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A revision of the Australian metaltellines (Araneae : Amaurobioidea : Amphinectidae : Metaltellinae)

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Abstract

Seven new metaltelline genera (*Quemusia*, *Magua*, *Keera*, *Jalkaraburra*, *Buyina*, *Cunnawarra* and *Penaoola*) are described with the following new species: *Q. aquilonia*, *Q. austrina*, *Q. raveni*, *Q. cordillera*, *M. wiangaree*, *K. longipalpis*, *J. alta*, *B. halifax*, *B. yeatesi*, *C. grayi*, *C. cassisi*, *P. algida* and *P. madida*. Patterns of the male palpal sclerites in eight Australian amaurobioids and *Amaurobioides* are illustrated and discussed. Cladistic analyses of the relationships between the Australian metaltelline species suggest that there are two clades, one of which includes the South American genera; it indicates that *Calacadia* is more closely related to some of the Australian genera than it is to *Metaltella*. The metaltellines are transferred from the Amaurobiidae to the Amphinectidae on the basis that they appear to be more closely related to genera in this family than to *Amaurobius fenestralis*, the outgroup in the cladistic analyses.

Introduction

In an earlier paper, Davies (1992: 488) discussed the dictynoid–amaurobioid complex of Australian families and endorsed the view of Coddington and Levi (1991) that 'these superfamilies are among the largest cladistic problem at the family level'. This position was attributed not only to 'the heterogeneity within families' but also to the few Australian genera on which some of the families are based. The ecribellate genus *Austmusia* Gray, 1983 is the only metaltelline described from Australia. In undertaking this revision it was hoped that a better understanding of the phylogeny of the group would emerge. The subfamily is also represented in South America by two genera, cribellate *Metaltella* Mello-Leitao, 1931 and ecribellate *Calacadia* Exline, 1940, with many more to be described (Leech 1972; N. I. Platnick, personal communication). Males of the group are recognised easily by the anticlockwise direction of the embolus of the (left) male palp, unique among the Amaurobioidea, unless one includes the claw-tufted Anyphaenidae in this superfamily.

Material and methods

The following new taxa were collected from litter and moss samples, by pyrethrum spraying and pitfall trapping in rainforests of north-eastern New South Wales and eastern Queensland. Other material from New South Wales and two specimens from South Australia were collected in pitfall traps. Notation of spines follows Platnick and Shadab (1975); measurements are in millimetres; the left male palp is used in all illustrations. Male palps were expanded in hot 10% potassium hydroxide. Material is lodged in QM, AM and SAM.

Abbreviations

Anatomy:	AL	abdomen length
	AW	abdomen width
	CL	carapace length
	CW	carapace width
	L	left
	R	right
Eyes:	ALE	anterior lateral
	AME	anterior median
	PLE	posterior lateral
	PME	posterior median
Spinnerets:	ALS	anterior
	PLS	posterior
	PMS	median

Museums:	AM	Australian Museum, Sydney
	QM	Queensland Museum, Brisbane
	SAM	South Australian Museum, Adelaide
Collectors:	DC	D. Cook
	DY	D. Yeates
	EWQM	Earthwatch, Queensland Museum
	GBM	G. B. Monteith
	GT	G. Thompson
	HJ	H. Janetzki
	RJR	R. J. Raven
	SRM	S. R. Monteith
	VED	V. E. Davies

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Male palpal sclerites in Amaurobioidea

The expanded male palps of several amaurobioid genera were examined to compare the course of the sperm duct, embolus and sclerites. The 'desids' *Forsterina*, *Namandia* and *Badumna* (Figs 1–3) show a typical amaurobioid pattern. Arising from the alveolus of the cymbium, a membraneous expandable basal haematodocha surrounds a petiolar sclerotisation and anneli to the sub-tegulum. A small median haematodocha attaches this to the tegulum, which has two apophyses (conductor and median apophysis) and a simple embolus (Sierwald 1990; Coddington 1990). The sperm duct trajectory is clockwise; it narrows gradually on the ventral tegular surface and forms a loop before entering the embolus. The large immovable conductor arises near the base of the embolus and supports it. The median apophysis arises further (following the trajectory of the sperm duct) round the tegulum and is inserted in an unsclerotised part of the tegulum (Lehtinen 1967). The long, tapering embolus runs in a clockwise direction. In *Storenosoma* (Fig. 4) and *Otira* (Amaurobiidae) the pattern is similar but the morphology of the sclerites is different. The sperm duct narrows but does not form a loop before entering the embolus, which is short, thick and pointed. The conductor is small and membraneous; the tip of the embolus rests on it. The median apophysis is large, complex and movable. In the Stiphidiidae (Figs 5, 6) the sperm duct forms a large loop before entering the embolus. The T-shaped conductor arises near the base of the long, slender embolus, which it supports. *Stiphidion* (Fig. 5) and *Baiami* have no median apophysis but some undescribed stiphidiids (Fig. 6) have a low mid-tegular membraneous protrusion that may be regarded as a median apophysis, i.e. it is in an appropriate position. The expanded male palp of *Desis* (Fig. 7) showed a very short sperm duct entering the embolus on the dorsal tegulum and continuing round to lie in the conductor (functional) on the ventral surface. A small antero-median sclerite is perhaps the 'primary' conductor *sensu* Lehtinen (1967). The median apophysis is small, rounded, with a sclerotised tip (giving a hook-like appearance viewed from some angles). If the functional conductor is regarded as a 'secondary' conductor then the palp of *Desis* is morphologically different from the aforementioned 'desids'.

In the metaltellines the sperm duct trajectory is clockwise though that of the embolus is anticlockwise, differing from all other amaurobioids. The metaltelline sperm duct may (e.g. in *Austmusia*) or may not (Fig. 9) form a loop before entering the embolus, which emerges from beneath a fold of the tegulum to lie in the large conductor (functional). One other apophysis arises on the retrolateral edge of the tegulum; it is firmly attached so is not regarded as a median apophysis by Lehtinen (1967) or Gray (1983) but as the 'primary conductor'. An anterior continuation of the tegulum forms a digitiform tegular process. Leech (1972) regarded the folded tegular area as the base of the very large conductor; he did not name the second apophysis. Exline (1960) described *Calacadia* as a pisaurid and called the functional conductor the terminal apophysis or 'fulcrum'.

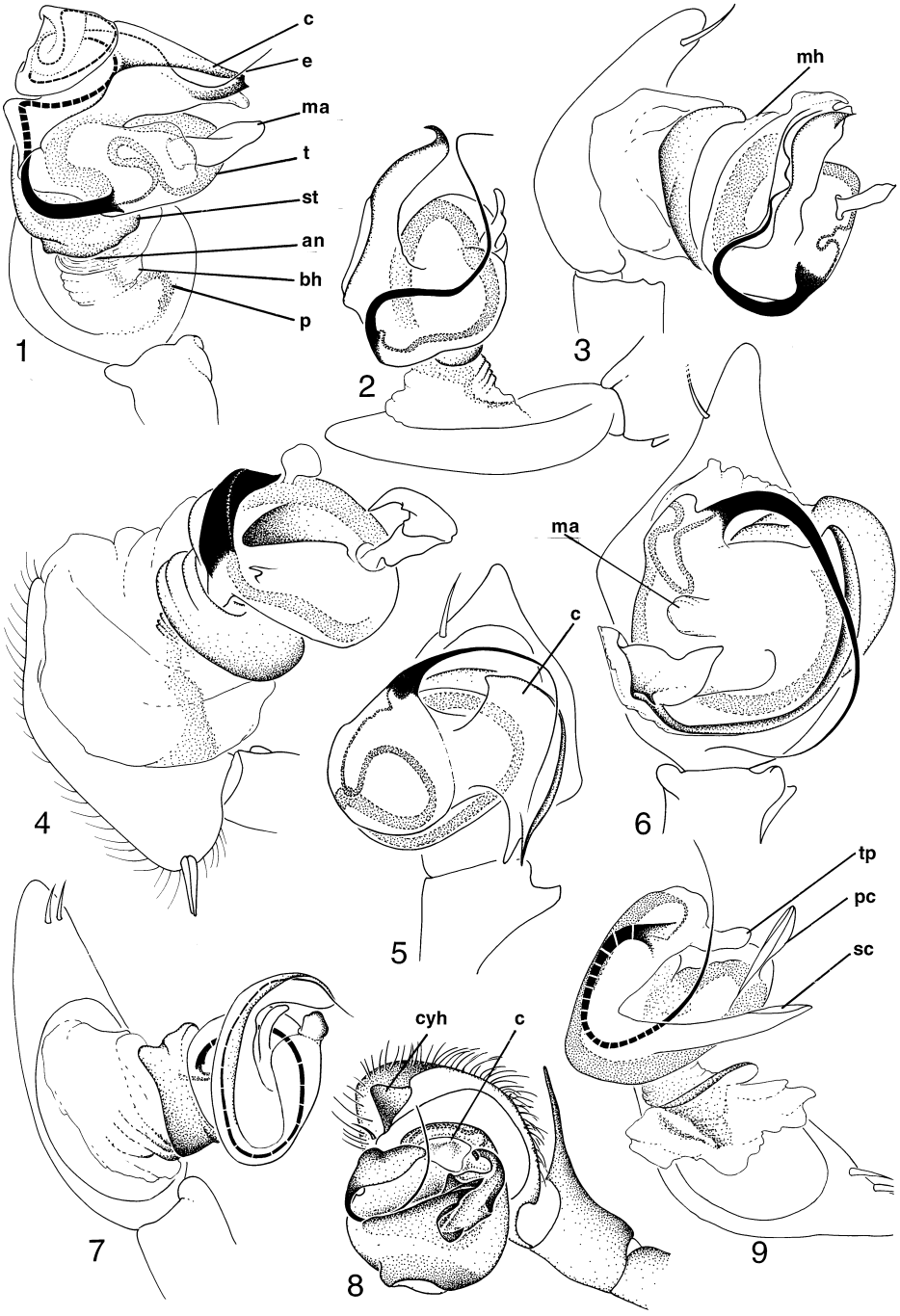
In naming the palpal sclerites the terminology of Lehtinen (1967) is followed here and thus the functional conductor is regarded as the 'secondary' conductor and there is no median apophysis.

Coddington (1990) noted that *Amaurobioides*, an anyphaenid, also has an anticlockwise embolus, so it seemed relevant to investigate it here. The palp of *A. isolatus* was examined; it is complex and the course of the sperm duct is long but unclear. The embolus lies against the raised edge of a large, spinose tegular sclerite, the 'conductor' of Forster (1970) and Ramirez (1995). Further along, the embolus rests on a small, lightly sclerotised structure before it reaches the apical hollow of the cymbium. On expansion (Fig. 8), the bulb is thrust out of the thickly fringed cymbium, and the embolus becomes displaced; the lightly sclerotised structure (see Hirst 1993: fig. 3) is seen to be a discrete sclerite, arising near the base of the embolus and thus it may be the 'primary conductor'; Ramirez (1995) recognises this as a secondary conductor. The large tegular sclerite has four spinose processes, the most anterior of which was regarded by Forster (1970) and Ramirez as the median apophysis. It is firmly attached and seems to be part of one large spinose sclerite. Whatever the homologies of these sclerites it seems clear that other characters (the strong lamelliform setae of the claw tufts, advanced tracheal opening and extensive tracheal system of *Amaurobioides*) place it in the Anyphaenidae (Platnick 1974; Ramirez 1995) and any similarities in palpal structure with the metaltellines are regarded as homoplasious.

Subfamily **METALTELLINAE** Lehtinen

Metaltellinae Lehtinen, 1967: 323.

Cribellate or ecribellate 3-clawed spiders with geniculate chelicerae. The sternum is pointed posteriorly. Legs 1423, 1=423 or 4123; without feathery hairs. The cymbium is slender. The



Figs 1–9. Expanded male palps (L). *1*, *Forsterina* sp.; *2*, *Badumna longinqua*; *3*, *Namandia* sp.; *4*, *Storenosoma* sp.; *5*, *Stiphidion facetum*; *6*, Stiphidiidae; *7*, *Desis kenyoni*; *8*, *Amaurobioides isolatus*; *9*, Metaltellinae (Kirrama Ra). an, anneli; bh, basal haematodocha; c, conductor; cyh, cymbial hollow; e, embolus; ma, median apophysis; mh, median haematodocha; p, petiole; pc, primary conductor; sc, secondary conductor; st, subtegulum; t, tegulum; tp, tegular process.

embolus of the left male palp runs anticlockwise on the tegulum; it arises under a tegular fold emerging from this to lie along the spathulate secondary conductor – henceforward referred to as 'the conductor'; the primary conductor is spathulate and smaller. There is a short anterior tegular process. The male palpal tibia has a keel-like ventro-retrolateral apophysis distally; a retrolateral spur may also be present.

Australian metaltellines

All Australian metaltellines have similar coloration and pattern (Fig. 57) (Gray 1983: figs 1–4). The carapace is brown, darker in the cephalic area; the dorsal abdomen is brown-black with lighter chevron pattern, venter pale medially with slight mottling; the legs are barred with darker pigmented bands that may fade in alcohol storage or with age. The cephalic area is prominent, bluntly rounded in front, almost as wide as the thoracic region. The AME are reduced. There are two retromarginal teeth on the chelicera, 3–7 on the promargin. Posterior trochanters are weakly notched. There is a row of tarsal trichobothria increasing in length distally; bothria collariform; the tarsal organ is slit-like, widening distally (Fig. 26). The leg cuticle is ridged. In the cribellate genus the labium is slightly wider than long; in the ecribellates it is as long as or longer than wide (as in *Austmusia*). The male palp has a distal keel-like ventro-retrolateral tibial apophysis; it is without a patellal boss. In the epigynum there are prominent 'glandular' structures from which ducts enter the insemination ducts thus dividing these into pre- and post-glandular parts.

Key to the genera of Metaltellinae

1. ♂ conductor arising about mid-tegulum (Fig. 19); ♀ first part of insemination duct (to gland) short (Fig. 41) 2
   ♂ conductor arising near posterior edge of tegulum (Fig. 80); ♀ first part of insemination duct long (Fig. 78) 5
2. Cribellate; small spiders <5 mm in length ..... *Quemusia*
   Ecribellate; ♀ >5 mm in length 3
3. ♀ short insemination duct from gland to spermatheca; ♂ palpal tibia without retrolateral spur (Fig. 44). ..... *Magua*
   ♀ short or long insemination duct from gland to spermatheca; ♂ palpal tibia with retrolateral spur (Fig. 55) 4
4. ♀ short insemination duct from gland to spermatheca; ♂ post-alveolar cymbium is twice as long as the alveolar portion (Fig. 54) ..... *Keera*
   ♀ long insemination duct from gland to spermatheca; post-alveolar cymbium is about same length as alveolar portion ..... *Jalkaraburra*
5. Cribellate; 4–6 retromarginal teeth on chelicera ..... *Metaltella* (South America)
   Ecribellate; 2 retromarginal teeth on chelicera 6
6. Strong trochanteral notch on posterior legs; patellal boss on ♂ palp ..... *Calacadia* (Chile)
   Weak trochanteral notch on posterior legs; without patellal boss on ♂ palp 7
7. Epigynum with thin cuticular laminae, without lateral teeth (Fig. 73); ♂ with posterior tegular bulge; sperm duct with loop (Fig. 74) ..... *Austmusia*
   Epigynum with lateral teeth; ♂ without posterior tegular bulge; sperm duct simple (Fig. 86) 8
8. ♀ with anterior epigynal grooves (Fig. 77); ♂ palpal tibia with retrolateral spur ..... *Buyina*
   ♀ without anterior epigynal grooves; ♂ palpal tibia with or without retrolateral spur 9
9. Legs 1423 or 1=423; ♀ proximal part of spermathecae is lateral to distal part; ♂ palpal tibia longer than wide without retrolateral spur ..... *Cunnawarra*
   Legs 4123; ♀ proximal part of spermathecae is anterior to distal part; ♂ palpal tibia as wide as long with retrolateral spur ..... *Penaoola*

Quemusia, gen. nov.

