

THE PHOLCIDS OF AUSTRALIA
(ARANEAE; PHOLCIDAE):
TAXONOMY, BIOGEOGRAPHY, AND
RELATIONSHIPS

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ABSTRACT

The pholcid spiders of Australia are revised. Only seven autochthonous genera are recognized: (1) *Wugigarra*, new genus, includes the Australian species previously assigned to *Psilochorus* Simon. This genus is largely restricted to eastern Australia. With 22 described species (20 of them new) and about 40 undescribed species in Australian collections, it is probably the most diverse genus on the continent. (2) *Trichocyclus* Simon is the dominant or only pholcid genus in most areas of Western and South Australia and the Northern Territory; 23 species are described, 20 of them new. (3) *Micromerys* Bradley is restricted to the tropical and subtropical areas of Queensland and Northern Territory; 7 species are described, 5 of them new. (4) *Pholcus* Walckenaer has within Australia the same distribution as does *Micromerys*; 4 autochthonous species are described, all new. *Pholcus litoralis* Koch is newly synonymized with *P. phalangioides* (Fuesslin). (5) *Panjange* Deeleman-Reinhold and Deeleman is represented by a single, previously described species in northern Queensland. (6) *Spermophora* is restricted to northeastern Queensland; 2 species are described, both new. (7) *Belisana* Thorell with a single new species in the tropical north of Queensland and Northern Territory. Nine pholcid species are introduced, some of them occurring throughout the continent. They are included in a key.

A numerical cladistic analysis is performed using a matrix of 71 taxa (10 of them Australian) and 65 characters. This analysis suggests that the two highly diverse genera (*Wugigarra*, *Trichocyclus*) are most closely related to New World, African, and Middle Eastern genera. All other genera are included in the *Pholcus* group sensu Huber. It is argued that these are probably new tropical elements, having entered Australia from the north probably not earlier than the Pleistocene, while *Wugigarra* and *Trichocyclus* are relicts of Gondwanaland, with their presence in Australia dating back to the Mesozoic.

INTRODUCTION

When this project was started, it had a much wider scope, covering at least Australian and southeast Asian pholcids. Of these two areas, Australia seemed incomparably easier to do, with just 14 species recorded, five of which were synanthropic cosmopolitan or cosmotropical species. However, when the four major loans of specimens arrived from Australia, totaling about 1800 specimens in 1100 vials, it soon became clear that I could either just touch the surface of the Australian fauna in order to keep up the original scope, or rather do Australia more thoroughly and drop southeast Asia. The question was actually decided by the unfortunate fact that the first major southeast Asian collection arrived too late to be substantially included.

Most Australian pholcids previously described were collected by European expeditions or private European collectors. Time constraints and other factors probably explain why only a few specimens of pholcids were thus collected. Australian collections have been included only recently (Deeleman-Reinhold, 1986b, 1993), but a more thorough

study of these collections has never been attempted. Any such earlier attempt would have been confronted with significantly fewer specimens, because most material in the Australian collections is quite new; that is, almost 70% of the specimens studied were collected after 1980.

Thus, the history of our knowledge of the family in Australia is quickly outlined. The first contributors were Koch (1867, 1872), Bradley (1877), and Simon (1908). Koch described one valid species (*Pholcus sphaeroides*, now *Wugigarra* s.) and created a synonym of *Pholcus phalangioides* (*P. litoralis*); Bradley described *Micromerys gracilis*, correctly creating a new genus; and for Simon, a couple of females of *Trichocyclus nigropunctatus* were enough to recognize that they belonged to a new genus. These pioneers were followed by a dormant phase of about 80 years, in which only a few records for introduced species like *Pholcus phalangioides* were added (e.g., Rainbow, 1911). Finally, a series of papers by Deeleman-Reinhold (1986b, 1993, 1995) increased the number of autochthonous species to nine, adding *Panjange* as a fourth genus.

MATERIALS AND METHODS

This work is based almost entirely on the material of four Australian institutions (AMS, QMB, SAM, WAM below). Only a few specimens (e.g., types) were studied from the other institutions listed. Further Australian collections (e.g., Melbourne, Canberra, Darwin) may contain important material but could not be incorporated because of time constraints.

AMNH	American Museum of Natural History, New York
AMS	Australian Museum, Sydney
CLD	Collection C. L. Deeleman-Reinhold, Ossendrecht, Netherlands
MNHN	Muséum National d'Histoire Naturelle, Paris
QMB	Queensland Museum, Brisbane
SAM	South Australia Museum, Adelaide
USNM	National Museum of Natural History, Washington
WAM	Western Australian Museum, Perth
ZMH	Zoologisches Museum, Hamburg

The methods used are described in Huber (2000). Eye measurements are $\pm 5 \mu\text{m}$. All photos were done on a Hitachi S-4700 cold-emission SEM. Localities are first ordered by territories and then roughly by their proximity to the type locality. Cladogram analysis was done with Clados, version 1.2 (Nixon, 1992), and Winclada, version 0.9.9 + (Nixon, 1999).

RELATIONSHIPS

The possible phylogenetic relationships of Australian genera were studied by simply adding several Australian species to the matrix in Huber (2000), and then submitting it to cladistic analysis. To the 61 taxa in Huber (2000), the following ten taxa were added:

62. *Trichocyclus arabana*, n. sp.: Western Australia, Canning Stock Rte, Well 25 (WAM)
63. *Trichocyclus nigropunctatus* Simon: Western Australia, Woodleigh Station (WAM)
64. *Wugigarra kaurna*, n. sp.: South Australia, Bunyeroo Gorge (SAM)
65. *Wugigarra sphaeroides* (Koch): Queensland, Homevale (QMB)
66. *Wugigarra bujundji*, n. sp.: Queensland, Home Rule (QMB)

67. *Micromerys gracilis* Bradley: Northern Territory, Radon Ck. (QMB)
68. *Micromerys daviesae* Deeleman-Reinhold: Queensland, Rundle Range (QMB)
69. *Panjange mirabilis* Deeleman-Reinhold: Queensland, Iron Range (QMB)
70. *Spermophora yao*, n. sp.: Queensland, Iron Range (QMB)
71. *Belisana australis*, n. sp.: Northern Territory, East and West Alligator (QMB)

To the 61 characters in Huber (2000), the following four characters were added:

Character 62. "Worm-shaped" projection on genital bulb: (0) absent; (1) present. This refers to a characteristic, more or less cylindrical, membranous projection distally on the bulb in most *Wugigarra* species (unshafted arrows in figs. 24, 64, 112, 157). This structure is either a synapomorphy of the genus with one or more reversals, or it is the synapomorphy of only the core group of *Wugigarra* (groups 1–3 under Specific Relationships, p. 12).

Character 63. Weak zone on male palpal cymbium: (0) absent; (1) present. This refers to a light (probably weakly sclerotized) zone dorsally on the male palpal cymbium (asterisks in figs. 201, 248, 265). This character is the proposed synapomorphy of *Trichocyclus*, and it is present in all species seen, except in one species assigned tentatively (*T. watta*). It is also present in *Aucana kaala* Huber, a ninetine from New Caledonia, and possibly also in *Holocneminus*.

Character 64. "Spermophora flap": (0) absent; (1) present. This refers to a short flap originating at about the middle of the procursus ventrally ("f" in figs. 396, 410). This flap is here interpreted as not homologous to the ventral hinged process of *Micromerys* and *Metagonia*, because it is much shorter, apparently not hinged, and it is positioned more vertically relative to the procursus (rather than parallel). As the name implies, this character seems to be restricted to *Spermophora* or a subgroup of *Spermophora*. It occurs both in the type species and in the two species newly described. It occurs also in several undescribed species from Kalimantan (Borneo), Sulawesi, Banda Islands (Moluccas), Sumatra, Philippines, and Sri Lanka (all in collection CLD).

Character 65. Posterior pocket or pockets on female opisthosoma: (0) absent; (1) present. This character is here interpreted as synapomorphy of *Spermophora*. Both newly described species have a median pocket between the epigynum and the spinnerets ("p" in figs. 399, 412; arrow in fig. 401). The type species, *S. senoculata*, has paired pockets that are situated on both sides of the spin-

nerets. In this species, the long, hooked apophyses on the male genital bulbs are inserted into these pockets during copulation (personal obs.). Presumably, the hooked apophyses in other species (e.g., "h" in fig. 396) serve the same function, but only in *S. senoculata* are the apophyses so long that the pocket has to be split up and positioned on both sides of the spinnerets. A median pocket occurs also in several undescribed species from Bali, Lombok and Sumbawa (Sunda Islands), Java, Philippines, and Papua New Guinea (all in collection CLD).

Instead of reproducing the entire matrix from Huber (2000), I give only the coding of characters for the new taxa (appendix 1). The coding of the four new characters for the "old" taxa follows logically from what is said above: character 62, state (0) for all taxa; character 63, state (0) for all taxa; characters 64 and 65, state (0) for all taxa except *Spermophora senoculata*. Apart from that, I have changed only one coding: character 17 (knob-shaped apophysis on epigynum) in *Spermophora senoculata* was coded as present in Huber (2000), but is now coded as absent. *Spermophora senoculata* has either an extremely poorly developed, almost invisible knob or no knob at all. Only the study of closely related congeners might bring a satisfying solution to this point.

RESULTS AND DISCUSSION

The basic topologies obtained by NONA (version 1.8; Goloboff, 1993) and Hennig86 (version 1.5; Farris, 1988) with equally weighted characters were very similar to those obtained in the previous analysis without Australian taxa (Huber, 2000). This similarity included both the major clades, as well as the ambiguity with respect to their interrelationships. As the worldwide cladogram seems thus not essentially improved, and the focus of this paper is rather the Australian fauna and its relationships, I only deal briefly with the overall topologies and concentrate more on the positions of the Australian genera.

Using NONA with hold/50, mult*100, and amb- resulted in 81 most parsimonious cladograms of length 180 (CI = 38; RI = 77). Using the same criteria for tree selection as in Huber (2000) (preference of AME loss versus gain, of epiandrous spigot loss versus

gain, of ALS piriform gland spigot loss versus gain, and of pseudosegmentation loss versus gain) left eight cladograms that differed only with respect to the New World clade, and only with respect to non-Australian taxa. One of these cladograms is shown in appendix 2. However, no single cladogram satisfied all constraining criteria above. For example, in all cladograms the AME were lost in the *Pholcus* group but were regained in *Pholcus* and its closest relatives (clade 71 in appendix 2). Moreover, in the cladogram shown, the epiandrous spigots are lost in clade 135 (i.e., in the ancestor of holocnemines [clade 100] + New World clade [clade 134]), but are regained in *Artema* + the *Holocnemus* group. Independent gains of these characters are possible theoretically, but a slightly longer cladogram with only independent losses would probably come closer to a phylogenetic tree than does the most parsimonious cladogram.

The groups consistently found in all topologies were (1) the *Pholcus* group sensu Huber, 1995 (clade 78), including most of the genera present in Australia (*Pholcus*, *Panjange*, *Spermophora*, *Micromerys*, and *Belisana*); (2) *Metagonia*, an exclusively New World genus (clade 81); (3) ninetines (clade 90), a group with worldwide distribution, but without Australian representatives known; and (4) the New World clade (clade 134), including the Australian genus *Wugigarra* (see discussion below).

The only other Australian genus, *Trichocyclus*, is included in holocnemines (clade 100: *Holocnemus* group sensu Timm, 1976 + *Artema*, *Physocyclus*, *Priscula*, and *Trichocyclus*) in the cladogram in appendix 2. However, holocnemines were not consistently resolved as a monophyletic group, but in some topologies they were paraphyletic, with the *Holocnemus* group branching off first, then *Artema*, then *Trichocyclus* + *Physocyclus*, and finally *Priscula* as sister group of the New World clade. These topologies were neither obviously better nor worse with respect to the constraints mentioned above.

Using Hennig86 with **mh*** and **bb*** resulted in many more most parsimonious cladograms with the same statistics, overflowing the tree buffer at 895 cladograms. The groups consistently found were the same

as above, with the same ambiguity with respect to holocnemines and the same relationships of Australian genera.

In addition to the analyses using equally weighted characters, two types of weighting were employed: implied weighting using Pee-Wee (version 2.8; Goloboff, 1997), and successive weighting using Hennig86 and NONA. Successive weighting resulted in 69 (Hennig86) and nine (NONA) most parsimonious cladograms, but these were too obviously much farther away from the true phylogeny to merit much attention. For example, they required four to five (Hennig86) or two (NONA) independent gains of AME, and they nested ninetines within the New World clade, requiring the independent gain of ALS piriform gland spigots and epiandrous spigots in ninetines. However, some of the groups found using equally weighted characters were also found using successive weighting; that is, the *Pholcus* group, *Metagonia*, the *Holocnemus* group, and ninetines. Holocnemines were always paraphyletic, as was the New World clade.

Implied weighting with Pee-Wee resulted in similarly unacceptable cladograms at most settings of the concavity (conc) constant. For example, at conc = 1, 2, and 6, the absence of epiandrous spigots and AME was primitive for pholcids. Instead, the presence of both characters is presumably the primitive condition in haplogynes. At conc = 3, 5, and 6, ninetines were nested within the New World clade, requiring the independent gain of ALS piriform gland spigots and epiandrous spigots in ninetines. However, using conc = 4 with hold/50 and mult*100 resulted in 43 most parsimonious cladograms of length 184 (CI = 37; RI = 76), which failed only at one of the constraining criteria above: AME were regained in *Pholcus* and its closest relatives, as in the analyses using equally weighted characters above. The only major variation among these 43 cladograms concerned the basal polytomy of clade 131 in appendix 3, including *Wugigarra* and the (paraphyletic) New World clade. It was either a tetratomy (as shown in appendix 3) or a trichotomy, with any of the three minor clades being the sister group of the large clade (clade 114). All other variation was within this latter clade and is not relevant in

the present context. The only notable and possibly significant difference from the NONA cladogram in appendix 2 is that *Metagonia* is nested within a paraphyletic *Pholcus* group (clade 82), as sister taxon of *Micromerys*, supported by the hinged process on the procursus and the narrow sternum (clade 78). The position of *Trichocyclus* as sister group of ninetines is dubious and weakly supported; that is, by the narrow opening of the capsulate tarsal organ (coding ambiguous) and the presence of stridulation on the male chelicerae (present also in several holocnemines). Also, the sister group relationship of this clade with holocnemines, resulting in clade 100, is not convincing. It is based on the pointed cheliceral lamina, a character that is difficult to code and that within ninetines is restricted to *Ibityporanga*.

The results confirm the inclusion of most Australian genera in the *Pholcus* group (as proposed in Huber, 1995), but unfortunately they fall short of providing a convincing hypothesis about the relationships of the two dominant genera, *Trichocyclus* and *Wugigarra*. Only the following can be said with some confidence: *Trichocyclus* is probably most closely related to several genera that together have a worldwide distribution, including *Physocyclus* in Central and North America, *Smeringopus* in Africa, and *Holocnemus*, *Hoplopholcus*, *Crossopriza*, and *Artema* in northern Africa and the Middle East, and possibly also *Priscula* in South America. These genera share a brush of hairlike structures distally on the procursus (not clearly present in the *Holocnemus* group), a tendency to reduce the pseudosegmentation of the tarsi (not in *Trichocyclus*), and narrowly pointed cheliceral laminae. It is notable that these genera share some morphological and ecological characters that were not included in the matrix: all include mostly large pholcids (some *Artema*, *Physocyclus*, and *Priscula* species are probably the largest pholcids), and most have the unusual tendency to be widespread in dry rather than in tropical humid life zones (this is particularly true for *Trichocyclus*, *Physocyclus*, *Holocnemus*, *Hoplopholcus*, *Crossopriza*, and *Artema*).

More puzzling is the position of *Wugigarra*. The inclusion within, or proximity to, the

New World clade rests on a few characters, none of them convincing; that is, the absence of ALS piriform gland spigots (these have been reduced at least five times independently within pholcids; see Huber, 2000) and the exposed tarsal organ (the rim of the cup-shaped tarsal organ has been reduced at least three times independently; see Huber, 2000). Moreover, *Wugigarra* does not share with other New World clade genera the distinct retrolateral apophysis on the male palpal coxa, and it would be the only representative in the New World clade to have cheliceral stridulation. Note that in the analyses using weighted characters, *Wugigarra* was not consistently included in the New World clade but was either sister group to the New World clade (which included ninetines, as mentioned above) or had its origin in the same polytomy as New World taxa. Thus, although the exact relationships definitely remain obscure, there seems to be some affinity with New World genera, and it is not without reason that previous authors included representatives of *Wugigarra* in the New World genus *Psilochorus*.

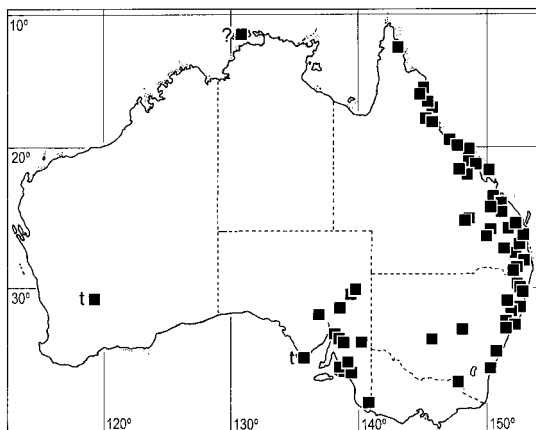
Apart from this apparent relationship with New World genera in general, *Wugigarra* has a pair of characters that seem to place it close to three genera of holocnemines (*Physocyclus*, *Trichocyclus*, and *Artema*): the dorsal apophysis on the procursus, coupled with a ventral pouch on the same structure. *Physocyclus globosus* is the only species of all these genera in which the very peculiar function of these characters has been established (Huber and Eberhard, 1997): they lock the procursi together during copulation, fitting the apophysis of one procursus into the pouch of the other one. This results in asymmetrical insertion of the procursi, while all other pholcids studied have symmetrical insertion. The respective structures in *Wugigarra*, *Trichocyclus*, and *Artema* are suspiciously similar, and my prediction is that *Wugigarra* will eventually fall closer to these genera than to the New World clade. Note, however, that the affinity of *Wugigarra* to New World taxa might remain intact, as *Physocyclus* is a New World genus.

BIOGEOGRAPHY

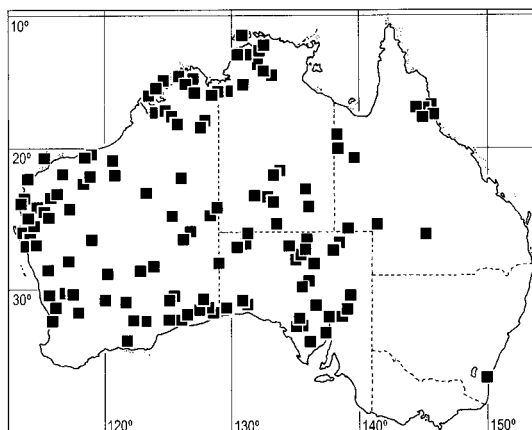
Australian pholcid genera and species show one of four distributions: (1) Most syn-

anthropic species seem to occur over the whole continent. Some may actually be more common in the tropical and subtropical areas in the north, but I have not studied the distributions of synanthropic species and will not refer to them further. (2) *Wugigarra* (map 1) is extremely species rich in the east, ranging from Cape York Peninsula in northern Queensland to Eyre Peninsula in South Australia. The apparent distributional gap in Victoria and southern New South Wales is probably artificial, resulting in part from biases in the collections studied and in part from the fact that these are among the areas with the highest habitat disturbance in Australia (Nix, 1981). Note, however, the absence of the genus in the Northern Territory (with the exception of one doubtful record). (3) *Trichocyclus* (map 2) covers the entire west of the continent, with gaps only in the driest deserts (Tanami Desert, Great Sandy Desert, Great Victoria Desert). The apparent gap in Arnhem Land is certainly artificial, while the gap in the far southwest may be real; that is, extensive collections in this region have produced no native pholcids (Mark Harvey, personal commun.). Most interesting is the near absence of the genus in the east. *Trichocyclus pustulatus* in the Cairns area is a notable exception, and more eastern localities will probably be added in the future, but the contrast with the distribution of *Wugigarra* is striking. (4) The genera of the *Pholcus* group (*Pholcus*, *Spermophora*, *Panjange*, *Micromerys*, *Belisana*) all have a northern and north-eastern distribution, as is exemplified in map 3 for *Micromerys*. Most of them do not reach farther south than the Cairns area, and *Panjange* seems to be restricted to the Cape York Peninsula.

What are the reasons for these distinct distributions? Both historical and contemporary factors are probably involved, and teasing apart their respective importance would depend (1) on a more detailed knowledge of the southeast Asian fauna from which several of the Australian genera seem to originate, and (2) on a more or less stable hypothesis for the phylogenetic relationships of the taxa involved. The following can be said with some confidence. First, the genera of the *Pholcus* group all seem to originate from the north, having entered either via New Guinea



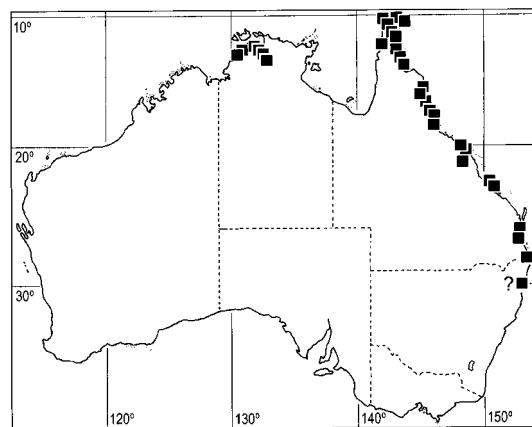
Map 1. Distribution of the genus *Wugigarra* in Australia. This map includes both described and undescribed species, as well as unidentified female specimens in the collections studied. t = assigned tentatively; ? = doubtful locality.



Map 2. Distribution of the genus *Trichocylus*. This map includes both the described species treated herein, as well as unidentified female specimens in the collections studied.

or the Sunda Islands. This occurred probably not earlier than the Pleistocene when sea levels were repeatedly significantly lower. At this time, Australia was broadly connected to New Guinea, and the Sunda and Sahul shelves greatly facilitated dispersal over Malaya (Malaya, Borneo, Sumatra, Java) (Keast, 1981b). This northern origin is most certainly true for *Panjange*, a genus that is so far only known from the Philippines, Borneo, Celebes, and New Guinea (Deeleman-Reinhold, 1986a: map 5). It is also probably true for *Belisana* and *Spermophora*, both of which are exclusively Old World genera with wide distributions (not counting the synanthropic *S. senoculata*), and in Australia these genera are restricted to the tropical north. Not so clear is the situation with *Pholcus*. *Pholcus* is primarily an Old World genus, but the presence of various (undescribed) *Pholcus* species in caves of the eastern United States (R. Baptista, personal commun.) points to the possibility that *Pholcus* might be a pangaean genus dating back to at least the Jurassic, and Australian representatives might rather be pre-Eocene relicts than more recent northern intrusions. The scant data, however, suggest that Australian *Pholcus* species (at least *P. tagoman*) are most closely related to southeast Asian species, which would rather hint to a post-Miocene intrusion. Similar prob-

lems occur with respect to the origin and age of *Micromerys*. *Micromerys* is apparently a purely Australian genus, but the cladistic analysis was not clearcut with respect to its sister taxon. While it is most probably part of the *Pholcus* group in the original sense (i.e., excluding *Metagonia*), the possibility that it is the sister taxon of the New World genus *Metagonia* cannot be definitely dismissed. If this turns out to be the case, then *Micromerys* would also be a relict Mesozoic



Map 3. Distribution of the genus *Micromerys* in Australia. This map includes both the described species treated herein, as well as unidentified female and juvenile specimens in the collections studied. ? = doubtful locality.

element in Australia, rather than a Pleistocene new tropical element.

The two large Australian genera (*Trichocyclus*, *Wugigarra*), on the other hand, are probably old (pre-Eocene) elements. Their closest relatives, even though not definitely resolved (see Relationships above), seem to be genera from the New World (*Physocyclus*, *Priscula*), Africa (*Smeringopus*), and the Middle Eastern–North African–Mediterranean region (*Crossopriza*, *Artema*, *Holocnemus*, *Hoplopholcus*). *Holocneminus*, a southeast Asian genus, probably belongs in this group too. The striking east–west separation of *Trichocyclus* and *Wugigarra* (maps 1, 2) may in part reflect ecological differences, but historical factors seem to play the major role. If *Wugigarra* were restricted geographically just for ecological and contemporaneous climatic reasons, then it might be expected to occur at least in caves of the west and in typical refuge areas like tropical Kimberley and the Northern Territory, as well as in the far southwest (e.g., Stirling Ranges). This is apparently not the case, however, and the real reason might rather be the marine subdivision of the continent in the Cretaceous. At that time, extensive inroads of the sea in the area of what is now the Great Artesian Basin separated the continent into a western and an eastern part (Brown et al., 1968), with a connection remaining only in the south (which was still connected to Antarctica). This suggests a Cretaceous origin or first major radiation, with subsequent speciation facilitated by the climatic fluctuations in the Pleistocene. During this period, vegetation belts repeatedly expanded and contracted, suggesting repeated creation of isolates along the Eastern Highlands after their creation in the Miocene (Keast, 1981a).

A similar argument seems to apply to *Trichocyclus*, with the exception that the comparatively more uniform western part of Australia offered less opportunities for speciation and differentiation. This would explain the comparative uniformity of the genus with respect to morphology. With the exception of the species in the tropical North (Kimberley, northern Northern Territory), most representatives are quite similar.

In sum, the present state of knowledge suggests that autochthonous Australian phol-

cids have two origins: they are either relicts of Gondwanaland, with their presence in Australia dating back to the Mesozoic (*Trichocyclus*, *Wugigarra*), or they are new tropical elements having entered Australia from the north, probably not earlier than the Pleistocene.

KEY TO THE PHOLCIDS OF AUSTRALIA

This key is primarily designed to work well if males are available, but in most cases a female is sufficient. In several cases the key goes down to species level. Because all described autochthonous Australian species are treated in this paper, I found it preferable in the other cases to end this key at the genus level and to refer for further determination to the descriptive section. At this level, comparing illustrations and distributions is probably a quicker and more reliable way to identify species.

1. Six eyes; AME missing or reduced to pigment specks 2
- Eight eyes; AME always fully developed (with lenses) 7
- 2(1). Opisthosoma roughly globular or higher than long 3
- Opisthosoma at least three times longer than high 6
- 3(2). Eyes on high eye turret; male clypeus with frontal cuticular lobe; introduced *Modisimus culicinus*
- Eyes not elevated or only slightly so 4
- 4(3). Distance between posterior median eyes (PME) more than three times their diameter; northeastern Queensland *Spermophora*
- Distance between PME less than two times diameter of PME 5
- 5(4). Male chelicerae with one pair of pointed distal apophyses and proximolateral apophyses (fig. 423); male palpal trochanter with long apophysis (fig. 419); epigynum with scape (fig. 424) *Belisana australis*
- Male chelicerae with several apophyses on each side, without proximolateral apophyses (fig. 288); male palpal trochanter without apophysis (fig. 292); epigynum without scape (fig. 289) *Trichocyclus watta*
- 6(2). Male genital bulb with only one projection (e.g., figs. 302, 316); opisthosoma worm-shaped (length >10× diameter);

- male chelicerae with only one pair of rounded light apophyses laterally (fig. 299); epigynum without scape
- *Micromerys*
- Male genital bulb with two very long projections (“a” and “e” in fig. 385); opisthosoma length $\sim 5 \times$ diameter medially; opisthosoma drawn out into point dorsoposteriorly (fig. 378); male chelicerae with only one pair of pointed light apophyses laterally (fig. 380); epigynum with long scape (fig. 382)
- *Panjange mirabilis*
- Male genital bulb with three projections (“u”, “e”, and “a” in fig. 372); opisthosoma length $\sim 3-4 \times$ diameter medially, not drawn out into point dorsoposteriorly (fig. 363); male chelicerae with one pair of rounded light apophyses laterally and dark frontal apophyses medially (fig. 369)
- *Pholcus tagoman*
- 7(1). Opisthosoma roughly globular or higher than long 8
- Opisthosoma at least three times longer than high 14
- 8(7). Procursus with long dorsal hinged process; male chelicerae with proximolateral light apophyses; pale, small pholcid ($\sim 1-1.5$ mm total length); introduced *Micropholcus fauroti*
- Procursus without dorsal hinged process; male chelicerae without proximolateral light apophyses; with dark markings, rarely under 2 mm total length 9
- 9(8). Genital bulb with worm-shaped projection ventrodistally (unshafted arrows in figs. 24, 64, 106); epigynum often with median pocket (e.g., figs. 26, 46, 66, 89) *Wugigarra* (part)
- Genital bulb without worm-shaped projection ventrodistally; epigynum never with median pocket 10
- 10(9). Male palpal cymbium with weak (light) area dorsally (asterisks in figs. 201, 248, 265); male chelicerae without or with only one pair of cone-shaped projections frontally; epigynum usually with rounded median elevation frontally *Trichocyclus* (part)
- Male palpal cymbium without weak (light) area dorsally; male chelicerae with two or more pairs of cone-shaped projections frontally 11
- 11(10). Conical projections on male chelicerae are modified hairs; male chelicerae without stridulatory ridges laterally; epigynum with a pair of dark humps frontally; introduced
- *Artema atlanta*
- Conical projections on male chelicerae are apophyses; male chelicerae with stridulatory ridges laterally 12
- 12(11). Male palpal femur with ventral apophysis (arrows in figs. 160, 167, 171); females unknown; only in Cairns area . . . *Wugigarra (idi, burgul, wanjuru)*
- Male palpal femur without ventral apophysis 13
- 13(12). Male chelicerae with only two to three pairs of apophyses frontally (figs. 175, 185); male palpal femur only slightly widened distally (figs. 176, 182) . . . *Wugigarra (nauo, kalamai)*
- Male chelicerae with four or more pairs of apophyses frontally; male palpal femur inflated; female carapace with median cone posteriorly; epigynum with forked apophysis frontally; introduced *Physocyclus globosus*
- 14(7). Male chelicerae with proximolateral light apophyses (*Pholcus*) 15
- Male chelicerae without proximolateral apophyses 16
- 15(14). Bulbal uncus wide, palpal trochanter apophysis short; epigynum with distinct “knob” frontally; introduced *Pholcus phalangioides*
- Bulbal uncus narrow (figs. 342, 358); palpal trochanter apophysis very long (fig. 343); epigynum with tiny or hidden knob posteriorly (arrows in figs. 347, 348, 357, 361, 362); only Queensland *Pholcus* (part)
- 16(14). Male chelicerae with two pairs of apophyses frontally; opisthosoma pointed posteriodorsally; introduced *Crossopriza lyoni*
- Male chelicerae with one pair of apophyses frontally; opisthosoma rounded posteriodorsally 17
- 17(16). Male femur 1 with spines ventrally; male and female chelicerae with stridulatory ridges; female palp enlarged; introduced *Holocnemus pluchei*
- Male femur 1 without spines ventrally; male and female chelicerae without stridulatory ridges; female palp not enlarged 18
- 18(17). Genital bulb with two apophyses (figs. 434, 435); epigynum as in fig. 436; introduced . . . *Smeringopus pallidus*
- Genital bulb with three apophyses (figs. 432, 433); epigynum as in fig. 437; introduced . . . *Smeringopus natalensis*

TAXONOMY

WUGIGARRA, NEW GENUS

TYPE SPECIES: *Wugigarra tjapukai*, new species.

ETYMOLOGY: The genus name is composed of two words in Yidini, the aboriginal language of the Cairns-Yarrabah region: *wugi*, to shake, and *garra*, spider. It refers to the shaking or whirling movements many pholcids (including representatives of this genus) make when disturbed. Gender feminine.

DIAGNOSIS: Small- to medium-sized (total length usually ~2–5 mm), pholcids with globular or higher-than-long opisthosoma, mostly with small AME (AME diameter usually 50–80% of PME diameter, in some species up to 90%; in *kalamai*, 110%), apparently restricted to Australia or the Australian region. Distinguished from *Trichocyclus* (which is the only similar genus in Australia) by the absence of a weak zone dorsally on the male cymbium; by the presence of a characteristic worm-shaped process on the bulb (unshafted arrows in figs. 24, 64, 96; missing only in some species that are assigned tentatively to this genus, see below); by the presence of curved hairs on the legs; by the presence of only two spigots on the ALS (~8–9 in *Trichocyclus*); by the presence of stridulatory files in females; and by the epigynum that is often provided with a median pocket (e.g., figs. 26, 46, 76).

DESCRIPTION: Total length in males usually ~2–4 mm; only *W. kaurna* up to 5 mm, in *W. burgul* and *wanjuru* only ~1.5 mm. Carapace oval, wider than long, with distinct thoracic groove, often with median and lateral dark bands (e.g., figs. 3, 70), only in *W. kaurna* with three pairs of lateral spots loosely connected to median spot by radial marks (fig. 18), as in most *Trichocyclus* species. Eight eyes in conservative pattern, on moderately elevated ocular area. AME diameter ~30–90% of PME diameter (in *W. kalamai* 110%). Distance PME-ALE usually ~40–80% of PME diameter, in *W. arcoona* only 25%, in *W. eberhardi* 100%. Clypeus usually unmodified (slightly modified in *W. tjapukai* and *mamu*: figs. 2–4; and in *W. bulburin*: fig. 91). Male chelicerae always with stridulatory ridges, otherwise extremely variable: often with pair of pointed apophyses near median

line (e.g., figs. 5, 21, 33, 51, 79), sometimes with large humps (figs. 34, 60, 124), modified hairs (fig. 101), small cones (figs. 110, 134), or almost unmodified (figs. 115, 143). Male palps moderately to extremely large in relation to overall size (e.g., figs. 1, 68, 158); coxa without retrolateral apophysis, trochanter without apophyses, femur slightly to conspicuously enlarged (e.g., fig. 111), with retrolateral hump proximally, usually without ventral apophyses (*W. bujundji*, *wunderlichi*, and *wulpura* with large medioventral apophysis: fig. 131; *W. idi*, *burgul*, and *wanjuru* with small distal apophysis: figs. 160, 167, 171); trochanter triangular in lateral view; tibia simple, with 2 trichobothria in very proximal position (e.g., figs. 35, 61, 111, 171); cymbium with relatively simple procurus that is usually provided with dorsal apophysis and ventral pocket (“a” and “p” in figs. 7, 61, 71, 103; apophysis always distinct, pocket often hardly recognizable), distally with membranous fringes, sometimes also with hairlike structures (e.g., fig. 47); bulb consisting of proximal globular part and distal sclerotized elements among which sperm duct opens without embolus (shafted arrows in figs. 15, 24, 88, 96), usually with worm-shaped projection on ventral side (unshafted arrows in figs. 24, 64, 96, 145, 157), missing only in two groups of closely related species (*W. idi*, *burgul*, *wanjuru*, and *W. nauo*, *kalamai*). Legs usually long (leg 1 about 7–15 × body length), medium-thin (tibia 1 l/d ~55–90), leg 1 always the longest, legs 2 and 4 about same length, leg 3 shortest; with or without dark rings subdistally on femur, patella + tibia proximally, and tibia subdistally; tips of femora and tibiae often whitish; tarsal organ exposed (examined: *W. kaurna* and *sphaeroides*: figs. 30, 49; see also fig. 84 in Huber, 2000). Legs usually without spines (present in *W. undanbi* and *jiman*), with few vertical hairs, with curved hairs on tibiae and metatarsi, sometimes also on femora (curved hairs missing only in three species assigned tentatively: *W. idi*, *burgul*, and *wanjuru*); retrolateral trichobothrium of tibia 1 usually at 5–15%, in *W. jiman* at 21%, in *W. arcoona*, *nauo*, and *kalamai* at 26–28%; tarsus 1 with up to 45 pseudosegments, but often only ~10–20 distal pseudosegments easily visible in dissecting microscope. Op-

isthosoma either globular or higher than long, gray with black spots and sometimes white spots dorsally; genital plate usually light brown, about rectangular, usually with distinct plate in front of spinnerets. Male gonopore without epiandrous spigots (examined: *W. sphaeroides*, *kaurna*, and *bujundji*: figs. 32, 43, 137); ALS with only two spigots (examined: *W. sphaeroides*, *eberhardi*, *yawai*, *undanbi*, *bujundji*, and *wunderlichi*: figs. 28, 29, 48, 141); other spinnerets typical for family.

Sexual dimorphism slight, females with shorter legs, often with larger (higher) opisthosoma and darker sternum, chelicerae, and palps; stridulatory ridges on chelicerae and curved hairs on legs also in females. Only *W. nauo* with enlarged female palps (fig. 179). In some species female opisthosoma provided with median brown spot dorsofrontally; corresponding side of thoracic groove either unmodified or slightly less deep. Epigynum shape very variable, often with median pocket (e.g., figs. 26, 57, 76) sometimes situated on a long membranous scape (figs. 41, 46); internally usually simple, with pair of relatively large pore plates (e.g., figs. 9, 42, 150); in *W. bujundji* and in *wunderlichi* complex, with median internal duct of unknown function (figs. 149, 152).

MONOPHYLY: Most species included share the worm-shaped projection ventrodistally on the bulb. Five species lacking this structure are assigned tentatively (*W. idi*, *burgul*, *wanjuru*, *nauo*, *kalamai*).

GENERIC RELATIONSHIPS: As discussed above (p. 6), the relationships of *Wugigarra* are not clear. It might be either (1) part of the New World group of genera, (2) the sister taxon of this group, or (3) part of holocnemines, a cosmopolitan group of genera. The cladograms in appendices 2 and 3 suggest the first and second options, but this rests on characters that show a relatively high degree of homoplasy (reduction of ALS piriform gland spigots; reduction of the tarsal organ rim, resulting in an exposed tarsal organ). Moreover, both the lack of a retrolateral apophysis on the male palpal coxa and the presence of cheliceral stridulation seem to argue against these options. The third option was not supported by any cladistic analysis, but rests on the peculiar set of structures on

the procursus (dorsal apophysis and ventral pouch or pocket) that is present also in some holocnemines (*Physocyclus*, *Artema*, *Trichocyclus*). Cladistic analysis suggested that this similarity results from convergence.

Finally, it has been suggested (Deeleman-Reinhold, 1995) that Australian "*Psilochorus*" (i.e., *Wugigarra*) are closely related to *Holocneminus*. This is probably correct, but I have not seen enough material of *Holocneminus* to study it in detail. A preliminary inclusion of an unidentified *Holocneminus* species in the matrix resulted in paraphyletic holocnemines, with *Holocneminus* as sister taxon of *Wugigarra* + New World clade.

SPECIFIC RELATIONSHIPS: Several operational (not necessarily monophyletic) species groups can be identified by morphological characters: (1) The most diverse and widely distributed *tjapukai* group is characterized in the male by a pair of pointed apophyses close to the median line of the chelicerae (e.g., figs. 5, 51, 79), and in the female by a median pocket on the epigynum (e.g., figs. 26, 46, 76). This group includes the type species *W. tjapukai* and *W. mamu*, *kaurna*, *sphaeroides*, *eberhardi*, *yawai*, *undanbi*, *jiman*, and *wiri*. Geographically, it covers most of the range of the genus, and might just be a paraphyletic assemblage of primitive species. (2) A certainly polyphyletic group of species with various shapes of chelicerae and epigyna, but with bulbs that closely resemble those of the first group; this *bulburin* group includes *W. bulburin*, *yirgay*, *arcoona*, *muluridji*, and *gia*. (3) The probably monophyletic *wunderlichi* group, with three described (*W. bujundji*, *wunderlichi*, *wulpura*) and at least one undescribed species in northeastern Queensland, is characterized by the ventral hump on the femur (fig. 131), the almost unmodified chelicerae (figs. 134, 143), and the complex structures in the female internal genitalia (figs. 149, 152). (4) A group lacking both the worm-shaped projection ventrodistally on the bulb and curved hairs on the legs, but assigned to *Wugigarra* because of their overall similarity, includes three known species from northeastern Queensland (*W. idi*, *burgul*, *wanjuru*). This *idi* group is probably monophyletic (shape of ventral femur apophysis, shape of proximal palpal segments) and may be close to *Holocneminus*. (5) Two species

from southern Australia that lack the worm-shaped process but have curved hairs (*W. nauo*, *kalamai*) are probably close relatives and share with *W. arcoona* (a more “typical” *Wugigarra*!) the distal position of the retrolateral tibial trichobothrium and the geographic distribution (southern rather than eastern Australia).

NATURAL HISTORY: Most specimens were apparently collected in humid forests where they live mainly in the low vegetation and in the leaf litter. Only one species has been the focus of detailed study: *W. tjapukai* (under *Psilochorus sphaeroides*: Jackson and Rowe, 1987; Jackson, 1992; Jackson et al., 1992). This spider was observed to build webs similar to those of *Pholcus phalangioides* and to invade contiguous webs, both alien and conspecific, presumably to steal prey. When attacked or disturbed, it started whirling, which reduced the ability of web-invading jumping spiders to capture the pholcid. Whirling only resulted from mechanical stimulation, not from chemical stimuli from potential predators.

DISTRIBUTION: Presently known from Australia only. “*Psilochorus*” *nigromaculatus* Kulczynski, 1911 from New Guinea might be congeneric, but I have not been able to see that species. The CLD collection has a male specimen of a probably undescribed species from Papua New Guinea (whose bulb seems to have a worm shaped process), and three males of an undescribed species from Dumoga, Sulawesi, that seem very close to the *idi* group above. Within Australia, the genus is remarkably restricted to the Great Dividing Range in Queensland and New South Wales, with the exception of only four species west of longitude 140° in southern Australia (map 1).

COMPOSITION: The genus as construed here includes a total of 22 described species, all of which are treated below. Of these, two are transferred from *Psilochorus*, the rest are new. The collections I have seen contain ~40 additional undescribed species, almost exclusively members of the *tjapukai* group above. Of this total of ~60 species, more than 50% are known from the type locality only. Moreover, the number of new species per decade represented in the collections studied seems to be increasing: to the ~25 species repre-

sented until 1980, ~15 were added by 1990, ~20 more by 2000. These numbers are approximations because I did not make the effort to sort the undescribed material into morphospecies, but they strongly suggest that the actual number of species may be well over 100.

Wugigarra tjapukai, new species

Figures 1–12

Psilochorus sphaeroides (misidentification; see Notes below): Jackson and Rowe, 1987; Jackson 1992; Jackson et al., 1992.

?“*Psilochorus*” sp. 1: Huber, 1998: fig. 2M (see Notes below).

NOTES: Robert Jackson and coworkers did not publish detailed collection data of the material they identified as *Psilochorus sphaeroides* (only “Cairns”, or “near Cairns”). A label accompanying the type material of the present species reads “R. R. Jackson, voucher specimens”, but these specimens were collected after the publication of all the papers listed above. Nevertheless, since the only four vials in the QMB containing specimens collected by R. Jackson contain the present species, I find it highly probable that this is actually the species studied by Jackson and coworkers.

Secondly, the species whose “valve” was studied in Huber (1998) is either conspecific or very close to the present species. (I copied the erroneous label, saying “Mittag Mittag”, which should be “Millaa Millaa”.)

TYPE: Male holotype from Crystal Cascades near Cairns (16°58’S, 145°42’E), Queensland, Australia; Dec. 1992 (R. R. Jackson), in QMB (S34679).

ETYMOLOGY: Named for the Tjapukai, a rainforest tribe in northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from most congeners by the modified male clypeus (figs. 2–4), from all known congeners (including the very similar *Wugigarra mamu*) by the shapes of procursus tip (figs. 10, 11) and dorsodistal bulbal elements (fig. 12).

MALE (holotype): Total length 3.9, carapace width 1.84. Leg 1: 53.9 (13.1 + 0.7 + 12.4 + 19.7 + 3.1), tibia 2: 8.1, tibia 3: 6.0, tibia 4: 8.4; tibia 1 l/d: 79. Habitus and prosoma shape as in figs. 1–4. Carapace ochre with wide median and marginal brown

bands, thoracic furrow black (fig. 3). Ocular area brown; distance PME-PME 0.135; diameter PME 0.135; distance PME-ALE 0.105; diameter AME 0.105. Clypeus ochre yellow, distally modified into black sclerotized rim (figs. 2–4); sternum dark brown, with small yellowish speckles, margins lighter (fig. 4). Chelicerae light brown, with pair of black pointed apophyses medially and low humps at their bases (fig. 5); apophyses not visible in lateral view (fig. 1). Palps as in figs. 6–7, mostly ochre-yellow, only procurus and bulb partly brown to black; procurus tip and bulb distinctive, as in figs. 6, 7, 10–12. Legs ochre to light brown, without dark rings, tips of femora and tibiae whitish; curved hairs on tibiae and metatarsi; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 8%; tarsus 1 with >40 distinct pseudosegments. Opisthosoma roundish, as in fig. 1, gray, with black and white spots except ventrally; genital plate brown, about trapezoidal; brown plate in front of spinnerets.

VARIATION: Tibia 1 in 7 males: 10.1–12.4 (\bar{x} = 11.4).

FEMALE: In general very similar to male. Tibia 1 in 11 females: 8.8–10.9 (\bar{x} = 9.7). Epigynum as in fig. 8, anterior plate laterally dark brown, medially whitish, with transparent scape, posterior plate light brown; dorsal view as in fig. 9.

DISTRIBUTION: Known from the Cairns area (northeastern Queensland) and from one locality about 300 km SSE of Cairns (map 4).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Crystal Cascades near Cairns: Male holotype above, with 1♂ 3♀, “R. R. Jackson, voucher specimens” (QMB S20897); same locality, Dec. 1982 (R. R. Jackson), 4♂ 4♀ (QMB S49973, 49963); Lamb Range (17°06’S, 145°37’E), Jan. 23, 1972 (N. Clyde Coleman), 1♂ (QMB S49979); Redlynch (16°53’S, 145°42’E), Jan. 1980 (R. R. Jackson), “prey of *Portia*”, 5♂ 5♀ (QMB S49812); Lower Mulgrave River (19°51’S, 147°10’E), Sept. 19, 1971 (N. Clyde Coleman), 1♂ 1♀ (QMB S49883).

***Wugigarra mamu*, new species**

Figures 13–16

TYPE: Male holotype from Bellenden Ker Range, Cableway Base Stn (17°16’S,

145°54’E), 100 m elev., Queensland, Australia; Oct. 17–24, 1981 (Earthwatch/QMB), in QMB (S27760).

ETYMOLOGY: Named for the Mamu, aboriginal rainforest dwellers in northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from most congeners by the modified male clypeus (cf. figs. 2–4), from all known congeners (including the very similar *Wugigarra tjapukai*) by the shapes of procurus tip (figs. 13, 14) and dorsodistal bulbal elements (figs. 15, 16).

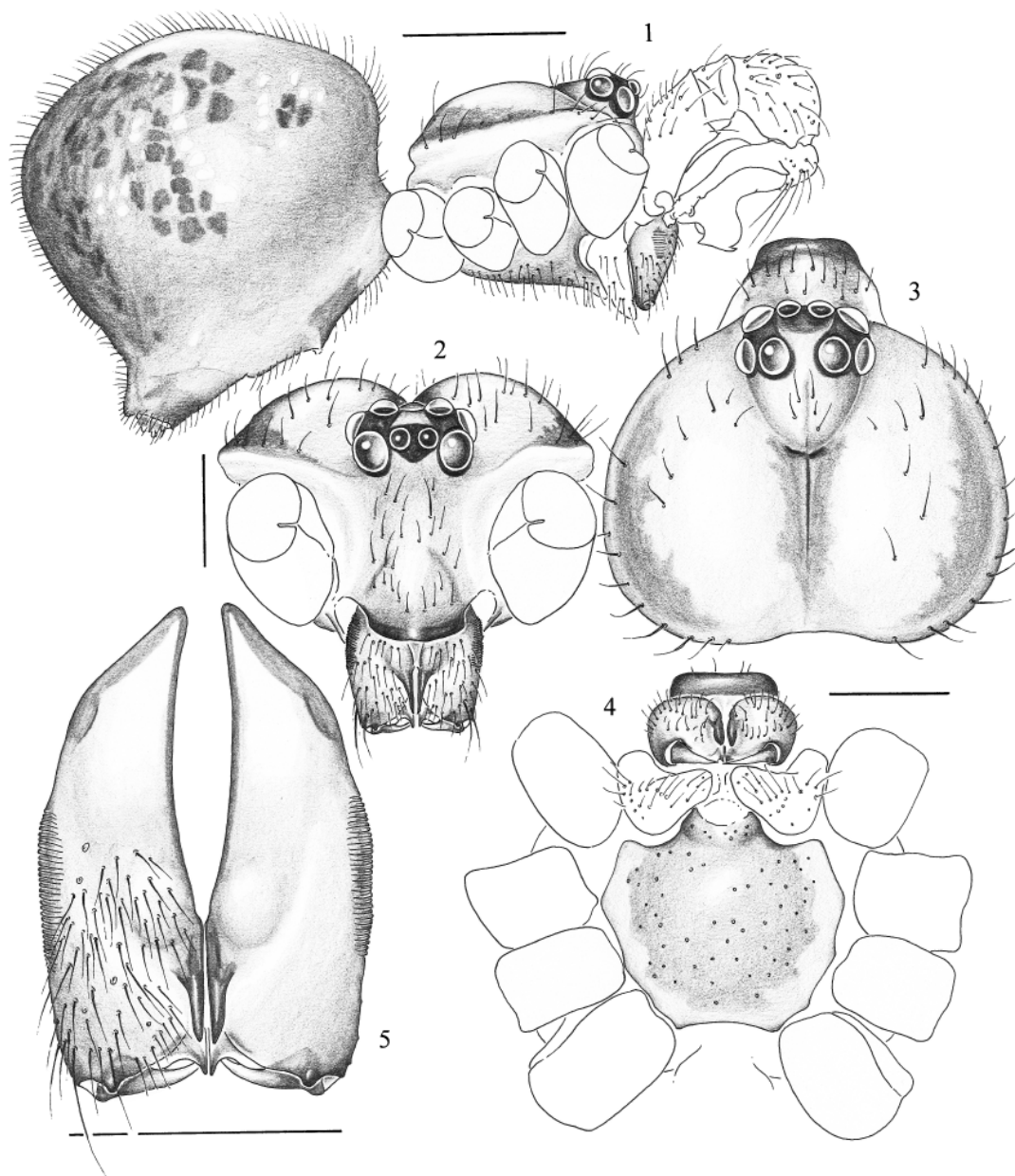
MALE (holotype): Total length 2.9, carapace width 1.42. Leg 1: 38.9 (10.0 + 0.5 + 9.6 + 16.1 + 2.7), tibia 2: 6.1, tibia 3: 4.4, tibia 4: 6.4; tibia 1 l/d: 85. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4), including color patterns and modified clypeus. Distance PME-PME 0.080; diameter PME 0.135; distance PME-ALE 0.095; diameter AME 0.105. Chelicerae and palps in general identical to those in *W. tjapukai* (cf. figs. 5–7), but procurus tip and dorsodistal bulbal elements significantly different (figs. 13–16). Legs as in *W. tjapukai*, including curved hairs on tibiae and metatarsi; retrolateral trichobothrium of tibia 1 at 7%; tarsus 1 with >40 distinct pseudosegments. Opisthosoma identical to that in *W. tjapukai* (cf. fig. 1).

VARIATION: Tibia 1 in 7 males: 9.6–10.9 (\bar{x} = 10.4).

FEMALE: In general very similar to male; tibia 1 in 8 females: 8.1–9.5 (\bar{x} = 8.6). Epigynum externally not distinguishable from that of *W. tjapukai* (cf. fig. 8).

DISTRIBUTION: Known only from the Bellenden Ker Range area near Cairns, northeastern Queensland (map 5).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Bellenden Ker Range, Cableway Base Stn: Male holotype above, with 3♀ 1 juvenile (QMB S34665); Bellenden Ker Range, Westgid Creek (N Branch) (17°16’S, 145°54’E), 100 m elev., Nov. 1, 1981 (Earthwatch/QMB), 1♂ (QMB S26257); Bellenden Ker Range, 0.5 km S of Cable Tower No. 7 (17°16’S, 145°51’E), 500 m elev., Oct. 17–24, 1981 (Earthwatch/QMB), 5♂ 3♀ (QMB S50181); same data but Oct. 25–31, 1981: 3♀ 5 juveniles (QMB S50182); same data but Nov. 1–7, 1981: 1♂ 2♀ (QMB S50239);



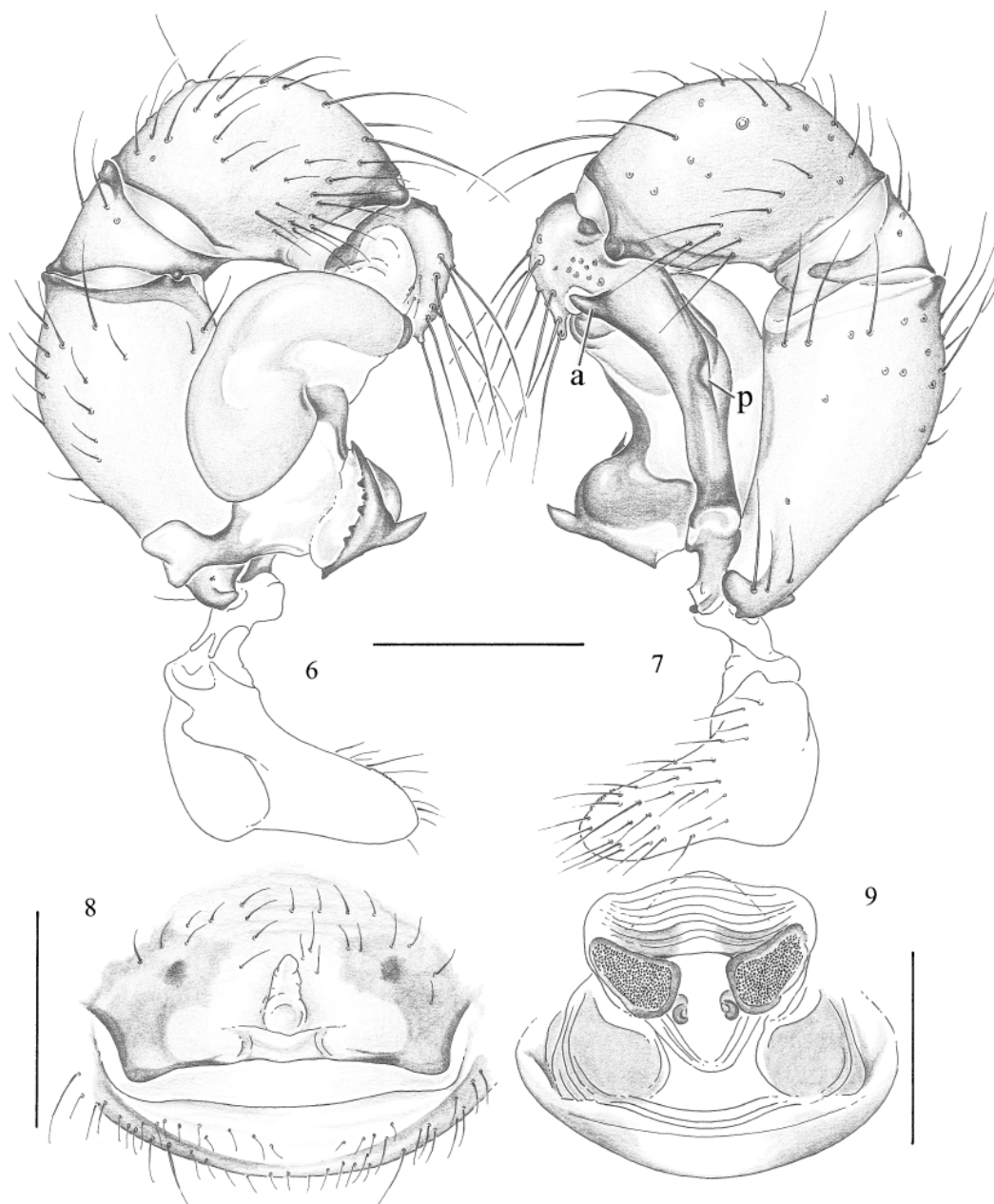
Figs. 1–5. *Wugigarra tjapukai*, n. gen., n. sp., male. 1. Habitus, lateral view. 2–4. Prosoma, frontal, dorsal, and ventral views. 5. Chelicerae, frontal view. Scale lines: 1 mm (1), 0.5 mm (2–5).

