected from under limestone rocks near Centipede Well, Carnarvon bioregion, Western Australia. The vegetation at the site is dominated by *Triodia* sp. with sparse *Acacia*.

ETYMOLOGY

This species is named in honour of Patrick Cullen, the collector of the type specimens and many other interesting short-range endemics throughout the Pilbara and Carnarvon regions.

Synsphyronus pharangites sp. nov.

Figures 36–46

urn:lsid:zoobank.org:act:FDCAD1DB-6EDB-49CC-A890-60C174EC57E9

MATERIAL EXAMINED

Holotype

Australia: Western Australia: ♂, Cape Range, Shothole Canyon Road, 22°02'43.40"S, 114°01'52.97"E, 22 June 2019, under bark of *Corymbia hamersleyana*, M.S. Harvey (WAM T148101).

Paratypes

Australia: Western Australia: 3 ♀, Cape Range, Shothole Canyon Road, 22°02'43.40"S, 114°01'52.97"E, 22 June 2019, under bark of *Corymbia hamersleyana*, M.S. Harvey (WAM T148098–148100).

DIAGNOSIS

Synsphyronus pharangites differs from most other species of the genus by the combined presence of fused metatarsi and tarsi (Figure 45), seven trichobothria on the fixed chelal finger, and one trichobothrium on the movable finger (Figure 42). The only other species of *Synsphyronus* with this character combination is *S. callus* Hoff, 1947, from southern Western Australia, which it differs by the straight pedipalpal femur (Figure 44) (slightly procurved in *S. callus*), the broadened chelal hand (Figure 44) (cylindrical in *S. callus*), and the position of trichobothria *et* and *it*, which are more basally situated than in *S. callus* (Figure 42).

DESCRIPTION

Adults

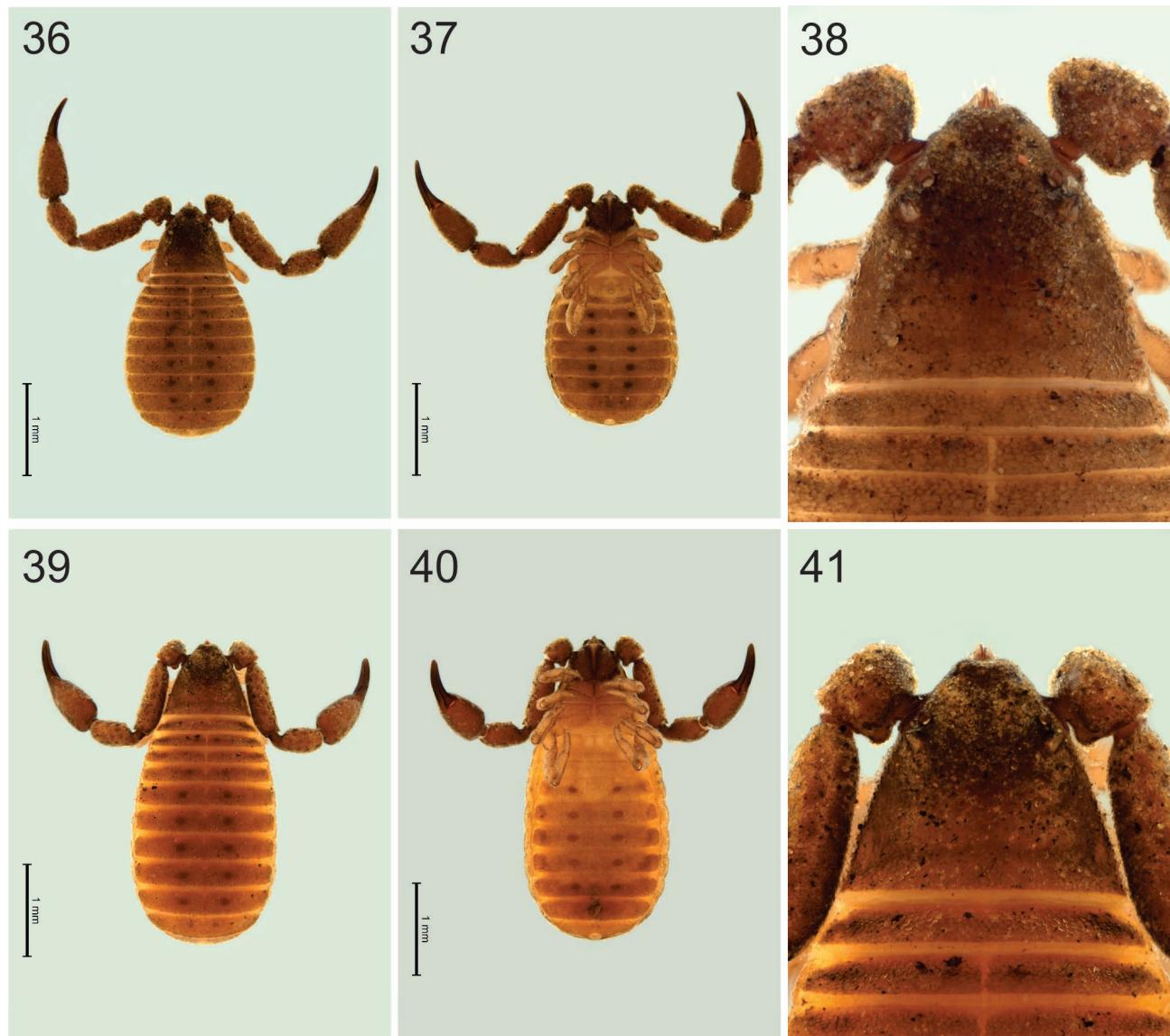
Colour (Figures 36–41) of sclerotised portions generally red-brown; tergites II–X with paired darker patches. Epicuticle waxy. Setae generally aligned

perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

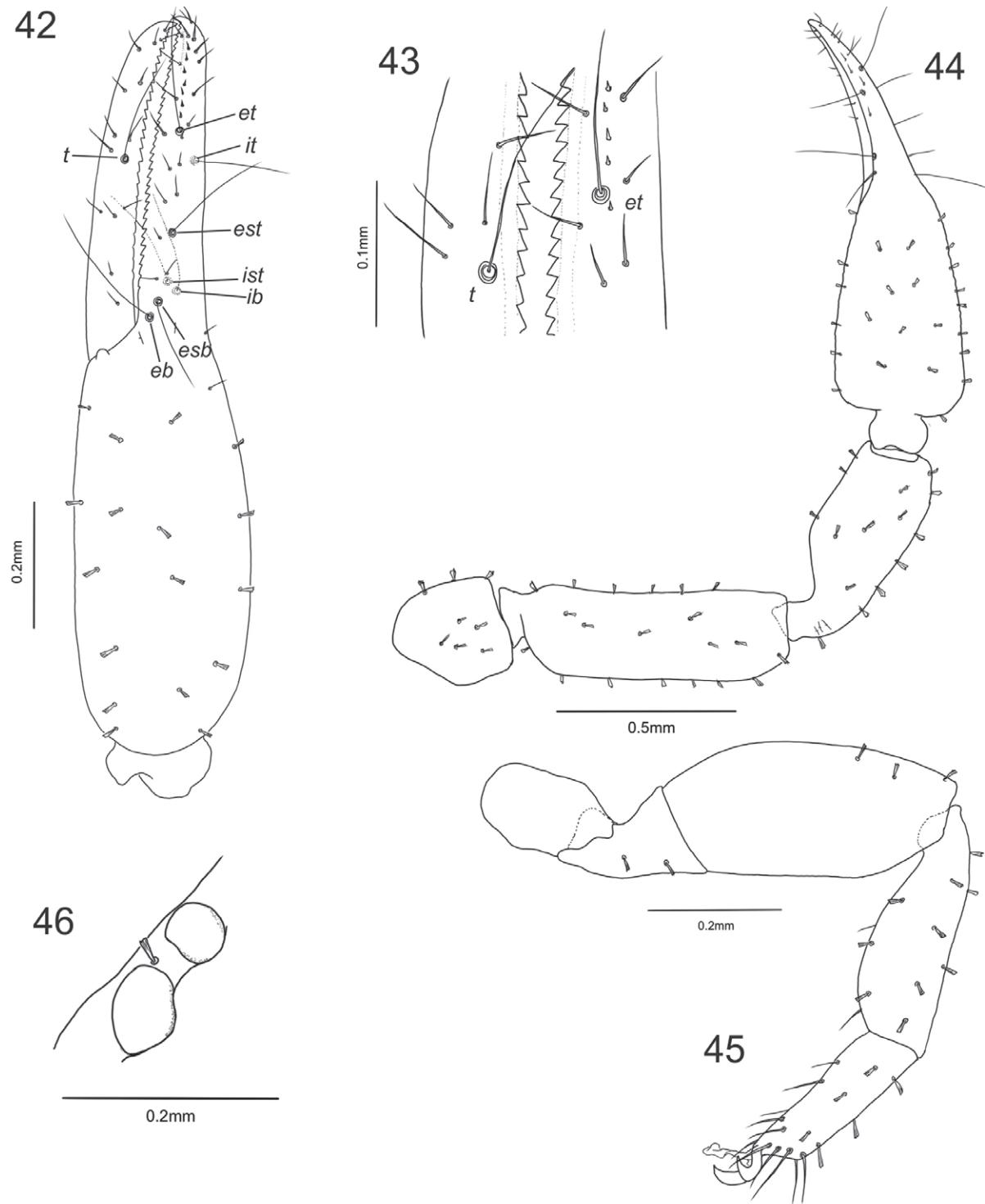
Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea of ♂ and ♀ unbranched; rillum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 18 blades; lamina exterior present.

