

## Two new species of the Australian spider genus *Missulena* Walckenaer (Araneae: Actinopodidae)

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**Abstract** – Two new species of the actinopodid genus *Missulena* Walckenaer, *M. dipsaca* and *M. rutraspina*, are described.

### INTRODUCTION

*Missulena* Walckenaer was erected in 1805 when its type species, *M. occatoria*, was described from a female. This specimen, now missing (Main 1985), was collected somewhere on the coast of New Holland during a voyage of discovery by Francois Peron.

In the succeeding years a number of species were added to the genus. Main (1956) observed that "the taxonomy of *Missulena* was very confusing until Womersley (1943) revised the genus, and reduced the number of species to six". In the latest bibliographic review of the genus Main (1985) lists seven species of *Missulena*: *M. occatoria* Walckenaer, 1805, *M. insignis* (Cambridge, 1877), *M. reflexa* Rainbow and Pulleine, 1918, *M. granulosa* (Cambridge, 1868), *M. hoggi* Womersley, 1943, *M. bradleyi* Rainbow, 1914 and *M. pruinosa* Levitt-Gregg, 1966.

In 1982 I began a study on a previously undescribed species of *Missulena*. This subsequently grew into a revision of the genus, of which the following descriptions form part. Dr. Barbara York Main has had important influences in this study, by encouraging the author to publish descriptions of new species of *Aganippe*, which led to *Missulena*, by her important behavioural observations on members of the genus and by her continuing encouragement, personally and through her writing, of arachnological endeavours.

### MATERIALS AND METHODS

Specimens are lodged in the following institutions: Australian Museum, Sydney (AM), Museum of Victoria, Melbourne (MV), Queensland Museum, Brisbane (QM), South Australian Museum, Adelaide (SAM), University of New England, Armidale (UNE), and Western Australian Museum, Perth (WAM).

A specimen of *Missulena dipsaca* had a palpal tarsus and a chelicera removed to be mounted and gold-palladium-coated in a Polaron sputter-coater

prior to being examined in a Joel JSM255 scanning electron microscope at an accelerating voltage of 25kv. The paratype of *Missulena rutraspina* had its right chelicera removed, and both it and the carapace drawn using a drawing tube.

All measurements in descriptions are in mm. The carapace height is the distance from the most ventral point on the carapace to the top of the caput, while the carapace width is the distance between edges of the carapace at its greatest width.

The following abbreviations are used: MOQ (median ocular quadrangle); p, d, r and v (prolateral, dorsal, retrolateral and ventral faces of leg segments); STC (superior tarsal claws); ITC (inferior tarsal claws); PLS (posterolateral spinneretts); PMS (posteromedian spinneretts). Where the latitude and longitude are indicated on the data label they are enclosed thus ( ), but where they have been independently determined they are enclosed thus [ ].

### SYSTEMATICS

#### Genus *Missulena* Walckenaer

*Missulena* Walckenaer, 1805: 8; Main, 1985: 9 (full synonymy)

#### Type species

*Missulena occatoria* Walckenaer, 1805, by monotypy.

#### *Missulena dipsaca* sp. nov.

Figures 1-2

#### Material Examined

##### Holotype

♂, Junee, New South Wales, Australia [34°52'S, 147°35'E], 26 June 1982, Holdsworth (AM KS9308).

##### Paratypes

**Australia: New South Wales:** 1♂, Round Hill near Euabalong [31°12'S, 150°01'E], running on

ground in mallee-*Triodia* association by day, 4 September 1968, J. Rice (AM KS1365); 1♂, Forbes [33°23'S,148°01'E], 20 June 1979, P.A. McDonnell (AM KS3074); 1♂, Taree [31°54'S,152°29'E], May 1975 (AM KS9309).