Russell R. at Bellenden Ker Landing (17°16'S, 145°57'E), 5 m elev., Nov. 1–9, 1981 (Earthwatch/QMB), 1♂ 1♀ (QMB S50246); Graham Range (17°17'S, 145°58'E), 550 m elev., Nov. 1, 1995 (G. Monteith), "Pyrethrum, trees and logs", 1♂ 2♀ (QMB S43364).

***Wugigarra kurna*, new species**

Figures 17–32

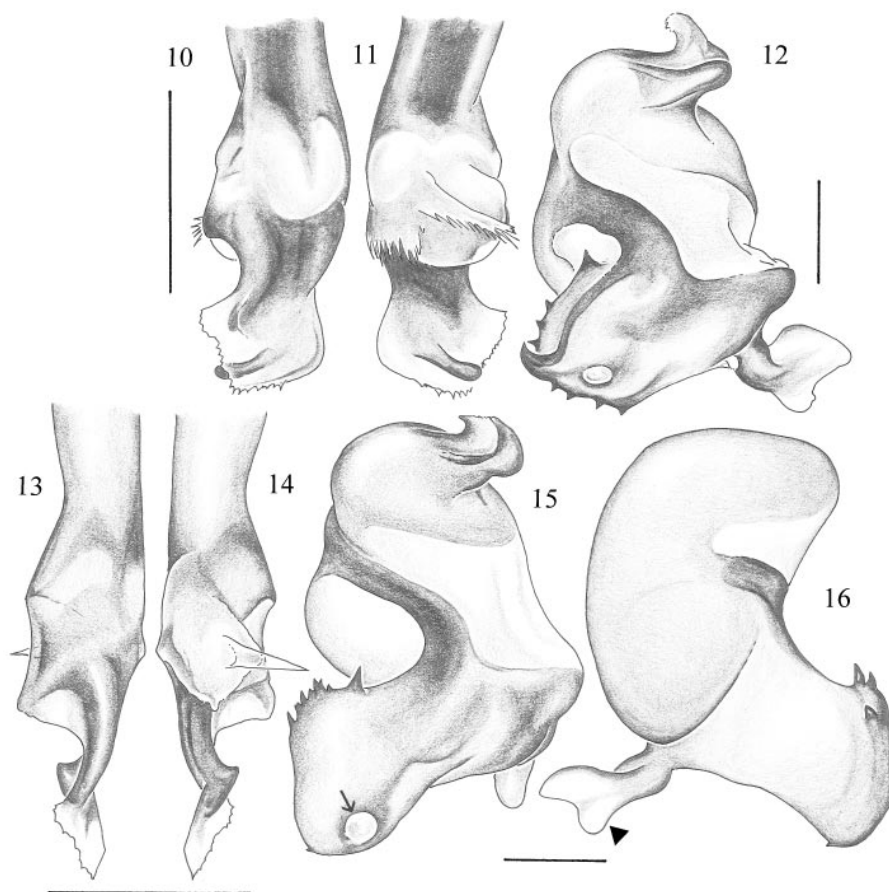
TYPE: Male holotype from Bunyeroo Gorge (31°25'S, 138°34'E), ABC Range, Flinders Range National Park, South Australia, Australia; May 16, 1991 (D. Hirst), in SAM (N1999/717).



Figs. 6–9. *Wugigarra tjapukai*, n. gen., n. sp. **6, 7.** Left male palp, prolateral (6) and retrolateral (7) views; “a”, “p” = apophysis and pocket. **8, 9.** Epigynum, ventral (8) and dorsal (9) views. Scale lines: 0.5 mm.

ETYMOLOGY: Named for the Kurna, an aboriginal tribe from the Mount Lofty Range area. The last woman survivor, Ivaritji, died in 1931. The species name is a noun in apposition.

DIAGNOSIS: Large species, distinguished from congeners by the tip of the procursus (figs. 22, 23), the distal bulbal elements (figs. 24, 25), the shape of the epigynum (fig. 26), and the three pairs of lateral spots on the car-

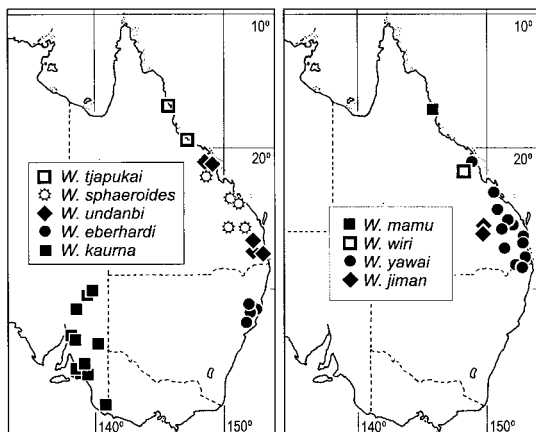


Figs. 10–16. *Wugigarra tjapukai*, n. gen., n. sp. (10–12), *W. mamu*, n. gen., n. sp. (13–16). **10, 11.** Tip of left procursus, retrolateral (10) and prolateral (11) views. **12.** Left genital bulb, dorsal (slightly retrolateral) view. **13, 14.** Tip of left procursus, retrolateral (13) and prolateral (14) views. **15, 16.** Left genital bulb, dorsal (15) and prolateral (16) views; shafted arrow: sperm duct opening; unshafted arrow: worm-shaped process. Scale lines: 0.2 mm.

apace (fig. 18). The AMS has a possibly closely related species from Capertee Valley (~33°10'S, 150°25'E), differing with respect to the procursus tip (AMS KS44134).

MALE (holotype): Total length 4.8, carapace width 2.03. Leg 1: 47.0 (12.8 + 0.8 + 12.5 + 18.1 + 2.8), tibia 2: 8.9, tibia 3: 6.7, tibia 4: 8.9; tibia 1 l/d: 63. Habitus and prosoma shape as in figs. 17–19. Carapace pale ochre with brown marks as in fig. 18. Ocular area pale ochre, slightly darker laterally; distance PME-PME 0.215; diameter PME 0.145; distance PME-ALE 0.065; diameter AME 0.095. Clypeus with pair of dark stripes (fig. 19); sternum brown, with small

yellowish speckles. Chelicerae light ochre-brown, with pair of black pointed apophyses medially and low humps at their bases (fig. 21); apophyses visible in lateral view (fig. 17). Stridulatory files as in fig. 31. Palps as in fig. 20, mostly ochre-yellow, only procursus and bulb partly brown to black; procursus tip and bulb distinctive, as in figs. 22–25. Palpal tarsal organ as in fig. 30. Legs ochre to light brown, dark rings on femora subdistally, patellae + tibiae proximally, and tibiae subdistally; with many curved hairs on tibiae and metatarsi 1–3; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 8%. Tarsus 1 distally with ~15 fair-



Maps 4, 5. Distribution of *Wugigarra* species: *tjapukai* group.

ly distinct pseudosegments; proximally pseudosegmentation difficult to see. Opisthosoma as in fig. 17, gray, with many black and some white spots except ventrally. Genital plate only slightly darker, about trapezoidal; gonopore without epiandrous spigots (fig. 32). Plate in front of spinnerets indistinct. Two spigots on ALS (fig. 29, showing also the usual two spigots on PMS).

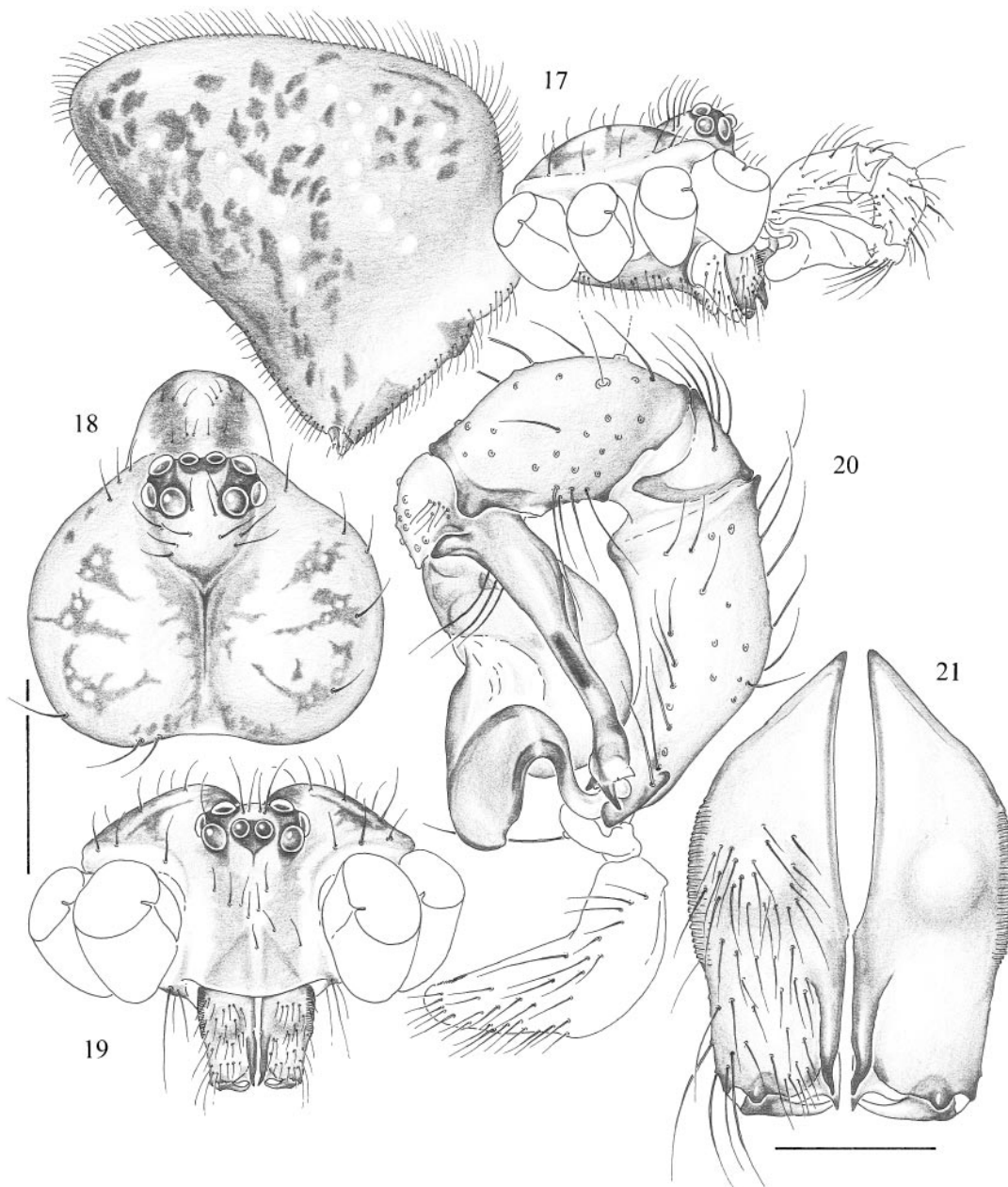
VARIATION: There is an impressive north-south clinal variation, especially in size—tibia 1 in 15 males from north of latitude 32°S: 10.5–13.7 (\bar{x} = 11.3), in 9 males from south of 34°S: 7.3–8.9 (\bar{x} = 8.3); the males from between 32° and 34°S have intermediate values: 8.9, 10.3, 10.3, 11.2. The same pattern occurs in females (see below). In addition, the number and size of teeth prolaterally on the male genital bulb follows a similar pattern: most specimens from northern populations have several teeth (as shown in figs. 24, 25); towards the south, these teeth get fewer and smaller, until they are completely absent.

FEMALE: In general very similar to male—tibia 1 in 8 females from north of latitude 32°S: 7.5–10.4 (\bar{x} = 9.1), in 8 females from south of 34°S: 5.5–8.0 (\bar{x} = 6.7). Epigynum as in fig. 26, anterior plate laterally brown, medially whitish with pocket on short transparent scape; dorsal view as in fig. 27. Spigots on ALS as in male (fig. 28).

DISTRIBUTION: Known from several localities in southeastern South Australia (map 4).

MATERIAL EXAMINED: AUSTRALIA: *South*

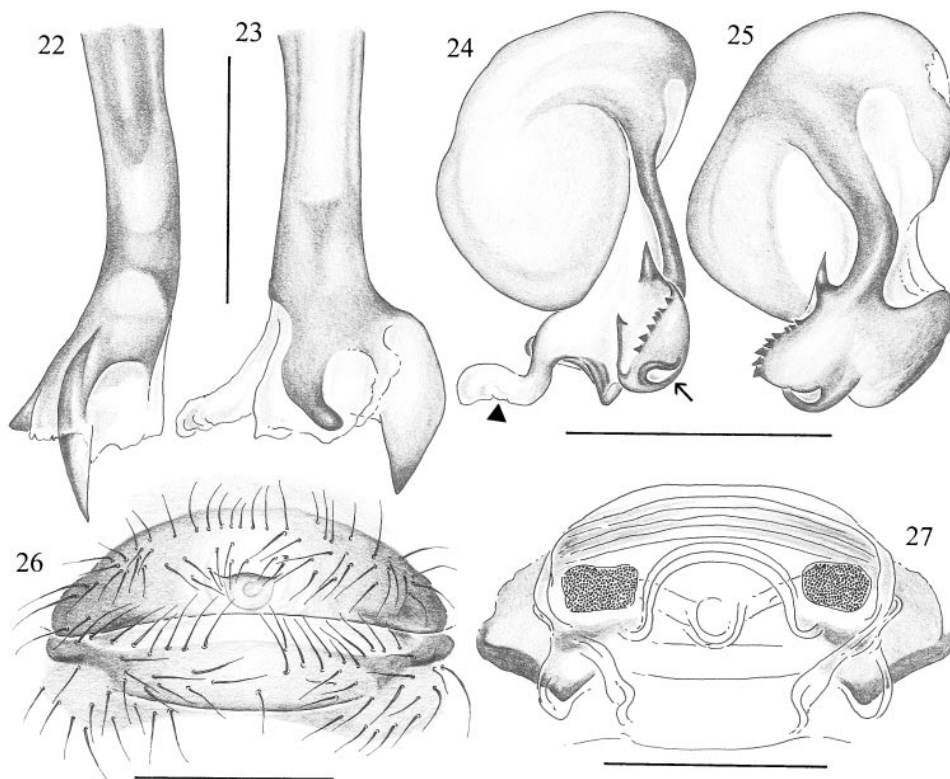
Australia: Flinders Range National Park: Male holotype above, with 5♂ 2♀ 2 juveniles (SAM N1999/718–24); Flinders Range National Park, Heysen Range, Bunyeroo Gorge (31°25'S, 138°32'E), May 16, 1990 (D. Hirst), 3♂ 2♀ 1 juvenile in SAM (N1999/712–6); Gammon Ranges National Park, Arcoona Creek near Sambot WH (30°27'S, 139°02'E), at night on cliffs, May 4, 1989 (D. Hirst), 2♂ 2♀ (SAM N1999/706–9); rocky ridge NE of Arcoona Creek (30°26'S, 138°58'E), May 3, 1989 (D. Hirst), 1♂ 2 juveniles (SAM N1999/710); near Grindells Hut, Gammon Ranges National Park (30°29'S, 139°13'E), Apr. 1985 (B. Guerin), 1♂ (SAM N1999/711); Gammon Ranges National Park, on cliff face, Weetootla Gorge (30°29'S, 139°14'E), Oct. 24, 1999 (D. Hirst), 1♂ 1 juvenile (SAM NN9036); Mawson Plateau (30°07'S, 139°25'E), Oct. 21–22, 1999 (D. Hirst), in rocky creek bank, 1♂ 4♀ (SAM NN9031–35); Alligator Gorge, Mt. Remarkable National Park (32°45'S, 138°03'E), on cliffs in gorge, Jan. 25, 1987 (D. Hirst), 1♂ 1♀ (SAM N1999/728–29); Melrose camping area (32°50'S, 138°11'E), Apr. 18, 1987 (D. Hirst), 3♀ (SAM N1999/730–2); Spring Ck., near Melrose (32°50'S, 138°11'E), Apr. 21, 1973 (M. R. Gray), 1♂ (AMS KS51544); Mambray Creek camp area (32°51'S, 138°00'E), from tree roots, steep creek bank, Oct. 4, 1988 (D. Hirst), 2♂ 1♀ (SAM N1999/725–7); Cave Cliff National Trust Reserve, Hd Parcoola (33°37'S, 140°03'E), Apr. 25, 1982 (J. J. Szent-Ivany), 1♂ 1♀ (SAM N1999/773–4); Cromer Conservation Park (34°47'S, 138°59'E), Sept. 7, 1985 (B. Guerin), under log, 1♀ (SAM N1999/733); Mt. Lofty Ranges, Castambul, Torrens Gorge (34°52'S, 138°46'E), Nov. 29, 1986 (D. Hirst), 2♂ 2♀ (SAM N1999/740–3); Adelaide (34°56'S, 138°36'E), no date (R. H. Pulleine), 1♂ 3♀ (poorly preserved) (SAM N1999/735–8); Adelaide, River Torrens (34°56'S, 138°36'E), 1903 (R. H. Pulleine), 1♀ (SAM N1999/734); Adelaide, Windsor Gardens (34°56'S, 138°37'E), Dec. 1–16, 1990 (D. Hirst), 1♂ (SAM N1999/739); Mt. Lofty Ranges, Belair (35°00'S, 138°38'E), Mar. 17, 1990 (L. N. Nicholson), 1♂ 1♀ (SAM N1999/748–9); same locality, Feb. 12, 1990 (L. N. Nicholson), 1♀ (SAM N1999/



Figs. 17–21. *Wugigarra kaurna*, n. gen., n. sp., male. **17.** Habitus, lateral view. **18, 19.** Prosoma, dorsal and frontal view. **20.** Left palp, retrolateral view. **21.** Chelicerae, frontal view. Scale lines: 1 mm (18, 19), 0.3 mm (21).

750); same locality, Dec. 20, 1989 (L. N. Nicholson), 4♀ (SAM N1999/744–7); same locality, Jan. 15, 1991 (L. N. Nicholson), 1♀ (SAM N1999/751); same locality, May 10, 1992 (L. N. Nicholson), 1♀ (SAM N1999/

753); same locality, May 16, 1991 (L. N. Nicholson), in garden shed, 1♀ (SAM N1999/752); Mt Lofty Ranges, Loftia Park (35°02'S, 138°42'E), Sept. 14, 1989 (D. Hirst), 1♂ (SAM N1999/755); same locality,



Figs. 22–27. *Wugigarra kaurna*, n. gen., n. sp. **22, 23.** Left procursus tip, retrolateral (22) and dorsal (23) views. **24, 25.** Left genital bulb, prolateral (24) and dorsal (25) views; shafted arrow: sperm duct opening; unshafted arrow: worm-shaped process. **26, 27.** Epigynum, ventral (26) and dorsal (27) views. Scale lines: 0.5 mm (24–27), 0.2 mm (22, 23).

Mar. 20, 1990 (D. Hirst), 4♂ 3♀ 2 juveniles (SAM N1999/756–63); Mt. Lofty Ranges, Hahndorf (35°02'S, 138°49'E), in fowl house, Dec. 1983 (B. Guerin), 3♀ (SAM N1999/764–6); Mt. Lofty Ranges, Coromandel Valley (35°02'S, 138°38'E), Apr. 1995 (L. N. Nicholson), 1♀ (SAM N1999/754); Mt. Lofty Ranges near Clarendon (35°07'S, 138°38'E), June 25, 1978 (A. F. Lees), 1♂ 2♀ (SAM N1999/768–70); Nappyalla (35°20'S, 139°07'E), Mar. 1995 (J. Eckert), 1♀ (SAM N1999/771); Snowgum Reserve, Carolyn Forest (37°56'S, 140°56'E), Apr. 20, 1979 (D. C. Lee), under *Eucalyptus* bark, 1♀ (SAM N1999/772).

Wugigarra sphaeroides (Koch, 1867),
new combination

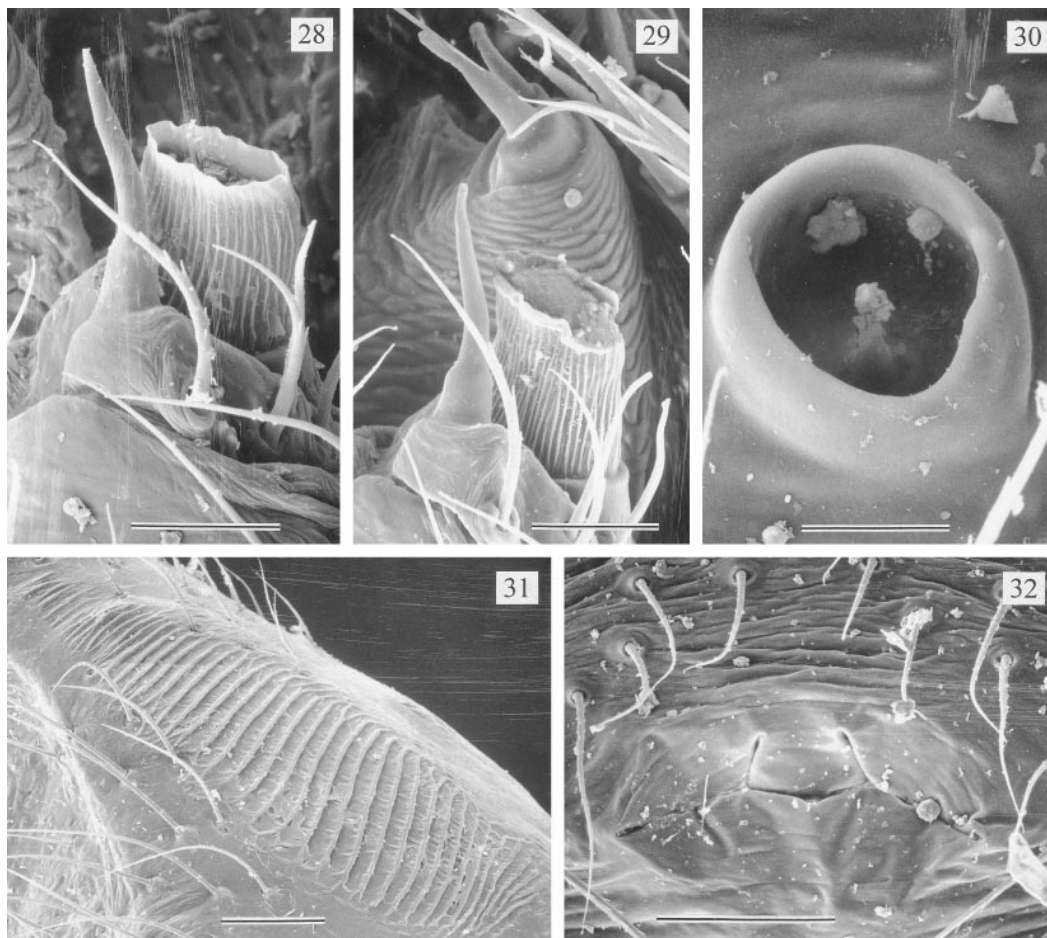
Figures 33–50

Pholcus sphaeroides Koch, 1867: 193; 1872: 283–285, pl. 23, figs. 6, 6a–d.

Psilochorus sphaeroides: Simon, 1893: 481–482.

TYPE: Koch (1867, 1872) described both sexes from Rockhampton (23°22'S, 150°32'E), Queensland. This material seems to be lost, but the ZMH has a male from Gayndah (~270 km SE of Rockhampton) from the Museum Godeffroy collection that is very likely conspecific with Koch's original material (see diagnosis below).

DIAGNOSIS: Closely related to *W. yawai* and *W. eberhardi*, distinguished from both by the long transparent scape on the epigynum (figs. 41, 46) (Koch's [1872] "*weicher . . . Fortsatz*"), from the first also by the cheliceral apophyses not visible in lateral view (fig. 34) and the more slender procursus (fig. 35), from the second also by the lateral cones on the epigynum (figs. 40, 41) (Koch's "*kegelförmige . . . Höckerchen*"), and the "stridulatory" cone frontodorsally on the female opisthosoma (Koch's "*kleines Höckerchen*").



Figs. 28–32. *Wugigarra kurna*, n. gen., n. sp. **28.** Female ALS, with two spigots. **29.** Male ALS (in front) and PMS (in back), with two spigots each. **30.** Male palpal tarsal organ. **31.** Stridulatory files on male chelicerae. **32.** Male gonopore, without epiandrous spigots. Scale lines: 60 μm (31, 32), 20 μm (28, 29), 10 μm (30).

MALE (Homevale): Total length 3.8, carapace width 1.55. Leg 1: 36.1 (9.6 + 0.7 + 9.6 + 14.3 + 1.9), tibia 2: 6.3, tibia 3: 4.5, tibia 4: 6.4; tibia 1 l/d: 64. Habitus and prosoma shape similar to *W. tjapukai* (cf. figs. 1–4). Carapace ochre with wide brown median band that is frontally widened, and with lateral bands. Ocular area brown; distance PME-PME 0.160; diameter PME 0.100; distance PME-ALE 0.060; diameter AME 0.095. Clypeus brown, not modified; sternum brown, lateral margins ochre-yellow. Chelicerae light brown with whitish humps and black apophyses that are not visible in lateral view (figs. 33, 34). Palps as in fig. 35, bulb

and procursus as in figs. 36–39. Brush of hairlike structures on tip of procursus (fig. 47). Legs ochre to light brown, with dark rings on femora subdistally, patellae + tibiae proximally, tibiae subdistally; tips of femora and tibiae whitish; without spines and vertical hairs; with curved hairs on tibiae and metatarsi 1–3 (few distally on femora and proximally on metatarsi); retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 distally with ~16 distinct pseudosegments (fig. 44 shows two from near the tip), proximally pseudosegmentation very indistinct. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), ochre gray with blackish spots dorsally. Gen-

ital plate brown; gonopore without epian-drous spigots (fig. 43). Brown plate in front of spinnerets; two spigots on ALS (fig. 48).

VARIATION: Tibia 1 in 5 males: 8.1–10.0 (\bar{x} = 9.1). Measurements of Koch's "type" from Gayndah: total length 3.4, carapace width 1.6; leg 1: 10.0 + 0.7 + 9.7, metatarsus and tarsus missing, tibia 2: 6.4, tibia 3: 4.7, tibia 4: 6.7.

FEMALE: In general very similar to male, but palps and chelicerae brown, and opisthosoma frontodorsally with unpaired sclerotized area, opposing part of thoracic furrow that is less deep and more heavily sclerotized than in male. Stridulatory files on chelicerae as in fig. 45. Palpal tarsal organ and palpal tarsus tip as in figs. 49 and 50. Epigynum as in figs. 40 and 41, with anterior plate divided into lateral brown parts with cones and median whitish part with long transparent scape provided with pocket (figs. 41, 46); dorsal view as in fig. 42.

DISTRIBUTION: Known from several localities between ~300 km N and 300 km S of Rockhampton, southeastern Queensland (map 4).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Rockhampton-Yeppoon (23°08'S, 150°44'E), Oct. 29, 1973 (V. E. Davies), 1♂ 1♀ (QMB S50272); Rundle Range, "site 5" (23°39'S, 150°59'E), Mar. 24–31, 1975 (R. Kohout, V. E. Davies), 1♂ 4♀ ~3 juveniles (QMB S50162); Gayndah (25°37'S, 151°37'E), "N° 11019" (or "1/019"?), no further data, 1♂ "type" in ZMH; Taroom, Dawson R., Nathan Gorge (25°27'S, 150°08'E), Nov. 14, 1996 (P. Lawless), 1♂ 2♀ (QMB S37385, 37395); Homevale (21°24'S, 148°33'E), Apr. 1–7, 1975 (R. Kohout, V. E. Davies), 3♂ ~8♀ several juveniles (QMB S50160); same locality, riverine rainforest, Apr. 1–7, 1975 (collector not given), 1♀ 1 juvenile (QMB S49976).

Wugigarra eberhardi, new species

Figures 51–58

TYPE: Male holotype from Carrai Bat Cave, Stockyard Creek (30°59'S, 152°20'E), New South Wales, Australia; Feb. 4, 1995 (S. Eberhard), in cave, "space webs", in AMS (KS65697).

ETYMOLOGY: Named for the collector of

the type specimen and of many more pholcids from caves in New South Wales.

DIAGNOSIS: Closely related to *W. yawai* and *sphaeroides*, distinguished from both by the low humps proximally on the male chelicerae (fig. 52) and the absence of a spine on the genital bulb (fig. 56); from the first also by the chelicerapophyses not visible in lateral view (fig. 52) and the more slender procursus (fig. 53), from the second by the absence of a long transparent scape and lateral cones on the epigynum (fig. 57).

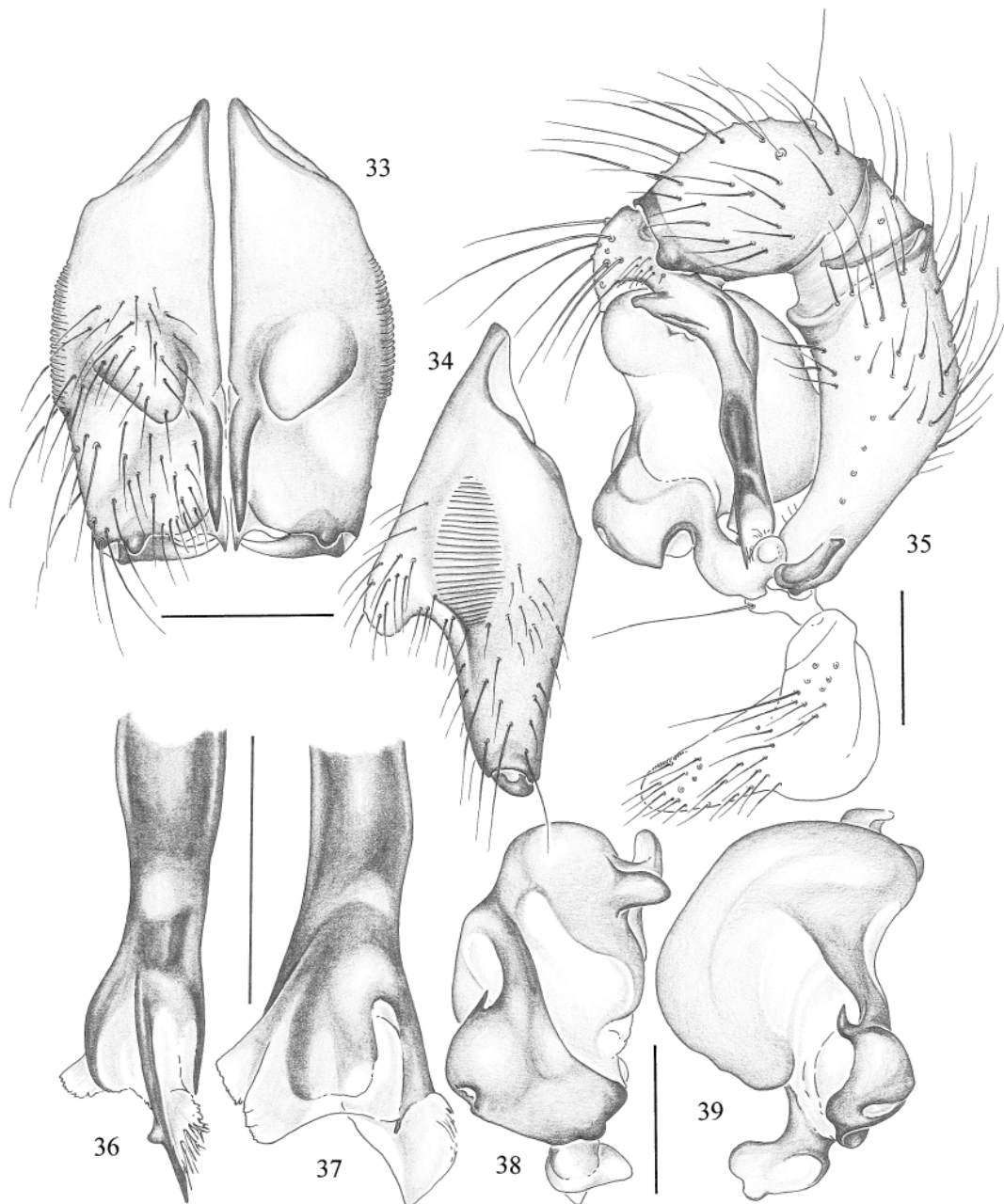
MALE (holotype): Total length 2.8, carapace width 1.35. Leg 1: 26.1 (6.9 + 0.5 + 7.1 + 9.7 + 1.9), tibia 2: 4.8, tibia 3: 3.5, tibia 4: 4.8; tibia 1 l/d: 67. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre with dark median line and spot behind ocular area, radial marks, and light ochre spots laterofrontally. Ocular area brown; distance PME-PME 0.175; diameter PME 0.065; distance PME-ALE 0.065; diameter AME 0.055. Clypeus brown, not modified; sternum brown. Chelicerae brown with low proximal humps and black apophyses that are not visible in lateral view (figs. 51, 52); with stridulatory ridges. Palps very similar to *W. sphaeroides* (cf. fig. 35), bulb and procursus as in figs. 53–56. Legs light brown, without any rings; without spines and vertical hairs; with curved hairs on all tibiae and metatarsi, and distally on femora; retrolateral trichobothrium of tibia 1 at 7%; tarsus 1 distally with ~14 distinct pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), ochre with dark spots dorsally; genital plate light brown, trapezoidal; brown plate in front of spinnerets.

VARIATION: Tibia 1 in other males: 6.8, 7.1, 8.7, 8.8. The male from Gecko Cave, Gloucester, differs minimally with respect to the bulb (arrow in fig. 53: this process is smaller; arrow in fig. 56: more prominent hump).

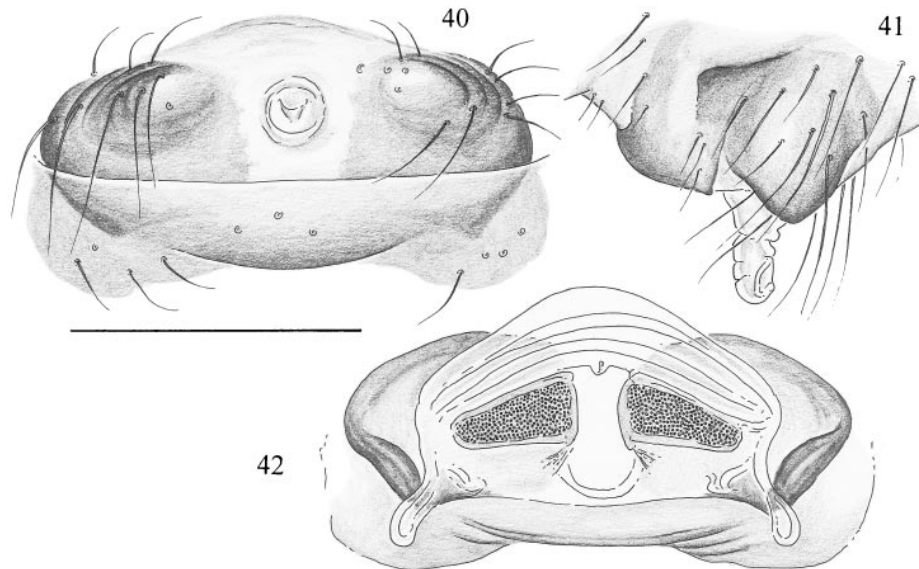
FEMALE: In general very similar to male. Epigynum without lateral elevations, with median pocket (fig. 57); dorsal view as in fig. 58.

DISTRIBUTION: Known from several localities in eastern New South Wales (map 4).

MATERIAL EXAMINED: AUSTRALIA: *New South Wales*: Carrai Bat Cave, Stockyard



Figs. 33–39. *Wugigarra sphaeroides* (Koch), n. comb., male. **33, 34.** Chelicerae, frontal and lateral views. **35.** Left palp, retrolateral view. **36, 37.** Left procursus tip, retrolateral (36) and dorsal (37) views. **38, 39.** Left genital bulb, dorsal (38) and prolateral (39) views. Scale lines: 0.3 mm (33–35, 38, 39), 0.2 mm (36, 37).



Figs. 40–42. *Wugigarra sphaeroides* (Koch), n. comb., epigynum in ventral (40), lateral (41), and dorsal (42) views. Scale line: 0.5 mm (40–42).

Creek: Male holotype above, with 1 ♂ (AMS KS49262); Youdale's Cave, Kunderang Brook (~31°00'S, 152°12'E), Jan. 2, 1995 (S. Eberhard), 1 ♂ 1 ♀ (AMS KS49264); Bat Cave, Yessabah (31°06'S, 152°41'E), Feb. 12, 1995 (S. Eberhard), dark zone, 2 ♂ 1 juvenile (AMS KS49259); N Plateau Rd ~3.5 km from Plateau Beach Picnic Area (31°11'S, 152°20'E), Mount Boss State Forest, Feb. 4–Apr. 9, 1993 (M. Gray, G. Cassis), 1 ♂ (AMS KS42177); Gecko Cave, Gloucester (~32°02'S, 151°58'E), May 22, 1995 (S. Eberhard), dark zone, 1 ♂ 1 juvenile (AMS KS49266).

***Wugigarra yawai*, new species**

Figures 59–67

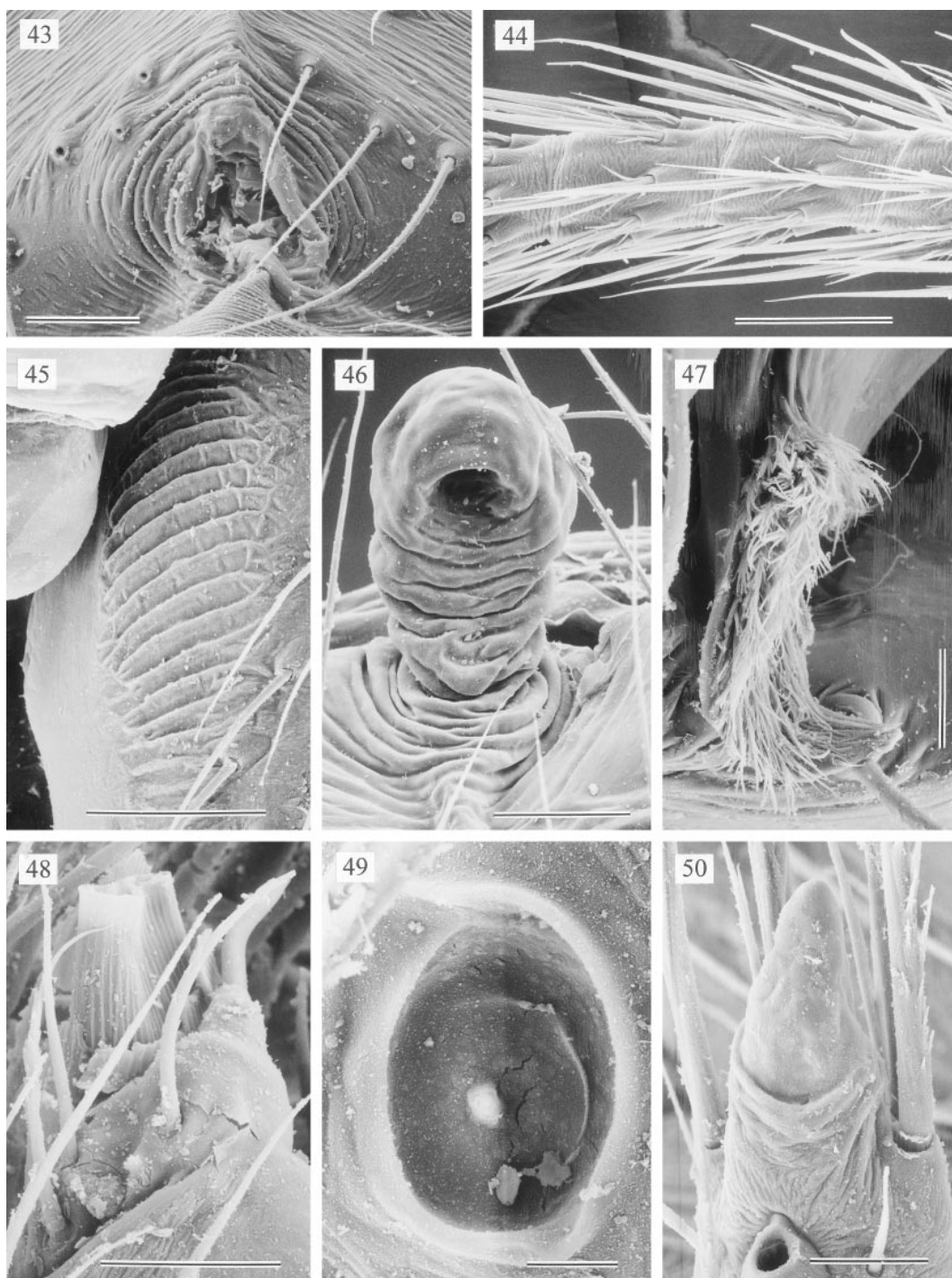
TYPE: Male holotype from Mt. Goonane-man (25°26'S, 152°08'E), Queensland, Australia; Nov. 3–6, 1980 (R. Raven, V. E. Davies), sieved litter, 670 m elev., in QMB (S34675).

ETYMOLOGY: Named for the Taribelang (also called Yawai), an aboriginal tribe in the Bundaberg area. The species name is a noun in apposition.

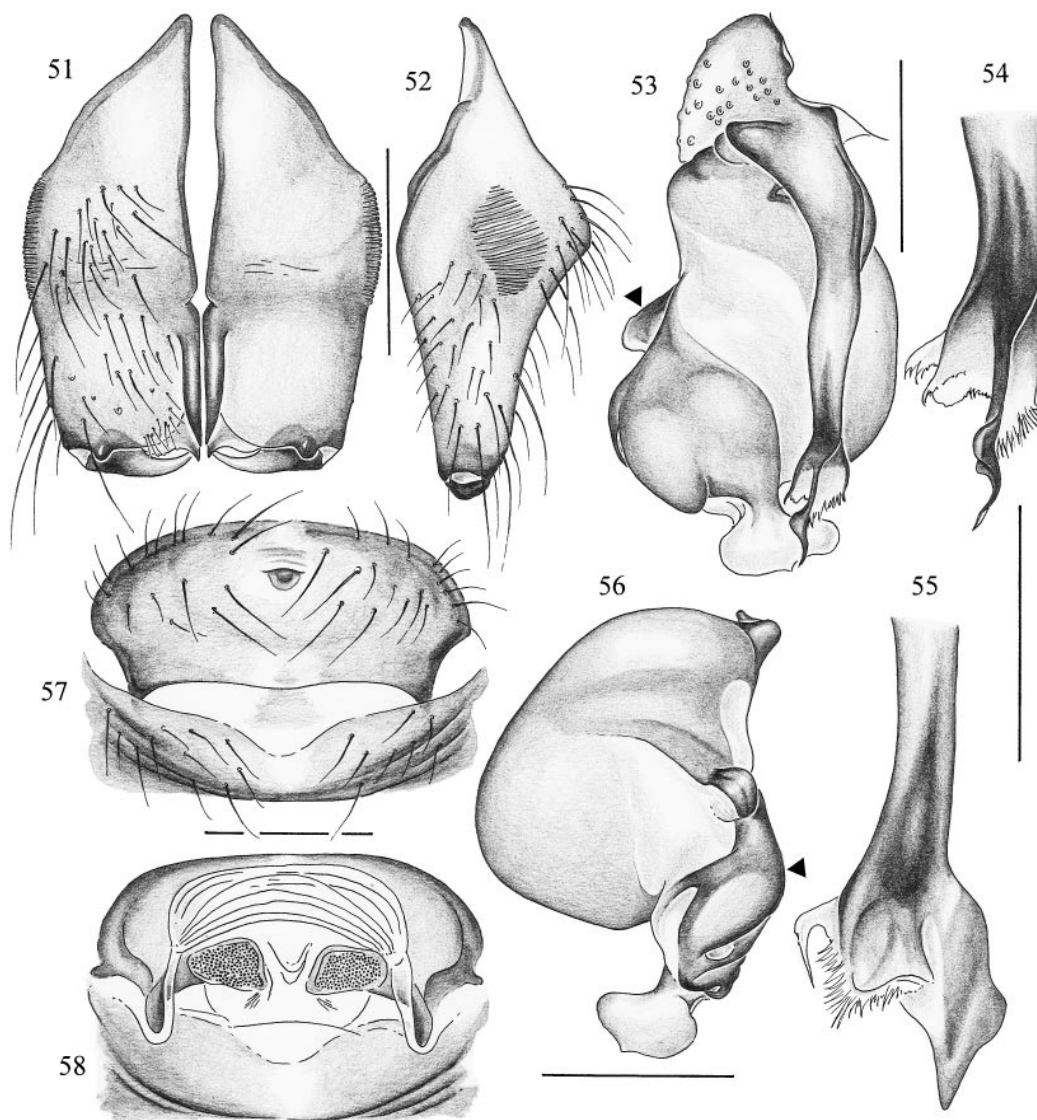
DIAGNOSIS: Closely related to *W. eberhardi* and *sphaeroides*, distinguished from both by the male cheliceral apophyses visible in lat-

eral view (fig. 60) and the broad procurus (fig. 61), from the first also by the presence of a spine on the genital bulb (fig. 64); from the second also by the absence of a long transparent scape on the epigynum (fig. 66).

MALE (holotype): Total length 2.4, carapace width 1.23. Leg 1: 28.2 (7.5 + 0.5 + 7.5 + 10.8 + 1.9), tibia 2: 4.8, tibia 3: 3.3, tibia 4: 5.1; tibia 1 l/d: 75. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace with dark pattern as in *W. tjapukai* (cf. fig. 3). Ocular area ochre; distance PME–PME 0.105; diameter PME 0.105; distance PME–ALE 0.055; diameter ALE 0.095. Clypeus with pair of dark stripes converging distally, not modified; sternum dark brown except laterally. Chelicerae light brown with pair of high proximal humps and distinctively projecting black apophyses that are visible in lateral view (figs. 59, 60), with stridulatory ridges. Palps as in fig. 61, bulb and procurus as in figs. 62–65. Legs light brown, with slightly darker rings preceding whitish tips of femora and tibiae; without spines and vertical hairs; with curved hairs on all tibiae and metatarsi 1–3; retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 with >25 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as



Figs. 43–50. *Wugigarra sphaeroides* (Koch), n. comb. **43.** Male gonopore. **44.** Male tarsus 1 near tip. **45.** Stridulatory ridges on female right chelicera. **46.** Scape on epigynum, ventrofrontal view. **47.** Tip of procursus, showing brush of hairlike structures. **48.** Male ALS, with two spigots. **49.** Female palpal tarsal organ. **50.** Tip of female palp. Scale lines: 50 μm (43–46), 20 μm (47, 48, 50), 5 μm (49).



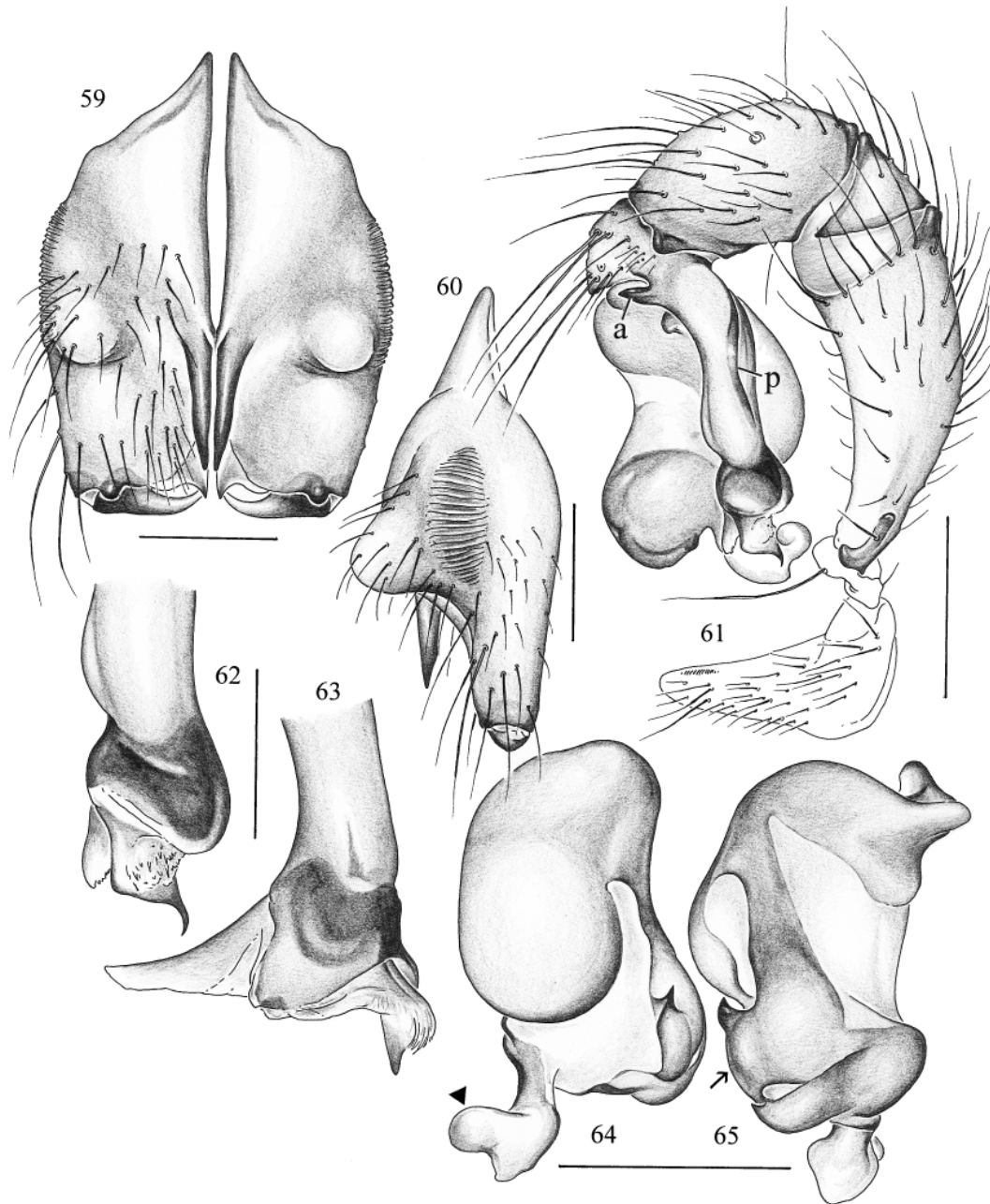
Figs. 51–58. *Wugigarra eberhardi*, n. gen., n. sp. **51, 52.** Male chelicerae, frontal and lateral views. **53.** Left procursus and bulb, retrolateral view. **54, 55.** Tip of left procursus, retrolateral (54) and dorsal (55) views. **56.** Left genital bulb, prolaterodorsal view. **57, 58.** Epigynum, ventral (57) dorsal (58) views. Scale lines: 0.3 mm (51–53, 56–58), 0.2 mm (54, 55). Arrows point to variable structures.

in *W. tjapukai* (cf. fig. 1), gray with blackish and white spots except ventrally; genital plate brown; brown plate in front of spinnerets.

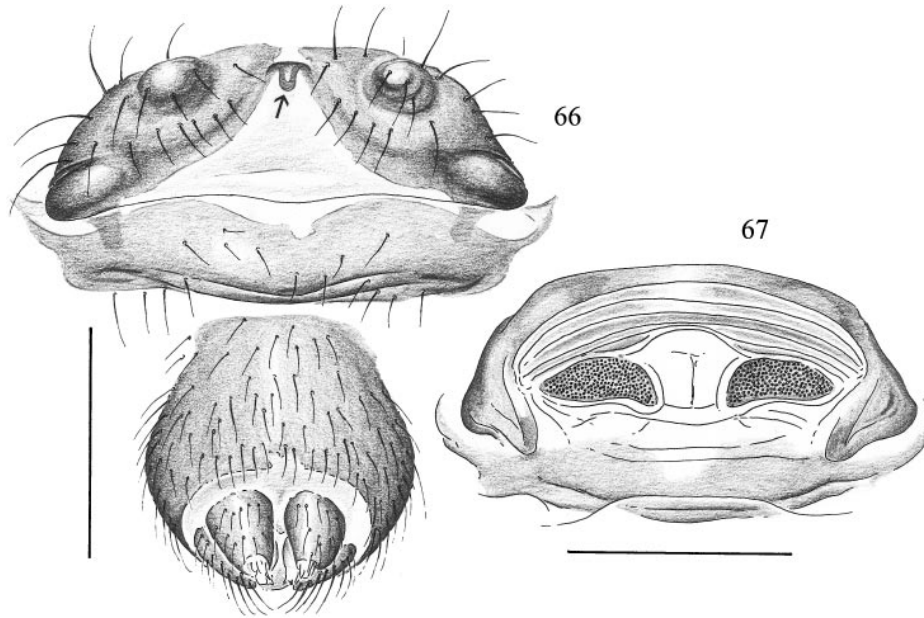
VARIATION: Tibia 1 in 5 males: 6.0–7.5; the male from Double Island is significantly larger (tibia 1: 9.7), but is otherwise identical. Several males have on the prolateral side

of the bulb, distal to the large spine (arrow in fig. 65), one or two additional tiny spines.

FEMALE: In general very similar to male, but chelicerae and palps dark brown, and opisthosoma frontodorsally with unpaired sclerotized area, opposing part of thoracic furrow that is less deep and more heavily sclerotized than in male. Tibia 1 in 8 females: 5.2–7.2;



Figs. 59–65. *Wugigarra yawai*, n. gen., n. sp., male. **59, 60.** Chelicerae, frontal and lateral views. **61.** Left palp, retrolateral view; “a”, “p” = apophysis and pocket. **62, 63.** Tip of left procursus, retrolateral (62) and dorsal (63) views. **64, 65.** Left genital bulb, prolateral (64) and dorsal (65) views; unshafted arrow: worm-shaped process; shafted arrow: area where some males have 1–2 additional tiny spines. Scale lines: 0.4 mm (61, 64, 65), 0.2 mm (59, 60, 62, 63).



