2003. The Journal of Arachnology 31:105–121

PROBLEM SOLVING IN THE SPIDER FAMILIES MITURGIDAE, CTENIDAE AND PSECHRIDAE (ARANEAE) IN AUSTRALIA AND NEW ZEALAND

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ABSTRACT. The genus *Uliodon* L. Koch is reviewed. It now includes only the type species, *Uliodon albopunctatus* L. Koch 1873, *Uliodon cervinus* L. Koch 1873, and *Zora frenatus* Koch 1873, and the genus is transferred to the Zoropsidae. *Uliodon* is known only from New Zealand. Through an original misreading of the type specimen locality data, both species were erroneously reported from Australia. Forster and Homann previously referred to *Uliodon* species as *Miturga*, which is endemic to Australia. The subfamily Uliodoninae Lehtinen 1967 was founded on the characters of *Zora tarantulina* L. Koch 1873, later transferred to *Uliodon* by Simon. The diagnostic character of the subfamily, the very long path of the embolus, is not found in *Uliodon*. The subfamily is here diagnosed from the genus; its validity is unclear. In any case, both *Uliodon* and Uliodoninae are transferred to the Zoropsidae along with the Australian *Huntia* Gray & Thompson 2001. *Zora tarantulina* is made the type species of a new monotypic genus, *Mituliodon*, included in the Miturgidae; the genus is known only from Australia and Timor. *Mituliodon tarantulinus* (L. Koch 1873) now newly includes in its synonymy, *Uliodon australiensis* (L. Koch 1873), *Uliodon torvus* (L. Koch 1873), *Miturga maculata* Hogg 1900, *Syspira rubicunda* Hogg 1900 and *Miturga velox* Hickman 1930. The New Zealand genus *Zealoctenus* is transferred from the Ctenidae to the Miturgidae because it is very similar to the Australian genus *Diaprograpta* Simon 1909; the other New Zealand ''ctenid'' genus, *Nemoctenus* Forster & Wilton 1973, along with the Australian zorid *Horioctenoides* Main 1954 are synonymized with the zorid genus *Argoctenus* L. Koch 1878, found in Australia, New Zealand and New Caledonia. The New Zealand ''psechrids'' *Poaka* Forster & Wilton 1973 and *Haurokoa* Forster & Wilton 1973 are transferred to the Amaurobiidae and Tengellidae, respectively.

Keywords: Australasia, Lycosoidea, Miturgidae, Psechridae

In our studies on the Australian Miturgidae, a problem was encountered with New Zealand taxa which Forster (e.g. Forster 1967; Forster & Forster 1973) had considered *Miturga* Thorell 1870. When that New Zealand material was examined and relationships sought, the late Ray Forster (pers. comm.) agreed that although it resembled *Miturga* it was not congeneric. Discerning what exactly constitutes a miturgid has been like the process of peeling a banana. Only by removing the monophyletic outer layers can the integrity and monophyly of the inner fruit (Miturgidae) be established. Raven et al. (2001) began this process with the description of a new ctenid genus, *Amauropelma* Raven et al. 2001, which under existing diagnoses was a miturgid.

The genus *Uliodon* L. Koch 1873 was described for females of two new species, *U. albopunctatus* L. Koch 1873 and *U. cervinus* L. Koch 1873, both reportedly from ''New Holland''. Later in that monograph, Koch described four new species (including one based on a male, *Zora tarantulina* L. Koch 1873) from Australia and placed them in the Palaearctic (zorid) genus *Zora*. Simon (1897) transferred the subsequent four species of *Zora* C.L. Koch 1847 into *Uliodon* (*Z. tarantulina*, *Z. australiensis*, *Z. torva* and *Z. ferruginea*), a transfer that has not since been contested. Lehtinen (1967) transferred *Uliodon* into the Miturgidae and raised a new subfamily based on the ''exceptional course of the embolus'' of the male palp of *Uliodon tarantulinus*. Recently, Griswold (1993) formed a cladogram using *Uliodon tarantulinus* as the exemplar for the Miturgidae.

Hence, although unrevised, the genus *Uliodon* has been used in two major phylogenetic studies (Lehtinen 1967; Griswold 1993). In the latter, it was the sole representative of the Miturgidae. Spiders heretofore assigned to

Uliodon in Australia are widespread and active hunters in leaf litter through coastal Australia. In our present studies on the Australian Miturgidae, we could find only one species of *Uliodon*, that figured by Griswold (1993) as *U. tarantulinus* (L. Koch). At the conclusion of the study, we examined the types of *Uliodon, U. albopunctatus* (the type species), and *U. cervinus*, in what we thought would be a confirmatory check. The types of both *U. albopunctatus* and *U. cervinus* are females and could not be matched morphologically with any Australian spider genus in the Miturgidae or other families. They lack both true claw tufts and a third claw but have a good scopula as in *Miturga*. Females differ from those of *Miturga* in the epigyne and the spigots on the PMS. We did, however, find material matching the type material of both species only in New Zealand. When males matching the females of *U. albopunctatus* and *U. cervinus* were recognized from New Zealand, even more differences between *Uliodon* s. strict. and *Miturga* were noted. Neither species originally placed in *Uliodon* by Koch is con-familial with *Uliodon tarantulinus*. Griswold (1993) was, nevertheless, correct in considering *Uliodon tarantulinus* as a miturgid and although the genus name is incorrect, his cladistic analysis is unaffected by this realization.

The *Uliodon* problem clearly began with conflicts in locality data with the types of *U. albopunctatus* (type species) and *U. cervinus*. Koch (1873: 433) listed them both as ''Neu Holland''. However, the types (from NHMW) are labelled 'Neuseeland: ''NOVARA''-Reise; Hochstetter don.', and 'Neu-Holland (Australien): ''NOVARA''-Reise; Hochstetter don.', respectively. That is, they were collected on the voyage of the vessel *Novara* and donated by Hochstetter. Hochstetter collected exclusively in New Zealand. The apparently conflicting labels may have lead Koch to assume the material was from Australia. Certainly, the Novara did visit both New Zealand and Australia (Fletcher 1985). However, the material has the same collection data as the types of the New Zealand hexathelid, *Hexathele hochstetteri* Ausserer 1871, also deposited in NHMW. In any case, the morphological data are compelling: *Uliodon albopunctatus* and *Uliodon cervinus* are New Zealand species.

Our current studies also indicated the presence of the Zoropsidae in Australia which further extend the concept of the family. Under that revised diagnosis, the New Zealand *Uliodon* fit well into the Zoropsidae.

Having removed *Uliodon* from the Miturgidae, a new genus is needed for *Zora tarantulina*. The begged question is then: What is a miturgid and are there any in New Zealand? Davies (1986: 35) keyed the Miturgidae by posterior eyes straight or slightly curved, long and conical apical segment of PLS, striped carapace, sheet web, two claws and claw tufts. That character combination does not apply to any known miturgid. *Diaprograpta, Mituliodon,* new genera, and most miturgid genera lack the elongate PLS; *Miturga* lacks claw tufts and alone builds a sheet web as a retreat. Raven et al. (2001) showed that those characters were insufficient to correctly place the ctenid genus *Amauropelma* Raven & Stumkat 2001.

Miturgidae are presently best defined by the character combination given below (also see Table 1). The boundary with the Ctenidae has been diffuse (see Raven et al. 2001) and hence it was to the New Zealand ctenids and psechrids (*Zealoctenus* Forster & Wilton 1973, *Nemoctenus* Forster & Wilton 1973, *Poaka* Forster & Wilton 1973) that our attention was drawn. Forster & Wilton (1973) had noted difficulty in applying the concepts of the Ctenidae and Zoridae given by Lehtinen (1967). The diagnosis of the Miturgidae given here fits that of *Zealoctenus*, a monotypic genus founded on a single female. *Nemoctenus* is clearly a zorid.

Poaka has similar eyes, carapace shape and pattern and abdominal stripes to the miturgid *Diaprograpta* and hence was examined. Forster & Wilton (1973) found difficulty in placing both *Poaka* and *Haurokoa* but ''dumped'' them uneasily into the Psechridae. On examination of fresh material in Lincoln University, New Zealand, it is clear that *Poaka* is an amaurobiid resembling the Australian *Manjala* Davies 1990 with which it shares the cribellum, the numerous strong paired spines on tibiae and metatarsi I, II, retrocoxal hymen and carapace shape and pattern and the abdominal pattern. Hence, *Poaka* is transferred to the Amaurobiidae. Equally, unlike the large tropical psechrids, *Haurokoa* lacks claw tufts and does not build a sheet web but hunts on low vegetation (Forster & Wilton 1973). The simple form of the palpal bulb and strongly

recurved eye group suggest either Ctenidae (cf. *Amauropelma* Raven & Stumkat 2001) or Tengellidae. In having only a weakly curved front row of eyes and three claws without tufts, the Tengellidae seems the most likely placement. Hence, it is to the Tengellidae that *Haurokoa* is tentatively transferred. This paper then clarifies the relationships of what was placed in the Miturgidae, Ctenidae and Psechridae in New Zealand and the resulting problems generated in Australia.