Type species: *Quemusia aquilonia*, sp. nov.

Diagnosis

Small (<5.0 mm) cribellate spiders. The cribellum has two spinning fields (Fig. 24). The labium is slightly wider than long. The external epigynum has two small gonopores and lateral teeth (difficult to see with light microscope). The conductor arises at about the mid-tegular level. *Quemusia* differs from *Austmusia* and other Australian metaltellines in that the female has a cribellum and the male has a bipartite colulus.

Description

The carapace is highest in the cephalic region (Fig. 10); the clypeus is twice the size of AME. Viewed from the top the anterior row of eyes is straight and the posterior row slightly procurved (Fig. 11); from the front both rows of eyes are procurved (Fig. 12). The chelicerae have two retromarginal and 3–5 promarginal teeth. The spermathecae are simple, the insemination ducts are short. The male palpal tibia has a distal ventro-retrolateral apophysis and may have a proximal retrolateral spur.

Etymology

Following the naming of *Calacadia* after the Californian Academy of Sciences and *Austmusia* after the Australian Museum, *Quemusia* takes its name from the Queensland Museum.

Quemusia aquilonia, sp. nov.

(Figs 10–29; Table 1)

Material examined

Holotype. ♀, Bellenden Ker Range, NE Queensland, Australia (17°16′S, 145°51′E) 1560 m, 17–24.x.1981, litter, EWQM (QM S22836).

Paratypes. **Queensland:** ♂, ♀, same data as holotype (QM S22837); ♂, same locality as holotype, 29.iv–2.v.1983, GBM, DY (QM S22838); ♂, 3♀; (QM S22839); 12♀ (QM S22840); 6♀ (QM S30242); ♂ (QM S30241); 3♂, 9♀ (QM S22841); 7♀ (QM S22843); 9♀, 2 juv. (QM S22842); 11♀, penult. ♂ (QM S22844); 4♀ (QM S22845); ♀ (QM S22846); 2♀, penult. ♂ (QM S28847); 3♂, 19♀, same data as holotype (QM S22848); 7♂, 5♀ (QM S22849); 2♂, 16♀, same locality as holotype, 28.x.1983, GBM (QM S22850); 11♀, ♂, 30.iv–2.v.1988, GBM (QM S30222); ♀, Bellenden Ker, 1054 m, 25–31.x.1981, EWQM (QM S30223); 2♂, 12♀, juvs, Bellenden Ker Centre Peak, 1500 m, 11.iv.1979, GBM (QM S30224); 3♂, 4♀, same locality, 23.x.1980, GBM (QM S30225); 3♀, Mt Fisher, 7 km SW Millaa Millaa (17°34′S, 145°34′E), 1100 m, 27.iv.1982, GBM, DY, DC (QM S30226); 2♂, 5♀, Mt Bartle Frere, South Peak Summit (17°24′S, 145°49′E), 1620 m, 6–8.xi.1981, EWQM (QM S30227); 2♂, 3♀, 0.5 km N of South Peak, EWQM (QM S30228); 6♂, juvs, Summit Creek, 1500 m, 24.ix.1981, GBM, DC (QM S30229); 2♀, Mt Bartle Frere, summit of NW Peak, 1440 m, 7.x.1980, moss from rocks, GBM, SRM (QM S30230); 2♀, below NW Peak summit, 1430 m, 7.x.1980, GBM (QM S30231); ♂, West face, 1000–1400 m, 7.x.1980, GBM (QM S30232).

Diagnosis

Three promarginal cheliceral teeth. Male palpal tibia twice as long as wide, with distal retrolateral apophysis only. First part of insemination duct – between gonopore and gland – very short, about an eighth the length of the rest of the duct.

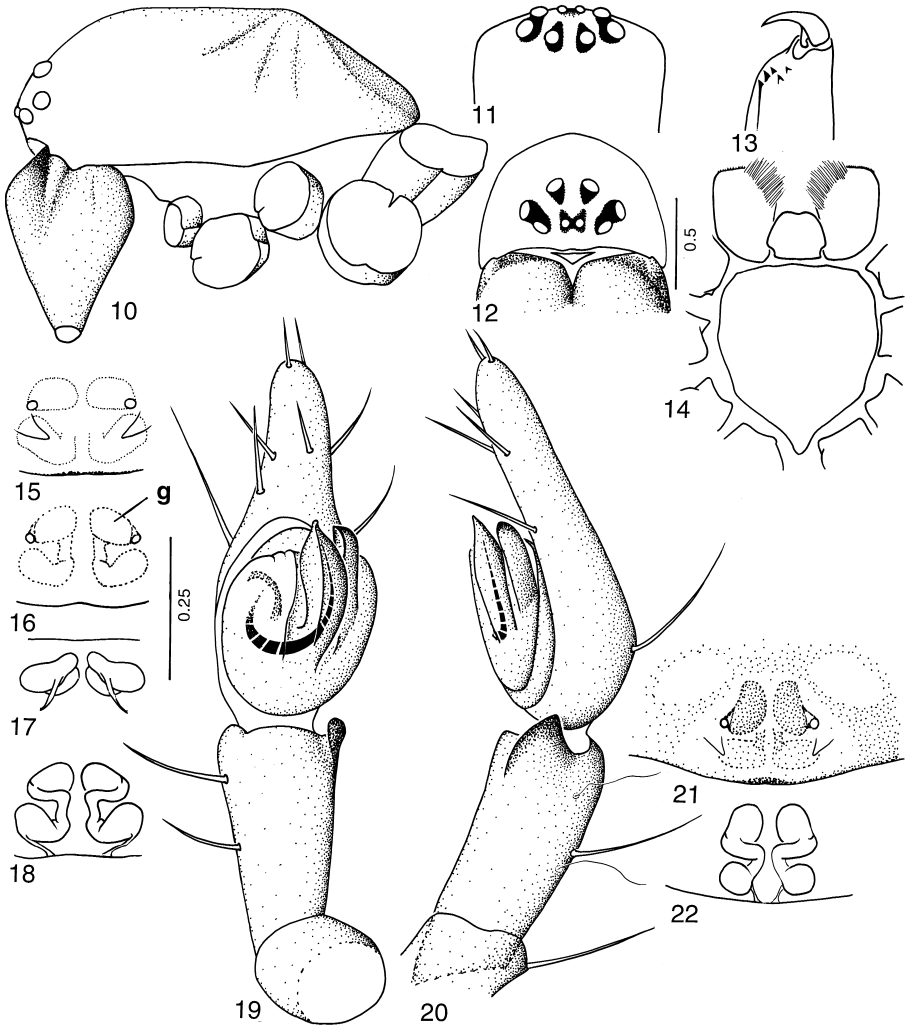
Description

Female

CL 2.1, CW 1.3, AL 2.7, AW 2.0 mm. Ratio of AME:ALE:PME:PLE: is 6:10:9:10. Legs 1423 (Table 1). There are 2 retromarginal and 3 promarginal cheliceral teeth (Fig. 13). The labium is slightly wider than long, 1:0.9; sternum longer than wide, 1:0.8. (Fig. 14).

Notation of spines as follows. Femora: I, D011, P002; II, D110, P001, R011; III, D111, P011, R011; IV, D111, P011, R011. Patellae: III, 101; IV, 101. Tibiae: I, V221; II, P101, V122; III, D110, P110, V112, R110; IV, D101, P101, V112, R101. Metatarsi: I, P001, V221, R001; II, P101, V221, R002; III, D011, P111, V221, R101; IV, D011, P111, V222, R101; calamistrum proximal, 10 setae in single line. Epigynum (Figs 15–18, 21–23). Very short insemination duct to gland then curving back to enter spermatheca. Spinnerets: ALS with two major ampullate spigots, anterior much larger than posterior; about 17 piriform spigots (Fig. 25). PMS with a large anterior spigot (cylindrical), a large posterior spigot (minor ampullate) and 11 smaller aciniform spigots (Fig. 29). PLS with uniform spigots.

Females varied in length from 3.4 to 4.8 mm.



Figs 10–22. *Quemusia aquilonia*. *10–18*, female. *10*, cephalothorax (lateral); *11*, *12*, eyes, above, frontal; *13*, cheliceral teeth; *14*, sternum, labium, endites; *15–18*, epigynum, ventral, ventral (cleared), posterior, dorsal. *19*, *20*, male palp; *19*, ventral; *20*, retrolateral. *21*, *22*, epigynum (Mt Fisher); *21*, ventral; *22*, dorsal. g, gland. Scales are in millimetres.

Male

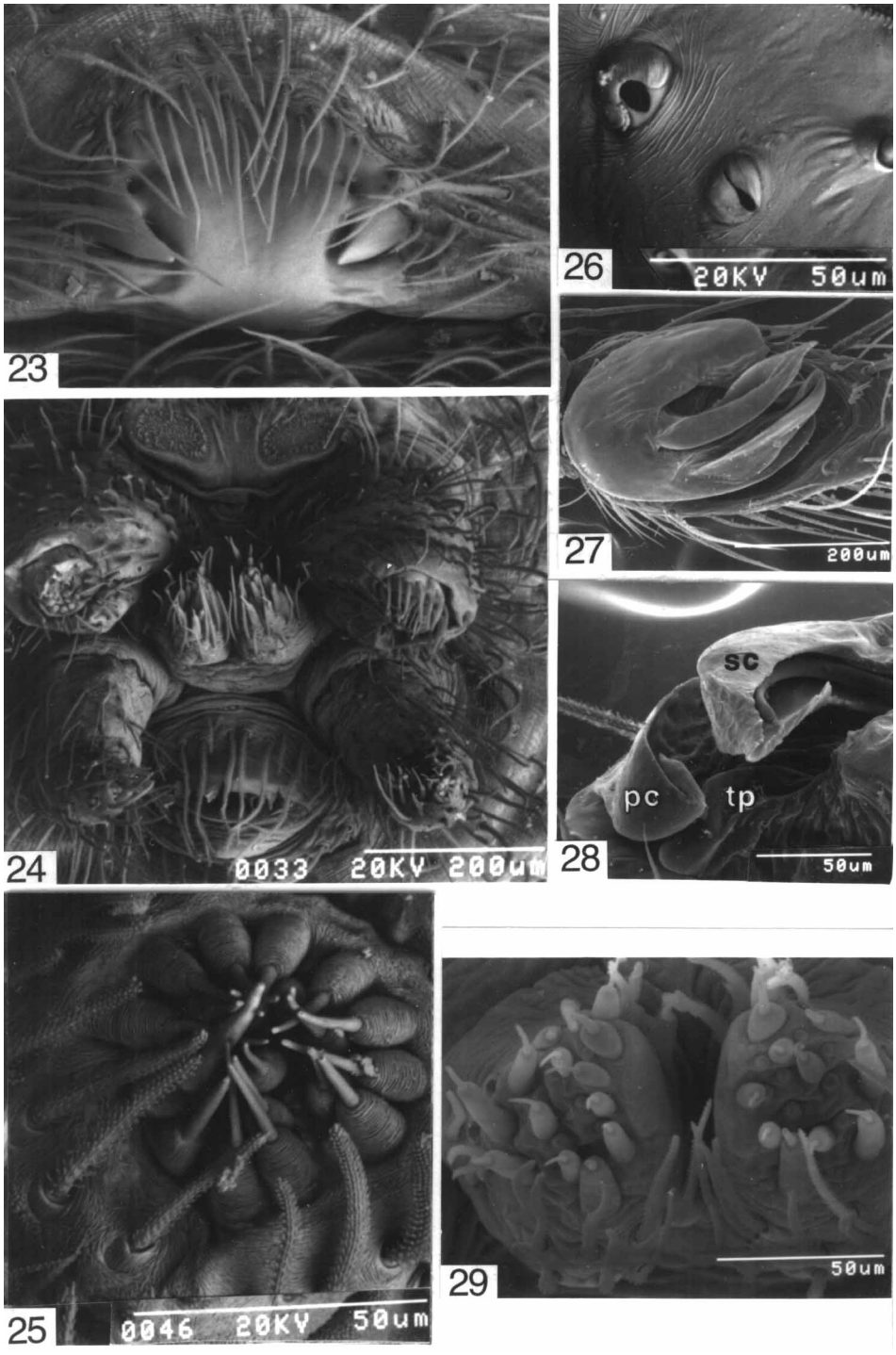
CL 2.5, CW 1.6, AL 2.3, AW 1.4. Eyes similar to those of female.

Notation of spines as follows. Femora: I, D110, P002; II, D111, P001; III, D111, P011, R011; IV, D111, P001, R001. Patellae: III, IV, D001. Tibiae: I, V221; II, P101, V222; III, D101, P101, V212, R001; IV, D001, P101, V212, R011. Metatarsi: I, P011, V221, R001; II, P011, V221, R011; III, D001, P111, V221, R111; IV, D010, P111, V221, R111. Male palp (Figs 19, 20, 27, 28) as follows. The tibia is more than twice as long as wide, 1:0.4. The tibial apophysis is an elongate ventro-retrolateral ridge. The primary conductor is a little smaller than the conductor; the anterior tegular process is small (Fig. 28). Bipartite colulus. ALS and PLS with a similar pattern of spigots to ♀. PMS without large anterior spigot (cylindrical).

Males varied in length from 3.6 to 4.8 mm.

Etymology

The specific epithet is from Latin *aquilonius*, northern, referring to northern Queensland.



Figs 23–29. *Quemusia aquilonia*. *23*, epigynum; *24*, female, spinneret field; *25*, ALS (R); *26*, bothrium and tarsal organ, leg I. *27*, *28*, male palp: *27*, ventral; *28*, conductor with embolus (distal). *29*, female, PMS. pc, primary conductor; sc, conductor; tp, tegular process.