Figs. 66–67. *Wugigarra yawai*, n. gen., n. sp. **66.** Epigynum and spinnerets, ventral view; arrow: pocket. **67.** Epigynum, dorsal view. Scale lines: 0.4 mm.

female from Double Island significantly larger (tibia 1: 9.2). Epigynum with two pairs of lateral elevations and median pocket (fig. 66); in some females median light area less diverging posteriorly; dorsal view as in fig. 67.

DISTRIBUTION: Widely distributed in eastern Queensland and northeastern New South Wales, from $\sim 20^{\circ}$ – 30° S (map 5).

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Mt. Goonaneman: Male holotype above, with 1♂ 1♀ (QMB S50119); Goodnight Scrub via Wallaville ($25^{\circ}05'S$, $152^{\circ}00'E$), June 28, 1974 (J. Covacevich), 1♂ (QMB S49886); Nipping Gully, “site 2” ($25^{\circ}40'S$, $151^{\circ}26'E$), Aug. 21–Oct. 9, 1998 (G. B. Monteith), rainforest, 200 m elev., 1♂ (QMB S49232); Double Island Pt., “near Little Freshwater Creek” ($25^{\circ}56'S$, $153^{\circ}11'E$), Aug. 4, 1985 (J. Gallon, K. Sedler, R. Kropp), 1♂ 1♀ (QMB S49814); Cooloola ($26^{\circ}12'S$, $153^{\circ}03'E$), Sept. 14, 1973 (R. Raven), dead tree trunk, 1♂ 2 juveniles (QMB S49885); Searys Scrub, Cooloola ($26^{\circ}12'S$, $153^{\circ}03'E$), Feb. 6, 1976 (R. Raven, V. E. Davies), under logs, 4♀ (QMB S50114); Mt. Coolum ($26^{\circ}34'S$, $153^{\circ}05'E$), Jan. 1984 (B. R. Jahake), 1♂ (QMB

S50161); Dandabah, Bunya National Park ($26^{\circ}53'S$, $151^{\circ}37'E$), Feb. 29, 1976 (unknown collector), 1♂ 2♀ (QMB S50126); Marlaybrook, Bunya Mountains ($26^{\circ}54'S$, $151^{\circ}39'E$), Mar. 6, 1976 (R. Raven, V. E. Davies), 1♂ 1♀ (QMB S50141); Bunya Mountain ($26^{\circ}54'S$, $151^{\circ}34'E$), Sept. 4, 1974 (R. Raven), 1♂ 1♀ (QMB S49816); Upper Brookfield ($27^{\circ}50'S$, $152^{\circ}55'E$), rainforest, April 29–May 13, 1981 (V. E. Davies, R. Raven), 1♂ (QMB S49790); same locality and collectors, Mar. 18, 1981, 1♀ 1 juvenile (QMB S49965); Gold Creek Reservoir, Brookfield ($27^{\circ}30'S$, $152^{\circ}55'E$), Sept. 17, 1980 (R. Raven, V. E. Davies), 1♀ 2 juveniles (QMB S 49977); Bahr’s Scrub ($27^{\circ}44'S$, $153^{\circ}10'E$), May 23, 1981 (G. Monteith), 1♂ 1 juvenile (QMB S50194); Killarney, “9 km out” ($\sim 28^{\circ}20'S$, $152^{\circ}20'E$), Aug. 10, 1997 (L. J. Boutin), under rocks and bark, 1♂ (QMB S40374); The Head, via Killarney ($28^{\circ}23'S$, $152^{\circ}19'E$), Aug. 18–Nov. 17, 1974 (G. & S. Monteith), 1♂ (QMB S50213); Kroombit Tops, Lower Dry Creek ($24^{\circ}24'S$, $151^{\circ}01'E$), Dec. 9–19, 1983 (V. E. Davies, J. Gallon), 1♂ 1♀ (QMB S49810); Kroombit Tops, 65 km SW of Gladstone ($24^{\circ}22'S$, $151^{\circ}01'E$), 1000–1100 m elev.,

Feb. 22–26, 1982, 1 ♀ (QMB S50314); Nob Creek, Byfield (22°52'S, 150°37'E), Apr. 27, 1979 (G. B. Monteith), rainforest, sieved litter, 1 ♀ (QMB S50209); 5 km NW of Mt. Macartney (20°49'S, 148°30'E), Apr. 21, 1979 (G. B. Monteith), open forest, sieved litter, 480 m elev., 1 ♂ (QMB S50202); Pandanus Creek (20°48'S, 148°33'E), Cathu SE, Apr. 22, 1979 (G. B. Monteith), creek margin, 80 m elev., 1 ♂ 2 ♀ 2 juveniles (QMB S50198, 50204, 50205). *New South Wales*: 0.5 km from Wheatly Creek Road on Camp Creek Road (28°47'S, 152°19'E), Feb. 4–Apr. 9, 1993 (M. Gray, G. Cassis), 1 ♂ (AMS KS38374).

***Wugigarra undanbi*, new species**

Figures 68–77

TYPE: Male holotype from Mt. Archer, Kilcoy (26°57'S, 152°34'E), Queensland, Australia; Apr. 29, 1985 (J. Gallon), rainforest, ~1500 ft. elev., in QMB (S34674).

ETYMOLOGY: Named for the Undanbi, an aboriginal tribe from northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Apparently closely related to *W. eberhardi*, *yawai*, and *sphaeroides* (note the similarity in procurus and bulb shapes), distinguished by the smaller size (note the lack of overlap in tibia 1 length), the higher carapace and opisthosoma (figs. 68, 69), and the simple flat epigynum with posterior pocket (fig. 76).

MALE (holotype): Total length 2.1, carapace width 1.06. Leg 1: 16.6 (4.0 + 0.4 + 4.4 + 6.5 + 1.3), tibia 2: 2.4, tibia 3: 1.9, tibia 4: 2.5; tibia 1 l/d: 55. Habitus and prosoma shape as in figs. 68–70. Carapace ochre, with darker markings as in fig. 70. Ocular area ochre, laterally darker; distance PME-PME 0.135; diameter PME 0.095; distance PME-ALE 0.045; diameter AME 0.055. Clypeus with wide dark mark; sternum brown. Chelicerae dark ochre, proximally thicker but without hump, distally with pair of black apophyses not visible in lateral view (figs. 68, 69). Palps in general as in *W. yawai* (cf. fig. 61), bulb and procurus as in figs. 71–75. Legs light brown, without rings; with single ventral row of spines on femora 1 (~25) and 2 (~8), with curved hairs on

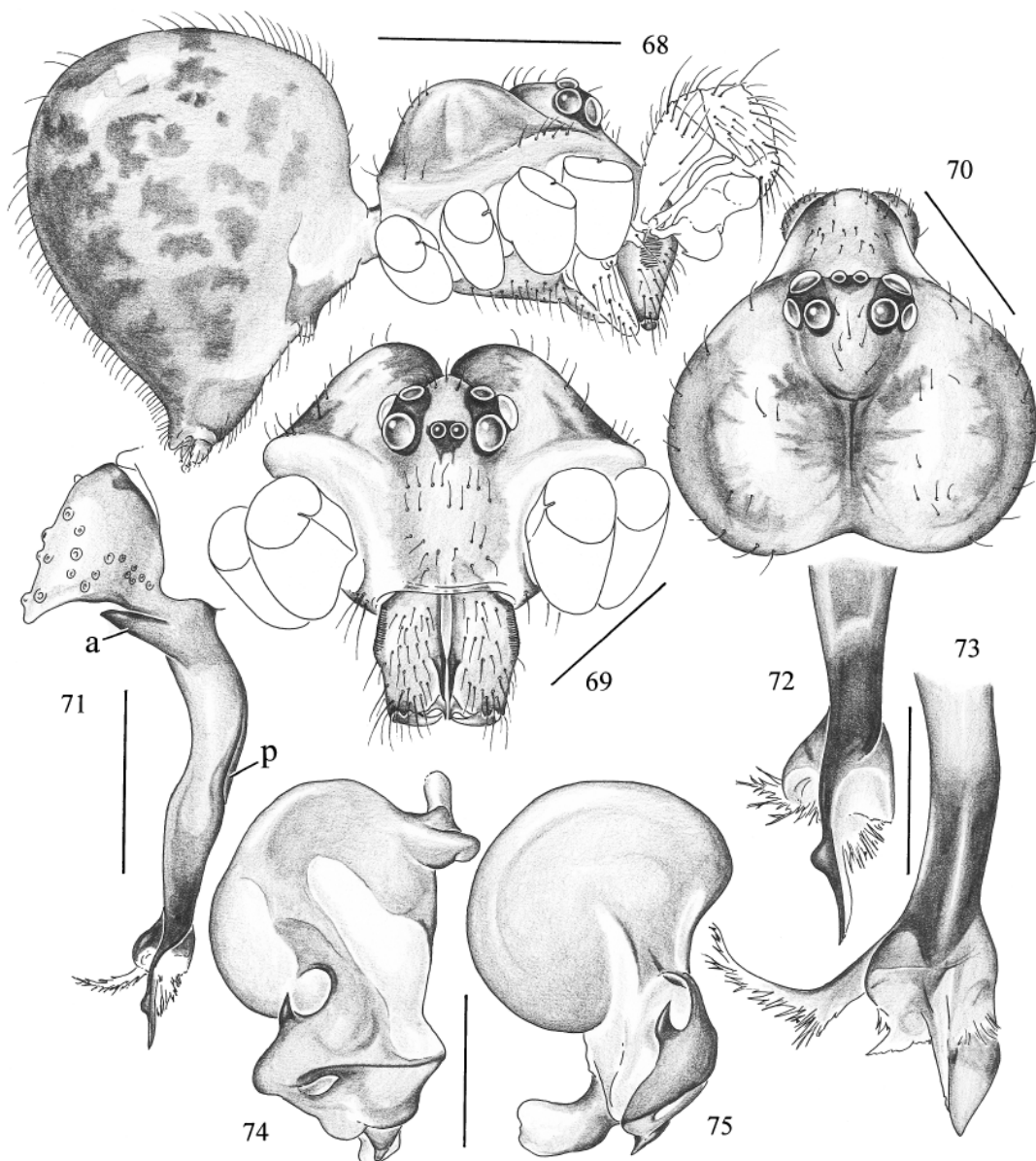
metatarsi 2 only, without vertical hairs; retrolateral trichobothrium of tibia 1 at 13%; tarsus 1 with >15 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as in fig. 68, gray with blackish spots except ventrally; genital plate large, brown, trapezoidal; brown plate in front of spinnerets.

VARIATION: Tibia 1 in 8 males: 3.6–4.8 (\bar{x} = 4.3).

FEMALE: In general very similar to male, but without spines on femora. Tibia 1 in 8 females: 2.4–3.6 (\bar{x} = 2.8). Epigynum simple brown plate with posterior pocket (fig. 76); dorsal view as in fig. 77.

DISTRIBUTION: Widely distributed in eastern Queensland, from ~20°–28°S (map 4).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Mt. Archer, Kilcoy: Male holotype above, with 1 ♀ in same vial; Mt. Mee, “site 2” (27°05'S, 152°41'E), 550 m elev., June 26–Oct. 30, 1978 (G. B. Monteith), 1 ♂ (QMB S50216); Neurum Creek, Mt. Mee (27°05'S, 152°42'E), 210 m elev., Oct. 28, 1977–Jan. 20, 1978 (G. B. Monteith), 1 ♀ (QMB S49975); Mt. Tenison Woods (27°19'S, 152°45'E), rainforest, 750 m elev., stick brushing, May 15, 1997 (G. B. Monteith), 1 ♂ 2 ♀ (QMB S43065); Mt. Glorious, Hiller property (27°20'S, 152°46'E), Jan. 20–Apr. 26, 1978 (G. B. Monteith), 1 ♀ (QMB S49972); Mt. Glorious (27°20'S, 152°46'E), Apr. 26, 1988 (P. Johns, V. E. Davies), 1 ♂ 1 ♀ (QMB S50302); same locality, Sept. 20, 1979 (G. B. Monteith), rainforest, stick brushing, 1 ♂ 1 ♀ 1 juvenile (QMB S50295); Upper Brookfield (27°30'S, 152°55'E), Sept. 7–Oct. 6, 1981 (V. E. Davies, R. Raven), rainforest, 1 ♂ (QMB S50294); same locality, Oct. 5, 1981 (V. E. Davies, R. Raven), rainforest, 2 ♀ 3 juveniles (QMB S50312); same locality, Aug. 14, 1981 (R. Raven, V. E. Davies), litter, rainforest, 1 ♂ 2 ♀ 9 juveniles (QMB S50301); same locality, Mar. 19, 1982 (R. Raven), litter, rainforest, 1 ♀ (QMB S50309); same locality, Jan. 12, 1982 (R. Raven), litter, rainforest, 1 ♀ 1 juvenile (QMB S50311); same locality, July 3, 1981 (V. E. Davies, R. Raven, Ditter), rainforest, 2 ♂ 1 ♀ (QMB S50313); 5 km NW of Mt. Macartney (20°49'S, 148°30'E), open forest, 480 m elev., sieved litter, Apr. 21, 1979 (G. B. Mon-



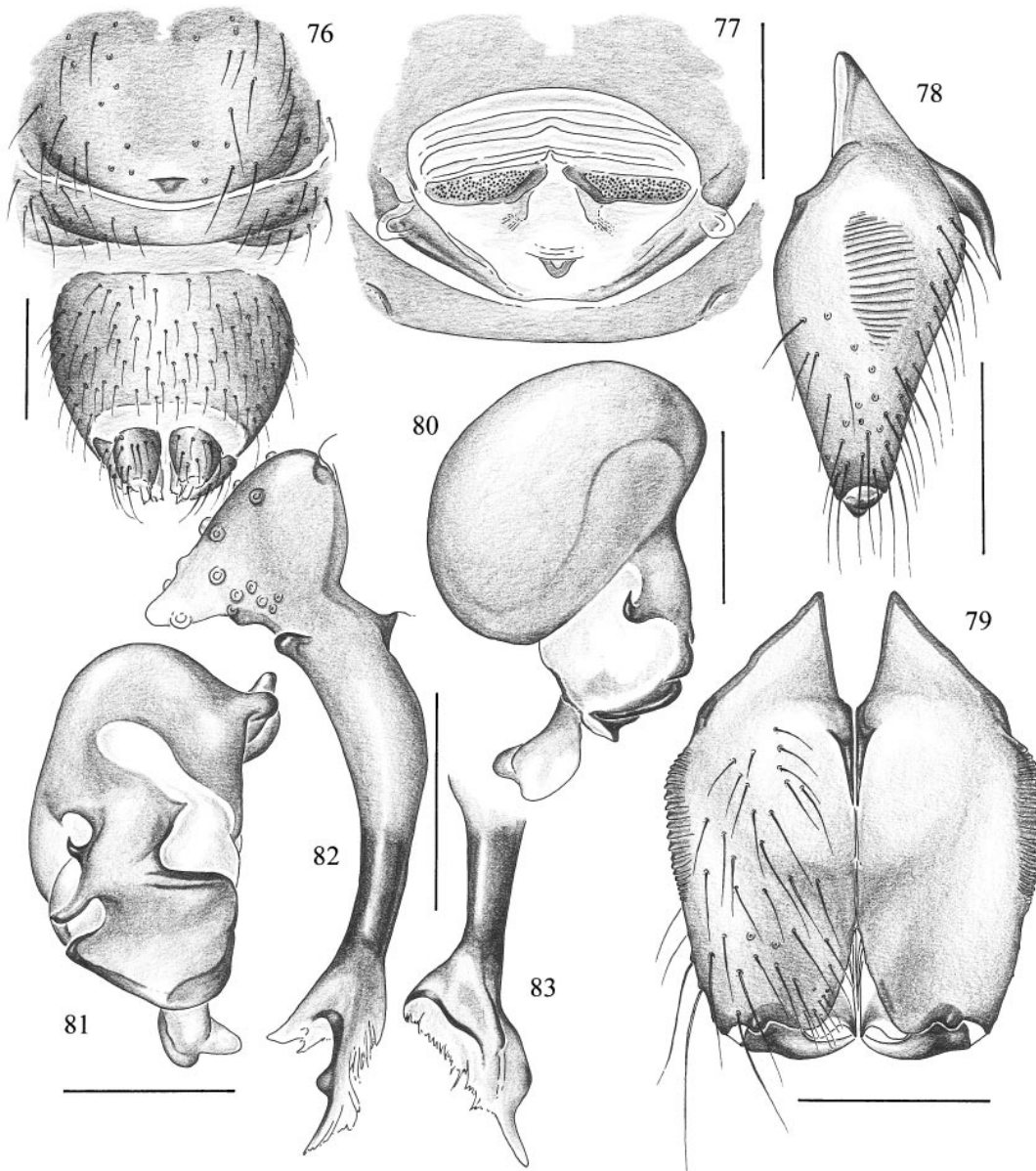
Figs. 68–75. *Wugigarra undanbi*, n. gen., n. sp., male. **68.** Habitus, lateral view. **69, 70.** Prosoma, frontal and dorsal views. **71.** Left cymbium and procursus, retrolateral view; “a”, “p” = apophysis and pocket. **72, 73.** Tip of left procursus, retrolateral (72) and dorsal (73) views. **74, 75.** Genital bulb, dorsal (74) and prolateral (slightly dorsal) views. Scale lines: 1 mm (68), 0.5 mm (69, 70), 0.2 mm (71, 74, 75), 0.1 mm (72, 73).

teith), 4♂ (QMB S50191, 50199, 50214); Cape Hillsborough (20°55'S, 149°03'E), open forest, 10 m elev., sieved litter, Apr. 16, 1979 (G. B. Monteith), 1♂ (QMB S50215).

***Wugigarra jiman*, new species**

Figures 78–83

?“*Psilochorus*” sp. 2: Huber, 1998: fig. 2L (see Note below).



Figs. 76–83. *Wugigarra undanbi* (76, 77), and *W. jiman* (78–83). **76.** Epigynum and spinnerets, ventral view. **77.** Epigynum, dorsal view. **78, 79.** Male chelicerae, lateral and frontal views. **80, 81.** Genital bulb, prolateral (80) and dorsal (slightly retrolateral) (81) views. **82.** Left cymbium and procurrus, retrolateral view. **83.** Tip of left procurrus, dorsal view. Scale lines: 0.2 mm.

?“*Psilochorus*” sp.: Huber, 2000: figs. 84, 132, 178 (see Note below).

NOTE: The species studied by Huber (1998, 2000) is either conspecific or closely related to the present species. However, it

was collected from Magnetic Island, about 700 km N of the localities listed below.

TYPE: Male holotype from Taroom District (25°25'S, 149°58'E), Queensland, Australia; Nov. 12, 1996–Jan. 1997 (P. Lawless), vine thicket on hill, in QMB (S37223).

ETYMOLOGY: Named for the Jiman, an aboriginal tribe from the Taroom area, Queensland. The species name is a noun in apposition.

DIAGNOSIS: Close relative of *W. undanbi*, easily distinguished from this and all other known congeners by the proximal position of the male cheliceral apophyses (figs. 78, 79).

MALE (holotype): Total length 1.9, carapace width 0.97. Leg 1: 14.3 (3.7 + 0.3 + 3.9 + 5.3 + 1.1), tibia 2: 2.3, tibia 3: 1.6, tibia 4: 2.3; tibia 1 l/d: 59. Habitus and prosoma shape very similar to *W. undanbi* (cf. figs. 68–70). Carapace ochre, with darker pattern similar to *W. undanbi* (cf. fig. 70). Ocular area ochre; distance PME-PME 0.120; diameter PME 0.080; distance PME-ALE 0.040; diameter AME 0.055. Clypeus with pair of brown marks; sternum brown. Chelicerae brown, proximally with pair of distinctive apophyses; with stridulatory ridges (figs. 78, 79). Palps in general similar to *W. yawai* (cf. fig. 61), bulb and procursus as in figs. 80–83. Legs light brown, tips of femora and tibiae whitish, preceded by darker rings; with single ventral row of spines on femora 1 (~20) and 2 (~10), with curved hairs on tibiae and metatarsi 1 and 2, without vertical hairs; retrolateral trichobothrium of tibia 1 at 21%; tarsus 1 with >13 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as in *W. undanbi* (cf. fig. 68), gray with blackish spots except ventrally; genital plate large, brown; brown plate in front of spinnerets.

VARIATION: Tibia 1 in other male: 3.5 (missing in others).

FEMALE: Unknown (the single female sectioned in Huber [1998] had a pair of characteristic horns laterally on the epigynum).

DISTRIBUTION: Known from two localities in southeastern Queensland (map 5). The species might actually have a much wider distribution (see Note above).

MATERIAL EXAMINED: AUSTRALIA: Queensland: Taroom District: Male holotype above; Mt. Rose via Taroom (25°25'S, 149°58'E), 260 m elev., vine scrub, Dec. 16, 1997–Mar. 4, 1998 (D. J. Cook), 1 ♂ (QMB S44355); Isla Gorge (25°16'S, 149°56'E), 8.4 km SSW of lookout, vine scrub, 360 m elev., Dec. 19, 1997–Mar. 3, 1998 (G. Monteith,

D. Cook), 1 ♂ (QMB S44351); same locality, Sept. 21–Dec. 19, 1997 (G. Monteith), 1 ♂ (QMB S44245).

Wugigarra wiri, new species

Figures 84–90

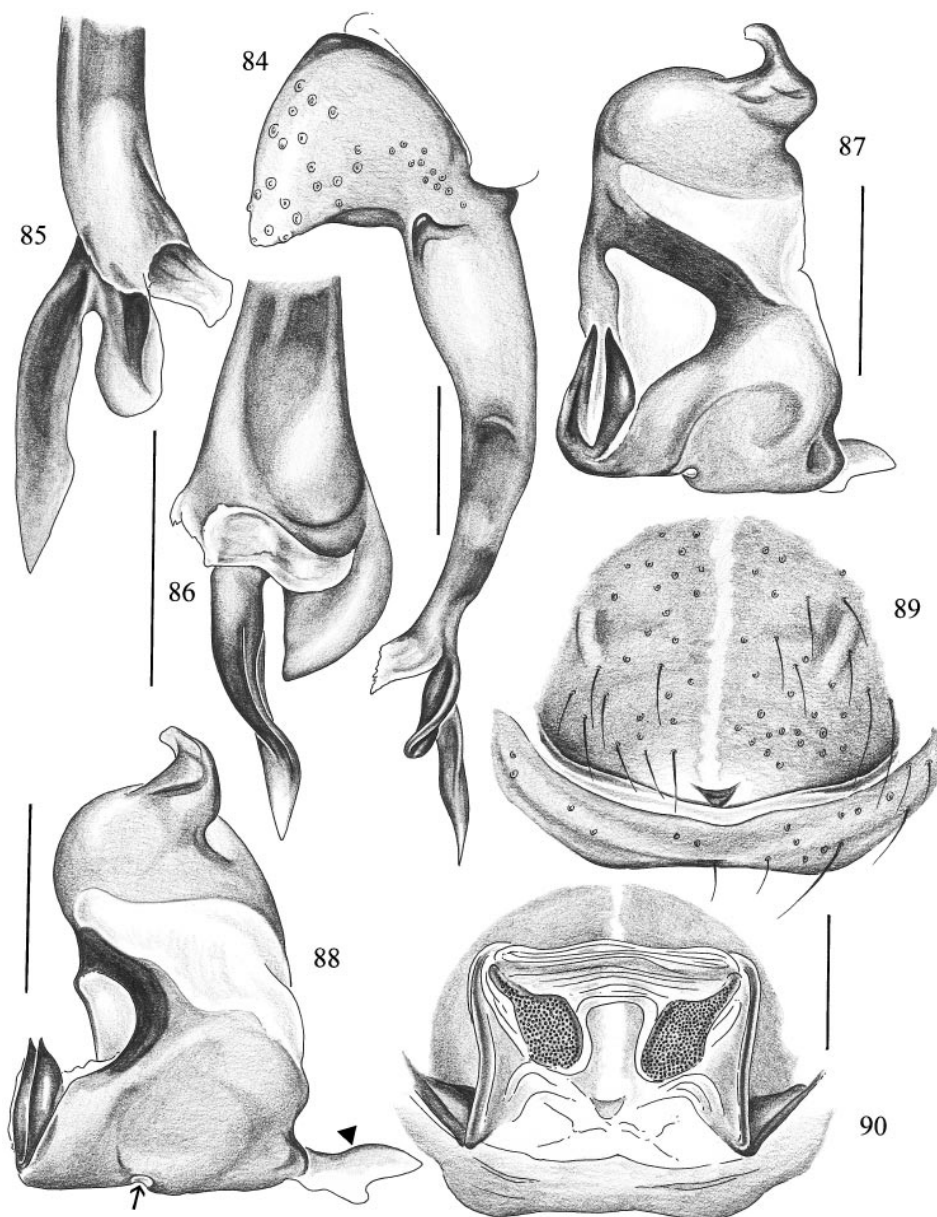
TYPE: Male holotype from Finch Hatton (21°09'S, 148°38'E), Queensland, Australia; Apr. 7–14, 1975 (R. Kohout, V. E. Davies), sheet web against rock, in QMB (S34678).

ETYMOLOGY: Named for the Wiri, an aboriginal tribe from middle-eastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from known congeners by the pair of apophyses distally on the bulb (figs. 87, 88) and by the shape of the procursus tip (figs. 84–86).

MALE (holotype): Total length 3.1, carapace width 1.48. Leg 1: 45.6 (11.7 + 0.7 + 11.7 + 18.7 + 2.8), tibia 2: 7.6, tibia 3: 5.5, tibia 4: 7.6; tibia 1 l/d: 88. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace with dark pattern as in *W. tjapukai* (cf. fig. 3). Ocular area brown; distance PME-PME 0.145; diameter PME 0.120; distance PME-ALE 0.095; diameter AME 0.095. Clypeus with wide brown band, not modified; sternum dark brown except laterally. Chelicerae brown, very similar to those of *W. tjapukai* (cf. fig. 5), with pair of black apophyses whose tips are visible in lateral view, without proximal humps, with stridulatory ridges. Palps in general as in *W. bulburin* (cf. fig. 94), bulb and procursus as in figs. 84–88. Legs light brown, tips of femora and tibiae whitish; without spines and vertical hairs; with curved hairs on tibiae and metatarsi 1 and 2; retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with >25 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), ochre-gray with dark spots except ventrally; genital plate large, brown; brown plate in front of spinnerets.

FEMALE: In general very similar to male, but chelicerae and palps dark brown. Tibia 1: 9.3 (missing in others). Epigynum brown, with posterior pocket (fig. 89); dorsal view as in fig. 90.



Figs. 84–90. *Wugigarra wiri*, n. gen., n. sp. **84**. Left cymbium and procursus, retrolateral view. **85**, **86**. Tip of left procursus, prolateral (slightly dorsal) (85) and dorsal (86) views. **87**, **88**. Left genital bulb, retrolaterodorsal (87) and retrolateral (88) views; unshafted arrow: worm-shaped process; shafted arrow: sperm duct opening. **89**, **90**. Epigynum, ventral (89) and dorsal (90) views. Scale lines: 0.3 mm (84, 87–90), 0.2 mm (85, 86).

DISTRIBUTION: Known only from type locality in middle-eastern Queensland (map 5).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Finch Hatton: Male holotype above, with 3 ♀ (QMB S50113).

***Wugigarra bulburin*, new species**

Figures 91–100

TYPE: Male holotype from Bulburin (24°30'S, 151°35'E), Queensland, Australia;

Mar. 17–24, 1975 (R. Kohout, V. E. Davies), in QMB (S34671).

ETYMOLOGY: Named for the type locality. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from all known congeners by the unique set of apophyses on the male chelicerae (figs. 92, 93).

MALE (holotype): Total length 1.9, carapace width 1.00. Leg 1: 21.5 (5.3 + 0.3 + 5.5 + 8.8 + 1.6), tibia 2: 3.1, tibia 3: 1.5, tibia 4: 3.0; tibia 1 l/d: 67. Habitus and prosoma shape very similar to *W. undanbi* (cf. figs. 68–70). Carapace ochre, with slightly darker spot behind ocular area, small spot posteriorly, and darker margins. Ocular area ochre; distance PME-PME 0.120; diameter PME 0.095; distance PME-ALE 0.055; diameter AME 0.055. Clypeus with pair of brown marks, distally with unsclerotized median projection (fig. 91); sternum light brown laterally, darker longitudinal band medially. Chelicerae ochre, with set of very distinctive apophyses and stridulatory ridges (figs. 92, 93). Palps as in fig. 94, bulb and procursus as in figs. 94–98. Legs ochre to light brown, femora and tibiae with whitish tips preceded by slightly darker rings; without spines and vertical hairs; with curved hairs on tibiae and metatarsi 1–3; retrolateral trichobothrium of tibia 1 at 8%; tarsus 1 with >20 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape similar to *W. undanbi* (cf. fig. 68), but not as high; gray with large blackish spots except ventrally; genital plate trapezoidal, brown; brown plate in front of spinnerets.

VARIATION: Tibia 1 in 9 males: 5.5–5.7 (\bar{x} = 5.6).

FEMALE: In general similar to male, but sternum without light lateral areas, and chelicerae and palps brown. Opisthosoma frontodorsally with unpaired sclerotized area, opposing posterior part of thoracic furrow that is less deep and more heavily sclerotized than in male. Tibia 1 in 2 females: 4.1, 4.2. Epigynum with posterior sclerotized scape, apparently with pocket (fig. 99); dorsal view as in fig. 100.

DISTRIBUTION: Known only from Bulburin area, southeastern Queensland (map 6).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Bulburin: Male holotype above, with 5♂ 3♀ (QMB S49818); Bulburin (For-

estry Nursery), NW of Bundaberg (24°31'S, 151°29'E), rainforest, 580 m elev., Mar. 1975 (M. Gray, C. Horseman), 1♂ 1 juvenile (AMS KS6571); same data, 2♀ 1 juvenile (AMS KS0099); same data, under rock and under logs, 3♂ (AMS KS6789).

Wugigarra yirgay, new species

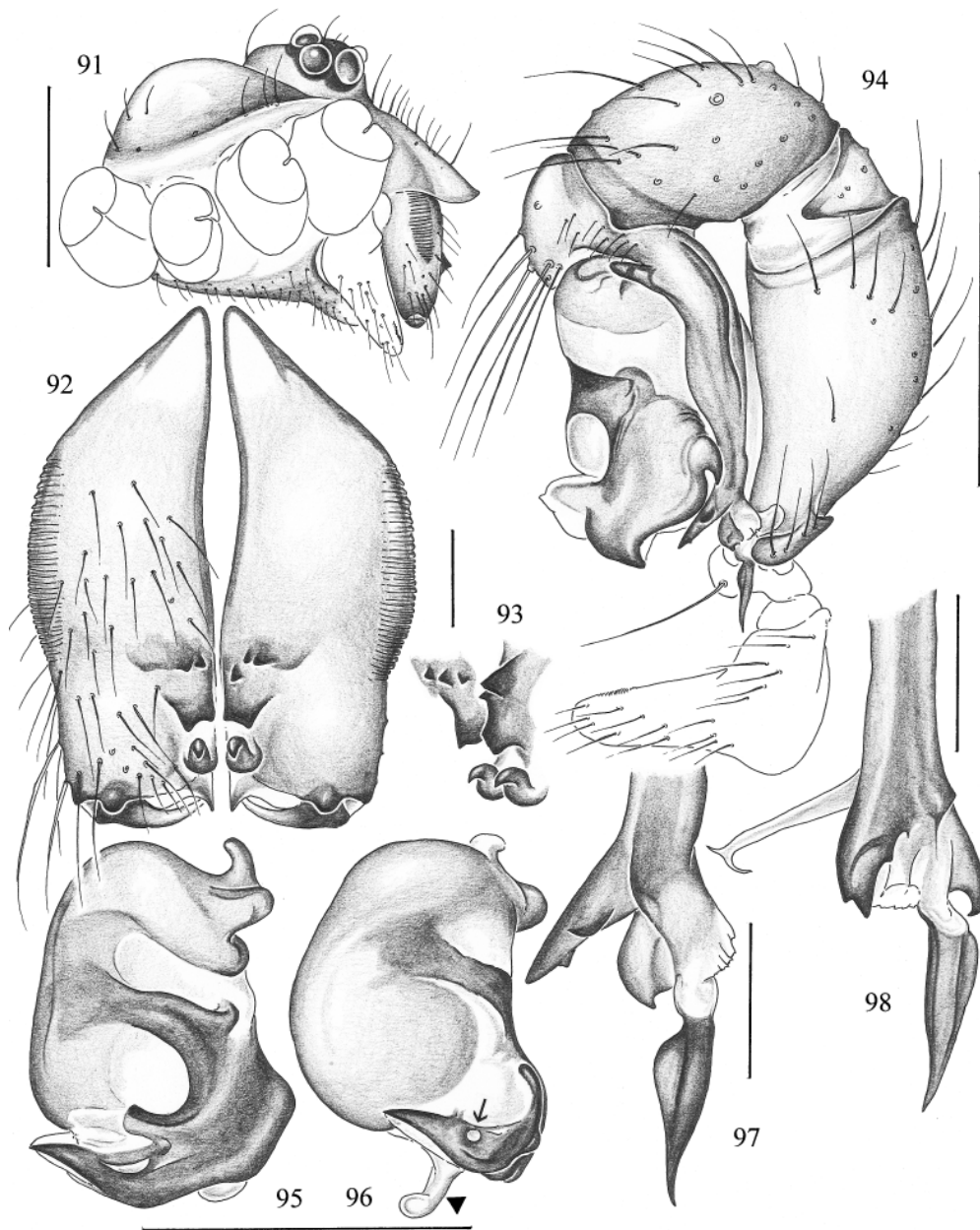
Figures 101–109

TYPE: Male holotype from Clifton Beach (16°46'S, 145°40'E), Queensland, Australia; 1971–1972 (N. Clyde Coleman), in QMB (S49884).

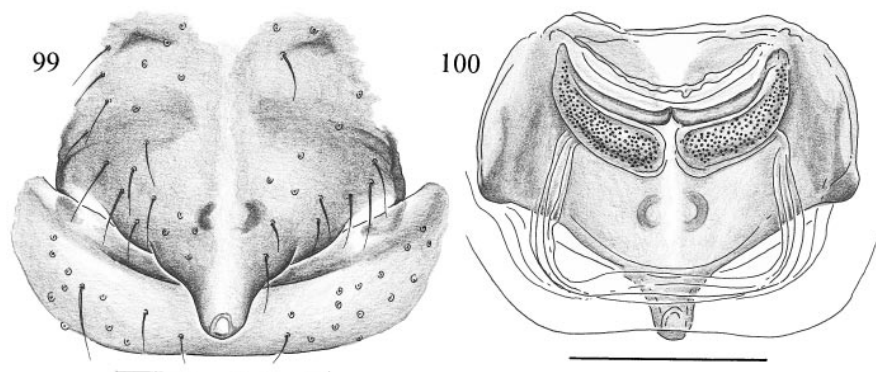
ETYMOLOGY: Named for the Irukandji (also called Yirgay), an aboriginal tribe from the Cairns area, northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from all known congeners by the male chelicerae provided with several modified hairs (figs. 101, 102), and by the long thin procursus (fig. 103). The QMB has a closely related undescribed species from Diamond Hill, Iron Range (northern Queensland), with identical chelicerae, but with different procursus tip, bulb, and epigynum (QMB S50263).

MALE (holotype): Total length 2.0, carapace width 0.97. Leg 1: 26.8 (6.9 + 0.4 + 6.9 + 10.7 + 1.9), tibia 2: 4.0, tibia 3: 2.8, tibia 4: 4.1; tibia 1 l/d: 74. Habitus and prosoma shape similar to *W. tjapukai* (cf. figs. 1–3). Carapace ochre, with slightly darker median and lateral bands. Ocular area ochre; distance PME-PME 0.135; diameter PME 0.085; distance PME-ALE 0.055; diameter AME 0.055. Clypeus ochre, unmodified; sternum ochre-yellow. Chelicerae ochre, with dark brown modified hairs, and stridulatory ridges (fig. 101). Palps as in fig. 103, femur without ventral apophysis, procursus tip and bulb as in figs. 103–107. Legs ochre-yellow, with slightly darker rings on femora subdistally, patellae and tibiae proximally, tibiae subdistally; tips of femora and tibiae whitish; with curved hairs on metatarsi 1 and 2; without spines and vertical hairs; retrolateral trichobothrium on tibia 1 at 8%; tarsus 1 distally with ~15–20 fairly distinct pseudosegments, proximally pseudosegmentation difficult to see. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), ochre gray with some blackish spots except ventrally; genital plate



Figs. 91–98. *Wugigarra bulburin*, n. gen., n. sp., male. **91.** Prosoma, lateral view, showing slightly modified clypeus. **92.** Chelicerae, frontal view. **93.** Cheliceral armature, oblique view. **94.** Left palp, retrolateral view. **95, 96.** Left genital bulb, dorsal (95) and prolateral (96) views; unshafted arrow: worm-shaped process; shafted arrow: sperm duct opening. **97, 98.** Tip of left procursus, retrolateral (97) and dorsal (98) views. Scale lines: 0.5 mm (91, 94–96), 0.1 mm (92, 93, 97, 98).



Figs. 99, 100. *Wugigarra bulburin*, n. gen., n. sp. Epigynum, ventral (99) and dorsal (100) views. Scale lines: 0.3 mm.

hardly darker; light brown plate in front of spinnerets.

VARIATION: Tibia 1 in 2 other males: 8.1 (both). These two males are slightly larger than the holotype, but appear identical in shape.

FEMALE: In general similar to male, but dark median band on carapace extends around ocular area, clypeus and sternum darker (brown), and dark rings on legs more distinct. Epigynum very simple in ventral view (fig. 108), without pocket; dorsal view as in fig. 109.

DISTRIBUTION: Known from three localities in northeastern Queensland (map 6).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Clifton Beach: Male holotype

above, with 1 ♀ in same vial; Endeavour Range 11 miles W of Cooktown (15°30'S, 145°06'E), Nov. 14, 1975 (R. Raven, V. E. Davies), litter, 1 ♂ (QMB S50269); Mt. Cook (15°30'S, 145°15'E), Nov. 14, 1975 (R. Raven, V. E. Davies), 1 ♂ 3 juveniles (QMB 50144).

Wugigarra arcoona, new species

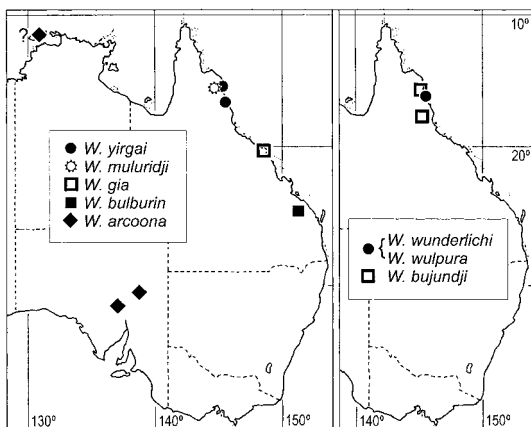
Figures 110–114

TYPE: Male holotype from Arcoona Bluff (30°26'S, 138°58'E), upper slopes at west end of bluff, Gammon Ranges National Park, South Australia, Australia; May 3, 1989 (D. C. Lee), in SAM (N1999/781).

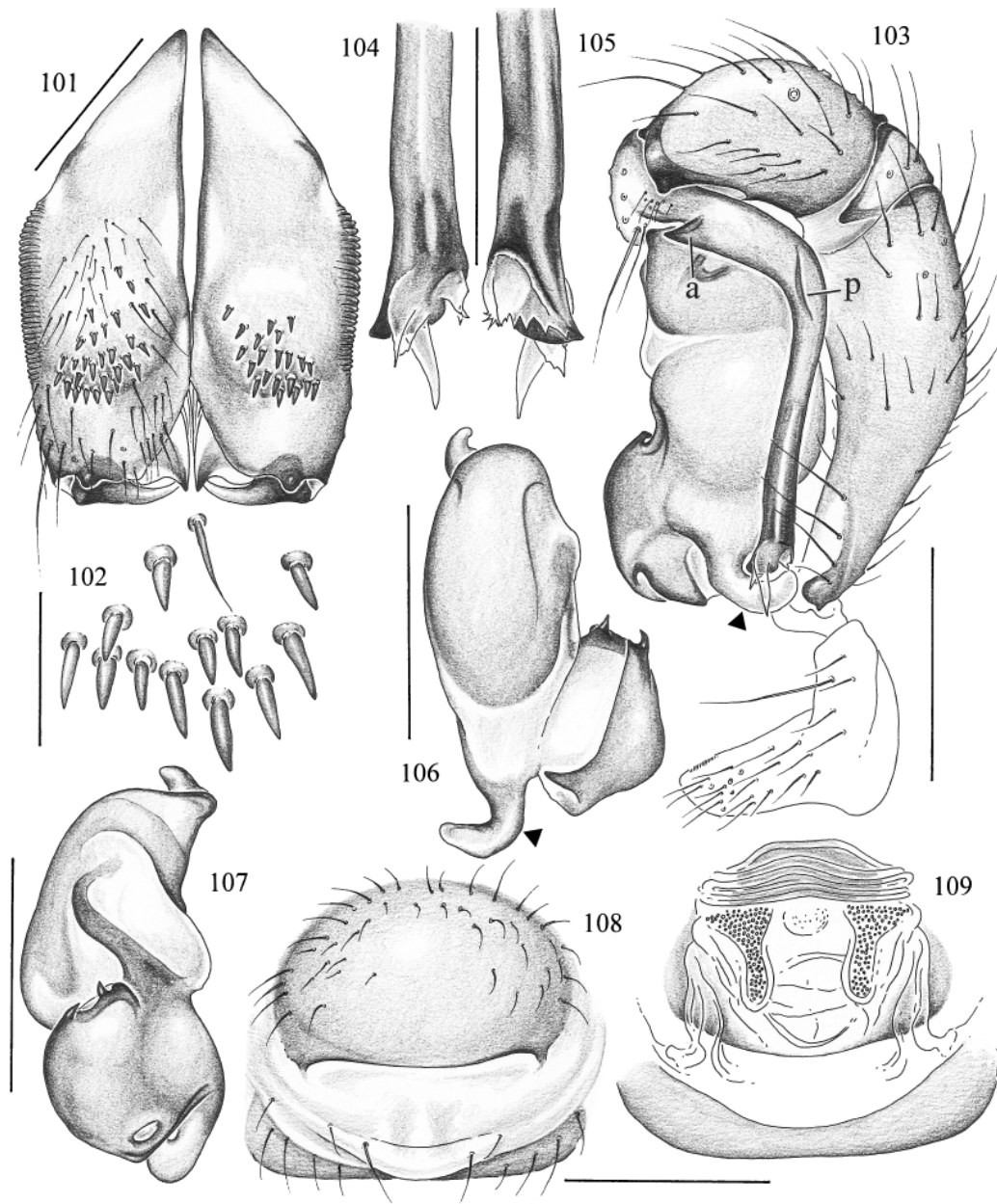
ETYMOLOGY: Named for the type locality. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from all known congeners by the male chelicerae having several small cones proximally and a pair of larger apophyses distally (fig. 110), and by the shape of the procurus tip (fig. 114) and the bulb (figs. 112, 113).

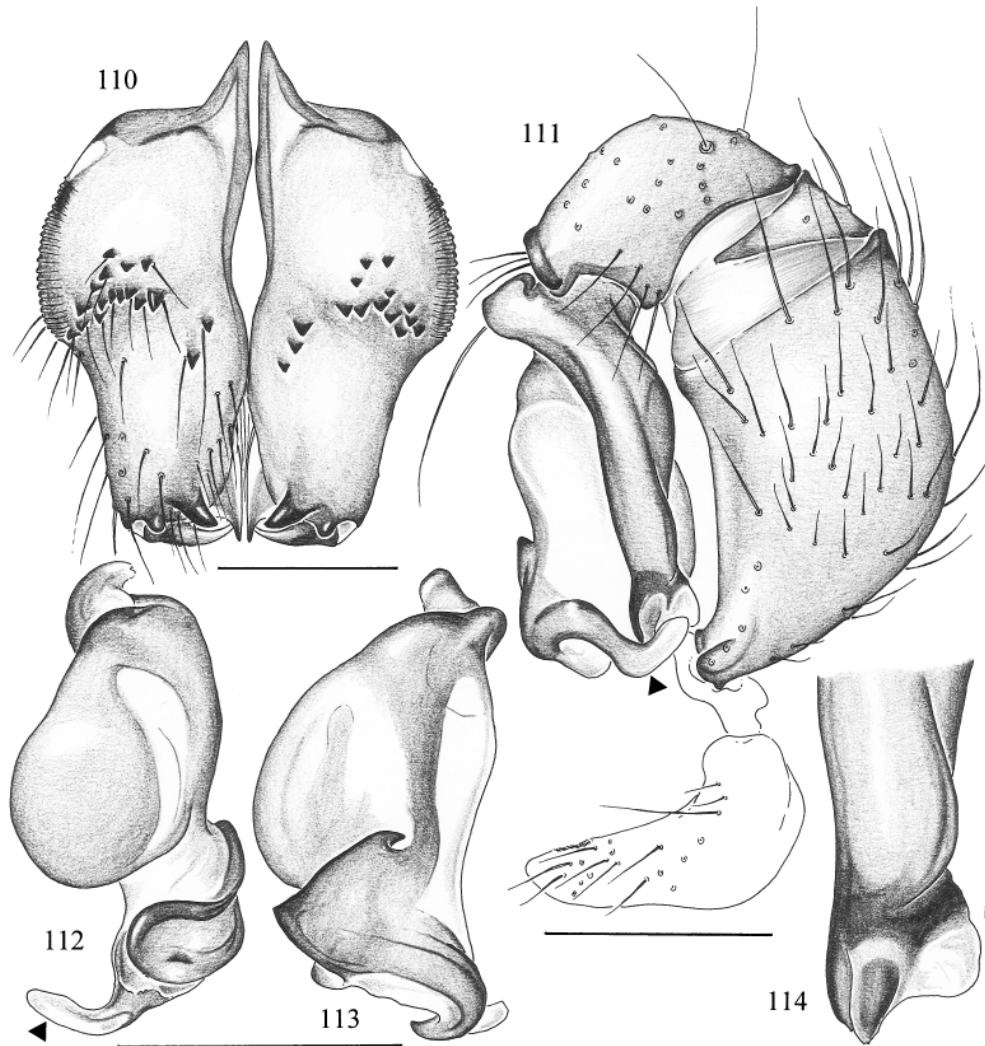
MALE (holotype): Total length 2.3, carapace width 1.03. Leg 1: 17.1 (4.7 + 0.4 + 4.9 + 5.9 + 1.2), tibia 2: 3.4, tibia 3: 2.5, tibia 4: 3.3; tibia 1 l/d: 57. Habitus and prosoma shape as in *W. undanbi* (cf. figs. 68–70), but carapace less high. Carapace ochre-yellow, with slightly darker band around ocular area. Ocular area light ochre; distance PME-PME 0.115; diameter PME 0.085; distance PME-ALE 0.020; diameter AME 0.080. Clypeus with slightly darker wide mark; sternum whitish. Chelicerae ochre to light brown, proximally much wider than



Maps 6, 7. Distribution of *Wugigarra* species: *bulburin* group (map 6, on left), and *wunderlichii* group (map 7, on right).



Figs. 101–109. *Wugigarra yirgai*, n. gen., n. sp. **101.** Male chelicerae, frontal view. **102.** Modified hairs on male chelicerae. **103.** Left male palp, retrolateral view; “a”, “p” = apophysis and pocket. **104, 105.** Tip of left procursus, retrolateral (104) and prolateral (105) views. **106, 107.** Left genital bulb, prolateral (106) and dorsal (107) views. **108, 109.** Epigynum, ventral (108) and dorsal (109) views. Scale lines: 0.4 mm (103, 106–109), 0.2 mm (101, 104, 105), 0.05 mm (102). Unshafted arrows: worm-shaped process.



Figs. 110–114. *Wugigarra arcoona*, n. gen., n. sp., male. **110.** Chelicerae, frontal view. **111.** Left palp, retrolateral view. **112, 113.** Left genital bulb, prolateral (112) and dorsal (113) views. **114.** Tip of left procursus, retrolateral view. Scale lines: 0.4 mm (111–113), 0.2 mm (110, 114). Unshafted arrows: worm-shaped process.

distally, with some black cones, with stridulatory ridges, distally with pair of inward-facing apophyses (fig. 110). Palps as in fig. 111, femur without ventral apophysis, procursus tip and bulb as in figs. 112–114. Legs ochre-yellow, darker rings hardly visible; with curved hairs on tibia 1 and metatarsi 1 and 2; without spines and vertical hairs; retrolateral trichobothrium on tibia 1 at 28%; tarsus 1 distally with ~10 indistinct pseudosegments, proximally pseudosegmentation

difficult to see. Opisthosoma shape as in *W. undanbi* (cf. fig. 70), ochre gray with some blackish spots except ventrally; genital plate and plate in front of spinnerets not darker.

VARIATION: Tibia 1 in 4 other males: 3.1, 4.3, 4.7, 4.8.

FEMALE: The SAM has a female specimen from “base of Beda Hill, South Gap Station” (31°51’S, 137°37’E) that might be conspecific (SAM N1999/784). It has a very distinctive epigynum with a sclerotized scape.

DISTRIBUTION: Known from two areas more than 2000 km apart: Gammon Ranges in South Australia, and Melville Island in Northern Territory (map 6). I personally find the Melville record dubious, and suggest that one question it until further material is found.

MATERIAL EXAMINED: AUSTRALIA: *South Australia:* Gammon Ranges, Arcoona Bluff: Male holotype above; same data, 1♂ (SAM N1999/778); Arcoona Creek near Elephant Hill (30°26'S, 138°59'E), May 5, 1989 (D. Hirst), 1♂ (SAM N1999/782); 3.3 km SSW of Welcome Well, Arcoona Station (31°17'S, 137°02'E), Nov. 10–14, 1996 (Stony Desert Survey), 1♂ (SAM N1999/783). *Northern Territory:* Melville Island, Pickertaramoor (~11°46'S, 130°53'E), Jan. 16, 1990 (M. J. Tyler), 1♂ in SAM (N1999/860).

***Wugigarra muluridji*, new species**

Figures 115–122

TYPE: Male holotype from Bakers Blue Mt., 17 km W of Mt. Molloy (16°42'S, 145°10'E), Queensland, Australia; Jan. 8–9, 1990 (ANZSES), 800–1000 m elev., in QMB (S34680).

ETYMOLOGY: Named for the Muluridji, an aboriginal tribe from northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most known congeners by the male chelicerae that have no modification other than a proximal pair of humps (fig. 115); *W. wunderlich* has similar chelicerae but extremely different palps (e.g., femora with ventral apophyses).

MALE (holotype): Total length 2.8, carapace width 1.35. Leg 1: ~36.5 (9.6 + 0.4 + 9.6 + ~14.5 + ~2.4), tibia 2: 6.3, tibia 3: 4.5, tibia 4: 6.4. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre-brown, with darker median band and lateral margins. Ocular area brown; distance PME-PME 0.135; diameter PME 0.105; distance PME-ALE 0.065; diameter AME 0.065. Clypeus ochre-brown; sternum light brown. Chelicerae light brown, with proximal bulge and stridulatory ridges (fig. 115); hairs on bulge slightly stronger than others. Palps in general as in *W. tjapukai* (cf. figs. 6, 7), procursus and bulb as in figs. 116–120. Legs ochre-brown, darker rings hardly visi-

ble (femora subdistally, tibiae proximally and subdistally), tips of femora and tibiae whitish; curved hairs on tibiae 1–3 and all metatarsi; without spines and vertical hairs; retrolateral trichobothrium on tibia 1 at 7%; tarsus 1 distally with ~25 fairly distinct pseudosegments, proximally pseudosegmentation difficult to see. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), dark gray with blackish spots except ventrally; genital plate and plate in front of spinnerets light brown.

VARIATION: Tibia 1 in other male: 9.3.

FEMALE: In general very similar to male, but chelicerae and palps brown. Tibia 1 in two females: 6.5, 7.8. Epigynum large, brown, without pocket (fig. 121); dorsal view as in fig. 122.

DISTRIBUTION: Known only from type locality in northeastern Queensland (map 6).

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Bakers Blue Mt.: Male holotype above, with 1♂ 2♀ 1 juvenile (QMB 47811).

***Wugigarra gia*, new species**

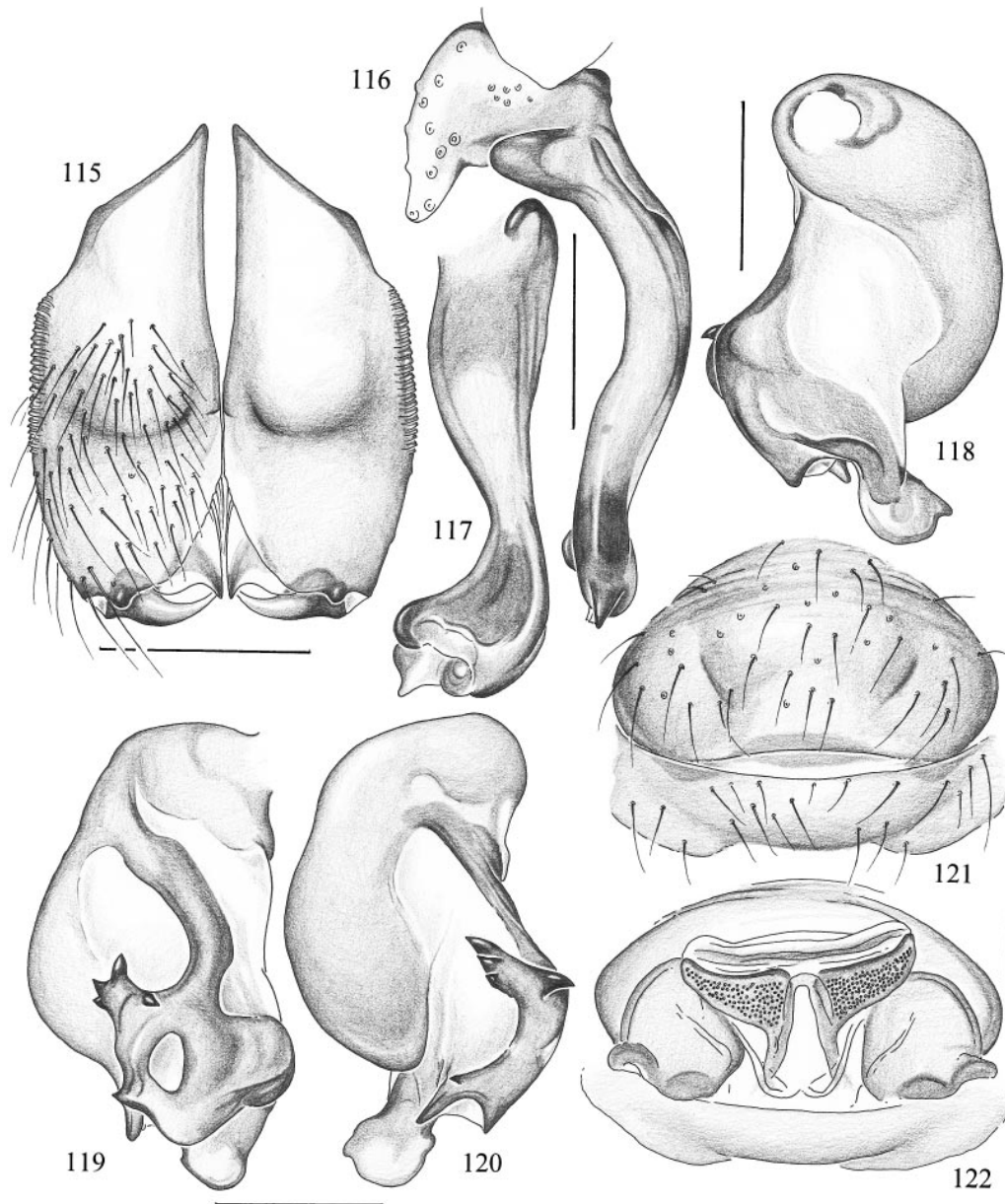
Figures 123–130

TYPE: Male holotype from Mt. Dryander (20°15'S, 148°33'E), Queensland, Australia; Nov. 21, 1992 (G. Monteith, G. Thompson, H. Janetzki), 700 m elev., in QMB (S49559).

