

A redescription and renaming of the Tasmanian spider *Amphinecta milvina* (Simon, 1903), with descriptions of four new species (Araneae: Amaurobioidea: Amaurobiidae)

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Summary

Amphinecta milvina (Simon, 1903) is transferred to *Tasmarubrius*, new genus. Four new species are described: *T. pioneer*, *T. truncus*, *T. tarraleah* and *T. hickmani*. The peculiar acellular lateral protuberances on the epigynum appear to serve as sperm plugs and possibly as sperm reservoirs. Cladistic analysis suggests that *Tasmarubrius* spp. form a derived clade within the Amaurobiidae.

Introduction

The primary purpose of this paper is to give a new name to a large spider from Tasmania which Lehtinen (1967), recognizing that it did not belong in the South American genus *Rubrius*, transferred to the New Zealand genus *Amphinecta*. Forster & Wilton (1973) remarked that it did not belong there and that the abdominal colour pattern was the only common characteristic of the genera. Four new species of the genus are described and the unusual lateral extensions of the epigynum are investigated.

Material and methods

The following taxa were all collected from Tasmania, an island state off the SE coast of mainland Australia, mainly by pitfall trapping, which accounts for the disproportionate number of males to females. Among the material examined there are about one hundred vials of specimens collected by R. Brereton from three locations near Tarraleah, Tasmania. These are listed without vegetation notes, pitfall trap numbers, altitudes or dates; these details may be obtained from the Tasmanian Museum on citing the registration numbers. Notation of spines follows Platnick & Shadab (1975); measurements are in millimetres; the left palp is used in all illustrations.

Abbreviations: CL, carapace length; CW, carapace width; AL, abdomen length; AW, abdomen width. Eyes: AME, anterior median; ALE, anterior lateral; PME, posterior median; PLE, posterior lateral. Spinnerets: ALS, anterior; PMS, median; PLS, posterior.

Collections: AMNH, American Museum of Natural History, New York; MNHP, Muséum National d'Histoire naturelle, Paris; NMV, Museum of Victoria, Melbourne; QM, Queensland Museum, Brisbane; QVM, Queen Victoria Museum, Launceston, Tasmania; TM, Tasmanian Museum and Art Gallery, Hobart, Tasmania. Abbreviations on illustrations are explained with the figures.

Genus *Tasmarubrius*, new genus

Type species: *Rubrius milvinus* Simon, 1903.

Etymology: A combination of "Tasma", from Tasmania, and *Rubrius*.

Diagnosis: A large, 3-clawed ecribellate spider with geniculate chelicerae. Preening combs are present on distal metatarsi II (one comb), III and IV (two combs). A large proximal paracymbium on the male palp and bulbous lateral protuberances (sometimes absent) on the epigynum distinguish this spider from other amaurobioids.

Description: The reddish-brown carapace, which is highest in the cephalic area (Fig. 47), is almost glabrous; the abdomen is dark brown

with a pale cardinal area and six paired pale patches dorsally (Fig. 6); there is a pale mottled pattern ventrally. Viewed from the top, the posterior eye row is slightly procurved and the anterior row straight (Figs. 1, 48); from the front, both eye rows are procurved (Fig. 3). The AME are smaller than the rest of the eyes. The chelicerae have two retromarginal and two promarginal teeth (Fig. 5). The labium is longer than wide (Fig. 49). Legs 4123: all the metatarsi and tibiae have paired ventral spines; these are longer on the posterior legs. The cuticle is ridged; feathery hairs are absent. There is a single row of trichobothria (Fig. 55) on the metatarsi and tarsi; the tarsal organ (Fig. 56) is slit like. There is a small D-shaped colulus. The epigynum consists of a median plate with large rounded protuberances (Figs. 2, 7) on each side, obscuring the gonopores. In the male palp (Figs. 14–16) the tegulum has distinct proximal and distal divisions, the latter having a small membranous conductor, a long movable median apophysis, a fixed tegular apophysis and a short and very thick embolus. The cymbium has a small bulge on the retrolateral edge; it narrows at the base and has a proximal apophysis (paracymbium). The palpal tibia has a large retrolateral excavation with ventral and dorsal apophyses. There are two major ampullate gland spigots on the ALS, the anterior larger than the

posterior; in the male the latter is reduced to a nubbin. In PMS and PLS of both sexes there is one large spigot (minor ampullate) with a number of smaller spigots; in the PMS of the female, two of these spigots (cylindrical) have larger fusules than the rest.

***Tasmarubrius milvinus* (Simon, 1903) new combination** (Figs. 1–10, 61; Table 1)

Rubrius milvinus Simon, 1903: 34 (♀, Hobart)

Rubrius milvinus Rainbow, 1911: 259

Rubrius milvinus Hickman, 1967: 69, figs. 124–126; pl xii, fig. 1 (♀, ♂)

Amphinecta milvina Lehtinen, 1967: 213, fig. 142 (♀)

Types: Holotype: ♀, *Rubrius milvinus*, Hobart, Tasmania [42°53'S, 147°19'E] (MNHP). Other Material: 2♀, Mt Wellington, [42°54'S, 147°14'E], 22 September 1935, J. W. Evans (TM J841); ♂, South Hobart, 1 April 1977, P. Podolak (TM J1194); ♂, Mt Stuart, Hobart, 31 May 1986, J. McKenzie (TM J2058); ♂, Blackmans Bay, SE Tasmania [43°00'S, 147°19'E], 10 May 1983, E. Turner (TM J2274); ♂, Blackmans Bay, June 1984, E. Turner (TM J2275); ♂, inside house, Tarooma [42°57'S, 147°20'E], 29 May 1990, E. Turner (TM J3043); 5♀, Ridgeway [42°56'S, 147°17'E], September 1948, C. Oke (NMV K-3991); ♂, Tarooma,

Key to *Tasmarubrius* species

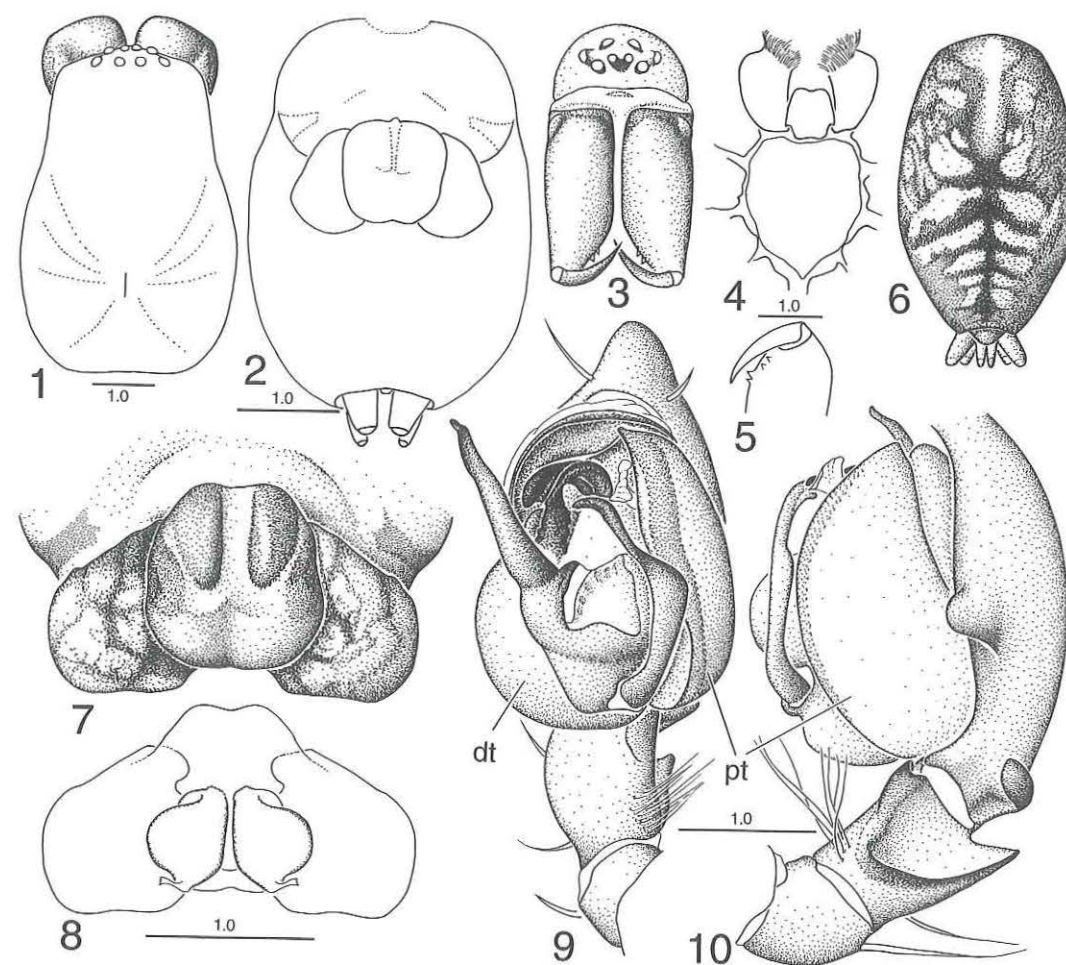
1. Epigynum with smooth anterior edge (Fig. 7). ♂ median apophysis with mid-line elbow-like thickening (Fig. 41) 2
- Epigynum with median “neck” interrupting anterior edge (Fig. 35). ♂ median apophysis about same diameter throughout (Fig. 42) 4
2. Two distinct parallel epigynal ridges reaching from the anterior edge to just beyond half way on median plate (Fig. 7). Blunt paracymbium 3
- Epigynal ridges indistinct, extending almost to posterior edge of median plate (Fig. 11). Pointed paracymbium (Fig. 15) *pioneer*
3. Median epigynal plate squarish. Large retrolateral projection on cymbial edge; blunt hook-like paracymbium; tip of median apophysis tapering *milvinus*
- Median epigynal plate narrowing posteriorly. Small retrolateral projection on cymbium; broadly truncated paracymbium; tip of median apophysis broadened subdistally *truncus*
4. Median epigynal plate squarish. ♂ (10.0) median apophysis “forked” distally (Fig. 43); blunt flanged paracymbium *tarraleah*
- Median epigynal plate rounded posteriorly. ♂ (13.0) median apophysis tapering distally; paracymbium blunt with knob posteriorly *hickmani*