METHODS

Localities.—Cons. Pk. = Conservation Park; ME.Q = mid-eastern Queensland; NE.Q = northeast Queensland; NP = National Park; SE.Q = south-east Queensland; SF = State Forest.

Abbreviations.—ALS = anterior lateral spinnerets; AME = anterior median spinnerets; AME = anterior median eyes; ALE = anterior lateral eyes; PLS = posterior lateral spinnerets; PMS = posterior median spinnerets; PLE = posterior lateral eyes; RTA = retrolateral tibial apophysis; RCH = retrocoxal hymen.

Museums.—NHMW = Naturhistorisches Museum, Wein, Austria; QM = Queensland Museum, Brisbane; WAM = Western Australian Museum, Perth; SAM = South Australian Museum, Adelaide; AMS = Australian Museum, Sydney; CAS = California Academy of Science (CAS), San Francisco; BMNH = Natural History Museum (London); QVM = Queen Victoria Museum, Launceston, Tasmania.

SYSTEMATICS

Family Zoropsidae Bertkau 1882

Zoropsididae [sic.] Bertkau 1882: 337.
Uliodoninae Lehtinen 1967: 316. NEW SYNONYMY.

Diagnosis.—Male Zoropsidae differ from those of Miturgidae in the presence of a dense scopula dorsally on the palpal cymbium, pedal tibiae with basal fracture and the presence of a sclerotized shield on the anterior face of the abdomen. Many female zoropsids have spigots evident dorsally on the posterior median spinnerets but all have strong paired spines on raised bases on tibiae (5–7 pairs) and at least 3 pairs on metatarsi I, II.

Description.—Males with dense scopula dorsally on male palpal cymbium, pedal tibia with basal fracture; tibial apophysis more dorsal than retrolateral; eyes in two recurved rows; 2 or 3 claws; claw tufts present or absent. Cribellum present or absent. Retrocoxal hymen distinct on retrolateral coxae I. Spigots present dorsally on PMS of females (*Zoropsis*, *Uliodon*, *Huntia*); apical PLS short, domed. Femur I, especially of females, with enlarged spine proventrally; at least 5 pairs of strong spines on tibia and 3 pairs on metatarsi I, II ventrally. Trochanters weakly but distinctly notched. Labium wider than long.

Included Genera.—*Zoropsis* Simon 1878 from southeast Asia and Europe; *Takeoa* Lehtinen 1967 from China and Japan; *Uliodon* L. Koch 1873 from New Zealand; and *Huntia* Gray & Thompson 2001 from Victoria and Western Australia; based upon Platnick 1998 with addition of new genera.

Remarks.—Uliodoninae were ''characterized by the exceptional course of the embolus in males'' (Lehtinen 1967: 317) but that was based on a male that is not confamilial with *Uliodon*. The subfamily diagnosis is hence incorrect. At present, the subfamily includes only *Uliodon* and serves no grouping function and in the absence of a cladogram reflects no indication of higher relationships. Other subfamilies listed by Lehtinen (1967) in the Miturgidae have been re-elevated to families, i.e. Tengellidae, Zoropsidae, or moved to other families Amaurobioidinae (Anyphaenidae). Eutichurinae have been moved to the Clubionidae, back to the Miturgidae and most recently back to the Clubionidae (Deeleman-Reinhold 2001; not accepted by Platnick 2001). Griswold (1991) left the Griswoldiinae (as Machadoninae) unplaced in the Lycosoidea. Lehtinen (1967) included *Uliodon*, the madagascan genera *Uduba* Simon 1880, *Zorodictyna* Strand 1907, *Calamistrula* Dahl 1908, the African genus *Raecius* Simon 1892, and from Baltic Amber, *Adamator* Petrunkevitch 1942 in the Uliodoninae. Griswold (1993) included *Uliodon* in a cladogram of lycosoids but did not formalize any nomenclatural conclusions. Relationships are not here extensively explored. However, character distributions are given (Table 1).

Homann (1971) reported that *Miturga* has a grate-shaped tapetum; in fact, that is true for *Miturga* but Homann's material was not *Miturga*. In the Forster laboratory, I found a letter and photographs by R.R. Forster in which

Table 1.—Diagnostic characters of miturgoid families. Abbreviations: PLS = posterior lateral spinnerets; PMS = posterior median spinnerets; PTF = predistal tarsal fracture; RCH = retrocoxal hymen; RTA = retrotibial apophysis.

	Ctenidae	Zoridae	Zoropsidae	Miturgidae	Tengellidae	Pisauridae	Eutichirinae
RCH	present	present	present	present	present	absent	pres./abs.
PTF	absent	absent	absent	absent	absent	present	absent
Tibial Crack, male	absent	absent	present	absent	absent	absent	absent
Cymbial scopula, male	pres./abs.	absent	present	absent	absent	absent	absent
Leg scopula	strong-absent	absent	strong-absent	strong	absent	absent	absent
Claw tufts	present	pres./abs.	pres./abs.	pres./abs.	pres./abs.	absent	present
Black eye row	recurved-2 rows	strongly recurved-2 rows	straight-recurved	straight-recurved	straight-recurved	strongly recurved-2 rows	procurved
Maxillae, shape	rectanquloid	rectanguloid	rectanguloid	rectanguloid	rectanguloid	rectanguloid	dumbell
Trochanters	notched	notched	notched	notched	notched	notched	unnotched
Claws	2	2	2–3	2	2–3	3	2
Tibial & metatarsal spines 1, 2	strong	strong	strong	weak	weak	weak	strong-weak
PLS, apical segment shape	domed	domed	domed	domed to digitiform	domed	domed	digitiform
PMS female, spigots	apical	apical	dorsal	apical	apical or dorsal	apical	apical
Interlocking lobes, male tegulum	absent	absent	present	absent	present	absent	absent
Autapomorphy	ALE high near PME	combination	male tibiae with basal crack	RTA with unsclerotized region	combination	combination	combination

it was clear that the material sent to Homann labelled *Miturga* was the New Zealand *Uliodon*. Grate-shaped tapeta are also found in the Zoropsidae (Griswold 1993).

Gray & Thompson (2001) described two new lycosoid genera, *Bengalla* Gray & Thompson 2001 and *Huntia* Gray & Thompson 2001. *Bengalla* will be dealt with elsewhere but is here considered to fit Griswold's (1991) concept of the Tengellidae. We have examined material of *Huntia*. Males have the tibial crack, the cymbial scopula, and a sclerotized shield on the anterior face of the abdomen and both males and females have the strong paired spines on tibiae I and II. Females of *Huntia deepensis* Gray & Thompson 2001 have spigots dorsally on the PMS. Also, like other undescribed Australian zoropsids, *Huntia* has a tarsal rod and tegular-subtegular interlocking lobes. Gray & Thompson (2001) considered the longer labium and absence of claw tufts reason to exclude the genus from the Zoropsidae. The labium of *Zoropsis spinimana* (female, BCB colln. examined) is about as long as wide and the character is not considered sufficient to exclude a genus from the family. The absence of claw tufts in *Huntia* simply places it lower on the cladogram than *Zoropsis*.

A more complete examination of the relationships of zoropsids will be presented with our pending revision of the group in Australia.

Uliodon L. Koch 1873

Uliodon L. Koch 1873: 431, type species *Uliodon albopunctatus* L. Koch 1873 by subsequent designation of Simon 1892: 113.

Diagnosis.—Two claws but no true tufts. Leg scopula dense on tarsi of males and females. Males: cymbium with dorsal scopula; tibial apophysis in dorsal region of tibia; tegulum massive and extending over base of tibia; interlocking lobes with subtegulum subtle, if present; median apophysis an unsclerotized vane. Females: epigynal plugs present; PMS with line of spigots on dorsal surface.

Species Included.—*Uliodon albopunctatus* L. Koch 1873, *Uliodon cervinus* L. Koch, 1873, *Zora frenatus* L. Koch 1873.

Distribution.—Known only from New Zealand.

Remarks.—*Uliodon* differs from the Australian *Huntia* in the complete absence of a third claw, the presence of dense leg scopula and males have a much smaller tegulum and a small unsclerotized median apophysis. The epigyne figured by Koch's artist faithfully rended the epigynal plug and hence partially obscured the detail of the epigyne.

Forster had consistently considered species here placed in *Uliodon* as *Miturga* (e.g. Forster & Forster 1999). However, he had begun a revision of that group in New Zealand with RJR. As with many spider taxa in New Zealand, the Zoropsidae are very diverse and may constitute several genera. Hence, the above diagnosis is based upon males and females from the Auckland region and presently considered conspecific with *U. albopunctatus*.

Family Miturgidae Simon 1885

Diagnosis.—Differs from Zoridae in males having tibial apophysis with an unsclerotized zone and from the Ctenidae and Zoropsidae in lacking strong paired spines on tibiae and metatarsi I, II.

Two claws, true claw tufts present or scopula extending around claws; weak paired spines ventrally on tibiae and metatarsi I & II, basally divided median apophysis, RTA with unsclerotized zone and maxillae rounded rectanguloid with short diagonal groove. Retrocoxal hymen distinct on I. Eight similarly-sized eyes in two rows; from above, front row straight to slightly recurved, back row slightly procurved, straight to clearly recurved; tapetum grate-shaped. Females with spigots only apical on PMS.