Table 1. Leg lengths of metaltelline species

Leg	Femur		Patella/tibia		Metatarsus		Tarsus		Total	
	F	M	F	M	F	M	F	M	F	M
Quemusia aquilonia, sp. nov.										
I	1.6	2.2	2.0	3.3	1.3	2.3	0.8	1.1	5.7	8.9
II	1.3	1.8	1.6	2.3	1.1	1.7	0.7	0.9	4.7	6.7
III	1.2	1.6	1.4	1.9	1.1	1.6	0.6	0.7	4.3	5.8
IV	1.5	2.0	1.8	2.6	1.5	2.1	0.8	0.8	5.6	7.5
Magua wiangaree, sp. nov.										
I	2.1	2.4	2.8	3.1	1.6	2.0	1.0	1.2	7.5	8.7
II	1.9	2.1	2.2	2.5	1.4	1.7	0.8	1.1	6.3	7.4
III	1.6	1.8	1.8	2.1	1.4	1.7	0.7	0.8	5.5	6.4
IV	2.2	2.4	2.6	2.8	1.7	2.1	0.9	1.1	7.4	8.4
Keera longipalpis, sp. nov.										
I	3.5	4.0	4.5	5.4	3.1	3.8	1.6	1.7	12.7	14.9
II	3.0	3.4	3.7	4.2	2.6	2.9	1.4	1.5	10.7	12.0
III	2.5	3.0	3.0	3.3	2.5	2.8	1.1	1.2	9.1	10.3
IV	3.4	3.7	4.1	4.5	3.1	3.6	1.3	1.5	11.9	13.3
Jalkaraburra alta, sp. nov.										
I	2.4	2.3	3.1	3.3	1.9	2.3	1.2	1.2	8.6	9.1
II	2.1	1.9	2.5	2.5	1.7	1.7	0.9	0.9	7.2	7.0
III	1.8	1.6	2.2	1.8	1.5	1.6	0.8	0.7	6.3	5.7
IV	2.4	2.1	3.0	2.6	2.1	2.0	1.0	1.2	8.5	7.9
Buyina halifax, sp. nov.										
I	3.0	3.9	3.8	5.2	2.3	3.7	1.4	1.9	11.5	14.7
II	2.5	3.5	3.0	4.3	2.0	3.0	1.2	1.5	8.7	12.3
III	2.3	3.0	2.5	3.5	2.0	2.8	0.9	1.3	7.7	10.6
IV	3.0	3.8	3.5	4.8	2.5	3.7	1.1	1.6	10.1	13.9
Cunnawarra grayi, sp. nov.										
I	2.3	2.9	2.8	3.6	1.7	2.2	1.1	1.4	7.9	10.1
II	–	2.2	–	2.9	–	2.0	–	1.2	–	8.3
III	1.8	2.0	1.9	2.3	1.4	2.0	1.8	1.0	5.9	7.3
IV	2.2	2.6	2.8	3.3	2.0	2.5	0.9	1.2	7.9	9.6
Penaoola algida, sp. nov.										
I	2.9	–	3.7	–	2.3	–	1.3	–	10.2	–
II	2.6	–	3.0	–	2.0	–	1.3	–	8.9	–
III	2.4	–	2.6	–	2.0	–	1.1	–	8.1	–
IV	3.1	–	3.8	–	2.6	–	1.2	–	10.7	–
Penaoola madida, sp. nov.										
I	–	3.4	–	4.3	–	3.0	–	1.6	–	12.3
II	–	2.9	–	3.5	–	2.5	–	1.3	–	10.2
III	–	2.5	–	3.0	–	2.5	–	1.2	–	9.2
IV	–	3.5	–	4.3	–	3.4	–	1.5	–	12.7

Quemusia austrina, sp. nov.

(Figs 30–34)

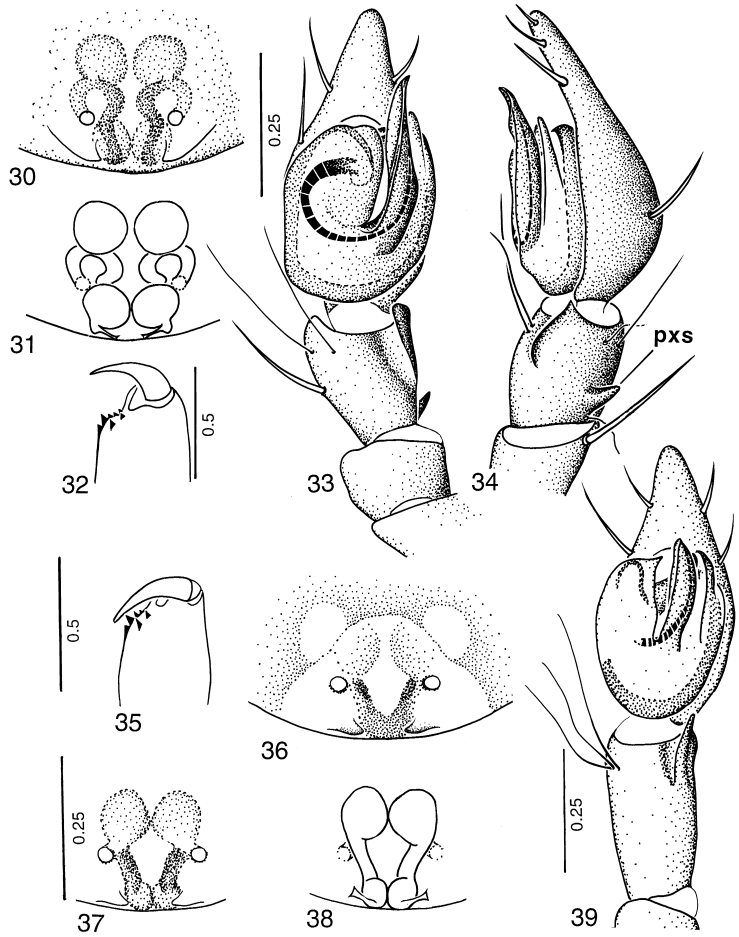
Material examined

Holotype. ♀, Springbrook Repeater Stn, SE Queensland, Australia (28°15′S, 153°16′E), 1000 m, 6.iv.1995, GBM (QM S30233).

Paratypes. ♂, same data as holotype (QM S30234); ♀ (QM S30235).

Diagnosis

Quemusia austrina differs from *Q. aquilonia* in having five promarginal cheliceral teeth, a short male palpal tibia with a proximal dorso-retrolateral spur (as well as the ventro-retrolateral apophysis). The first part of the insemination duct to the gland is twice as long as that of *Q. aquilonia* and about half the length of the rest of the duct.



Figs 30–39. *Quemusia* spp. *30–34*, *Q. austrina*: *30*, *31*, epigynum, ventral, dorsal; *32*, chelicera; *33*, *34*, male palp, ventral, retrolateral. *35–38*, *Q. raveni*: *35*, chelicera; *36–38*, epigynum, ventral, ventral (cleared), dorsal. *39*, *Q. cordillera*, male palp, ventral. pxs, proximal dorso-retrolateral spur. Scales are in millimetres.

Description

Female

CL 1.5, CW 0.9, AL 1.5. AW 1.0 mm. Ratio of AME:ALE:PME:PLE is 4:9:8:9. Legs 1423 (I, 3.8; II, 3.1; III, 2.9; IV, 3.7 mm). The labium is slightly wider than long, 1:0.9. There are 2 retromarginal and 5 promarginal cheliceral teeth (Fig. 32).

Notation of spines as follows. Femora: I, D110, P001; II, D110, P001; III, D1(1)1, P(1)01, R(1)01; IV, D101, R001. Patellae: I, D001; II, D001; III, D101; IV, D101. Tibiae: I, V020; II, P101, V012; III, D110, P110, V012, R110; IV, D101, P101, V112, R101. Metatarsi spined with distal whorl of 4–5. Calamistrum with 12 setae. Epigynum shown in Figs 30, 31. The insemination duct to the glandular area is short.

Paratype ♀ is 3.3 mm in length.

Male

CL 1.7, CW 1.0, AL 1.6, AW 0.9 mm. Eye sizes similar to those of ♀. Legs 1423 (I, 5.6; II, 4.2; III, 3.7; IV, 5.1 mm).

Notation of spines as follows. Femora: I, D110, P002; II, D111, P001; III, D1(1)1, P101, R001; IV, D101, P001, R001. Patellae III, D101; IV, D001. Tibiae: I, V021; II, V112; III, D110, P110, V112, R110; IV, D111, P101, V112, R101. Metatarsi spined with distal whorl 4–5. Sparse

calamistrum of 10 setae. Male palpal tibia with distal ventro-retrolateral apophysis and a small proximal dorso-retrolateral spur (Figs 33, 34).

Etymology

Specific epithet from Latin *austrinus*, southern, referring to southern Queensland.

Quemusia raveni, sp. nov.

(Fig 35–38)

Material examined

Holotype. ♀, O'Reillys Guest House, Lamington Natl Pk, SE Queensland, Australia (28°14′S, 153°08′E), 960 m, 23.viii.1981, GBM (QM S30236).

Paratypes. **Queensland:** ♀, same data as holotype (QM S30237); 2♀, same locality, 9–10.viii.1977, RJR (QM S30238); 2♀, Mt Hobwee, Lamington Natl Pk (28°12′S, 153°10′E), 1140 m, 8.iv.76, RJR, VED (QM S30239).

Diagnosis

The first part the of insemination duct to the gland is about half the length of that of *Q. austrina* and about a quarter of the length of the rest of the duct.

Description

Female

CL 1.6, CW 1.0, AL 2.1, AW 1.3 mm. Ratio of AME:ALE:PME:PLE is 5:8:8:8. Legs 1423 (I 3.7, II 3.1, III 2.9, IV 3.6 mm). Two retromarginal and 4 (5) promarginal cheliceral teeth (Fig. 35).

Notation of spines as follows. Femora: I, D011, P001; II, D011, P001; III, D101, P(1)01, R001; IV, D101, P001, R001. Patellae: III, 001. Tibiae: I, V021; II, P001, V011; III, D101, P101, V112, R101; IV, P101, V112, R101. Metatarsi spined with distal whorl 4–5. Calamistrum with 12 setae. Epigynum shown in Figs 36–38.

Females varied in length from 2.9 to 3.7 mm.

Note on male. A male from Mt Hobwee sketched at the time of collection, but not located, had a proximal dorso-retrolateral spur on the palpal tibia similar to that in *Q. austrina*, sp. nov.

Etymology

Specific epithet is a patronym in honour of Robert Raven.

Quemusia cordillera, sp. nov.

(Figs 39, 45)

Material examined

Holotype. ♂, Brindle Ck Rd, Border Ranges, NE New South Wales, Australia (28°22′S, 153°04′E) 965 m, pitfall trap, 4–18.ii.1993, M. Gray, G. Cassis (AM ks 35749).

Paratypes. **New South Wales:** 2♂, same data as holotype (AM ks 49070).

Diagnosis

The male has a bipartite colulus. The palpal tibia has a distal ventro-retrolateral apophysis only (cf. south-eastern Queensland species *Q. austrina* and *Q. raveni*, which have a retrolateral spur as well). The ratio of tibial length:width is 1:0.6 (cf. north Queensland species *Q. aquilonia*, 1:0.4).

Description

Male

CL 2.2, CW 1.4, AL 1.9, AW 1.1 mm. Eyes, labium, sternum, notation of spines are similar to *Q. aquilonia*. Legs 1423 (I, 7.0; II, 5.3; III, 4.7; IV, 6.4 mm).

Male palp is shown in Figs 39, 45. Tibia is less than twice as long as wide, 1:0.6. Tibial apophysis is an elongate unflanged ridge.

Males varied in length from 3.6 to 4.3 mm. The female is unknown.

Etymology

The specific epithet is from Spanish *cordillera*, chain of mountains, referring to the Border Ranges between Queensland and New South Wales.

Remarks

From the bipartite colulus of the male, it is assumed that the female has a cribellum.

Magua, gen. nov.

Type species: *Magua wiangaree*, sp. nov.

Diagnosis

Ecribellate spiders with 2 retromarginal and 4 promarginal cheliceral teeth. The labium is longer than wide. There are anterior grooves on the epigynum (cf. *Quemusia*) and lateral teeth (cf. *Austmusia*, Fig. 73); the insemination duct is short and enters the spermatheca at the medial constriction. The male palpal tibia has a distal ventro-retrolateral apophysis only. The conductor arises a little below mid-tegulum (cf. *Austmusia*) and has a pointed, sculptured tip. The tegular process is short and blunt.

Etymology

From the Aboriginal *magué*, eyebrow, referring to the anterior epigynal grooves.

Magua wiangaree, sp. nov.

(Figs 40–44, 46–50; Table 1)

Material examined

Holotype. ♀, Brindle Ck, Wiangaree State Forest, via Kyogle, NE New South Wales, Australia (28°22′S, 153°00′E), 777 m, 23.iii–2.viii.1975, pitfall traps, GBM, SRM (QM S30264).

Paratypes. **New South Wales:** ♂, same data as holotype (QM S30265); ♀, same locality as holotype, 16.xi–26.xii.1974 (QM S30266); 2♂, same locality as holotype, 26.xii.1974–23.iii.1975, GBM, SRM (QM S30267); ♂, same locality as holotype, 23.iii–2.viii.1975, GBM, SRM (QM S30268); 7♀, 6♂, Tweed Range Rd, Border Ranges Natl Pk (28°24′S, 153°01′E), 500 m, 4–18.ii.1993, pitfall traps, M. Gray, G. Cassis (AM ks 35744); ♂ (AM ks 49071).

Other material. ♂, Brindle Ck Rd, Border Ranges Natl Pk (28°22′S, 153°05′E), pitfall traps, 4–18.ii.1993, M. Gray, G. Cassis (AM ks 35747).

Description

Female

CL 3.0, CW 1.9, AL 2.5, AW 1.8 mm. Both rows of eyes straight. Ratio of AME:ALE: PME:PLE is 8:15:14:15. Labium longer than wide, 1:0.9. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P001; II, D110, P001; III, D100, P001, R001; IV, D100, R001. Tibiae: I, P001, V222; II, P101, V112; III, D110, P101, V112, R101; IV, D001, P101, V112, R101. Metatarsi: P012, V221, R002; II, P012, V221, R002; III, D010, P112, V221, R012; IV, D010, P112, V221, R112.