	Femur	Patella	Tibia	Metatarsus	Tarsus	TOTAL
I	4.2 (5.4)	1.8 (2.3)	3.7 (4.9)	3.4 (5.2)	2.0 (3.1)	15.1 (20.9)
II	3.8 (5.1)	1.7 (2.3)	2.9 (4.0)	2.9 (4.8)	1.7 (2.6)	13.0 (18.8)
III	3.4 (4.8)	1.7 (2.2)	2.5 (3.6)	3.1 (5.1)	1.5 (2.2)	12.2 (17.9)
IV	4.5 (6.0)	1.8 (2.4)	3.9 (5.4)	4.6 (6.8)	1.7 (2.7)	16.5 (23.3)

Table 1: Leg lengths ♀(♂) *Tasmarubrius milvinus*, new combination.

26 April 1971, Mrs Barnett (TM J765); 4♀, Fern Tree, Mt Wellington [42°55'S, 147°15'E] 420–520 m, 10 June 1996, L. J. Boutin (TM J3178).

Description: Female (TM J841): CL 5.9, CW 3.9, AL 5.7, AW 3.3. Ratio of AME: ALE: PME: PLE is 8:12:10:11. Labium longer than wide, 1:0.8; sternum longer than wide, 1:0.9, pointed



Figs. 1–10: *Tasmarubrius milvinus* (Simon). 1–5 ♀: 1 cephalothorax (dorsal); 2 abdomen (ventral); 3 eyes, chelicerae (frontal); 4 endites, labium, sternum; 5 chelicera. 6 ♂ abdomen (dorsal); 7–8 epigynum, ventral, dorsal; 9–10 ♂ palp (ventral, retrolateral). dt = distal tegulum, pt = proximal tegulum.

posteriorly (Fig. 4). Legs 4123 (Table 1). Preening combs on metatarsi II (one with 7 tines), III (two with 7 tines) and IV (two with 5/7 tines). Notation of spines. Femora: I, D110, P002; II, D110, P001; III, D111, P001, R001; IV, D111, P001, R001. Tibiae: I, V222; II, P111, V222; III, D010, P111, V222, R111; IV, D001, P111, V222, R111. Metatarsi: I, P001, V221, R001; II P002, V221, R001; III, D100, P122, V221, R122; IV, D110, P112, V221, R112. The epigynum (Figs. 7–8) is almost twice as wide as long. The bulbous lateral protuberances appear to be acellular extrusions blocking and obscuring the gonopores. A cut across the protuberance (this had already been done by a previous examiner of the holotype) reveals a key-hole shaped canal which diminishes in size as it progresses outwards (see below). What appear to be large glandular areas fill the space ventral to the spermathecae. Length 10.0–14.4.

Male: CL 6.7, CW 5.6, AL 5.4, AW 3.6. A light brown sclerotized area on the front and the cardinal region of the abdomen, otherwise coloration is similar to the female. Ratio of AME:ALE:PME:PLE is 9:12:11:12. Labium slightly longer than wide, 1:0.9; sternum longer than wide 1:0.8. Legs 4123 (Table 1). Preening combs are present on metatarsi II (6 tines), III (7/7 tines) and IV (5/6 tines). Notation of spines. Femora: I, D111, P002, R001; II, D111, P001, R001; III, D111, P001, R001; IV, D110, P001, R001. Tibiae: I, P111, V222; II, P111, V222; III, D010, P111, V222, R111; IV, D001, P111, V222, R111. Metatarsi: I, P012, V221, R002; II, P112, V221, R012; III, D010, P112, V221, R112; IV, D010, P112, V221, R112. ♂ palp (Figs. 9–10): the proximal tegulum is yellow-brown, the distal tegulum a deeper yellow-brown; the median and tegular apophyses are about the same length. The blunt paracymbium arises dorso-retrolaterally and turns at right angles to lie retroventrally. The tibia is deeply excavated retrolaterally and has a ventral and sharper dorsal apophysis. Length 11.6–12.8.

Distribution: *T. milvinus* is found in southern Tasmania, near Hobart (Fig. 61).

Biology: Hickman (1967) stated that the "spider does not spin a web. It lives in rotten logs and under loose stones in shady moist areas. When about to make her egg-sac, the female selects a small cavity in a rotten log or in the soil under a log or stone. She then lines the

cavity with silk completely enclosing herself. Within this cocoon-like nest the spider makes a white, more or less spherical egg-sac and remains with it until the young emerge. Any attempt to break open the nest and remove the egg-sac is resisted energetically by the spider." Nothing is known of the spider's mating habits. It is assumed that the virgin females lack lateral protuberances on the epigynum.

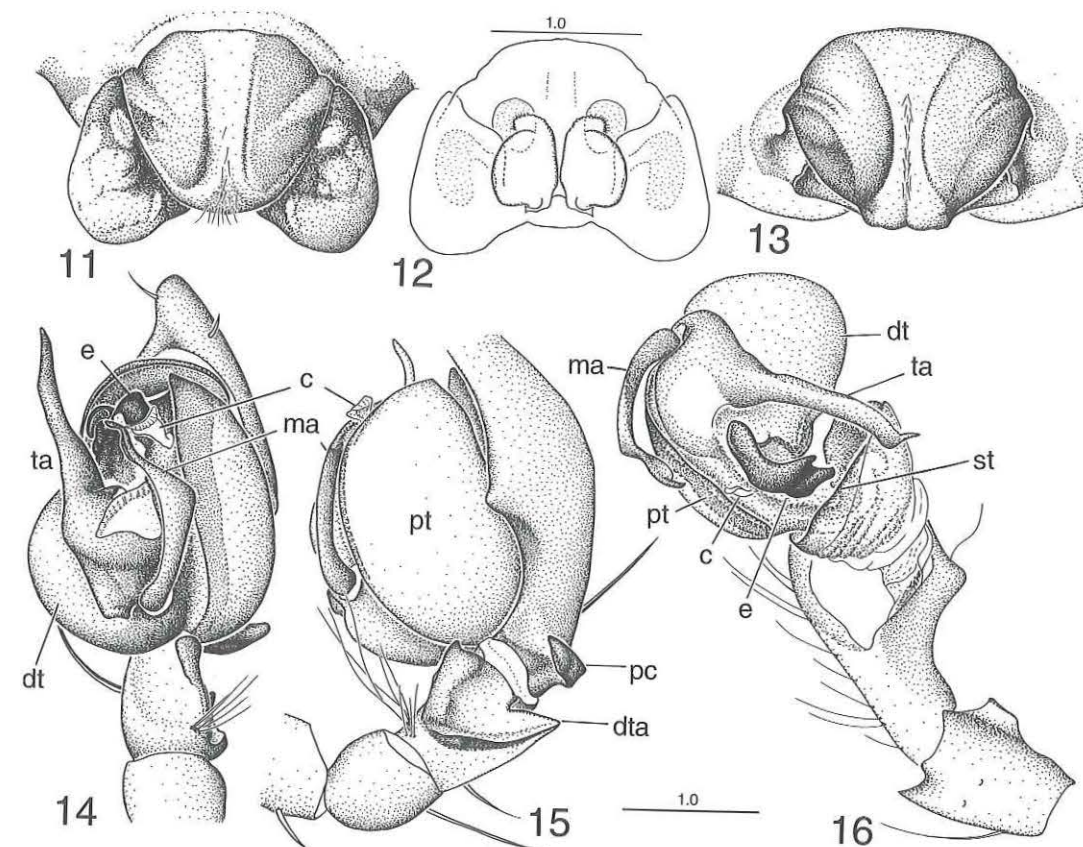
***Tasmarubrius pioneer*, new species**
(Figs. 11–19, 41, 61)