#### Other Material Examined

**Australia: New South Wales:** 1♂, Armidale [30°31'S,151°40'E], 20 April 1982, N. Cotsell (AM KS10411); 1♂, Armidale [30°31'S, 151°40'E], 27 June 1982, P. Smith (AM KS13453); 1♂, Cowra [33°50'S,148°41'E], 10 March 1987 (AM KS17082); 1♂, Crescent Head [31°12'S, 152°59'E], 31 May 1976, D. Kemp (AM KS6228); 1♂, Glen Innes [29°44'S, 151°44'E], 1 May 1985, E. Burgess (AM KS17062); 1♂, Greenthorpe 18 km from Cowra [34°00'S, 148°24'E], 2 April 1987, J. Cooper (AM KS17209); 1♂, Junee [34°52'S, 147°35'E], 27 May 1982, Holdsworth (AM KS34482); 1♂, Mudgee [32°36'S, 149°35'E], 14 May 1991, M.R. Hescop (AM KS27914); 1♂, Mudgee area [32°36'S, 149°35'E], 3 May 1991, J. McQuiggin (AM KS27868); 1♂, Forest Reefs near Orange [33°27'S,149°07'E], 26 March 1991, P.J. Kennedy (AM KS28190); 1♂, Tamworth [31°05'S, 150°55'E], 17 October 1983, M. Brown (AM KS13542); 1♂, Vittoria [33°27'S, 149°26'E], 8 April 1987, M. Gordon (AM KS17185); 1♂, Old Gostwick Rd., East Armidale [30°31'S, 151°40'E], 16 May 1979, H. Heatwole (QM S8588); 1♂, Lynches Rd., Armidale [30°31'S, 151°40'E], 12 May 1980 (QM S8584); 1♂, Invergowrie [30°31'S, 151°40'E], 8 October 1985, R. Hobbs (QM S8587); 1♂, Armidale [30°31'S, 151°40'E], 7 May 1985, R. Hobbs (QM S8589); 1♂, Armidale [30°31'S, 151°40'E], 13 September 1983 (UNE); 1♂, Armidale [30°31'S, 151°40'E], 16 May 1983 (UNE); 1♂, Lynches Rd, Armidale [30°31'S, 151°40'E], 13 April 1983 (UNE). **Queensland:** 1♂, Noosa [26°23'S, 153°07'E], 16 April 1982, M. Leggett (QM S8583); 1♂, Gympie [26°11'S, 152°40'E], 24 June 1979, L. Schultz (QM S8586). **South Australia:** 1♂, Ferries, McDonald National Park [35°15'S,139°09'E], 1 May 1978, E.G. Matthews (SAMA N1992562); 1♂, 0.5 km S. Mitcherie Rockhole [31°27'S, 132°49'E], 16–21 October 1987, Yellabima Survey MI.5 (SAMA N1992563). **Victoria:** 1♂, Murray Valley Hwy and Annuella Rd. (35°51'S,142°31'E), May 1986, survey site 9 (MV); 1♂, near Hattah (34°41'S, 142°19'E), October 1985, survey site 26 (MV); 1♂, near Patchewollock (35°13'S,142°19'E), May 1986, survey site 56 (MV); 1♂, near Millewa Sth. Bore (34°45'S, 141°04'E), February 1986, survey site 95B (MV); 1♂, near Murrayville (35°22'S,141°03'E), October 1986, survey site 73 (MV); 1♂, near Millewa Sth. Bore (34°35'S, 141°03'E), November 1985, survey site 84 (MV); 1♂, near Hattah (34°48'S, 142°21'E), October 1985, survey site 5 (MV); 1♂, near Hattah (34°41'S, 142°19'E), September 1986, survey site 26 (MV); 1♂, near Murrayville (35°29'S, 141°06'E), October 1986,

survey site 68 (MV); 1♂, near Meringer (34°29'S,141°06'), February 1986, survey site 82 (MV). **Western Australia:** 1♂, Edel Land (26°11'S,113°15'E), 21 August 1989, G. Harold, trapline 10 (WAM 91/45); 2♂, Edel Land (26°11'S, 113°15'E), 19 August 1989, G. Harold, trapline 10 (WAM 91/43–44).