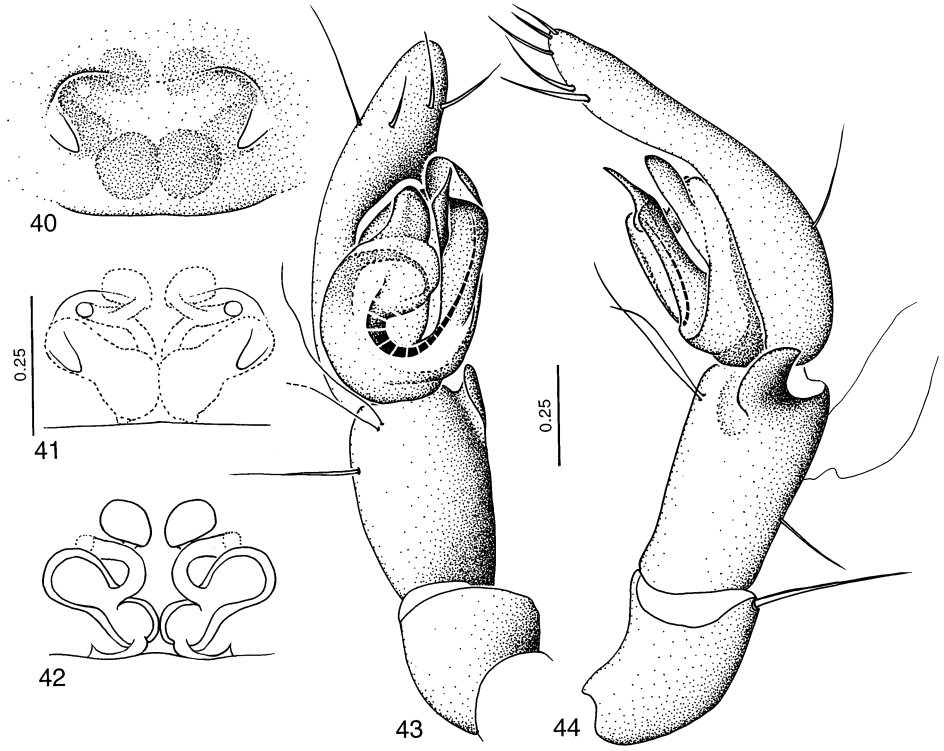
Epigynum shown in Figs 40–42, 46. Insemination duct with short loop to enter spermatheca at constriction. Spinnerets: ALS with two major ampullate spigots, anterior larger than posterior (Fig. 49); more than 30 piriform spigots. PMS with a large anterior spigot, a large posterior spigot and several small aciniform spigots. PLS with about 11 spigots, 3 larger than the rest.

Females varied in length from 5.5 to 6.1 mm.

Male

CL 2.9, CW 1.9, AL 2.5, AW 1.8 mm. Eyes similar to those of female. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P001; III, D110, P011, R011; IV, D110, P001. Tibiae: I, P001, V222, R001; II, P101, V122; III, D101, P011, V212, R011; IV, D001, P101, V212, R101. Metatarsi: I, P012, V221, R002; II, D010, P012, V221, R011; III D011, P112, V221, R112; IV, D010, P112, V221, R112. Male palp (Figs 43, 44). The tibia is



Figs 40–44. *Magua wiangaree*. *40–42*, epigynum, ventral, ventral (cleared), dorsal; *43*, *44*, male palp, ventral, retrolateral. Scales are in millimetres.

longer than wide, 1:0.5; there is a distal apophysis only. The pointed tip of the conductor has sculpturing (Figs 47, 48); the primary conductor is broad, the tegular process rounded and blunt. Spinnerets: ALS with a major ampullate spigot and nubbin (Fig. 50); less than 30 piriform spigots and some tartipores. PMS with 7 spigots. PLS with 8 spigots and 5 smaller spigots.

Males varied in length from 4.4 to 5.2 mm.

The conductor of the left palp of male (AM ks 35747) has a very long extended tip. However, that of the right palp is similar to *M. wiangaree* and thus it is placed as 'other material' rather than as a paratype.

Etymology

The specific epithet is from the locality, Wiangaree, New South Wales.

Keera, gen. nov.

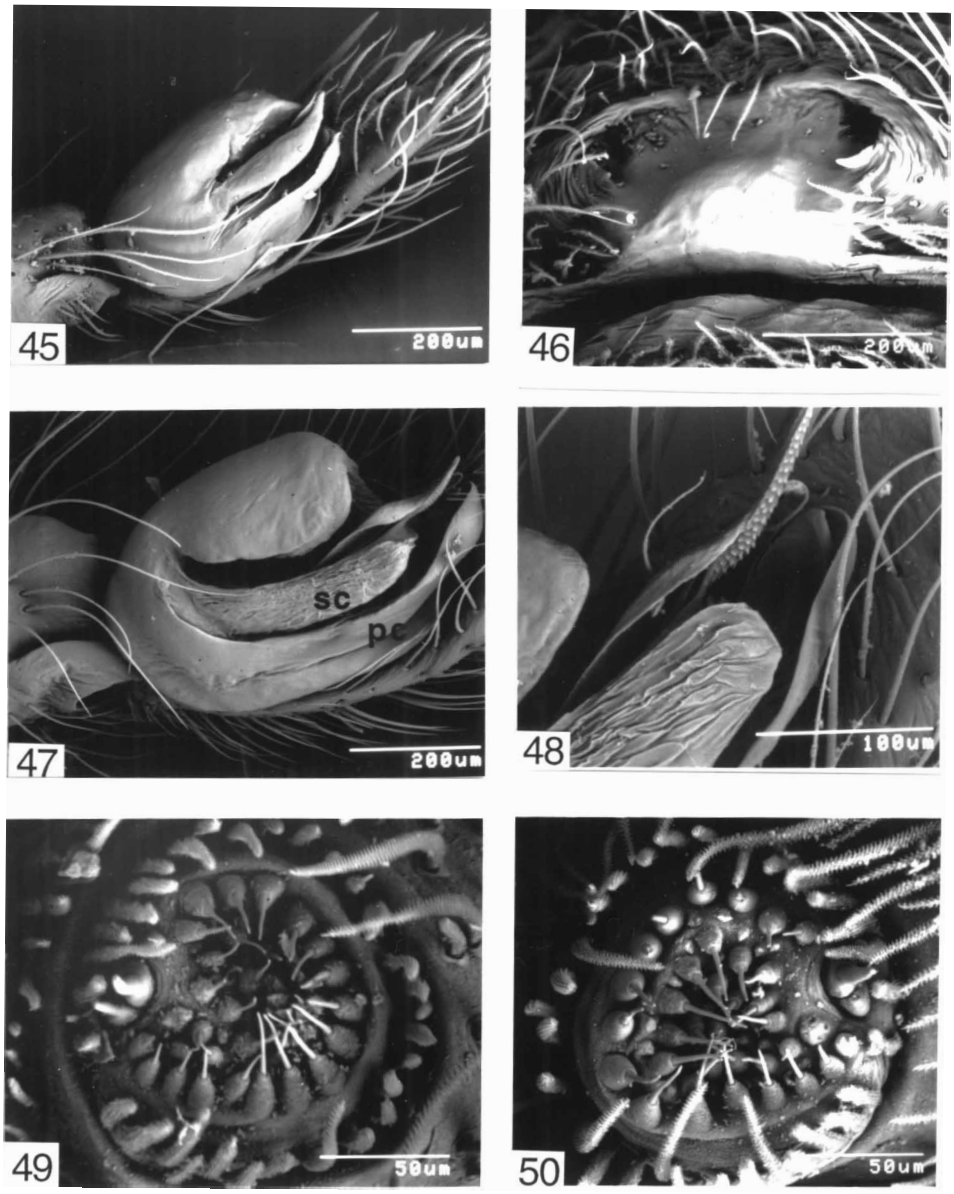
Type species: *Keera longipalpis*, sp. nov.

Diagnosis

Ecribellate spiders with 2 retromarginal and 3 promarginal cheliceral teeth. The labium is longer than wide. It lacks marked epigynal grooves (cf. *Magua*). The insemination ducts are short (cf. *Austmusia* Fig. 74). The male palpal tibia has a spur (cf. *Magua*). The conductor arises about mid-tegulum (cf. *Austmusia*). The cymbium has a very long post-alveolar section, twice as long as the alveolar portion; the tegular process is directed forwards.

Etymology

From the Aboriginal *keera*, high mountain, referring to the locality, Mt Keira, which has the same derivation.



Figs 45–50. Metaltellines. *45*, *Quemusia cordillera*, male palp, retrolateral. *46–50*, *Magua wiangaree*: *46*, female epigynum; *47*, *48*, male palp, retrolateral, tip of conductor with sculpturing. *49*, *50*, ALS, female (L), male (R). pc, primary conductor; sc, conductor.

Keera longipalpis, sp. nov.

(Figs 51–56; Table 1)

Material examined

Holotype. ♀, Mt Keira Fauna Reserve Scout Camp, New South Wales, Australia (34°25′S, 150°51′E), pitfall trap, 17.ii.1978, C. Horseman (AM ks 1464).

Paratypes. **New South Wales:** ♂, same locality as holotype, pitfall trap, 3.i.1979, C. Horseman (AM ks 2363); ♂, pitfall trap, 7.iii.1978, M. Gray, C. Horseman (AM ks 1459), 2♂, pitfall trap, 17.ii.1978, C. Horseman (AM ks 1462); ♂, pitfall trap, 28.iii.1979, C. Horseman (AM ks 2843).

Description

Female

CL 4.0, CW 2.6, AL 3.0, AW 2.2 mm (abdomen contracted). Ratio of AME:ALE:PME:PLE is 7:11:8:10. Two retromarginal and 3 promarginal cheliceral teeth. The labium is longer than wide, 1:0.9; sternum longer than wide, 1:0.9. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P011, R011; III, D111, P011, R011; IV, D111, P001, R001. Tibiae: I, V222; II, P101, V222; III, D010, P110, V212, R101; IV, P101, V212, R101. Metatarsi: I, P012, V221, R012; II, P012, V221, R012, III, D010, P112, V221, R112; IV, D010, P112, V221, R112.

Epigynum shown in Figs 51–53. The insemination duct is short; the spermatheca simple.

Male

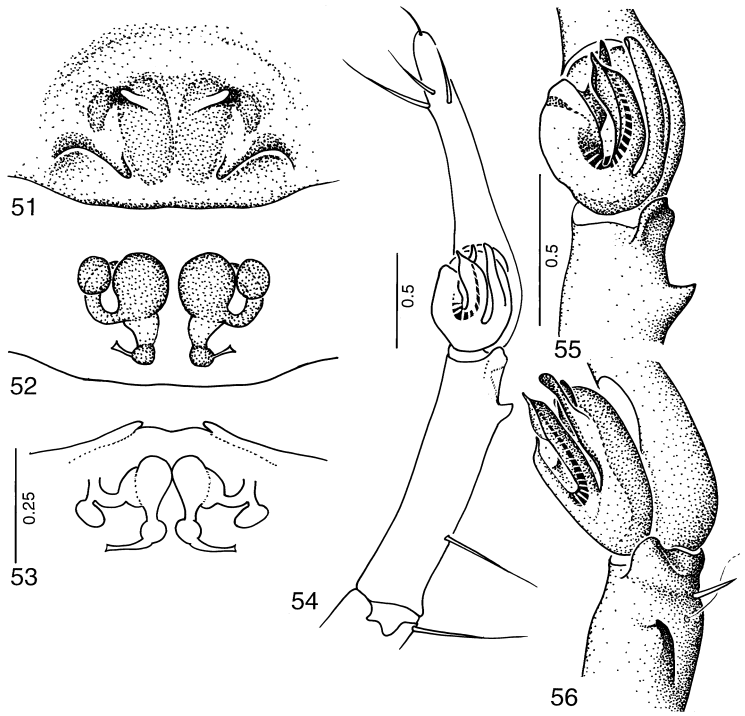
CL 4.0, CW 2.9, AL 3.6, AW 2.4 mm. Ratio of AME:ALE:PME:PLE is 8:11:9:10. The labium is longer than wide 1:0.8; the sternum longer than wide, 1:0.9. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II D110, P012, R010; III, D110, P012, R011; IV, D110, R001. Tibiae: I, V222; II P101, V222; III, D001, P101, V212, R101; IV, D001, P101, V212, R101. Metatarsi: I, P012, V222, R012, II, P012, V221, R012; III, P112, V221, R112; IV, P112, V221, R112. The male palp (Figs 54–56, 72) is very long (6.0 mm) much longer than the carapace (cf. *Magua*, a little longer than carapace). The tibia has a ventro-retrolateral apophysis and a retrolateral spur. The post-alveolar cymbium is twice as long as the alveolar portion.

Males varied in length from 6.0 to 7.6 mm.

Etymology

The specific name, *longipalpis*, is a combination of Latin *longus* and *palpus*, referring to the long male palp.



Figs 51–56. *Keera longipalpis*. *51–53*, female epigynum, ventral, dorsal, posterior. *54–56*, male palp, tibia and tarsus, ventral, retrolateral. Scales are in millimetres.

Remarks

The lateral epigynal teeth arise from extensions on the inside of cuticular laminae that are very like those of *Austmusia* (Fig. 73) (Gray 1983: fig. 14).

Jalkaraburra, gen. nov.

Type species: *Jalkaraburra alta*, sp. nov.

Diagnosis

Ecribellate spiders with marked anterior epigynal grooves. The first part of the insemination duct is short (cf. *Austmusia*) and the second part (post-glandular) is long (cf. *Magua* and *Keera*); the proximal and distal parts of the spermatheca are joined by a short duct. The male palpal tibia has an isolated spur retrolaterally. The conductor arises a little below mid-tegulum. There is no posterior tegular bulge (cf. *Austmusia*, Fig. 75).

Etymology

From the Aboriginal *jalkaraburr*, high reaches of mountains, in Kuku Yalangi language.

Jalkaraburra alta, sp. nov.

(Figs 57–71, Table 1)

Material examined

Holotype. ♀, Bellenden Ker Range, NE Queensland, Australia (17°16′S, 145°51′E), 1560 m, 25–31.x.1981, under stones, EWQM (QM S30240).

Paratypes. **Queensland:** ♀, juv., same data as holotype (QM S30243); ♀, Mt Bellenden Ker, Centre Peak Summit, 1500 m, 10–12.iv.1979, GBM (QM S30244); ♂, Bellenden Ker Range, 1054 m, 25–31.x.1981, EWQM (QM S30245); ♀, Massey Range, 4 km W of Centre Peak, Bellenden Ker (17°16′S, 145°49′E), 1250 m, 9–11.x.1991, GBM, HJ, DC (QM S30246); ♂, Massey Range, 12 km S of Gordonvale, 1300 m, 2.v.1983, moss on rocks, GBM, DC (QM S30247).