Types: Holotype: ♀, on slopes above Old Chum Dam, 10–15 km NE Pioneer, NE Tasmania [41°03'S, 148°01'E], 200 m, pitfall trap, October 1989–April 1990, Forestry (TM J3179). Paratypes: ♂, same data as holotype (TM J3180); 3♂ (TM J3181); ♀ (TM J3182); ♂, *Nothofagus* forest close to Weldborough [41°12'S, 147°54'E], 20–25 February 1993, P. Cranston, J. Trueman (QM S30272); 2♂ (QM S30273); 10♂, dry sclerophyll, Peters Link Rd [41°08'S, 148°07'E], 22–27 May 1993, P. Cranston, J. Trueman (QM S30274); 2♂ (QM S30275); 4♂ (QM S30276); 4♂ (QM S30277); ♂ (QM S30278); ♂, *Nothofagus* forest, 4.4 km SE Weldborough, 460 m, 12–14 February 1980, A. Newton, M. Thayer (AMNH); ♀, ♂, St Columba Falls, 12–14 February 1980, A. Newton, M. Thayer (AMNH); ♂, Honeycomb Cave-side, Mole Ck [41°34'S, 146°24'E], 13 March 1988, QVM (QVM 13:22714); ♂, Douglas Apsley National Park [41°46'S, 146°13'E], 26 May 1996, L. J. Boutin (TM J3183); ♂, Cataract Gorge, nr Launceston, 30 May 1996, L. J. Boutin (TM J3184); ♂, dry hillside, Gray [41°38'S, 148°13'E], 13 August 1974, R. Mesibov (TM J3185).

Etymology: The specific epithet is from the type locality, Pioneer in NE Tasmania.

Diagnosis: The parallel ridges on the epigynum are slight and reach almost to the posterior edge of the median plate. The retrolateral cymbial projection is smaller than that of *T. milvinus* and the paracymbium is flange-like and pointed.

Description: **Female:** CL 5.7, CW 3.7, AL 5.8, AW 3.6. The colour and pattern are lighter than those of *T. milvinus* (this may be due to fading in alcohol). Eyes and leg spines are similar to *T. milvinus*. Legs 4123 (I, 15.9; II, 14.0; III,



Figs. 11–16: *Tasmarubrius pioneer*. 11–13 ♀ epigynum, ventral (with lateral protuberances), dorsal, ventral (without protuberances); 14–16 ♂ palp, ventral, retrolateral, expanded and displaced. c = conductor, dt = distal tegulum, dta = dorsal tibial apophysis, e = embolus, ma = median apophysis, pc = paracymbium, pt = proximal tegulum, st = subtegulum, ta = tegular apophysis.

12.7; IV, 17.5). Preening combs on metatarsi II (6 tines), III (6/6 tines), IV (6/6 tines). Epigynum (Figs. 11–12): sometimes the protuberance was missing from one or both sides (Fig. 13) so that the gonopore was visible. The insemination ducts enter the base of the large spermathecae. Large oval structures (?glandular) fill the space ventral to the spermathecae. Length 11.1–16.7.

Male: CL 5.6, CW 3.7, AL 5.2, AW 3.2. Colour and pattern similar to those of *T. milvinus*. Legs 4123 (I, 12.1; II, 10.2; III, 9.4; IV, 12.6). Preening combs on metatarsi II (5 tines), III (6/5 tines), IV (7/6 tines). Distribution of leg spines are similar to those in *T. milvinus*. ♂ palp (Figs. 14–16, 41): the median apophysis

is sinuous distally. The paracymbium is flange-like and less blunt than that of *T. milvinus*. The ALS have one major ampullate spigot and a nubbin; there are about 30 piriform spigots and about 20 tartipores; the PMS, on a long shared base, have one large spigot (minor ampullate) and about 25 aciniform spigots; the PLS have one large spigot and about 30 aciniform spigots. Length 10.0–12.9.

Distribution: *T. pioneer* is found across NE Tasmania (Fig. 61).

Note: Hickman (1967: 69) stated that *milvinus* occurs throughout Tasmania. I believe his illustrations (figs. 125–126) may refer to *T. pioneer*.

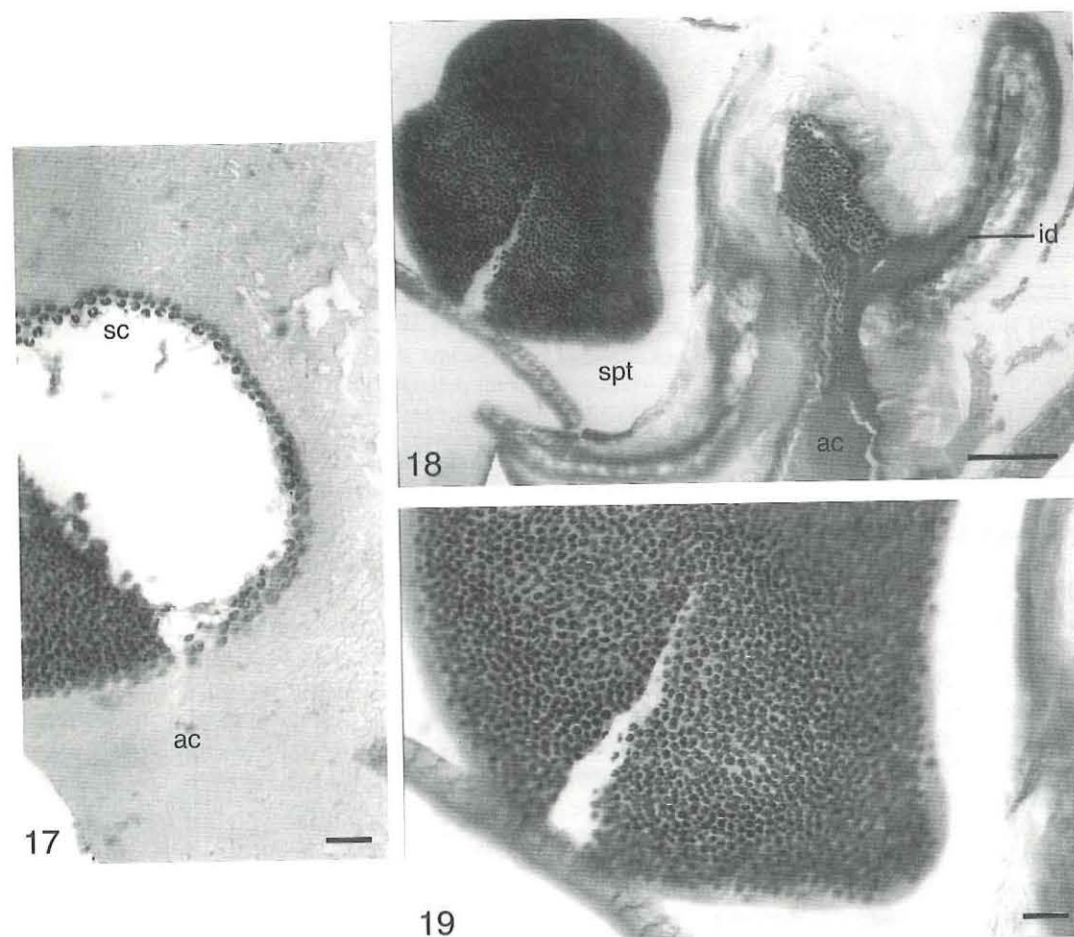
Lateral protuberances on the epigynum (Figs. 17–19)

Sagittal sections were made of the excised and partly dissected epigynum of *T. pioneer*. The material had been in alcohol for some time. It showed that the protuberances were formed from acellular material with a well defined space internally which diminished as it continued outwards. Heavily staining comma-shaped structures, thought to be sperm cells (Fig. 17) were found in this space. Sectioning further into the median plate, similar structures (i.e. sperm cells) were found in the spermatheca (Figs. 18–19).

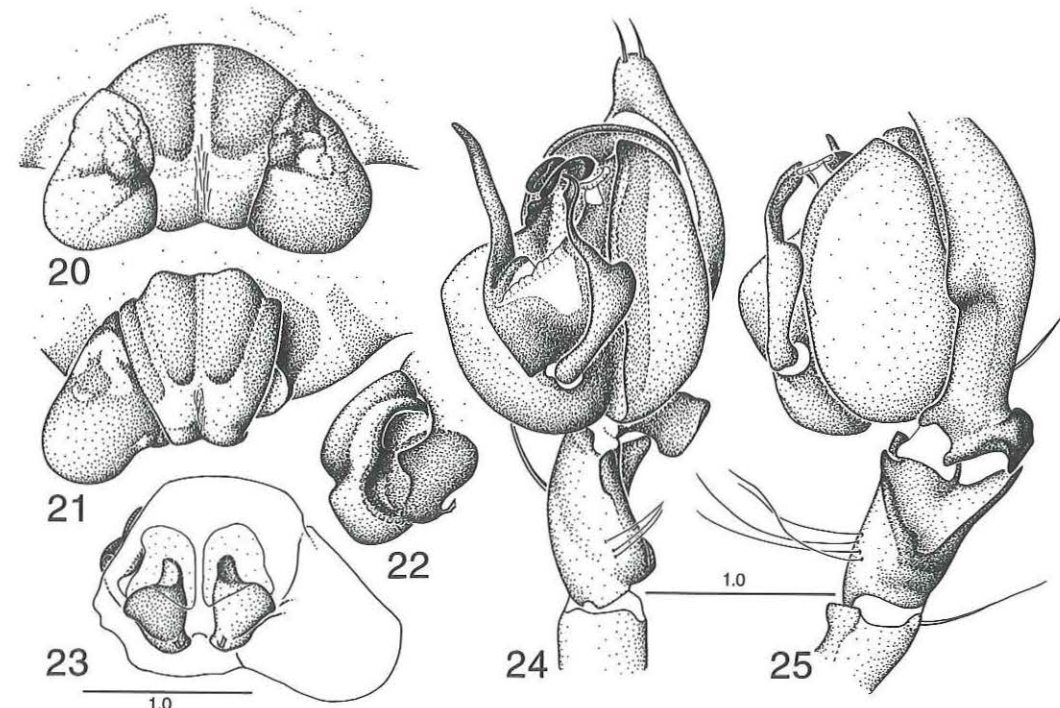
The protuberances certainly plug the gonopores and may also serve as external sperm reservoirs, however the mechanism for this function is unclear.