Pedipalp (Figure 44): trochanter 1.55 (♂), 1.22–1.29 (♀), femur 3.14 (♂), 3.42–3.58 (♀), patella 2.56 (♂), 2.18–2.48 (♀), chela (with pedicel) 3.97 (♂), 3.47–3.62 (♀), chela (without pedicel) 3.74 (♂), 3.29–3.36 (♀), hand (without pedicel) 1.97 (♂), 1.67–1.84 (♀) × longer than broad, moveable finger 0.92 (♂), 0.80–0.94 (♀)

× longer hand (without pedicel). Fixed chelal finger with 7 trichobothria, movable chelal finger with 1 trichobothrium (Figure 42): *eb* and *esb* situated basally, *isb* absent, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* submedially, well posterior to *et*; *b* and *st* absent; *t* situated subdistally; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 43); fixed finger with 33 (♂), 37 (♀) teeth; movable finger with 26 (♂), 28 (♀) teeth; accessory teeth absent.



FIGURES 36–41 *Synsphyronus pharangites*, sp. nov., holotype ♂ (WAM T148101): 36) body, dorsal; 37) body, ventral; 38) cephalothorax, dorsal. Paratype ♀ (WAM T148098): 39) body, dorsal; 40) body, ventral; 41) cephalothorax, dorsal.



FIGURES 42–46 *Synsphyronus pharangites* sp. nov., holotype ♂ (WAM T148101): 42) left chela, retrolateral; 43) detail of chelal teeth, retrolateral; 44) right pedipalp, dorsal; 45) left leg IV, retrolateral; 46) left eyes, dorsal.

Carapace (Figures 38, 41): 0.82 (δ , ♀) \times longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of rounded corneate eyes (Figure 46) situated c. one-third carapace length from anterior margin; anterior eye broad; with 4 setae near anterior margin and 6 near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 2 apical acuminate setae, plus 6 (δ , ♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: δ , 3: 4: 5: 5; ♀, 4: 5: 7: 9.

Legs (Figure 45): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate;

femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.05 (♂), 3.07 (♀) × longer than deep; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–X (♂), II–VI (♀) and sternites V–X with median suture line, some only partially divided (Figures 36, 37, 39, 40). Tergal chaetotaxy: ♂, 4: 4: 4: 4: 7: 8: 8: 6: 6: 7: 2: 2; ♀, 4: 5: 5: 7: 9: 6: 6: 10: 8: 6: 4: 2; uniserial; all setae quadricarinate. Sternal chaetotaxy: ♂, 7: (0) 4 [2 + 2] (0): (0) 2 (0): 4: 4: 7: 8: 7: 8: 4: 2; ♀, 7: (0) 6 (0): (0) 6 (0): 6: 8: 8: 8: 6: 4: 2; uniserial; all setae quadricarinate except for setae on sternites II–IV and medial setae on sternites V–VIII, which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia ♂: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Genitalia ♀: with one pair of lateral cibiform plates and 2 pairs of median cibiform plates.

Dimensions ♂: holotype (WAM T148101): Body length 2.72. Pedipalps: trochanter 0.410/0.265, femur 0.800/0.255, patella 0.615/0.240, chela (with pedicel) 1.210/0.305, chela (without pedicel) 1.140, hand (without pedicel) length 0.600, movable finger length 0.550. Carapace 0.720/0.880; eye diameter, anterior 0.055, posterior 0.080. Leg IV: femur + patella 0.580/0.190, tibia 0.360/0.105, tarsus 0.260/0.075.

Dimensions ♀: paratype (WAM T148098) followed by 2 other females (when measured): Body length 3.47 (2.94–3.18). Pedipalps: trochanter 0.400/0.320, femur 0.890/0.260 (0.820–0.860/0.230–0.240), patella 0.645/0.260 (0.610–0.660/0.270–0.280), chela (with pedicel) 1.300/0.375 (1.340/0.370–0.380), chela (without pedicel) 1.260 (1.220–1.260), hand (without pedicel) length 0.670 (0.630–0.700), movable finger length 0.610 (0.560–0.590). Carapace 0.760/0.930; eye diameter, anterior 0.055, posterior 0.075. Leg IV: femur + patella 0.630/0.205, tibia 0.395/0.115, tarsus 0.315/0.085.

REMARKS

Synsphyronus pharangites has only been collected from a single location in Cape Range National Park, where the specimens were collected from under the bark of *Corymbia hamersleyana*. Cape Range is situated in the Carnarvon bioregion.

ETYMOLOGY

The species epithet an adjective referring to the species occurrence in Shothole Canyon (*pharangites*, Greek, of a gully) (Brown 1956).

Synsphyronus samueli sp. nov.

Figures 47–55

urn:lsid:zoobank.org:act:E0A52346-6B67-40BC-874D-827B48EE8B1C

MATERIAL EXAMINED

Holotype

Australia: Western Australia: ♂, Cane River Conservation Park, site CR20, mesa just below top, 22°14'43.0"S, 115°28'49.4"E, 26 June 2011, under rocks beneath fig tree, J.M. Waldock (WAM T115038).

Paratype

Australia: Western Australia: 1 deutonymph, collected with holotype (WAM T140365).

DIAGNOSIS

Synsphyronus samueli resembles many other species of the genus by having separate metatarsi and tarsi (Figure 54), eight trichobothria on the fixed chelal finger, and three trichobothria on the movable finger (Figure 50). The other species of *Synsphyronus* with this character combination are *S. absitus* Harvey, 1987, *S. amplissimus* Harvey, 1987, *S. apimelus* Harvey, 1987, *S. attiguus* Harvey, 1987, *S. bounites* Harvey, 1987, *S. christopherdarwini* Harvey, 1987, *S. dewae* Beier, 1969, *S. dorothyae* Harvey, 1987, *S. gigas* Beier, 1971, *S. gracilis* Harvey, 1987, *S. gurdoni* Harvey, Abrams & Burger, 2015, *S. hansenii* With, 1908, *S. mimulus* Chamberlin, 1943, *S. patricki*, sp. nov., *S. platnicki* Harvey, 2020, and *S. silveirai* Harvey, 1987. It differs from all of these species by the undulate dorsal and ventral margins of the chelal hand (Figure 50).

DESCRIPTION

Adults

Male only. Colour (Figures 47–49) of sclerotised portions generally red-brown; tergites II–X with paired darker patches. Epicuticle waxy. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea unbranched; rallum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 18 blades; lamina exterior present.

Pedipalp (Figure 53): trochanter 1.25, femur 3.49, patella 2.88, chela (with pedicel) 4.03, chela (without pedicel) 3.73, hand (without pedicel) 2.14 × longer than broad, hand (without pedicel) 1.29 × longer than movable finger. Fixed chelal finger with 8 trichobothria, movable chelal finger with 3 trichobothria (Figure 50): *eb*, *esb* and *isb* situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal



FIGURES 47–49 *Synsphyronus samueli* sp. nov., holotype ♂ (WAM T115038): 47) body, dorsal; 48) body, ventral; 49) cephalothorax, dorsal.

row, and *it* subdistally, well posterior to *et*; *st* situated slightly closer to *b* than to *t*; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 51); fixed finger with 38 teeth; movable finger with 27 teeth; accessory teeth absent.

Carapace (Figure 49): 0.96 × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of rounded corneate eyes (Figure 55) situated c. one-third carapace length from anterior margin; anterior eye broad; with 4 setae near anterior margin and 5 near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 4 apical acuminate setae, plus 2 additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: 1: 2: 3: 3.

Legs (Figure 54): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 4.11 × longer than deep; metatarsi and tarsi not fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–X and sternites V–X with median suture line (Figures 47, 48). Tergal chaetotaxy: ♂, 4: 4: 4: 4: 4: 4: 4: 2: 2; uniserrate; all setae quadricarinate. Sternal chaetotaxy: ♂, 9: (0) 5 [5 + 5] (0): (0) 6 (0): 4: 4: 4: 6: 4: 3: 3; uniserrate; all setae quadricarinate except for setae on sternites II–IV and

medial setae on sternites V–VIII, which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Dimensions: holotype (WAM T115038): Body length 3.38. Pedipalps: trochanter 0.420/0.335, femur 0.995/0.285, patella 0.850/0.295, chela (with pedicel) 1.410/0.350, chela (without pedicel) 1.305, hand (without pedicel) length 0.750, movable finger length 0.580. Carapace 0.835/0.870; eye diameter, anterior 0.065, posterior 0.082. Leg IV: femur + patella 0.780/0.190, tibia 0.550/0.115, metatarsus 0.229/0.097, tarsus 0.184/0.080.