Included genera.—Australian region; *Miturga*, *Diaprograpta* Simon 1909, *Zealoctenus* Forster & Wilton 1973. Middle East; *Prochora* Simon 1885. North & South America; *Teminius* Keyserling 1887.

Remarks.—Australian species currently placed in the otherwise Neotropical genus *Odo* Keyserling 1887 are all clearly considered miturgids but are not correctly placed in *Odo*.

The Eutichurinae lack the grate-shaped tapetum, critical for their inclusion in the Lycosoidea (Griswold 1993) and, unlike the lycosoids, have maxillae modified with an ectal constriction as in Clubionidae. The character used to align the Eutichurinae and Miturgidae was the elongate apical article of the PLS (Ramírez, Bonaldo, & Brescovit 1997) which is simply a synapomorphy of the genus *Miturga*. Hence, Deeleman-Reinhold's (2001) restora-

Figure 1.—*Mituliodon tarantulinus* (L. Koch), habitus.

tion of the Eutichurinae to the Clubionidae is upheld (contra Platnick 2001).

Subfamily Miturginae Simon 1885
Mituliodon new genus

Type species.—*Zora tarantulina* L. Koch 1873.

Diagnosis.—Differs from *Diaprograpta* and *Zealoctenus* in the extensive conductor in males and the form of the epigyne in females and from all other described Australian miturgid genera in the presence of true claw tufts. As more miturgids are described, the flattened form of the cymbium with retrolateral flare and the very extensive conductor will provide further distinguishing characters.

Description.—*Color:* Carapace yellow brown with darker banding medially, around edges and along striae. Legs yellow brown without pattern; abdomen fawn brown with paired central dark spots; ventrally black field with line of white dots breaking into two bigger dots posteriorly; 2 large spots anteriorly and 2 in front of spinnerets.

Carapace low, with low broad caput; fovea long, straight; silver and brown hairs enhance pattern; 3 bands of silver hair between eyes of back row. Eyes: 8 in 2 rows, both rows gently recurved; front row eyes smaller than those of back row; ALE each just past inside edge of PLE; front row eyes set close, ca. 0.7–1.0 diameter apart; back row eyes ca. 1 diameter apart. ALE look to side. Tapetum grate-shaped. Chelicerae small; teeth formula: 2r, 3p. Sternum scalloped shield; setation: uniform cover of bristles and hair. Labium short. Maxillae with deeply narrowed base, almost diamond-shaped, converging to base and apex from midpoint; apex rounded. Legs: coxae with small distinct anterior process; large, distinct retrocoxal hymen on coxae I; trochanteral notches ca. 1.5 x wider than deep on IV, shallower on I; no feathery hairs. Spines: tibiae I & II v2.2.2 not strong or overlapping; metatarsi I, II v2 long basal; prolateral spines on tibia I, II; proventral spine on femora. Scopula: dense on tarsi I-IV and metatarsi I-III, weak on IV, also present as two lateral fringes in distal half of tibiae I, II. Trichobothrial base laminate, collariform; cuticle finely grooved. Claws: 4–5 teeth on long, similar, paired claws; unpaired claw absent. Dense, wide tufts distally fused and reach to lower edge of claws. Spinnerets: colulus, an hirsute triangle; ALS conical; PLS basal segment as long as ALS but more slender with triangular coniform apical segment; PMS much smaller than PLS; ALS with 2 major ampullate spigots; 8–10 pyriforms. Male palp: tibia with flange-like distal retrolateral tibial apophysis with diagonal ridge and soft tissue beside that and distal triangular flat process beyond; cymbium wide, flattened, basal and basolateral margins wide, apical cone short without ventral groove; long wide shallow groove from base almost to tip of cymbium along retrolateral edge; embolus small, gourd-shaped, retrobasally reflexing back basally to be long and filiform around back of tegulum along long conductor; median apophysis has slender soft junction with embolus and with small, apical, retrolateral hook; tegulum n-shaped, distal, flat with large grooved conductor sweeping up from near embolus base to near tip of median apophysis; subtegulum wide, transverse, basal; slight scopula and thick setae behind cymbial tip.

Etymology.—An arbitary combination of letters formed from *Miturga* and *Uliodon*; the gender is masculine.

Included species.—*Mituliodon tarantulinus* (L. Koch 1873).

Distribution.—As for species.

Relationships.—Among the known Miturgidae (excluding the Eutichurinae), *Mituliodon*, *Diaprograpta* and *Zealoctenus* are unusual in possessing true movable claw tufts which are on separate pads beside the claws. In *Miturga*, claw tufts are absent; the scopula simply extends beyond the tarsal tip. No other miturgids, however, have the very extensive conductor. *Mituliodon* shares with other miturgids the basally divided median apophysis

and an unsclerotized zone on the tibial apophysis. A revision of the Australian Miturgidae will deal more fully with the relationships.

From fresh material of *Zora marmorea* Hogg 1896 and comparison with the types (in AMS and the Museum of Victoria), we have established that the species is a miturgid but does not belong in *Mituliodon* or any described genera. It will be placed elsewhere in a pending revision.

Mituliodon tarantulinus (L. Koch 1873)
new combination
(Figs. 1–11)

Zora tarantulina L. Koch 1873: 445; Simon 1897: 106.
Zora australiensis L. Koch 1873: 441. NEW SYNONYMY.
Zora torva L. Koch 1873: 444. NEW SYNONYMY.
Miturga maculata Hogg 1900: 109. NEW SYNONYMY.
Syspira rubicunda Hogg 1900: 108. NEW SYNONYMY.
Miturga velox Hickman 1930: 114. NEW SYNONYMY.

Types.—*Zora tarantulina:* ZMH: Museum Godeffroy no. 8190: holotype male, Port Mackay, Queensland, Australia.

Zora australiensis: ZMH: holotype, subadult female, Wollongong, New South Wales, Australia.

Zora torva: holotype, male premolt, ''Australia'', Thorell collection, in RMS, examined.

Miturga maculata: BMNH 1907.2.24.1–5 (including 1 juvenile of *Miturga gilva* L. Koch): 2 juvenile females, 3 females, 2 males, Mt Macedon, Victoria, Australia: intact male here designated as lectotype, remainder as paralectotypes.

Syspira rubicunda: BMNH 1907.2.24.11–12: holotype female, paratype male, ''Cheniston'', Mt Macedon, Victoria, Australia.

Miturga velox: holotype male, paratype female, Launceston, Tasmania, Australia, QVM 13: 7325 and 7324, examined.

Description.—*Female*: (QM S36672) Color and Pattern: Union Jack pattern on yellow brown carapace: U-shaped darker areas (of hair) radiating from fovea along each interstrial ridge; longitudinal bands of darker hairs on caput broken by sinuous streaks arising between each pair of PME–PLE and PME–PME; curved area of silver hairs from between lateral eyes around PLE. Abdomen fawn brown with black flecking laterally and in posterior half paired small dark flecking; ventrally with a black field; behind epigastric furrow two large white spots, lateral of those 4 in a diamond-pattern posterior of that a triangle of 3 white spots pointed centrally; legs orange brown without annulations, scopula makes distal half of metatarsi I and II and tarsi I, II darker; sternum and coxae orange brown; maxillae, labium and chelicerae dark red brown.