Tasmarubrius truncus, new species (Figs. 20–34, 61)

Types: Holotype: ♀, Darcy's Bluff, [42°12'S, 146°18'E], nr Tarraleah, Tasmania, 880 m, pit-fall trap #19.5, 19 February 1992, R. Brereton (TM J3186). Paratypes: 6♂, same data as holotype (TM J3187); 5♂ (TM J3188); ♂ (TM J3189); 2♂ (TM J3190); ♂ (TM J3191); ♂ (TM



Figs. 17–19: *Tasmarubrius pioneer*, ♀ epigynum. 17 sagittal section through lateral protuberance showing sperm cells in cavity; 18 section through median plate, showing spermatheca and insemination duct; 19 sperm mass in spermatheca. ac = acellular secretion, id = insemination duct, sc = sperm cell, spt = spermatheca. Scale lines = 0.5 mm.



Figs. 20–25: *Tasmarubrius truncus*. 20–23 ♀ epigynum, ventral, ventral (without left protuberance), lateral showing gonopore, dorsal; 24–25 ♂ palp, ventral, retrolateral.

J3192); ♀, 15♂ (TM J3193); 11♂ (TM J3194); 2♂ (TM J3195); 2♂ (TM J3196); 3♂ (TM J3197); 18♂ (TM J3198); 2♂ (TM J3199); 3♂ (TM J3200); 4♂ (TM J3201); 5♂ (TM J3202); 2♂ (TM J3203); 8♂ (TM J3204); 6♂ (TM J3205); 7♂ (TM J3206); 4♂ (TM J3207); 7♂ (TM J3208); 2♂ (TM J3209); 5♂, Hornes Dam [42°16'S, 146°24'E], nr Tarraleah, 750 m, pitfall trap, 21 January 1992, R. Brereton (TM J3210); 2♂, same data (TM J3211); 3♂ (TM J3212); ♀ (TM J3213); 13♂ (TM J3214); 3♂ (TM J3215); 2♂ (TM J3258); 3♂ (TM J3216); 3♂ (TM J3217); 2♂ (TM J3218); 9♂ (TM J3219); 5♂ (TM J3220); 6♂ (TM J3221); 6♂ (TM J3222); 4♂ (TM J3223); 3♂ (TM J3224); 5♂ (TM J3225); ♀, Butlers Rd [42°17'S, 146°21'E], 700 m, 15 April 1992, R. Brereton (TM J3226); 17♂, 20 February 1992 (TM J3227); 14♂ (TM J3228); 2♀, Cradle Mtn Rd [41°32'S, 145°50'E], 800 m, 25 February 1996, G. Thompson, C. Fewtrell (QM S30279); ♀, ♂, Maggs Mtn Plateau [41°45'S, 146°12'E], 12 May 1980, R. H. Green (QVM 13:22723–4); ♀, Scotts

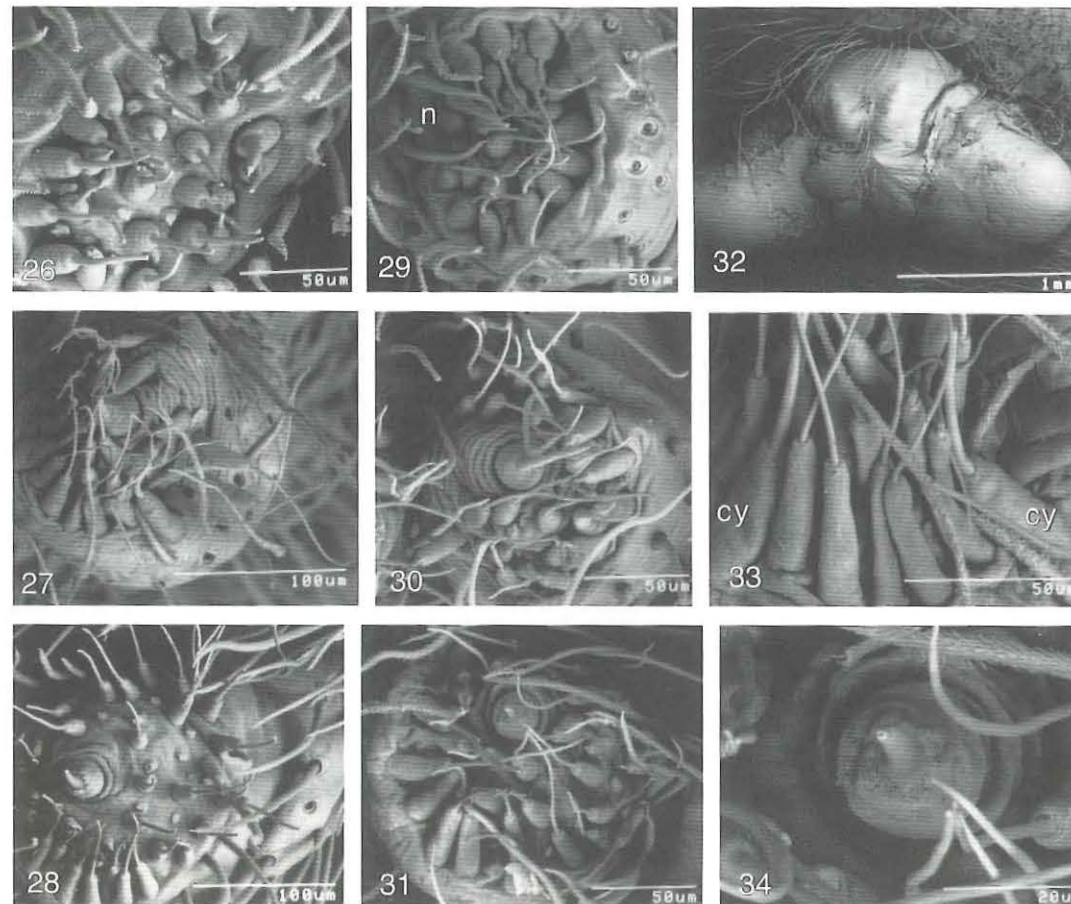
Peak Dam Rd [42°59'S, 146°20'E], 300 m, 26 April 1987, N. I. Platnick, R. J. Raven, T. Churchill (AMNH); ♀, Lyell Hwy [42°10'S, 145°55'E], 400 m, 19–20 February 1980, A. Newton, M. Thayer (AMNH); ♀, Lake St Clair [42°04'S, 146°10'E], February 1941, D. Turner (TM J834); 2♀, 6♂, Tussock Corner, Maggs Mtn Rd, 18 March 1980, R. H. Green (QVM 13:22715–22); ♀, Franklin Picnic Ground [42°12'S, 146°00'E], 29 April 1987, T. Churchill, R. Raven (QM S30281); ♀, ♂, Mt Field National Park [42°40'S, 146°37'E], 1000 m, 30 January–5 February 1980, A. Newton, M. Thayer (AMNH); 5♂, E edge Wombat Moor, 1060 m (AMNH); ♂, Mt Field National Park, Lake Dobson Rd, 710 m (AMNH); 2♂, W side Lake St Clair, 750 m, 25–29 January 1980, A. Newton, M. Thayer (AMNH); ♂, Rufus Canal, 800 m, 26–28 January 1980, A. Newton, M. Thayer (AMNH); ♂, Hartz Mts National Park, 740 m, 8–10 February 1980, A. Newton, M. Thayer (AMNH); ♂, Lachlan [42°50'S, 147°04'E],

400–600 m, April 1983, M. Kacprzyk (TM J2273); ♀, Huon R. crossing via Geeveston [43°06'S, 146°46'E], 20 April 1997, G. Thompson (QM S35248); ♀, Hartz Mts Arve River walk [43°09'S, 146°48'E], G. Thompson, C. Fewtrell (QM S35250).

Etymology: The specific epithet is from the Latin *truncus*, referring to the truncate paracymbium.

Diagnosis: The parallel epigynal ridges are separated by a pale narrow strip; the median plate narrows posteriorly (cf. *T. milvinus*). The paracymbium is broadly truncated (cf. *T. milvinus* and *T. pioneer*). The median apophysis is broadened subdistally.