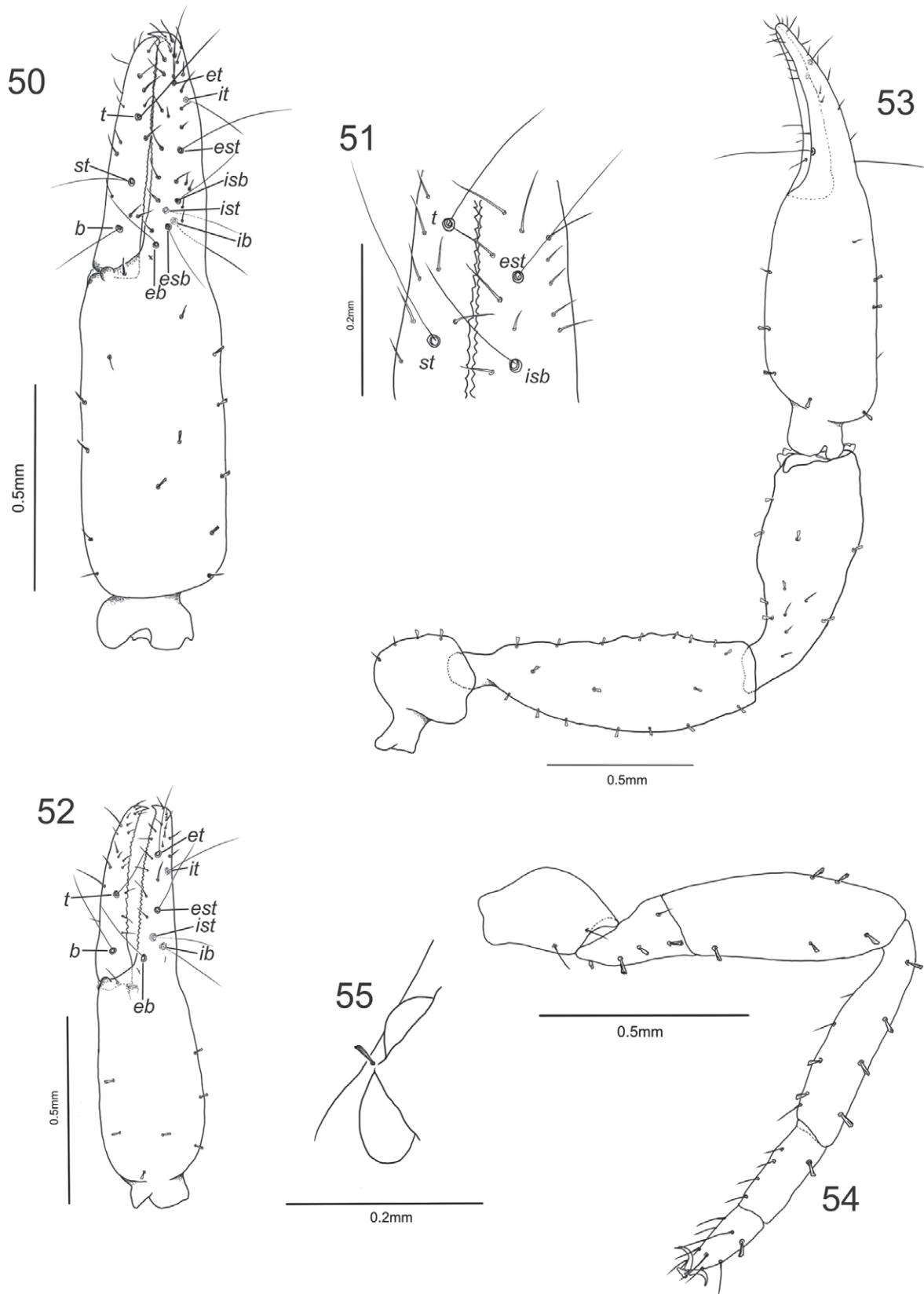
Deutonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.42, femur 3.2, patella 2.41, chela (with pedicel) 3.69, chela (without pedicel) 3.31, hand (without pedicel) 1.71 × longer than broad, and movable finger 0.949 × longer than hand (without pedicel). Fixed chelal finger with 6 trichobothria, movable chelal finger with 2 trichobothria (Figure 52): *eb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *b* subbasally; *t* subdistally.

Carapace: 0.85 × longer than broad; with 4 setae near anterior margin and 4 near posterior margin.



FIGURES 50–55 *Synsphyronus samueli* sp. nov., holotype ♂ (WAM T115038), unless stated otherwise: 50) left chela, retrolateral; 51) detail of chelal teeth, retrolateral; 52) left chela, retrolateral, deutonymph paratype (WAM T140365); 53) right pedipalp, dorsal; 54) left leg IV, retrolateral; 55) left eyes, dorsal.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 2: 2: 2: 2: 4: 4: 4: 4: 4: 4: 2: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 2: 2: 2: 2: 2: 2: 2.

Dimensions: WAM T140365: Body length 2.35. Pedipalps: trochanter 0.305/0.215, femur 0.640/0.20, patella 0.555/0.23, chela (with pedicel) 1.07/0.290, chela (without pedicel) 0.96, hand (without pedicel) length 0.495, movable finger length 0.470. Carapace 0.660/0.775.

REMARKS

Synsphyronus samueli has been collected from Cane River Conservation Park, where the specimens were found under rocks beneath a fig tree. The Park is located in the south-western corner of the Pilbara bioregion.

ETYMOLOGY

This species is named for the senior authors' son Sam Cullen.

Synsphyronus sertus sp. nov.

Figures 56–69

urn:lsid:zoobank.org:act:C6165A7F-11FB-4CAC-8CCC-524D72CBF2ED

MATERIAL EXAMINED

Holotype

Australia: Northern Territory: ♂, Henbury Station, James Range, c. 7 km WNW. of Mt Keartland, 24°01'31"S, 133°02'30"E, 592 m, 17 May 2013, under shaded sandstone rocks, south-facing gully, M.S. Harvey (NTM A005328).

Paratypes

Australia: Northern Territory: 3 ♂, 5 ♀, 6 tritonymphs, 1 deutonymph, 1 protonymph, collected with holotype (NTM A005329–A005344); 2 ♂, 2 ♀, 2 tritonymphs, 1 protonymph, collected with holotype (WAM T131644, T131645, T140375–140379).

DIAGNOSIS

Synsphyronus sertus differs from most other species of the genus by the combined presence of fused metatarsi and tarsi (Figure 68), eight trichobothria on the fixed chelal finger, and three trichobothria on the movable finger (Figure 62). The other species of *Synsphyronus* with this character combination are *S. ejuncidus* Harvey, 1987 and *S. codyi* sp. nov. from Western Australia, *S. hadronennus* Harvey, 1987 from the Northern Territory, and *S. meganennus* Harvey, 1987 from New South Wales from which it differs by the broad anterior eye (Figure 69) (constricted in *S. hadronennus* and *S. meganennus*), *st* midway between *b* and *t* (Figure 62) (much closer to *b* than *t*

in *S. ejuncidus*) and the chelal hand (without pedicel) 2.41–2.73 (♂), 2.09–2.53 (♀) × longer than broad (1.72–1.83 × (♀) longer than broad in *S. codyi*).

DESCRIPTION

Adults

Colour (Figures 56–61) of sclerotised portions generally red-brown; tergites IV–X with paired darker patches. Epicuticle waxy. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

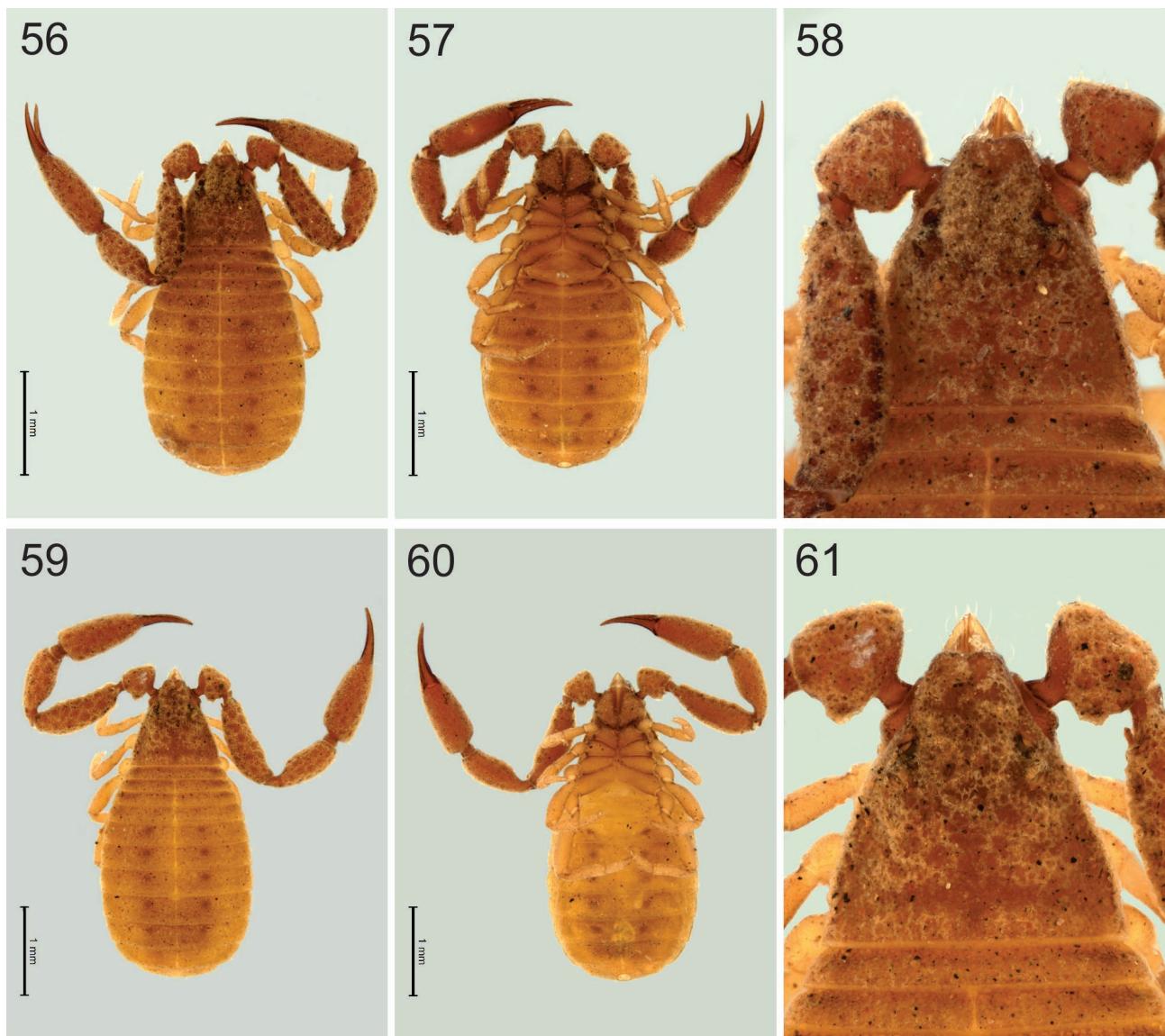
Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea of ♂ and ♀ unbranched; rallum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 17 (♂), 18 (♀) blades; lamina exterior present.