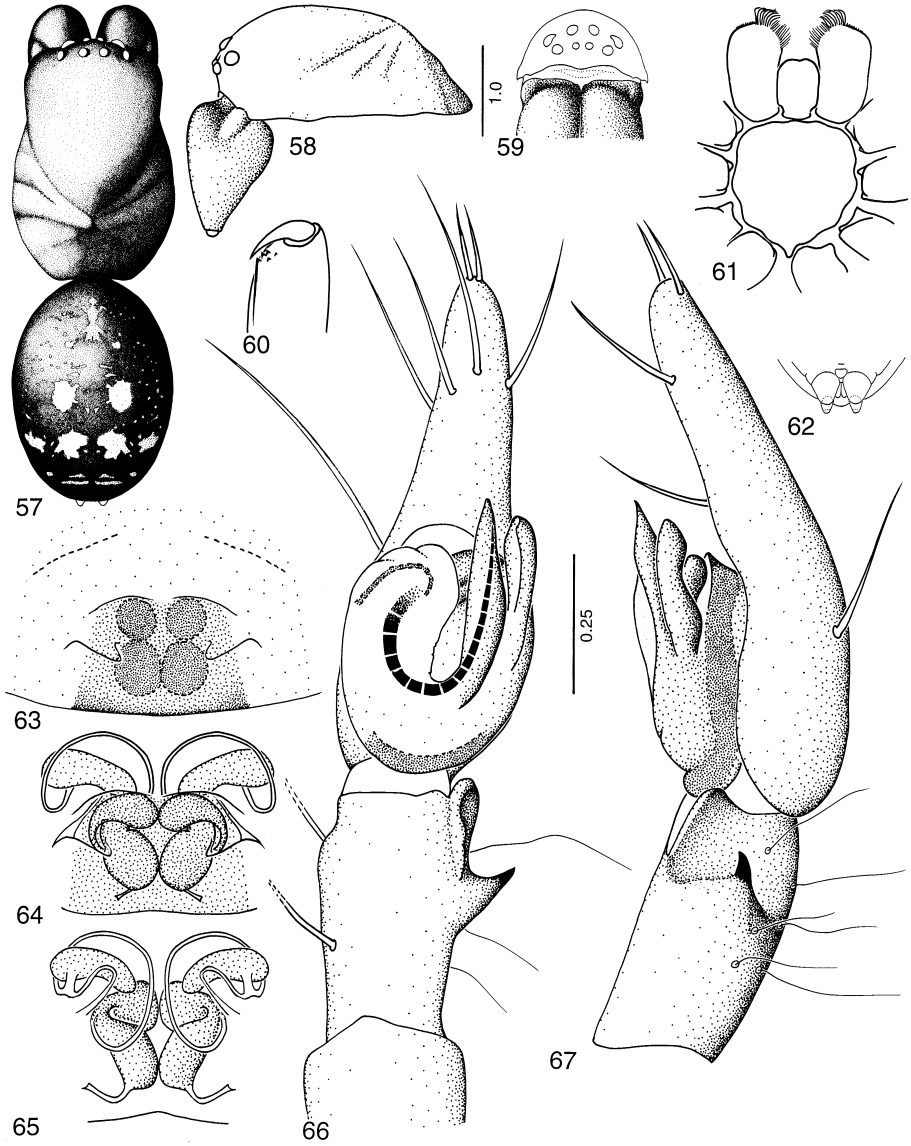
Description

Female

CL 3.4, CW 2.2, AL 3.3, AW 2.5 mm. Ratio of AME:ALE:PME:PLE is 10:17:15:17. The carapace is highest in the cephalic region (Fig. 58). From above, both rows of eyes straight to slightly recurved; from the front, both rows procurved (Fig. 59). Chelicerae with 2 retromarginal and 3 promarginal teeth (Fig. 60). Legs 1423 (Table 1). The labium is longer than wide, 1:0.8; the sternum is longer than wide, 1:0.9 (Fig. 61).

Notation of spines as follows. Femora: I, D110, P002; II, D111, P001; Tibiae: I, P101, V222, R101; II, P101, V122; III, D010, P110, V112, R210; IV, D00(1), V112, R101. Metatarsi: I, P011, V222, R002; II, P011, V221, R011; III, P011, V221, R011; IV, P012, V221, R012. The epigynum (Figs 63–65, 69) has eyebrow-like anterior grooves. The insemination duct to the glandular area continues in a wide loop to enter the base of the short connecting duct between the two parts of the spermatheca. The ALS has 2 major ampullate spigots, about 50 piriform spigots and some tartipores (Fig. 68). The PMS has 3 large spigots – anterior (cylindrical), lateral (?) and posterior (minor ampullate) – and 3 small (aciniform) spigots (Figs 70, 71). The PLS has one large distal spigot (cylindrical) and about 12 smaller ones. Rounded colulus (Fig. 62).

Lengths of females varied from 5.2 to 6.7 mm.



Figs 57–67. *Jalkaraburra alta*. *57*, body (dorsal); *58*, cephalothorax (lateral); *59*, eyes (frontal); *60*, chelicera; *61*, endites, labium, sternum; *62*, colulus and spinnerets; *63–65*, epigynum, ventral, ventral (cleared), dorsal; *66*, *67*, male palp, ventral, retrolateral. Scales are in millimetres.

Male

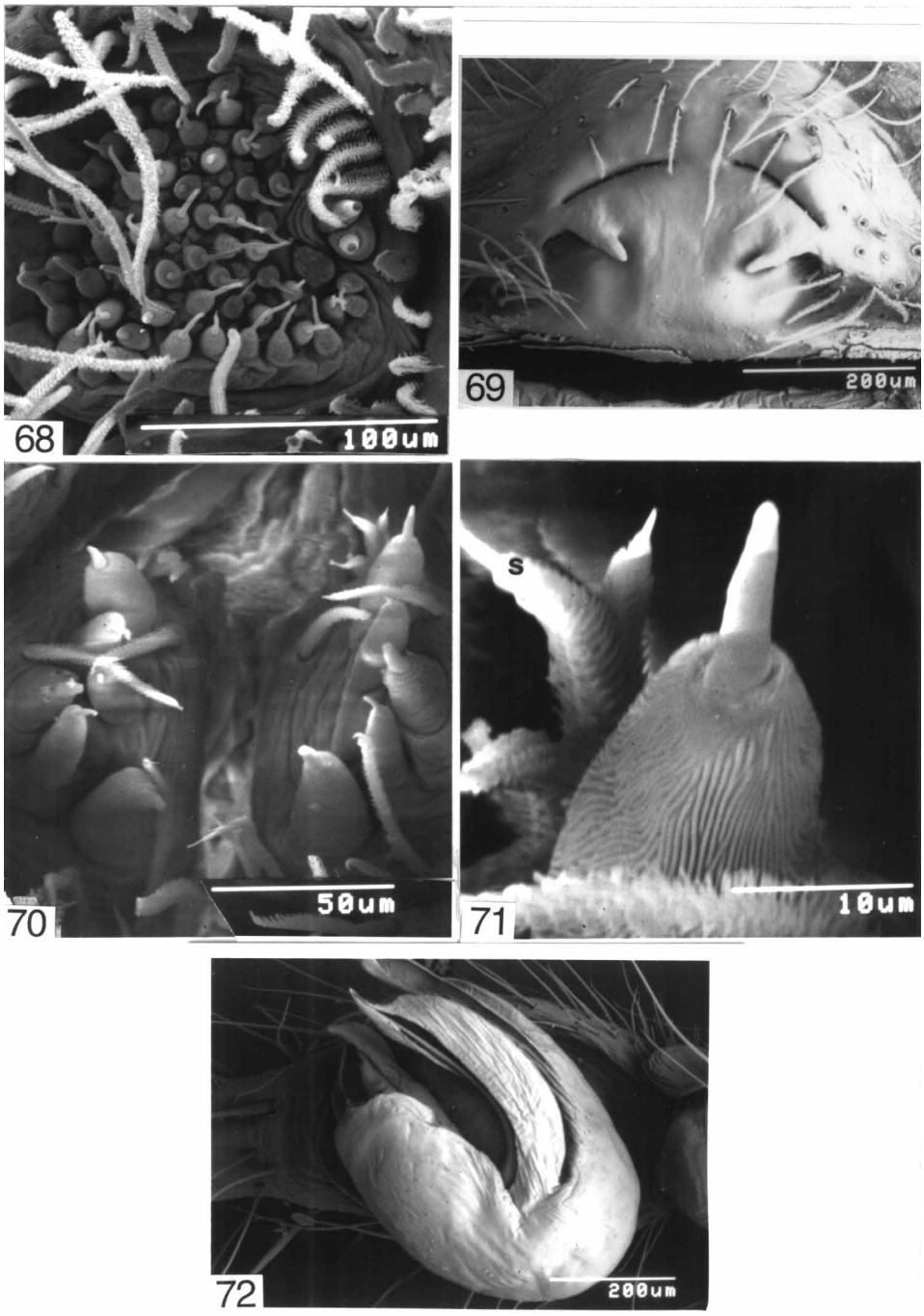
CL 2.4, CW 1.6, AL 2.3, AW 1.3 mm. Eyes similar to those of female.

Notation of spines as follows. Femora: I, D011, P002; II, D011, P001; III, D111, P101, R011; IV, D111, P001, R001. Patellae: II, III, IV, D001. Tibiae: I, V222; II, P011, V222; III, D001, P101, V212, R101; IV, P101, V212, R101. Metatarsi: I, P001, V221, R001; II, P012, V221, R012; III, V221, R112; IV, P112, V221, R112. Male palp shown in Figs 66, 67. The tibia is longer than wide, 1:0.5; it has a small isolated dorso-retrolateral spur.

Lengths of other males are 4.3 and 4.5 mm.

Etymology

The specific epithet is from Latin *altus*, high (altitude).



Figs 68–72. Metaltellines. *68–71*, *Jalkaburra alta*: *68*, ALS (R); *69*, epigynum; *70*, PMS; *71*, anterior cylindrical spigot. *72*, *Keera longipalpis*, male palp, ventral. s, seta.

Remarks

Jalkaraburra alta occurs in the same locality as the smaller litter cribellate, *Quemusia aquilonia*. *J. alta* appears to live in moss at the base of trees or on rocks.

Buyina, gen. nov.

Type species: *Buyina halifax*, sp. nov.

Diagnosis

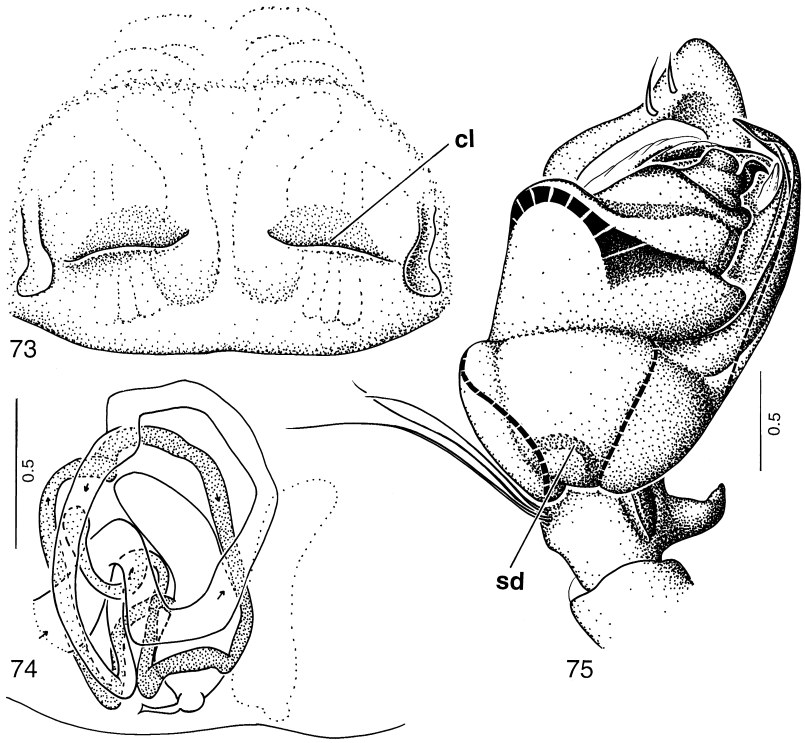
Ecribellate spiders with marked anterior epigynal grooves (cf. *Austmusia*). The first part of the insemination duct is long (cf. *Jalkaraburra*, *Keera* and *Magua*) and the second part is also long. The two parts of the spermatheca are separated by a long connecting duct. The male palpal tibia has a large retrolateral spur. The conductor arises on the posterior region of the tegulum (cf. *Jalkaraburra*, *Keera* and *Magua*). The male palpal bulb is without a posterior bulge or an accompanying loop in the sperm duct (cf. *Austmusia*).

Description

The carapace is highest in the cephalic region (Fig. 76). From above, both rows of eyes are straight; from the front, the rows are procurved. The chelicerae have 2 retromarginal and 3 promarginal teeth. The labium is longer than wide. The male palpal tibia may be almost as wide as long or twice as long as wide. It has a keel-like ventro-retrolateral apophysis and a retrolateral spur.

Etymology

From the Aboriginal *buyin*, eyebrow, in the Wargamay language of north Queensland. This refers to the eyebrow-like epigynal grooves.



Figs 73–75. *Austmusia wilsoni*. *73*, *74*, epigynum, ventral, dorsal (left half); *75*, male palp, ventral. cl, cuticular lamina; sd, sperm duct. Scales are in millimetres.

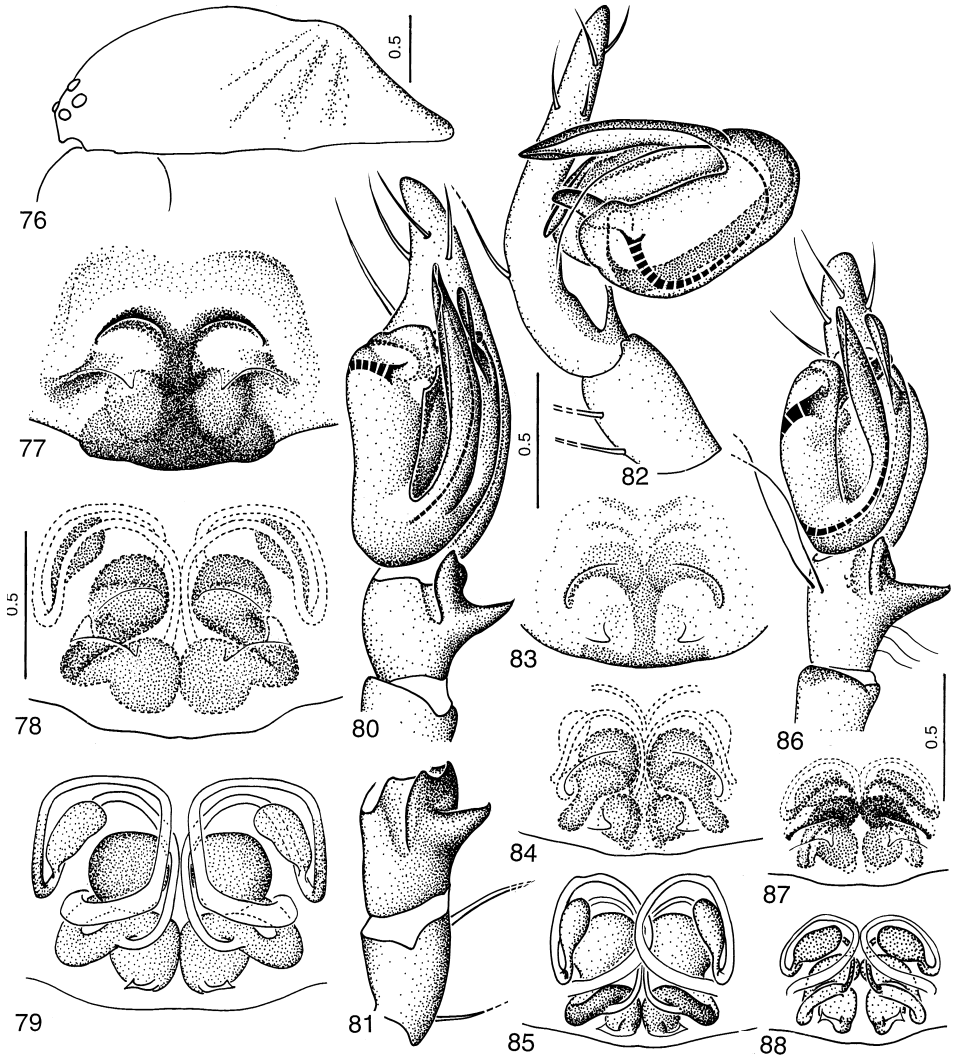
Buyina halifax, sp. nov.