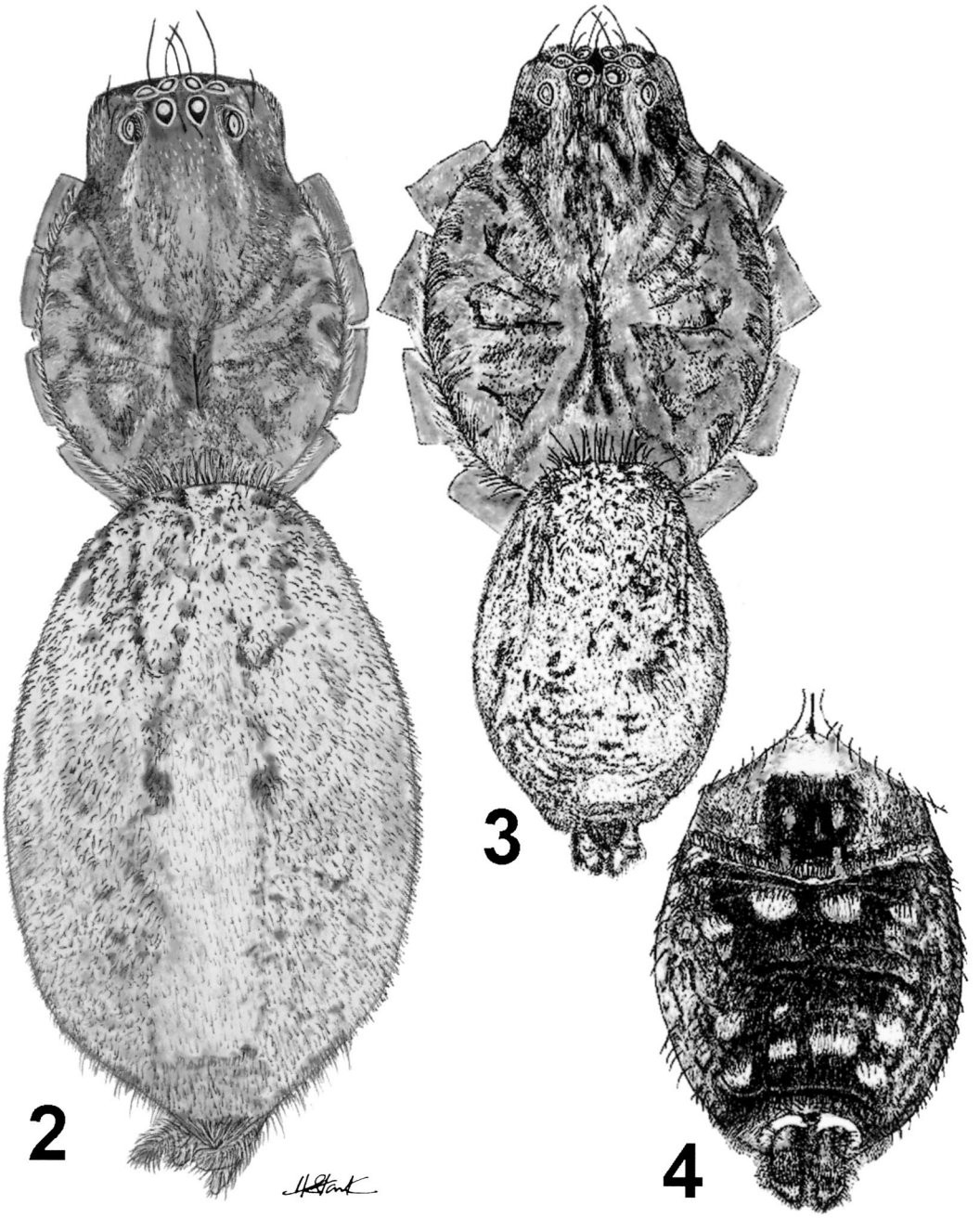
Carapace pear-shaped, rounded laterally with distinct but rounded cephalic portion; caput arched but gradually defined; fovea begins at end of caput and extends for last portion of thorax and slightly down posterior slope; light pilosity with cuticle evident in all parts; clypeus steep but short; chilum of 2 distinct triangles.

Eyes occupy 0.75 of head-width; front row recurved; from above AME set just out from cephalothorax margin; AME on mound look forward and to side; ALE on mound highest in front look to front and side; PME not on mound look up and to front; PLE on low mound look to side and up; all eyes of similar size, AME further from ALE than AME; likewise PME and PLE. Back eye row recurved and almost an eye diameter wide from front row. From in front, front row centers—straight with ALE (slightly larger) margins above and end below those of AME.

Chelicerae with low but distinct boss; fangs moderately long. Serrula a distinct curved line. Maxillae almost tear-shaped with 2 glabrous regions ventrally and proventrally near posterior apex; cylindrical in cross-section. Labium extends barely to half length of maxillae, broad. Sternum roundly cordate with elevated ridges opposite intercoxal spaces; no extension between any coxae.

Legs: coxae rounded, all of similar size with similar flange to *Miturga*. Trochanters all short, similarly (I–IV) and deeply notched. Relative lengths of leg segments: femur about equal to tibia longer than metatarsus much longer than tarsus = patella except IV, metatarsus longer than all. Pilosity: moderately long black bristles and fine hair not obscuring cuticle on legs; no evident clustering.

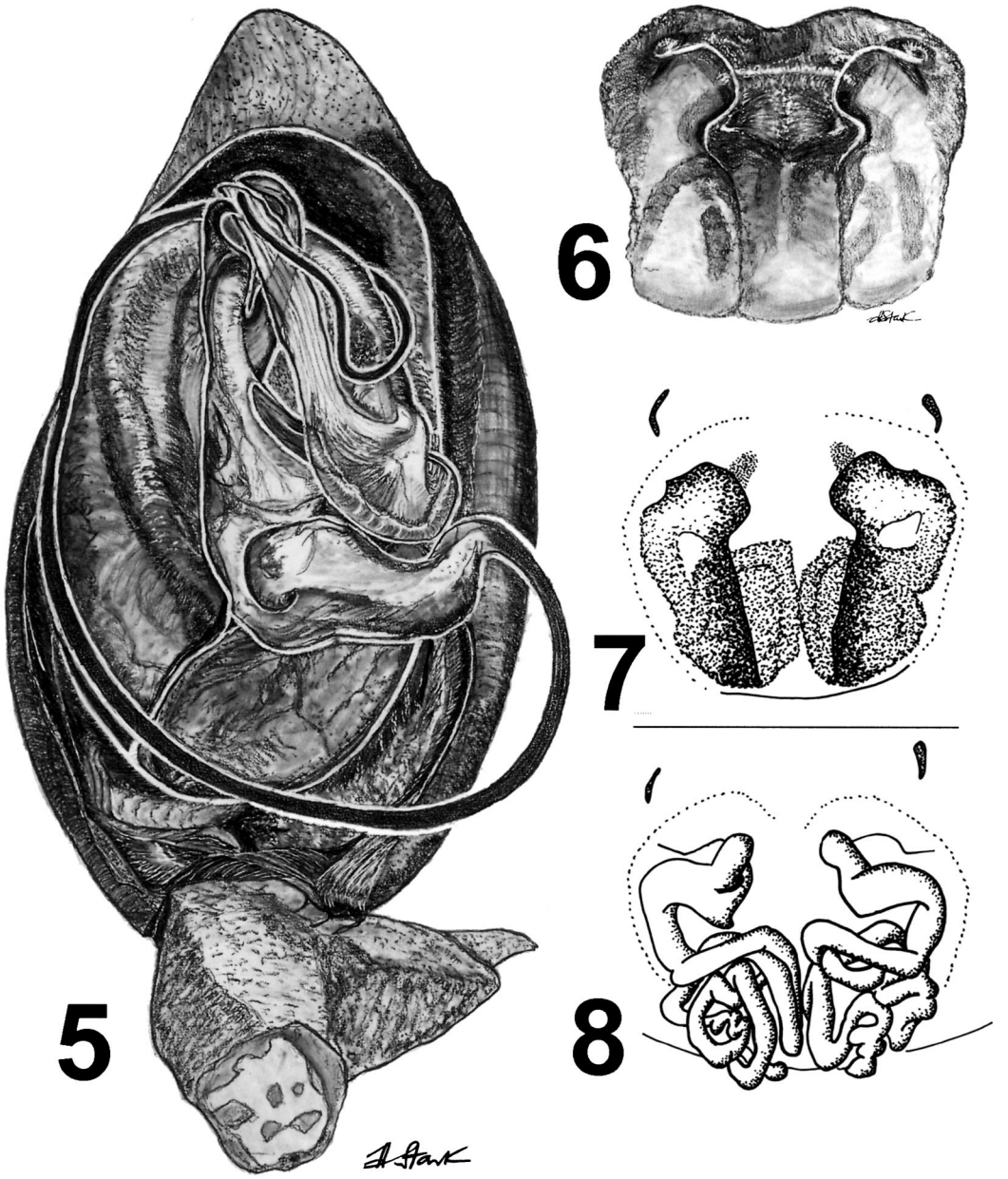
Scopula: dense, obscuring cuticle on metatarsi and tarsi I, II; laterally with scoop-like ridges of hair on tibiae I, II; thinner but entire and full tarsi and metatarsi III divided medially by setae on tarsi IV; 3 bands for 0.75 of metatarsi IV.



Figures 2–4.—*Mituliodon tarantulinus* (L. Koch). 2, female. 3, 4, male. 2, 3, cephalothorax and abdomen, dorsal view. 4, abdomen, ventral view.

Spines. I: fe p2d2r2w, pa 0, ti v2.2.2, me v2 long, basal. II: fe p4d2r2w, pa 0, ti v2.2.2, me v2 long, basal. III: fe p4d3r4, pa 0, ti p2d2r2v2.2.2, me p3r1v2 long, basal + 1 mid-distal. Palp: fe p1d4, pa p1, ti p3r2, ta p3r2.

Claws: palpal, long curved with 4–5 long teeth. Long paired claws with 3–5 teeth; tufts absent on female palp, small elsewhere, not as high as scopula and just covering teeth on claws; claws set well above tufts.