Pedipalp (Figure 67): trochanter 1.28 (♂), 1.22 (♀), femur 3.38–4.80 (♂), 3.56–4.17 (♀), patella 2.81–3.07 (♂), 2.84–2.91 (♀), chela (with pedicel) 4.41–5.13 (♂), 3.93–4.32 (♀), chela (without pedicel) 4.11–4.69 (♂), 3.71–4.03 (♀), hand (without pedicel) 2.41–2.73 (♂), 2.09–2.53 (♀) × longer than broad, movable finger 0.68–0.74 (♂), 0.80–0.77 (♀) × longer than hand (without pedicel). Fixed chelal finger with 8 trichobothria, movable chelal finger with 3 trichobothria (Figure 62): *eb*, *esb* and *isb* situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* subdistally, well posterior to *et*; *st* situated midway between *b* and *t*; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 63); fixed finger with 32 (♂), 38 (♀) teeth; movable finger with 28 (♂), 31 (♀) teeth; accessory teeth absent.

Carapace (Figures 56, 59): 0.91 (♂), 0.90 (♀) × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of rounded corneate eyes (Figure 69) situated c. one-third carapace length from anterior margin; anterior eye broad; with 4 setae near anterior margin and 4 near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 3 apical acuminate setae, plus 2 (♂, ♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: ♂, 2: 2: 3: 3; ♀, 3: 3: 4: 9.

Legs (Figure 68): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.58 (♂), 3.80 (♀) × longer than deep; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.



FIGURES 56–61 *Synsphyronus sertus* sp. nov., holotype ♂ (NTM A005328): 56) body, dorsal; 57) body, ventral; 58) cephalothorax, dorsal. Paratype ♀ (NTM A005333): 59) body, dorsal; 60) body, ventral; 61) cephalothorax, dorsal.

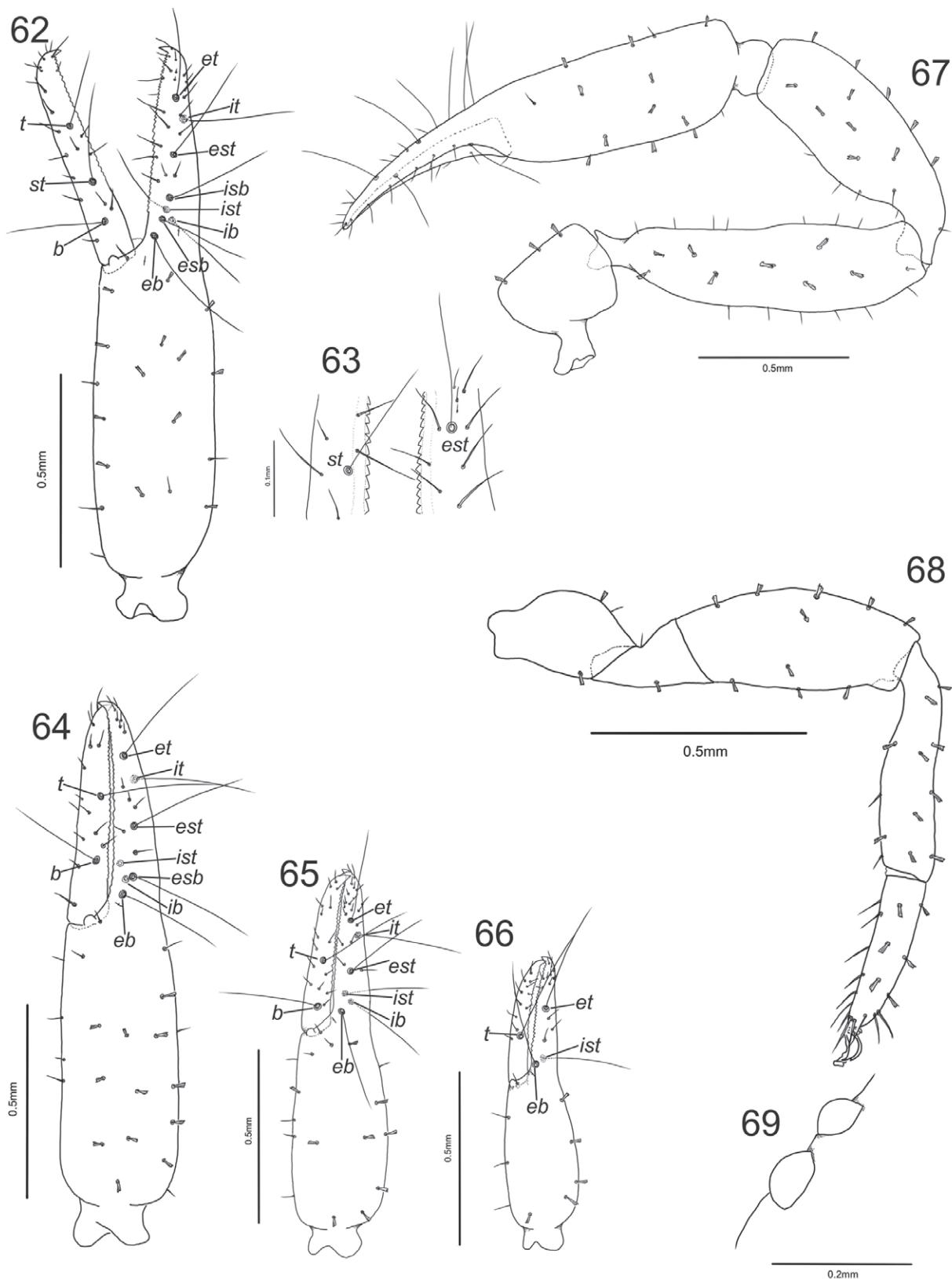
Abdomen: tergites II–X and sternites V–X with median suture line (Figures 56–57, 59–60). Tergal chaetotaxy: ♂, 2: 2: 2: 4: 4: 4: 5: 6: 4: 2; ♀, 5: 4: 4: 4: 6: 6: 6: 4: 2; uniserial; all setae quadricarinate. Sternal chaetotaxy: ♂, 5: (0) 4 [2 + 2] (0): (0) 5 (0): 5: 4: 4: 4: 6: 4: 2; ♀, 8: (0) 5 (0): (0) 7 (0): 8: 8: 8: 6: 6: 2: 2; uniserial; all setae quadricarinate except for setae on sternites II–IV and medial setae on sternites V–VI, which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia ♂: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Genitalia ♀: with one pair of lateral cribiform plates and 2 pairs of median cribiform plates.

Dimensions ♂: holotype (NTM A005328) followed by 5 other males (when measured): Body length 3.29 (2.96–3.12). Pedipalps: trochanter 0.365/0.285, femur 1.060/0.280 (0.940–1.060/0.250–0.290), patella 0.870/0.280 (0.760–0.870/0.270–0.300), chela (with pedicel) 1.520/0.315 (1.470–1.540/0.290–0.345), chela (without pedicel) 1.420 (1.360–1.430), hand (without pedicel) length 0.820 (0.790–0.840), movable finger length 0.625 (0.540–0.610). Carapace 0.860/0.950; eye diameter, anterior 0.065, posterior 0.090. Leg IV: femur + patella 0.770/0.215, tibia 0.550/0.115, tarsus 0.370/0.085.

Dimensions ♀: paratype (NTM A005333) followed by 5 other females (when measured): Body length 3.73 (3.34–3.68). Pedipalps: trochanter 0.500/0.410,



FIGURES 62–69 *Synsphyronus sertus* sp. nov., holotype ♂ (NTM A005324), unless stated otherwise: 62) left chela, retrolateral; 63) detail of chelal teeth, retrolateral; 64) left chela, retrolateral, tritonymph paratype (NTM A005339); 65) left chela, retrolateral, deutonymph paratype (NTM A005343); 66) left chela, retrolateral, protonymph paratype (NTM A005344); 67) right pedipalp, dorsal; 68) left leg IV, retrolateral; 69) left eyes, dorsal.

femur 1.140/0.320 (1.060–1.250/0.290–0.330), patella 0.925/0.320 (0.910–0.960/0.320–0.330), chela (with pedicel) 1.610/0.410 (1.620–1.740/0.390–0.430), chela (without pedicel) 1.520 (1.510–1.640), hand (without pedicel) length 0.880 (0.830–0.950), movable finger length 0.705 (0.610–0.720). Carapace 0.940/1.040; eye diameter, anterior 0.070, posterior 0.095. Leg IV: femur + patella 0.835/0.220, tibia 0.575/0.120, tarsus 0.385/0.095.

Tritonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.21, femur 3.76, patella 2.88, chela (with pedicel) 3.79, chela (without pedicel) 3.52, hand (without pedicel) 2.02 × longer than broad, and movable finger 0.75 × longer than hand (without pedicel). Fixed chelal finger with 7 trichobothria, movable chelal finger with 2 trichobothria (Figure 64): *eb*, *esb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *b* subbasally; *t* subdistally.