Description: Female: CL 5.2, CW 3.4, AL 8.0, AW 4.6. Legs 4123 (I, 14.1; II, 11.9; III, 11.1; IV, 15.0). Preening combs are present on metatarsi II (5 times) on III (5, 6 times) and IV (5/7 times). Distribution of leg spines is similar to that of *milvinus* but with fewer dorsal spines and occasionally one less ventral spine. Epigynum (Figs. 20–23): the median plate narrows posteriorly. Posterior to the ridges there is a slight transverse indentation (Fig. 32). Laterally the gonopore is in a rounded indentation which is connected to a posterior indentation by a narrow groove, partly roofed over by a dorso-lateral flange (Fig. 22). The ALS have two major ampullate spigots (the anterior one larger)



Figs. 26–34: *Tasmarubrius truncus*. 26–28 ♀ spinnerets, ALS(r), PMS(r), PLS(r); 29–31 ♂ spinnerets, ALS(l), PMS(l), PLS(r); 32 ♀ epigynum; 33 ♀ PMS(r); 34 ♂ PLS large terminal spigot. cy = cylindrical gland spigots, n = nubbin.

and about 21 piriform spigots with some tartipores (Fig. 26); the PMS have one large spigot (Fig. 27) and about 22 smaller ones, two of which (Fig. 33) have larger fusules (?cylindrical); the PLS also have one large spigot and about 26 smaller ones (Fig. 28). Cephalothoracic lengths of females vary little, from 5.0–5.8. Total lengths varied from 10–13.8. Some epigyna have one lateral protuberance missing.

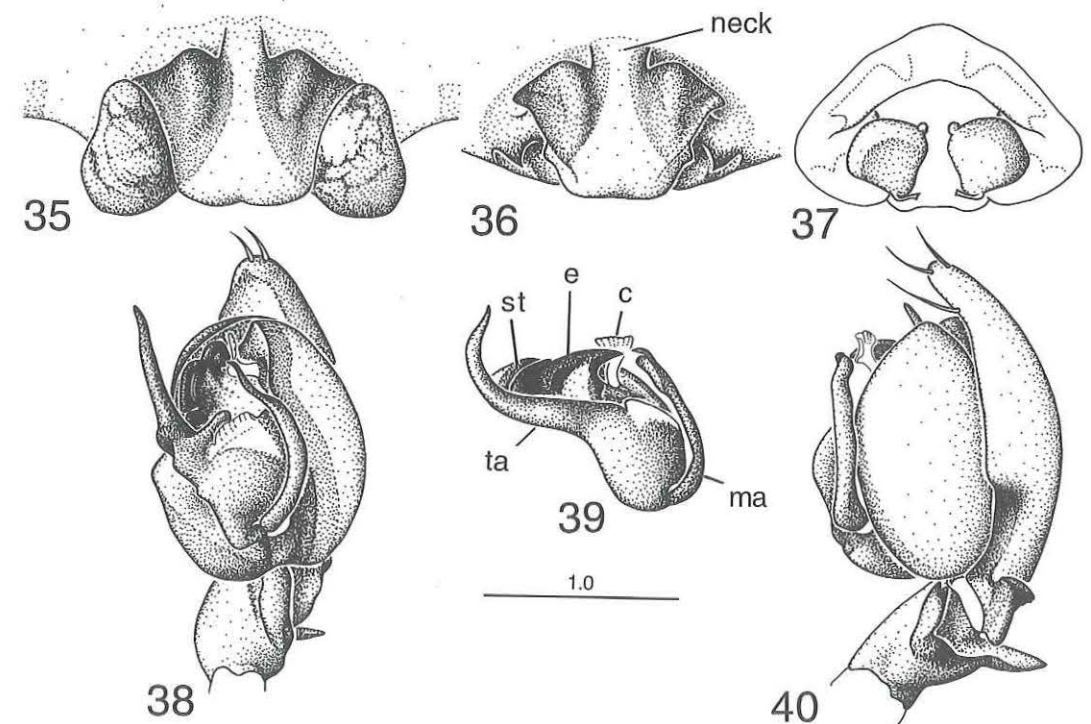
Male: CL 5.0, CW 3.6; AL 4.5, AW 3.0. Legs 4123 (I, 18.4; II, 14.5; III, 13.8; IV, 18.6). Preening combs are present on metatarsi II (5 times) on III (6/6 times) and IV (3/6 times). Distribution of leg spines is similar to *T. milvinus*. ♂ palp (Figs. 24–25): the median apophysis curves at the mid-line thickening then broadens sub-distally to end in a curved tip. The paracymbium is sharply truncated. The ALS have one major ampullate spigot and a nubbin and about 20 piriform spigots (Fig. 29); the PMS have one large spigot (minor ampullate) distally

and about 18 small spigots (Fig. 30); the PLS have a large spigot distally and about 20 smaller spigots (Figs. 31, 34). Length 9.4–10.4.

Distribution: *T. truncus* is found over a wide area in the central plateau region of Tasmania (Fig. 61).

***Tasmarubrius tarraleah*, new species**
(Figs. 35–40, 42–46, 62)

Types: Holotype: ♀, mixed forest myrtle/tea tree, central plateau, Hornes Dam [42°16'S, 146°24'E] nr Tarraleah, 750 m, pitfall trap #2.6, 19 May 1992, R. Brereton (TM J3229). Paratypes: ♂, same data as holotype (TM J3230); 2♂ (TM J3231); 6♂ (TM J3232); ♂ (TM J3233); 2♂ (TM J3234); ♀, 6♂, Darcy's Bluff [42°12'S, 146°18'E], nr Tarraleah, 880 m (TM J3235); 4♂ (TM J3236); 3♂ (TM J3237); 4♂ (TM J3238); 4♂ (TM J3239); 5♂ (TM J3240); 4♂ (TM J3241); 5♂ (TM J3242); 5♂ (TM J3243); 4♂, Butlers Rd [42°17'S,



Figs. 35–40: *Tasmarubrius tarraleah*. 35–37 ♀ epigynum, ventral, ventral (without protuberances), dorsal; 38–40 ♂ palp, ventral, ventro-retrolateral, retrolateral. See figure legend 11–16 for abbreviations.

146°21'E] (TM J3244); 2♀, Lemonthyme Lodge [41°33'S, 146°06'E], 450 m, 10–12 April 1997, G. Thompson, C. Fewtrell (QM S35249).

Etymology: The specific epithet is from the locality, Tarraleah.

Diagnosis: A median "neck" interrupts the anterior edge of the epigynum (cf. *milvinus*, *pioneer* and *truncus*). The median apophysis is long and slender without mid-line thickening; a spoon-shaped swelling subdistally with a terminal curved tip gives it a fork-shaped appearance; the paracymbium is blunt and flanged.

Description: Female: CL 5.4, CW 3.8; AL 7.8, AW 4.8. Legs 4123 (I, 14.8, II 12.6, III 11.8, IV 16.1). Preening combs are present on metatarsi II (5 tines), III (4/5 tines) and IV 3/5 tines). The notation of leg spines is very similar to *T. milvinus*. Epigynum (Figs. 35–37): there is an anterior median "neck" between the broad epigynal ridges. The female from Darcy's Bluff is 10.0 in length and the lateral epigynal protuberances are absent (Fig. 36).

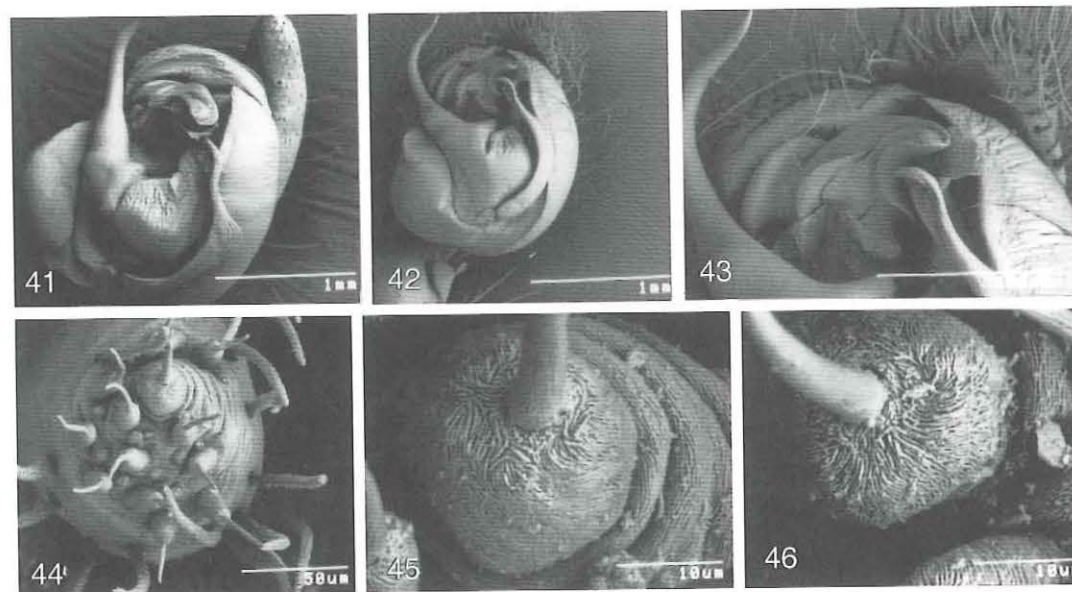
Male: CL 4.3, CW 3.3, AL 4.0, AW 2.6. Legs 4123 (I 15.3, II 13.0, III 11.8, IV 16.3). Preening

combs on metatarsi II (5 tines), III (5/4 tines) and IV (3/5 tines). Notation of spines similar to ♂ *T. milvinus*. ♂ palp (Figs. 38–40, 42–43): the median apophysis is slender with a spoon shaped swelling subdistally before the curved tip; the paracymbium is short and truncate. There is a short ventral apophysis and a long sharp dorsal apophysis on the tibia (Fig. 40). The spigots on the spinnerets are similar to those of other males. The single large terminal spigots on the PMS and PLS appear to have a similar structure (Figs. 44–46). Length 8.0–9.5.