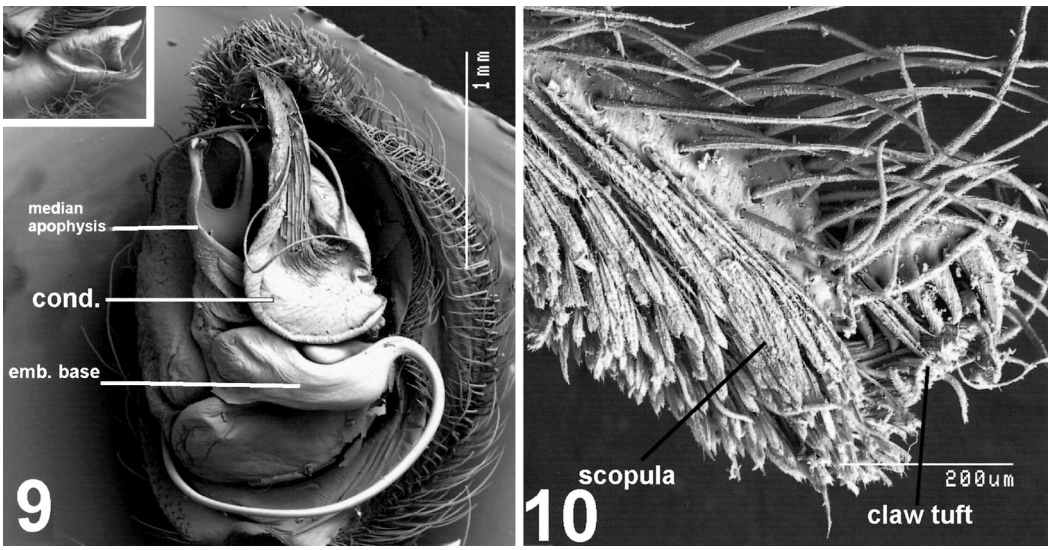
Figures 5–8.—*Mituliodon tarantulinus* (L. Koch). 5, male, tibia, cymbium & bulb, ventral left. 6, 7, epigyne. 8, vulva.

Trichobothria: 2 bands on each side dorsally of tibiae; trichobothria as long basally on tibia as distally; single line dorsally on tarsi with distal trichobothria longer.

Spinnerets: all of similar length but PLS smaller in diameter; PMS cylindrical; colulus a small setose area.

Epigyne: Two lateral lobes with inner anterior lobes plus medial ridge. Copulatory fossae lie behind anterior lobes; a large duct folds slowly and then reduces in diameter and forms complexly folded basal portion; fertilization ducts basal.

Male (QM S36201) (like female except as follows): Spines. I: fe p3d3r4, pa 0, ti p3d1r2v6, me v2 basal. II: fe p4d3r4, pa 0, ti



Figures 9, 10.—*Mituliodon tarantulinus* (L. Koch), male. 9, cymbium & bulb, ventral left, scanning electron micrograph with tibial apophysis (inset). 10, tarsus, lateral view showing different orientation of hairs in claw tufts and scopula.

p2r2v6, me v2 basal. III: fe p5d3r4, pa 0, ti p2d2r2v6, me p4r3v2 basal+ 1 distal. IV: fe p4d3r3, pa 0, ti p2d3r2v6, me p5r5v2.2.1.

Palp: As for genus.

Remarks.—As first revisers, the senior of the synonymous species in L. Koch (1873) is taken because the holotype is a male, the most distinctive of the sexes.

Variation.—Throughout its range *Mituliodon tarantulinus* is very consistent in sexual morphology with the biggest variation occurring in Western Australia where a subtle difference in the shape of the apical portion of the tibial apophysis is sometimes discernible. The pattern on the dorsal carapace is effectively a black Union Jack on a mottled brown background. The darkness of the background varies making the radiating lines less distinct in some specimens. The white pattern on the black field on the ventral abdomen varies from two convergent white lines to a series of dots. Neither of these variations shows any clear correlation with habitat, distribution or other morphology. However, around Adelaide, South Australia, the sternum of *Mituliodon tarantulinus* (where the two color forms are sympatric) is a deep burgundy red whereas elsewhere it is light to dark brown.

Distribution and Habitat.—*Mituliodon tarantulinus* is the most widely distributed species of the known Australian miturgids (Fig. 11). It is known from the Wet Tropics (Thornton Peak) in north Queensland, west to south central Queensland, and south along coastal and near coastal areas through New South Wales, Victoria, eastern Tasmania, southern South Australia and in the south-western corner of Western Australia. It has not been recorded from the Northern Territory. It is also known from Timor. The only common factor that may explain its distribution is the presence of a litter layer of some depth. Habitats with such a layer occur in rainforest, semi-evergreen vine thicket and eucalypt forests but not desert or grassland. The hypothesis needs further testing, however.

Biology.—*Mituliodon* is litter dwelling and nocturnally active. However, when a forest is subjected to vibration (at any time but diurnally most easily seen) from a slowly idling big engine (e.g. tractor or diesel 4x4) a number of spiders become very active (first reported by D. Hirst, XII International Congress of Arachnology, Brisbane 1992, Special Methods meeting). On a number of occasions, RJR has noted that larger *Mituliodon* can be seen running across the litter from over 20 m directly towards the vibration source.

Neither juveniles nor adults are taken commonly in vegetation sweeps nor are they often seen off the ground at night. Hence, any significance attributed to the presence of claw

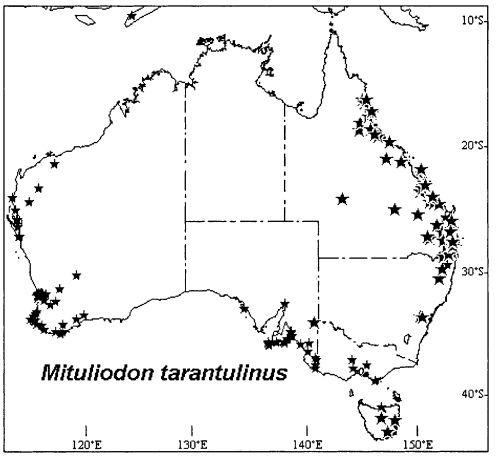


Figure 11.—Distribution map of *Mituliodon tarantulinus* (L. Koch).

tufts for scaling smooth vertical surfaces is without much support. Diurnally, *Mituliodon* is found under litter and when rotting logs resting on the ground are lifted or broken open. In Queensland, *Mituliodon* is often taken in houses.

The egg sac is a small soft disc attached to the underside of rocks and logs.

Toxinology.—Euphoria, dizziness, pain, and light-headedness have been reported after the bite (Queensland Museum records).

Material Examined.—TIMOR: WAM 99/1235:♀, Lelofui, site A, 9°32′S 124°14′E; WAM 99/1236: ♂, Gunung Mutus, summit, 9°31′S 124°16′E. WESTERN AUSTRALIA. WAM 93/1761:♀, Hovea, 31°53′00″S 116°06′00″E; WAM 98/429:♂, Barlee Range Nature Reserve, site BR 7, 23°22′45″S 115°52′50″E; WAM 99/1214–5: 2 ♂, Bush Bay, site BB 5, 25°07′54″S 113°46′05″E. Cape Cuvier, Quobba Station, site CU 6, 24°08′20″S 113°26′44″E: WAM 99/1216–7:♂ & ♀; WAM 99/1218–9: 2♂; WAM 99/1220–1: juvenile♀; WAM 99/1222:♂. WAM 99/1223:♂, Kennedy Range NP, site KE 1, 24°29′34″S 115°01′50″E. Nanga Station, site NA 3, 26°31′21″S 114°00′08″E: WAM 99/1224: ♂; WAM 99/1225: ♂; WAM 99/1226: ♀; WAM 99/1227: ♂. WAM 99/1228: ♂, Zuytdorp, site ZU 2, 27°16′00″S 114°02′00″E; WAM 99/1229: ♂, Zuytdorp, site ZU 4, 27°15′45″S 114°09′13″E. Zuytdorp, site ZU 5, 27°14′43″S 114°11′36″E, WAM 99/1230–1: 2 ♂; WAM 99/1232–3: 2 ♂. WAM 99/1234: ♂, Zuytdorp, site ZU 3, 27°15′50″S 114°04′14″E; WAM 99/1243: ♂, Ambergate Reserve, 33°42′S 115°20′E; WAM 99/1244: ♂, 14 km E. of Black Point, 34°25′30″S 115°41′30″E; WAM 99/1245: ♂, Capel, lot 7 NW Road, 33°33′S 115°33′E; Crowea, ridge site, 34°28′S 116°10′E: WAM 99/1248: ♀; WAM 99/1249–50: 2 ♀. WAM 99/1251: juvenile ♀, 3 km W. of Darradup, 34°05′S 115°34′E; WAM 99/1252: ♀, Dog Pool on Shannon River, 34°46′S 116°22′E; WAM 99/1253: ♂, Dryandra Woodland, 32°47′S 116°55′E; WAM 99/1254: ♂, Durokoppin Nature Reserve, site DKR F2, 31°30′S 117°44′E; WAM 99/1255–6: ♂, Faure Island, TL-31, 25°53′30″S 113°54′00″E; WAM 99/1257: ♀, Faure Island, TL-30, 25°53′30″S 113°54′45″E; WAM 99/1259: ♀, Gelorup Rise, Gelorup, 33°23′S 115°38′E; WAM 99/1260:♀, Gunjin Gully, 31°59′S 116°08′E; WAM 99/1261–2: ♂ 2J, Ledge Point, site 2, 35°01′S 118°00′E; WAM 99/1263:♂, Margaret River, 33°57′S 115°04′E; WAM 99/1264:♂, 17 miles NE of Millstream Stn homestead, 21°25′S 117°15′E. Mt Cooke, 32°25′S 116°18′E, WAM 99/1265: ♂, WAM 99/1266:♀, site 3; WAM 99/1267: ♀, site 3; WAM 99/1268:♀, site 3; WAM 99/1269–71: 2 ♂, 1♀, site 2; WAM 99/1272: ♂. WAM 99/1273:♂, Mt Observation, 31°54′S 116°33′E; WAM 99/1274:♂, Mt Jackson, site MJR 1, 30°24′45″S 119°14′45″E; WAM 99/1275:♂, 25 km SE of Mundaring, 32°04′S 116°21′E. Nedlands, 31°59′S 115°48′E: WAM 99/1276:♀; WAM 99/1277:♂; WAM 99/1278:♂; WAM 99/1279:♂; WAM 99/1280–1: 2♀; WAM 99/1282–3: 2♀; WAM 99/1284:♂; WAM 99/1285:♀; WAM 99/1286:♀; WAM 99/1287–8:♂, ♀; WAM 99/1289–90: ♀J; WAM 99/1291–2: 2♂; WAM 99/1293:♀; WAM 99/1294–5: ♂J; WAM 99/1296–7:♂, ♀; WAM 99/1298:♀; WAM 99/1299:♂; WAM 99/1300:♂; WAM 99/1301:♂; WAM 99/1302:♀; WAM 99/1303:♂; WAM 99/1304:♂; WAM 99/1305:♂. WAM 99/1306:♀, W. of South Australia/Western Australia border; WAM 99/1307:♀, Salter Point, 32°02′S 115°52′E; WAM 99/1308:♀, Stirling Range NP, SW spur of Mt Hasse, 34°23′S 118°04′E; WAM 99/1309–11: ♂ 2J, Torndirrup NP, Sharp Point, 35°07′S 117°52′E; WAM 99/1312: juvenile ♂, Tutanning [Nature Reserve], 32°32′S 117°20′E, T.Evans; WAM 99/1313: ♀, Wilson Inlet, site 2, 34°59′S 117°22′E; WAM 99/1314–6: ♂ 2J, Bold Park, site BP 1, 31°57′11″S 115°45′50″E; WAM 99/