ETYMOLOGY: Named for the Gia, an aboriginal tribe from the Proserpine area. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from all known congeners by the male chelicerae with their large, light, bifid protrusions (figs. 123, 124) and by the tip of the procursus and the bulb (figs. 125–127).

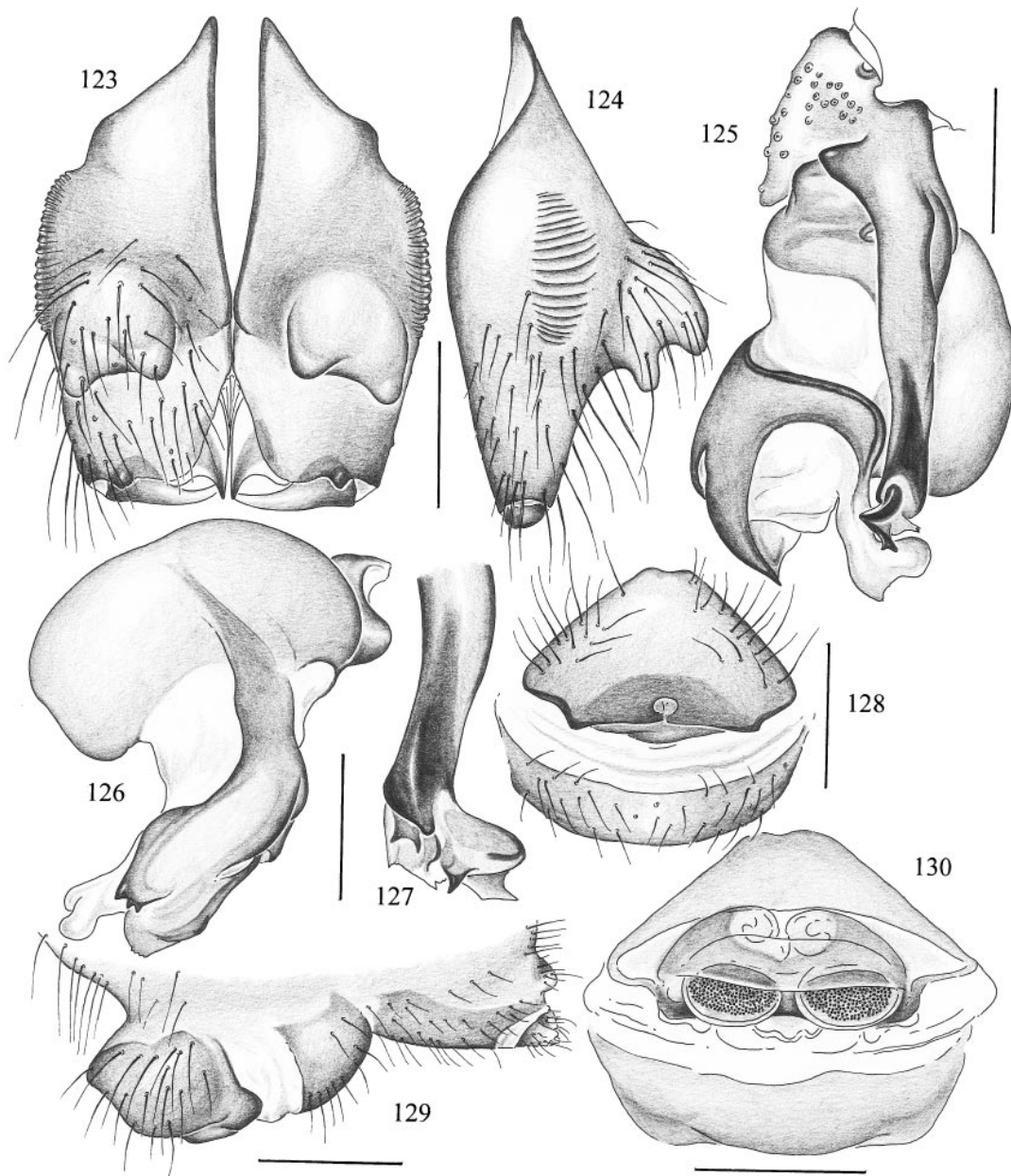
MALE (holotype): Total length 3.7, carapace width 1.74. Leg 1 missing, tibia 2: 7.9, tibia 3: 5.7, tibia 4: 7.7. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre, medially and laterally slightly darker. Ocular area slightly darker than carapace; distance PME-PME 0.185; diameter PME 0.105; distance PME-ALE 0.055; diameter AME 0.065. Clypeus ochre, unmodified; sternum ochre-yellow. Chelicerae ochre to light brown, with pair of light protrusions and stridulatory ridges (figs. 123, 124). Palps in general similar to *W. yawai* (cf. fig. 161), but retrolateral apophysis on



Figs. 115–122. *Wugigarra muluridji*, n. gen., n. sp. **115.** Male chelicerae, frontal view. **116.** Left cymbium and procursus, retrolateral view. **117.** Left procursus, dorsal view. **118–120.** Left genital bulb, retrolateral (118), dorsal (119), and prolateral (120) views. **121, 122.** Epigynum, ventral (121) and dorsal (122) views. Scale lines: 0.3 mm.

femur without distal projection; procursus and bulb as in figs. 125–127. Legs light brown, without darker rings, tips of tibiae whitish; with curved hairs on tibiae and metatarsi; without spines and vertical hairs;

retrolateral trichobothrium on tibia 2 at 11%; tarsus 2 distally with ~14 quite distinct pseudosegments, proximally pseudosegmentation difficult to see. Opisthosoma shape as in *W. tjapukai* (cf. fig. 1), ochre-gray, covered with



Figs. 123–130. *Wugigarra gia*, n. gen., n. sp. **123, 124.** Male chelicerae, frontal and lateral views. **125.** Procursus and genital bulb, retrolateral view. **126.** Genital bulb, prolateral view. **127.** Tip of procurus, dorsal view. **128.** Epigynum, ventral view. **129.** Epigynum and spinnerets, lateral view. **130.** Epigynum, dorsal view. Scale lines: 0.5 mm (128–130), 0.3 (123–127).

blackish spots except ventrally; genital plate and plate in front of spinnerets light brown.

FEMALE: In general very similar to male, but sternum much darker; opisthosoma dor-

sofrontally with small transverse plate, but opposing side of carapace apparently not modified. Epigynum as in figs. 128, 129; dorsal view as in fig. 130.

DISTRIBUTION: Known only from type locality in middle-eastern Queensland (map 6).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Mt. Dryander: Male holotype above, with 1 ♀ in same vial.

***Wugigarra bujundji*, new species**

Figures 131–142, 148–150

TYPE: Male holotype from Mt. Finnigan (15°49'S, 145°17'E), Queensland, Australia; Nov. 9, 1974 (L. R., V. E. Davies, D. Joffe), on tree trunks, 3200–3600' elev., in QMB (S49974).

ETYMOLOGY: Named for the Kokobujundji (also called Bujundji), an aboriginal tribe from the Mt. Finnigan area. The species name is a noun in apposition.

DIAGNOSIS: Closely related to *W. wunderlichii* and *wulpura*, distinguished by the pair of apophyses distally on the male chelicerae (fig. 134), by the tip of the procurus (compare figs. 133, 147, 155), and by the bulbal apophyses (compare figs. 131 and 135 with 114–146). The QMB also has a very close undescribed relative from Spear Creek, northeastern Queensland (QMB 50139, 50117), which differs only in details of procurus and bulb shape.

MALE (holotype): Total length 3.3, carapace width 1.58. Leg 1: 39.5 (10.0 + 0.7 + 9.9 + 16.1 + 2.8), tibia 2 missing, tibia 3: 5.1, tibia 4 missing; tibia 1 l/d: 74. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre, with wide median and marginal brown bands. Ocular area brown; distance PME-PME 0.145; diameter PME 0.145; distance PME-ALE 0.095; diameter AME 0.105. Clypeus ochre, unmodified; sternum brown, lateral margins lighter. Chelicerae light brown, with pair of small apophyses distally and low humps frontally (fig. 134); stridulatory ridges as in fig. 138. Stridulatory pick is a modified hair proximally on palpal femur (fig. 140). Palps as in figs. 131 and 132, mostly ochre-yellow, only procurus and bulb partly brown to black; femur with distinct ventral apophysis (fig. 131); procurus tip and bulb distinctive, as in figs. 131–133 and 135. Legs ochre-brown, without rings, tips of femora and tibiae whitish; curved hairs on tibia 1 and all metatarsi; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 5%; tarsus 1 dis-

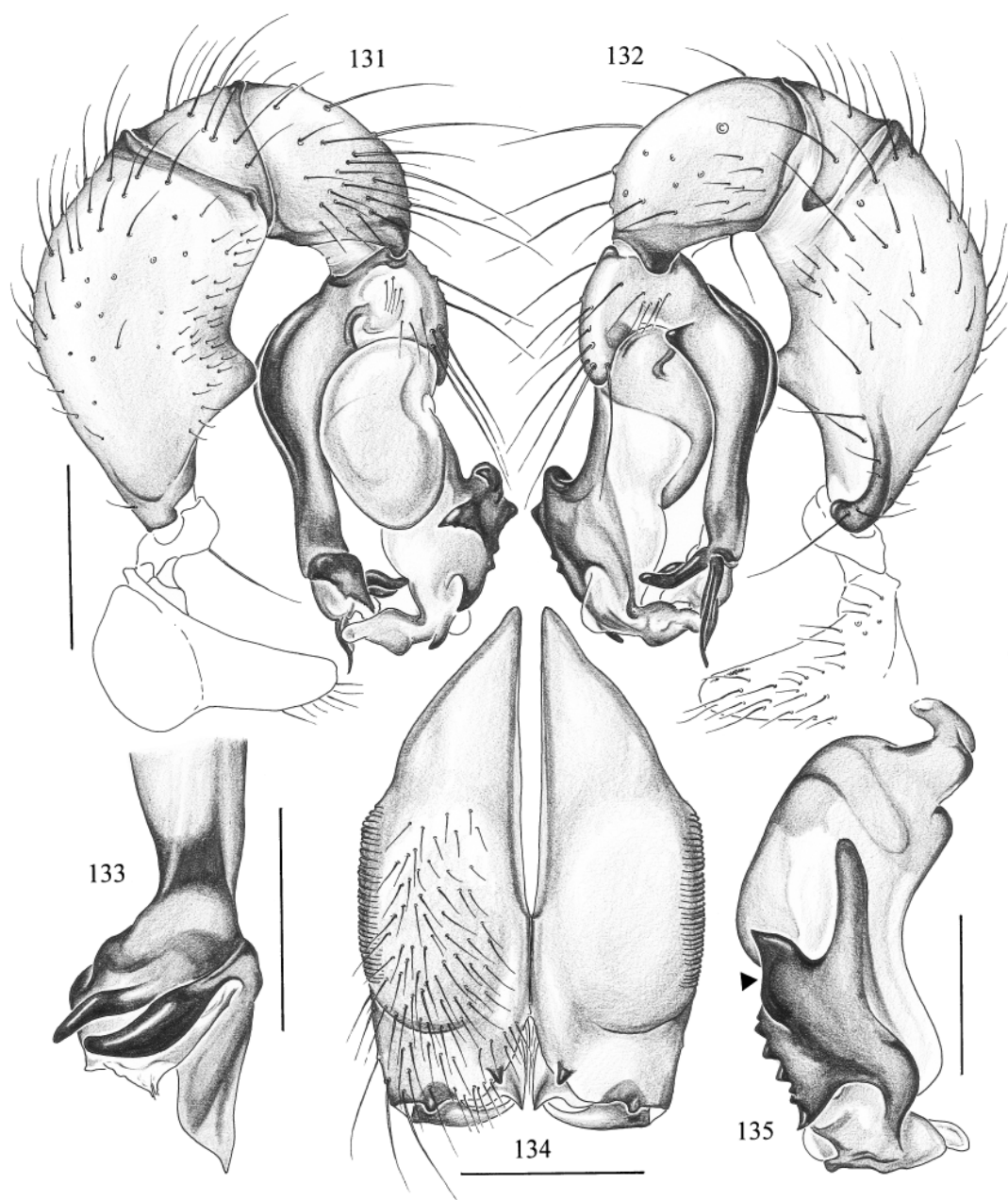
tally with ~18 quite distinct pseudosegments (fig. 136 shows two near the tip), proximally pseudosegmentation not visible in dissecting microscope. Tarsal claws as in fig. 142. Opisthosoma similar to *W. tjapukai*, slightly longer, ochre-gray, with blackish spots except ventrally. Genital plate brown, about trapezoidal; gonopore without epiandrous spigots (fig. 137). Brown plate in front of spinnerets.

VARIATION: Tibia 1 in 9 males: 9.7–11.9 (\bar{x} = 10.5). Some males have an additional small spine where the arrow points in fig. 135.

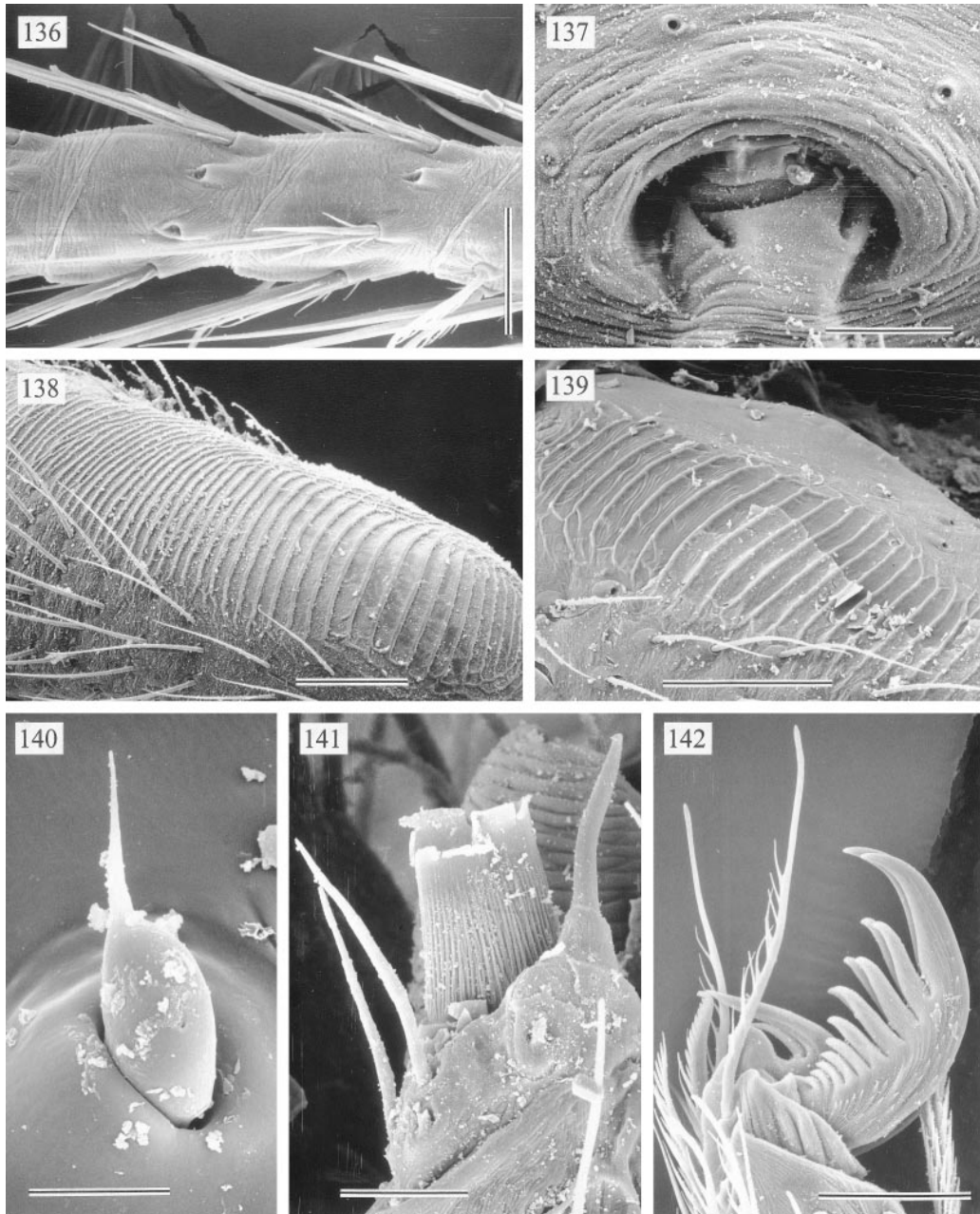
FEMALE: In general very similar to male, but chelicerae and palps darker brown; fewer stridulatory ridges than male (fig. 139). Tibia 1 in 13 females: 7.3–10.0 (\bar{x} = 8.7). Epigynum as in fig. 148, light to dark brown; dorsal view and cleared ventral view as in figs. 149 and 150. Two spigots on ALS (fig. 141).

DISTRIBUTION: Known from several localities in the Cairns area, northeastern Queensland (map 7).

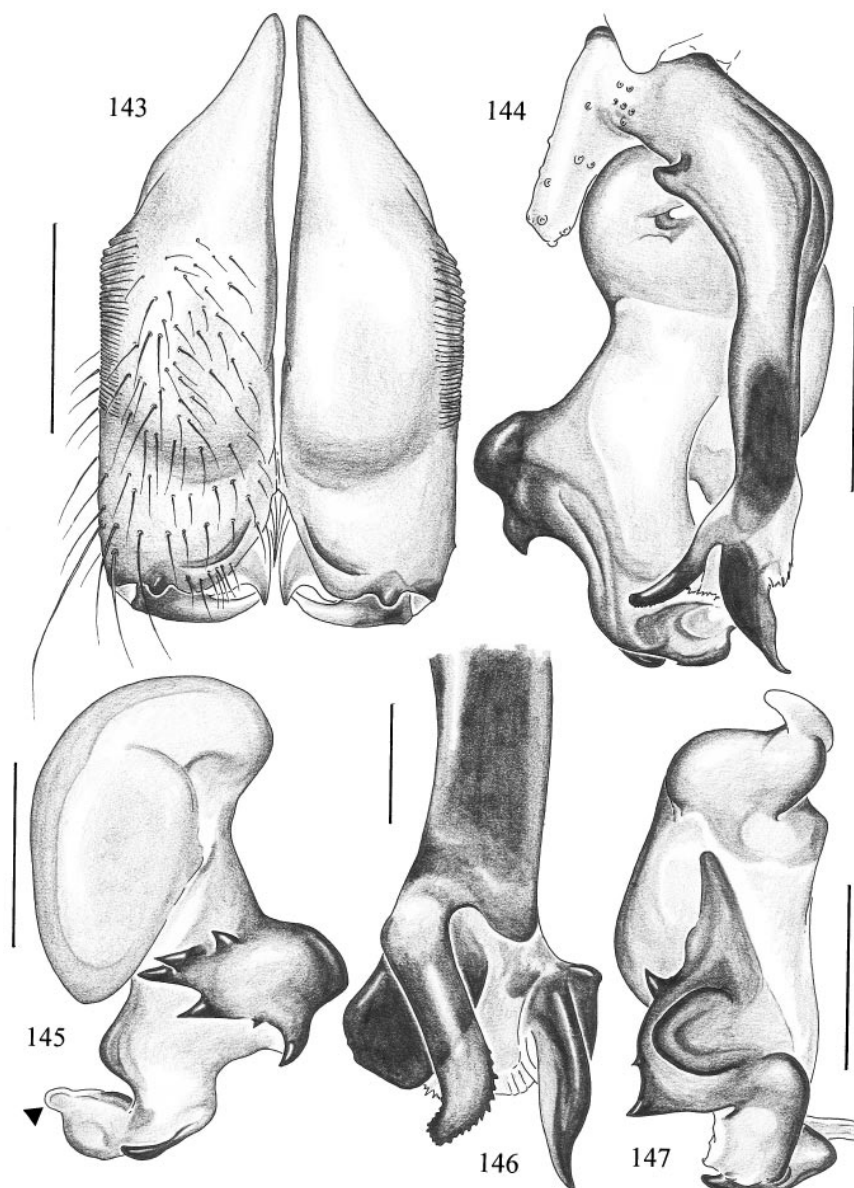
MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Mt. Finnigan: Male holotype above, with 1 ♀ in same vial; Mt. Finlay (15°49'S, 145°21'E), Nov. 29, 1975 (R. M., V. E. Davies), 2 ♂ 4 ♀ 1 juvenile (QMB S49978); Twelve Mile Scrub (15°50'S, 145°19'E), Nov. 22–27, 1975 (collector not given), complex mesophyll vine forest on granite, 1 ♂ 1 ♀ 1 juvenile (QMB S50140); Gap Creek (15°50'S, 145°19'E), Nov. 19, 1974 (D. Joffe), 1 ♂ 2 ♀ (QMB S50127); Mt. Hartley (15°46'S, 145°20'E), 1600 ft elev., Nov. 6, 1974 (J. C., D. Joffe, V. E. Davies), 1 ♀ (QMB S50138); Home Rule, Granites Track (15°44'S, 145°18'E), tangle web against tree trunks, 1200' elev., Nov. 16, 1974 (D. Joffe, V. E. Davies), 5 ♂ 6 ♀ (QMB S50261); same locality, Nov. 11, 1974 (J.C., D.J., K.Mc.D.), 3 ♀ (QMB S50121); Home Rule (15°44'S, 145°18'E), in base of dead palm frond, Nov. 13, 1974 (D. Joffe), 1 ♂ 1 ♀ (QMB S50115); Mt. Hedley, The Hummock (15°44'S, 145°17'E), fine shawl web in hollow, Oct. 12, 1974 (V. E. Davies), 2 ♂ 2 ♀ (QMB S50116); Mt. Fisher, 7 km SW of Millaa Millaa (17°33'S, 145°34'E), Apr. 27–29, 1982 (G. Monteith, D. Yeates, D. Cook), 1050–1100 m elev., 1 ♂ 1 ♀ 2 juveniles (QMB S50238).



Figs. 131–135. *Wugigarra bujundji*, n. gen., n. sp., male. **131, 132.** Left palp, prolateral (131) and retrolateral (132) views. **133.** Tip of left procursus, dorsal view. **134.** Chelicerae, frontal view. **135.** Left genital bulb, dorsal view; arrow: area where some males have a small additional spine. Scale lines: 0.5 mm (131, 132), 0.3 mm (133–135).



Figs. 136–142. *Wugigarra bujundji*, n. gen., n. sp. **136.** Pseudosegmentation of male tarsus 1. **137.** Male gonopore. **138, 139.** Stridulatory ridges on male (138) and female (139) chelicerae. **140.** Stridulatory pick on female palpal femur. **141.** Female ALS with two spigots. **142.** Tarsal claws on male tarsus 1. Scale lines: 60 μm (138, 139), 30 μm (136, 137, 142), 15 μm (141), 5 μm (140).



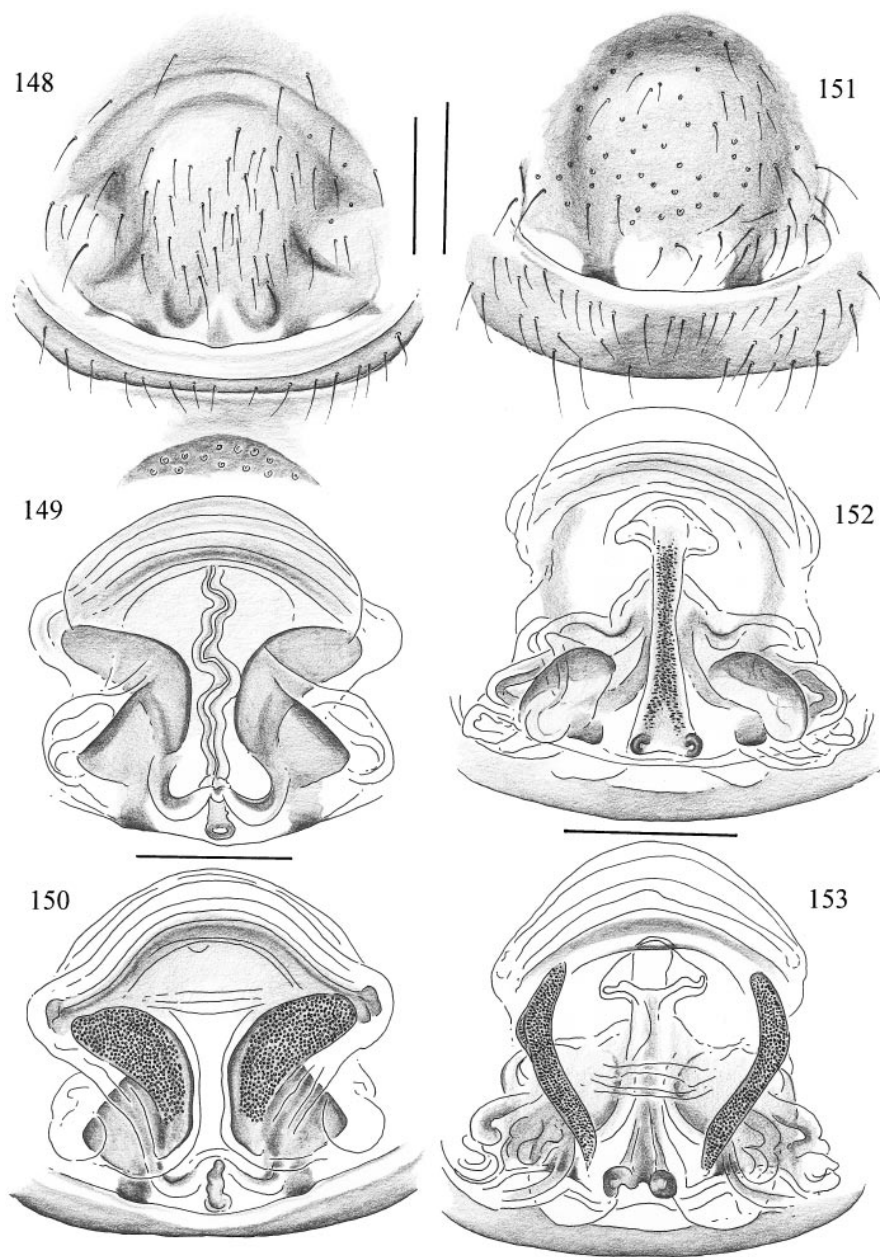
Figs. 143–147. *Wugigarra wunderlichi* (Deeleman-Reinhold), n. comb., male. **143.** Chelicerae, frontal view. **144.** Left procursus and genital bulb, retrolateral view. **145, 147.** Left genital bulb, prolateral (145) and dorsal (147) views; arrow: worm-shaped process. **146.** Tip of left procursus, dorsal view. Scale lines: 0.3 mm (143–145, 147), 0.1 mm (146).

Wugigarra wunderlichi
(Deeleman-Reinhold, 1995),
new combination

Figures 143–147, 151–153

Psilochorus wunderlichi Deeleman-Reinhold,
1995: 37–38, figs. 16–21.

TYPES: Male holotype from Cape Tribulation (16°05'S, 145°26'E), Queensland, Australia; July–Aug. 1992 (J. Wunderlich), in QMB (S51022), examined. One male and one female paratypes, same collection data, in QMB (male) and Collection Deeleman-Reinhold (female), not examined.



Figs. 148–153. *Wugigarra bujundji* (148–150) and *W. wunderlichi* (151–153), epigyna. **148, 151.** Ventral views. **149, 152.** Cleared ventral views. **150, 153.** Dorsal views. Scale lines: 0.3 mm (148–153).

DIAGNOSIS: Closely related to *W. bujundji* and *wulpura*, distinguished from the first by the absence of apophyses on the male chelicerae (fig. 143), from the second by the tip of the procursus (compare figs. 144 and 155),

and by the bulbal apophyses (compare figs. 145 and 147 with 156 and 157).

MALE (type locality, QMB S50304): Total length 2.8, carapace width 1.42. Leg 1: 40.4 (10.4 + 0.5 + 10.0 + 16.8 + 2.7), tibia 2:

6.6, tibia 3: 4.7, tibia 4: 6.8; tibia 1 l/d: 75. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre, with wide median and marginal brown bands. Ocular area brown; distance PME-PME 0.105; diameter PME 0.135; distance PME-ALE 0.095; diameter AME 0.080. Clypeus brown, unmodified; sternum dark brown. Chelicerae brown, unmodified except pair of frontal bulges, with stridulatory ridges (fig. 143). Palps in general as in *W. bujundji* (cf. figs. 131, 132), femur apophysis slightly thinner and more proximal; procursus tip and bulb distinctive, as in figs. 144–147. Legs light brown, without darker rings, tips of femora and tibiae whitish; curved hairs on tibiae 1 and 2 and on metatarsi 1, 2, and 4; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 7%; tarsus 1 distally with ~25 quite distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma similar to *W. tjapukai*, but slightly longer; ochre-gray, with many blackish and some white spots except ventrally; genital plate brown, about trapezoidal; dark brown plate in front of spinnerets.

VARIATION: Tibia 1 in 3 other males: 9.2, 9.3, 9.6 (holotype); carapace width in holotype: 1.28.

FEMALE: In general very similar to male, but chelicerae and palps darker brown; stridulatory files on chelicerae present, not absent as described by Deeleman-Reinhold (1995); tibia 1 in 2 females: 7.6, 8.9. Epigynum as in figs. 151–153, light to dark brown; dorsal view and cleared ventral view as in figs. 152 and 153.

DISTRIBUTION: Known only from the Cape Tribulation area, northeastern Queensland (map 7).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Cape Tribulation: Male holotype above; 5 km W of Cape Tribulation (16°05'S, 145°26'E), 780 m elev., Sept. 28, 1982 (G. Monteith, D. Yeates, G. Thompson), 1♀ 1 juvenile, (QMB S50298); 3.0 km W of Cape Tribulation (16°05'S, 145°27'E), 500 m elev., Oct. 2, 1982 (G. Monteith, D. Yeates, G. Thompson), 1♂ 1♀ (QMB S50318); 1.5 km NW of Cape Tribulation (16°05'S, 145°28'E), sea level, Oct. 8, 1982 (G. Monteith, D. Yeates, G. Thompson), 4♂ 2 juve-

niles (QMB S50304); Cape Tribulation, Pilgrim Sands (16°04'S, 145°28'E), Aug. 27, 1988 (J.C., T.C., R. Raven), 1♂ 1♀ (QMB S13924).

Wugigarra wulpura, new species

Figures 154–157

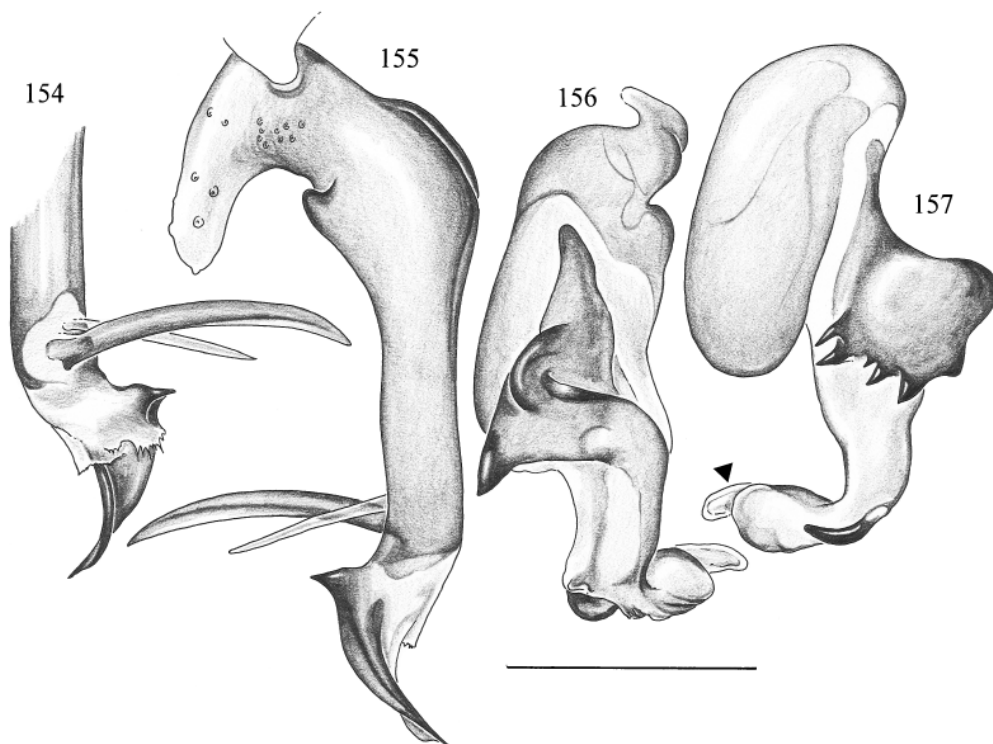
TYPE: Male holotype from 4.5–5 km W of Cape Tribulation (16°05'S, 145°26'E), Top Camp, Queensland, Australia; 760–780 m elev., Oct. 1–6, 1982 (G. Monteith, D. Yeates, G. Thompson), in QMB (S34662).

ETYMOLOGY: Named for the Wulpura, aboriginal rainforest dwellers in northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Closely related to *W. wunderlichii* and *W. bujundji*, distinguished from both by the two long dorsal projections on the procursus (figs. 154, 155), and by the bulbal apophyses (figs. 156, 157).

MALE (holotype): Total length 3.1, carapace width 1.61. Leg 1: 38.5 (9.5 + 0.5 + 9.5 + 15.9 + 3.1), tibia 2: 6.7, tibia 3: 4.8, tibia 4: 7.0; tibia 1 l/d: 68. Habitus and prosoma shape as in *W. tjapukai* (cf. figs. 1–4). Carapace ochre, with wide median and marginal brown bands. Ocular area brown; distance PME-PME 0.145; diameter PME 0.145; distance PME-ALE 0.120; diameter AME 0.095. Clypeus ochre, unmodified; sternum brown, lateral margins lighter. Chelicerae light brown, similar to those of *W. wunderlichii* (cf. fig. 143), with low humps frontally and stridulatory ridges; without apophyses. Palps in general as in *W. bujundji* (cf. figs. 131, 132), but femur more slender and ventral apophysis smaller; procursus tip and bulb distinctive, as in figs. 154–157. Legs light brown, without dark rings, tips of femora and tibiae whitish; with curved hairs on tibiae 1 and 2 and metatarsi 1–3; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 6%; tarsus 1 distally with ~25 quite distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma similar to *W. tjapukai* (cf. fig. 1), slightly longer, ochre-gray, with blackish spots except ventrally; genital plate brown, about trapezoidal; brown plate in front of spinnerets.

FEMALE: In general very similar to male,



Figs. 154–157. *Wugigarra wulpura*, male. **154.** Tip of left procursus, prolateral view. **155.** Left cymbium and procursus, retrolateral view. **156, 157.** Left genital bulb, dorsal (156) and retrolateral (157) views; arrow: worm-shaped process. Scale line: 0.5 mm (154–157).

but chelicerae and palps darker brown; tibia 1 in single known female: 8.9. Epigynum externally not distinguishable from that of *W. wunderlich* (cf. fig. 151). It is possible that this female is in fact *W. wunderlich*, which occurs in the same area.

DISTRIBUTION: Known only from type locality near Cape Tribulation, Queensland (map 7).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: 4.5–5 km W of Cape Tribulation: Male holotype above, with 1♂ 1♀ 2 juveniles (QMB S50293).

***Wugigarra idi*, new species**

Figures 158–163

TYPE: Male holotype from Bellenden Ker Range, Summit TV Station (17°16'S, 145°37'E), Queensland, Australia; 1560 m elev., dung trap in rainforest, Nov. 1–7, 1981 (Earthwatch/Queensland Museum), in QMB (S50235).

ETYMOLOGY: Named for the Idindji (also called Idi), aboriginal rainforest dwellers from the Cairns area, northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most congeners by the male chelicerae (several cones; fig. 161); from *W. burgul* (which has very similar chelicerae) by the procursus (longer and very different tip: figs. 160, 162), and especially by the bulb with its prominent prolateral armature of black apophyses (figs. 159, 163). The QMB has a very close undescribed relative from Mt. Bartle-Frere, 0.5 km N of S Peak (17°24'S, 145°49'E) (QMB S49721), with different procursus tip and bulbal apophyses.

MALE (holotype): Total length 2.0, carapace width 1.10. Leg 1: 18.3 (4.7 + 0.3 + 4.8 + 6.9 + 1.6), tibia 2: 2.9, tibia 3: 2.1, tibia 4: 3.0; tibia 1 l/d: 63. Habitus as in fig. 158. Prosoma shape similar to *W. undanbi*

(cf. figs. 69, 70), but carapace less elevated; carapace ochre, medially with slightly darker broad band. Ocular area light brown; distance PME-PME 0.120; diameter PME 0.085; distance PME-ALE 0.040; diameter AME 0.040. Clypeus with wide brown mark; sternum dark brown. Chelicerae light brown, with several small cones (fig. 161), proximal cones on elevation (fig. 158). Palps as in figs. 159 and 160; femur with distinct retrolatero-ventral apophysis (arrow in fig. 160); bulb and procurus tip as in figs. 159, 160, 162, 163. Legs light brown, with indistinct darker rings subdistally on femora and tibiae; tips of femora and tibiae whitish; without spines, curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 14%; tarsus 1 with >15 pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma shape as in fig. 158, gray with blackish spots except ventrally; genital plate large, light brown, trapezoidal; light brown plate in front of spinnerets.

VARIATION: Tibia 1 in 2 other males: 5.2 (both).

FEMALE: Unknown.

DISTRIBUTION: Known only from Bellenden Ker Range, northeastern Queensland (map 8).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Bellenden Ker Range, Summit TV Station: Male holotype above; same data, 1♂ (QMB S50237); same locality, Oct. 28, 1983 (G. Monteith, D. Yeates, G. Thompson), 1♂ (poorly preserved) (QMB S50253); Bellenden Ker Range, Cable Tower 3 (17°16'S, 145°51'E), 1054 m elev., Oct. 25–31, 1981 (Earthwatch/Queensland Museum), 1♂ (QMB S27997).

***Wugigarra burgul*, new species**

Figures 164–169

TYPE: Male holotype from 3.0 km W of Cape Tribulation (16°05'S, 145°27'E), Queensland, Australia; 500 m elev., Oct. 2, 1982 (G. Monteith, D. Yeates, G. Thompson), in QMB (S34659).

ETYMOLOGY: In Yidini, the aboriginal language of the Cairns-Yarrabah region, *burgul* is a mythical being, believed to be able to take on any form. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most congeners by the male chelicerae (several cones; fig. 165); from *W. idi* (which has very similar chelicerae) by the procurus (shorter and very different tip; figs. 167–169), and by the simpler bulb (compare figs. 159 and 166).

MALE (holotype): Total length 1.4 (1.6 with clypeus), carapace width 0.72. Leg 1 missing, tibia 2: 2.24, tibia 3: 1.56, tibia 4: 2.24. Habitus as in fig. 164. Prosoma shape similar to *W. undanbi* (cf. figs. 69, 70), but carapace less elevated; carapace ochre, without dark marks. Ocular area ochre; distance PME-PME 0.095; diameter PME 0.075; distance PME-ALE 0.035; diameter AME 0.025. Clypeus slightly darker than carapace; sternum brown. Chelicerae light brown, with several small cones (fig. 165), proximal cones on slight elevation. Palps as in figs. 166 and 167, femur with distinct retrolatero-ventral apophysis (arrow in fig. 167), procurus tip as in figs. 168 and 169. Legs ochre, with indistinct darker rings subdistally on femora and tibiae; without spines, curved, and vertical hairs (legs 1 missing). Opisthosoma shape as in fig. 164, gray with large blackish spots except ventrally; genital plate light brown, trapezoidal; light brown plate in front of spinnerets.

FEMALE: Unknown.

DISTRIBUTION: Known only from type locality in northeastern Queensland (map 8).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: 3.0 km W of Cape Tribulation: Male holotype above.

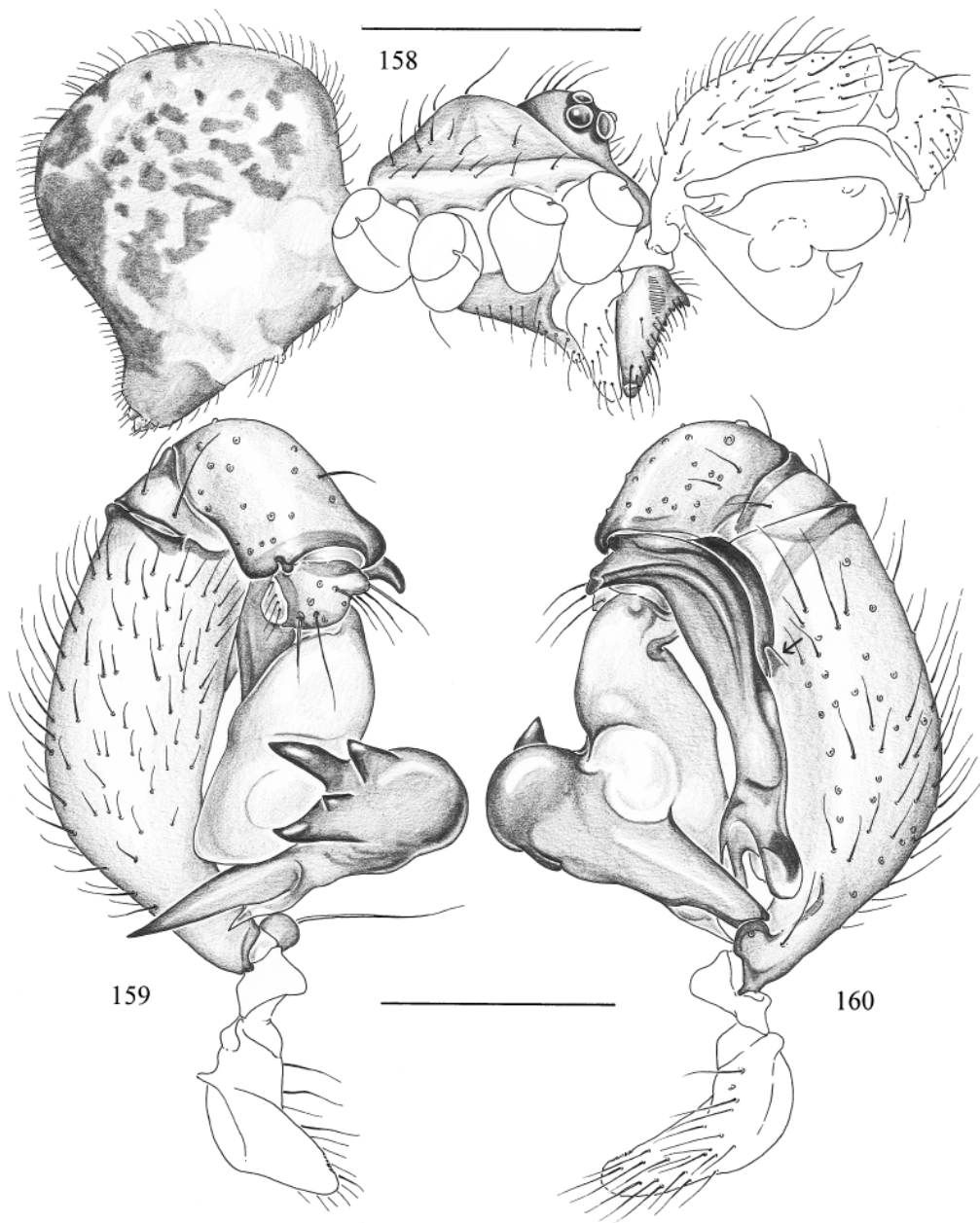
***Wugigarra wanjuru*, new species**

Figures 170–172

TYPE: Male holotype from east margin of Palmerston National Park (17°37'S, 145°46'E), Queensland, Australia; 400 m elev., Dec. 10, 1995–Feb. 7, 1996 (G. Monteith, D. Cook), in QMB (S43258).

ETYMOLOGY: Named for the Wanjuru, aboriginal rainforest dwellers in the Innisfail and Babinda area. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from congeners by the male chelicerae provided with a few small cones (fig. 170), and by the long

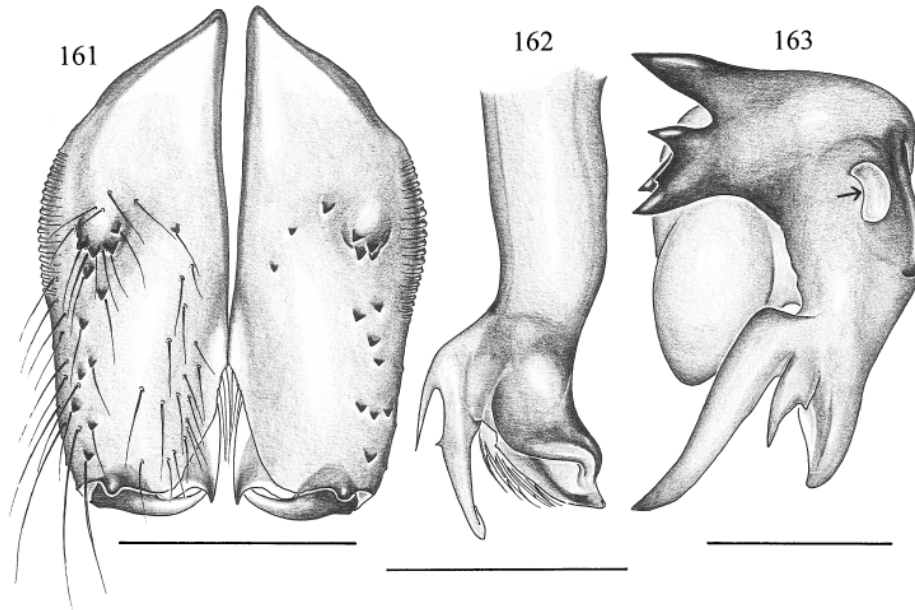


Figs. 158–160. *Wugigarra idi*, male. **158.** Habitus, lateral view. **159, 160.** Left palp, prolateral (159) and retrolateral (160) views; arrow: femur apophysis. Scale lines: 1 mm (158), 0.5 mm (159, 160).

dorsodistal projection on the procurus (fig. 171).

MALE (holotype): Total length 1.5, carapace width 0.64. Leg 1: 13.97 (3.41 + 0.27 + 3.61 + 5.51 + 1.17), tibia 2: 1.95, tibia 3: 1.32, tibia 4 missing. Habitus as in *W. burgul*

(cf. fig. 164). Prosoma shape similar to *W. undanbi* (cf. figs. 69, 70), but carapace less elevated; carapace ochre, only medially and around ocular area slightly darker. Ocular area ochre, slightly darker than carapace; distance PME-PME 0.095; diameter PME



Figs. 161–163. *Wugigarra idi*, male. **161.** Chelicerae, frontal view. **162.** Tip of left procursus, retrolateral view. **163.** Left genital bulb, “distal” view; arrow: sperm duct opening. Scale lines: 0.3 mm.

0.065; distance PME-ALE 0.025; diameter AME 0.025. Clypeus slightly darker than carapace; sternum brown. Chelicerae light brown, with some small cones and stridulatory ridges (fig. 170). Palps as in fig. 171; femur with distinct retrolateroventral apophysis (arrow in fig. 171); bulb as in figs. 171 and 172. Legs pale ochre, with indistinct darker rings subdistally on femora and tibiae;

without spines, curved, and vertical hairs (legs 4 missing). Opisthosoma shape as in *W. burgul* (cf. fig. 164), gray with blackish spots except ventrally; genital plate light brown, trapezoidal; light brown plate in front of spinnerets.

FEMALE: Unknown.

DISTRIBUTION: Known only from type locality in northeastern Queensland (map 8).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Palmerston National Park: Male holotype above.

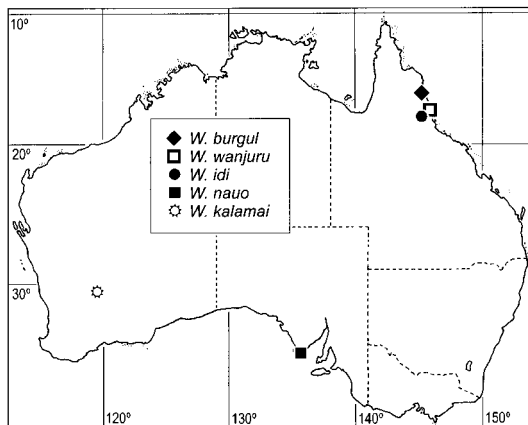
Wugigarra nauo, new species

Figures 173–181

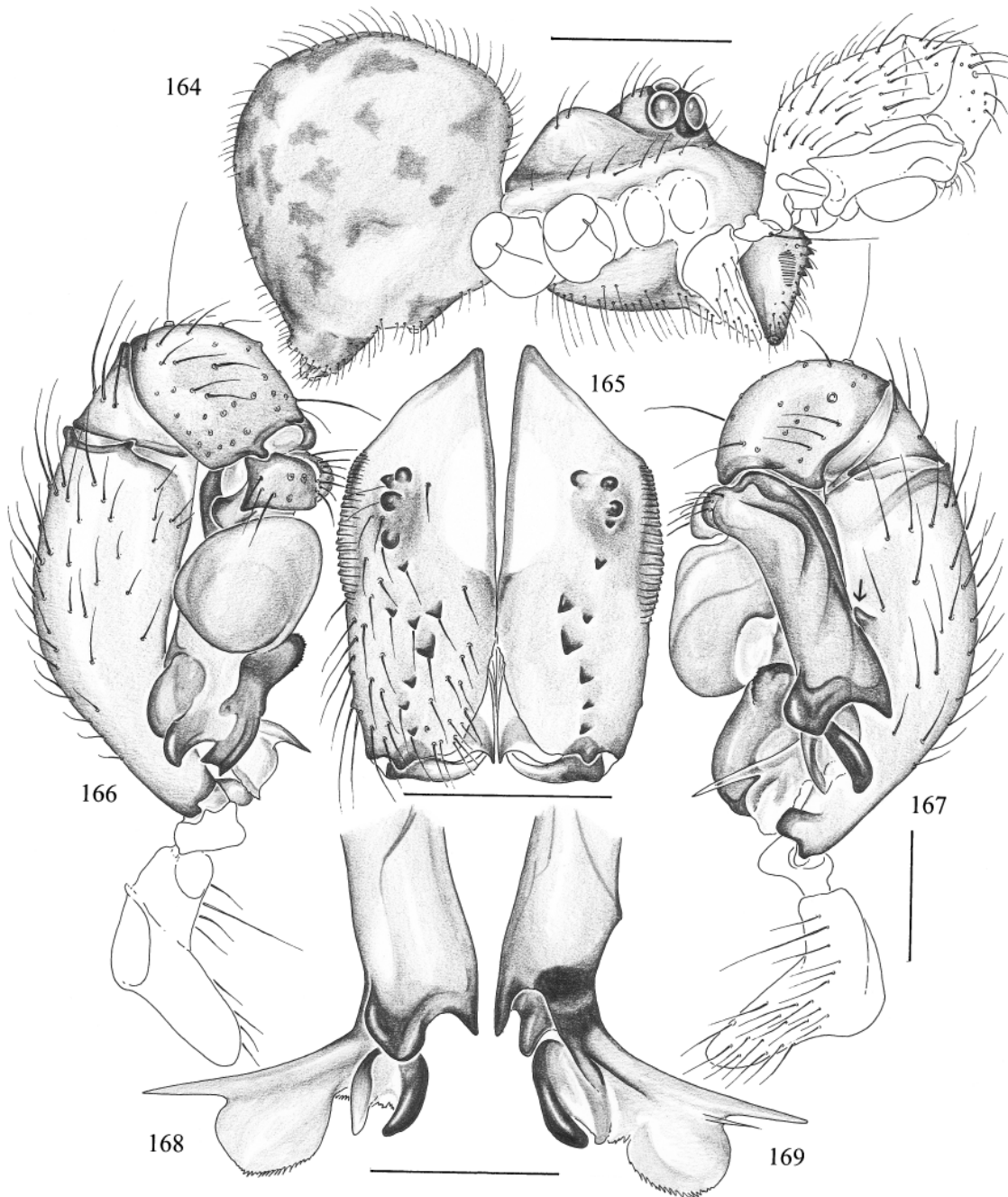
TYPE: Male holotype from Kirton Point, Port Lincoln (34°43'S, 135°52'E), South Australia, Australia; Dec. 17, 1981 (D. Hirst), in SAM (N1999/855).

ETYMOLOGY: Named for the Nauo, a now extinct aboriginal tribe that originally inhabited the coastal scrub gum tree forest country in South Australia. The species name is a noun in apposition.