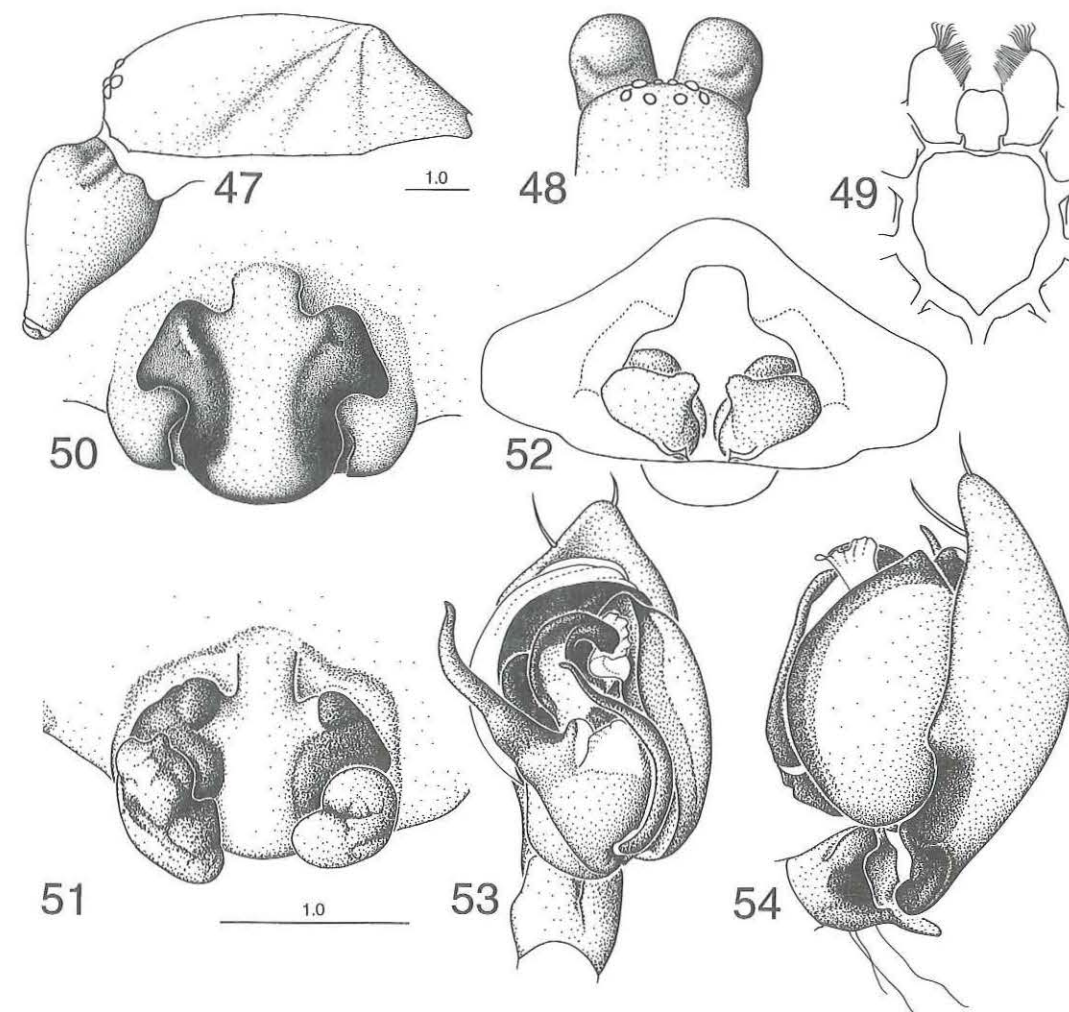
Distribution: *T. tarraleah* was found in traps with *T. truncus* in the central plateau region of Tasmania (Fig. 62).

***Tasmarubrius hickmani*, new species**
(Figs. 47–60, 62)

Types: Holotype: ♀, Tarraleah [42°18'S, 146°26'E], Tasmania, 6 May 1963, V. V. Hickman (QM S952). Paratypes: ♂, Hornes Dam [42°16'S, 146°24'E], nr Tarraleah, 750 m, pitfall #2.6, 19 May 1992, R. Brereton (TM J3245); 2♀, same data as holotype (QM



Figs. 41–46: ♂ *Tasmarubrius* spp. 41 *T. pioneer* palp. 42–46 *T. tarraleah*: 42–43 bulb, ventral, distal tip; 44–45 spinnerets PMS(r), minor ampullate spigot; 46 spinnerets PLS(l), terminal spigot.



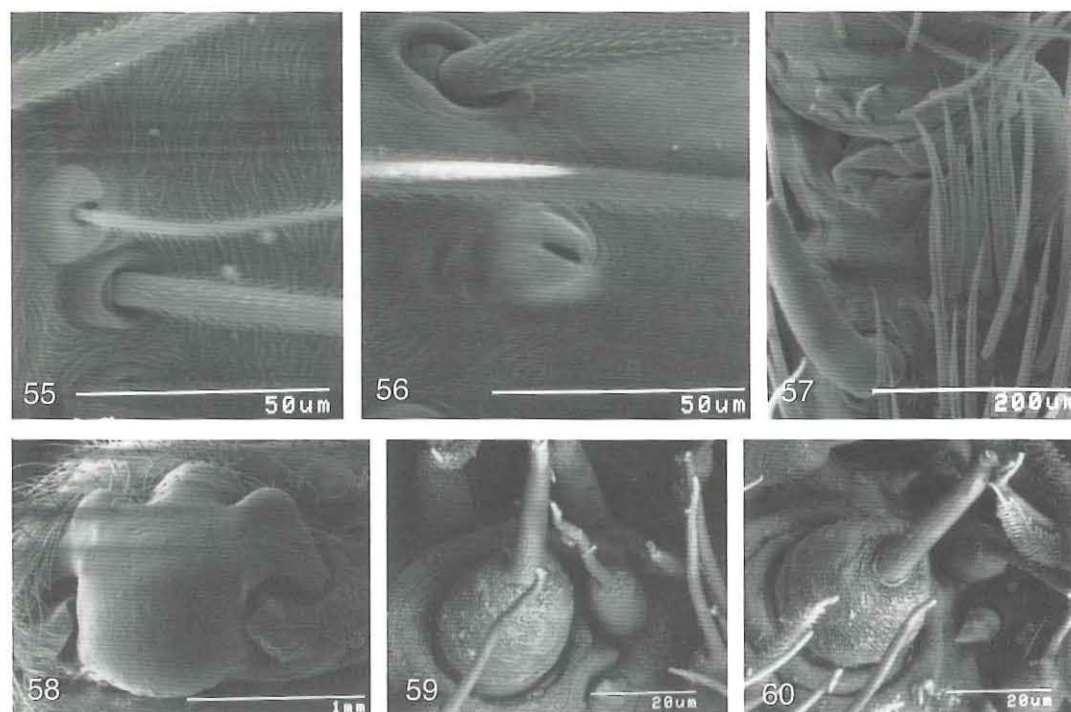
Figs. 47–54: *Tasmarubrius hickmani*. 47–52 ♀: 47 cephalothorax (lateral); 48 eyes, geniculate chelicerae; 49 endites, labium, sternum; 50–52 epigynum, ventral, ventral (with protuberances), dorsal. 53–54 ♂ palp, ventral, retrolateral.

S30280); ♀, Pelham [42°35'S, 147°00'E], 9 June 1974, J.R. Penprase (TM J998); ♀ Cradle Mtn Rd [41°32'S, 145°50'E], 800 m, 26 February 1996, G. Thompson, C. Fewtrell (QM S30282); ♀, ♂, Mt Field National Park [42°41'S, 146°43'E], 200 m, 20 May 1996, L. J. Boutin (TM J3246); 2♂ Darcy's Bluff, central plateau [42°12'S, 146°10'E], nr Tarraleah, 880 m, (TM J3247); ♂ (TM J3248); 3♂ (TM J3249); 2♂, Darcy's Bluff, 880 m (TM J3250); 4♂, Hornes Dam, 750 m (TM J3251); 2♂ (TM J3252); 3♂ (TM J3253); ♂ (TM J3254); 3♂ (TM J3255); ♂,

ex rotten logs, Lake St Clair [42°08'S, 146°10'E], 17 May 1996, L. J. Boutin (TM J3256); ♂, same locality and collector, 16 May 1996 (TM J3257); 3♂, Maggs Mtn [41°45'S, 146°12'E], 13 June–19 September 1979, R. H. Green (QVM 13:22725–7).