#### Diagnosis

This species is distinguished by the male rastellum having a number of narrow spines on distinct process (Fig. 1), rather than few wide spines on distinct process (*M. rutraspina*), or number of narrow spines on at most low mound (all other species). Fangs with basomedial tooth (absent in *M. rutraspina*). Male caput and chelicerae black, rather than red (*M. occatoria*). Dorsal and lateral abdomen concolorous, rather than dorsum at least partly off-white (*M. bradleyi*). Tip of palpal embolus varies from arrowhead form (Fig. 2) to the duckbill form (Fig. 3) also found in *M. occatoria* and *M. granulosa*. Scopulae present on metatarsus IV, occasionally proximal half of tarsus IV also, present on metatarsus and tarsus III in all other species. Rasps present on patellae III only, also present on patellae I in all other species.

Female unknown.

Biometrics (10♂♂) mean ± standard deviation (range): carapace length 2.9±0.4 (2.4–3.5), width 3.3±0.4 (2.8–4.1), height 1.8±1.0 (1.1–1.8); caput width 2.5±0.3 (2.0–3.2); maxillary length 1.2±0.1 (0.9–1.4), width 1.0±0.1 (0.8–1.3); sternum length 2.0±0.2 (1.7–2.5), width 1.8±0.2 (1.5–2.2); labium length 0.8±0.2, width 0.6±0.1 (0.4–0.8).

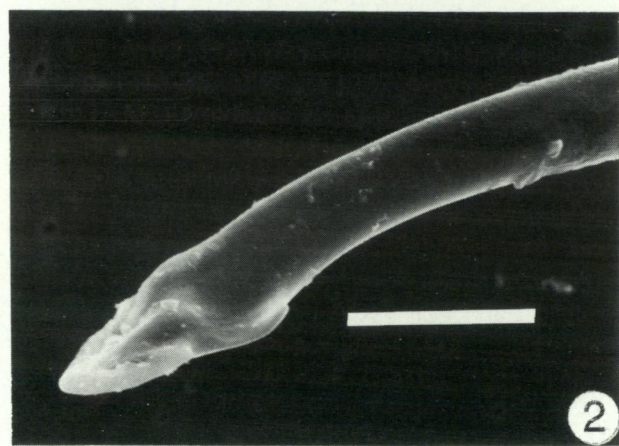
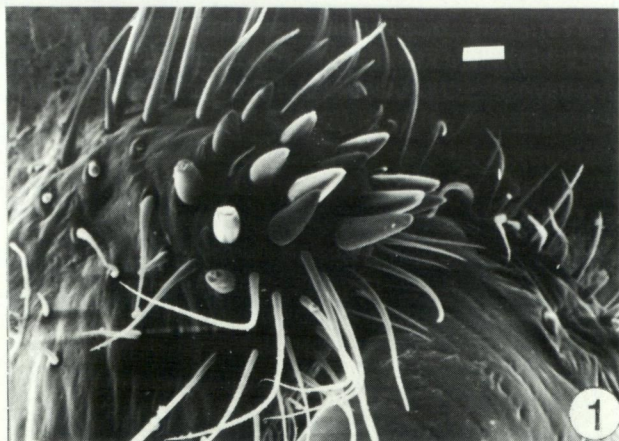
#### Description

##### Holotype Male

Carapace length 3.5, width 4.1, height 1.8. Caput width 3.2. Abdomen length 3.6, width 3.2.

Colour in alcohol: Carapace dark reddish-brown, caput black. Chelicerae concolorous with caput dorsally, lighter and redder ventrally. Legs yellowish grey-brown, metatarsi and tarsi slightly lighter and redder. Abdomen dark grey with lighter streaks. Fangs red-brown. Sternum, labium and maxillae reddish grey-brown.