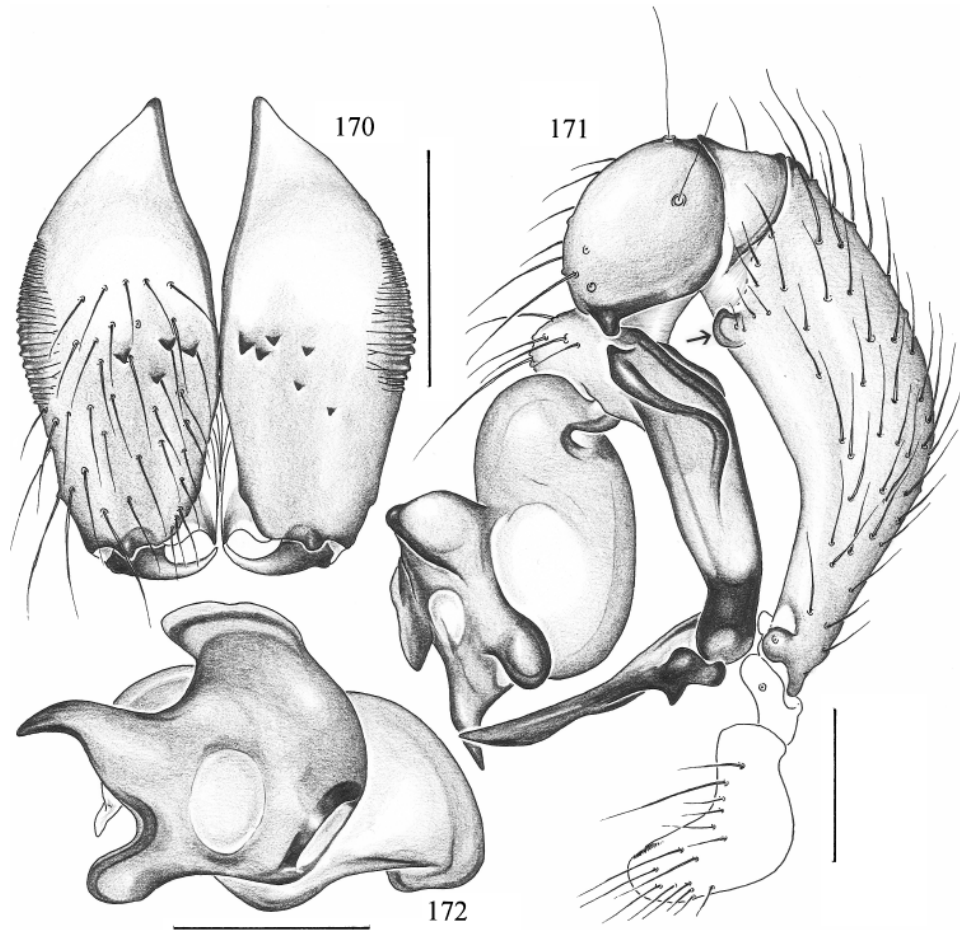
DIAGNOSIS: Distinguished from the closely related *W. kalamai* by the much larger size, by the apophyses on the male chelicerae (compare figs. 175 and 185), and by details



Map 8. Distribution of *Wugigarra* species: species assigned tentatively (*idi* group and *nauo* group).



Figs. 164–169. *Wugigarra burgul*, male. **164.** Habitus, lateral view. **165.** Chelicerae, frontal view. **166, 167.** Left palp, prolateral (166) and retrolateral (167) views; arrow: femur apophysis. **168, 169.** Tip of left procursus, retrolateral (168) and prolateral (169) views. Scale lines: 0.5 mm (164), 0.2 mm (165–169).



Figs. 170–172. *Wugigarra wanjuru*, male. **170.** Chelicerae, frontal view. **171.** Left palp, retrolateral view (note that the genital bulb is rotated out of its natural position); arrow: femur apophysis. **172.** Left genital bulb (view not clear). Scale lines: 0.2 mm.

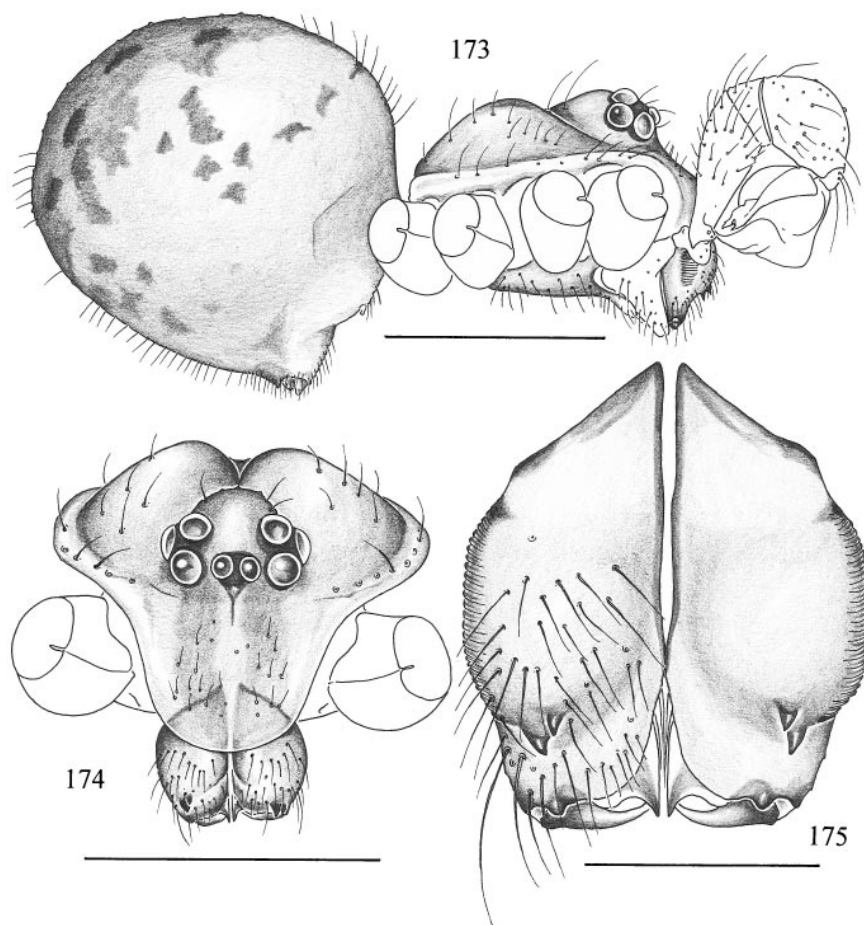
of procursus and bulb (compare figs. 177 and 184).

MALE (holotype): Total length 3.0, carapace width 1.39. Leg 1: 22.8 (6.0 + 0.5 + 6.3 + 8.4 + 1.6), tibia 2: 4.5, tibia 3: 3.1, tibia 4: 4.0; tibia 1 l/d: 53. Habitus and prosoma shape as in figs. 173 and 174; carapace brown, slightly darker medially, with radial stripes and darker mark posteriorly around ocular area. Eye pattern as in fig. 174; distance PME-PME 0.185; diameter PME 0.105; distance PME-ALE 0.055; diameter AME 0.075. Clypeus brown, unmodified; sternum ochre-brown, centrally lighter. Chelicerae brown, with two small cones on each side, with stridulatory ridges (fig. 175). Palps

as in fig. 176, procursus and bulb as in figs. 176–178. Legs light brown, dark rings on femora (subdistally) and tibiae (proximally, subdistally); tips of femora and tibiae whitish; with curved hairs on all tibiae and metatarsi; without spines and vertical hairs; retrolateral trichobothrium of tibia 1 at 26%; tarsus 1 with ~22 quite distinct pseudosegments. Opisthosoma gray, with some blackish spots except ventrally; genital plate slightly darker, plate in front of spinnerets hardly visible.

VARIATION: Tibia 1 in other male: 5.1.

FEMALE: In general very similar to male, but carapace higher with the two lobes almost touching each other. Opisthosoma fron-



Figs. 173–175. *Wugigarra nauo*, male. **173.** Habitus. **174.** Prosoma, frontal view (slightly dorsal). **175.** Chelicerae, frontal view. Scale lines: 1 mm (173, 174), 0.3 mm (175).

todorsally apparently unmodified. Chelicerae also with stridulatory files. Palpal distal segments enlarged (fig. 179). Tibia 1 in 3 females: 4.5, 4.7, 5.3. Epigynum as in fig. 180, dorsal view as in fig. 181.

DISTRIBUTION: Known only from type locality in South Australia (map 8).

MATERIAL EXAMINED: AUSTRALIA: *South Australia*: Kirton Point, Port Lincoln: Male holotype above, with 1♂ 3♀ (SAM N1999/856–9).

***Wugigarra kalamai*, new species**

Figures 182–185

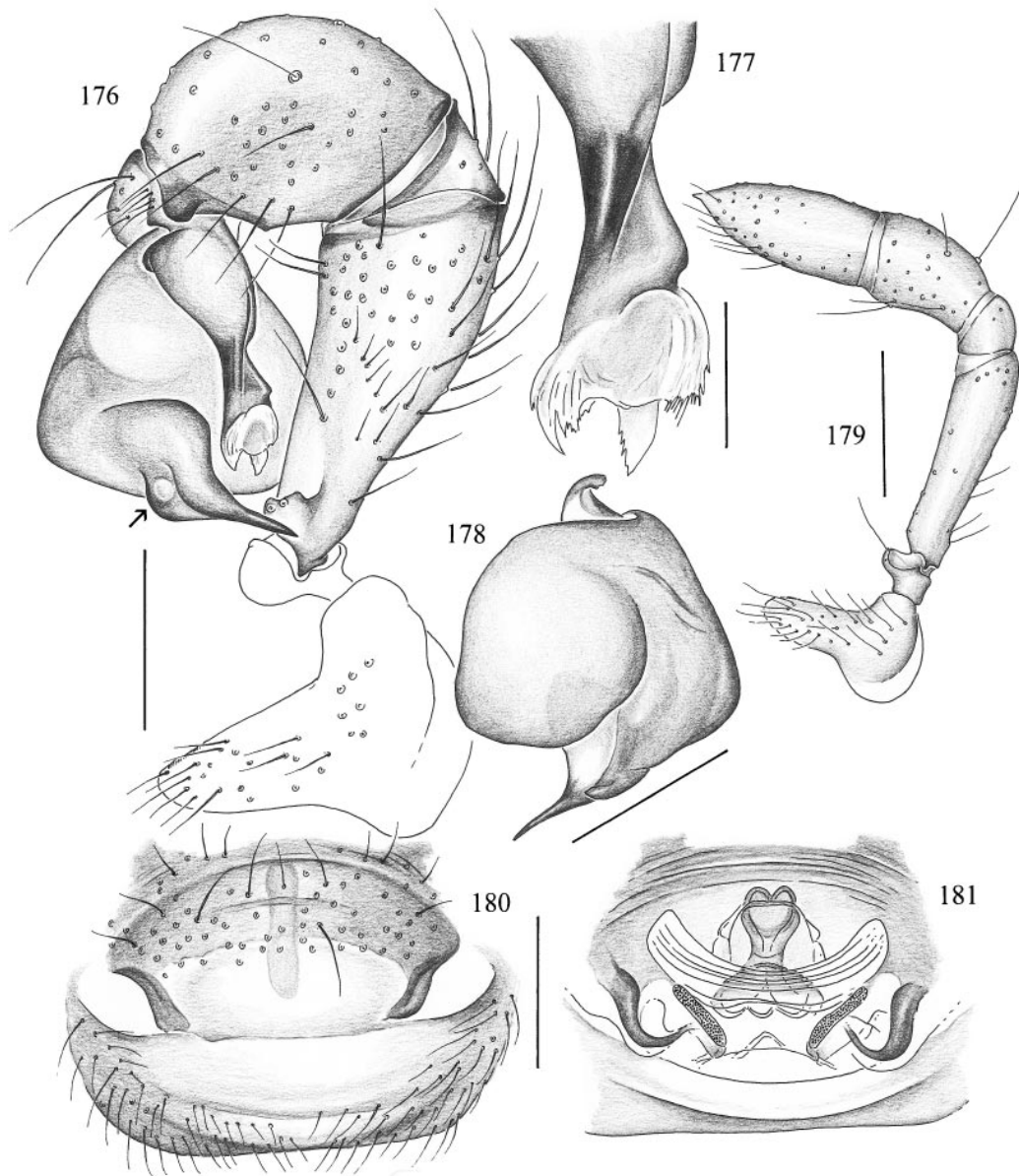
TYPE: Male holotype from Helena-Aurora Ranges (30°23'S, 119°38'E), Western Aus-

tralia, Australia; Sept. 26, 1995 (R. P. McMillan), pitfall traps, in WAM (99/1781).

ETYMOLOGY: Named for the Kalamai (Kalamai is a valid short form), an aboriginal tribe in southern Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the closely related *W. nauo* by the much smaller size, by the apophyses on the male chelicerae (compare figs. 175 and 185), and by details of procurus and bulb (compare figs. 177 and 178 with 183 and 184).

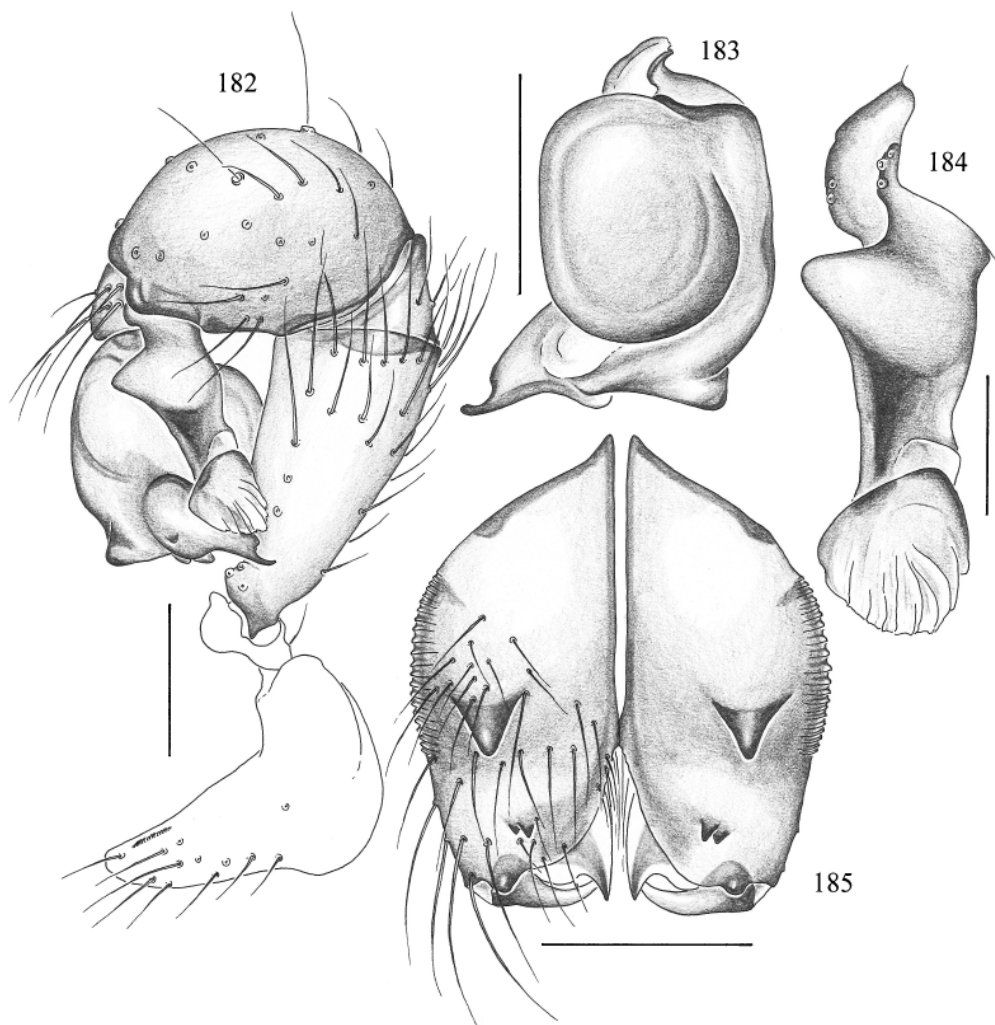
MALE (holotype): Total length 1.7, carapace width 0.94. Leg 1: 17.3 (4.8 + 0.4 + 4.9 + 6.1 + 1.1), tibia 2: 2.9, tibia 3: 2.1, tibia 4: 2.8; tibia 1 l/d: 61. Habitus and prosoma shape very similar to *W. nauo* (cf. figs.



Figs. 176–181. *Wugigarra nauo*. **176.** Left male palp, retrolateral view; arrow: sperm duct opening. **177.** Tip of left procursus, retrolateral view. **178.** Left genital bulb, prolateral view. **179.** Left female palp, retrolateral view. **180, 181.** Epigynum, ventral (180) and dorsal (181) views. Scale lines: 0.5 mm (179), 0.3 mm (176, 178, 180, 181), 0.1 mm (177).

173 and 174); carapace ochre, posteriorly with single dark spot. Ocular area slightly darker; distance PME–PME 0.145; diameter PME 0.075; distance PME–ALE 0.025; diameter AME 0.080. Clypeus and sternum ochre. Chelicerae light brown, with proximal

pair of large brown apophyses and two pairs of smaller distal, black apophyses (fig. 185). Palps as in fig. 182, procursus and bulb as in figs. 182–184. Legs light brown, without rings; with curved hairs on tibia and metatarsus 1 only; without spines and vertical



Figs. 182–185. *Wugigarra kalamai*, male. **182.** Left palp, retrolateral view. **183.** Left genital bulb, prolateral view. **184.** Left procursus, retrolateral view. **185.** Chelicerae, frontal view. Scale lines: 0.2 mm (182, 183, 185), 0.1 mm (184).

hairs; retrolateral trichobothrium of tibia 1 at 27%; tarsus 1 distally with ~8 quite distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma shape as in *W. nauo* (cf. fig. 173); gray with many blackish spots except ventrally; genital plate brown.

FEMALE: Unknown.

DISTRIBUTION: Known only from type locality in southern Western Australia (map 8).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Helena-Aurora Ranges: Male holotype above.

TRICHOCYCLUS SIMON, 1908

Trichocyclus Simon, 1908: 407 (type species by monotypy *T. nigropunctatus* Simon, 1908; examined).—Deeleman-Reinhold, 1993: 325; 1995: 35–36.

NOTE: The following diagnosis and description do not cover the “aberrant” *T. watta*, which is assigned tentatively to *Trichocyclus*.

DIAGNOSIS: Small- to medium-sized (total length usually 3–5 mm, rarely under 2 mm) pholcids with globular or higher-than-long

opisthosoma, mostly with large AME (AME diameter usually 80–130% of PME diameter, in *T. harveyi* only 70%), apparently restricted to Australia or the Australian region. Distinguished from *Wugigarra* (which is the only similar genus in Australia) by a characteristic weak zone dorsally on the male cymbium (asterisks in figs. 201, 248, 265); by the absence of the worm-shaped process on the bulb characteristic for *Wugigarra*; by the absence of curved hairs on the legs; by the presence of several piriform gland spigots on the ALS (only 2 spigots on each spinneret in *Wugigarra*); by the absence of stridulatory files in females; and by the characteristic and conservative shape of the epigynum that has a median projection but lacks a pocket (e.g., figs. 193, 213, 217).

DESCRIPTION: Total length in males usually ~2.5–5 mm, only *T. harveyi* and *T. ungumi* under 2 mm. Carapace oval, wider than long, with distinct thoracic groove not widened into thoracic pit, often with three pairs of lateral spots loosely connected to median spot by radial marks (e.g., fig. 187). Eight eyes in conservative pattern on moderately elevated ocular area. AME distinctively large (see above), only in *T. septentrionalis* male on elevation (fig. 244). Distance PME-ALE relatively small (~30–55% of PME diameter). Clypeus never modified. Male chelicerae usually with two pairs of distinctive frontal apophyses, the distal one more prominent (e.g., figs. 190, 199, 211). Significantly different cheliceral armature in *T. septentrionalis* (figs. 245, 246), *arawari* (figs. 264, 266), *arnga* (figs. 269, 270), and *bugai* (fig. 274). Stridulatory ridges always present on male chelicerae. Male palps large in relation to overall size (e.g., figs. 186, 275); coxa without retrolateral apophysis, trochanter without apophyses; femur conspicuously enlarged (e.g., figs. 191, 238, 256), with retrolateral hump proximally, usually without ventral apophyses (*T. ungumi*, *T. harveyi*, and *T. oborindi* with brown ventral knob; fig. 277); patella triangular in lateral view (e.g., fig. 192); tibia simple, with 2 trichobothria in very proximal position (e.g., figs. 192, 206, 247, 256); cymbium with characteristic weak zone dorsally (e.g., figs. 201, 248, 265), with heavily sclerotized procursus usually provided with dorsal apophysis and ventral pocket

(“a” and “p” in figs. 197, 201, 206, 229, 232, 260, 273; apophysis always distinct, pocket shallow to very deep), distally with brush of hairlike membranous structures (e.g., figs. 216, 221, 229); bulb consisting of proximal globular part and distal sclerotized elements, often with transparent dorsal projection (arrows in figs. 191, 203, 252, 254, 260; asterisk in fig. 220); sperm duct opens close to this projection, without any embolus (shafted arrow in fig. 220). Tarsal organ capsulate (fig. 208). Legs usually long (leg 1 about 8–13 × body length, in *T. harveyi* only 5.6 × body length), usually medium thin (tibia 1 l/d ~50–85, in *T. harveyi* only 34), leg 1 always the longest, legs 2 and 4 about same length, leg 3 shortest; with dark rings on femur subdistally, patella + tibia proximally, and tibia subdistally; tips of femora and tibiae whitish; legs without spines and curved hairs, with few vertical hairs; retrolateral trichobothrium of tibia 1 usually at 7–16%, in *T. harveyi* at 30%; tarsus 1 sometimes with fairly distinct pseudosegments distally, sometimes pseudosegmentation not visible in light microscope; in SEM regular pseudosegmentation visible (fig. 210). Opisthosoma either globular or higher than long (very “high” opisthosomata usually point in dorsoposterior direction and could be regarded as secondarily long; e.g., fig. 204); gray with black spots and sometimes white spots dorsally; genital plate usually light brown, about rectangular. Male gonopore without epiandrous spigots (figs. 207, 219). ALS with several piriform gland spigots (figs. 195, 209, 224, 225; examined: *T. aranda*, *arawari*, *arabana*, *nigropunctatus*); other spinnerets typical for family.

Sexual dimorphism slight, females with shorter legs, often with larger (higher) opisthosoma; female chelicerae without stridulatory ridges. In most species female opisthosoma provided with two indistinct, usually whitish humps dorsofrontally; corresponding side on carapace either unmodified or distinctively elevated (fig. 261). Epigynum shape very conservative, consisting of two plates, frontal plate with median elevation (e.g., figs. 193, 213, 217), rarely with paired indentations (e.g., figs. 240, 241); internally simple, with pair of relatively small pore plates (e.g., figs. 194, 214, 234).

MONOPHYLY: All species included (except *T. watta*) share the weak zone dorsally on the male cymbium. This character is otherwise only present in *Aucana kaala*, a ninetene from New Caledonia. The transparent projection dorsally on the bulb might be a further synapomorphy of the genus, but seems to be absent in some species (difficult to see).

GENERIC RELATIONSHIPS: *Trichocylus* is apparently part of holocnemines, whether this group is mono- or paraphyletic. Within this group, the presence of fairly distinct pseudosegments suggests it is basal, while the procurus with its dorsal apophysis and ventral pouch, as well as the reduction of epianthrous spigots, suggest it might form a clade with *Physocyclus* and *Artema* (and possibly with *Wugigarra*). *Holocneminus* might be close, but is insufficiently well known. See Relationships above (p. 6) for more detailed discussion.

SPECIFIC RELATIONSHIPS: Several species groups can be identified by morphological characters and are roughly supported by their geographical distribution: (1) The *nullarbor* group is most diverse in South Australia and southern Western Australia (map 9). *T. nullarbor* and *kokata* have identical chelicerae; *T. nullarbor* and *hirsti* have very similar procuri. *T. pandima* is assigned to this group because of the long dorsal apophysis on the procurus, similar only to *kokata*. (2) The *nigropunctatus* group, with three species in western Western Australia (*T. nigropunctatus*, *balladong*, *warianga*) and with *T. arabana* widely distributed in central Australia (map 10), share the shape of the procurus and the wide but short distal apophyses on the male chelicerae. (3) The *aranda* group, just to the north of the previous group (map 11), is distinguished by the rather slender procurus (*T. aranda*, *djaun*, *gnalooma*). *T. kurara* is assigned to this group because the male chelicerae are similar to those of *T. gnalooma*. (4) *T. septentrionalis* is geographically close to the previous two groups, but is highly autapomorphic in structure. (5) The eastern group (*T. grayi*, *oborindi*, *pustulatus*), which is presently the only group known from Queensland (map 12), is distinguished by the straight distal element of the procurus. (6) The *arawari* group, with four species, is only known from Kimberley (map

13), and includes *T. arawari*, *worora*, *arnga*, and *bugai*. These species share a distinctive sclerotized element on the bulb set with scales (figs. 259, 272), as well as relatively huge pockets ventrally on the procurus; *T. arawari* and *worora* have very similar procuri, as do *T. arnga* and *bugai*. (7) *T. harveyi* and *ungumi*, both from Kimberley (map 14), have an unknown relation to each other and to any other species. (8) Finally, *T. watta* is assigned tentatively to *Trichocylus*.

NATURAL HISTORY: The genus is most remarkable for its unparalleled ability among pholcid spiders to thrive in the Australian deserts, in the "dry heart" of the continent. Summarizing the information on collection labels, the spiders build their webs between and under rocks, at rocky cliff faces and overhangs, at the bases of trees and under logs, and in caves, hollows and wells, and in termite mounds and nests. No single-species study, or any closer published observation, is known to me.

DISTRIBUTION: Presently known from Australia only. The CLD collection has a male of an undescribed species from Togian Islands, Sulawesi, with remarkably similar chelicerae but very different procurus. Within Australia, all described species are from the western part of the continent (west of 140°E), with the remarkable exception of *T. pustulatus*. However, the collections studied contain (apart from *T. pustulatus*) some unidentified females from Queensland and New South Wales (map 2), suggesting that the genus is rare rather than absent in the Great Artesian Basin and in the east.

COMPOSITION: The genus now includes a total of 23 species. Several types of evidence suggest that the actual number is significantly higher. First, nine species are known from just a single locality. Rather than indicating limited distribution, this probably reflects the spotty effort made so far by collectors. Second, the number of new species per decade represented in the collections studied does not seem to be leveling off; that is, six species were represented until 1980, 14 species until 1990, and 23 species until 2000. Third, vast areas of Australia lack any record, probably in part because of collector bias.

Trichocycclus nullarbor, new species

Figures 186–197

TYPE: Male holotype from northern overhang, Knowles Cave (31°08'S, 130°30'E), Nullarbor Plain, South Australia, Australia; Sept. 29, 1988 (D. Hirst), in SAM (N1999/842).

ETYMOLOGY: Named for the Nullarbor Plain, where this species is common. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most congeners by the long narrow apophyses on the male chelicerae (fig. 190); from *T. kokata* (which has identical chelicerae) by the shape of the dorsal apophysis on the procursus (compare figs. 197 and 201); from *T. hirsti* by the less voluminous procursus (compare figs. 197 and 198), and by the apophyses on the male chelicerae (compare figs. 190 and 199).

MALE (holotype): Total length 3.7, carapace width 1.65. Leg 1: 31.8 (8.8 + 0.7 + 8.7 + 11.7 + 1.9), tibia 2: 6.3, tibia 3: 4.5, tibia 4: 6.2; tibia 1 l/d: 54. Habitus and prosoma shape as in figs. 186–189; carapace pale ochre with light brown pattern as in fig. 187. Eye pattern as in fig. 188; distance PME-PME 0.185; diameter PME 0.105; distance PME-ALE 0.045; diameter AME 0.135. Clypeus with wide, light brown band; sternum pale ochre, labium darker. Chelicerae ochre with pair of long, narrow frontal apophyses, smaller cones at their bases, and stridulatory ridges (fig. 190). Palps as in figs. 191 and 192, procursus as in fig. 197. Legs ochre, with indistinct darker rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker; tips of femora and tibiae whitish; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 15%; tarsal pseudosegments very indistinct, not countable. Opisthosoma ochre gray, dorsally with some blackish spots; genital plate light brown, about square.

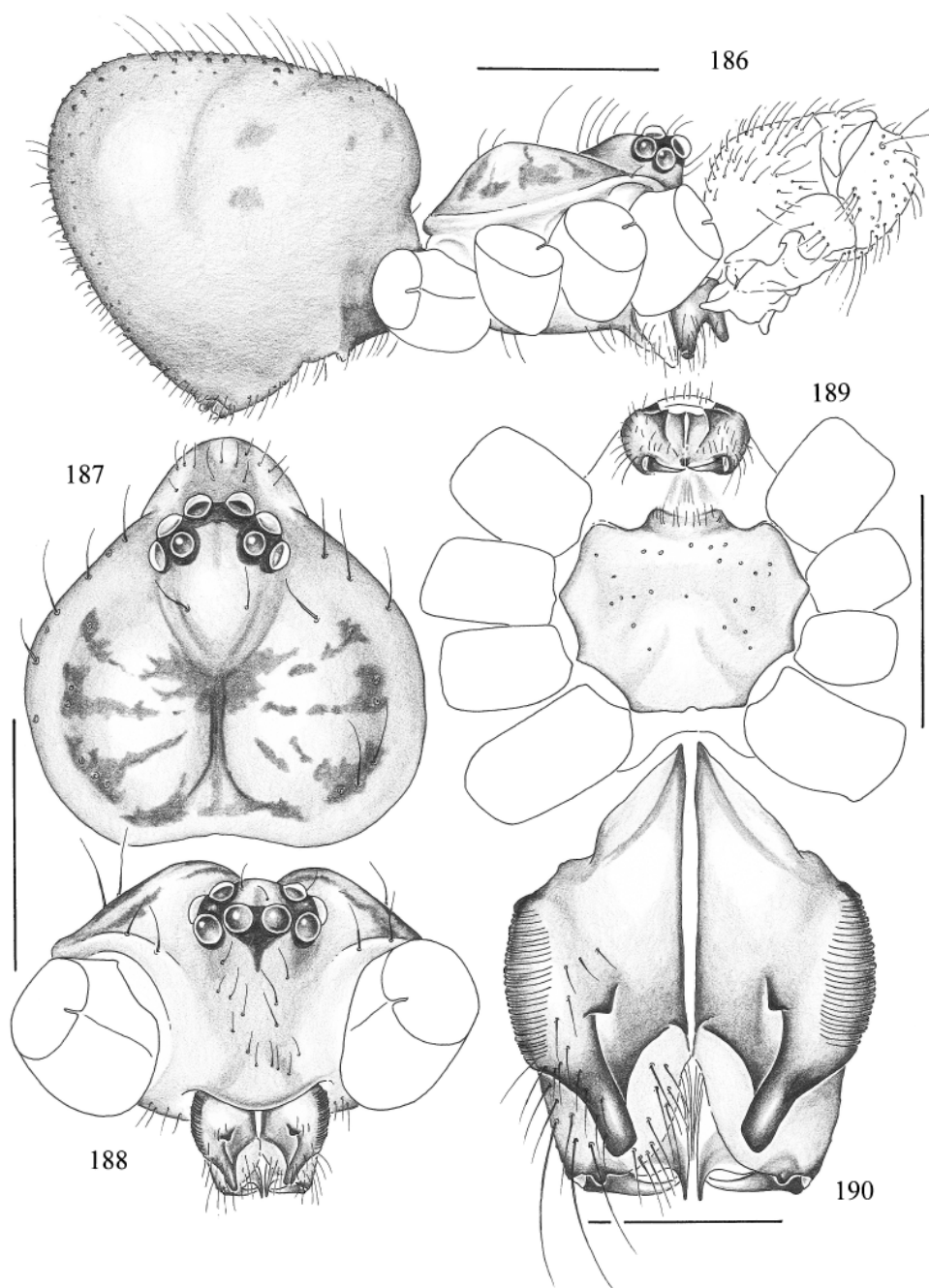
VARIATION: Tibia 1 in 19 males: 6.5–10.4 (\bar{x} = 8.1). The specimens from near Perth have slightly narrower dorsal apophyses on the procursus, and are therefore assigned tentatively.

FEMALE: In general very similar to male, but opisthosoma usually much higher (i.e.,

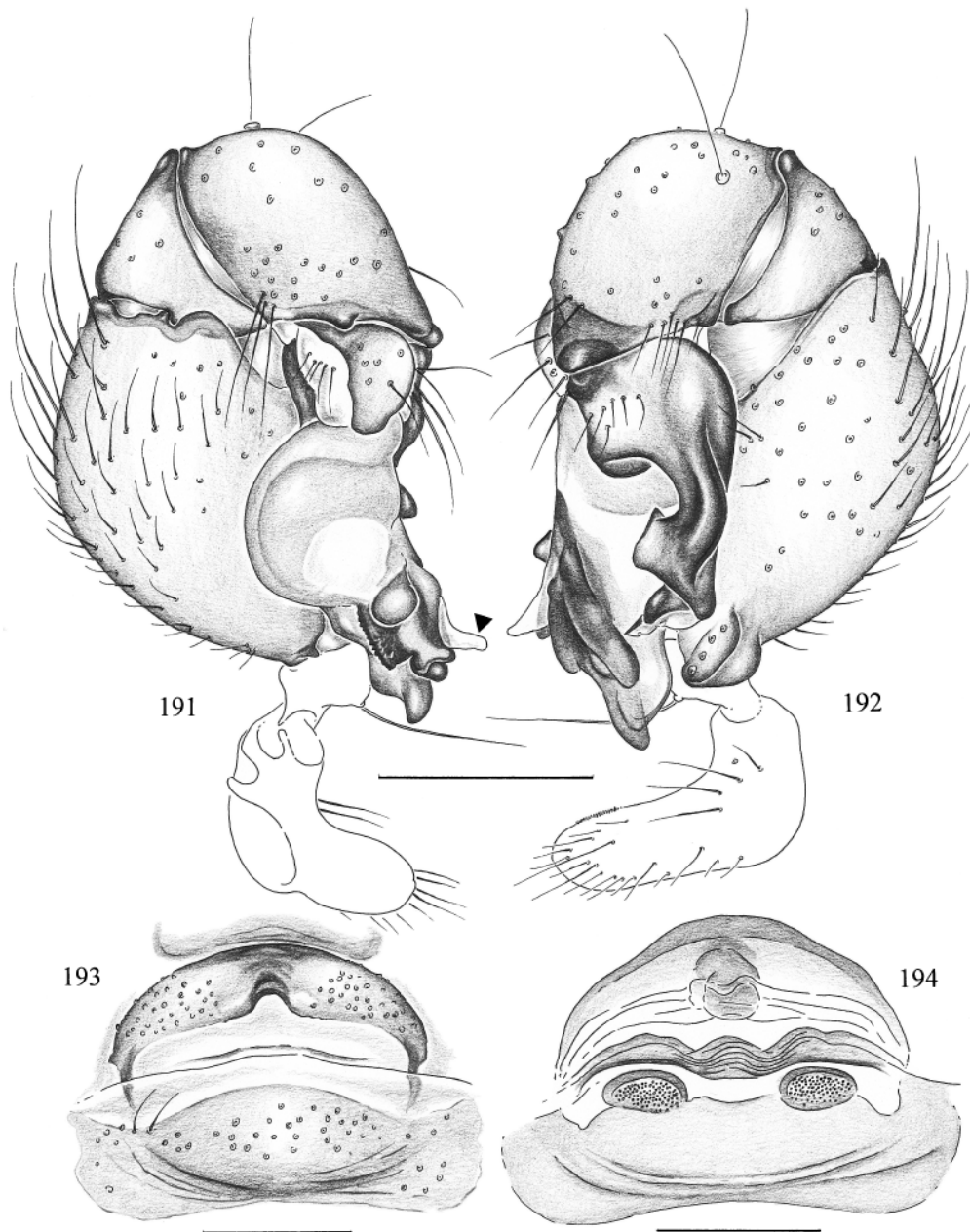
dorsoposteriorly more elongated), chelicerae without stridulatory ridges. Tibia 1 in 11 females: 6.8–10.3 (\bar{x} = 8.2). Palpal tarsus tip as in fig. 196. Opisthosoma frontodorsally apparently without humps. Epigynum as in fig. 193, dorsal view as in fig. 194. Several piriform gland spigots on ALS (fig. 195).

DISTRIBUTION: Widely distributed in western South Australia and southern Western Australia (map 9).

MATERIAL EXAMINED: AUSTRALIA: *South Australia*: Nullarbor Plain: Knowles Cave: Male holotype above, with 1 ♀ (SAM N1999/843); same data, 2 ♂ 5 ♀ several juveniles (SAM N1999/844–50); Koonalda area (31°24'S, 129°50'E), Feb. 1957 (C. Warner), 1 ♂ (SAM N1999/841); Koonalda Cave (31°24'S, 129°50'E), Apr. 3, 1970 (J. Lowry), 1 ♂ (WAM 93/2356); Warbla Cave (31°31'S, 129°07'E), Oct. 10, 1966 (J. Lowry), 1 ♀ (WAM 93/2377); unnamed cave 8.6 km E of Bore no. 5 off Murrawinjine Caves Road, N of Nullarbor Station (~31°10'S, 131°00'E), Feb. 19, 1985 (N. Poulter), 1 ♂ 1 juvenile (AMS KS16911); unnamed cave 14.5 km E of Bore no. 5 off Murrawinjine Caves Road, N of Nullarbor Station (~31°10'S, 131°00'E), Feb. 18, 1985 (N. Poulter), 1 juvenile assigned tentatively (AMS KS16909). *Western Australia*: Nullarbor Plain: Top of Eucla Pass (31°39'S, 128°52'E), Mar. 9, 1979 (collector not given), 1 ♂ 1 juvenile (AMS KS14997); unnamed cave (31°11'S, 128°29'E), Sept. 14, 1966 (J. Lowry), 1 ♂ 3 ♀ 3 juveniles (WAM 96/39–45); Old Homestead Cave (31°09'S, 127°56'E), Sept. 7, 1966 (J. Lowry), 1 ♀ (WAM 93/2382), assigned tentatively; Skink Hole (31°28'S, 127°55'E), Sept. 10, 1966 (J. Lowry), 1 ♂ (WAM 93/2353); degraded doline S of Mullamullang Cave (31°45'S, 127°15'E), Jan. 8, 1966 (J. Lowry), 1 ♀ (WAM 96/64); Kestral Cavern no.1 (31°39'S, 127°13'E), cave doline, Jan. 9, 1972 (M. Gray), 1 ♂ (AMS KS56196); Firestick Cave (31°46'S, 127°02'E), Oct. 17, 1966 (J. Lowry), 1 ♂ (WAM 93/2379); Dingo Cave (31°51'S, 126°44'E), Oct. 28, 1968 (J. Lowry), 3 ♀ 1 juvenile (WAM 93/2320–3) assigned tentatively; Mullamullang Cave (31°44'S, 126°44'E), north doline, Jan. 3, 1966 (J. Lowry), 1 ♂ (WAM 93/2381); same locality, doline, Aug. 30, 1966 (J. Lowry),



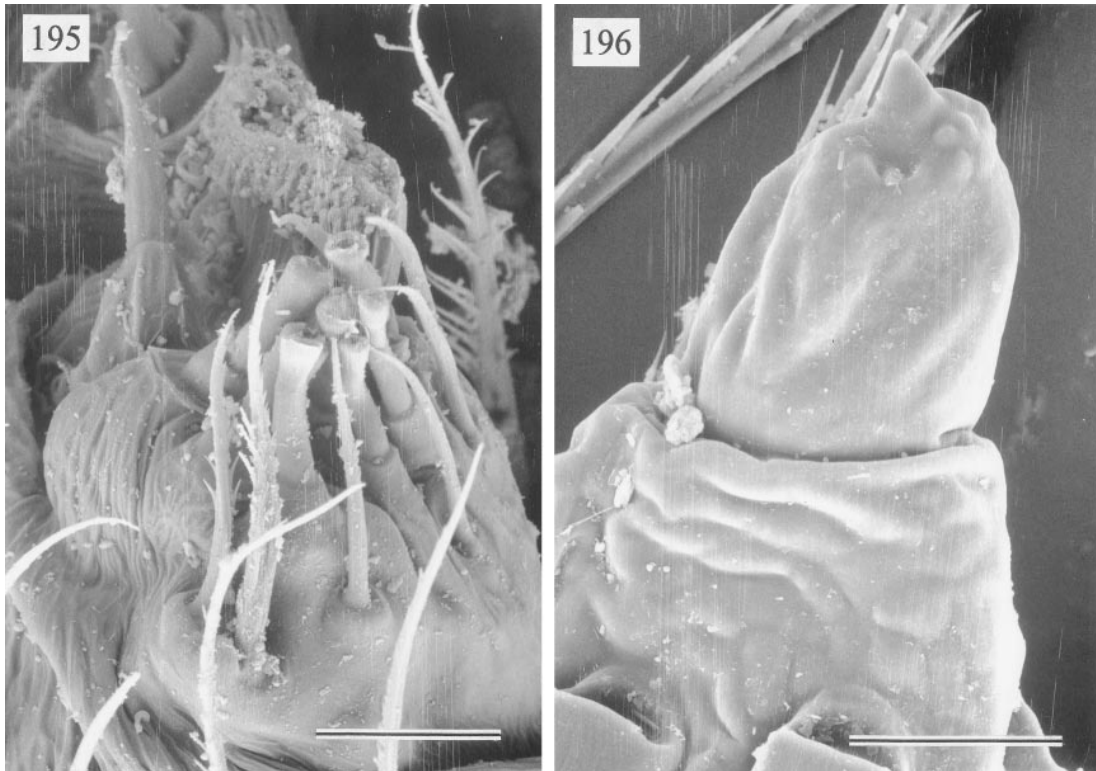
Figs. 186–190. *Trichocyclops nullarbor*, male. **186.** Habitus. **187–189.** Prosoma, dorsal, frontal, and ventral views. **190.** Chelicerae, frontal view. Scale lines: 1 mm (186–189), 0.3 mm (190).



Figs. 191–194. *Trichocyclus nullarbor*. **191, 192.** Left male palp, prolateral (191) and retrolateral (192) views; arrow: transparent bulbal process. **193, 194.** Epigynum, ventral (193) and dorsal (194) views. Scale lines: 0.5 mm.

3 ♀ (WAM 92/2385–7); same locality, Jan. 6, 1972 (M. Gray), 1 ♀ (AMS KS56198); Haig Cave (30°44'S, 126°23'E), July 29, 1966 (J. Lowry), 1 ♂ (WAM 93/2374); caves at 30°51'S, 126°07'E, Apr. 15, 1990 (A. Baynes

“et al.”), 1 ♂ 1 ♀ (WAM 99/1643–4); Cocklebidy Cave (31°58'S, 125°53'E), Jan. 10, 1966 (J. Lowry), 2 ♂ (WAM 93/2236–7); Grass Patch (33°14'S, 121°44'E), house ceiling, Jan. 3, 1988 (A. F. Longbottom), 2 ♂ 1 ♀



Figs. 195, 196. *Trichocyclus nullarbor*, female. **195.** ALS, showing several piriform gland spigots. **196.** Tip of palp. Scale lines: 20 μ m.

(WAM 99/1721–3); Great Victoria Desert, S of Skipper Knob ($\sim 26^{\circ}57'S$, $126^{\circ}20'E$), wall under overhang, Aug. 12, 1970 (J. Lowry), 1 σ 2 ϕ (WAM 99/2112–4). The following material from near Perth is assigned tentatively (see above): Walyunga ($31^{\circ}44'S$, $116^{\circ}04'E$), Nov. 28, 1981 (D. Hirst), 1 σ 1 ϕ (SAM N1999/863–4); between Chittering and Pearce ($\sim 31^{\circ}33'S$, $116^{\circ}03'E$), no date (G. H. Lowe), 1 σ (WAM 99/1638); Darlington ($31^{\circ}54'S$, $116^{\circ}04'E$), 1975–79 (G. H. Lowe), 1 σ (WAM 99/1639); Gooseberry Hill on Darling Swamp near Perth, Aug. 26, 1971 (J. Lowry), 1 σ (AMS KS45158).

***Trichocyclus hirsti*, new species**

Figures 198–200

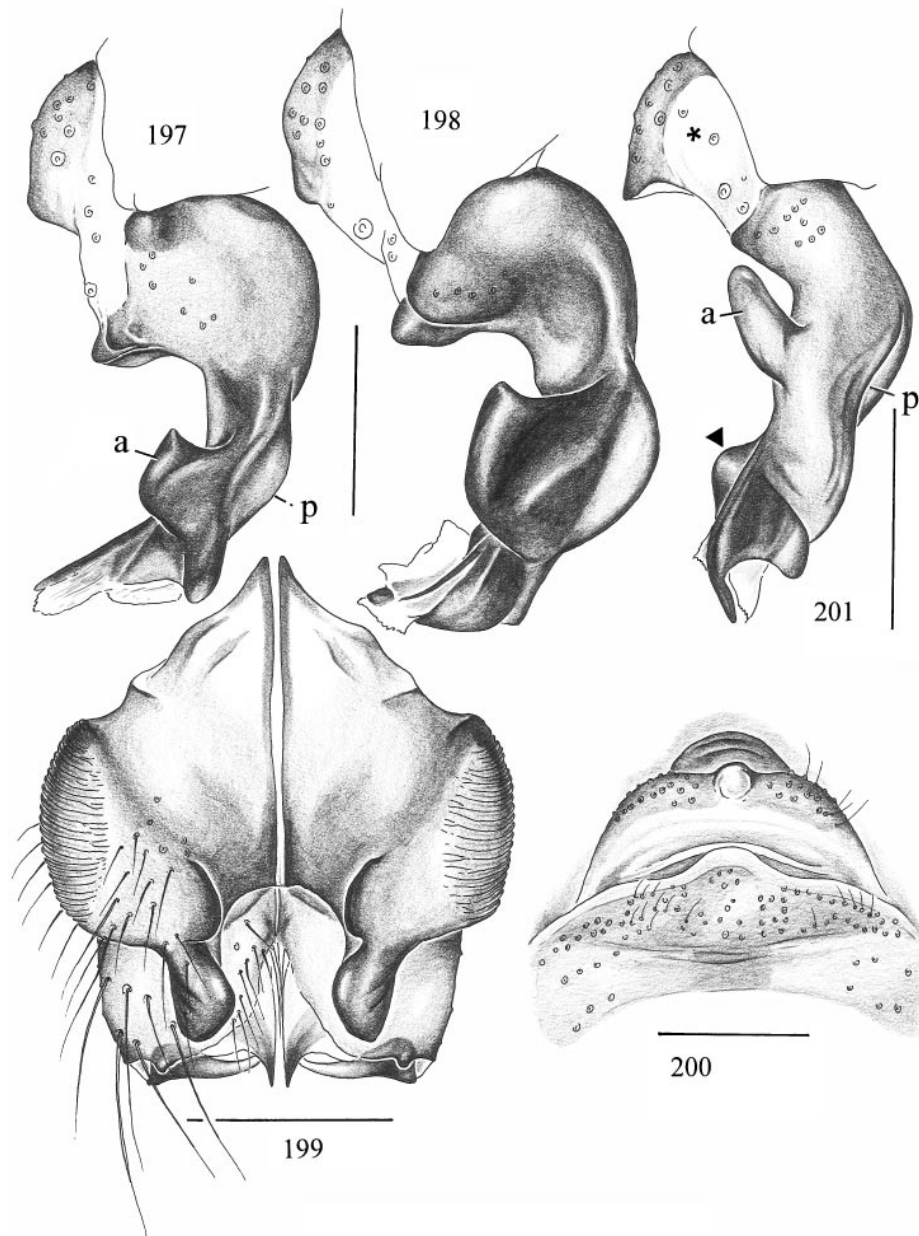
TYPE: Male holotype from rocky cliff face near ephemeral waterfall, 8 km SE of Mitchell Nob, Musgrave Ranges ($26^{\circ}11'S$, $131^{\circ}53'E$), South Australia, Australia; Oct.

18, 1994 (D. Hirst/Pitlands Survey), in SAM (N1999/837).

ETYMOLOGY: Named for the collector of this material and of many more pholcids in the South Australian Museum.

DIAGNOSIS: Distinguished from the very similar *T. nullarbor* by the much stronger dorsal apophysis on the procursus (compare figs. 197 and 198) and by the apophyses on the male chelicerae (distal apophyses wider, proximal apophyses larger; compare figs. 190 and 199).

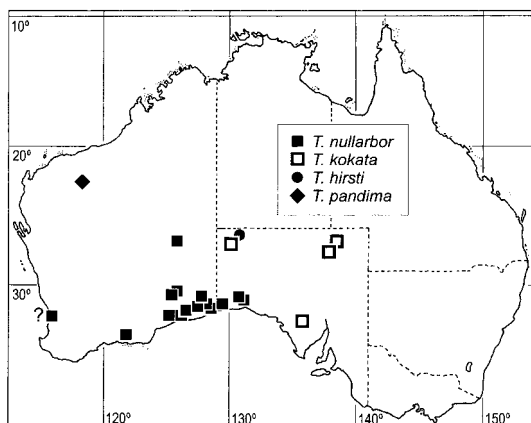
MALE (holotype): Total length 3.7, carapace width 1.84. Leg 1: 44.8 ($11.9 + 0.8 + 11.7 + 17.7 + 2.7$), tibia 2: 8.5, tibia 3: 6.0, tibia 4: 8.3; tibia 1 l/d: 68. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown pattern as in *T. nullarbor*, but less distinct. Distance PME–PME 0.160; diameter PME 0.145; distance PME–ALE 0.045; diameter AME 0.120. Clypeus with wide, distally ta-



Figs. 197–201. *Trichocyclus nullarbor* (197), *T. hirsti* (198–200), and *T. kokata* (201). **197, 198, 201.** Left procursi, retrolaterodorsal views; “a”, “p” = apophysis and pocket; asterisk: weak zone on cymbium; unshafted arrow: more prominent in other male studied. **199.** Male chelicerae, frontal view. **200.** Epigynum, ventral view. Scale lines: 0.3 mm (197–199, 201), 0.5 mm (200).

pering light brown band; sternum light brown, with light speckles and larger spots near bases of coxae. Chelicerae ochre with pair of strong, black apophyses distally and another pair of shorter apophyses more prox-

imally, and stridulatory ridges (fig. 199). Palps in general very similar to *T. nullarbor* (cf. figs. 191, 192), but procursus with much stronger dorsal apophysis (fig. 198). Legs ochre-yellow, with indistinct darker rings on



Map 9. Distribution of *Trichocyclus* species: *nullarbor* group.

femora (subdistally) and tibiae (proximally and subdistally), patellae also darker; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 distally with ~13 quite distinct pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma ochre gray, covered with blackish spots except ventrally; genital plate gray-brown, about rectangular.

VARIATION: Tibia 1 in other male: 9.7; carapace width in this male: 1.61.

FEMALE: In general very similar to male; tibia 1 in 2 females: 8.2, 8.8. Opisthosoma frontodorsally apparently without humps. Epigynum as in fig. 200, dorsal view not distinguishable from *T. nullarbor* (cf. fig. 194).

DISTRIBUTION: Known only from type locality in Musgrave Ranges, South Australia (map 9).

MATERIAL EXAMINED: AUSTRALIA: *South Australia*: Musgrave Ranges: Male holotype above, with 1♂ 2♀ (SAM N1999/838–40).

***Trichocyclus kokata*, new species**

Figure 201

TYPE: Male holotype from Kolay Hut, Paney Station, Gawler Ranges (32°33'S, 135°36'E), South Australia, Australia; Dec. 9, 1989 (D. Hirst), in SAM (N1999/832).

ETYMOLOGY: Named for the Kokata, the so-called Gawler Range tribe, whose territory included some of the most inhospitable country in Australia; the water from tree

roots was a necessary source over much of the area. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most congeners by the long narrow apophyses on the male chelicerae, which are identical to those of *T. nullarbor* (cf. fig. 190); distinguished from *T. nullarbor* by the long dorsal apophysis on the procursus (fig. 201).

MALE (holotype): Total length 3.1, carapace width 1.35. Leg 1: 24.3 (6.7 + 0.5 + 6.7 + 8.7 + 1.7), tibia 2: 4.9, tibia 3: 3.3, tibia 4: 4.8; tibia 1 l/d: 50. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown pattern similar to that of *T. nullarbor* (cf. fig. 187). Distance PME-PME 0.160; diameter PME 0.095; distance PME-ALE 0.045; diameter AME 0.120. Clypeus with wide, distally tapering light brown band; sternum pale ochre, light brown speckled. Chelicerae identical to those of *T. nullarbor* (cf. fig. 190), ochre with pair of long, narrow frontal apophyses, smaller cones at their bases, and stridulatory ridges. Palps in general as in *T. nullarbor* (cf. figs. 191, 192), but procursus with long dorsal apophysis (fig. 201). Legs ochre, with darker rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker; tips of femora and tibiae whitish; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 12%; tarsal pseudosegments very indistinct, hardly countable (apparently >10). Opisthosoma roundish, ochre gray, dorsally with many blackish spots; genital plate very light brown, about rectangular.

VARIATION: Tibia 1 in male from Musgrave Ranges: 8.1; this male is in general slightly larger, the pattern on the carapace is more distinct, and the prolateral apophysis on the procursus (unshafted arrow in fig. 201) is slightly more prominent. Tibia 1 in males from Kalamurina Station and Murda Hill: 6.5, 7.1; these males differ slightly from the holotype with respect to the procursus (dorsodistal black flap missing, dorsoproximal apophysis slightly more slender).

FEMALE: In general very similar to male, but dark patterns on carapace and legs more distinct. Tibia 1 in 2 females accompanying male holotype: 7.2, 7.9. Opisthosoma frontodorsally apparently without humps. Epi-

gynum externally not distinguishable from that of *T. nullarbor* (cf. fig. 193).

DISTRIBUTION: Known from four localities in South Australia (map 9).

MATERIAL EXAMINED: AUSTRALIA: *South Australia*: Gawler Ranges, Paney Station: Male holotype above, with 2 ♀ (SAM N1999/833–4); Musgrave Ranges, Ngarutjara (26°14'S, 131°47'E), amongst rocks, Oct. 13, 1994 (D. Hirst), 1 ♂ 1 juvenile (SAM N1999/836); 1 km E of Rat Hole Yard, Kalamurina Station (27°56'S, 138°00'E), Oct. 2–8, 1999 (D. Hirst), 1 ♂ (SAM NN9037); Simpson Desert, 1.7 km S of Murda Hill (26°58'S, 138°22'E), broad claypan between dunes, Mar. 24–29, 1998 (Sandy Desert Survey), 1 ♂ (SAM NN9038).

***Trichocyclus pandima*, new species**

Figures 202, 203

TYPE: Male holotype from Dales Gorge, Karijini National Park (22°28'S, 118°33'E), Western Australia, Australia; Sept. 11, 1981 (D. Hirst), in SAM (N1999/798).

ETYMOLOGY: Named for the Pandjima (also called Pand'ima), an aboriginal tribe in Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from most congeners by the long dorsal apophysis on the procursus (fig. 203); from *T. kokata* (which has a similar procursus; fig. 201) by the shorter and wider distal cheliceral apophyses and the shape of the bulb (figs. 202, 203).