Carapace: 0.93 × longer than broad; with 4 setae near posterior margin.

Legs: much as in adults.

Abdomen: tergal chaetotaxy: 4: 4: 4: 4: 4: 5: 6: 6: 6: 4: 2. Sternal chaetotaxy: 0: (0) 4 (0): (0) 4 (0): 5: 6: 6: 6: 4: 2: 2.

Dimensions: NTM A005339: Body length 3.01. Pedipalps: trochanter 0.370/0.305, femur 0.940/0.250, patella 0.720/0.250, chela (with pedicel) 1.270/0.335, chela (without pedicel) 1.180, hand (without pedicel) length 0.675, movable finger length 0.505. Carapace 0.860/0.930.

Deutonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.27, femur 3.18, patella 2.43 chela (with pedicel) 3.90, chela (without pedicel) 3.59, hand (without pedicel) 1.89 × longer than broad, and movable finger 0.91 × longer than hand (without pedicel). Fixed chelal finger with 6 trichobothria, movable chelal finger with 2 trichobothria (Figure 65): *eb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *b* subbasally; *t* subdistally.

Carapace: 0.88 × longer than broad; 4 near posterior margin.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 2: 4: 4: 2: 4: 4: 6: 6: 4: 2: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 4: 4: 4: 6: 4: 2: 2.

Dimensions: NTM A005343: Body length 2.32. Pedipalps: trochanter 0.330/0.260, femur 0.700/0.220, patella 0.570/0.235, chela (with pedicel) 1.130/0.290, chela (without pedicel) 1.040, hand (without pedicel) length 0.550, movable finger length 0.500. Carapace 0.715/0.810.

Protonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 4 setae on hand and 0 on movable finger; galea unbranched.

Pedipalp: trochanter 1.62, femur 3.33, patella 2.37, chela (with pedicel) 4.15, chela (without pedicel) 3.76, hand (without pedicel) 2.00 × longer than broad, and movable finger 0.88 × longer than hand (without pedicel). Fixed chelal finger with 3 trichobothria, movable chelal finger with 1 trichobothrium (Figure 65): *eb* and *ist* situated basally; *et* situated subdistally; *t* situated medially.

Carapace: 0.90 × longer than broad.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 2: 2: 4: 4: 4: 4: 4: 4: 4: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 2: 2: 2: 2: 2: 2.

Dimensions: NTM A005344: Body length 0.945. Pedipalps: trochanter 0.275/0.170, femur 0.500/0.150, patella 0.380/0.160, chela (with pedicel) 0.850/0.205, chela (without pedicel) 0.770, hand (without pedicel) length 0.410, movable finger length 0.360. Carapace 0.575/0.640.

MOLECULAR DATA

A single specimen of this species (WAM T131645) was successfully sequenced for COI, and accessioned in GenBank under Accession No. MZ934365 (Table 1).

REMARKS

The specimens of *Synsphyronus sertus* were found under sandstone rocks in a south-facing gully, with the rocks apparently shaded for much of the year. The collecting site is located in the MacDonnell Ranges bioregion in central Australia.

ETYMOLOGY

This species is named for the fused metatarsi and tarsi (*sertus*, Latin, join, knit, plait, connect) (Brown 1956).

Synsphyronus xynus sp. nov.

Figures 70–83

urn:lsid:zoobank.org:act:F1561BA0-85AD-44D8-99E6-3A75A717E1F5

Synsphyronus sp. ‘PSE093’: Harvey et al. 2020: 37.

MATERIAL EXAMINED

Holotype

Australia: Western Australia: ♂, Karijini National Park, c. 20 km SW. of Hancock Gorge, 22°29'02"S, 118°08'51"E, 806 m, 15 March 2015, under eucalypt bark, M.S. Harvey et al. (WAM T135584).

Paratype

Australia: Western Australia: 1 ♀, collected with holotype (WAM T135549).

Other material

Australia: Western Australia: 1 ♂, 5 ♀, Area C West to Yandi, 101.8 km NW. of Newman, 22°38'46"S, 119°06'06"E, 12 September 2011, under bark, N. Watson (WAM T117770–T117775); 2 ♂, Area C, 22.7 km NE. of Tom Price, 22°31'48"S, 117°54'46"E, 31 May 2010, under bark, D. Keirle (WAM T108732, T133432); 1 ♂, 2 ♀, Area C, 27.2 km NE. of Tom Price, 22°34'48"S, 118°01'05"E, 2 June 2010, under bark, D. Kamien (WAM T108727, T133170–T133171); 3 ♀, Area C, 27.5 km NE. of Tom Price, 22°34'48"S, 118°01'17"E, 2 June 2010, under bark, M. Menz (WAM T108744, T124675); 1 ♀, Area C, 28.4 km NE. of Tom Price, 22°33'54"S, 118°01'22"E, 1 June 2010, under bark, D. Keirle (WAM T108737); 3 ♂, Area C, 61.8 km NW. of Newman, 22°59'56"S, 118°52'09"E, 25 February 2010, under bark, Z. Hamilton (WAM T101208); 1 ♂, Area C, 78.2 km NW. of Newman, 22°55'04"S, 119°08'21"E, 18 February 2010, under bark, M. Greenham (WAM T101187); 2 tritonymphs, Area C, 82.7 km NW. of Newman, 23°00'18"S, 119°01'26"E, 21 February 2010, under bark, M. Greenham (WAM T101202); 1 ♀, Area C, 83.6 km NW. of Newman, 22°59'30"S, 118°57'32"E, 23 February 2010, under bark, M. Greenham (WAM T101174); 2 tritonymphs, Area C, 84.7 km NW. of Newman, 22°54'09"S, 119°04'15"E, 17 February 2010, under bark, Z. Hamilton (WAM T101192, T101201); 1 ♂, 3 ♀, Area C, 84.9 km NW. of Newman, 22°58'54"S, 119°00'49"E, 21 February 2010, under bark, D. Kamien (WAM T101182); 1 ♂, 1 ♀, Area C, 85.2 km NW. of Newman, 23°00'14"S, 118°59'41"E, 22 February 2010, under bark, T. Sachse (WAM T101204); 6 ♂, Area C, 86.2 km NW. of Newman, 23°00'43"S, 118°58'53"E, 22 February 2010, under bark, M. Greenham (WAM T101205, T133172, T33413); 1 ♂, 1 ♀, Area C, 88.3 km NW. of Newman, 22°56'09"S, 119°00'16"E, 20 February 2010, under bark, M. Greenham (WAM T101181); 1 ♂, Area C, 89 km NW. of Newman, 22°57'22"S, 118°58'59"E, 23 February 2010, under bark, M. Greenham (WAM T101186); 1 ♀, Area C, 89.3 km NW. of Newman, 22°54'23"S, 119°00'44"E, 19 February 2010, under bark, M. Greenham (WAM T101177); 1 ♂, Area C, 89.4 km NW. of Newman, 22°58'48"S, 118°57'43"E, 23 February 2010, under bark, D. Kamien (WAM T101203); 2 ♀, Area C, 89.5 km NW. of Newman, 22°58'48"S, 118°57'43"E, 23 February 2010, under bark, T. Sachse (WAM T101183); 2 ♂, Area C, 89.6 km NW. of Newman, 23°00'03"S, 118°56'49"E, 18 February 2010, under bark, M. Greenham (WAM T101178); 1 ♂, 1 tritonymph, Area C, 90.6 km NW. of Newman, 22°59'52"S, 119°01'47"E, 22 February 2010, under bark, M. Greenham (WAM T101184, T101195); 2 ♂, 2 ♀, Area C, 93.7 km NW. of Newman, 22°59'55"S, 118°54'24"E, 18 February 2010, under bark, M. Greenham, Z. Hamilton (WAM T101180, T101198); 3 ♂, 1 deutonymph, BlueSpec, 18 km NE. of Nullagine, 21°49'51.70"S, 120°16'19.80"E, 1 August 2012, under