(Figs 76–92; Table 1)

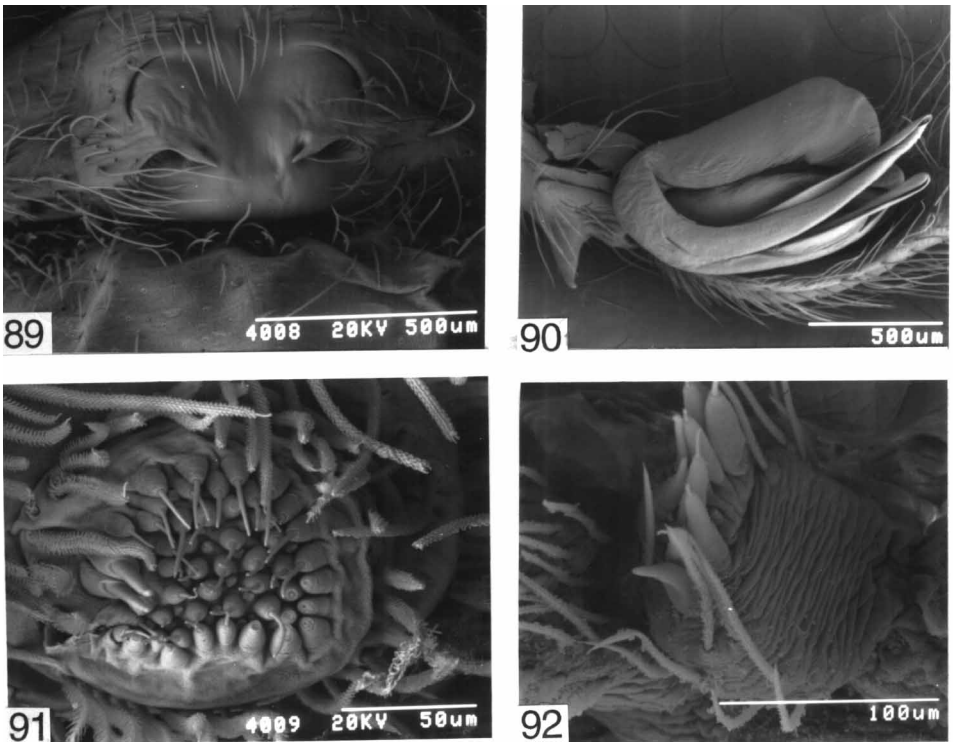
Material examined

Holotype. ♀, Mt Halifax, NE Queensland, Australia (19°07′S, 146°23′E), 1050 m, 4.xii.1990–8.i.1991, pitfall trap, A. Graham (QM S30249).

Paratypes. **Queensland:** ♂, Mt Halifax, SE Ridge, 950 m, 19–21.iii.1991, GBM, DC (QM S30250); ♂, ♀, 8 juvs (QM S30251); 3♂, ♀, juvs (QM S17949); 3♂, juv., same locality as holotype, 1050 m, 19–21.iii.1991, GBM, DC (QM S17959); ♂, same locality as holotype, 1050 m, 1–20.iii.1991, A.Graham (QM S30252); ♂, ♀, Bluewater Range, NE Queensland (19°10′S, 146°23′E), 600 m, 7.xii.1986, GBM, GT (QM S30253); 2♂, 2♀, Hinchinbrook I., NE Queensland (18°22′S, 146°15′E), Upper Gayundah Ck, 850 m, 9–11.xi.1984, pitfall traps, GBM, DC (QM S30254); ♀, same locality,



Figs 76–88. *Buyina halifax*. *76–82*, Mt Halifax: *76*, cephalothorax (lateral); *77–79*, epigynum, ventral, ventral (cleared), dorsal; *80*, *81*, male palp, ventro-retrolateral, tibial apophysis and spur (retrolateral); *82*, male palp (partly expanded). *83–85*, Blue Water Range: epigynum, ventral, ventral (cleared), dorsal. *86–88*, Kirrama Range: *86*, male palp, ventro-retrolateral; *87*, *88*, epigynum, ventral, dorsal. Scales are in millimetres.



Figs 89–92. *Buyina halifax*. *89*, epigynum; *90*, male palp; *91*, female ALS (L); 92, PMS (R).

flight-intercept trap (QM S30255); ♀, 3 juvs, sieved litter (QM S30256); ♀, Cardwell Range, NE Queensland, Upper Broadwater Ck Valley, 17–21.xii.1986, 700–800 m, GBM, GT, S. Hamlet (QM S30257)

Other material. ♀, Kirrama Range, Douglas Ck Rd, NE Queensland (18°13′S, 144°48′E), 850 m, 10–12.xii.1986, pyrethrum knockdown, GBM, GT, S. Hamlet (QM S30258); 3♂, 800 m, flight-intercept traps (QM S30259); 4♂, Kirrama Range, main road W side (18°13′S, 145°47′E), 700 m, 10.xii.1986–11.i.1987, pitfall traps, GBM, GT, S. Hamlet (QM S30260).

Diagnosis

The glandular area of the epigynum is smaller than the anterior part of the spermatheca. The male palpal tibia is about as wide as long and has a large retrolateral spur.

Description

Female

CL 3.5, CW 2.5, AL 3.1, AW 2.3 mm. Both rows of eyes straight. AME:ALE:PME:PLE is 10:17:15:17. The labium is longer than wide, 1:0.8, sternum longer than wide, 1:0.9. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P001; III, D111, P011, R011; IV, D111, R001. Tibiae: I, P011, V222, R101; II, P101, V222, R101; III, D110, P110, V212, R101; IV, P101, V112, R011. Metatarsi: I–IV spined.

The epigynum (Figs 77–79, 83–85, 87–89) has curved eyebrow-like anterior grooves and below these a pair of thin cuticular laminae with lateral teeth on inner edge. The insemination ducts are very long; the glandular area is smaller than the anterior (proximal) part of the

spermatheca. The ALS has two major ampullate gland spigots, anterior one larger than posterior; about 50 piriform spigots (Fig. 91). PMS with 3 large spigots – anterior (cylindrical), lateral (? cylindrical) and posterior (minor ampullate) – and 5 smaller spigots (Fig. 92). PLS with a large distal spigot (cylindrical) and about 16 smaller ones.

Other females varied in length from 6.7 to 8.5 mm.

Male

CL 4.3, CW 3.1, AL 4.0, AW 2.6 mm. The coloration, pattern and eyes are similar to those in the female. The labium is longer than wide, 1:0.8. The sternum is longer than wide, 1:0.9. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P(1)01, R010; III, D111, P011, R011; IV, D111, R001. Patellae: III, D100. Tibiae: I, P101, V222, R(1)01; II, P101, V222, R101; III, D010, P101, V212, R101; IV, P100, V212, R101. Metatarsi: all well spined. Male palp shown in Figs 80–82, 86, 90. The primary conductor is very slender; the tegular process digitiform.

Sizes of males varied greatly, from 4.7 to 8.4 mm.

Etymology

The specific epithet is from Mt Halifax, the type locality.

Buyina yeatesi, sp. nov.

(Figs 93–97)

Material examined

Holotype. ♀, North Bell Peak, NE Queensland, Australia, Malbon Thompson Range (17°05′S, 145°52′E), 10 km E Gordonvale, 850–1000 m, 13.x.1982, GBM, DY, GT (QM S30261).

Paratypes. **Queensland:** ♀, same data as holotype (QM S30262); ♂, North Bell Peak, 1000 m, 20.xi.1990, GBM, GT (QM S30263); 2♂, North Bell Peak, 20 km S Cairns, 900–1000 m, 15–16.ix.1981, GBM, DC (QM S30269).

Diagnosis

Buyina yeatesi differs from *B. halifax* in having the glandular area in the epigynum larger than the anterior part of the spermatheca and the male palpal tibia twice as long as wide.

Description

Female

CL 4.0, CW 3.0, AL 4.3, AW 3.1 mm. The eyes, cheliceral teeth, ratio of measurements, leg lengths and spination similar to *B. halifax*. Epigynum (Figs 93–95) has large glandular structures. The proximal part of the spermatheca is piriform rather than spherical.

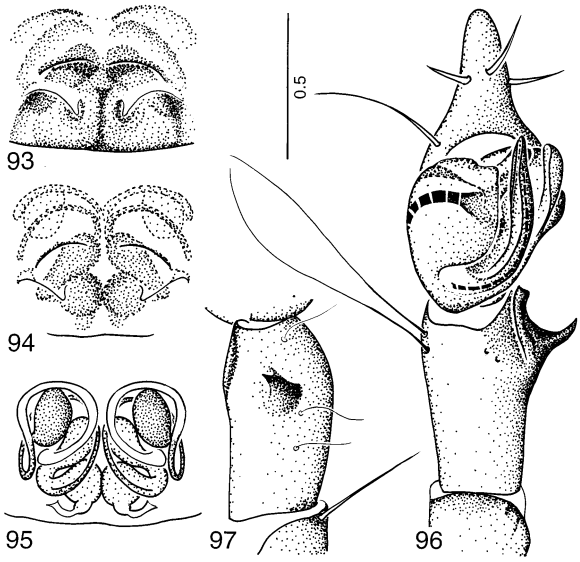
Length of paratype female is 7.7 mm.

Male

CL 3.3, CW 2.3 mm, abdomen damaged. The male palp (Fig. 96) has a broad primary conductor. The male palpal tibia is longer than wide, 1:0.5; it has a large dorso-retrolateral spur (Fig. 97).

Etymology

The specific epithet is a patronym in honour of David Yeates, one of the collectors of the holotype.



Figs 93–97. *Buyina yeatesi*. *93–95*, epigynum, ventral, ventral (cleared), dorsal; *96*, *97*, male palp, ventral, tibial spur. Scale is in millimetres.

Cunnawarra, gen. nov.

Type species: *Cunnawarra grayi*, sp. nov.

Diagnosis

Ecribellate spiders. Externally the epigynum is without anterior or lateral grooves. It has large ventral gonopores and lateral teeth (cf. *Austmusia*). Internally the first part of the insemination duct is long, flat and lightly sclerotised; the second part is long (cf. *Magua* and *Keera*), narrower and more sclerotised. It opens at the narrowing between the parts of the spermatheca the proximal part of which is lateral (not anterior as in previous genera) of the distal part. The glands are elongate. A sclerotised ridge on the ventral posterior tegulum cradles the base of the conductor. The male palpal tibia lacks a retrolateral spur (cf. *Jalkaraburra*, *Buyina* and *Austmusia*).

Description

Viewed from the top, the anterior row of eyes is straight, the posterior row procurved; from the front, both rows are procurved. The labium is almost as wide as long.

Etymology

From the nearby locality, Cunnawarra Creek.

Cunnawarra grayi, sp. nov.

(Figs 98–100, 106; Table 1)

Material examined

Holotype. ♀, Styx River State Forest, 800 m N of Cunnawarra Ck, NE New South Wales, Australia (30°33′S, 152°19′E), 950 m, pitfall trap, 4–18.ii.1993, M. Gray, G. Cassis (AM ks 35300).

Paratypes. **New South Wales:** ♂, same data as holotype (AM ks 49072); 28♂, same data as holotype (AM ks 49073).

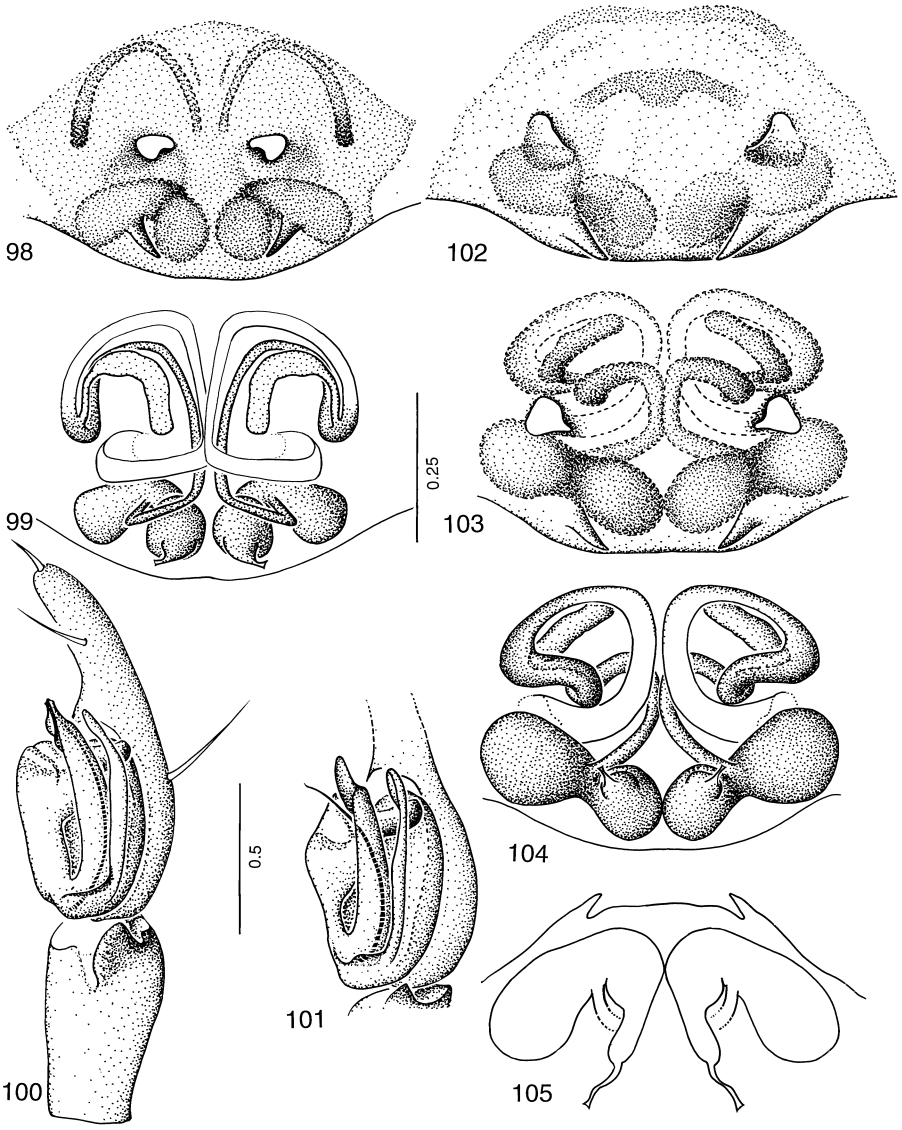
Diagnosis

The gonopores lie closer together than the lateral teeth on the epigynum. The tip of the conductor is broadly flanged.