Etymology: The specific patronym is in honour of Professor V. V. Hickman, doyen of Australian arachnologists, who collected these specimens.

Diagnosis: The anterior edge of the epigynum is interrupted by a "neck". The ♂ median



Figs. 55–60: ♀ *Tasmarubrius hickmani*. 55 trichobothrium, ridged cuticle; 56 tarsal organ; 57 preening comb on distal metatarsus II; 58 epigynum; 59 PMS(I), minor ampullate spigot; 60 PLS(I), large distal spigot.

apophysis is long and slender. *T. hickmani* differs from *T. tarraleah* in that the epigynal plate is rounded posteriorly, the median apophysis tapers distally and the paracymbium has a posterior knob.

Description: Female: CL 6.0, CW 4.0, AL 7.8, AW 5.0. Colour, pattern, eyes and leg spines similar to *T. milvinus*. Legs 4123 (I, 15.2; II, 13.8; III, 13.2; IV, 17.4). Preening combs (Fig. 57) are present on metatarsi II (6 times), III (6/7 times) and IV (6/7 times). Epigynum (Figs. 50–52, 58): lateral protuberances may or may not be present. The median plate has slight ridges tapering laterally. Broad insemination ducts enter the base of the spermathecae. The spigots on the spinnerets are similar to those of other ♀♀. The large terminal spigots (minor ampullate) on the PMS and PLS appear to have a similar structure (Figs. 59–60) to each other and to those found in the ♂♂ of *T. tarraleah* (Figs. 45–46). Length 11.9–14.4.

Male: CL 5.8, CW 4.5, AL 5.8, AW 3.4. Colour, pattern, eyes, leg spines, similar to ♂

T. milvinus. Legs 4123 (I, 17.8; II, 15.0; III, 14.3; IV, 19.0). Preening combs are present on metatarsi II (5 times), III (5/7 times), IV (4/7 times). ♂ palp (Figs. 53–54). The median apophysis is long, slender and tapering; the paracymbium is blunt with a posterior knob. Length 11.2–12.7.

Distribution: *T. hickmani* is confined to central plateau localities extending into the northern mountains (Fig. 62).

Relationships of *Tasmarubrius* spp.

A cladistic analysis examined relationships between *Tasmarubrius* spp. and the following exemplars: *Amaurobius fenestralis* (Stroem) from Europe, *Amphinecta milina* Forster & Wilton from New Zealand, and the following Australian spiders: *Strenosoma terranea* Davies, *Desis* sp., *Badumna longinqua* (L. Koch), *Paramatachia decorata* Dalmas, *Forsterina* sp., *Austmusia wilsoni* Gray,

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1 <i>Wa. barbarella</i>	3	1	3	0	0	1	0	0	0	0	1	0	2	0	–	–	–	0	0	0	0	0	0
2 <i>Am. fenestralis</i>	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	4	1
3 <i>Storeno. terranea</i>	1	0	2	0	1	1	1	0	1	–	–	–	1	0	0	0	0	1	1	0	2	4	1
4 <i>Desis</i> sp.	1	0	0	0	2	1	0	0	1	–	–	–	1	1	0	0	0	0	0	0	1	3	1
5 <i>Bad. longinqua</i>	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	1
6 <i>Param. decorata</i>	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1
7 <i>Forsterina</i> sp.	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8 <i>Amph. milina</i>	1	0	0	0	1	1	1	0	1	–	–	?	0	1	0	0	0	0	0	0	1	2	1
9 <i>Austm. wilsoni</i>	1	0	0	0	1	1	0	0	1	–	–	–	0	0	1	0	0	0	0	0	?	3	2
10 <i>Stiph. facetum</i>	1	0	1	2	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
11 Dictynidae A	2	0	0	1	0	0	0	0	0	1	0	2	2	0	0	0	0	0	0	0	0	1	1
12 <i>Tasm. milvinus</i>	1	0	2	0	1	1	1	0	1	–	–	–	0	0	1	1	0	0	1	1	3	4	1
13 <i>Tasm. pioneer</i>	1	0	2	0	1	1	1	0	1	–	–	–	0	0	1	1	0	0	1	1	3	4	1
14 <i>Tasm. truncus</i>	1	0	2	0	1	1	1	0	1	–	–	–	0	0	1	1	0	0	1	2	3	4	1
15 <i>Tasm. tarraleah</i>	1	0	2	0	1	1	1	0	1	–	–	–	0	0	1	1	1	0	1	2	3	4	1
16 <i>Tasm. hickmani</i>	1	0	2	0	1	1	1	0	1	–	–	–	0	0	1	1	1	0	1	2	3	4	1

Table 2: Data matrix.

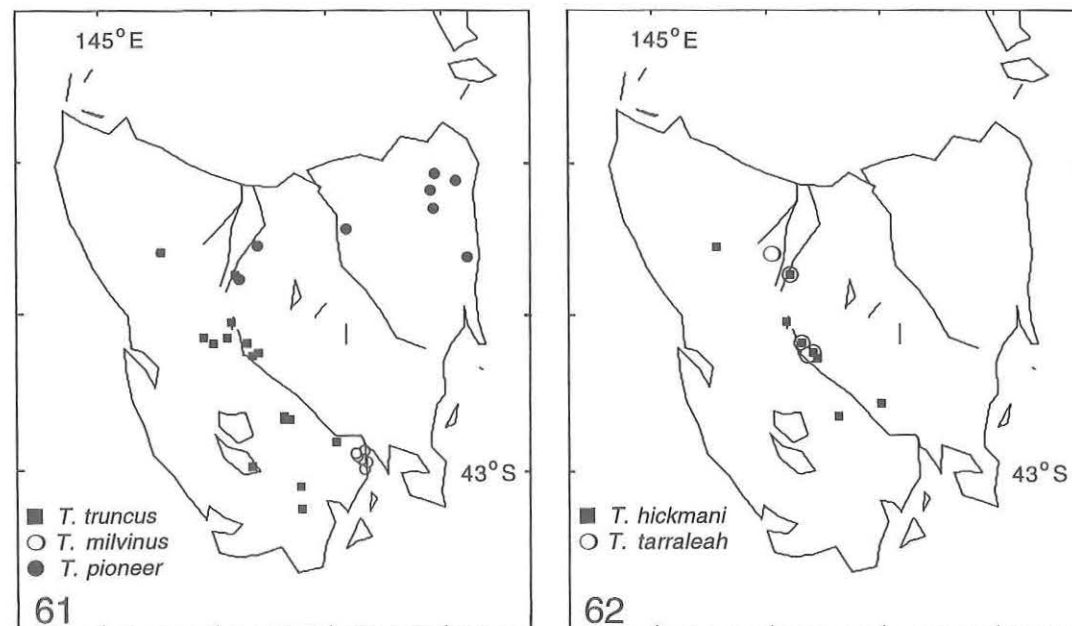
Stiphidion facetum Simon and an undescribed dictynid, Dictynidae A. Outgroup comparison was with *Wandella barbarella* Gray, an Australian filistatid. A data matrix (Table 2) was assembled for these taxa (generic names abbreviated) using 23 characters. These are numbered according to the sequence in the matrix and the designated states are in brackets. Unknown characters are represented by “?”, inapplicable characters by “–”.

Characters and character states

- Retromarginal cheliceral teeth: 2 + (0); 2 (1); 1 (2); 0 (3).
- Cheliceral lamina: absent (0); present (1).
- Promarginal cheliceral teeth: 3 + (0); 3 (1); 2 (2); 0 (3).
- Filamentous seta at base of fang: absent (0); short (1); long (2).
- Tarsal trichobothria: absent (0); 2 + (1); double row (2).
- Metatarsal trichobothria: 1–2 (0); 2 + (1).
- Metatarsal preening combs: absent (0); present (1).
- Feathery hairs: absent (0); present (1).
- Cribellum: present (0); absent (1).
- Cribellar spinning fields: 2 (0); 1 (1).
- Cribellar fusules: longitudinally ribbed (0); annulated (1).
- Fusules on paracribellar base: single (0); grouped (1); absent (2).
- ♀ Map on ALS: 2 (0); 1 and nubbin (1); 1 (2).
- ♀ Position of Map on ALS: lateral (0); anterior (1).
- ♀ Gonopores: median (0); lateral (1).
- ♀ Lateral protuberances on epigynum: absent (0); present (1).
- ♀ Anterior margin of epigynum: continuous (0); interrupted by neck (1).
- ♂ Coxa of palp with stridulatory ridges: absent (0); present (1).
- ♂ Tibial apophysis with dorsal branch: absent (0); present (1).
- ♂ Dorso-retrolateral proximal paracymbium: absent (0); long, finger-like (1); short, blunt (2).
- ♂ Median apophysis: absent (0); membranous (1); irregular, sclerotized (2); long, slender, sclerotized (3).
- ♂ Conductor: absent (0); T-shaped (1); large S-shaped (2); falciform (3); rounded (4).
- ♂ Direction of embolus: straight (0); clockwise (1); anticlockwise (2).