bark of *Melaleuca argentea* and *Corymbia* sp., M.K. Curran, S.R. Bennett (WAM T127500, T133154, T133155, T133156); 1 ♂, Cane River Conservation Park, site CR30, 22°15'09.3"S, 115°30'45.0"E, 28 June 2011, under bark of *Corymbia* sp., J.M. Waldock (WAM T115048); 1 ♂, 2 ♀, Hillside Station, c. 150 km SE. of Wodgina Mine, 21°54'50.10"S, 119°13'55.90"E, 23 May–13 June 2014, B. Parsons (WAM T134245); 2 ♀, Hope Downs, 74 km NW. of Newman, 22°59'26"S, 119°05'28"E, 25 June 2010, under bark, G. Humphreys, P. Runham (WAM T107400, T133433); 2 ♂, Hope Downs 4, c. 100 km NW. of Newman, HD4-3, 23°09'10.7"S, 119°31'44.5"E, 12 May 2008, J. Francesconi (WAM T91720); 7 ♂, 4 ♀, Hope Downs 4, c. 100 km NW. of Newman, HD4-6, 23°09'15.7"S, 119°34'54.1"E, 10 May 2008, J. Francesconi (WAM T91718, T91721); 1 ♂, 1 ♀, same data (AM KS.131088); 1 ♂, 1 ♀, same data (QM S116491); 1 ♀, Little Sandy Desert, 11.9 km SE. of Burranbar Pool, site LSD-S5-F1, 23°52'48"S, 120°30'11"E, August 1997, S. van Leeuwen, B. Bromilow (WAM T110086); 3 ♂, 3 ♀, 1 tritonymph, Marandoo Mine Expansion, 35 km ENE. of Tom Price, 22°06'20"S, 118°18'22"E, 13 April 2007, L. Beesley, P. Runham (WAM T82334, T82335, T155130, T155131); 1 ♀, Marandoo Mine Expansion, 35 km ENE. of Tom Price, 22°07'37"S, 118°19'59"E, 12 April 2007, L. Beesley (WAM T82336); 1 ♂, Marandoo Mine Expansion, 35 km ENE. of Tom Price, 22°39'43"S, 118°10'49"E, 12 April 2007, L. Beesley (WAM T82340); 1 ♂, 1 ♀, 3 tritonymphs, Mesa G and Warramboo, 50.8 km W. of Pannawonica, 21°40'25"S, 115°50'03"E, 27 August 2009, under bark, M.A. Cowan (WAM T102897); 2 ♂, 8 ♀, 1 tritonymph, Mesa K, 10 km SW. of Pannawonica, 21°43'45"S, 116°15'18"E, 13 November 2006, D. Kamien (WAM T82356, T82355, T133117–T133125); 1 ♂, 2 ♀, 19 km SW. of Mt Brockman, site BRO936, 22°35'37"S, 117°10'23"E, 21–28 October 2004, R. Teale (WAM T73311); 4 ♂, 6 ♀, 3 tritonymphs, 1 protonymph, c. 22 km SW. of Mt Brockman, site BRO36, 22°35'37"S, 117°10'23"E, 27 October 2004, under bark of *Corymbia hamersleyana*, R. Teale, Z. Hamilton (WAM T65209); 2 ♀, 1 protonymph, Mt Webber, c. 200 km SE. of Port Hedland, 21°41'37.90"S, 119°40'43.10"E, 7–24 March 2014, dry pitfall, A. Slabber, M. Quinn (WAM T132825); 1 ♂, Mudlark, 111 km W. of Newman, 23°04'51"S, 118°41'03"E, 2 July 2011, under *Eucalyptus* bark, M. Greenham, N. Watson (WAM T117776); 10 ♂, 8 ♀, 1 tritonymph, 5 deutonymphs, Nammundi-Silvergrass, 52.1 km NW. of Tom Price, 22°23'01"S, 117°24'23"E, 8–12 October 2008, under bark, E. Harris, M. Greenham (WAM T99572, T99573, T133182–T133191); 11 ♂, 7 ♀, Nammundi-Silvergrass, 52.3 km NW. of Tom Price, 22°23'53"S, 117°23'30"E, 8–12 October 2008, under bark, E. Harris, M. Greenham (WAM T99575, T133192–T133195, T133408–T133410); 5 ♂, 1 tritonymph, 1 protonymph, Nammundi-Silvergrass, 53.6 km NW. of Tom Price, 22°23'30"S, 117°22'48"E, 8–12 October 2008, under bark, E. Harris, M. Greenham (WAM T99574, T133157, T133411, T133412); 10 ♂, 10 ♀, 5 tritonymphs, Nammundi-

Silvergrass, 79.7 km NW. of Tom Price, 22°14'28"S, 117°10'56"E, 11 May 2009, under bark, M. Greenham, R. Hamilton (WAM T102844); 1 ♀, 2 tritonymphs, 64 km NW. of Newman, 22°54'16"S, 119°20'27"E, 12 March 2011, under *Corymbia hamersleyana* bark, Z. Hamilton (WAM T110435, T133137); 13 ♂, 2 tritonymphs, 2 deutonymphs, 114.4 km NW. of Newman, 22°34'51"S, 119°00'06"E, 20 November 2011, under bark, M. Greenham, Z. Hamilton (WAM T126241, T133145–T133147); 1 ♀, Orebody 24, c. 7 km N. of Newman, 23°17'16.32"S, 119°44'48.41"E, 5–13 August 2013, leaf sifting, S. Callan (WAM T131262); 13 ♂, 4 ♀, 3 tritonymphs, 17.1 km S. of Pannawonica, Bungaroo Lease, 21°47'04"S, 116°15'31"E, 8 August 2009, under bark, M. Greenham (WAM T102835); 12 ♂, 2 ♀, 5 tritonymphs, 1 protonymph, 50.7 km W. of Pannawonica, Mesa G - Warramboo Lease, 21°37'01"S, 115°49'59"E, 27 August 2009, under bark, M. Greenham, M.A. Cowan (WAM T102892, T102893, T133414–T133421, T133426–T133431); 8 ♂, 1 ♀, 2 tritonymphs, 2 deutonymphs, 52.4 km W. of Pannawonica, Mesa G - Warramboo Lease, 21°38'09"S, 115°49'08"E, 27 August 2009, under bark, M.A. Cowan (WAM T102890, T133158, T133422–T133425); 1 tritonymph, 1 deutonymph, c. 150 km SE. of Port Hedland, Shaw River, 21°04'26.99"S, 119°14'53.22"E, 23–29 July 2011, leaf litter, N. Dight, M. Majer (WAM T117733, T117746); 1 ♂, 1 tritonymph, Robe Valley, 15 km SW. of Pannawonica, 21°43'59"S, 116°13'10"E, 26 October 2010, under bark, D. Kamien J. Cairnes (WAM T109110, T109111); 3 ♂, 1 tritonymph, Robe Valley, 16 km SW. of Pannawonica, 21°44'46"S, 116°13'12"E, 26 October 2010, under bark, J. Cairnes (WAM T109113); 1 ♂, 2 ♀, 1 tritonymph, Robe Valley, 39.6 km WSW. of Pannawonica, 21°43'51"S, 115°57'13"E, 25 October 2010, under bark, D. Kamien (WAM T109109); 1 ♂, 6 ♀, 5 km S. of Shay Gap, 20°32'S, 120°10'E, 5 October 1992, under bark of bloodwood, G. Harold (WAM T127289); 1 ♀, South Flank, c. 95 km NW. of Newman, 22°58'15.0"S, 118°47'33.7"E, 16–23 March 2016, under bark, B. Durrant (WAM T140230); 1 ♀, Southern Flank to Jinidi, 68.1 km NW. of Newman, 22°57'48"S, 119°12'58"E, 15 April 2011, under bark, R. Teale, M. Greenham (WAM T111892); 13 ♂, 1 ♀, 5 tritonymphs, 2 deutonymphs, Sulphur Springs, 21°08'27"S, 119°11'20"E, 4 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63976, T63968, T133100–T133105); 4 ♂, 3 ♀, 1 deutonymph, Sulphur Springs, 21°08'10"S, 119°12'06"E, 4 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63974); 6 ♂, 2 ♀, 2 tritonymphs, Sulphur Springs, 21°09'06"S, 119°12'10"E, 4 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63965, T63978); 8 ♂, 5 ♀, Sulphur Springs mine, 21°08'52"S, 119°12'14"E, 2 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63988, T133112–133116); 1 ♂, 2 ♀, 2 tritonymphs, 1 deutonymph, Sulphur Springs, 21°08'16"S, 119°12'20"E, 4 September 2006, under bark

of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63975); 2 ♂, Sulphur Springs, 20°59'03"S, 119°18'14"E, 3 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63967); 3 ♂, 2 ♀, near Sulphur Springs, 20°46'01"S, 119°19'17"E, 28 October 2007, under bark of *Corymbia hamersleyana*, M.S. Harvey, R.J. Teale (WAM T95086, T133129, T133130); 7 ♂, 4 ♀, Sulphur Springs, 20°46'10"S, 119°19'17"E, 3 September 2006, under bark of *Corymbia hamersleyana*, R. Teale, P. Runham, M. Greenham (WAM T63979, T133106–T133111); 4 ♀, Tom Price Powerline, 1 km WSW. of Tom Price, 22°42'06"S, 117°46'28"E, 8 August 2009, under bark, M. Menz (WAM T98406, T133126); 1 ♂, 3 ♀, Tom Price Powerline, 10 km NW. of Tom Price, 22°38'50"S, 117°42'32"E, 8 August 2009, under bark, M. Menz (WAM T98408, T153910); 1 ♂, 1 ♀, 1 deutonymph, 1 protonymph, Tom Price Powerline, 6 km NW. of Tom Price, 22°40'25"S, 117°44'11"E, 7 September 2008, under bark, M. Menz (WAM T98404, T98407, T133127, T133128); 3 ♂, 9 ♀, 3 tritonymphs, Tom Price Powerlines, 4.1 km WNW. of Tom Price, 22°41'10"S, 117°44'55"E, 1–30 September 2007, under bark, D. Kamien (WAM T102920, T133159–T133163); 3 ♂, 1 tritonymph, Tom Price Powerlines, 6.1 km NW. of Tom Price, 22°39'47"S, 117°43'11"E, 1–31 September 2007, under bark, E. Harris (WAM T102916, T102917, T155164); 3 ♂, 1 ♀, Tom Price Powerlines, 6.4 km NW. of Tom Price, 22°39'45"S, 117°43'48"E, 1–31 September 2007, under bark, D. Kamien (WAM T102918, T102919); 1 tritonymph, West Turner Corridor, 23 km W. of Tom Price, 22°42'22"S, 117°34'18"E, 1–31 September 2007, under bark, M. Greenham (WAM T102925); 4 ♂, 9 ♀, 4 tritonymphs, West Turner Corridor, 23 km W. of Tom Price, 22°43'04"S, 117°34'30"E, 1–30 September 2007, under bark, M. Greenham (WAM T102921, T133164–T133169); 5 ♂, 1 ♀, West Turner Corridor, 23 km W. of Tom Price, 22°43'17"S, 117°40'33"E, 1–31 September 2007, under bark, M. Greenham (WAM T10292, T102926); 4 ♂, 2 ♀, 1 tritonymph, West Turner Syncline, 35 km SW. of Tom Price, 22°40'13"S, 117°27'17"E, 18 July 2007, under bark, D. Kamien, M. Greenham (WAM T98420, T98421); 1 protonymph, West Turner Syncline, 24 km W. of Tom Price, 22°40'19"S, 117°28'01"E, 24 July 2008, under *Eucalyptus* bark, D. Kamien (WAM T98417); 3 ♂, 1 ♀, 1 deutonymph, West Turner Syncline, 33 km W. of Tom Price, 22°40'19"S, 117°28'01"E, 24 July 2008, under *Eucalyptus* bark, D. Kamien (WAM T98415); 2 ♂, 5 tritonymphs, West Turner Syncline, 31 km WSW. of Tom Price, 22°44'12"S, 117°30'09"E, 20 July 2007, under bark, D. Kamien, M. Greenham (WAM T98411, T133179, T133180); 9 ♂, 7 ♀, 2 tritonymphs, West Turner Syncline, 28 km W. of Tom Price, 22°39'57"S, 117°31'22"E, 21 July 2007, under bark, D. Kamien, M. Greenham (WAM T98410, T98422, T133138–T133144); 12 ♂, 12 ♀, 1 tritonymph, 1 deutonymph, West Turner Syncline, 22 km W. of Tom Price, 22°43'00"S, 117°34'32"E, 25 July 2008, under *Corymbia* bark, E. Harris (WAM T98413); 8 ♂, 12 ♀, West Turner Syncline, 18 km W. of Tom Price,