Carapace: abruptly raised anterior of strongly procurved fovea, forming distinct caput. Eye tubercule absent, clypeus wide. Eyes widely spaced on sloping face; group wider in front than behind. Eye group 3.1 times wider than long, occupying 83% of caput width; MOQ 4.0 times wider than long. One pair of small setae medially at anterior edge of caput, other small setae scattered on caput and lateral margins of carapace. Caput moderately rugose on top, strongest between the PLE. Lower carapace with bands of fine, random fissures radiating from fovea.



Figures 1–2 *Missulena dipsaca* sp. nov., ♂: 1, rastellum, anterior view; 2, tip of embolus, dorsolateral view. Scale lines = 100  $\mu$ m.

Chelicerae: Length 2.2, height 1.4, width 1.3. Porrect, broad; rastellum of normal spines on distinct process; intercheliceral tumescence absent. Slight rugosity extends posteriorly for about one-third of length of each chelicera. Long setae extend forward from anterior margin of each chelicera, including rastellar process. Short setae on interior face of each chelicera, with longer setae on latero-ventral face. Fangs diagonal. Inner margin of cheliceral furrow with four large and five small teeth, outer margin with two large and five small teeth and two small teeth in furrow. Outer surface of fang smooth except for basomedial tooth.

Maxillae: Length 1.4, width 1.3, cuspules visible ventrally 32. Broad, subquadrate; a ventrobasal recess to receive the labium; produced ventrodistally beyond maxilla-trochantal joint, forming conical process. Cuspules present along length of inner ventral face. Long, fine setae along inner dorsal face.

Labium: Length 0.8, width 0.8, cuspules 7. Labiosternal suture a shallow groove, no visible associated separate sigillae. Long, fine setae, especially anteriorly.

Sternum: Length 2.4, width 2.2. Oval,

rebordered. Sparse setae present. Sigillae: anterior pair round, separated from lateral margin by just over three times their length; medial pair roughly oval, their long axes inclined at about 45° to long axis of body, separated from lateral margin by just over their length; posterior pair roughly oval, separated from the posterior sternal margin by about their length, and from each other by roughly five times their width.

Palpal tarsus: Aspinose, short, bilobed distally with dorsal lobe approximately three times longer than ventral lobe. Palpal bulb basally with narrow band; medially globular with spiral depression; embolus narrow, long and almost straight. Embolus tip of duckbill form.

Legs: Preening combs absent. All tarsi integral. Tarsi and metatarsi I and II ascopulate, metatarsi III ascopulate, tarsi III very sparsely scopulate, tarsi IV scopulate basally, metatarsi IV scopulate both basally and distally.

Length (Width)	Palp	I	II	III	IV
Femur	3.1	3.1	2.9	2.8	3.2
Patella	1.5	1.3	1.3	1.5	1.2
Tibia	2.9(1.0)	1.9	1.7	1.4	1.9
Metatarsus	–	1.6	1.7	1.7	2.1(0.6)
Tarsus	1.0	1.0	1.0	1.2	1.3

Spination: Patellae IV with rasps, prodorsal and retrodorsal bands of short, stout spines. Palp: nil. Leg I: patella 9p; tibia 12v; metatarsus 17v; tarsus 13v. Leg II: patella 5p; tibia 11v; metatarsus 14v; tarsus 15v. Leg III: patella 30p 7d 5r; tibia 5p 4d 5r 9v; metatarsus 5p 9d 3r 11v; tarsus 3p 4d 3r 13v. Leg IV: patella 26pd 1rd(rasp); tibia 4d; metatarsus 5p 6d 1r 10v; tarsus 9p 5d 9r 18v.