1317–8: Bold Park, site BP 3, 31°56′30″S 115°46′27″E; WAM 99/1319: ♀, Bold Park, site BP 4, 31°56′29″S 115°46′01″E. WAM 99/1320: ♂, Dianella Open Space, sites DO 1, DO 2, 31°53′S 115°50′Es WAM 99/1321: ♂, Jandakot Airport, site JK 1, 32°05′36″S 115°52′39″E. *Kings Park*. WAM 99/1322: ♂, site 4/3, 31°58′15″S 115°50′05″E; WAM99/1323: ♀, site 5/2, 31°58′15″S 115°50′00″E; WAM 99/1324: ♀, site 4/8, 31°58′15″S 115°50′05″E; WAM 99/1325: ♀, site 4/3, 31°58′15″S 115°50′05″E; WAM 99/1326–7: ♂, ♀, 31°58′15″S 115°50′05″E, JD. *Perth Airport*, site PA 5, 31°58′03″S 115°58′11″E. WAM 99/1328–9: ♂ J, site PA 6, 31°58′05″S 115°58′05″E; WAM 99/1330: ♂, site PA 7, 31°58′34″S 115°58′25″E, JMW et al. WAM 99/1331–2: 1 ♂ 1J ♀, Talbot Road Reserve, site TR 2, 31°52′25″S 116°03′03″E; WAM 99/1333–6: 4 ♂, JD; WAM 99/1337: ♀; WAM 99/1338: ♀; WAM 99/1339: ♀, Tuart Hill, site TH 1, 31°52′49″S 115°51′30″E. WAM 99/1340–1: 2 ♀, Tuart Hill, site TH 3, 31°52′50″S 115°51′34″E. WAM 99/1342–3: ♀ J; WAM 99/1344: ♂, Woodman Point, site WO 2, 32°07′50″S 115°45′28″E; WAM 99/1345–6: 2 ♂, Woodman Point, site WO 1, 32°07′47″S 115°45′23″E; WAM 99/1246–7: 2 ♂, Cocanarup Timber Reserve, 33°38′S 119°54′E; WAM 99/1258: ♂, Fitzgerald River NP, 11 km NW. of Roes, 33°57′47″S 119°16′39″E; WAM 99/1354: ♂, Shenton Park Bush, site A, 31°57′52″S 115°47′57″E; WAM 99/1355–8: 4 ♂, University of W.A. Research Park, cnr Selby St/Und, 31°57′02″S 115°48′05″E; QMS32803: 1 ♂, Nedlands, 31°59′S 115°48′E; SAM N1999134: ♀, Sawyers Valley, 31°54′S 116°12′E. SOUTH AUSTRALIA. *Fleurieu Peninsula, Seg Fleurieu Survey*. SAM N1999123, 1999141: 2 ♀, 5km ENE Parawa, 35°32′27″S 138°24′24″E; SAM N1999122: ♂, 8km WSW Parawa, 35°34′25″S 138°16′18″E; SAM N1999135–6: 2 ♂, 7km E Mt Compass, 35°20′43″S 138°41′56″E; SAM N1999137–8: ♂, 11km E Mt Compass, 35°21′16″S 138°44′11″E; SAM N1999139: ♂, 6.75km NNE Mt Compass, 35°18′39″S 138°40′34″E; SAM N1999140: ♂, 7.5km WSW Parawa, 35°34′25″S 138°16′18″E. *Kangaroo Island*. SAM N1999114–5: 2 ♂, 0.4km W Rocky R NPWS HQ, 35°57′03″S 136°43′43″E; SAM N1999110: ♂, 1.6km NE Cape du Couedic Lighthouse, 36°02′45″S 136°42′55″E; SAM N1999118: ♂, 10km NW Parndana, 35°50′05″S 137°21′37″E; SAM N1999119: ♂, 4.7km WNW Gosse Oval, 35°47′30″S 136°55′30″E; SAM N1999120: ♂, 7.9km SW Cape Willoughby Lighthouse, 35°51′08″S 138°02′56″E; SAM N1999121: ♂, same data but 8.5km SW Cape Willoughby Lighthouse, 35°52′49″S 138°04′14″E; SAM N1999113: ♂, 7km N Ravine de Casoars, 35°47′S 136°37′E; SAM N1999112: ♀, Ravine de Casoars, 35°48′S 136°36′E; SAM N1999116: ♂, Rocky R crossing W ranger HQ., 35°57′S 136°43′E; SAM N1999117: ♀ + eggsac, Snake lagoon, Flinders Chase NP, 35°57′S 136°39′E; SAM N1999111: ♂, West Bay, 35°53′S 136°37′E. *Mt Lofty Ranges*. SAM N1999130: ♀, Belair, 35°00′S 138°38′E; SAM N1999128: ♂, Coromandel Valley, 35°02′S 138°38′E; SAM N1999127: ♂, same data; SAM N1999107: ♂ juv., Kyeema CP, 35°16′28″S 138°41′30″E; SAM N1999129: ♂, 1km S Coromandel Valley P.O., 35°02′S 138°38′E; SAM N1999124: ♀, Loftia Recreation Park, 35°02′S 138°42′E; SAM N1999125–6: 2 ♂, same data. SAM N1999100: ♂, Bottle-brush Nature Res., Caroline Forest, 37°58′S 140°51′E; SAM N1999131: ♂, Burnside, Adelaide (foothills), 34°56′S 138°38′E; SAM N1999106: ♂, Comaum, 37°14′S 140°56′E; SAM N1999105: ♂, Hoods Scrub, Joanna, 37°06′S 140°53′E; SAM N1999133: ♂, Wilmington, 32°39′S 138°06′E; SAM N1999109: ♂, 1.5km WNW Rabbit I. Dam, Mt Rescue CP, 35°55′22″S 140°19′19″E; SAM N1999103: ♀, 13km N Keilira Stn, 36°37′S 140°10′E; SAM N1999104: ♀, same data; SAM N1999108: ♂, 1km SW Stony Well, 35°58′22″S 139°31′44″E; SAM N1999132: ♂, Mitcham, Adelaide, 34°59′S 138°37′E; SAM N1999101–2:2 ♂, Mount Meridith, 15km N Mt Gambier, 37°40′47″S 140°53′08″E; WAM 99/1237–8: 2 ♀, Baird Bay, 33°09′S 134°22′E; QMS32005: 1 ♀, Renmark, 14k WNW, 34°06′S 140°36′E. VICTORIA. BMNH 1924.3.1.834: ♀, ‘‘Cheniston’’, Mt Macedon; WAM 99/1239: ♂, Coranderrk Reserve, Healesville, 37°41′S 145°31′E; WAM 99/1240–1: 2 ♀ 1J, Mirranahua Gap, Grampian Ranges; WAM 99/1242: ♀, 1 juvenile, 2 km N. of Porcupine Ridge, N. of Daylesford, 37°17′S 144°11′E; QMS34573: 1 ♂, Mt Macedon; SAM N199998: ♀, 1km NW Anakie Junction, Brisbane Ranges, 37°54′S 144°15′E; SAM N199999: ♀, The Gums, Wilsons Prom-