22°40'37"S, 117°35'53"E, 22 July 2007, under bark, D. Kamien, M. Greenham (WAM T98412, 133173-T133177); 9 ♂, 10 ♀, 2 tritonymphs, West Turner Syncline, 18 km W. of Tom Price, 22°40'12"S, 117°36'48"E, 22 July 2007, under bark, D. Kamien, M. Greenham (WAM T98409); 3 ♂, 3 ♀, West Turner Syncline, 18 km W. of Tom Price, 22°40'12"S, 117°36'48"E, 22 July 2007, under bark, D. Kamien, M. Greenham (WAM T133131-T133136); 6 ♂, 1 ♀, 3 tritonymphs, Wheatstone Biological Survey, 23 km SSE. of Onslow, 21°51'12.11"S, 115°08'51.30"E, 22 April 2009, *Corymbia* sp., G. Humphreys, M. Greenham (WAM T98750); 5 ♂, Wheatstone Biological Survey, 62 km SE. of Onslow, 22°04'55.73"S, 115°28'58.83"E, 20 April 2009, G. Humphreys, M. Greenham (WAM T98747).

DIAGNOSIS

Synsphyronus xynus differs from all other species of the genus by the combined presence of fused metatarsi and tarsi (Figure 82), a constricted anterior eye (Figure 83), eight trichobothria on the fixed chelal finger, and one trichobothrium on the movable finger (Figure 76).

DESCRIPTION

Adults

Colour (Figures 70–75) of sclerotised portions generally dark red-brown; tergites IV–X with paired darker patches. Waxy epicuticle. Setae generally aligned perpendicularly from body, each seta quadricarinate. Most cuticular surfaces roughened, but not granulate.

Chelicera: with 5 setae on hand and 1 subdistal seta on movable finger, all setae acuminate; setae *sbs* and *bs* shorter than others; 2 dorsal lyrifissures and 1 ventral lyrifissure; galea of ♂ and ♀ unbranched; rillum of 3 blades, the most distal blade with spinules on leading edge, other blades smooth; serrula exterior with 16 (♂, ♀) blades; lamina exterior present.

Pedipalp (Figure 81): trochanter 1.37 (♂), 1.64 (♀), femur 3.27–4.38 (♂), 3.74–4.32 (♀), patella 2.22–2.71 (♂), 2.47–2.74 (♀), chela (with pedicel) 3.28–3.85 (♂), 3.33–3.79 (♀), chela (without pedicel) 2.96–3.65 (♂), 3.13–3.56 (♀), hand (without pedicel) 1.53–1.85 (♂), 1.61–1.94 (♀) × longer than broad, movable finger 0.88–1.02 (♂), 0.86–0.97 (♀) × longer than hand (without pedicel). Fixed chelal finger with 8 trichobothria, movable chelal finger with 1 trichobothrium (Figure 76): *eb*, *esb* and *isb* situated basally in straight row, *est* submedially, *et* subdistally, *ib* and *ist* basally in diagonal row, and *it* subdistally, well posterior to *et*; *t* subdistally; patch of microsetae present on retrolateral margin of fixed chelal finger near *et*. Venom apparatus present in both chelal fingers, venom ducts long, terminating in nodus ramosus midway near *et* in fixed finger and midway between *t* and tip of finger in movable finger. Chelal teeth retrorse and acute distally, becoming rounded basally (Figure 77); fixed finger with 37 (♂), 35 (♀) teeth; movable finger with 27 (♂), 26 (♀) teeth; accessory teeth absent.

Carapace (Figures 72, 75): 0.82–0.90 (♂), 0.79–0.92 (♀) × longer than broad; anterior margin slightly indented medially; subtriangular; with 2 pairs of corneate eyes (Figure 83) situated c. one-third carapace length from anterior margin; anterior eye strongly constricted; with 4 setae near anterior margin and 8 (♂) 9 (♀) near posterior margin; with numerous lyrifissures; without furrows.

Coxal region: manducatory process rounded, with 3 apical acuminate setae, plus 4 (♂, ♀) additional setae; medial maxillary lyrifissure situated submedially; chaetotaxy of coxae I–IV: ♂, 3: 4: 5: 6; ♀, 4: 5: 6: 12.

Legs (Figure 82): junction between femora and patellae I and II slightly oblique to long axis; junction between femora and patellae III and IV very angulate; femora III and IV much smaller than patellae III and IV; femur + patella of leg IV 3.00 (♂), 3.29 (♀) × longer than deep; metatarsi and tarsi fused and without tactile seta; subterminal tarsal setae arcuate and acute; arolium much longer than claws, not divided.

Abdomen: tergites II–X (♂, ♀) and sternites X (♂), IX–X (♀) with median suture line (Figures 70, 71, 73, 74). Tergal chaetotaxy: ♂, 4: 8: 10: 10: 11: 12: 10: 10: 8: 4: 2; ♀, 10: 9: 10: 13: 14: 14: 13: 11: 7: 8: 4: 2; uniserial; all setae quadricarinate. Sternal chaetotaxy: ♂, 6: (0) 4 [2 + 3] (0): (0) 4 (0): 4: 6: 7: 9: 8: 9: 8: 2; ♀, 8: (0) 6 (0): (0) 6 (0): 6: 8: 9: 11: 10: 4: 2; uniserial; all setae quadricarinate except for setae on sternites II–IV and medial setae on sternites V–VI, which are acuminate. Spiracles without helix. Anal plates (tergite XII and sternite XII) situated within sternite XI, surrounded by slightly raised rim. Pleural membrane wrinkled-plicate; without any setae.

Genitalia ♂: lateral apodeme laterally extended and distally broadened; anterior apodeme acute; a pair of acute dorsal apodemes; lateral rod very broad ventrally and with a blunt, anterior projection; ejaculatory canal atrium large and cup-shaped.

Genitalia ♀: with one pair of lateral cribiform plates and 2 pairs of median cribiform plates.

Dimensions ♂: holotype (WAM T135584) followed by 10 other males (when measured): Body length 2.50 (2.14–2.69). Pedipalps: trochanter 0.335/0.245, femur 0.735/0.180 (0.690–0.770/0.160–0.230), patella 0.540/0.205 (0.490–0.570/0.185–0.245), chela (with pedicel) 1.045/0.300 (1.030–1.245/0.270–0.370), chela (without pedicel) 0.990 (0.980–1.095), hand (without pedicel) length 0.520 (0.490–0.565), movable finger length 0.460 (0.475–0.525). Carapace 0.690/0.765 (0.670–0.765/0.780–0.885); eye diameter, anterior 0.035, posterior 0.055. Leg IV: femur + patella 0.540/0.180, tibia 0.340/0.135, tarsus 0.265/0.075.

Dimensions ♀: paratype (WAM T135549) followed by 10 other females (when measured): Body length 3.12 (2.36–3.23). Pedipalps: trochanter 0.385/0.235, femur 0.830/0.205 (0.750–0.815/0.185–0.215), patella 0.610/0.225 (0.545–0.625/0.210–0.235), chela (with pedicel) 1.195/0.315 (1.150–1.200/0.320–0.360), chela



FIGURES 70–75 *Synsphyronus xynus* sp. nov., holotype ♂ (WAM T135584): 70) body, dorsal; 71) body, ventral; 72) cephalothorax, dorsal. Paratype ♀ (WAM T135549): 73) body, dorsal; 74) body, ventral; 75) cephalothorax, dorsal.

(without pedicel) 1.120 (1.090–1.125), hand (without pedicel) length 0.610 (0.545–0.610), movable finger length 0.505 (0.510–0.555). Carapace 0.770/0.975 (0.710–0.760/0.800–0.940); eye diameter, anterior 0.030, posterior 0.055. Leg IV: femur + patella 0.625/0.190, tibia 0.390/0.110, tarsus 0.300/0.085.

Tritonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.53, femur 3.84, patella 2.49, chela (with pedicel) 3.73, chela (without pedicel) 3.54, hand (without pedicel) 1.81 × longer than broad, and movable finger 0.93 × longer than hand (without pedicel). Fixed chelal finger with 7 trichobothria,

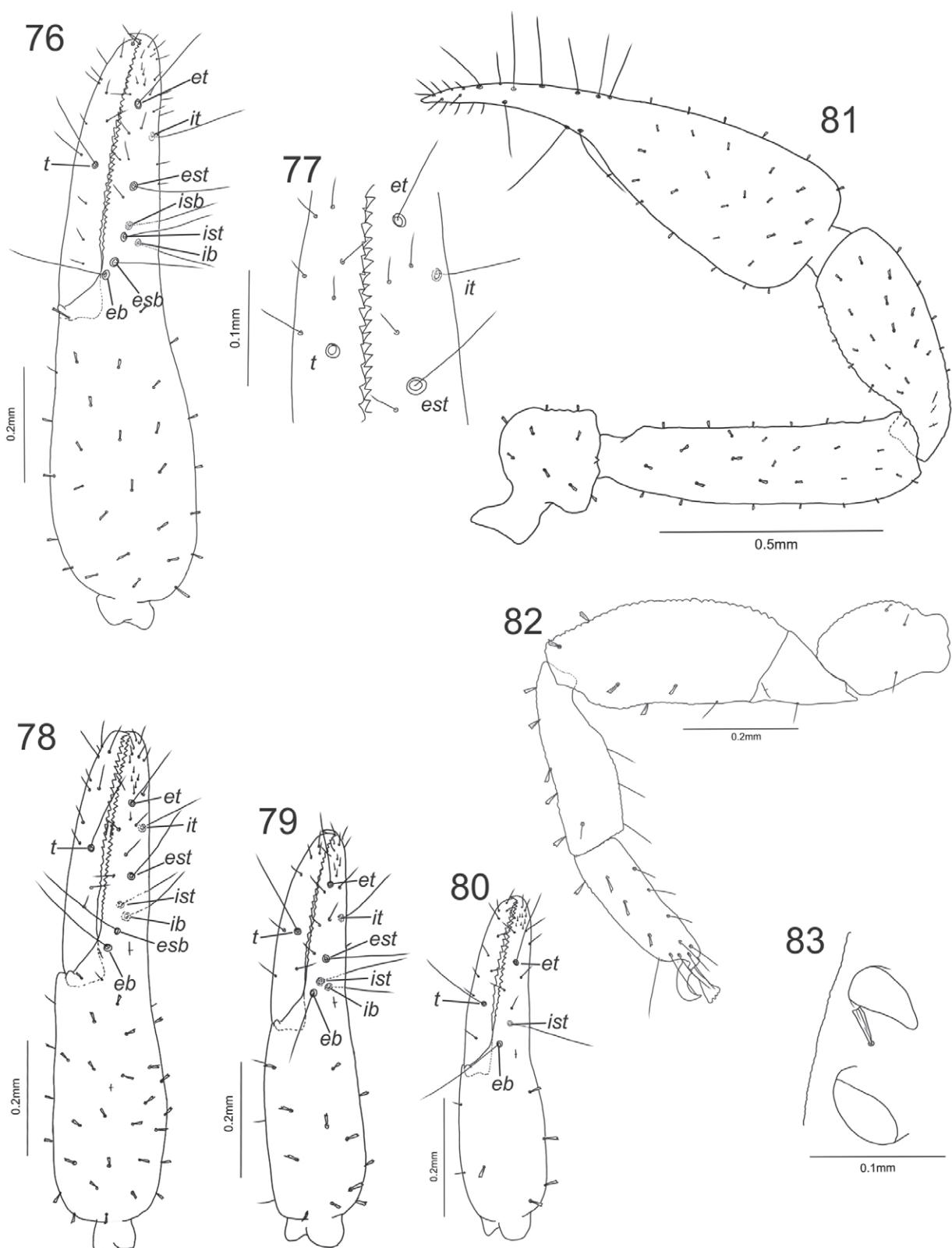
movable chelal finger with 1 trichobothrium (Figure 78); *eb*, *esb*, *ist* and *ib* situated basally; *est* situated medially; *et* subdistally; *it* submedially; *t* submedially.

Carapace: 0.83 × longer than broad; with 6 setae near posterior margin.

Legs: much as in adults.

Abdomen: tergal chaetotaxy: 8: 8: 8: 10: 10: 10: 11: 8: 9: 4: 4: 4. Sternal chaetotaxy: 0: (0) 4 (0): (0) 4 (0): 4: 4: 4: 6: 10: 8: 2: 2.

Dimensions: WAM T155164: Body length 1.73. Pedipalps: trochanter 0.290/0.190, femur 0.595/0.155, patella 0.435/0.175, chela (with pedicel) 0.895/0.240, chela (without pedicel) 0.850, hand (without pedicel) length 0.435, movable finger length 0.405. Carapace 0.575/0.690.



FIGURES 76–83 *Synsphyronus xynus* sp. nov., holotype ♂ (WAM T135584), unless stated otherwise: 76) left chela, retrolateral; 77) detail of chelal teeth, retrolateral; 78) left chela, retrolateral, tritonymph (WAM T155164); 79) left chela, retrolateral, deutonymph (WAM T133157); 80) left chela, retrolateral, protonymph (WAM T98417); 81) right pedipalp, dorsal; 82) left leg IV, retrolateral; 83) left eyes, dorsal.

Deutonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 5 setae on hand and 1 on movable finger; galea unbranched.

Pedipalp: trochanter 1.44, femur 3.44, patella 2.13, chela (with pedicel) 3.64, chela (without pedicel) 3.44, hand (without pedicel) 1.72 × longer than broad, and movable finger 1.00 × longer than hand (without pedicel). Fixed chelal finger with 6 trichobothria, movable chelal finger with 1 trichobothrium (Figure 79): *eb*, *ist* and *ib* situated basally; *est* situated medially; *et* distally; *it* subdistally; *t* submedially.

Carapace: 0.86 × longer than broad; with 28 setae including 2 near anterior margin and 4 near posterior margin.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 3: 6: 6: 6: 6: 6: 7: 6: 2: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 2: 2: 2: 3: 6: 6: 4: 2.

Dimensions: WAM T133157: Body length 1.51. Pedipalps: trochanter 0.230/0.160, femur 0.465/0.135, patella 0.330/0.155, chela (with pedicel) 0.710/0.195, chela (without pedicel) 0.670, hand (without pedicel) length 0.335, movable finger length 0.335. Carapace 0.510/0.590.

Protonymph

Colour mostly as for adults, but generally paler.

Chelicera: with 4 setae on hand and 0 on movable finger; galea unbranched.

Pedipalp: trochanter 1.50, femur 3.22, patella 2.08, chela (with pedicel) 3.66, chela (without pedicel) 3.41, hand (without pedicel) 1.75 × longer than broad, and movable finger 0.98 × longer than hand (without pedicel). Fixed chelal finger with 3 trichobothria, movable chelal finger with 1 trichobothrium (Figure 80): *eb* and *ist* situated basally; *et* situated subdistally; *t* situated submedially.

Carapace: 0.86 × longer than broad.

Legs: metatarsi and tarsi fused.

Abdomen: tergal chaetotaxy: 2: 4: 4: 4: 4: 4: 4: 4: 2: 2. Sternal chaetotaxy: 0: (0) 2 (0): (0) 2 (0): 2: 2: 2: 2: 4: 2.

Dimensions: WAM T98417: Body length 1.38. Pedipalps: trochanter 0.180/0.120, femur 0.370/0.115, patella 0.270/0.130, chela (with pedicel) 0.585/0.160, chela (without pedicel) 0.545, hand (without pedicel) length 0.280, movable finger length 0.275. Carapace 0.425/0.495.

MOLECULAR DATA

We successfully sequenced 98 specimens of this species for COI, which have been accessioned in GenBank (Table 1). Sequence data from a single specimen of this species were reported by Harvey et al. (2020) under the name *Synsphyronus* 'PSE093'.

REMARKS

Synsphyronus xynus has features that suggest a close relationship with the *S. paradoxus* group of species, including fused metatarsi and tarsi (Figure 82), a broad chelal hand (Figure 81) and a strongly constricted anterior eye (Figure 83). This group currently includes species with differing numbers of trichobothria: *S. paradoxus* from south-eastern Australia with 8/2, *S. hadronennus* from the Northern Territory and *S. meganennus* from New South Wales with 8/3, and *S. heptatrichus* from the Northern Territory with 7/2. The new species differs from them by having an 8/1 arrangement (Figure 76).

Synsphyronus xynus occurs throughout the Pilbara region of Western Australia where it occurs under tree bark, including tree species such as *Corymbia hamersleyana*, *Melaleuca argentea* and unidentified species of *Eucalyptus*. This corticolous habitat is similar to other species of the *paradoxus* group, which are all found under tree bark (Harvey 1987b).

ETYMOLOGY

This species is named for its widespread distribution in the Pilbara region of Western Australia (*xynus*, common) (Brown 1956).

Synsphyronus gurdoni

Harvey, Abrams & Burger, 2015

Synsphyronus gurdoni Harvey, Abrams and Burger 2015: 138–142, figures 1–13.

REMARKS

The description of *S. gurdoni* by Harvey et al. (2015a) contained incorrect ratios for some pedipalpal segments. The corrected ratios are presented here:

Femur 2.44–3.42 (♂), 2.90–3.60 (♀), patella 2.12–2.62 (♂), 2.32–2.76 (♀), chela (with pedicel) 3.12–3.80 (♂), 3.25–3.53 (♀), chela (without pedicel) 3.15–3.42 (♂), 2.97–3.30 (♀) × longer than broad.

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