Description

Female

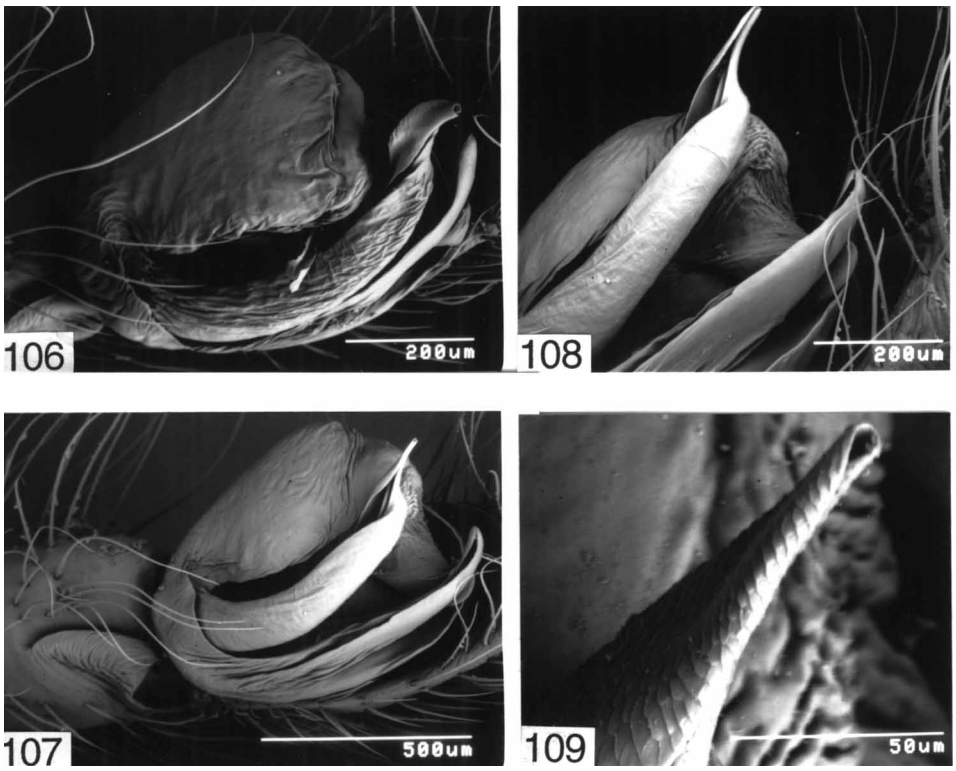
CL 2.8, CW 1.9, AL 3.1, AW 2.0 mm. Ratio of AME:ALE:PME:PLE is 8:14:12:15. Legs 1=423 (Table 1). Two retromarginal and 3 promarginal cheliceral teeth. The sternum is longer than wide, 1:0.9.



Figs 98–105. *Cunnawarra* spp. *98–100*, *C. grayi*: *98*, *99*, epigynum, ventral, dorsal; *100*, male palp, retrolateral. *101–105*, *C. cassisi*: *101*, male palp, retrolateral; *102–105*, epigynum, ventral, ventral (cleared), dorsal, posterior. Scales are in millimetres.

Notation of spines (Legs II missing). Femora: I, D110, P002; III, D111, P001, R001; IV Diii, R001. Patellae: III, D101; IV, D001. Tibiae: I, P001, V222, R001; III D101, P110, V112, R011; IV, D001, P101, V111, R101. Metatarsi: I, P012, V221, R002; III, P112, V221, R111; IV, P112, V110, R112. There are about 10 setae on colulus. The epigynum (Figs 98–99) is without anterior or lateral grooves; it has large ventral gonopores and lateral teeth. The insemination ducts are long and the glands elongate.

This was the only female collected with 29 males, which is not unusual in pitfall collections.



Figs 106–109. *Cunnawarra* spp. *106*, *C. grayi*, male palp, retrolateral. *107–109*, *C. cassisi*, male palp: *107*, retrolateral; *108*, tip conductor (with embolus) primary conductor and tegular process; *109*, tip of conductor with sculpturing.

Male

CL, 2.9; CW, 2.1; AL, 2.4; AL, 1.7 mm. Eyes, chelicerae, labial and sternal proportions similar to those of female. Legs 1423 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P011, R010; III, D111, P011, R011; IV, D111, P001, R001. Patellae: III, D001. Tibiae: I, P001, V222; II, P011, V222; III, D101, P101; V212, R101; IV, D101, P101, V212, R101. Metatarsi: I, P001, V212, R011; II, D010, P111, V221, R012; III, D010, P012, V221, R111; IV, D010, P111, V221, R112. Male palp shown in Figs 100, 106. The conductor has a broad flange distally. Ratio of cymbial length : post-alveolar length is 1:0.4.

Males varied in length from 4.9 to 5.5 mm.

Etymology

The specific epithet is a patronym in honour of Michael Gray, one of the collectors of the holotype.

Cunnawarra cassisi, sp. nov.

(Figs 101–105, 107–109)

Material examined

Holotype. ♀, Marengo State Forest, 0.5 km NE on Foamy Ck Rd, New South Wales, Australia (30°07′S, 152°24′E), 1200 m, pitfall trap, 4–18.ii.1993, M. Gray, G. Cassis (AM ks 35250).

Paratypes. **New South Wales:** ♂, same data as holotype (AM ks 49074); 16♂, same data as holotype (AM ks 49075); ♂, Point Lookout (Upper), New England Natl Pk (30°31′S, 152°25′E), 1400 m, pitfall trap, 11.xi.1980–16.iii.1981, GBM (QM S30270); ♂, The Glade, Dorrigo (30°20′S, 152°43′E), 800 m, pitfall trap, 12.xi.1980–16.iii.1981, GBM (QM S30271).

Other material. ♂, Ewingar State Forest, Elkhorn Rd, NE New South Wales (29°06′S, 152°26′E), 670 m, pitfall trap, 4–18.ii.1993, M. Gray, G. Cassis (AM ks 43210).

Diagnosis

The gonopores are nearer the lateral edge of the epigynum than in *C. grayi* and there is an extra loop in the insemination duct. The conductor is not flanged distally as in *C. grayi*.

Description

Female

CL 3.5, CW 2.3, AL 2.8, AW 2.3 mm. The eyes and cheliceral teeth as in *C. grayi*. Legs 1=423 (I, 9.4; II, 7.8; III, 6.9; IV, 9.4). The labium is as wide as long. The sternum is longer than wide, 1:0.8.

Notation of spines as follows. Femora: I, D110, P002; II, D111, P001; III, D111, P011, R011; IV, D111, P001, R001. Patellae: III, 001. Tibiae: I, P101, V222, R001; II, P101, V222, R001; III, D110, P110, V212, R110; IV, D101, P101, V212, R011. Metatarsi: I, P012, V221, R002, II, D010, P112, V221, R012; III, P112, V221, R112; IV, P112, V221, R112. Epigynum shown in Figs 102–105. The gonopores are well separated, wider apart than the lateral teeth. The insemination duct has an extra loop after the entry of the duct from the gland.

This was the only female collected.

Male

CL 3.9, CW 2.5, AL 3.2, AW 2.3 mm. The ratio of eyes is similar to *C. grayi*. A very small fourth tooth may be present on the cheliceral promargin. Legs 1423 (I, 13.7; II, 11.3; III, 9.9; IV, 12.8 mm). The labium is as wide as long, sternum longer than wide, 1:0.9.

Notation of spines as follows. Femora: I, D110, P002; II, D111, P002; III, D111, P010, R011; IV, D111, R001. Patellae: III, D101; IV, D101. Tibiae: I, P001, V222; II, P101, V222; III, D101, P101, V212, R101; IV, D001, P101, V212, R101. Metatarsi: I, P012, V221, R001; II, P112, V221, R012; III, D010, P112, V221, R112; IV, D010, P112, V221, R112. Male palp shown in Figs 101, 107–109. The conductor is without a broad flange. The ratio of cymbial length : post-alveolar length is 1:0.5. The tip of the conductor has a scale-like pattern (Fig. 109). The males varied in length from 5.0 to 7.3 mm.

Remarks

The scale-like pattern on the tip of the conductor differs from that of *Magua wiangaree* (Fig. 48).

Etymology

The specific epithet is a patronym in honour of G. Cassis, one of the collectors of the holotype.

Penaoola, gen. nov.

Type species: *Penaoola algida*, sp. nov.

Diagnosis

Ecribellate spiders. The AME are the same size as or slightly larger than the PME. The labium is longer than wide. The fourth leg is longer than the first. The gonopores open at the end of a shallow lateral furrow; lateral teeth are present (cf. *Austmusia*); the proximal part of the

spermatheca is anterior to the distal part (cf. *Cunnawarra*). The male palpal tibia is about as long as wide and has a sharp retrolateral spur (cf. *Cunnawarra*). The conductor arises on the postero-ventral tegulum; the tegular process is curved forwards.

Etymology

From the Aboriginal *penaoorla*, swamp. The locality, Penola, has the same derivation.

Penaoola algida, sp. nov.

(Figs 110–112; Table 1)

Material examined

Holotype. ♀, Penola Forest, South Australia, Australia (37°27′S, 140°50′E), pitfall trap, 13.iv.1995, T. Herbert (SAM N1996458).

Description

Female

CL 3.6, CW 2.4, AL 3.5, AW 2.2 mm. Ratio of AME:ALE:PME:PLE is 7:10:7:9. Two retromarginal and 3 promarginal cheliceral teeth. The labium is longer than wide, 1:0.8. Sternum longer than wide, 1:0.9. Legs 4123 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P001; III, D111, P101, R001; IV, D110, R001. Tibia: I, P101, V222; II, P101, V122; III, D110, P101, V212, R101; IV, P001, V112, R101. Metatarsus: I, P012, V221, R002; II, P012, V221, R012; III, D010, P112, V221, R112; IV, P112, V211, R112. More than 20 setae on colulus. Epigynum shown in Figs 110–112. Short grooves lead to the gonopores. The glands are elongate. The proximal part of the spermatheca is anterior to the distal portion.

The male is unknown.

Etymology

The specific epithet is from Latin *algidus*, cold, referring to the cold climate in this southern area of South Australia.

Penaoola madida, sp. nov.

(Figs 113, 114; Table 1)

Material examined

Holotype. ♂, Mt Crawford Forest Reserve, South Australia (34°42′S, 138°58′E), pitfall trap, 22.v–9.ix.1988, R. Tuckwell (SAM N1991273).

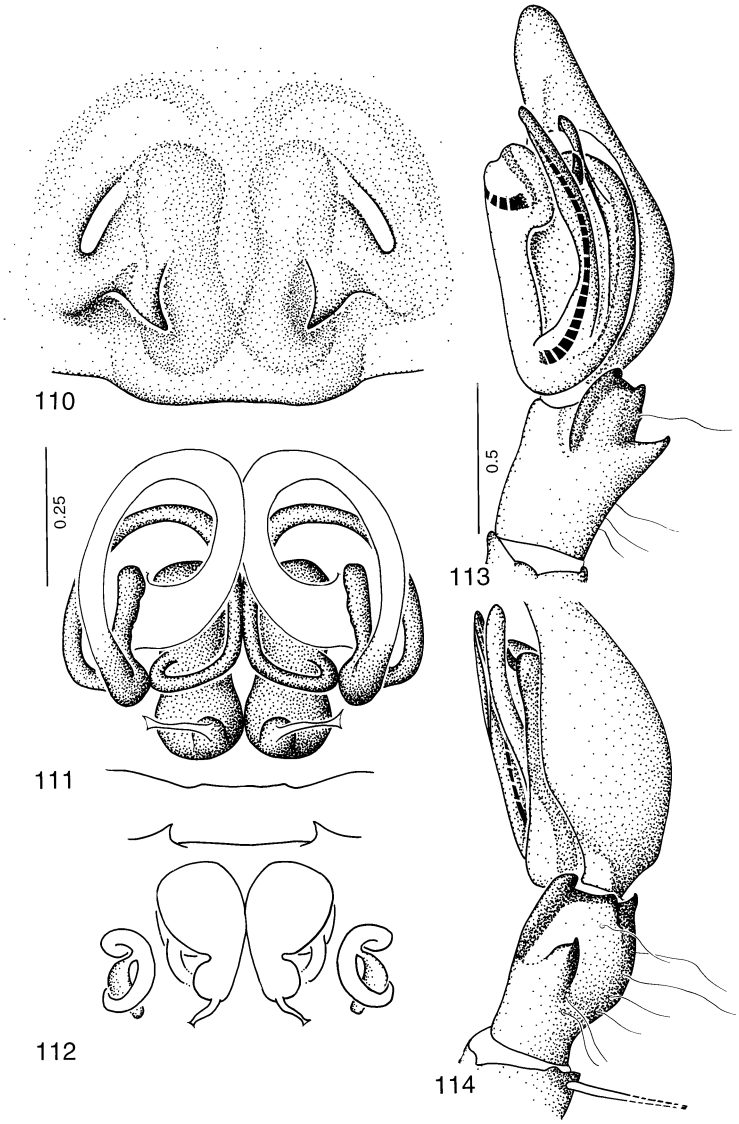
Description

Male

CL 3.6, CW 2.3, AL 3.1, AW 1.9 mm. Ratio of AME:ALE:PME:PLE is 8:10:7:9; AME > PME. There are 2 retromarginal and 3 promarginal cheliceral teeth. The labium is longer than wide, 1:0.8; the sternum is longer than wide, 1:0.8. Legs 4123 (Table 1).

Notation of spines as follows. Femora: I, D110, P002; II, D110, P001, III, D111, P101, R101; IV, D111, R001. Tibiae: I, P101, V222, R001; II P101, V122, R101; III, D101, P101, V222, R101; IV D001, P101, V212, R101. Metatarsi: I, P012, V222, R012; II, P112, V222, R012; III, D010, P112, V221, R112; IV, D101, P112, V221, R112. The male palp (Figs 113–114) has a long conductor arising on the postero-ventral tegulum; the tegular process has a curved tip. The palpal tibia has a sharp dorso-retrolateral spur.

The female is unknown.



Figs 110–114. *Penaoola* spp. *110–112*, female *P. algida*, epigynum, ventral, dorsal, posterior; *113*, *114*, male *P. madida*, male palp, ventro-retrolateral, retrolateral. Scales are in millimetres.

Etymology

The specific epithet is from Latin *madidus*, drenched, referring to the very high rainfall in the area.

Remarks

The species is thought to be congeneric with *P. algida* and may be found to be conspecific.