MALE (holotype): Total length ~3.5 (opisthosoma shrunken), carapace width 2.03. Leg 1: 14.9 + 0.9 + 15.1 + 22.8; tarsus missing; tibia 2: 10.5, tibia 3: 6.8, tibia 4: 9.5; tibia 1 l/d: 81. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown spot behind ocular area and three lateral spots hardly visible, without radial marks. Ocular area with darker median and lateral marks; distance PME–PME 0.160; diameter PME 0.135; distance PME–ALE 0.030; diameter AME 0.135. Clypeus with slightly darker median band; sternum ochre-yellow, posteriorly light brown with yellowish speckles. Chelicerae with two pairs of apophyses and stridulatory ridges (fig. 202). Palps in general

as in *T. aranda* (cf. fig. 231), but femur with distinct dark knob ventrally subdistally; procursus with long dorsal apophysis (fig. 203). Legs ochre-yellow, with barely visible darker rings on femora (subdistally); tips of femora and tibiae whitish; almost all hairs missing; retrolateral trichobothrium of tibia 1 at 10%; distally with ~12 quite distinct pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma roundish, gray, with blackish and white spots except ventrally; genital plate very light brown, about rectangular.

VARIATION: Tibia 1 in other male: 11.7.

FEMALE: In general very similar to male, but sternum darker, with many yellowish speckles and larger light spots near bases of coxae. Tibia 1 in 2 females: 12.8, 12.7. Opisthosoma frontodorsally with pair of distinct, sclerotized humps. Epigynum externally very similar to that of *T. aranda* (cf. fig. 233), but plate in front of frontal plate wider.

DISTRIBUTION: Known only from type locality, Karijini National Park, Western Australia (map 9).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Karijini National Park, Dales Gorge: Male holotype above, with 1 ♂ (and a non-conspecific female) (SAM N1999/799–800); same locality, July 24–25, 1998 (D. Hirst), 1 ♂ 3 ♀ 5 juveniles (SAM N1999/794–7).

***Trichocyclus arabana*, new species**

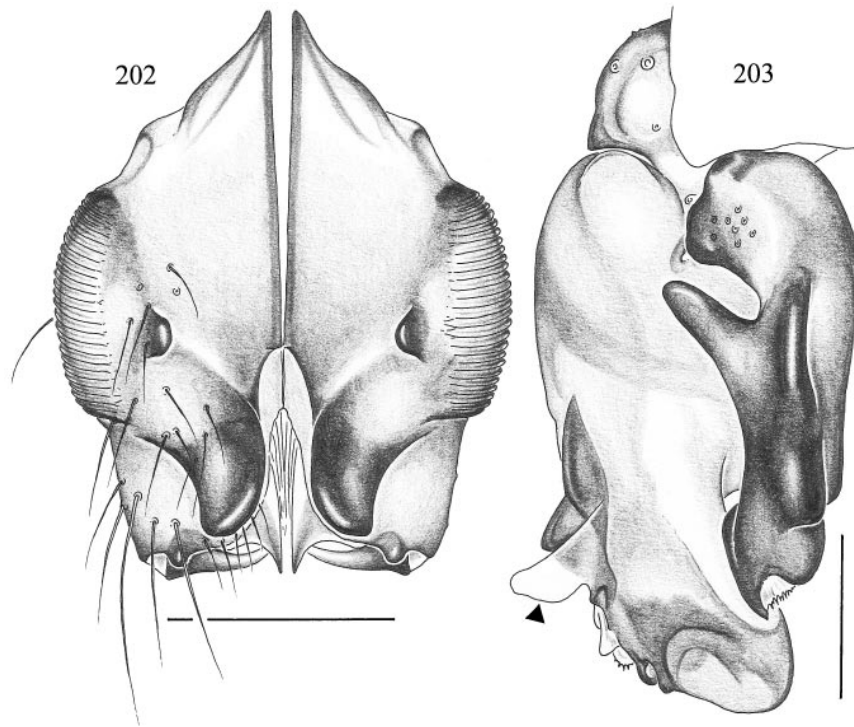
Figures 204–214

TYPE: Male holotype from 9.8 km WSW of Mt. Bray, Mt. Barry Station (28°11'S, 134°42'E), South Australia, Australia; Sept. 18–21, 1996 (Stony Desert Survey), in SAM (N1999/814).

ETYMOLOGY: Named for the Arabana (Ngarabana), an aboriginal tribe of the Lake Eyre area, South Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. balladong* by the much narrower dorsal apophysis on the procursus (compare figs. 206 and 229); from all other congeners by the short but wide distal apophyses on the male chelicerae (fig. 211).

MALE (holotype): Total length 2.7, carapace width 1.35. Leg 1: 24.2 (6.8 + 0.5 +



Figs. 202, 203. *Trichocyclus pandima*, male. **202.** Chelicerae, frontal view. **203.** Left procurus and genital bulb, retrolateral view; arrow: transparent bulbal process. Scale lines: 0.3 mm.

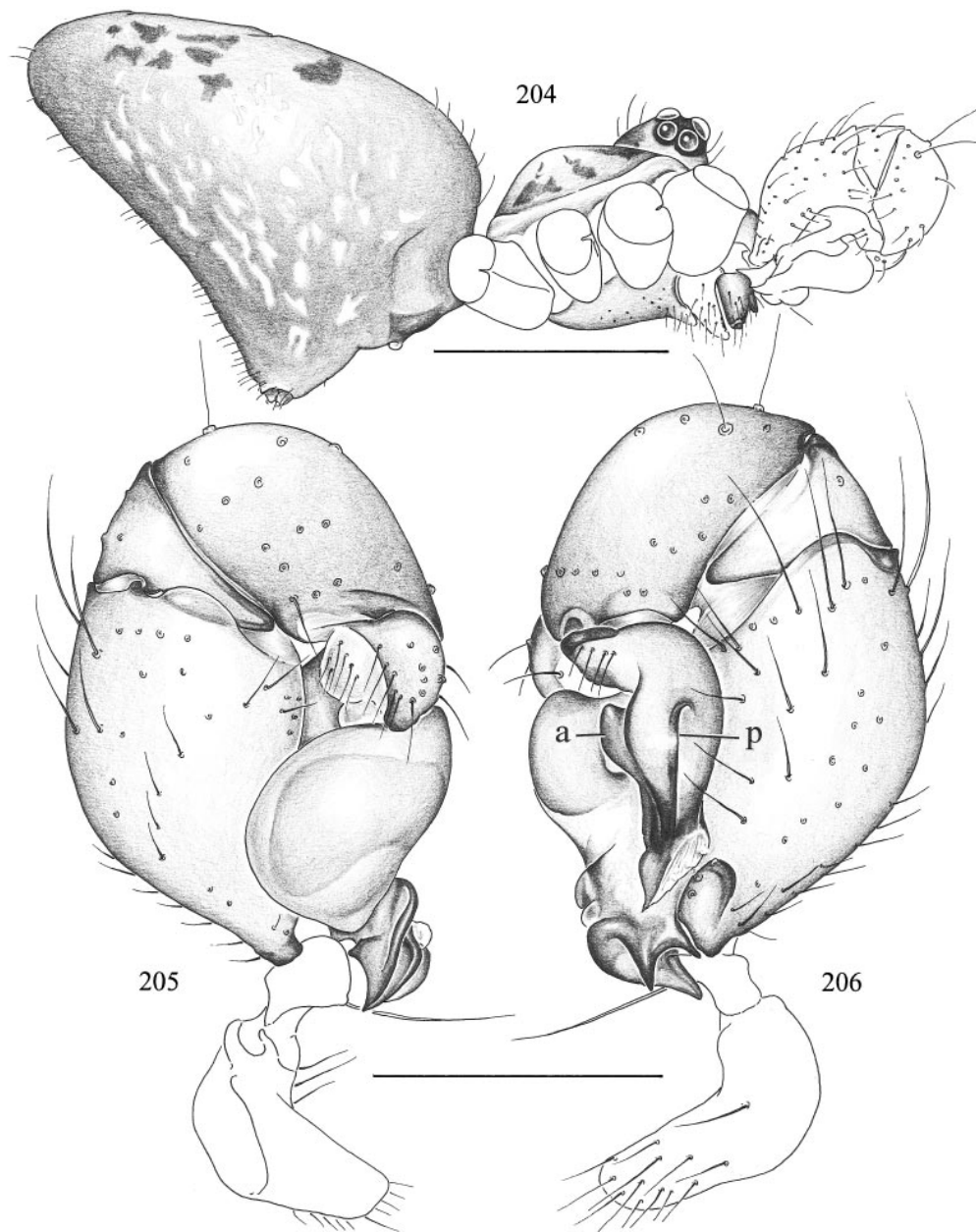
6.7 + 8.9 + 1.3), tibia 2: 4.7, tibia 3: 3.2, tibia 4: 4.8; tibia 1 l/d: 50. Habitus as in fig. 204. Prosoma shape as in *T. nullarbor* (cf. figs. 187–189); carapace pale ochre with light brown pattern similar to that of *T. nullarbor* (cf. fig. 187), but without radial marks and with only two pairs of lateral spots instead of three. Distance PME–PME 0.165; diameter PME 0.095; distance PME–ALE 0.035; diameter AME 0.105. Clypeus with pair of brown bands converging distally; sternum pale ochre, light brown speckled. Chelicerae as in fig. 211, ochre, with pair of short, wide distal apophyses and proximal pair laterally, and stridulatory ridges. Palps as in figs. 205 and 206, procurus with rounded dorsal apophysis (fig. 212). Legs pale ochre, with light brown rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 12%; tarsal pseudosegments very indistinct, only distally ~7 discernible. Opisthosoma dorsoposteriorly

long (fig. 204), gray, covered with many black spots except ventrally. Genital plate light brown; gonopore without epiandrous spigots (fig. 207). Several piriform gland spigots on ALS (fig. 209).

VARIATION: Tibia 1 in 24 males: 5.1–7.7 (\bar{x} = 6.6). In some specimens the pattern on the carapace resembles more that of *T. nullarbor*, that is, there are radial marks and a third pair of lateral spots; some specimens have a very long opisthosoma, but it is only the dorsal part that is elongated, projecting far beyond the spinnerets.

FEMALE: In general very similar to male, but dark pattern on carapace more distinct, and sternum darker (brown). Tibia 1 in 14 females: 4.9–7.2 (\bar{x} = 5.80). Palpal tarsal organ as in fig. 208. Pseudosegmentation of tarsus 1 near tip as in fig. 210. Opisthosoma frontodorsally with pair of indistinct, transparent humps. Epigynum as in fig. 213, dorsal view as in fig. 214.

DISTRIBUTION: Widely distributed in South

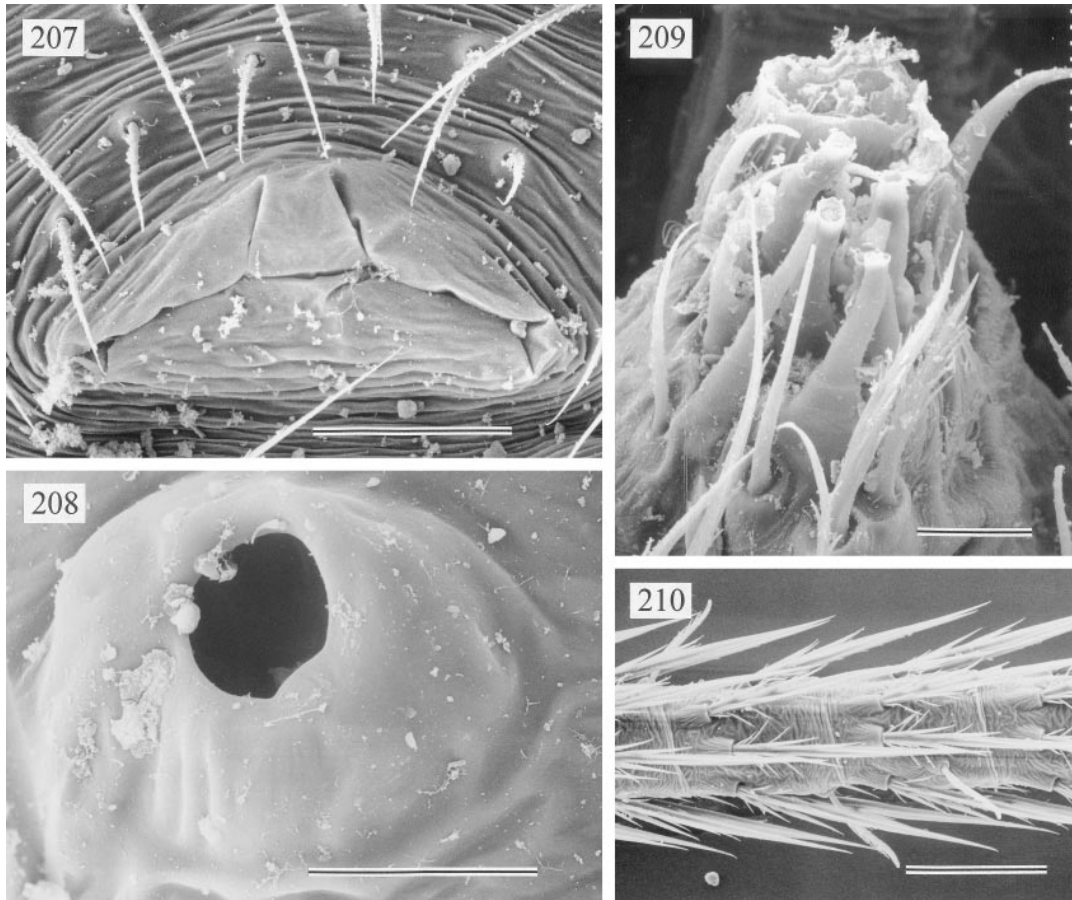


Figs. 204–206. *Trichocyclus arabana*, male. **204.** Habitus. **205, 206.** Left palp, prolateral (205) and retrolateral (206) views; “a”, “p” = apophysis and pocket. Scale lines: 1 mm (204), 0.5 mm (205, 206).

Australia, southern Northern Territory, and eastern Western Australia (map 10).

MATERIAL EXAMINED: AUSTRALIA: *South Australia:* Mt. Barry Station: Holotype above; Jimmy Waterhole, Mt. Barry Station

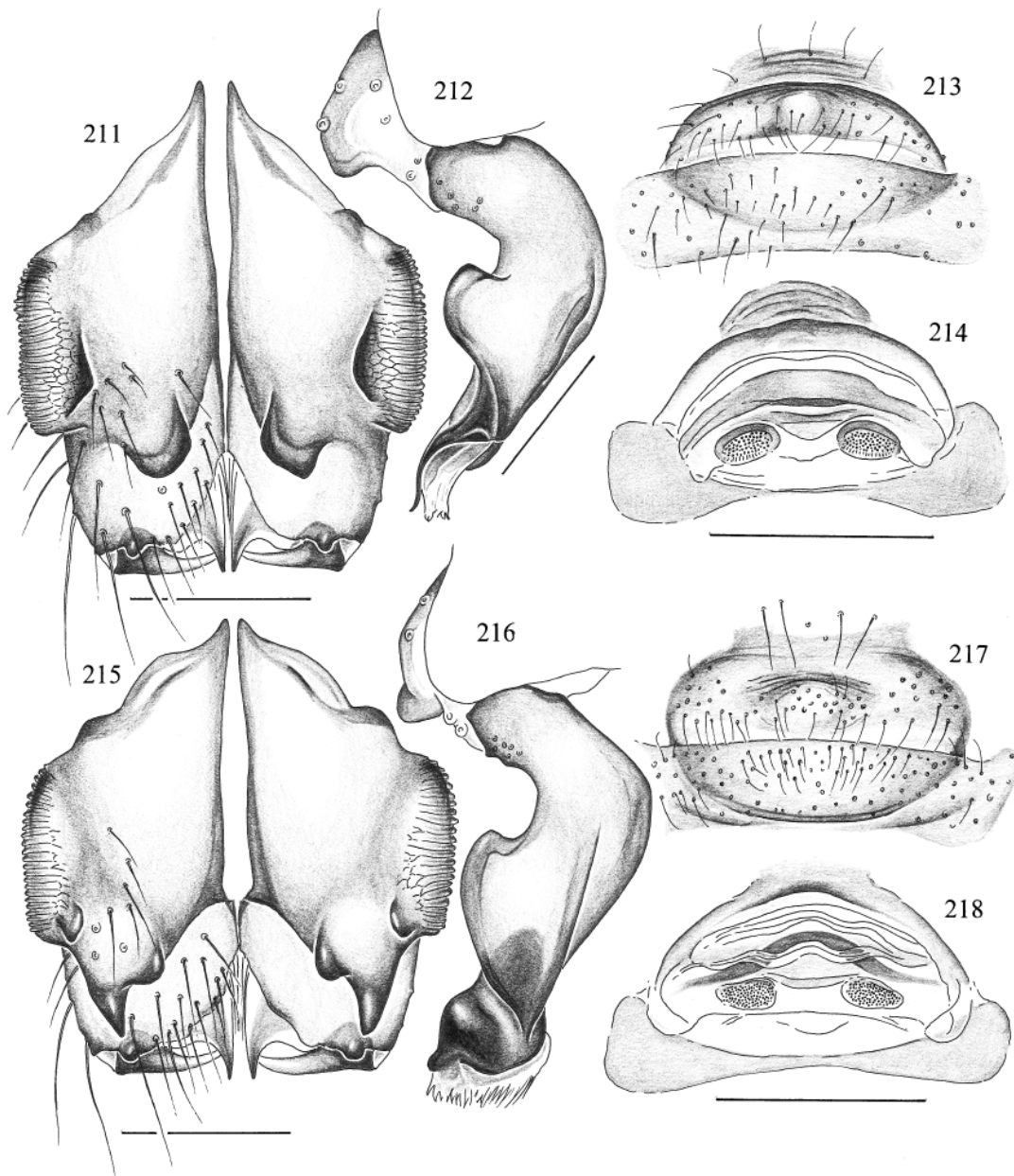
(28°13'S, 134°32'E), Sept. 18–21, 1996 (Stony Desert Survey), 1♂ (SAM N1999/813); 5.5 km NW of Mt. Minalcooroo, Arckaringa Station (27°57'S, 135°06'E), Sept. 15–20, 1996 (Stony Desert Survey),



Figs. 207–210. *Trichocyclops arabana*. **207.** Male gonopore. **208.** Female palpal tarsal organ. **209.** Male ALS, with several piriform gland spigots. **210.** Female tarsus 1 near tip. Scale lines: 50 μ m (207, 210), 10 μ m (208, 209).

1 ♂ (SAM N1999/816); 31.5 km SE of Ucutanna Hill, Allendale Station (27°25'S, 135°54'E), Nov. 14–17, 1995 (Stony Desert Survey), 1 ♂ (SAM N1999/817); sanddune 4.5 km NE of Cheesman Peak (27°22'S, 130°42'E), Oct. 25, 1996 (Pitjantjatjara Lands Survey), 1 ♂ (SAM NN9021); 4.1 km ESE of Parke Camp Waterhole, Todmorden Station (27°21'S, 134°29'E), Sept. 21–25, 1996 (Stony Desert Survey), 1 ♂ (SAM N1999/818); 9.7 km S of Ampeinna Hills (27°09'S, 131°08'E), Mar. 19–23, 1995 (D. Hirst; Pitlands Survey), 1 ♂ (SAM N1999/820); 10.2 km E of Ampeinna Hills (27°05'S, 131°14'E), Mar. 19–23, 1995 (D. Hirst; Pitlands Survey), 1 ♂ (SAM N1999/821); 14.2 km ESE of Maryinna Hill (27°00'S,

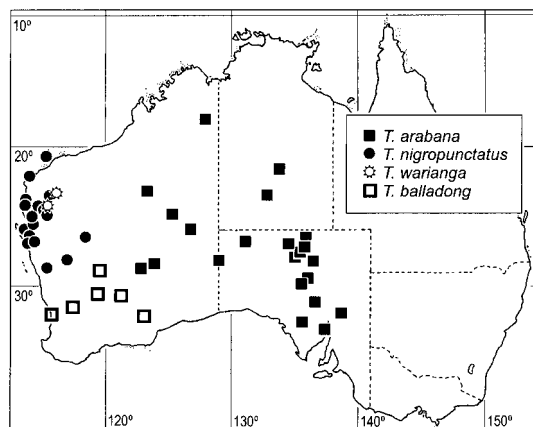
131°21'E), Mar. 14–18, 1995 (Pitjantjatjara Lands Survey), 1 ♂ (SAM NN9022); 5.8 km SSW of Mt. Goodair, Witjira National Park (26°42'S, 135°36'E), Nov. 24, 1995 (Stony Desert Survey), 1 ♂ (SAM N1999/819); Serpentine Lake, west side on base of cliffs (28°30'S, 129°00'E), Apr. 17, 1994 (D. Hirst), 1 ♂ 5 ♀ (SAM N1999/823–8); quartz-gibber plain 4.6 km ESE of Patsy Dam (28°37'S, 135°58'E), Oct. 26–31, 1995 (Lake Eyre South Survey), 1 ♂ (SAM N1999/815); 4 km N of Halifax Hill (29°41'S, 135°49'E), Sept. 29–Oct. 5, 1995 (Painted Hills Survey), 1 ♂ (SAM N1999/812); Stuart Highway, roadside rest area (29°50'S, 135°08'E), May 11, 1999 (M. Gray, G. Milledge, H. Smith), 11 ♀, 1 juvenile (AMS KS56195);



Figs. 211–218. *Trichocyclus arabana* (211–214), *T. nigropunctatus* (215–218). **211, 215.** Male chelicerae, frontal views. **212, 216.** Left procursus, retrolaterodorsal views. **213, 217.** Epigynum, ventral views. **214, 218.** Epigynum, dorsal views. Scale lines: 0.5 mm (213, 214, 217, 218), 0.2 mm (211, 212, 215).

Stuart Highway, N of Port Augusta (31°15'S, 136°32'E), May 10, 1999 (M. Gray, G. Milledge, H. Smith), 1♂ 1 juvenile (AMS KS56194); Hanker Caravan Park (31°53'S, 138°25'E), May 1, 1989 (D. C. Lee, D.

Hirst), 1♂ (SAM N1999/810); Stone Dam, Paney Station, Gawler Ranges (32°35'S, 135°25'E), Dec. 11, 1989 (D. Hirst), 1♂ 2♀ (SAM N1999/802–4); Middleback Station (32°57'S, 137°23'E), Dec. 1983 (B. Guerin),



Map 10. Distribution of *Trichocyclus* species: *nigropunctatus* group.

2♂ (SAM N1999/808–9). *Western Australia*: Warburton Mission (26°08'S, 126°25'E), inside house, Aug. 25, 1970 (J. Lowry), 1♂ 1♀ 1 juvenile (WAM 99/1960–2); Warri Well (24°53'S, 125°06'E), July 19, 1982 (B. Muir), 1♂ 1♀ (WAM 99/1735–6); Canning Stock Route, Well 25 (22°59'S, 123°24'E), inside dry well, July 31, 1987 (A. E. de Jong), 2♂ 2♀ 1 juvenile (WAM 99/1626–30); 7–8 km WNW of Point Salvation (28°12'S, 123°36'E), Nov. 8–10, 1990, and Feb. 25–Mar. 5, 1991 (E. R. Pianka), 2♂ (WAM 99/1660–1); 39 km E of Laverton (28°28'S, 122°50'E), Nov. 1–4, 1989 (E. R. Pianka), 1♂ (WAM 99/1658); Red Sands (28°12'S, 123°35'E), Nov. 5–7, 1989 (E. R. Pianka), 1♂ (WAM 99/1662); Halls Creek (18°14'S, 127°40'E), July 1, 1981 (D. Hirst), 1♂ (with a non-conspecific female!) (SAM N1999/867–8). *Northern Territory*: West MacDonnell Natl. Park, Serpentine Gorge (23°46'S, 132°59'), under rock, May 17, 1999 (M. Gray, G. Milledge, H. Smith), 1♂ (AMS KS56178); Stuart Highway at 21°38'S, 133°45'E, May 18, 1999 (M. Gray, G. Milledge, H. Smith), 1♂ 2♀ 1 juvenile (AMS KS65696).

Trichocyclus nigropunctatus Simon, 1908
Figures 215–225

Trichocyclus nigropunctatus Simon, 1908: 407.—
Deeleman-Reinhold, 1993: 325–327, figs. 1A–E

TYPE: Female lectotype (designated by Deeleman, 1993) from Yalgoo (28°21'S,

116°41'E), Western Australia, Australia; 1905 (W. Michaelsen), in MNHN (collection Simon 23021; examined).

NOTES: As already noted by Deeleman-Reinhold (1993), the penultimate male in the Zoological Museum Hamburg that was collected at the same locality during the same expedition, and was identified by Simon himself as *T. nigropunctatus*, is not a holotype (contra Rack, 1961), but a paralectotype.

Unfortunately, I could not study any new material collected at the type locality. Because females of *Trichocyclus* species are hardly or not at all distinguishable, the material described herein is only tentatively identified as *T. nigropunctatus*, based primarily on geographic proximity. Yalgoo is only 120 km from the nearest locality of the material listed below, while it is 270 km from the nearest locality of the next species (*T. balladong*). Collecting males at and around Yalgoo should easily solve this problem.

DIAGNOSIS: Distinguished from congeners by the distal male cheliceral apophyses that appear divided into two parts each (fig. 215), and by the tip of the procurus (fig. 216).

MALE (Bush Bay): Total length 3.1, carapace width 1.35. Leg 1: 26.0 (7.3 + 0.5 + 7.2 + 9.5 + 1.5), tibia 2: 5.2, tibia 3: 3.5, tibia 4: 5.9; tibia 1 l/d: 54. Prosoma shape, colors, and pattern as in *T. nullarbor* (cf. figs. 186–189); ocular area with dark median mark posteriorly. Distance PME–PME 0.145; diameter PME 0.095; distance PME–ALE 0.045; diameter AME 0.120. Clypeus with large brown mark tapering distally; sternum ochre, with brown speckles medially and posteriorly. Chelicerae as in figs. 215 and 223; ochre, with distinctive distal apophyses that appear divided into long lateral and shorter medial part. Palps in general as in *T. arabana* (cf. figs. 205, 206), only procurus different, with much wider dorsal apophysis (fig. 216); with brush of hairlike structures (fig. 221). Bulb very similar to *T. nullarbor* (cf. figs. 191, 192); distal view as in fig. 220. Legs ochre, with brown rings on femora (subdistally) and tibiae (proximally), patellae also darker; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 14%; tarsus 1 distally

with ~9 barely distinguishable pseudosegments, proximally pseudosegmentation not visible. Opisthosoma higher than long, but posteriorly rounded, gray, covered with many black and white spots except ventrally. Genital plate light brown; gonopore without epiandrous spigots (fig. 219). Several piriform gland spigots on ALS (fig. 224).

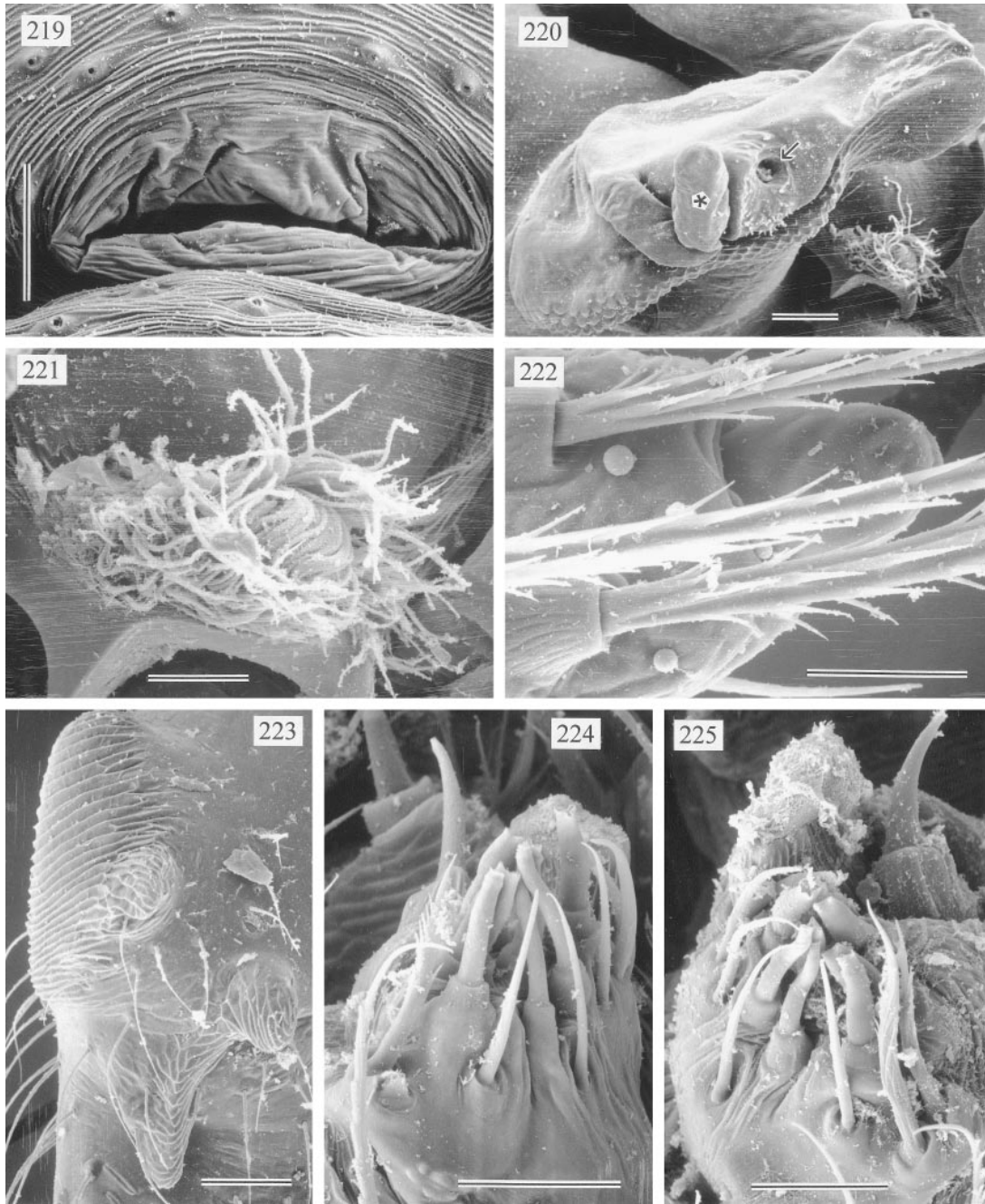
VARIATION: Tibia 1 in 80 males: 5.3–8.0 (\bar{x} = 6.7).

FEMALE: In general very similar to male, but sternum darker, and chelicerae without stridulatory ridges. Tibia 1 in 22 females: 4.1–6.5 (\bar{x} = 5.4). Palpal tarsus tip as in fig. 222. Opisthosoma frontodorsally apparently without humps. Epigynum as in fig. 217, dorsal view as in fig. 218. (Note that it is hardly distinguishable from that of *T. arabana*; cf. figs. 213, 214.) Spigots on ALS as in male (fig. 225).

DISTRIBUTION: Known from several localities in western Western Australia (map 10).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia:* **Yalgoo:** Female holotype above; **Greenough River**, 2 km SW of Eradu (28°43'S, 115°02'E), under rock, Feb. 22, 1979 (M. R. Gray), 1♂ (AMS KS14914); **Zuytdorp** (27°16'S, 114°04'E), Aug. 26, 1994–May 18, 1995 (A. Sampey, M. S. Harvey “et al.”), 4♂ 5 juveniles (WAM 99/2026–34); **Nerren Nerren Station** (27°00'S, 114°32'E), Aug. 25, 1994–Aug. 18, 1995 (P. West, N. McKenzie, J. Rolfe, J. M. Waldock, N. Hall), 4♂ 2♀ 3 juveniles (WAM 99/1972–8); same locality at 27°03'S, 114°36'E, Aug. 25, 1994–May 28, 1995 (J. M. Waldock, P. West, N. McKenzie, J. Rolfe), 2♂ 2♀ 1 juvenile (WAM 99/1979–83); **Polelle Station** (26°55'S, 118°33'E), Aug. 5, 1982 (B. Y. Main), 1♂ (WAM 99/2102); **Nanga Station** (26°29'S, 114°03'E), Aug. 23, 1994–Aug. 30, 1995 (A. Sampey, N. Hall, N. McKenzie, J. Rolfe, P. West), 11♂ 4♀ 4 juveniles (WAM 99/1952–71); **Hamelin Pool** (26°24'S, 114°10'E), Nov. 27, 1991 (M. S. Harvey, M. E. Blosfelds), 1♂ 1 juvenile (WAM 99/1645–6); **Woodleigh Station** (26°12'S, 114°32'E), Oct. 11, 1994–May 17, 1995 (P. West, N. McKenzie, J. Rolfe), 8♂ 1♀ 5 juveniles (WAM 99/1993–7, 1999–2007); same locality at 26°11'S, 114°32'E, May 17–Aug. 21, 1995 (N. Hall), 1♀ (WAM 99/1998), assigned tentatively; same locality

at 26°12'S, 114°31'E, Aug. 22–Oct. 10, 1994 (M. Harvey “et al.”), 2♂ (WAM 99/2008–9); same locality at 26°12'S, 114°25'E, Aug. 22, 1994–Aug. 21, 1995 (N. McKenzie, J. Rolfe, P. West, N. Hall, M. S. Harvey), 9♂ 5♀ 3 juveniles (WAM 99/2010–25); same locality at 26°13'S, 114°35'E, Jan. 17–May 17, 1995 (P. West “et al.”), 3♂ 1♀ (WAM 99/1989–92); same locality at 26°13'S, 114°35'E, Jan. 12–Aug. 21, 1995 (N. Hall, P. West), 3♂ 1♀ 1 juvenile (WAM 99/1984–8); **Francois Peron National Park** (25°50'S, 113°36'E), Oct. 12, 1994–May 27, 1995 (M. S. Harvey, N. McKenzie, J. Rolfe), 5♂ 1♀ 1 juvenile (WAM 99/1900–6); **Meedo Station** (25°43'S, 114°36'E), Aug. 22–Oct. 11, 1994 (P. West “et al.”), 2♂ 1 juvenile (WAM 99/1949–51); same locality at 25°37'S, 114°42'E, May 28–Aug. 21, 1995 (N. Hall), 1♂ 1 juvenile, 1 prosoma (WAM 99/1940–1); same locality at 25°41'S, 114°37'E, May 18–Aug. 22, 1995 (N. Hall), 1♂ (WAM 99/1948); same locality at 26°37'S, 114°41'E, May 16–21, 1995 (A. Sampey “et al.”), 2♀ (WAM 99/1942–3), assigned tentatively; same locality at 25°39'S, 114°37'E, Aug. 22, 1994–Jan. 12, 1995 (P. West, N. McKenzie, J. Rolfe), 2♀ 3 juveniles (WAM 99/1944–7), assigned tentatively; **Bidgemia Station, Gascoyne Junction** (25°07'S, 115°26'E), Aug. 17, 1994–Aug. 20, 1995 (A. Sampey, N. Hall, J. M. Waldock), 3♂ 2 juveniles (WAM 99/1848–52); same locality at 25°10'S, 115°29'E, Jan. 16–June 4, 1995 (J. M. Waldock “et al.”), 1♀ (WAM 99/1845) assigned tentatively; same locality at 25°05'S, 115°22'E, Aug. 17–Oct. 5, 1994 (A. Sampey “et al.”), 1♀ (WAM 99/1853); same locality at 25°11'S, 115°29'E, Aug. 17, 1994–Jan. 13, 1995 (N. McKenzie, J. Rolfe, A. Sampey), 2♂ (WAM 99/1846–7); same locality at 25°13'S, 115°31'E, Oct. 4, 1994–Jan. 13, 1995 (N. McKenzie, J. Rolfe), 1♂ 1 juvenile (WAM 99/1841–2); same locality at 25°12'S, 115°30'E, Aug. 17–Oct. 4, 1994 (A. Sampey “et al.”), 1♀ 1 juvenile (WAM 99/1843–4), assigned tentatively; same locality at 25°03'S, 115°18'E, Jan. 13–June 6, 1995 (J. M. Waldock “et al.”), 2♂ 4 juveniles (WAM 99/1856–61); same locality at 25°03'S, 115°17'E, June 6–Aug. 20, 1995 (N. Hall), 1♀ 1 juvenile (WAM 99/1862–3), assigned tentatively; same locality, Aug. 17–



Figs. 219–225. *Trichocyclops nigropunctatus*. **219.** Male gonopore. **220.** Genital bulb, distal view; shafted arrow: sperm duct opening; asterisk: transparent bulbal process. **221.** Tip of procursus with brush of hairlike structures. **222.** Tip of female palp. **223.** Stridulatory ridges and apophyses on male right chelicera. **224, 225.** ALS of male (224) and female (225), with several piriform gland spigots. Scale lines: 50 μm (219, 220, 223), 20 μm (221, 222, 224, 225).

Oct. 5, 1994 (A. Sampey "et al."), 1 ♀ 2 juveniles (WAM 99/1854–5), assigned tentatively; **Bush Bay** (25°07'S, 113°48'E), Sept. 27–Jan. 26, 1995 (P. West, M. S. Harvey, N. McKenzie, J. Rolfe), 3 ♂ 5 ♀ (WAM 99/1877–84); **Kennedy Range National Park** (24°30'S, 115°01'E), Aug. 18, 1994–Aug. 28, 1995 (N. McKenzie, J. Rolfe, M. S. Harvey, P. West, N. Hall), 7 ♂ 5 ♀ 3 juveniles (WAM 99/1911–24); same locality at 24°34'S, 114°57'E, Aug. 18–Oct. 8, 1994 (M. S. Harvey "et al."), 3 ♂ 1 juvenile (WAM 99/1925–8); same locality at 24°30'S, 115°02'E, May 29–Aug. 28, 1995 (N. Hall "et al."), 2 ♂ (WAM 99/1908–9); **Boothathana Station** (24°25'S, 113°42'E), Sept. 27, 1994–Aug. 25, 1995 (J. M. Waldock, N. Hall, N. McKenzie, J. Rolfe, A. Sampey), 6 ♂ 1 ♀ 3 juveniles (WAM 99/1865–73, 1875); same locality at 24°24'S, 113°40'E, May 28–June 2, 1995 (J. M. Waldock "et al."), 1 ♀ (WAM 99/1864) assigned tentatively; same locality at 24°24'S, 113°42'E, May 28–June 2, 1995 (J. M. Waldock "et al."), 1 ♀ (WAM 99/1874) assigned tentatively; same locality at 24°25'S, 113°46'E, Aug. 20–Sept. 30, 1994 (A. Sampey "et al."), 1 ♂ (WAM 99/1876); **Mardathuna Station** (24°24'S, 114°28'E), Oct. 5, 1994–May 28, 1995 (N. McKenzie, J. Rolfe, A. Sampey), 5 ♂ (WAM 99/1933–7); same locality at 24°24'S, 114°27'E, Oct. 5, 1994–Jan. 14, 1995 (N. McKenzie, J. Rolfe), 1 ♂ 1 ♀ (WAM 99/1938–9); same locality at 24°30'S, 114°38'E, May 23–28, 1995 (A. Sampey "et al."), 1 ♀ (WAM 99/1929), assigned tentatively; same locality at 24°27'S, 114°31'E, Oct. 5, 1994–Jan. 14, 1995 (N. McKenzie, J. Rolfe), 1 ♂ 2 juveniles (WAM 99/1930–2); **Cape Cuvier, Quobba Station** (24°13'S, 113°30'E), Sept. 29, 1994–May 30, 1995 (N. McKenzie, J. Rolfe, A. Sampey), 8 ♂ 5 ♀ 2 juveniles (WAM 99/1885–99); **Barlee Range Nature Reserve** (23°05'S, 115°47'E), June 15–18, 1994 (P. G. & G. W. Kendrick), 1 ♂ 3 ♀ (WAM 99/2139–41); same locality at 23°03'S, 115°49'E, June 15–18, 1994 (P. G. & G. W. Kendrick), 2 ♂ 1 ♀ (WAM 99/2136–8); **Kuburu Well Cave**, near Exmouth (~21°55'S, 114°07'E), Sept. 17, 1983 (J. Lowry), 1 ♂ 2 ♀ (WAM 99/1716–18); **Barrow Island**, John Wayne Country (20°45'S, 115°22'E), Oct. 28, 1998 (M. S. Harvey, V.

T. Ovtsharenko), 1 ♂ 1 ♀ (WAM 99/2092–5); same locality, WAPET camp (20°49'S, 115°27'E), Nov. 5–Dec. 3, 1993 (M. S. Harvey, J. M. Waldock), 1 ♂ 1 juvenile (WAM 99/1738); Barrow Island, Apr. 2, 1971 (A. A. Burbidge, W. H. Butler), 1 ♂ 2 ♀ (WAM 79/334–6).

Trichocyclus warianga, new species

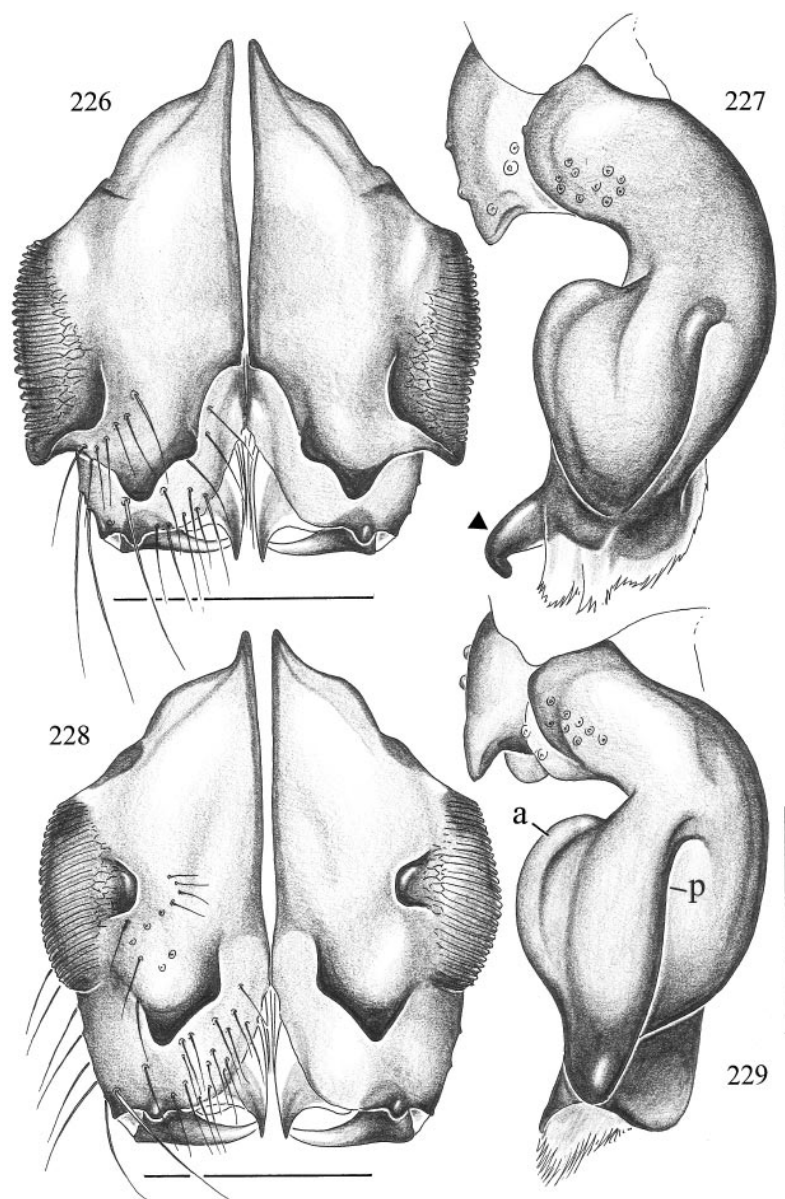
Figures 226, 227

TYPE: Male holotype from Barlee Range Nature Reserve (23°23'S, 115°53'E), Western Australia, Australia; June 11–14, 1994 (P. G. & G. W. Kendrick) (WAM 99/1820).

ETYMOLOGY: Named for the Wariangga (also Warianga), an aboriginal tribe in the Barlee Range area. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from similar congeners (*T. arabana*, *balladong*, *nigropunctatus*) by the presence of a dorsodistal apophysis on the procursus (arrow in fig. 227).

MALE (holotype): Total length 2.9, carapace width 1.19. Leg 1: 27.2 (7.6 + 0.5 + 7.3 + 10.1 + 1.7), tibia 2: 5.1, tibia 3: 3.5, tibia 4: 5.1; tibia 1 l/d: 62. Prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace ochre with wide brown median spot and three pairs of lateral spots, without radial marks; ocular area posteriorly with median and lateral brown bands. Distance PME–PME 0.135; diameter PME 0.100; distance PME–ALE 0.025; diameter ALE 0.100. Clypeus with pair of brown bands converging distally; sternum light brown with yellow speckles, larger yellow spot behind labium. Chelicerae as in fig. 226; ochre, with short, wide apophyses distally, and smaller proximal apophyses laterally; with stridulatory ridges. Palps in general as in *T. arabana* (cf. figs. 205, 206), but procursus with distinctive dorsodistal apophysis (arrow in fig. 227). Legs ochre-yellow, with light brown rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker, tips of femora and tibiae whitish; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 13%; tarsus 1 distally with ~12 quite distinct pseudosegments, proximally they are very indistinct. Opisthosoma dorsoposteriorly very long,



Figs. 226–229. *Trichocyclops warianga* (226, 227), and *T. balladong* (228, 229), male. **226, 228.** Chelicerae, frontal views. **227, 229.** Left procursi, retrolateral (slightly dorsal) views; unshafted arrow: diagnostic apophysis; “a”, “p” = apophysis and pocket. Scale lines: 0.3 mm.

gray, covered with black and white spots except ventrally; genital plate light brown, about rectangular.

VARIATION: Tibia 1 in 2 other males: 7.2, 7.7.

FEMALE: In general very similar to male, but sternum with median light band. Opis-

thosoma frontodorsally with pair of indistinct, transparent humps. Epigynum externally not distinguishable from that of *T. arabana* (cf. fig. 213).

DISTRIBUTION: Known from two localities in western Western Australia (map 10).

MATERIAL EXAMINED: AUSTRALIA: *West-*

ern Australia: Barlee Range Nature Reserve: Male holotype above, with 1♂ 2♀ (WAM 99/1821–3); Kennedy Range National Park (24°31'S, 114°58'E), Aug. 18–Oct. 4, 1994 (M. S. Harvey “et al.”), 1♂ (WAM 99/1836).

***Trichocyclus balladong*, new species**

Figures 228, 229

TYPE: Male holotype from Tammin (31°38'S, 117°29'E), Western Australia, Australia; May 1962 (B. Y. Main), in WAM (99/1698).

ETYMOLOGY: Named for the Balardong (also Balladong), an aboriginal tribe from the Tammin area. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. arabana* by the much wider dorsal apophysis on the procurus (compare figs. 206 and 229); from all other congeners by the short but wide distal apophyses on the male chelicerae (fig. 228).

MALE (holotype): Total length 3.7, carapace width 1.77. Leg 1: 37.3 (10.1 + 0.7 + 10.0 + 14.4 + 2.1), tibia 2: 7.3, tibia 3: 4.9, tibia 4: 7.5; tibia 1 l/d: 63. Prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown pattern very similar to that of *T. nullarbor* (cf. fig. 187). Distance PME–PME 0.215; diameter PME 0.120; distance PME–ALE 0.065; diameter AME 0.145. Clypeus with large brown mark tapering distally; sternum ochre-yellow with triangular dark mark posteriorly. Chelicerae as in fig. 228; ochre, with pair of short, wide distal apophyses and smaller proximal pair, with stridulatory ridges. Palps in general as in *T. arabana* (cf. figs. 205, 206), only procurus different, with much wider dorsal apophysis (fig. 229). Legs ochre, with light brown rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker, tips of femora and tibiae whitish; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 13%; tarsus 1 distally with ~8 distinct pseudosegments, proximally pseudosegmentation very indistinct. Opisthosoma dorsoposteriorly longer than in *T. nullarbor*, ochre gray, covered with many black spots except ventrally; genital plate light brown.

VARIATION: Tibia 1 in 2 males from Newmans Rocks: 5.7, 5.7 (these males are in general much smaller than the holotype, but are identical in structure); tibia 1 in all other males examined (N = 5): 8.7–10.0 (\bar{x} = 9.3). Some males have also white spots on the opisthosoma.

FEMALE: In general very similar to male, but sternum brown with yellowish speckles. Tibia 1 in 3 females from Newmans Rocks: 4.3–4.9; in 2 females from Tammin: 7.7, 8.4. Opisthosoma frontodorsally with pair of indistinct, transparent humps. Epigynum externally not distinguishable from that of *T. arabana* (cf. fig. 213).

DISTRIBUTION: Known from several localities in southwestern Western Australia (map 10).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Tammin: Holotype above, with 1♂ 2♀ (WAM 99/1699–1701); same locality, Feb. 1963 (B. Y. Main), 1♂ 1♀ (WAM 99/1686–7); same locality, 1963 (B. Y. Main), 1♂ (WAM 99/1684); Perth airport (31°58'S, 115°58'E), wet pitfalls, Jan. 6–Mar. 18, 1994 (M. S. Harvey, J. M. Waldo), 2♂ (WAM 99/2115–6); Mt. Elvire Station (29°19'S, 119°38'E), Sept. 13–17, 1994 (A. Burbidge “et al.”), 1♂ (WAM 99/1783); Helena-Aurora Ranges (30°23'S, 119°38'E), Sept. 24, 1995 (R. P. McMillan), 1♂ (WAM 99/1782); Kalgoorlie (30°48'S, 121°28'E), Feb. 3–6, 1974 (T. Crawford), 1♂ (WAM 99/1570); Newmans Rocks (32°07'S, 123°10'E), Feb. 24, 1989 (M. S. Harvey, M. E. Blosfelds), 2♂, 3♀ (WAM 99/1728–32).

***Trichocyclus aranda*, new species**

Figures 230–234

TYPE: Male holotype from rocky cliff face, Glen Annie Gorge, Ruby Gap Nature Park (23°27'S, 135°00'E), Northern Territory, Australia; Mar. 21, 1993 (D. Hirst), in SAM (N1999/786).

ETYMOLOGY: Named for the Aranda, an aboriginal tribe from Northern Territory. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. djauan* by the absence of two bulbal apophyses (fig. 231; compare fig. 235, apophysis “y” and fig. 236, arrow). From other congeners by the apophyses on the

male chelicerae (small proximal and strong, curved distal apophyses; fig. 230).

MALE (holotype): Total length 4.4, carapace width 1.87. Leg 1: 49.6 (13.6 + 0.8 + 13.5 + 19.2 + 2.5), tibia 2: 9.6, tibia 3: 6.4, tibia 4: 8.9; tibia 1 l/d: 78. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown pattern as in *T. nullarbor*, but radial spots less complete. Distance PME-PME 0.145; diameter PME 0.145; distance PME-ALE 0.045; diameter AME 0.120. Clypeus with narrow brown band; sternum brown, with ochre speckles. Chelicerae dark ochre with pair of strong, curved black apophyses distally and another pair of small apophyses more proximally, and stridulatory ridges (fig. 230). Palps as in fig. 231, procurus as in fig. 232. Legs ochre-yellow, with indistinct darker rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 13%; tarsus 1 distally with ~10 quite distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma roundish, gray, with many blackish spots except ventrally; genital plate gray-brown, about rectangular.

VARIATION: Some specimens from Western Australia (see below) are very similar to the type, but differ slightly with respect to the procurus (the proximal hump is more prominent: arrow "1" in fig. 232; the tip is narrower in dorsal view: arrow "2" in fig. 232; the distal ridge is smaller, and missing in the male from Barrow Island: arrow "3" in fig. 232), and the palpal femur which has a small dark ventral hump subdistally. Also, PME-PME distance is larger in these males (0.160) while PME diameter is smaller (0.120). Tibia 1 in the three known males from Western Australia: 12.7, 13.6, 14.1. More collecting is needed to decide on the taxonomic status of these specimens.

FEMALE: In general very similar to male; tibia 1 in 3 females: 9.9, 10.5, 10.7. Opisthosoma frontodorsally apparently without humps. Epigynum as in fig. 233, dorsal view as in fig. 234. ALS with several piriform gland spigots.

DISTRIBUTION: Known from southern

Northern Territory and northwestern Western Australia (map 11).

MATERIAL EXAMINED: AUSTRALIA: Northern Territory: Ruby Gap Nature Park: Male holotype above, with 1♂ 3♀ 4 juveniles (SAM N1999/787–90). All other material is assigned tentatively. Western Australia: Woodstock Station, Site WS10 (21°40'S, 119°03'E), in cave, Oct. 26, 1990 (M. S. Harvey), 1♂ 1 juvenile (WAM 99/1834–5); Dales Gorge, Karijini National Park (22°28'S, 118°33'E), Sept. 11, 1981 (D. Hirst), 1♂ 1♀ (SAM N1999/865–6); Barrow Island, cave B4 (20°45'S, 115°22'E), Sept. 3, 1991 (W. F. Humphreys, B. Vine), 1♂ (WAM 99/1624).

Trichocyclops djauan, new species

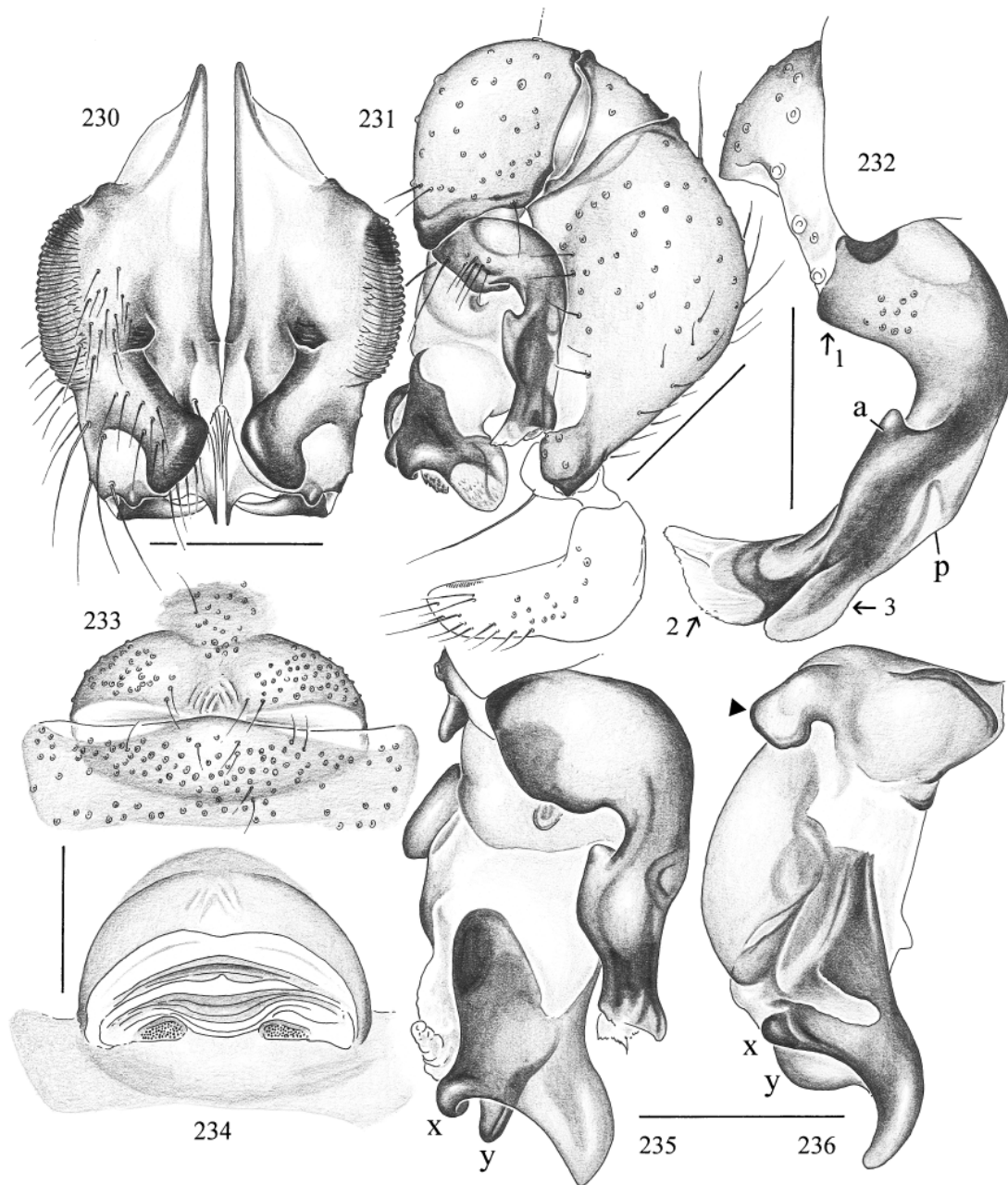
Figures 235, 236

TYPE: Male holotype from Katherine Gorge (14°19'S, 132°28'E), Northern Territory, Australia; Dec. 1980 (R. R. Jackson), in QMB (S34667).