ontory, c. 38°55′S 146°15′E. QUEENSLAND. QMS32713: 1 ♀, Ashgrove, Brisbane, 27°27′S 153°02′E; QMS39538: 1 ♂, 2 ♀, Ayr, 19°34′S 147°27′E; QMS32692: 2 ♀, Bahrs Scrub, 27°45′S 153°10′E; QMS32705: 1 ♀, same data; QMS32700: 1 ♂, Bardon, Brisbane, 27°28′S 152°58′E; QMS32206: 1 ♂, Beerburrum, 26°57′S 152°58′E. *Beerwah Forestry Reserve*, 26°51′S 152°57′E, heath. QMS19569: 1 ♀; QMS32663: 2 juveniles; QMS32668: 1 ♀; QMS32676: 1 ♀; QMS32682: 1 juvenile. QMS27869: 4 juv., Bellenden Ker Ra, Centre Peak Summit, 17°15′S 145°50′E; QMS27870: 1 ♀, 1 juv., same data; QMS27861: same data; QMS27718: 1 ♂, Bellthorpe, 26°51′S 152°42′E, QMS39048: 1 ♂, Blackbutt Ra, base, 26°52′S 152°11′E; QMS32661: 1 ♀, Blackbutt Ra, summit, 5km E Benarkin, 26°52′S 152°11′E; QMS36814: 1 ♀, Boggomoss No 3, 25°26′S 150°00′E; QMS19689: 2 ♂, Bondoola (Stonier), 23°11′S 150°41′E; QMS32000: 1 ♀, Boyne R, H'way Xing, 23°55′S 151°19′E; QMS30691: 1 ♀, same data; QMS32715: 8 juv., Braemar SF, 27°12′S 150°50′E; QMS32741: 1 juv., same data; QMS30729: 1 ♂, Brisbane, Acacia Ridge, 27°28′S 153°02′E, spider bite; QMS32738: 1p juv., Brisbane, The Gap, 28°27′S 153°00′E, Brookfield, Gold Ck Reservoir, 27°29′S 152°55′E. QMS32697: 1 juv.; QMS32704: 1 ♀; QMS32698: 2 juv.; QMS32696: 1 juv.; QMS32703: 2 ♀. QMS32718: 20 juv., Bulburin SF, 24°29′S 151°35′E; QMS25608: 1 ♂, Bushley Stn, 23°31′S 150°14′E; QMS32675: 1 ♀, same data; QMS32689: 1 ♀, Calamvale, Brisbane, 27°37′S 153°02′E; QMS32733: 1 ♂, same data. CAMIRA, 27°37′S 152°55′E. QMS31001: 1 ♂; QMS29680: 1 ♀; QMS25525: 1 ♂; QMS23026: 1 ♀; QMS30596: 1 ♂; QMS30595: 1 ♂; QMS31351: 1 juv.; QMS32699: 1 ♂; QMS32736: 1 ♂; QMS32730: 1 ♂. QMS32742: 1 ♀, Capalaba, Brisbane, 27°31′S 153°11′E; QMS32727: 1 ♀, Carina Heights, Brisbane, 27°28′S 153°00′E; QMS32711: 1 ♀, Carina, Brisbane, 27°29′S 153°05′E; QMS32720: 2 juv., Crediton (7), 21°12′S 148°32′E; QMS25385: 1 ♂, Deepwater NP, 24°31′S 151°58′E; QMS21830: 1 ♀, Eight Mile Ck (NQ 31/2), 18°40′S 144°42′E; QMS22415: 1 ♀, 1 juv., Enoggera, Army Lands, 27°43′S 152°58′E; QMS7062: 1 ♀, Eungella (Schoolhouse), 21°07′S 148°28′E; QMS18856: 1 juv., Eungella NP, 21°11′S 148°30′E. EWAN MADDOCK DAM, 26°47′S 152°58′E. QMS32667: 1 ♀, (site B); QMS32664: 1 juv., (site E) ; QMS32665: 1 ♀, Old homesite (site F) ; QMS32673: 1 ♀, Site E, 26°47′S 152°58′E, heath; QMS32264: 1 juv., Site F; QMS32680: 1 ♀, Site C; QMS32257: 1 juv., Site C. QMS32716: 1 ♂, Forty Mile Scrub SW Mt Garnet, 18°04′S 144°50′E; QMS22154: 1 juv., Frenchville, 23°20′S 150°24′E; QMS4185: 1 ♀, Gatton, 27°34′S 152°16′E; QMS32726: 1 ♀, Goodna, Ipswich, 27°37′S 152°53′E; QMS32723: 1 ♀, Great Dividing Ra., near Teviot Brook; QMS32725: 1 ♂, 1 ♀, Griffith Univ., Brisbane, 27°28′S 153°00′E; QMS32719: 1 ♀, Jindalee, Brisbane, 27°31′S 152°55′E; QMS32684: 1 juv., Karawatha Forest, 27°37′S 153°05′E; QMS32677: 1 ♂, same data; QMS32695: 1juv., Kroombit Tops, 24°22′S 151°01′E. QMS39077: 1 ♀, Lake Broadwater, 27°20′S 151°05′E; QMS39526: 1 ♀, same data but Site 1; QMS39076: 1 ♂, 1 juv., same data but SW track; QMS32671: 1 ♂, Landsborough, 26°48′S 152°58′E; QMS32678: 1 ♀, same data; QMS32734: 8 juv., Malaan SF, 17°35′S 145°35′; QMS32672: 1 ♀, Meikleville Hill, Yeppoon, 23°05′S 150°42′E; QMS32674: 1 juv., same data; QMS32729: 1 ♂, Moreton I, S Eagers Swamp, 27°11′S 153°24′E; QMS32728: 1 ♂, Mt Coolum, 26°34′S 153°05′E, heathland; QMS32737: 3 juv., Mt Coot-tha, Brisbane, 27°29′S 152°57′E; QMS32683: 1 ♀, Mt Halifax, 19°06′S 146°22′E; QMS15981: 1 ♂, Mt Moffatt NP, Dargonelly Rock Holes, 25°01′S 147°57′E; QMS39049: 1 ♀, Mt Nebo, 1/2 way down track in Reserve, 27°23′S 152°47′E; QMS39285: 1 ♂, Mt Spurgeon (trap 4), 16°27′S 145°11′E; QMS22656: 1 ♂, Mt Windsor Tbld, Whypalla SF, 16°12′S 144°58′E; QMS33185: 1 ♀, same data; QMS25542: 1 ♀, N Tamborine, 27°54′S 153°08′E; QMS32670: 1 ♀, Nob Ck, 22°52′S 150°36′E; QMS32002: 1 ♀, North Bell Peak, Malbon Thompson Ra, 17°06′S 145°53′E; QMS39050: 1 ♀, North East I, Percy Is, 21°42′S 150°19′E; QMS32712: 1 ♀, North Stradbroke Is, Pt Lookout, 27°26′S 153°32′E; QMS32666: 1 ♀, Olsen's Caverns, 23°10′S 150°27′E; QMS14113: 1 ♀, Paluma Dam Rd, 18°56′S 146°08′E; QMS39075: 1 ♀, Ravenshoe, 17°36′S 145°28′E. *Rochedale SF*, 27°37′S 153°08′E. QMS32706: 1 ♂;

QMS32702: 3 juv.; QMS32688: 1 ♀; QMS32690: 1 juv.; QMS32708: 1 ♂; QMS32687: 1 ♂, under logs; QMS32707: 1 ♂, 1 juv.; QMS32709: 1 ♀; QMS32710: 1 ♂; QMS32691: 1 ♂, 2 juv.; QMS32693: 1 ♀. QMS19632: 1 ♀, Rockhampton, 23°21′S 150°32′E. *Roedean St, Fig Tree Pkt, Brisbane, 27°28′S 153°00′E, SE.Q.* QMS39051: 1 ♂; QMS32717: 1 ♂; QMS32735: 1 ♂; QMS39529: 1 ♀. QMS32681: 1 juv., Rosslyn Head (DW4), 23°10′S 150°47′E; QMS19587: 1 ♀, same data; QMS32722: 1 ♀, Samford, 27°23′S 152°50′E; QMS32679: 3 juv., South Percy I, Lagoon area, 21°45′S 150°17′E; QMS27561: 1 juv., same data; QMS27494: 2 ♂, same data; QMS27502: 1 ♂, same data. *Taroom District, Boggomoss.* QMS36210: 1 ♂, (No.19), 25°25′S 150°00′E; QMS36352: 1 ♂, 2 ♀, 1 juv., QMS36288: 1 ♂, 1 ♀, (No. 8), 25°27′S 150°02′E, baited flight trap; QMS36672: 1 ♀; QMS36201: 1 ♂, (No. 19), 25°25′S 150°00′E; QMS32724: 1 juv., Teewah Ck, Cooloola, 25°55′S 153°02′E; QMS32714: 2 juv., Teviot Brook, Boonah, 27°54′S 152°33′E; QMS32701: 1 ♀, Upper Kroombit Ck, Kroombit Tops, 24°25′S 151°02′E; QMS39528: 1 ♀, Valette Stn, in Ck Pd, 24°10′S 143°12′E; QMS32686: 1 ♀, Wallaman Falls, 18°36′S 145°47′E; QMS32790: 1 ♂, Wynnum West, Brisbane, 27°28′S 153°00′E; QMS32662: 1 ♂, 1 ♀, Yeppoon, Byfield Rd (DW18), 23°03′S 150°42′E; QMS32685: 1 ♂, Hidden Valley, Yeppoon, 20°56′S 147°11′E; QMS32731: 1 ♂, No locality data; QMS32669: 1 ♂, The Bluff, Keysland, 26°14′S 151°42′E. AMKS 6793: ♂ j, Bulburin SF (Nursery), 24°30′S 151°28′E; AMKS 9163: ♂, Thornton Peak, N of Daintree, 16°10′S 145°22′E; SAM N199995: ♂, Lookout, W of Glasshouse Mountains, c. 26.54′S, 152.57′E; SAM N199994: ♂, Munumburra Fauna Sanctuary, Mt Bauple, c. 25°47′S 152°34′E. NEW SOUTH WALES. AMKS 37440: ♂, London Bridge SF, 3.7km SW Lookout, 29°51′S 152°12′E; AMKS 37425: ♀, 0.5km from Wheatley Ck Rd on Camp Ck Rd, 28°46′S 152°19′E; AMKS 30395: ♂, Kanangra-Boyd NP, Boyd Plateau, 33°43′S 150°25′E; AMKS 7419: ♂, Richmond Ra SF, Jnct Wattle Ck Rd and Wattle Ck, 28°37′S 152°46′E; AMKS 36068: ♂, Richmond Ra SF, Wattle Ck Rd, 28°38′S 152°46′E; QMS39527: 1 ♂, Mt Victoria, 33°34′S 150°14′E; QMS32740: 1 ♀, Hillgrove, 30°34′S 151°53′E; SAM N199996: ♀, Clarence R, Copmanhurst, 29°35′S 152°46′E. TASMANIA. AMKS 30744: ♀ j, Great Lakes, 41°52′S 146°44′E; AMKS 34434: ♂, Ferntree, 42°54′S 147°16′E; AMKS 29025: ♀j, Eaglehawk Neck, 42°00′S 147°55′E; SAM N199997: ♀, George Town, 41°06′S 146°49′E.