Trichobothria: filiform in more or less straight rows. Leg I: tibia 2 rows of 8, metatarsus 4, tarsus 4. Leg II: tibia 2 rows of 8, metatarsus 7, tarsus 4. Leg III: tibia 2 rows of 6, metatarsus 4, tarsus 4. Leg IV: tibia 2 rows of 6, metatarsus 5, tarsus 4.

Claws: STC on legs I and II with four teeth, on

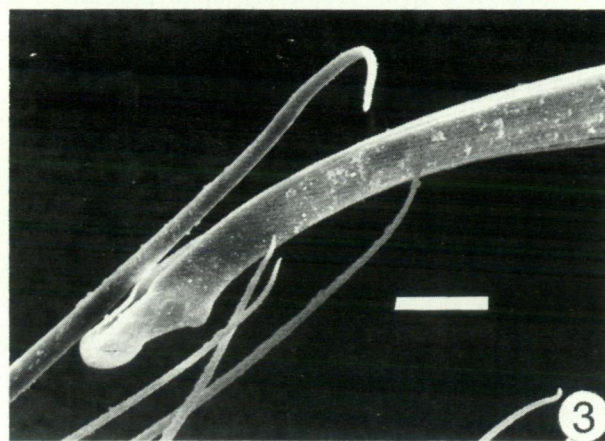


Figure 3 *Missulena occatoria* Walckenaer, tip of embolus, dorsolateral view. Scale line = 100  $\mu$ m.

legs III and IV with three teeth. ITC apparently with two teeth.

Spinnerets: Four spinnerets, only PLS visible dorsally; all with raised bases, giving appearance of two basal segments; PLS very short with domed distal segment. PMS 0.4 long, 0.2 wide. PLS 0.5 wide, basal article 0.4 long, apical articles retracted. Spigots: PMS 7; PLS basal article 5, medial article 13, apical article 16.

### Remarks

The holotype was submitted by Mr Holdsworth of the Junee Ambulance Station after it bit a woman.

### Distribution

Southern and central slopes and central and northern highlands of New South Wales, northern coast of New South Wales and lower south coast of Queensland. Northwest Victoria. Mid-southeast South Australia. South central coast of Western Australia.

### Etymology

The specific name is derived from the Latin word for the seed-head of the teasle plant, which the rastellum resembles.

### *Missulena rutraspina* sp. nov.

Figures 4–6

### Material Examined

#### Holotype

♂, near Meringur, Victoria, Australia (34°29'S, 141°06'E), February 1986, part of pitfall trapping programme (MV K1034).

#### Paratype

**Australia: Victoria:** 1♂, near Millewa Sth. Bore (34°45'S, 141°04'E), February 1986, part of pitfall trapping programme (MV K1035).

#### Other Material Examined

**Australia: South Australia:** 2♂, Dangali Conservation Park [33°20'S, 140°43'E], 3 June 1991, Uni. S.A., Salisbury (SAMA N1992383–4). **Western Australia:** 2♂, Woodstock Station (21°36'S, 118°58'E), 10–17 February 1989 (WAM 92/292).

### Diagnosis

This species is distinguished by the male rastellum consisting of a few wide spines on a distinct process (Fig. 5), rather than a number of narrow spines, either on distinct process (*M. dipsaca*) or at most on low mound (all other species). Fangs lack basomedial tooth, present in

all other species. Caput and chelicerae of males black, rather than red (*M. occatoria*). Dorsal and lateral abdomen concolorous, rather than dorsum at least partly off-white (*M. bradleyi*). Tip of embolus of arrowhead form. Scopulae present on entire metatarsi and tarsi III and IV. Rasps present on patellae III only, also present on patellae I in all other species.

Female not known.

Biometrics (5♂♂) mean ± standard deviation (range): carapace length 3.8±0.2 (3.5–4.0), width 4.4±0.4 (4.1–5.0), height 2.0±0.5 (1.6–2.8); caput width 3.3±0.4 (3.0–4.0); maxillary length 1.4±0.1 (1.3–1.6), width 1.2±0.2 (1.1–1.5); sternum length 2.6±0.3 (2.2–2.9), width 2.2±0.2 (2.0–2.5); labium length 1.0±0.2 (0.8–1.3), width 0.8±0.1 (0.7–0.9).