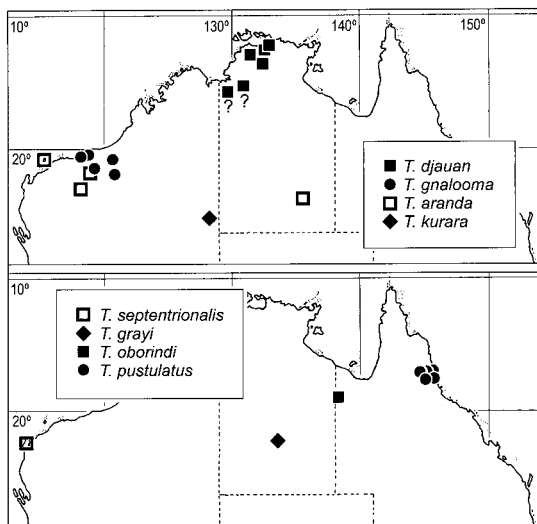
ETYMOLOGY: Named for the Djauan, an aboriginal tribe in the Katherine area of Northern Territory. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. aranda* by the presence of two bulb apophyses ("y" in fig. 235 and arrow in fig. 236). From other congeners by the apophyses on the male chelicerae, identical to those of *T. aranda* (small proximal and strong, curved distal apophyses; cf. fig. 230).

MALE (holotype): Total length 3.6, carapace width 1.55. Leg 1: 47.3 (12.0 + 0.7 + 12.3 + 19.6 + 2.7), tibia 2: 8.8, tibia 3: 5.7, tibia 4: 8.0; tibia 1 l/d: 77. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with light brown pattern as in *T. nullarbor*, but without radial spots. Distance PME-PME 0.175; diameter PME 0.120; distance PME-ALE 0.055; diameter AME 0.145. Clypeus with large, distally tapering brown band; sternum brown, with light spots anteriorly and smaller ones near bases of coxae. Chelicerae identical to those of *T. aranda* (cf. fig. 230). Palps also very similar to *T. aranda* (cf. fig. 231), procurus not distinguishable, but bulb significantly different: with distinct proximal apophysis (unshafted arrow in fig. 236) and distal apophyses or crests ("x" and "y" in



Figs. 230–236. *Trichocyclus aranda* (230–234), *T. djauan* (235, 236). **230.** Male chelicerae, frontal view. **231.** Left male palp, retrolateral view. **232.** Left procursus, retrolaterodorsal view; “a”, “p” = apophysis and pocket; arrows “1–3”: variable structures (see text). **233, 234.** Epigynum, ventral (233) and dorsal (234) views. **235, 236.** Left procursus and genital bulb, retrolateral view (235), and left genital bulb, dorsal view (236); “x” and “y” = diagnostic distal bulbal structures; unshafted arrow: diagnostic proximal bulbal apophysis. Scale lines: 0.5 mm (231, 233, 234), 0.3 mm (230, 232, 235, 236).



Maps 11, 12. Distribution of *Trichocyclops* species: *aranda* group (map 11, top), and *T. septentrionalis* and *pustulatus* group (map 12, bottom).

figs. 235, 236). Legs ochre-yellow, with darker rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker, tips of femora and tibiae whitish; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 distally with ~12 quite distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma roundish, ochre-gray, with blackish spots except ventrally; genital plate light brown, about rectangular.

VARIATION: All specimens from other localities are significantly smaller: tibia 1 in males from type locality: 11.1, 12.3; all other localities: 5.6–8.5 (N = 5). In addition, the proximal apophysis on the genital bulb in these males is less developed, and is even missing in the males from Saddle Creek and Gregory National Park. The material from the latter two localities is therefore assigned tentatively.

FEMALE: In general very similar to male; tibia 1 in 2 females: 5.1 (Kakadu Natl. Park), 11.3 (Katherine Gorge). Opisthosoma frontodorsally with pair of indistinct, transparent humps. Epigynum externally not distinguishable from that of *T. nullarbor* (cf. fig. 193).

DISTRIBUTION: Known only from northern Northern Territory (map 11).

MATERIAL EXAMINED: AUSTRALIA: Northern Territory: Katherine Gorge: Male holotype above, with 2♂ 1♀ (QMB S50259); Kakadu National Park, Mirrai (Mt. Cahill), under stones (12°53'S, 132°42'E), July 5–7, 1994 (M. S. Harvey, D. M. Hyder), 1♂ 1♀ 1 juvenile (WAM 99/1807–9); Jabiru Residency (12°41'S, 132°53'E), May 28, 1992 (M. S. Harvey), 1♂ (WAM 99/1673); 77 km N of Pine Creek (13°07'S, 131°50'E), under rocks, July 4, 1987 (M. S. Harvey), 1♂ (WAM 99/1676). The following material is assigned tentatively: Gregory National Park, Victoria Highway (15°36'S, 131°09'E), under rock, May 25, 1999 (M. Gray, G. Milledge, H. Smith), 1♂ (AMS KS56177); Saddle Creek, Victoria Highway (15°56'S, 129°34'E), under logs, May 26, 1999 (M. Gray, G. Milledge, H. Smith), 1♂ (AMS KS56176).

Trichocyclops gnalooma, new species

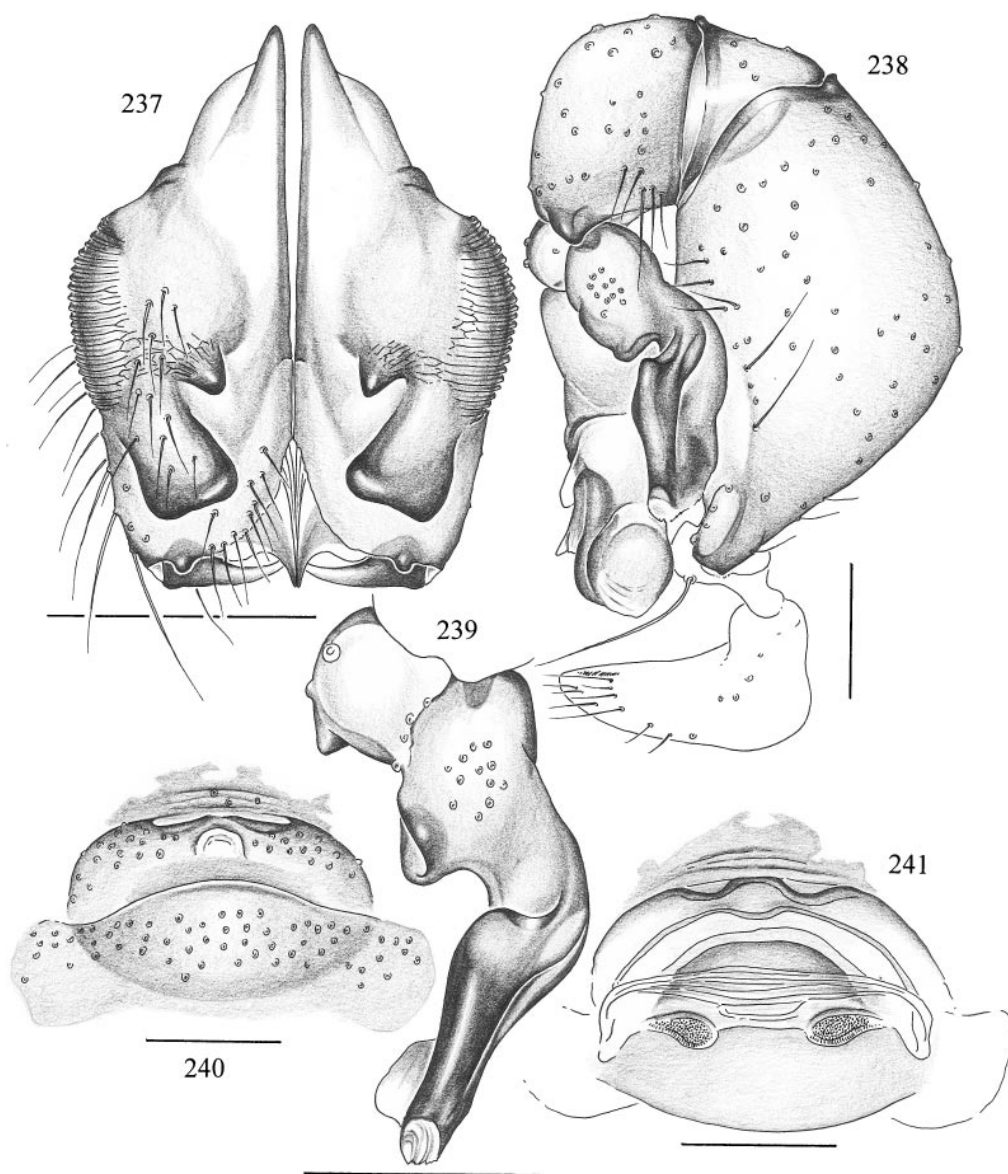
Figures 237–241

TYPE: Male holotype from Woodstock Homestead (21°37'S, 118°57'E), Western Australia, Australia; July 28, 1987 (B. Y. Main), inside house, in WAM (99/1792).

ETYMOLOGY: Named for the Ngaluma (also Gnalooma), an aboriginal tribe in Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the similar *T. aranda* by the shape of the procurus (compare figs. 232 and 239) and by the shape of the distal male cheliceral apophyses (compare figs. 230 and 237).

MALE (holotype): Total length 3.5, carapace width 1.84. Leg 1: 35.3 (9.7 + 0.7 + 9.6 + 13.2 + 2.1), tibia 2: 7.1, tibia 3: 4.9, tibia 4: 6.9; tibia 1 l/d: 58. Prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace ochre with wide brown median band and only two pairs of lateral spots, without radial marks; ocular area brown, posteriorly with median and lateral darker bands. Distance PME-PME 0.175; diameter PME 0.120; distance PME-ALE 0.045; diameter AME 0.120. Clypeus with pair of brown bands converging distally; sternum brown with many yellowish speckles, larger spot near



Figs. 237–241. *Trichocyclus gnalooma*. **237**. Male chelicerae, frontal view. **238**. Left male palp, retrolateral view. **239**. Left cymbium and procursus, retrolaterodorsal view. **240, 241**. Epigynum, ventral (240) and dorsal (241) views. Scale lines: 0.3 mm.

coxae. Chelicerae as in fig. 237; brown, with black apophyses, and stridulatory ridges. Palps as in fig. 238, procursus in retrolaterodorsal view with slender distal element (fig. 239). Legs ochre, with brown rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker, tips of femora and tibiae whitish; legs without spines,

without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 12%; tarsus 1 distally with ~8 quite distinct pseudosegments, proximally they are very indistinct. Opisthosoma dorsoposteriorly very long, gray, covered with black spots except ventrally; genital plate brown, large, about square.

VARIATION: Tibia 1 in 4 other males: 4.7 (Boodarie Hill), 7.1, 7.1, 7.2.

FEMALE: In general very similar to male. Opisthosoma frontodorsally with pair of indistinct, transparent humps. Epigynum as in fig. 240, with pair of distinctive indentations frontally; dorsal view as in fig. 241.

DISTRIBUTION: Known from several localities in northwestern Western Australia (map 11).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Woodstock Homestead: Male holotype above, with 2 ♀ (WAM 99/1793–4); same locality, May 2, 1988 (J. M. Waldock), 1 ♀ (WAM 99/1670); Woodstock Station (21°37'S, 118°57'E), Feb. 10–17, 1989 (J. Dell, R. A. How, J. M. Waldock), 1 ♂ (WAM 99/1832); same locality, Oct. 27, 1990 (M. S. Harvey), 1 ♂ (WAM 99/1831); same locality at 21°37'S, 118°59'E, Feb. 10–17, 1989 (J. Dell, R. A. How, J. M. Waldock), 1 ♂ (WAM 99/1833); Boodarie Hill area, ~15 km SW of Port Hedland (~20°25'S, 118°28'E), Oct. 11–17, 1994 (G. Harold, J. Dell), 1 ♂ (WAM 99/1741); Mundabullangana Station (20°32'S, 118°02'E), July 21, 1981 (D. Hirst), 1 ♂ 2 ♀ (SAM N1999/869–71); Nigger Ring Rockhole, 7 km SSW of Camel Rock (22°37'S, 122°36'E), July 11, 1982 (B. Muir), 2 ♀ (WAM 99/1618–20), assigned tentatively; Lower Carawine Gorge (21°29'S, 121°02'E), June 20–30, 1986 (K. McKenna), 1 ♀ (WAM 99/1615), assigned tentatively.

Trichocyclus kurara, new species

Figures 242, 243

TYPE: Male holotype from Glen Cummings Gorge (25°02'S, 128°18'E), Western Australia, Australia; Jan. 13–14, 1990 (M. S. Harvey, T. F. Houston), in WAM (99/1592).

ETYMOLOGY: Named for the Ngadadjara, an aboriginal tribe from Western Australia, whose people of the Rawlinson Ranges are also called Kurara. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from known congeners by the distinctively bifurcated bulbal tip (fig. 243) and by the shape of the procurus (fig. 243); also by the shape of the male cheliceral apophyses (fig. 242), which

are similar to those of *T. gnalooma* (cf. fig. 237).

MALE (holotype): Total length 3.4, carapace width 1.74. Leg 1: 41.8 (10.9 + 0.7 + 11.2 + 16.5 + 2.5), tibia 2: 7.9, tibia 3: 5.1, tibia 4: 7.2; tibia 1 l/d: 70. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189); carapace ochre with three pairs of lateral spots; median and radial spots barely visible; ocular area ochre. Distance PME–PME 0.145; diameter PME 0.125; distance PME–ALE 0.045; diameter ALE 0.105. Clypeus ochre; sternum pale ochre. Chelicerae as in fig. 242; brown, with black apophyses, and stridulatory ridges. Palps in general as in *T. gnalooma* (cf. fig. 238), procurus and bulb as in fig. 243. Legs ochre-yellow, with slightly darker rings on femora (subdistally) and tibiae (proximally and subdistally), patellae also darker, tips of femora and tibiae whitish; almost all hairs on legs missing; retrolateral trichobothrium of tibia 1 at 11%; tarsus 1 distally with ~7 fairly distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma roundish, gray, with many dark spots dorsally; genital plate light brown, about rectangular.

FEMALE: In general very similar to male, but opisthosoma much higher, though not pointed dorsoposteriorly. Tibia 1: 8.9. Opisthosoma frontodorsally with pair of fairly distinct, transparent humps. Epigynum very similar to that of *T. gnalooma* (cf. fig. 240), but instead of frontal pockets only pair of sclerotized areas.

DISTRIBUTION: Known only from type locality in eastern Western Australia (map 11).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Glen Cummings Gorge: Male holotype above, with 1 ♀ (WAM 99/1593).

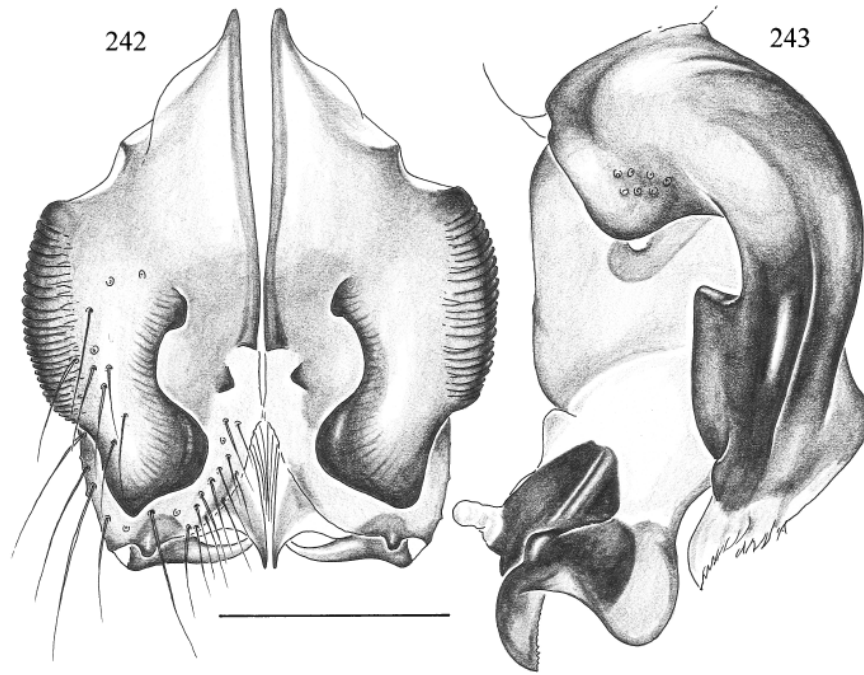
Trichocyclus septentrionalis

Deeleman-Reinhold, 1993

Figures 244–250

Trichocyclus septentrionalis Deeleman-Reinhold, 1993: 327–328, figs. 1G–N.

TYPE: Male holotype from outside cave C227 (22°03'S, 114°00'E), Cape Range, Western Australia; May 24, 1990 (J. M. Waldock), in WAM (92/629), examined. (All



Figs. 242, 243. *Trichocyclops kurara*, male. **242.** Chelicerae, frontal view. **243.** Left procurus and genital bulb, retrolateral view. Scale line: 0.3 mm.

other specimens treated in the original description were designated paratypes.)

DIAGNOSIS: Large species, easily distinguished from congeners by the huge protrusions (and their shape) on the male chelicerae (figs. 245, 246), by the elevation in males carrying the AME (fig. 244), by the procurus with its wide distal part (fig. 248), and by the large notch on the frontal plate of the epigynum (fig. 249).

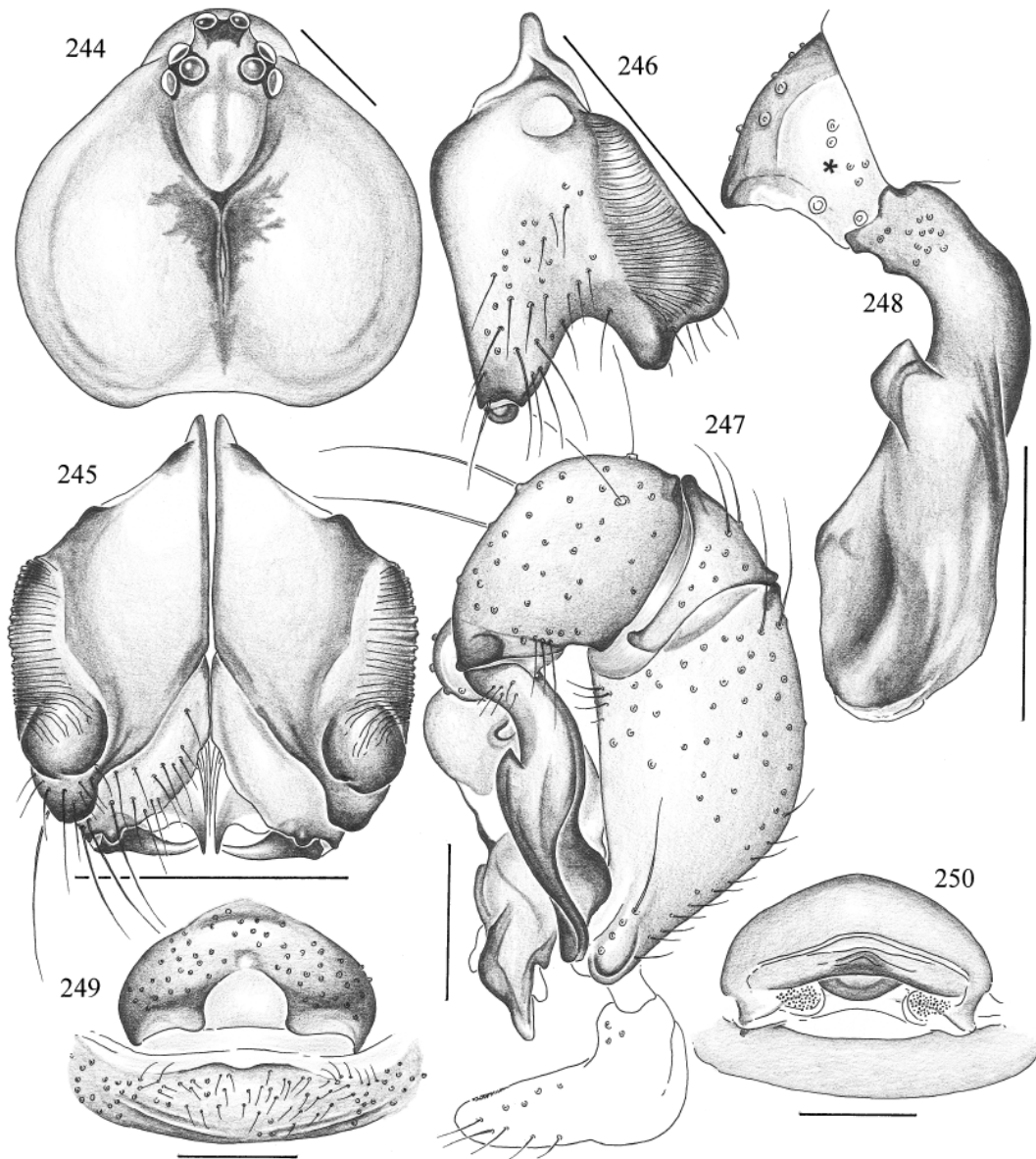
MALE (holotype): Total length 4.2, carapace width 1.77. Leg 1: 50.1 (13.2 + 0.9 + 13.6 + 19.6 + 2.8), tibia 2: 10.0, tibia 3 missing, tibia 4: 9.3; tibia 1 l/d: 73. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189), but AME on elevation (fig. 244); carapace ochre, with brown spot behind ocular area, without lateral spots. Eye pattern as in fig. 244; distance PME–PME 0.175; diameter PME 0.115; distance PME–ALE 0.055; diameter AME 0.120. Clypeus light ochre-yellow; sternum ochre yellow, with darker margins and slightly darker median band. Chelicerae brown, with prominent black apophyses and stridulatory ridges (figs. 245, 246). Palps as in fig. 247, procurus as

in fig. 248, with very broad but simple distal part. Legs ochre, with indistinct darker rings on femora and tibiae (subdistally), patellae also darker; tips of femora and tibiae whitish; legs without spines, without curved and vertical hairs (most hairs missing in holotype); retrolateral trichobothrium of tibia 1 at 13%; tarsal pseudosegments very indistinct, only distally ~10 visible. Opisthosoma rounded as in *T. nullarbor* (cf. fig. 186), ochre gray, dorsally with some blackish spots; genital plate light brown, about rectangular.

VARIATION: Tibia 1 in 2 other males: 12.5, 12.8.

FEMALE: In general very similar to male, but AME not on elevation, carapace laterally with dark marks; sternum often darker than in male, chelicerae without stridulatory ridges. Tibia 1 in 16 females: 8.6–13.6 (\bar{x} = 11.6); in one exceptionally small female: 5.6. Opisthosoma frontodorsally without humps. Epigynum as in fig. 249, with distinctive large notch; dorsal view as in fig. 250.

DISTRIBUTION: Known only from Cape Range, northwestern Western Australia (map 12).



Figs. 244–250. *Trichocyclops septentrionalis*. **244.** Male prosoma, dorsal view. **245, 246.** Male chelicerae, frontal and lateral views. **247.** Left male palp, retrolateral view. **248.** Left cymbium and procursus, retrolaterodorsal view; asterisk: weak zone on cymbium. **249, 250.** Epigynum, ventral (249) and dorsal (250) views. Scale lines: 0.5 mm.

MATERIAL EXAMINED: AUSTRALIA: *Western Australia:* Cape Range, unnamed cave “C94”, Sept. 16–17, 1983 (J. Lowry), 1 ♀ (WAM 99/1711); near Cape Range No. 2 Well, May 1965 (G. W. Kendrick, G. & T. Hitchin), 1 ♀ (WAM 99/1708); Cape Range, July 8, 1987 (W. F. Humphreys), 1 ♀

(WAM 99/1632); Cape Range, Shot Pot Cave, Sept. 21, 1983 (J. Lowry), 1 ♀ 1 juvenile (WAM 99/1709–10); Cape Range, Anomaly Cave “C96” near Learmonth (~22°15’S, 114°05’E), Sept. 16–17, 1983 (J. Lowry), 2 ♀ (WAM 99/1712–5); Cape Range, Camerons Cave “C452” (21°58’S,

114°07'E), May 21, 1995 (J. M. Waldock), entrance chamber, 1♂ 1♀ (WAM 99/1633–4).

Other than these specimens, I have seen all the material listed in the original publication (Deeleman-Reinhold, 1993), except for the three specimens deposited in the Rijksmuseum van Natuurlijke Historie, Leiden, and two specimens in the WAM (92/131, 92/629).

***Trichocyclus grayi*, new species**

Figures 251, 252

TYPE: Male holotype from Stuart Highway at 21°37'S, 133°45'E, Northern Territory, Australia; May 18, 1999 (M. Gray, G. Milledge, H. Smith), under rock, in AMS (KS56192).

ETYMOLOGY: Named for the first collector of the type specimen and of many more pholcids in the Australian Museum in Sydney.

DIAGNOSIS: Distinguished from known congeners by the shape of the procursus with its distal prominent brush (fig. 252) and by the male chelicerae with their rounded, wide apophyses facing inwards (fig. 251).

MALE (holotype): Total length 2.7, carapace width 1.29. Leg 1: 25.1 (6.5 + 0.5 + 6.8 + 9.6 + 1.7), tibia 2: 4.7, tibia 3: 3.2, tibia 4: 4.6; tibia 1 l/d: 60. Habitus and prosoma shape similar to *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with three pairs of lateral spots with radial marks, without median spot. Ocular area pale ochre; distance PME-PME 0.105; diameter PME 0.120; distance PME-ALE 0.040; diameter AME 0.105. Clypeus with small light spot, tapering distally; sternum whitish. Chelicerae ochre with two pairs of black, frontal apophyses, and stridulatory ridges (fig. 251). Palps in general as in *T. harveyi* (cf. fig. 277), but femur ventrally without hump; procursus and bulb as in fig. 252. Legs pale ochre, with darker rings on femora (subdistally), patellae + tibiae proximally, and tibiae subdistally; tips of femora and tibiae whitish; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 12%; tarsus 1 distally with ~5 hardly visible pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma shape similar to *T. nullarbor* (cf.

fig. 186); ochre-gray, with many blackish spots except ventrally; genital plate not darker than surrounding area.

FEMALE: Unknown.

DISTRIBUTION: Known only from type locality in Northern Territory (map 12).

MATERIAL EXAMINED: AUSTRALIA: Northern Territory: Male holotype above.

***Trichocyclus oborindi*, new species**

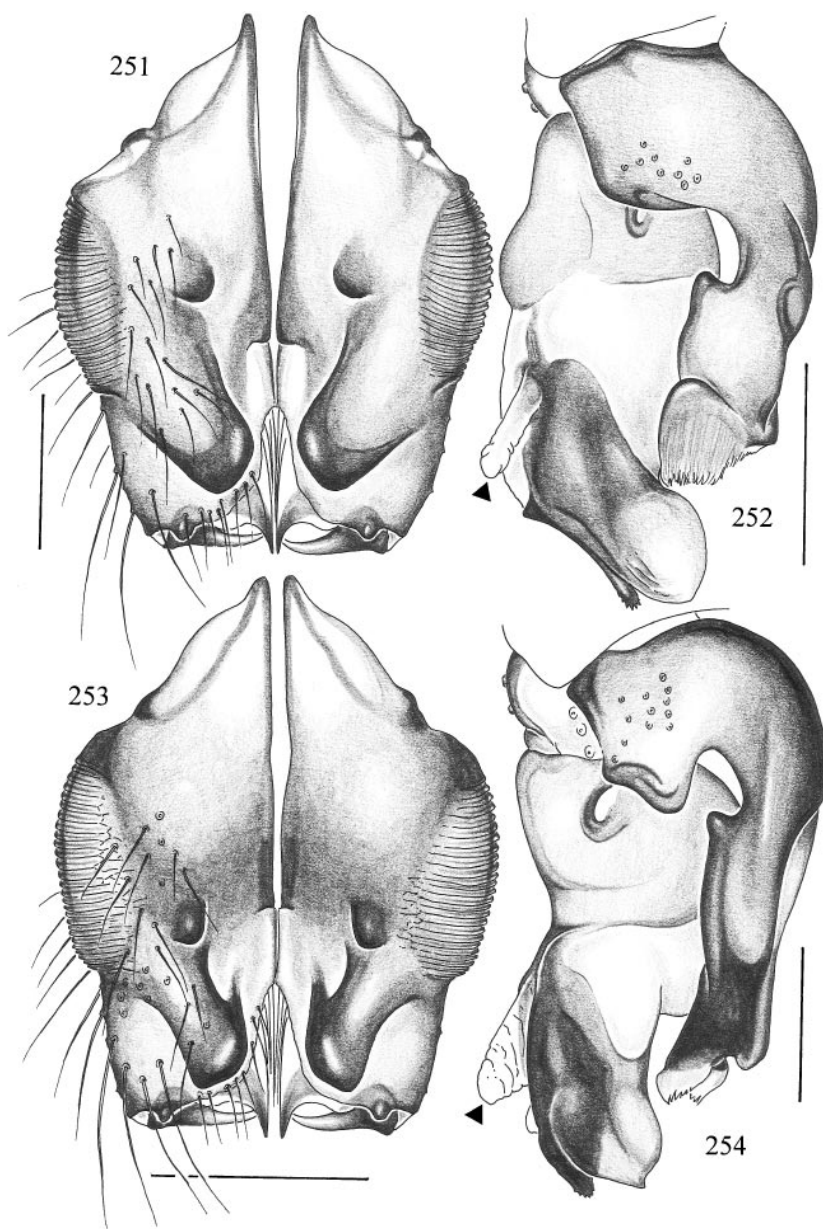
Figures 253, 254

TYPE: Male holotype from Bat Cave, Louie Creek (~18°15'S, 138°05'E), Lawn Hill National Park, Queensland, Australia; Oct. 13, 1993 (R. Drysdale), in AMS (KS37501).

ETYMOLOGY: Named for the Ngoborindi (also called Oborindi), an aboriginal tribe from the Lawn Hill area, Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from known congeners by the shape of the procursus with its small dorsal apophysis and long straight distal element (fig. 254) and by the apophyses on the male chelicerae (fig. 253; similar to *T. grayi*, fig. 251).

MALE (holotype): Total length 3.9, carapace width 1.77. Leg 1: 50.2 (13.3 + 0.7 + 13.6 + 20.3 + 2.3), tibia 2: 8.8, tibia 3: 5.7, tibia 4: 8.0; tibia 1 l/d: 85. Habitus and prosoma shape similar to *T. nullarbor* (cf. figs. 186–189); carapace ochre with small darker spot behind ocular area and black line in thoracic furrow, without lateral and radial spots. Ocular area light brown, slightly darker laterally; distance PME-PME 0.135; diameter PME 0.135; distance PME-ALE 0.040; diameter AME 0.105. Clypeus slightly darker than carapace; sternum brown with many yellowish speckles. Chelicerae ochre with two pairs of black, frontal apophyses, and stridulatory ridges (fig. 253). Palps in general as in *T. harveyi* (cf. fig. 277), including distinct ventrodistal hump on femur; procursus and bulb as in fig. 254. Legs ochre-yellow, with slightly darker rings on femora (subdistally), patellae + tibiae proximally, and tibiae subdistally; tips of femora and tibiae whitish; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 distally with ~13 quite distinct pseudosegments, proximally pseu-

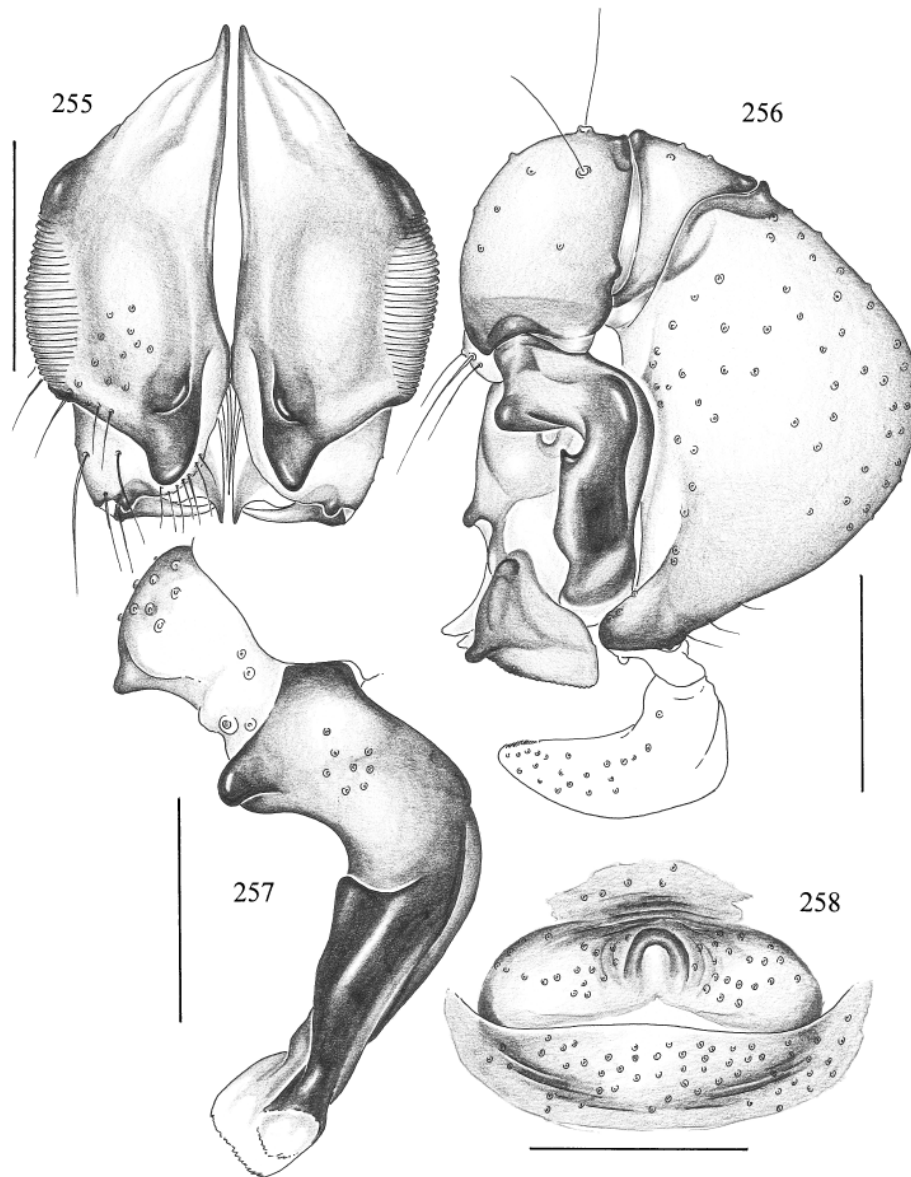


Figs. 251–254. *Trichocyclus grayi* (251, 252), and *T. oborindi* (253, 254), males. **251, 253.** Chelicerae, frontal views. **252, 254.** Left procursi and genital bulbs, retrolateral views. Arrows: transparent bulbal processes. Scale lines: 0.3 mm.

dosegmentation not visible in dissecting microscope. Opisthosoma shape similar to *T. nullarbor* (cf. fig. 186); gray, with many blackish spots dorsally; genital plate light brown, about rectangular.

FEMALE: The AMS has two female speci-

mens from the Lawn Hill area, one of which is probably conspecific with the male holotype. The epigynum of this female is similar to that of *T. pustulatus* (cf. fig. 258), but is medially more elevated; coloration as in male; tibia 1: 12.3.



Figs. 255–258. *Trichoocyclus pustulatus*. **255.** Male chelicerae, frontal view. **256.** Left male palp, retrolateral view. **257.** Left cymbium and procurrus, retrolaterodorsal view. **258.** Epigynum, ventral view. Scale lines: 0.5 mm (256, 258), 0.3 mm (255, 257).

The other female has a dark pattern on the carapace similar to *T. nullarbor* (cf. fig. 187), shorter legs (tibia 1: 7.6), and an even higher epigynum.

DISTRIBUTION: Known only from Lawn Hill National Park, western Queensland (map 12).

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Lawn Hill National Park: Male holotype above; Lawn Hill National Park, Colonel Light Cave (~18°15'S, 138°05'E), Colless Ck., Oct. 28, 1993 (R. Drysdale), 1 ♀ (AMS KS37498), assigned tentatively.

Trichocyclus pustulatus

Deeleman-Reinhold, 1995

Figures 255–258

Trichocyclus pustulatus Deeleman-Reinhold, 1995: 36–37, figs. 9–15.

TYPES: Male holotype and female paratype from Mareeba (17°00'S, 145°25'E), Queensland, Australia; July–Aug. 1992 (J. Wunderlich), in QMB (S51023–4), examined; and one additional female paratype from Chillagoe (17°09'S, 144°32'E), Queensland, Aug. 1992 (J. Wunderlich), under stone, in QMB (S51025), examined.

DIAGNOSIS: Similar to *T. oborindi* and *T. aranda*, distinguished by the apophyses on the male chelicerae (distal pair shorter, proximal pair more distal; fig. 255), and by the slightly different male cymbium and procurus (fig. 256).

MALE (holotype): Total length ~2.7 (opisthosoma deformed), carapace width 1.48. Leg 1: 7.9 + 0.6 + 8.0, metatarsus and tarsus missing, tibia 2: 5.7, tibia 3: 3.5, tibia 4 missing; tibia 1 l/d: 57. Habitus and prosoma shape similar to *T. nullarbor* (cf. figs. 186–189); carapace pale ochre with darker spot behind ocular area and black line in thoracic furrow, with three pairs of light brown lateral spots. Ocular area pale ochre with darker median line; distance PME-PME 0.175; diameter PME 0.120; distance PME-ALE 0.055; diameter AME 0.135. Clypeus pale ochre with brown mark; sternum light brown with many yellowish speckles. Chelicerae brown with black, frontal apophyses, and stridulatory ridges (fig. 255). Palps as in fig. 256, with small but distinct ventrodiscal hump on femur (smaller than in *T. harveyi*, cf. fig. 277); procurus as in fig. 257. Legs light ochre-yellow, with dark rings on femora (subdistally), patellae + tibiae proximally, and tibiae subdistally; tips of femora and tibiae whitish; legs apparently without spines, without curved and vertical hairs (most hairs missing); retrolateral trichobothrium of tibia 1 at 15%. Opisthosoma deformed, but apparently similar to *T. nullarbor* (cf. fig. 186; see also original illustrations by Deeleman-Reinhold, 1995), ochre-gray, with blackish and white spots dorsally.

FEMALE: Very similar to male; epigynum as in fig. 258. Opisthosoma dorsofrontally

without humps. Tibia 1 in two females: 4.7, 6.8.

DISTRIBUTION: Known from several localities in northern Queensland (map 12).

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Mareeba: Male holotype and female paratype above; Chillagoe: female paratype above; Chillagoe, Apr. 25, 1978 (R. Raven, V. E. Davies), 1 ♀ (QMB S50271), assigned tentatively; Wolfram (17°05'S, 144°57'E), Feb. 13, 1972 (N. Clyde Coleman), 1 ♀ (QMB S50275), assigned tentatively; Almaden (17°21'S, 144°41'E), Mar. 1929 (W. D. Campbell), 1 ♀ (AMS KS65699), assigned tentatively; Mt. Garnet (17°41'S, 145°07'E), Feb. 24, 1972 (N. Clyde Coleman), 1 ♀ (QMB S50133), assigned tentatively.

Trichocyclus arawari, new species

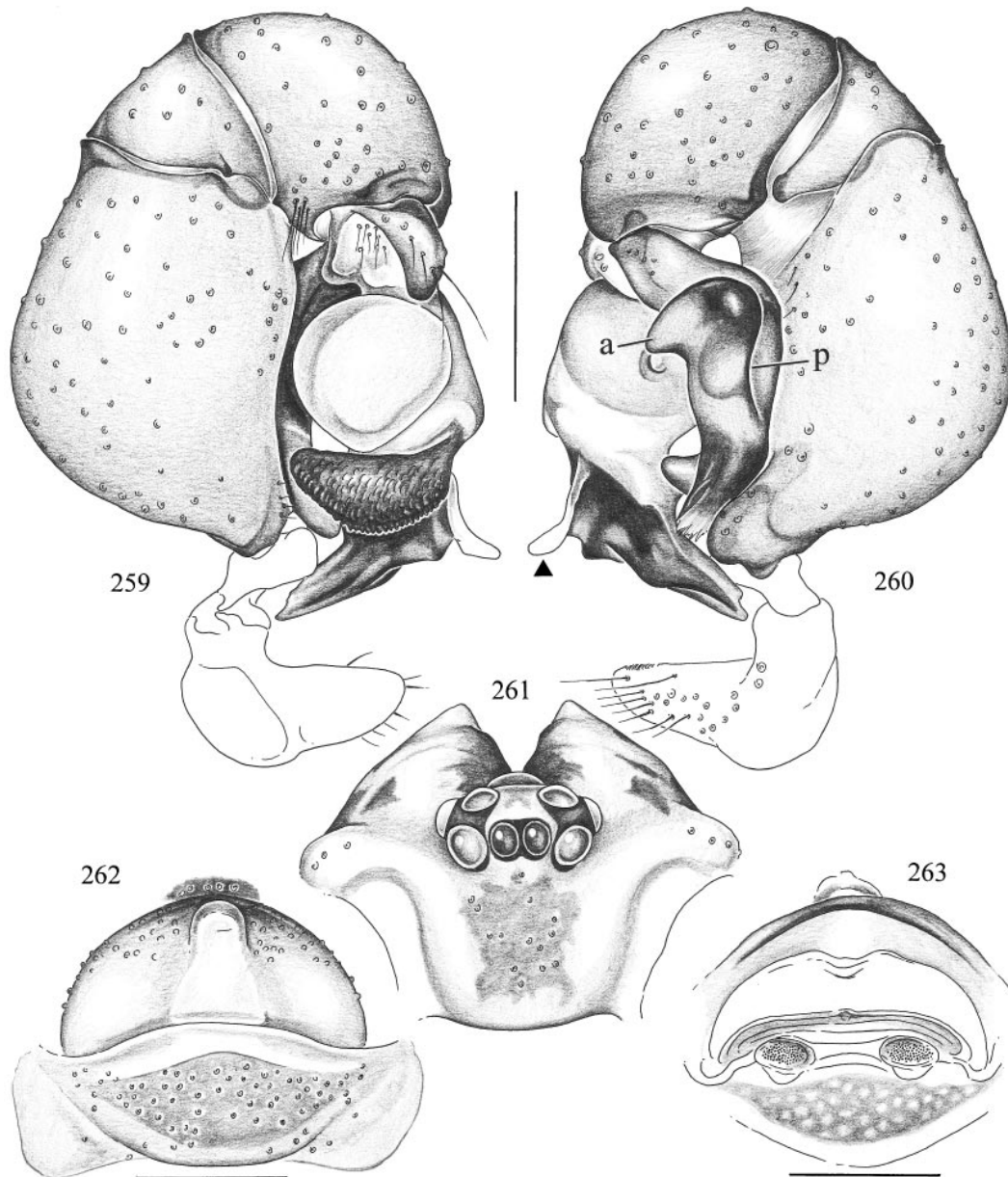
Figures 259–266

TYPE: Male holotype from Three-Mile Valley, Wyndham (~15°30'S, 126°05'E), Western Australia, Australia; June 30, 1981 (D. Hirst), in SAM (N1999/872).

ETYMOLOGY: Named for the Ngarinjin (also called Arawari), an aboriginal tribe in Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. worora* by the shape of the procurus (compare figs. 265 and 268) and by the shape of the male chelicerae that lack the strong median projection (compare figs. 264 and 267); distinguished from all other known congeners also by the high elevations on the female carapace (fig. 261).

MALE (holotype): Total length 4.1, carapace width 1.58. Leg 1: 36.9 (9.9 + 0.7 + 9.7 + 14.1 + 2.5), tibia 2: 6.9, tibia 3: 4.7, tibia 4: 6.7; tibia 1 l/d: 63. Prosoma shape and pattern as in *T. nullarbor* (cf. figs. 186–189), but without radial marks; ocular area posteriorly with brown median band. Distance PME-PME 0.145; diameter PME 0.120; distance PME-ALE 0.045; diameter AME 0.125. Clypeus with brown mark not reaching eyes; sternum brown with yellowish speckles. Chelicerae as in fig. 264; brown, with only one pair of simple apophyses. Palps as in figs. 259–260; procurus as in fig. 265. Legs ochre, with indistinct darker rings

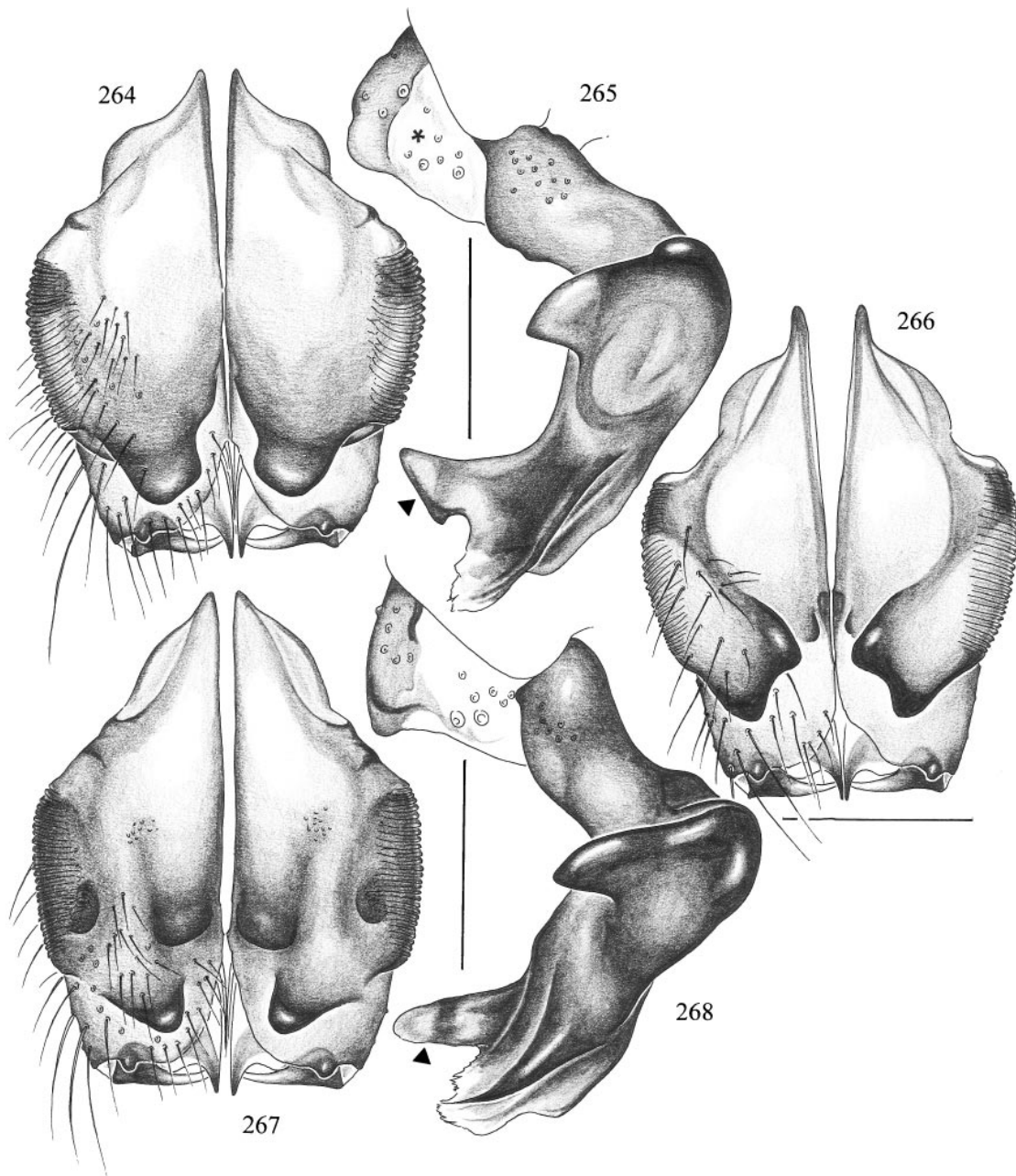


Figs. 259–263. *Trichocyclus arawari*. **259, 260.** Left male palp, prolateral (259) and retrolateral (260) views; “a”, “p” = apophysis and pocket; arrow: transparent bulbal process. **261.** Female prosoma, frontal view. **262, 263.** Epigynum, ventral (262) and dorsal (263) views. Scale lines: 0.5 mm.

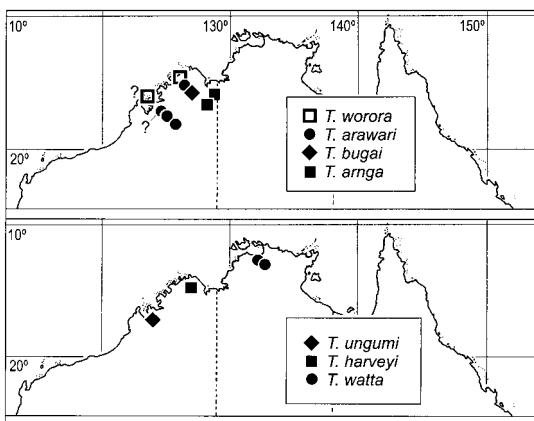
on femora (subdistally) and tibiae (proximally and subdistally); patellae also darker; most hairs on legs missing; retrolateral trichobothrium of tibia 1 at 14%; tarsus 1 distally with ~11 distinct pseudosegments, proximally the pseudosegmentation is very indistinct. Op-

isthosoma dorsoposteriorly very long, gray, covered with black spots except ventrally; genital plate light brown, about rectangular.

VARIATION: Tibia 1 in other males: 11.1, 11.7, 13.6, 13.7; in the males from Tunnel Creek National Park the prolaterodorsal



Figs. 264–268. *Trichocyclus arawari* (264–266), and *T. worora* (267, 268), males. **264, 266, 267.** Chelicerae, frontal views (264: male from Three-Mile Valley, Wyndham; 266: male from Napier Range). 265, 268. Left cymbia and procursi, retrolaterodorsal views; asterisk: weak zone on cymbium; arrows: prolaterodorsal apophysis. Scale lines: 0.3 mm (264–268).



Maps 13, 14. Distribution of *Trichocylus* species: *arawari* group (map 13, top); species of unknown affinities and *T. watta* (map 14, bottom).

apophysis on the procurus (arrow in fig. 265) is simpler, more like that in *T. worora* (cf. fig. 268); the males from Geikie Range and Napier Range have a posteriorly rounded opisthosoma and lack both radial and lateral marks on the carapace; the males from Napier Range differ significantly with respect to the chelicerae (fig. 266), but have apparently almost identical palpal structures. The specimens from Napier Range are therefore assigned tentatively.

FEMALE: In general very similar to male, but carapace with pair of conspicuous elevations (fig. 261). Opisthosoma frontodorsally with pair of indistinct, transparent humps that oppose elevations on carapace. Tibia 1 in 3 females: 10.1, 11.2, 11.3. Epigynum as in fig. 262; dorsal view as in fig. 263.

DISTRIBUTION: Known from several localities in northern Western Australia (map 13).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia:* Three-Mile Valley, Wyndham: Male holotype above, with 1♂ 2♀ (SAM N1999/873–5); Napier Range, cave KN-90 (17°14'S, 124°39'E), July 24, 1998 (S. M. Eberhard), 2♂ 1♀ 1 juvenile (WAM 99/2481–4), assigned tentatively; Tunnel Creek National Park (17°37'S, 125°10'E), June 7, 1999 (M. Gray, G. Milledge, H. Smith), in webs, cave wall, 2♂ 1♀ (AMS KS56188); Geikie Range, cave KG-47 (18°02'S, 125°44'E), July 1, 1998 (S. M. Eberhard), 1♂ (WAM 99/2473).

Trichocylus worora, new species

Figures 267, 268

TYPE: Male holotype from Kandiwal (Camp Creek) (14°52'S, 125°42'E), Mitchell Plateau, Western Australia, Australia; Dec. 11, 1993 (A. F. Longbottom), in WAM (99/1759).

ETYMOLOGY: Named for the Worora, an aboriginal tribe in Kimberley, Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the very similar *T. arawari* by the shape of the procurus (compare figs. 265 and 268) and by the male chelicerae with their pair of strong median projections (compare figs. 264 and 267); from all other known congeners also by the high elevations on the female carapace (cf. fig. 261).

MALE (holotype): Total length 3.3, carapace width 1.52. Leg 1: 33.9 (9.2 + 0.7 + 9.0 + 13.3 + 1.7), tibia 2: 6.4, tibia 3: 4.4, tibia 4: 6.3; tibia 1 l/d: 64. Prosoma shape and pattern as in *T. nullarbor* (cf. figs. 186–189), but without radial marks; ocular area and clypeus dark brown; sternum almost black. Distance PME-PME 0.145; diameter PME 0.120; distance PME-ALE 0.045; diameter AME 0.135. Chelicerae as in fig. 267, dark brown, with pair of simple distal apophyses, pair of strong median projections, and low lateral humps, all black. Palps in general as in *T. arawari* (cf. figs. 259, 260), procurus as in fig. 268. Legs light brown, with black rings on femora (subdistally) and tibiae (proximally and subdistally); patellae also darker, tips of femora and tibiae whitish; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 11%; pseudosegmentation of tarsi hardly visible. Opisthosoma posteriorly more pointed than in *T. nullarbor*; gray, with black spots except ventrally; genital plate dark brown.