Zealoctenus Forster & Wilton 1973

Zealoctenus Forster & Wilton 1973: 295. Type species *Zealoctenus cardronaensis* Forster & Wilton 1973 (holotype female in Otago Museum, Dunedin, examined) by original designation.

Diagnosis.—Eight similarly-sized eyes in two recurved rows, back row strongly recurved; ALE clearly closer to AME than PME or PLE; tapetum grate-shaped. Only 2 claws with true claw tufts. Scopula weak on leg I, strong on tibia to tarsi II, only on metatarsi and tarsi III, IV. Trochanters deeply notched. Two pairs of weak spines on tibiae and metatarsi I, II. Carapace and abdomen hirsute with longitudinal dark stripes. Female epigyne with medial ridge diverging anteriorly into two slightly diagonal ridges. Males unknown.

Included Species.—*Zealoctenus cardronaensis* Forster & Wilton 1973.

Distribution and Habitat.—Known only from Cardrona Valley, New Zealand, where Forster & Wilton (1973) reported them to be found in ''grassland and scrub.''

Remarks.—The female of *Zealoctenus* is virtually indistinguishable from those of the Australian miturgid *Diaprograpta* Simon 1909 which we are revising. The males of the latter have a very diagnostic palp and until males of *Zealoctenus* are known, we simply wish to note that the genera may prove to be synonymous but both are retained at present. The diagnostic feature of Ctenidae is putatively the close juxtaposition of the ALE with either the PME or PLE (see Raven et al. 2001) and that is not the case in *Zealoctenus*.

Family Zoridae F.O.P.-Cambridge 1893

Diagnosis.—Eight eyes in two recurved rows; from front, ALE at same level as AME or higher but clearly closer to AME than ALE. Claw tufts present or absent with no hairs around claws (*Hestimodema*); leg scopula weak or absent. Retrocoxal hymen distinct on I. Males without fracture on pedal tibia, without cymbial scopula, and without unscleroti-

zed region on tibial apophysis. C-shaped tegulum but basal to basolateral embolic origin for half circumference of bulb; single distal median apophysis; conductor short, membraneous. Females with spigots only apical on PMS. Strong and often long paired spines (2–7 pairs) on tibiae I, II, 2–3 pairs on metatarsi I, II.

Included genera (Australian region).—*Argoctenus* L. Koch 1878, *Odomasta* Simon 1909, *Hestimodema* Simon 1909, *Elassoctenus* Simon 1909, *Thasyraea* L. Koch 1878, *Simonus* Ritsema 1881.

Remarks.—Lehtinen (1967) placed *Elassoctenus* into the synonymy of the *Diallomus* Simon 1897 which he had transferred from the Ctenidae. Davies (pers. comm.) had examined the type species of both genera and found that, contrary to Lehtinen (1967), that *Elassoctenus* is a valid genus as it was listed (Davies 1985: 124). We also examined that material and concur on *Elassoctenus* and note that *Diallomus fuliginosus* Simon 1897 is a ctenid (from above and in front the ALE are beside the PME, the ctenid condition) whereas in *Elassoctenus harpax* Simon 1909 and other congeners the ALE are clearly below the PME from in front and lie anterior to them when viewed from above.

Argoctenus L. Koch 1878

Argoctenus L. Koch 1878: 990; Simon 1897: 123; Roewer 1954: 636; Davies 1985: 123. Type species *Argoctenus igneus* L. Koch 1878 (type specimen not located in ZMB, ZMH, BMNH, RMS or NHMW) by subsequent designation of Simon 1892: 132.

Aenigma Karsch 1878: 825: Bonnet 1955: 176. Type species *Aenigma australiana* Karsch 1878 (holotype female in ZMB, examined) by monotypy.

Aenigmaaranea Strand 1929: 11. Replacement name for *Aenigma* Karsch 1878 preoccupied in the Coleoptera (Newman 1836) Mollusca (Koch 1846) and Lepidoptera (Strecker 1876). First synonymized by Davies 1985: 123.

Aenigmaranea: Bonnet 1955: 176. Invalid emendation.

Miturgina Simon 1889: 244. Type species *Miturgina vittata* Simon 1889 (holotype juvenile female, in MNHP, examined). First synonymized by Simon 1897: 132.

Horioctenoides Main 1954: 42; Forster & Wilton 1973: 293; Davies 1985: 124. Type species *Horioctenoides bidentatatus* Main 1954 (holotype subadult female in WAM, examined) by monotypy. NEW SYNONYMY.

Nemoctenus Forster & Wilton 1973: 290. Type species *Argoctenus aureus* Hogg 1911 (holotype female in BMNH, examined) by original designation. NEW SYNONYMY.

Diagnosis.—Two claws and true claw tufts. Eyes of front row clearly smaller than those of back row; from above and in front, front row clearly recurved; from above back row strongly recurved; ALE small, from front upper edges not higher than lower edges of PME. 3–7 pairs of strong spines ventrally on tibiae I, II. Retrocoxal hymen present; pretarsal fracture absent; trochanters deeply notched. Strong paired spines on tibiae (2–7 pairs) and metatarsi (2 pairs) I, II. Scopula absent. Six spinnerets: ALS two segmented, coniform with domed tip; PLS with short domed apical segment. Male palp with RTA; cymbium often with retrolateral groove. Male palp with elongate RTA often with translucent vanes in three planes; cymbium boat-shaped, tapering to apical cone without dorsal scopula but most species with cluster of thick setae apically; cymbium commonly with deep retrolateral groove. C-shaped prolateral tegulum; median apophysis short, sinuous, base triangular narrows quickly, apex acuminate twisted, embolus long curved.

Distribution.—Australia, New Zealand and New Caledonia.

Remarks.—The type of *Horioctenoides bidentatus* is a subadult female and until adult material from the type locality is located its identity cannot be certain. However, only one large *Argoctenus* with the characteristic bell-shape on the abdomen is known from the region and it differs from the New Zealand *Argoctenus aureus* only in the lobes on the tibial apophysis.

ACKNOWLEDGMENTS

This work was produced with generous support from Australian Biological Resources Study grant (1996–8) to RJR. Grateful thanks for comfortable access to collections and loans by Dr. Jürgen Gruber, Naturhistorisches Museum, Vienna, Dr. Mark Harvey, Western Australian Museum (WAM), Perth, Mr. David Hirst, South Australian Museum (SAM), Adelaide, Dr. M. Gray and Mr. G. Milledge, Australian Museum (AMS), Sydney, Dr. Charles Griswold, California Academy of Science

(CAS), San Francisco, Mr. Paul Hillyard, Natural History Museum (London), Ms. Lisa Boutin (Queen Victoria Museum, Launceston, Tasmania). Hospitality was generously provided by Drs. Mark Harvey, Tracey Churchill, Norman Platnick, Hilke Ruhberg, Lyn and the late Ray Forster, Mark Judson, Jason Dunlop, Hieronymous Dastych, the late Jacqueline Heurtault; Mr. John Murphy not only provided hospitality and company but also gave access to his remarkable collection. We are very grateful to Mrs. Helen Stark for her patience and perseverance in accurate rendition of Figures 2–6.

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Manuscript received 13 August 2001, revised 1 August 2002.