### Description

#### Holotype Male

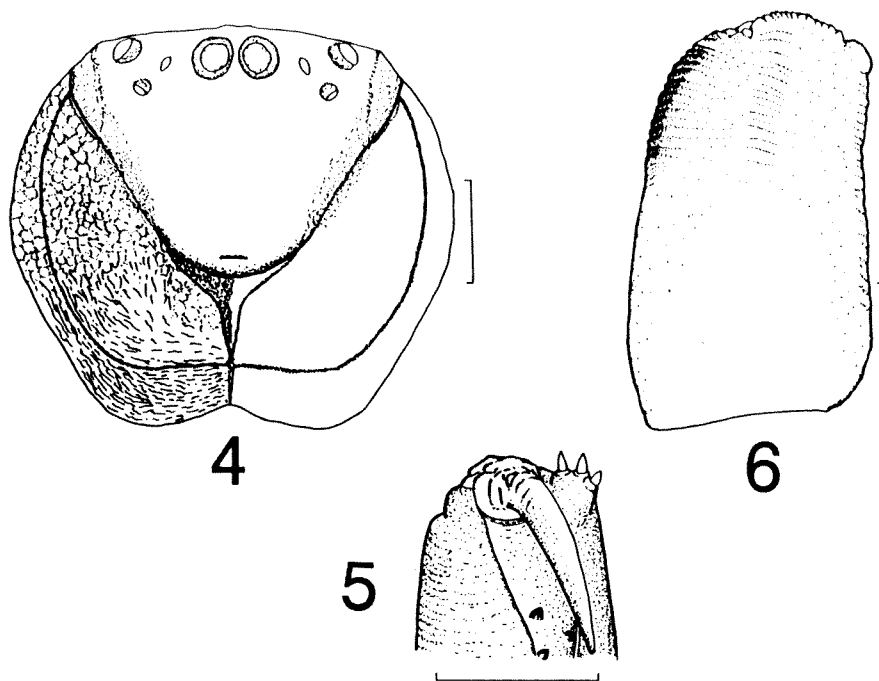
Carapace length 3.8, width 4.2, height 1.6. Caput width 3.2. Abdomen length 4.7, width 3.6.

Colour in alcohol: Carapace brown, caput black. Chelicerae concolorous with caput. Legs yellowish grey-brown, femorae darkest. Abdomen blue-grey, with small, pale spots. Fangs red-brown. Sternum reddish grey-brown.

Carapace: abruptly raised anterior of the strongly procurved fovea, forming a distinct caput. Eye tubercle absent, clypeus wide (Fig. 4). Eyes set on sloping face; group wider in front than behind; eyes widely spaced. Eye group 3.3 times wider than long, occupying 72% of caput width; MOQ 3.8 times wider than long. One pair of setae medially at the anterior edge of the caput, carapace otherwise glabrous. Caput smooth, carapace anteriorly with finely-granulose polygons grading into fine rugosity posteriorly.

Chelicerae: Length 2.4, height 1.6, width 1.4. Porrect. Chelicerae broad; rastellum of four short, wide spines on a distinct process (Fig. 5); intercheliceral tumescence absent; fangs noticeably diagonal, outer surface smooth, outer edges smoothly rounded. Pronounced row of lateral ridges extending posteriorly behind the rastellar process for about a third the length of each chelicera (Fig. 6). Long setae extend forward from anterior margin of each chelicera including rastellar process. Small, short setae on interior face of each chelicera, with longer setae on latero-ventral. Inner margin of cheliceral furrow with four large and two small teeth, outer margin with two large and one small tooth. Outer surface of fang smooth, without basomedial tooth.