Data analysis

The data matrix (Table 2) was used in Paup version 3.1.1. An heuristic search of the data

Figs. 61–62: Distribution maps of *Tasmarubrius* spp.

with 10 random-addition sequences and TBR branch-swapping generated four most parsimonious trees; length = 50, CI = 0.760, CI excluding uninformative characters = 0.727, RI = 0.859, RC = 0.653. Semi-strict consensus of the most parsimonious trees is shown (Fig. 63).

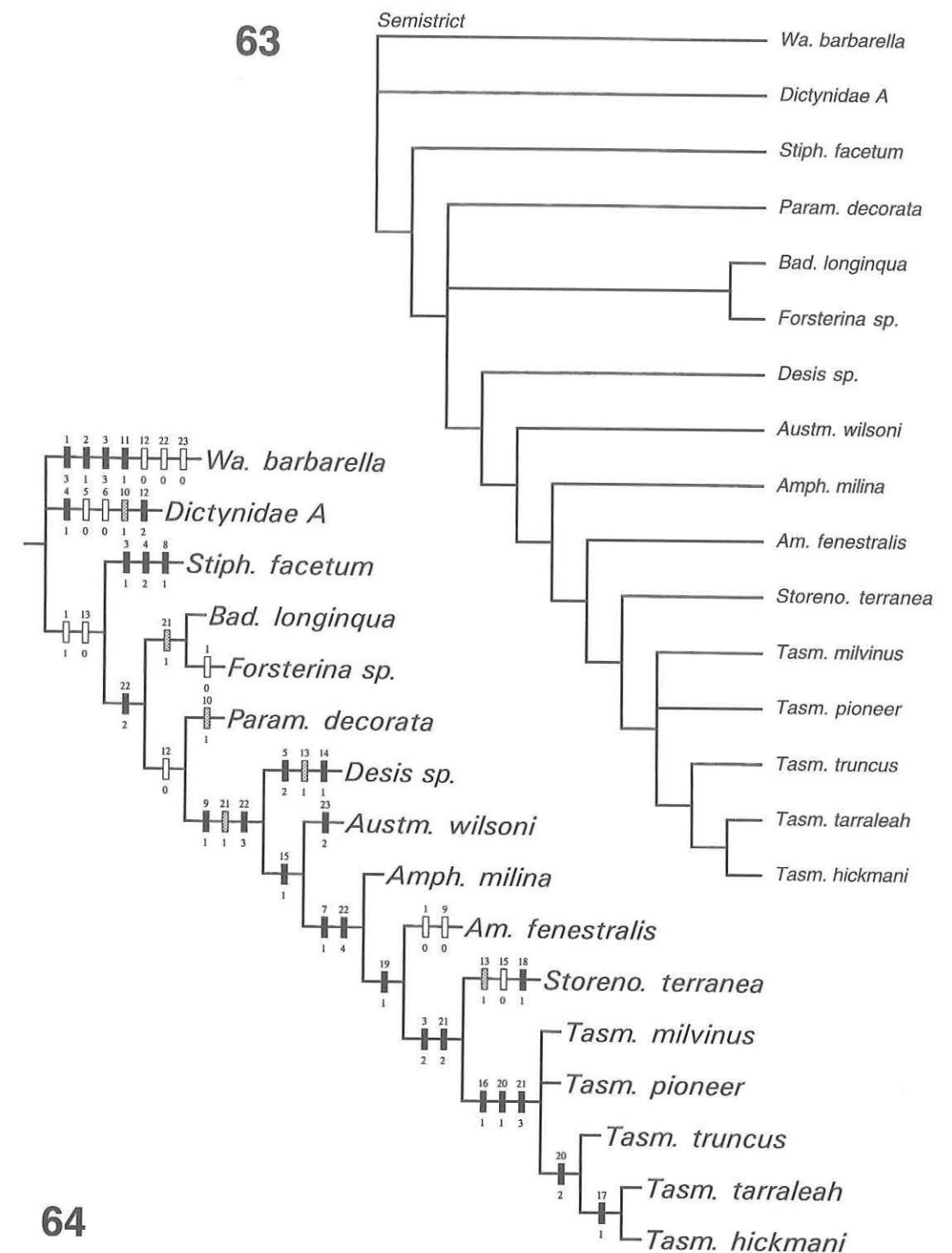
The analysis was repeated using Hennig 86 with identical results. In this case the command mh* which applies branch-swapping to trees (each found after different passes through the data) and retains the shortest trees, was used. The trees retained were then passed to the extended branch-swapper, bb*. The most parsimonious tree, closest to the semi-strict consensus tree, with characters and character states mapped, is shown (Fig. 64). This cladogram was prepared using CLADOS version 1.2 with DELTRAN optimization.

Results

There is close agreement between the cladograms (Figs. 63–64). *Tasmarubrius* emerges as a derived clade within the Amaurobiidae.

Acknowledgements

I thank the following curators and assistants: Dr Christine Rollard (MNHP) for sending the holotype ♀ *Rubrius milvinus* to London for me to examine and sketch at the British Museum of Natural History, and Mr Paul Hillyard for the use of facilities there; Ms Elizabeth Turner (TM) and Ms Liza Boutin who sorted and labelled many vials of Tasmanian spiders in Hobart; Dr Michael Gray and Ms Rebecca Harris (AM), Dr R. Mesibov (QVM), Mr Graham Milledge (NMV) and Professor Norman Platnick (AMNH) for collections. The Australian National Insect Collection donated survey material collected by Drs P. Cranston and J. Trueman from northern Tasmania. I am grateful to the Councils of the Australian Biological Study for their financial support of illustrator, Mrs Christine Lambkin, who also set up the program for phylogenetic analysis resulting in the cladograms. I also thank Mrs Kylie Stumkat, scanning electron microscope technician, and other staff of the Queensland Museum, particularly Mrs Audra Topping, for their help in preparation of this paper.



Figs. 63–64: Cladograms. 63 semi-strict consensus of the four most parsimonious trees; 64 most parsimonious tree showing characters and character states.

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Hogg's phantom spider from Central Australia: a century-old mystery solved

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Summary

A trapdoor spider collected by the Horn Scientific Expedition to Central Australia in 1894 was identified by H. R. Hogg as belonging to the New Zealand species *Migas paradoxus* L. Koch of the family Migidae. A few years later, Hogg suggested that the species should be in a new genus. The Migidae is a Gondwanan family. Several genera are known from Australia, where all species occur in wet habitats. No spiders of the family have ever subsequently been collected from Central Australia. Hogg's fragmented specimen has not been traced, and later authors have doubted his identification. The taxonomic and biological rationale for now regarding Hogg's specimen as a species of *Conothele* Thorell is presented. It is suggested that *Conothele* should be synonymized with *Ummidia* Thorell.

Introduction

In his introduction to the report of The Horn Scientific Expedition to Central Australia of 1894, Horn (1896) cited the opinion of Australian scientists of the day "that when the rest of the continent was submerged the elevated portions of the McDonnell Range existed as an island, and that consequently *older forms of life* [my italics] might be found in the more inaccessible parts". At that time it was already known that during the Cretaceous the extensive lakes of Central Australia effectively divided the continent into western and eastern blocks. Later geological studies suggest that there were three island continents (Morgan, 1980). The ancient inland seas in turn account for many of the affinities of relict biota in the southwestern and eastern parts of the present day landscape. In addition, the prediction that "older forms of life" might be preserved in the McDonnell Range is still being fulfilled, as there continue to be discoveries of examples of relict biota from the region.

The Horn Expedition, sponsored by the wealthy South Australian W. A. Horn who had mining and pastoralist interests, and supported by several state Governments, covered a large area of central Australia. The primary aim of the expedition was to gather information on the

plants and animals, and on the social customs of the Aborigines, of the area. The collections were first returned to Adelaide and Melbourne, then they were dispersed amongst specialists for identification and description. Professor Baldwin Spencer of Melbourne, who had been in the expedition team, subsequently edited the resultant scientific reports (Spencer, 1896a).

In the collections were 150 specimens of spiders, which Hogg (1896) attributed to 36 genera and 57 species, of which 18 were described as new. One of the mygalomorph (trapdoor) spider species he identified as *Migas paradoxus* L. Koch, a species originally described from New Zealand (Koch, 1872). Occurrence of *Migas* (or any member of the Migidae) in Central Australia would be of considerable biogeographic significance. However, Hogg's specimen which he noted as "mutilated" has not been seen subsequently and is believed lost (Main, 1985).

Transport of the expedition collections was by camel (Fig. 1) and various authors have considered this as the cause of the damaged and fragmented condition of some of the invertebrate material (Yen, 1996). Earlier, Spencer (1896b) described the discomfort of camel travel which had a "peculiar churning effect on specimens", and that it was "not always possible