Relationships of the Metaltellinae

It appears that all of the genera are derived from a palaeoaustral fauna that occupied the southern parts of Gondwanaland (Gray 1983). The cladistic analyses examined relationships among the species *Metaltella simoni*, *Calacadia chilensis* (neither examined) from South

America and 16 species of the 8 Australian genera. The following three species were examined and also included: *Amphinecta milina* Forster & Wilton and *Maniho ngaitahu* Forster & Wilton (New Zealand members of the family Amphinectidae, which has been suggested as a sister-group of the metaltellines), and *Amphinecta milvina* (Simon), a Tasmanian spider that was transferred from *Rubrius* to *Amphinecta* by Lehtinen (1967). Davies (in press) is proposing a new name for this genus. Outgroup comparison was with *Amaurobius fenestralis* (Stroem), an amaurobiid. The 27 characters used in the analysis are presented in Table 2. A data matrix (Table 3) was then assembled for these taxa from the 27 characters.

Table 2. Characters and character states

No.	Character, with states in parentheses
1	AME: as large or larger than ALE (0); smaller than ALE (1)
2	Retromarginal cheliceral teeth: >2 (0); 2 (1)
3	Labium: wider than long (0); as long or longer than wide (1)
4	Male palpal patellal boss: absent (0); present (1)
5	Male palpal tibia: much longer than basal width (0); as long as basal width (1)
6	Keel-like ventro-retrolateral tibial apophysis: absent (0); present (1)
7	Retrolateral tibial spur: absent (0); present (1)
8	Dorsal tibial apophysis: absent (0); present (1)
9	Origin of conductor: mid-tegulum (0); posterior tegulum (1); anterior (2)
10	Sclerotised tegular heel at base of conductor: absent (0); present (1)
11	Conductor: sclerotised (0); membranous (1)
12	Apex of primary conductor: level with or above tegular process (0); below tegular process (1)
13	Direction of embolus (left palp): clockwise (0); anticlockwise (1)
14	Posterior prolateral tegular bulge: absent (0); present (1)
15	Post-alveolus: half or less than half cymbial length (0); much more than half cymbial length (1)
16	Preening combs: absent (0); present (1)
17	Female anterior epigynal grooves: absent (0); present (1)
18	Lateral epigynal grooves: absent (0); present (1)
19	Lateral epigynal teeth: present (0); absent (1)
20	Thin cuticular laminae on epigynum: absent (0); present (1)
21	Large chitinous invaginations on epigynum: absent (0); present (1)
22	Spermatheca: simple (0); with connecting duct between parts (1)
23	Direction of spermatheca: longitudinal (0); transverse (1)
24	First part of insemination duct (to gland): short (0); long (1)
25	Second part of insemination duct (from gland to spermatheca): short (0); long (1)
26	Shape of gland: spherical (0); elongate (1)
27	Cribellum: present (0); absent (1)

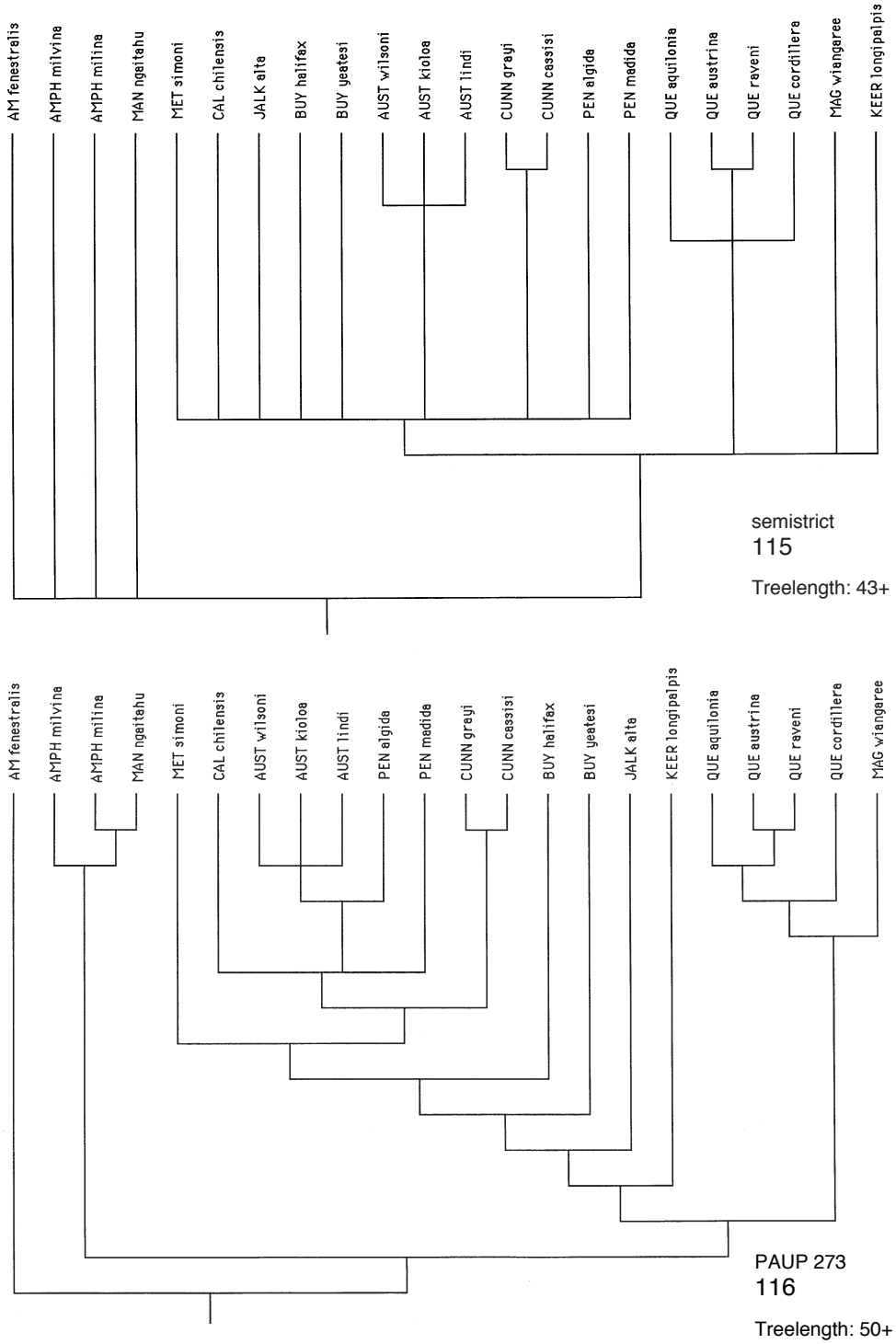
Data analysis

The data matrix (Table 3) was used in PAUP Version 3.1.1 (Swofford 1993). A heuristic search of the data with 10 random-addition sequences and TBR (tree bisection reconnection) branch-swapping generated more than 7000 most parsimonious trees: length = 50, CI (consistency index: Kluge and Farris 1969) = 0.56, CI excluding uninformative characters = 0.511, RI (retention index; Farris 1989) = 0.758, RC (rescaled consistency index: Farris 1989) = 0.425. Semistrict (Bremer 1990) consensus of the most parsimonious trees is shown in Fig. 115. A most parsimonious tree (Fig. 116) was chosen. The cladograms were prepared with MacClade version 3.03 (Maddison and Maddison 1992).

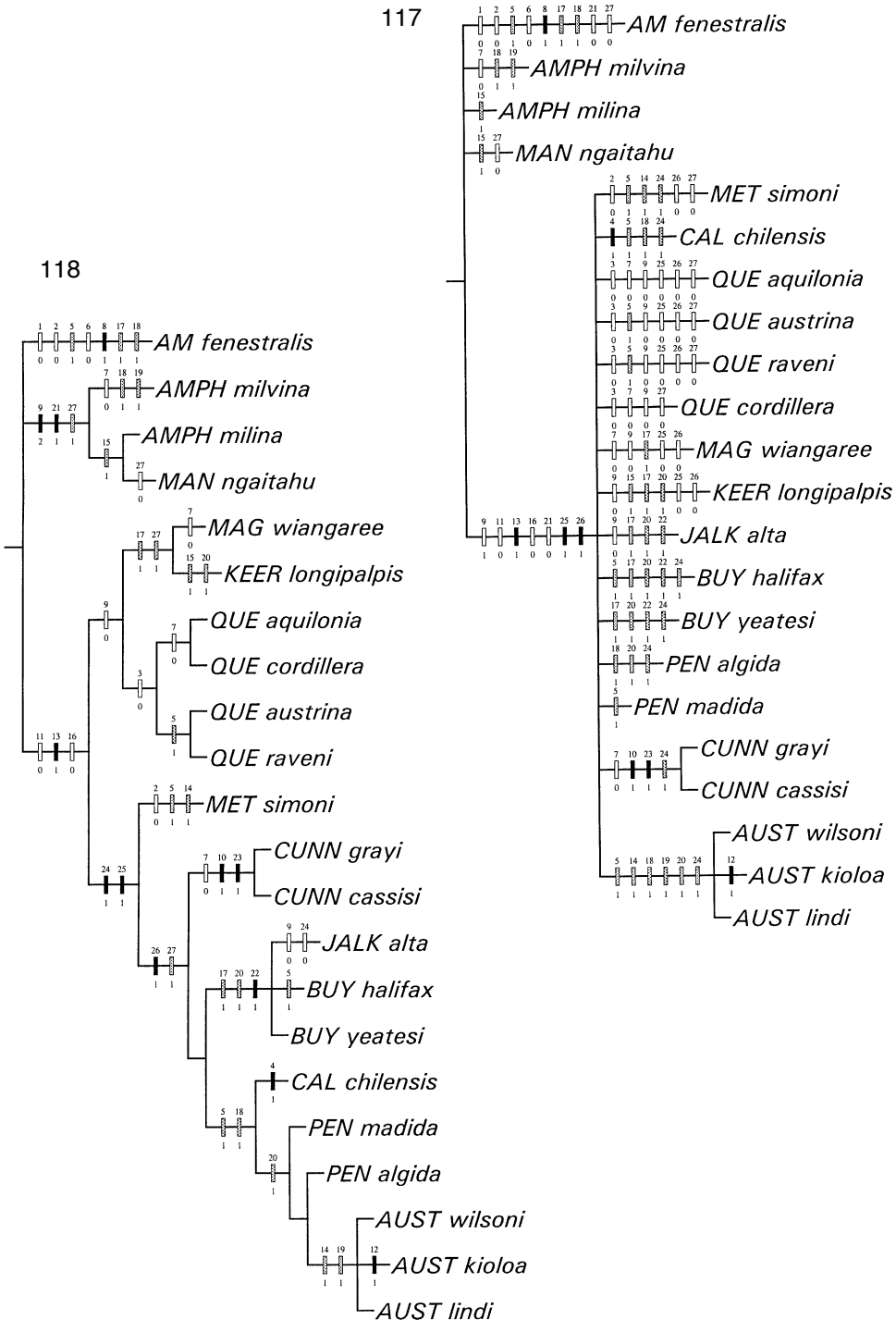
The analysis was repeated with Hennig86 Version 1.5 (Farris 1988). In this case the command mh*, which applies branch-swapping to several trees (each found after different passes through the data) and retains the shortest tree(s), was used. The trees retained were then passed to the extended branch-swapper, bb*. Strict (Nelsen) consensus of 2718+ most parsimonious trees is shown in Fig. 117. A most parsimonious tree showing characters and character states was chosen (Fig. 118). The cladograms were prepared with CLADOS Version 1.2 (Nixon 1992) with DELTRAN optimisation.

Table 3. Data matrix: character states of metaltelline species

No.	Species	Character No.																										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	*Amaurobius fenestralis*	0	0	1	0	1	0	1	1	–	–	1	–	0	0	0	1	1	1	0	0	0	0	0	0	–	–	0
2	*Amphinecta milvina*	1	1	1	0	0	1	0	0	2	0	1	–	0	0	0	1	0	1	1	0	1	0	0	0	0	0	1
3	*Amphinecta milina*	1	1	1	0	0	1	1	0	2	0	1	–	0	0	1	1	0	0	0	0	1	0	0	–	–	–	1
4	*Maniho ngaitahu*	1	1	1	0	0	1	1	0	2	0	1	–	0	0	1	1	0	0	0	0	1	0	0	–	–	–	0
5	*Metaltella simoni*	1	0	1	0	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0
6	*Calacadia chilensis*	1	1	1	1	1	1	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	1	1
7	*Quemusia aquilonia*	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	*Quemusia austrina*	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	*Quemusia raveni*	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	*Quemusia cordillera*	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	?	?	?	?	?	?	?	?	?	?	0
11	*Magua wiangaree*	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	–	0	0	0	1
12	*Keera longipalpis*	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	1
13	*Jalkaraburra alta*	1	1	1	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	1	1	1
14	*Buyina halifax*	1	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1	1	1	1
15	*Buyina yeatesi*	1	1	1	0	0	1	1	0	1	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1	1	1	1
16	*Austmusia wilsoni*	1	1	1	0	1	1	1	0	1	0	0	0	1	1	0	0	0	1	1	1	0	0	0	1	1	1	1
17	*Austmusia kioloa*	1	1	1	0	1	1	1	0	1	0	0	1	1	1	0	0	0	1	1	1	0	0	0	1	1	1	1
18	*Austmusia lindi*	1	1	1	?	?	?	?	?	?	?	?	?	?	?	?	0	0	1	1	1	0	0	0	1	1	1	1
19	*Cunnawarra grayi*	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1
20	*Cunnawarra cassisi*	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1
21	*Penaoola algida*	1	1	1	?	?	?	?	?	?	?	?	?	?	?	?	0	0	1	0	1	0	0	0	1	1	1	1
22	*Penaoola madida*	1	1	1	0	1	1	1	0	1	0	0	?	1	0	0	0	?	?	?	?	?	?	?	?	?	?	1



Figs 115, 116. Cladograms: *115*, semistrict consensus of more than 7000 parsimonious trees; *116*, a most parsimonious tree. AM, *Amaurobius*; AMPH, *Amphinecta*; AUST, *Austmusia*; BUY, *Buyina*; CAL, *Calacadia*; CUNN, *Cunnawarra*; JALK, *Jalkaraburra*; KEER, *Keera*; MAG, *Magua*; MAN, *Maniho*; MET, *Metaltella*; PEN, *Penaoola*; QUE, *Quemusia*.



Figs 117, 118. Cladograms: *117*, strict (Nelsen) consensus of 2718+ most parsimonious trees; *118*, a most parsimonious tree showing characters and character states. AM, *Amaurobius*; AMPH, *Amphinecta*; AUST, *Austmusia*; BUY, *Buyina*; CAL, *Calacadia*; CUNN, *Cunnawarra*; JALK, *Jalkaraburra*; KEER, *Keera*; MAG, *Magua*; MAN, *Maniho*; MET, *Metaltella*; PEN, *Penaoola*; QUE, *Quemusia*.

Results

There is close agreement between the cladograms (Figs 116, 118). Both show two clades within the metaltellines, with the South American genera in the same clade. *Calacadia* appears to be more closely related to some of the Australian genera than it is to *Metaltella*. Both cladograms also suggest that the New Zealand amphinectids are more closely related to Tasmanian *Amphinecta milvina* than either is to the metaltellines. On the basis of the relationship shown in the cladogram (Fig. 116), the metaltellines are transferred from the Amaurobiidae to the Amphinectidae.

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