Maxillae: Length 1.3, width 1.1, cuspules visible ventrally 27. Maxillae broad, subquadrate, cuspules present along maxilla length; a ventrobasal recess to receive the labium; produced ventrodistally beyond the maxilla-trochantal joint,



**Figures 4–6** *Missulena rutraspina* sp. nov., paratype ♂: 4, carapace, showing surface texture on left half; 5, right chelicera, distal half, ventral view; 6, right chelicera, dorsomedian view. Setae not shown. Scale lines = 1 mm.

forming conical process. Cuspules present along inner ventral face. Long, fine setae along inner dorsal face.

**Labium:** Length 1.0, width 0.8, cuspules 17. Labiosternal suture a shallow groove, associated sigillae marked only by pair of small, irregular, light-coloured patches. Long, fine setae, especially anteriorly.

**Sternum:** Length 2.2, width 2.0. Oval, rebordered. Sparse setae present. Sigillae: anterior pair irregular, separated from lateral margin by two to three times their length; right medial sigillum absent, left round, separated from margin by twice its diameter; posterior pair roughly oval, separated from posterior sternal margin by one to two times their length, and from each other by roughly twice their width.

**Palpal tarsus:** Aspines, short, bilobed distally with dorsal lobe approximately three times longer than ventral lobe. Palpal bulb basally with a narrow band; medially globular with a spiral depression; embolus narrow, long and almost straight. Embolus tip of arrowhead form.

**Legs:** Preening combs absent. All tarsi integral. Sparse scopulae on tarsi I and II, dense scopulae on tarsi III and IV and metatarsi III and IV.

Length (Width)	Palp	I	II	III	IV
Femur	2.4	3.3	1.5	3.3	3.9
Patella	1.1	1.6	1.6	1.6	1.7
Tibia	2.5(1.1)	2.3	2.2	2.0	3.0
Metatarsus	–	2.0	2.0	2.4	2.6(0.6)
Tarsus	0.8	1.1	1.2	1.8	1.7

**Spination:** Patellae III with rasps, prodorsal and retrodorsal bands of short, stout spines. Palp: nil. Leg I: patella 4r; tibia 2p 13v 7r; metatarsus 6r 10v; tarsus 9v. Leg II: patella 5r; tibia 3r 6v; metatarsus 2p 12v 2r; tarsus 9v. Leg III: femur 16p 6v 4r; patella 55pd(rasp) 4v; tibia 7p 9d 12r 12v; metatarsus 8p 8d 13r 9v; tarsus 8p 4d 6r. Leg IV: femur 8d; patella 15d 7v; tibia 6d 7r 15v; metatarsus 4p 6d 12r 18v; tarsus 4p 5d 12r 16v.

**Trichobothria:** filiform in more or less straight rows. Legs I–IV: tibia 2 rows of 4, metatarsus 4. Tarsus I, II 3, III, IV 4.

**Claws:** STC on legs I and II with 2 teeth, on legs III and IV no teeth evident. ITC with two teeth evident.

**Spinnerets:** Four spinnerets, only PLS visible dorsally; all with raised bases, giving appearance of two basal segments; PLS very short with domed distal segment. PMS 0.1 long, 0.05 wide. PLS 0.3 wide, basal segment 0.1 long, apical segment 0.05 long. Spigots: PMS 4; PLS basal article 16, medial article 18, apical article 12.

#### Etymology

The specific name is derived from the Latin words for 'shovel' and 'spine', and refers to the spines of the rastellum.

#### ACKNOWLEDGEMENTS

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Valerie Davies (Queensland Museum, Brisbane), Alan Yen (Museum of Victoria, Melbourne) and Mark Harvey (Western Australian Museum, Perth) lent material for this study, and they and their staff provided facilities and assistance. The CSIRO Division of Water Resources, Hanwood, provided access to and assistance with their scanning electron microscope, while the Yanco Agricultural Institute provided most other facilities.

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