VARIATION: Tibia 1 in male from Cockatoo Island: 8.2. This male has a slightly more pointed prolaterodorsal apophysis on the procurus (arrow in fig. 268), and the median projection on the chelicerae is longer.

FEMALE: In general very similar to male, but carapace with pair of conspicuous elevations (cf. fig. 261), and opisthosoma dorso-posteriorly much longer. Opisthosoma

frontodorsally with pair of fairly distinct, transparent humps opposing elevations on carapace. Tibia 1 in 2 females: 6.5, 8.0. Epigynum ventrally as in *T. arawari* (cf. fig. 262).

DISTRIBUTION: Known from two localities in northern Western Australia (map 13). Note, however, that the locality Cockatoo Island is not certain.

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Kandiwal (Camp Creek): Male holotype above, with 2♀ 1 juvenile (WAM 99/1759–63); ?Cockatoo Island (16°06'S, 123°37'E), Oct. 30, 1961 (A. R. Main), 1♂ (WAM 99/1693).

***Trichocyclus arnga*, new species**

Figures 269–272

TYPE: Male holotype from Jeremiah Hills (15°26'S, 128°44'E), Kimberley, Western Australia, Australia; May 4, 1994 (R. D. Brooks), cave KJ-8, in WAM (99/2047).

ETYMOLOGY: Named for the Arnga, an aboriginal tribe in Kimberley, Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from known congeners by the huge median apophyses on the male chelicerae (figs. 269, 270).

MALE (holotype): Total length 3.9, carapace width 1.65. Leg 1: 41.7 (11.3 + 0.7 + 11.5 + 16.1 + 2.1), tibia 2: 8.3, tibia 3: 5.4, tibia 4: 7.6; tibia 1 l/d: 78. Prosoma shape similar to *T. nullarbor* (cf. figs. 186–189); carapace ochre with dark median band and wider spot behind ocular area, without lateral marks. Ocular area dark brown; distance PME-PME 0.175; diameter PME 0.120; distance PME-ALE 0.040; diameter AME 0.120. Clypeus with large brown spot; sternum ochre with yellowish speckles. Chelicerae ochre with two very distinctive pairs of apophyses, as well as stridulatory ridges (figs. 269, 270). Palps in general as in *T. nullarbor* (cf. figs. 191, 192), with distinctive procurus (similar only to *T. bugai*) and bulb (figs. 271, 272). Legs ochre, with darker rings on femora (subdistally) and patellae + tibiae proximally; legs without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 7%; tarsus 1 distally with ~20 quite distinct pseudosegments, proximally pseudosegmentation not

visible in dissecting microscope. Opisthosoma roundish, but higher than long (2.7/2.4); gray, with blackish spots except ventrally; genital plate not darker than surrounding area.

VARIATION: The other known male (see below) is much smaller (carapace width: 1.00; tibia 1: 5.6), but the shapes of chelicerae and palpal structures appear identical.

FEMALE: Unknown.

DISTRIBUTION: Known from two localities in Kimberley, Western Australia (map 13).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Jeremiah Hills: Male holotype above; Great Northern Highway, 52 km N of Turkey Creek (16°38'S, 128°12'E), June 7, 1999 (M. Gray, G. Milledge, H. Smith), in webs, cave wall, 1♂ (AMS KS56182).

***Trichocyclus bugai*, new species**

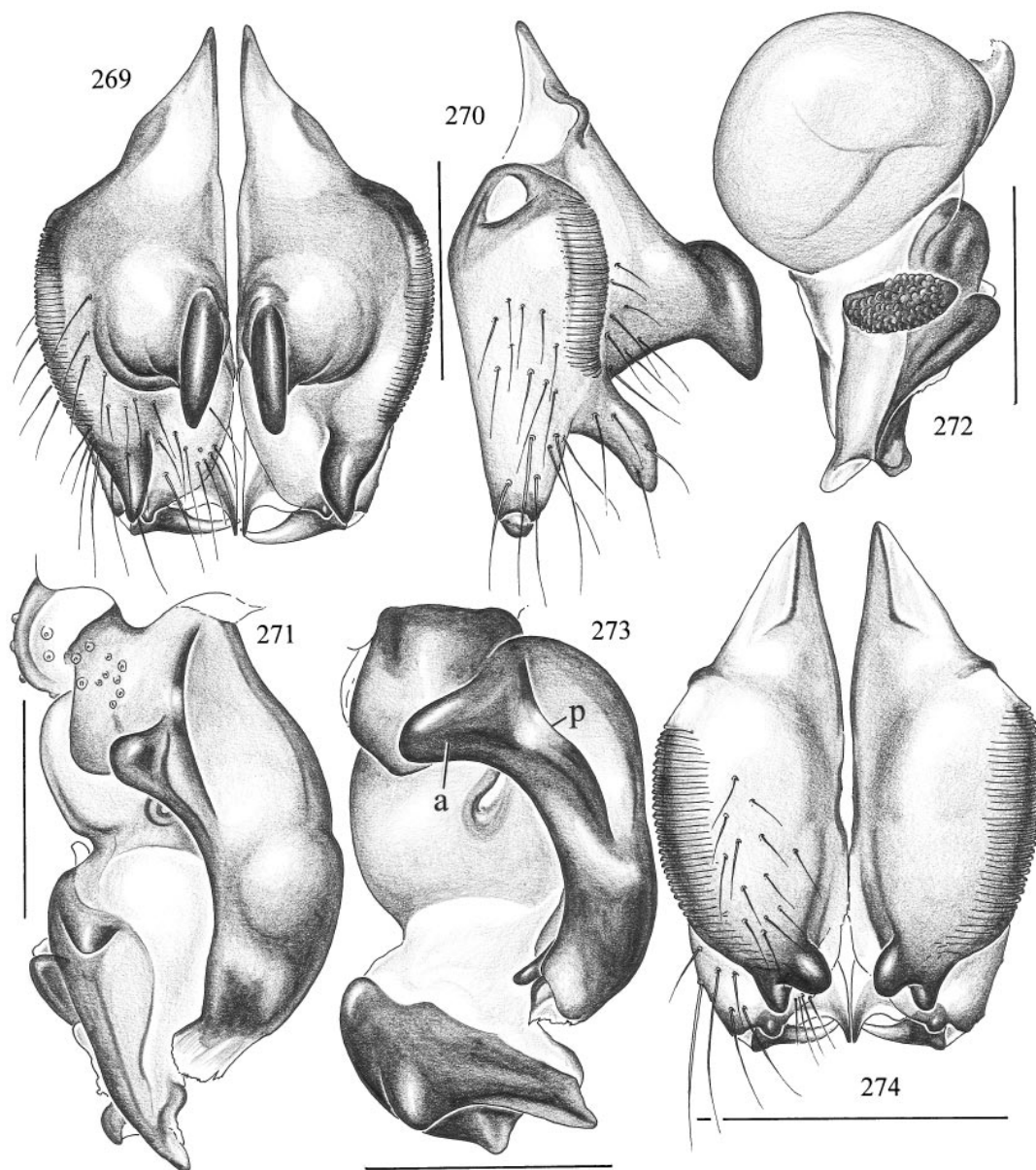
Figures 273, 274

TYPE: Male holotype from Drysdale River Station airfield (15°43'S, 126°23'E), under airfield runway marker, Kimberley, Western Australia, Australia; March 10, 1994 (A. F. Longbottom), in WAM (99/1750).

ETYMOLOGY: Named for the Bugai, aboriginal people of the Wenambal tribe in Kimberley, Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from known congeners by the single pair of cheliceral apophyses that are divided into two lobes each (fig. 274), and by the shape of the procurus (fig. 273; similar only to *T. arnga*, cf. fig. 271).

MALE (holotype): Total length 2.4, carapace width 1.03. Leg 1: 18.7 (5.2 + 0.4 + 5.1 + 6.8 + 1.2), tibia 2: 3.5, tibia 3: 2.4, tibia 4: 3.5; tibia 1 l/d: 55. Prosoma shape similar to *T. nullarbor* (cf. figs. 186–189); carapace ochre with pattern as in *T. nullarbor* (cf. fig. 187). Ocular area with darker median and lateral marks; distance PME-PME 0.120; diameter PME 0.080; distance PME-ALE 0.040; diameter AME 0.105. Clypeus with wide dark band tapering distally; sternum ochre, medially with light brown speckles. Chelicerae with only one pair of bilobed apophyses, as well as stridulatory ridges (fig. 274). Palps in general as in *T. arawari* (cf. figs. 259, 260, rather than



Figs. 269–274. *Trichocyclus arnga* (269–272), and *T. bugai* (273, 274), males. **269, 270, 274.** Chelicerae, frontal and lateral views. **271, 273.** Left procursi and genital bulbs, retrolateral views; “a”, “p” = apophysis and pocket. **272.** Left genital bulb, prolateral view. Scale lines: 0.3 mm.

T. nullarbor!), with distinctive procursus (similar only to *T. arnga*) and bulb (fig. 273). Legs ochre, with darker rings on femora (subdistally), patellae + tibiae proximally, and tibiae distally; tips of femora and tibiae whitish; legs without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia

1 at 16%; tarsus 1 distally with ~15 very distinct pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma probably roundish (damaged); gray, with blackish spots except ventrally; genital plate dark brown, rectangular.

FEMALE: In general very similar to male, but sternum with wide brown median band; tibia 1: 4.7. Opisthosoma frontodorsally without humps. Epigynum in general similar to *T. arabana* (cf. fig. 213) but with pair of distinctive, round invaginations near raised median part of frontal plate.

DISTRIBUTION: Known only from type locality in Kimberley, Western Australia (map 13).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Kimberley: Drysdale River Station airfield: Male holotype above; same collection data, 1 ♀ (WAM 99/1749).

***Trichocyclus harveyi*, new species**

Figures 275–282

TYPE: Male holotype from N of Larryoo (14°51'S, 126°49'E), Kimberley, Western Australia, Australia; June 12, 1992 (M. S. Harvey, J. M. Waddock), under rock, in WAM (99/1654).

ETYMOLOGY: Named for the first collector of the present material and of many more pholcids in the Western Australian Museum.

DIAGNOSIS: Small species, distinguished from known congeners by the shape of the procurus (figs. 277, 280) and bulb (figs. 277, 279), and by its small size and short legs (the legs of *T. ungumi*, the second smallest known species, are more than twice as long).

MALE (holotype): Total length 1.4, carapace width 0.74. Leg 1: 8.07 (2.16 + 0.26 + 2.26 + 2.68 + 0.71), tibia 2: 1.52, tibia 3: 1.03, tibia 4: 1.65; tibia 1 l/d: 34. Habitus and prosoma shape as in figs. 275 and 276; carapace pale ochre with slightly darker spots medially and laterally. Distance PME-PME 0.075; diameter PME 0.080; distance PME-ALE 0.025; diameter AME 0.055. Clypeus slightly darker than carapace; sternum pale ochre, shape as in *T. nullarbor* (cf. fig. 189). Chelicerae pale ochre with two pairs of frontal apophyses, and stridulatory ridges (fig. 278). Palps as in fig. 277; femur ventrally with distinct brown hump (fig. 277); procurus as in fig. 280, bulb as in fig. 279. Legs ochre-gray, without rings; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 30%; tarsus 1 distally with ~7 fairly visible pseudosegments, proximally pseudosegmentation

not visible in dissecting microscope. Opisthosoma roundish (fig. 275), pale ochre-gray, with large blackish spots except ventrally; genital plate not darker than surrounding area.

FEMALE: In general very similar to male; tibia 1 in 2 females: 1.97, 2.03; carapace width in 2 females: 0.73, 0.77. Opisthosoma frontodorsally without humps. Epigynum as in fig. 281; dorsal view as in fig. 282.

DISTRIBUTION: Known only from type locality in Kimberley, Western Australia (map 14).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Kimberley, N of Larryoo: Male holotype above, with 2 ♀ 1 juvenile (WAM 99/1655–7).

***Trichocyclus ungumi*, new species**

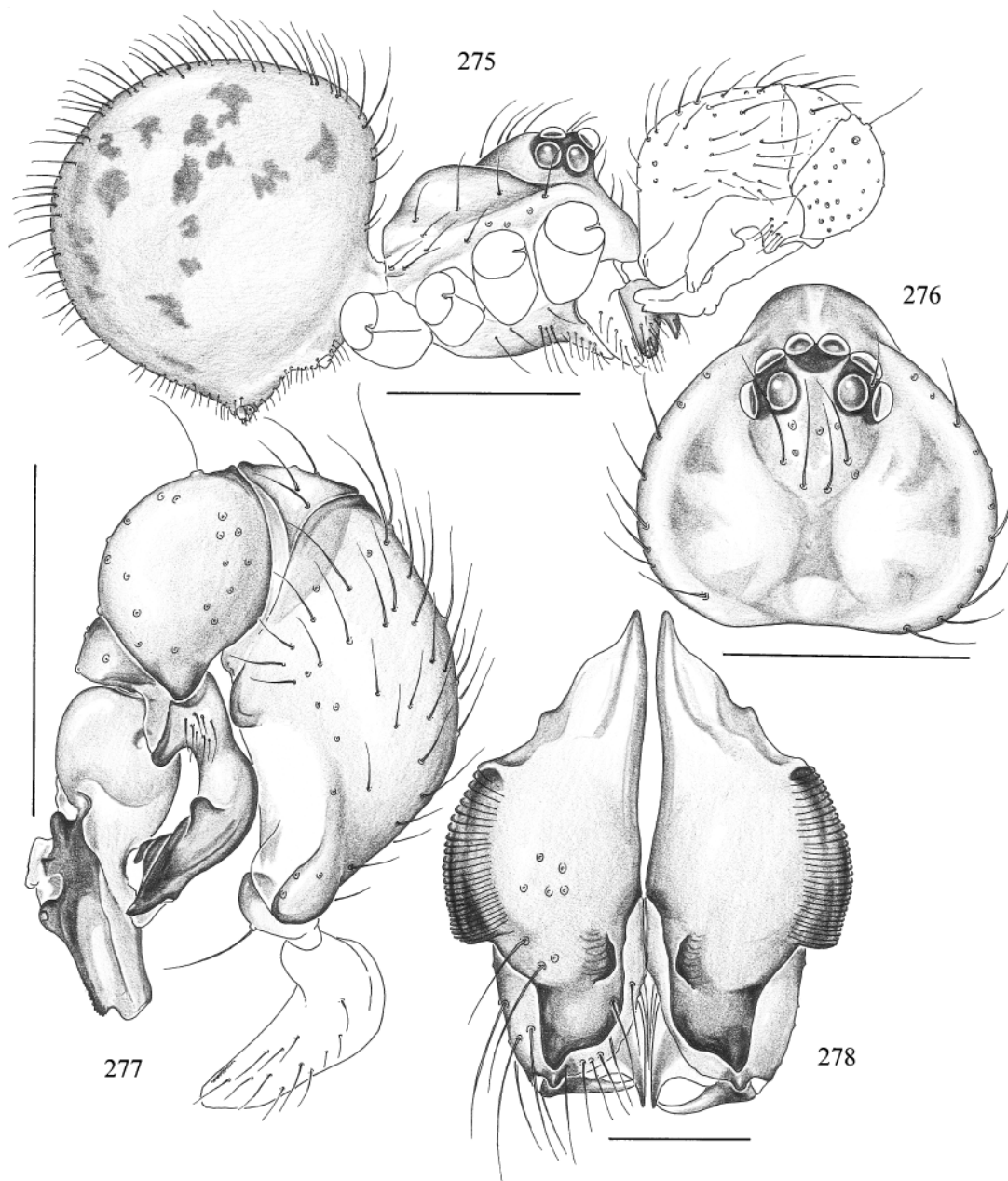
Figures 283, 284

TYPE: Male holotype from 30 miles E of Derby (17°19'S, 124°05'E), Kimberley, Western Australia, Australia; June 8, 1970 (Hemley Exped.), in WAM (99/1719).

ETYMOLOGY: Named for the Ongkomi (also called Ungumi), an aboriginal tribe from Kimberley, Western Australia. The species name is a noun in apposition.

DIAGNOSIS: Small species, distinguished from congeners by the two-lobed distal male cheliceral apophyses and the position of the proximal apophyses (very proximal: fig. 283), and by the shape of the procurus (slightly similar to *T. aranda*, compare figs. 232 and 284).

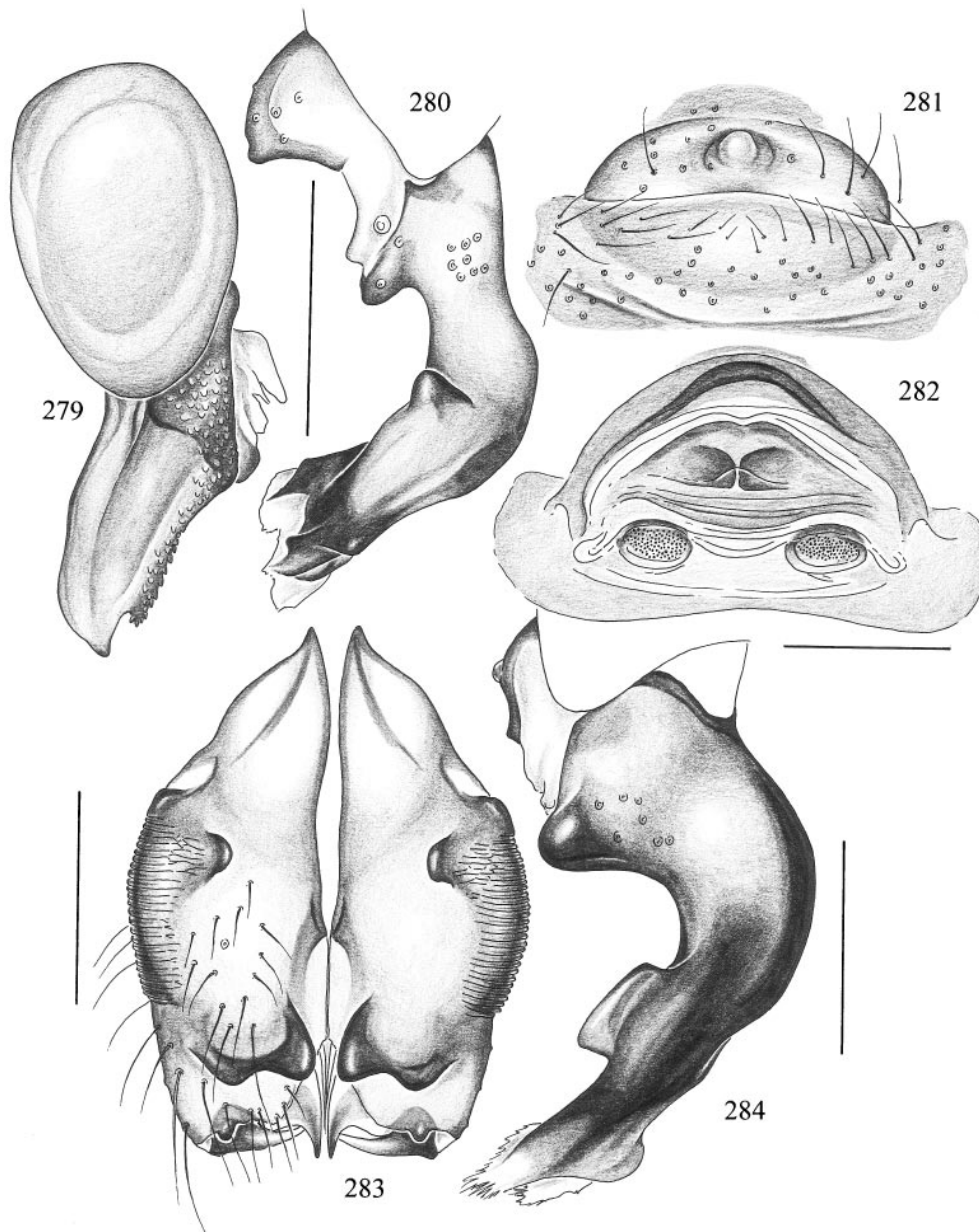
MALE (holotype): Total length 1.6, carapace width 0.97. Leg 1: 19.2 (5.2 + 0.4 + 5.2 + 7.2 + 1.2), tibia 2: 3.5, tibia 3: 2.5, tibia 4: 3.5; tibia 1 l/d: 52. Habitus and prosoma shape as in *T. nullarbor* (cf. figs. 186–189), but much smaller; carapace ochre-yellow with brown mark behind ocular area, black in thoracic groove, two pairs of lateral brown marks posteriorly, without radial marks. Ocular area with median dark band posteriorly. Distance PME-PME 0.095; diameter PME 0.085; distance PME-ALE 0.040; diameter AME 0.095. Clypeus with pair of brown bands under ALE, distally converging into large spot; sternum medially light brown with yellowish spots, laterally ochre-yellow. Chelicerae ochre with pair of



Figs. 275–278. *Trichocyclus harveyi*, male. **275.** Habitus. **276.** Prosoma, dorsal view. **277.** Left palp, retrolateral view. **278.** Chelicerae, frontal view. Scale lines: 0.5 mm (275–277), 0.1 mm (278).

two-lobed distal apophyses and another pair very proximally, and stridulatory ridges (fig. 283). Palps in general as in *T. harveyi* (cf. fig. 277), femur medioventrally with distinct brown knob, bulb similar to that of *T. aranda* (cf. fig. 231), procursus as in fig. 284. Legs

ochre-yellow, with darker rings on femora (subdistally) and tibiae (proximally and subdistally); patellae also darker; tips of femora and tibiae whitish; most hairs on legs missing; retrolateral trichobothrium of tibia 1 at 14%; tarsus 1 distally with ~7 barely visible



Figs. 279–284. *Trichocyclus harveyi* (279–282), and *T. ungumi* (283, 284). **279.** Left genital bulb, prolateral view. **280, 284.** Left cymbia and procursi, retrolaterodorsal views. **281, 282.** Epigynum, ventral (281) and dorsal (282) views. **283.** Chelicerae, frontal view. Scale lines: 0.2 mm (279–284).

pseudosegments, proximally pseudosegmentation not visible in dissecting microscope. Opisthosoma roundish, only slightly higher than long, ochre-gray, with many blackish spots except ventrally; genital plate relatively large, brown, trapezoidal.

FEMALE: In general very similar to male, with three pairs of lateral spots on carapace; tibia 1: 4.5. Opisthosoma frontodorsally without humps. Epigynum in ventral view as in *T. aranda* (cf. fig. 233).

DISTRIBUTION: Known only from type lo-

cality in Kimberley, Western Australia (map 14).

MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Kimberley, 30 miles E of Derby: Male holotype above, with 1 ♀ (WAM 99/1720).

***Trichocyclus watta*, new species**

Figures 285–292

TYPE: Male holotype from Gorge NE of Mt. Gilruth (13°02'S, 133°05'E), Northern Territory, Australia; July 12, 1979 (G. B. Monteith), rainforest, sieved litter, in QMB (S50178).

ETYMOLOGY: Named for the Watta, an aboriginal tribe in the area of the Alligator Rivers, Northern Territory. The species name is a noun in apposition.

DIAGNOSIS: Tiny species, easily distinguished from all congeners and other possible relatives (*Wugigarra nauo*, *W. kalamai*) by the absence of AME. Also distinguished by the row of apophyses on the male chelicerae (fig. 288), and by the very short legs.

MALE (holotype): Total length 1.2, carapace width 0.51. Leg 1: 3.50 (1.00 + 0.19 + 0.95 + 0.97 + 0.39), tibia 2: 0.84, tibia 3: 0.63, tibia 4: 0.95; tibia 1 l/d: 16. Habitus and prosoma shape as in figs. 285–287; entire prosoma monochromatic ochre. Ocular area only slightly elevated (fig. 285); distance PME-PME 0.055; diameter PME 0.055; distance PME-ALE 0.015; AME missing. Sternum wide, similar to *T. nullarbor* (cf. fig. 189). Chelicerae light brown, with row of apophyses on each side (fig. 288). Palps as in figs. 291 and 292, with weak zone dorsally on cymbium. Legs monochromatic ochre; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 apparently at 58% (difficult to see); tarsus 1 with ~5–7 pseudosegments (difficult to count). Opisthosoma oval, monochromatic gray.

FEMALE: Very similar to male. Chelicerae apparently without stridulatory files. Epigynum as in fig. 289; dorsal view as in fig. 290.

DISTRIBUTION: Known from two localities in Northern Territory (map 14).

MATERIAL EXAMINED: AUSTRALIA: *Northern Territory*: NE of Mt. Gilruth: Male holotype above, with 1 ♀ 4 juveniles in same

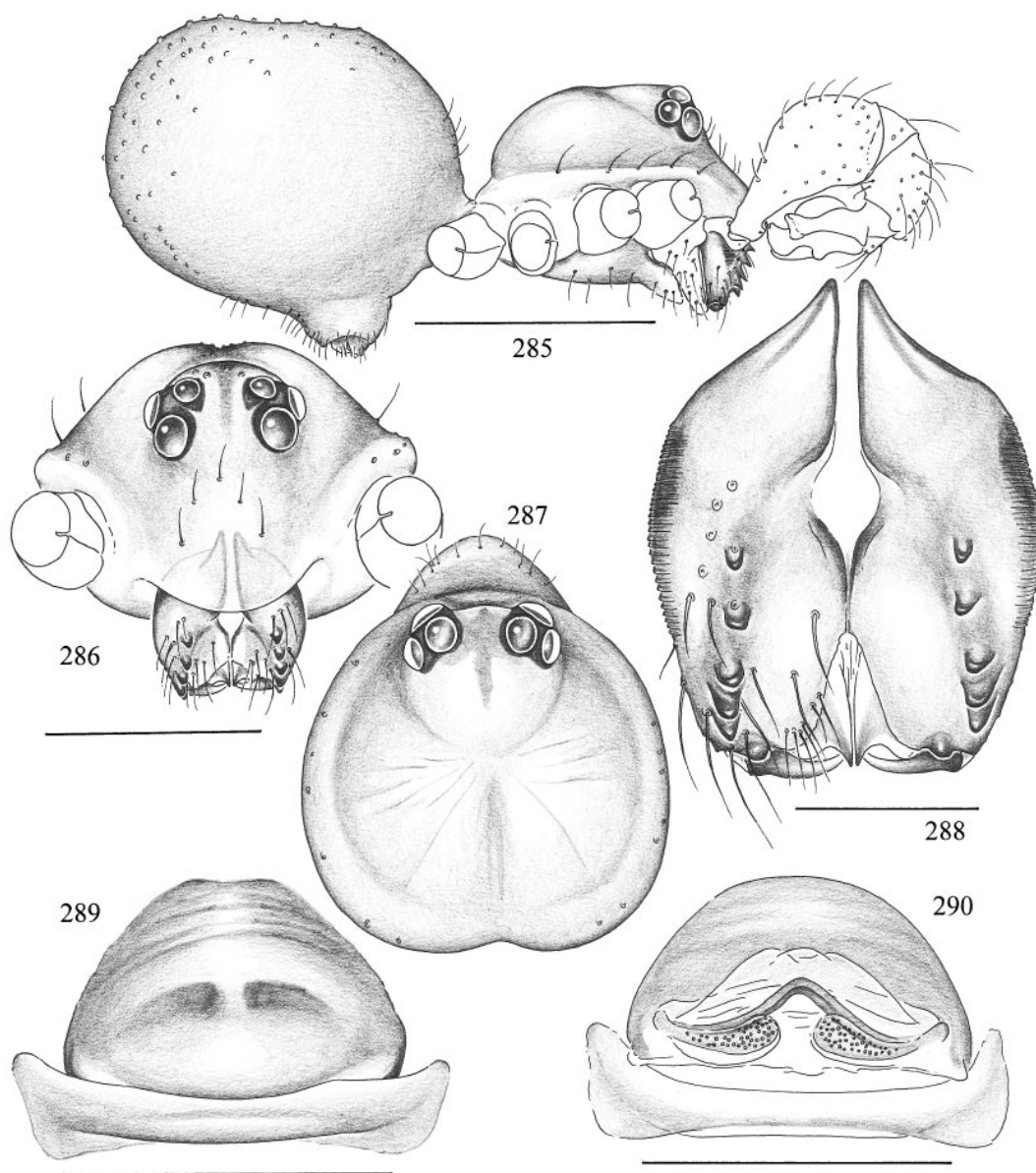
vial; same locality and collector, July 10, 1979: 1 ♀ 1 juvenile (QMB S50176); Kakadu National Park, Mirrai (Mt. Cahill) (12°53'S, 132°42'E), July 5–7, 1994 (M. S. Harvey, D. M. Hyder), under stones, 1 ♀ (WAM 99/1511), assigned tentatively.

MICROMERYS BRADLEY, 1877

Micromerys Bradley, 1877: 119 (type species by monotypy *M. gracilis* Bradley, 1877, examined).—Simon, 1893: 474.—Deeleman-Reinhold, 1986b: 205–224.—Huber, 1997c: 358.

DIAGNOSIS: Pale long-legged pholcids with small flat prosoma and very long cylindrical opisthosoma (fig. 293); total length ~6–8 mm; apparently restricted to the Australian region. Six eyes, AME either completely missing or reduced to pigment specks. Distinguished from *Panjange* (which is the only similar genus in Australia) by the single sclerotized process on the bulb (e.g., figs. 302, 313, 316), the hinged process ventrally on the procurus (“hp” in figs. 296, 318), the simple epigynum (e.g., figs. 303, 337; in *Panjange*, the epigynum has a long scape), the absence of eye turrets in the male, and the cylindrical opisthosoma. Distinguished from *Leptopholcus*, *Calapnita*, and probably also from *Uthina* (of which only females have been described) by the single bulbal projection and the hinged process on the procurus, and by the absence of frontal apophyses on the male chelicerae (fig. 299).

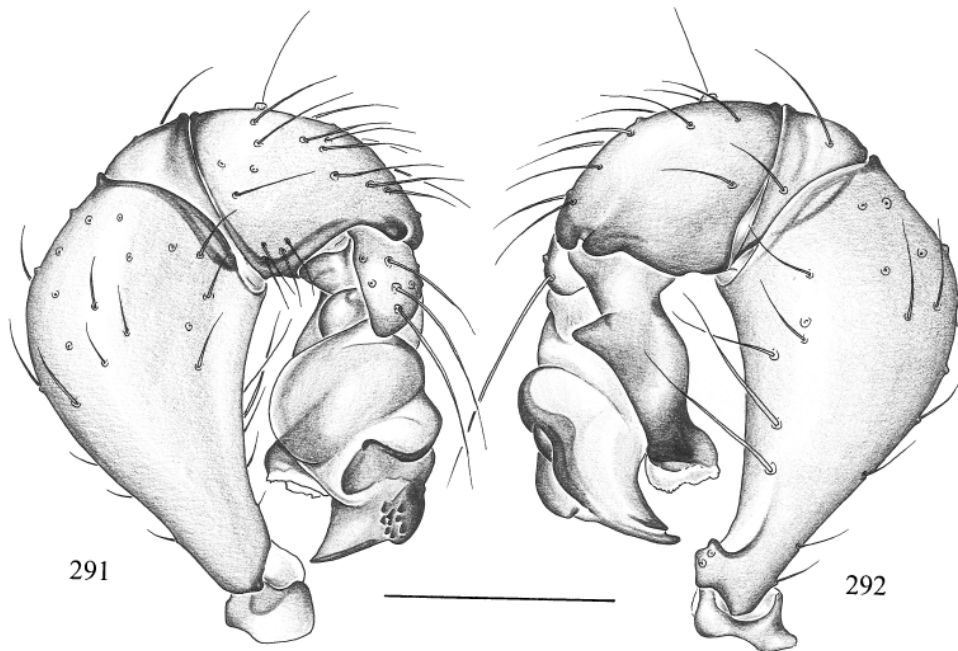
DESCRIPTION: Total length in males ~6–8 mm. Carapace roundish to slightly longer than wide, flat and without markings. Six eyes in two triads, sometimes slightly raised; AME missing or reduced to pigment specks (e.g., fig. 310). Distance PME-ALE small (~25–55% of PME diameter). Clypeus never modified, in some species very short compared to all other pholcids (figs. 294, 305, 310). Male chelicerae extremely conservative, with pair of lateral apophyses, without frontal apophyses (fig. 299), without stridulatory ridges. Male palps large in relation to prosoma size (figs. 293); coxa without retrolateral apophysis, trochanter with long ventral apophysis that is distally provided with distinct ridges (figs. 300, 333); femur almost cylindrical, with small retrolateral hump proximally, with ventrodistal process in some



Figs. 285–290. *Trichocycclus watta*. **285.** Habitus, male. **286, 287.** Male prosoma, frontal and dorsal views. **288.** Male chelicerae, frontal view. **289, 290.** Epigynum, ventral (289) and dorsal (290) views. Scale lines: 0.5 mm (285), 0.3 mm (286, 287, 289, 290), 0.1 mm (288).

species (fig. 314); patella triangular in lateral view; tibia considerably enlarged, with 2 trichobothria (fig. 296); cymbium and procurus characteristically S-shaped (e.g., figs. 296, 312, 318; following dorsal contour); procurus consisting of main branch, complex hinged process ventrally (e.g., figs. 301,

312, 318), and translucent fringed projection arising near base of hinged process (arrows in figs. 301, 317, 320); bulb consisting basically of globular part and flat sclerotized process (“p” in fig. 313); globular part of bulb connected to cymbium by arched sclerotized structure (“c” in fig. 313), to flat pro-



Figs. 291, 292. *Trichocyclops watta*, left male pedipalp, prolateral (291) and retrolateral (292) views. Scale line: 0.2 mm.

cess by triangular element ("t" in fig. 313). (I have not been able to find the sperm duct opening; the sperm duct may or may not enter the flat sclerotized process.) Tarsal organ capsulate (figs. 308, 330). Legs long and thin (leg 1 $\sim 4\text{--}5 \times$ body length, $\sim 27\text{--}35 \times$ prosoma length; tibia 1 l/d $\sim 75\text{--}85$); leg formula 1423, leg 4 significantly longer than leg 2; with dark ring in patella area and dark tibiametatarsus joint; legs without spines, without vertical and curved hairs; retrolateral trichobothrium of tibia 1 at 2–4%; tarsi without pseudosegmentation but with unique striation of cuticle (figs. 306, 332); tarsal claws as usual for family (see Note below). Opisthosoma very long and cylindrical, spinnerets at the tip. Male gonopore with four epiandrous spigots (examined: *M. daviesae*, *gracilis*; fig. 307). ALS with only one pair of spigots each (examined: *M. daviesae*, *gracilis*; fig. 329); other spinnerets typical for family.

Sexual dimorphism slight, females with shorter legs, often with longer opisthosoma, eye triads less raised. Epigynum shape extremely simple and conservative; internally more diverse and complex (e.g., figs. 304,

315, 328), but mostly transparent and difficult to study.

NOTE: Deeleman-Reinhold (1986b) mentioned a difference between the claws on tarsi 1–3 versus tarsus 4. A detailed reexamination of *M. gracilis* revealed no difference between the claws on tarsi 1 and 4, except that the claws on tarsus 4 were slightly longer (32 versus 27 μm).

MONOPHYLY: All described species share the bulbal morphology (flat sclerotized process, triangular element) and the single pair of lateral apophyses on the male chelicerae. An undescribed species from Papua New Guinea (see below) has the "triangular" element slightly more elaborate (longer, distally divided into two parts), but it is otherwise very similar and clearly congeneric. The files on the tip of the male palpal trochanter apophysis and the transparent projection arising from near the basis of the hinged process might be further synapomorphies of the genus.

GENERIC RELATIONSHIPS: Two characters support the inclusion of *Micromerys* in the *Pholcus* group sensu Huber, 1995: the prox-

imolateral male cheliceral apophyses (functionally related to the ventral trochanter apophysis); and the spindle-shaped male palpal tibia. This was supported by cladistic analyses using equally weighted characters, as well as by using successive weighting in Hennig86. However, implied weighting in Pee-Wee suggested an alternative scenario at all settings of the concavity constant except at $\text{conc} = 6$: the South American *Metagonia* was sister group of *Micromerys*, supported by the ventral hinged process on the procurus. (Both genera were nested in a “*Pholcus* group sensu lato”.)

NATURAL HISTORY: The genus seems to be restricted to humid forests, where the spiders live mainly on the underside of leaves (as judged from a few labels giving relevant information; see also Deeleman-Reinhold and Deeleman, 1983, Deeleman-Reinhold, 1986a, b). No single-species study, or any closer observation, is known to me.

DISTRIBUTION: Known from Australia and (one undescribed species in the CLD collection) from Papua New Guinea (Deeleman-Reinhold [1986a: fig. 2; 1986b: 206] reported “an unedited species from West Irian”, which I have not seen). Within Australia, the genus is restricted to northern Northern Territory and to the Great Dividing Range in Queensland and New South Wales. It is remarkable that four of the seven known species occur within a limited area around Cairns.

COMPOSITION: The genus now includes 7 described species, 5 of them new. All described species are treated below. The collections studied contain numerous further vials with females only, which does not allow useful guesses about possible undescribed species. For species previously assigned to *Micromerys*, see Millot (1946), Brignoli (1980), Deeleman-Reinhold (1986a), and Huber (1997c, 2000).

Micromerys gracilis Bradley, 1877

Figures 293–309

Micromerys gracilis Bradley, 1877: 119.—Simon, 1893: 474.—Deeleman-Reinhold, 1986b: 206–209, figs. 5–9, 60 (female only; male see *M. yidin* below).

TYPE: Female neotype designated by Dee-

leman-Reinhold (1986b), from Lake Boronto near Somerset, 5 km S of Cape York (10°45'S, 142°35'E), Queensland, Australia; Feb. 3–4, 1975 (R. Raven), in QMB (S885), examined.

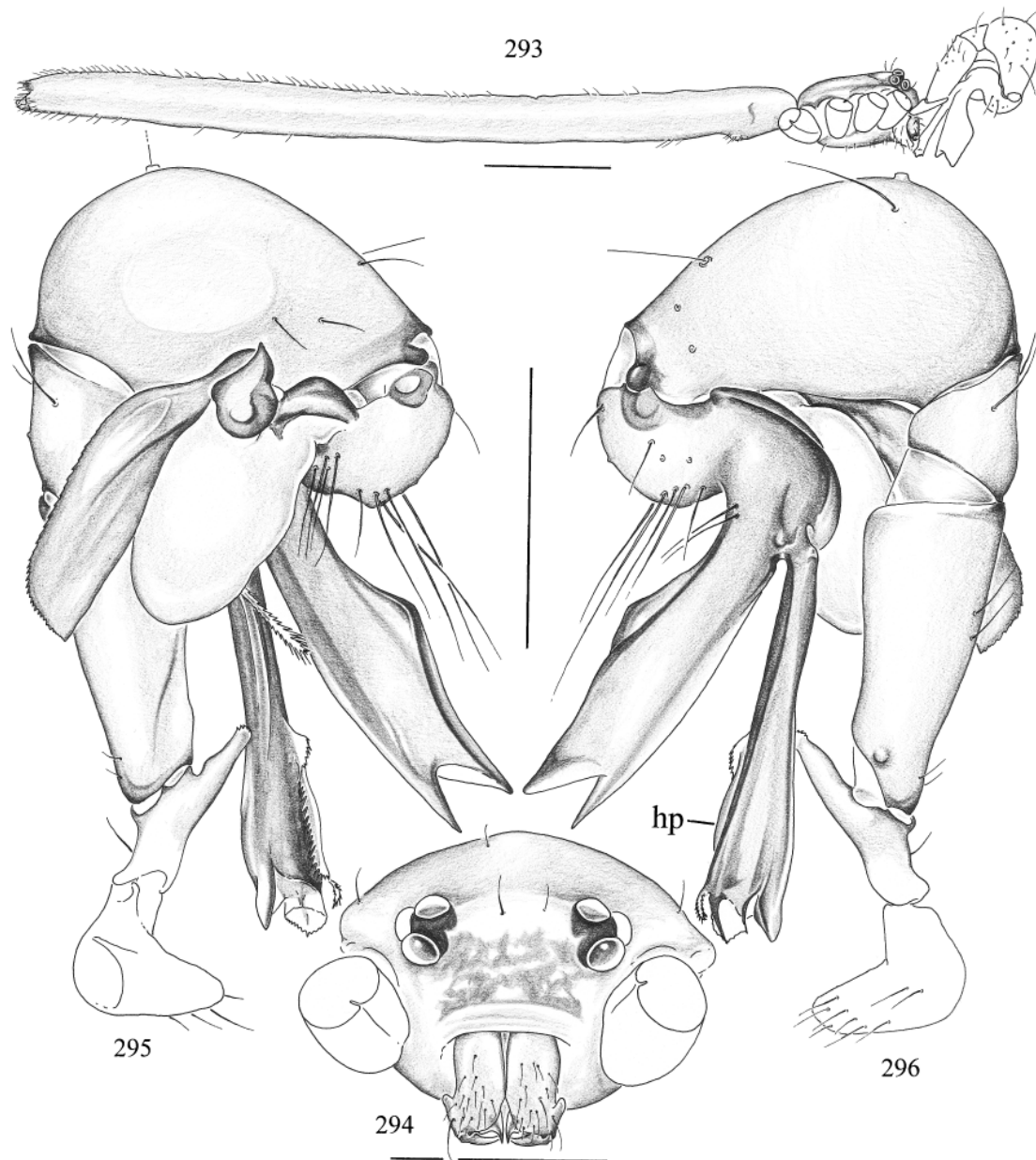
REMARK: The selection of a female as type poses some problems as females of *Micromerys* are extremely difficult to identify. However, *M. gracilis* seems to be the only species on Cape York Peninsula (map 15; note that the locality Shiptons Flat in Deeleman-Reinhold [1986b] rests on a misidentification; see *M. yidin* below), suggesting that the material studied is indeed conspecific with the neotype.

DIAGNOSIS: Distinguished from congeners by the wide main branch of the procurus (fig. 301) and by the straight bulbal apophysis that is slightly longer than the bulb (figs. 295, 302).

MALE (Murray Island): Total length 5.8, carapace width 0.84. Leg 1: 27.6 (7.3 + 0.4 + 6.3 + 10.9 + 2.7), tibia 2: 5.1, tibia 3: 3.2, tibia 4: 5.9; tibia 1 l/d: 79. Habitus and prosoma shape as figs. 293, 294, 297, 298. Entire prosoma whitish ochre, only proximal part of clypeus light brown (fig. 294). Ocular area flat; distance PME-PME 0.280; diameter PME 0.105; distance PME-ALE 0.050; AME missing, only tiny black spot between triads. Sternum slightly longer than wide (fig. 298). Chelicerae whitish, without modification except pair of lateral apophyses (fig. 299). Palps as in figs. 295 and 296, pale ochre, only procurus and bulbal apophysis light to dark brown; trochanter apophysis, procurus, and bulb as in figs. 300–302; tip of hinged process as in fig. 309; palpal tarsal organ as in fig. 308. Legs pale ochre; patellae, femora tips, and tibia–metatarsus joints darker; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 2.3%; tarsi without pseudosegmentation (fig. 306). Opisthosoma shape as in fig. 293, monochromatic pale ochre; two spigots on ALS (fig. 307).

VARIATION: Tibia 1 in 14 males: 6.1–7.4 ($\bar{x} = 6.7$). Some males have no trace of AME, others have black spots in that area, but lenses are always missing. Some males have darker smudges on the opisthosoma.

FEMALE: In general very similar to male, but clypeus proximally not darker. Tibia 1 in

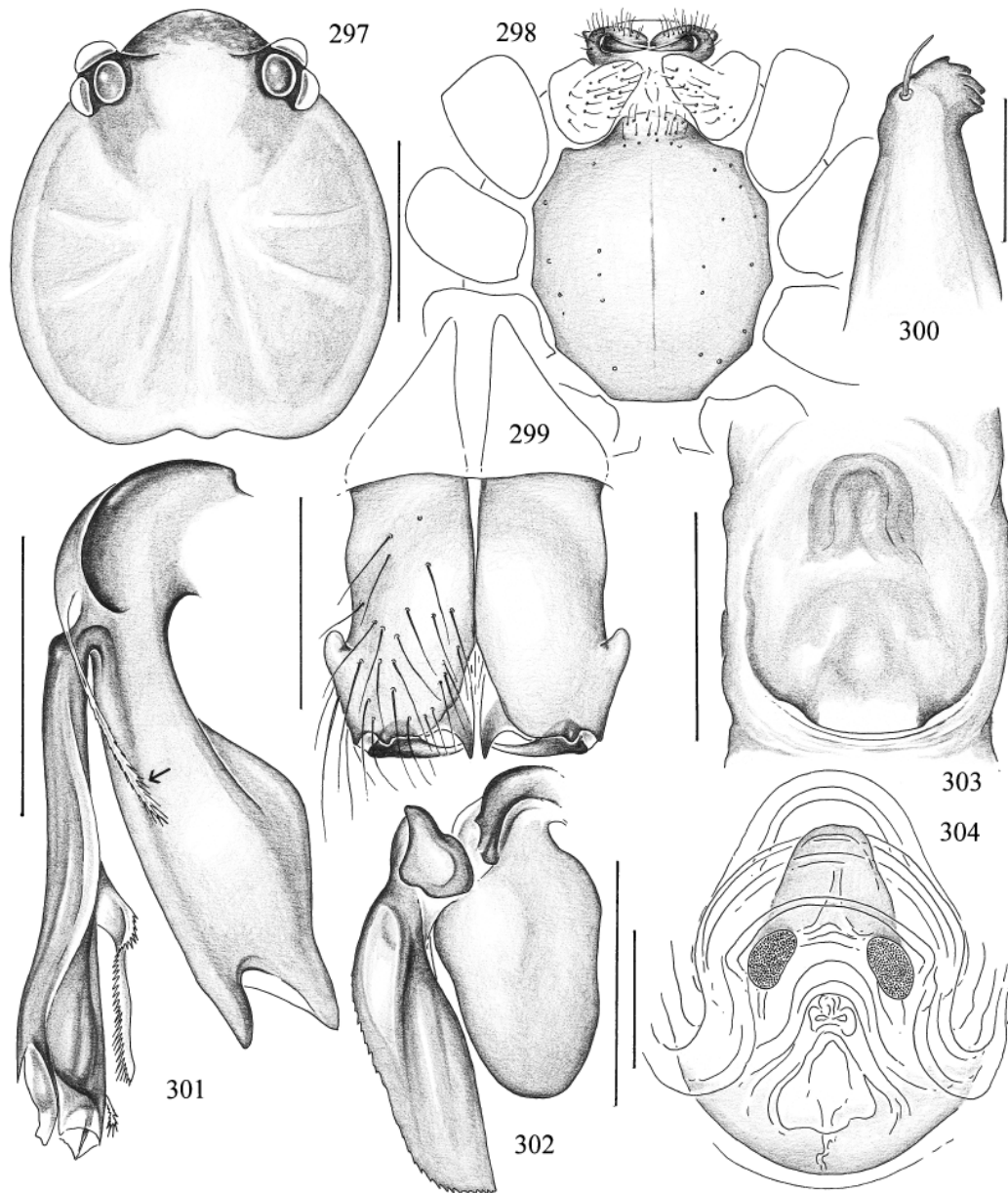


Figs. 293–296. *Micromerys gracilis*, male. **293.** Habitus. **294.** Prosoma, frontal view. **295, 296.** Left palp, prolateral (295) and retrolateral (296) views; “hp” = hinged process. Scale lines: 1 mm (293), 0.5 mm (294–296).

9 females: 5.2–6.2 (\bar{x} = 5.8). Tibia 1 in neotype: 5.5. Variation in AME spots as in male (neotype without spots). Epigynum very simple, unsclerotized, with possibly distinctive arch shining through (fig. 303); dorsal view as in fig. 304.

DISTRIBUTION: Known from several localities in northern Northern Territory and northern Queensland (map 15).

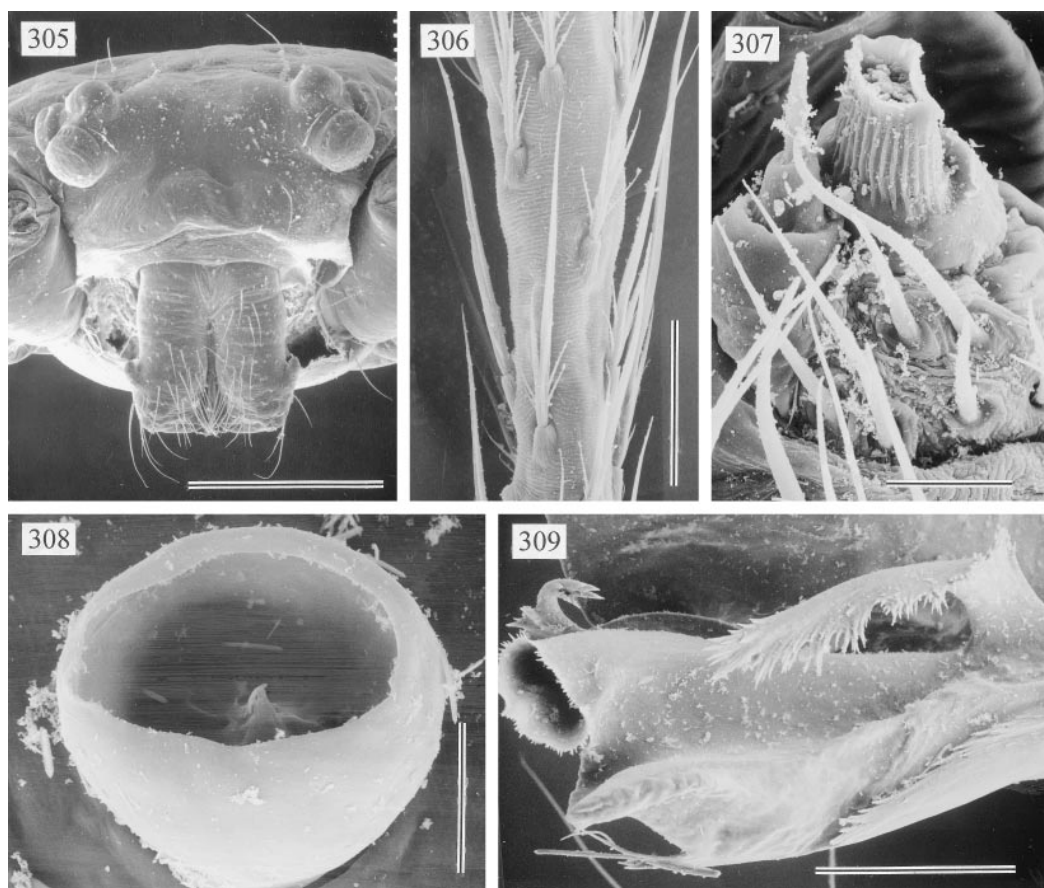
MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Lake Boronto near Somerset: Female neotype above; Dividing Range, 15 km



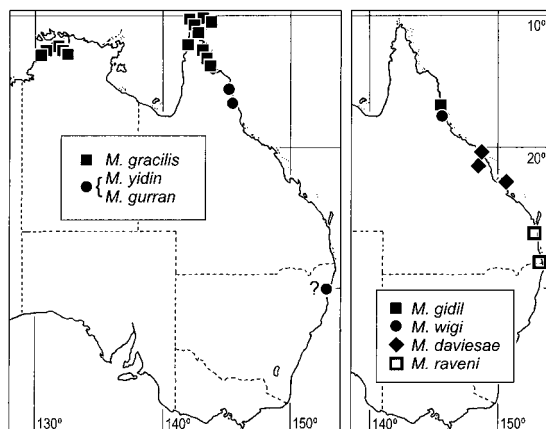
Figs. 297–304. *Micromerys gracilis*. **297, 298.** Male prosoma, dorsal and ventral views. **299.** Male chelicerae, frontal view. **300.** Tip of male palpal trochanter apophysis. **301.** Left procursus, prolateral view; arrow: translucent fringed projection. **302.** Left genital bulb, prolateral view. **303, 304.** Epigynum, ventral (303) and dorsal (304) views. Scale lines: 0.4 mm (297, 298, 301–303), 0.2 mm (299, 304), 0.05 mm (300).

W of Captain Billy Creek (11°40'S, 142°45'E), July 4–9, 1975 (G. B. Monteith), 2 juveniles (QMB S49743), assigned tentatively; Andoom near Weipa (12°31'S,

141°50'E), Feb. 5–8, 1975 (G. B. Monteith), rainforest, 1 ♂ (QMB S49738); Gordon Creek, Iron Range (12°43'S, 143°19'E), June 24–30, 1976 (R. Raven, V. E. Davies), me-



Figs. 305–309. *Micromerys gracilis*. **305.** Male prosoma, frontal view. **306.** Male tarsus 1 near tip, showing absence of pseudosegmentation. **307.** Male ALS, with only two spigots. **308.** Male palpal tarsal organ. **309.** Tip of hinged process of right procursus, prolateral view. Scale lines: 300 μm (305), 100 μm (309), 30 μm (306, 308), 10 μm (307).



Maps 15, 16. Distribution of *Micromerys* species in Australia.

sophyll vine forest, 2♀ (QMB S886); same data, “+ Lamond Hill”, 3♀ several juveniles (QMB S49741); West Claudie Range, Iron Range (12°45’S, 143°14’E), Dec. 3–10, 1985 (G. Monteith, D. Cook), rainforest, 50 m elev., 2♂ 3 juveniles (QMB S50306); same collection data, 2♀ 1 juvenile (QMB S50289); McIlwraith Range (~13°43’S, 143°15’E), July 20, 1995 (J. Thompson, M. Moulds, T. Olive), 1♂ (AMS KS46098); Silver Plains Station, near Chester R. (13°58’S, 143°22’E), Nov. 2, 1985 (I. Fanning) 1♀ (QMB S50307), assigned tentatively; Thursday Island, Torres Strait (10°35’S, 142°13’E), Aug. 1949 (N.L.H. Krauss), 1♀ in AMNH; Hammond Island, Torres Strait (10°32’S, 142°13’E), July 4–8, 1974 (H. Heatwole, E.

Cameron), 1 ♀ (QMB S50226), assigned tentatively; Murray Island, Torres Strait (9°56'S, 144°04'E), July 1974 (H. Heatwole, E. Cameron), 2 ♂ 2 ♀ (QMB S50228); Yam Island, Torres Strait (9°53'S, 142°55'E), Nov. 28–Dec. 2, 1986 (J. Gallon), under bark, night coll., 1 ♀ (QMB S12400), assigned tentatively. *Northern Territory*: Gorge NE of Mt Gilruth (13°02'S, 133°05'E), July 10–13, 1979 (G. Monteith, D. Cook), 1 ♀ several juveniles (QMB S49771), assigned tentatively; Kakadu National Park, Baroalba (12°50'S, 132°57'E), July 6, 1994 (M. S. Harvey, D. M. Hyder), 1 ♀ (WAM 99/1509), assigned tentatively; Radon Creek (12°45'S, 132°53'E), rainforest, July 14–16, 1979 (G. Monteith, D. Cook), 2 ♂ 4 ♀ some juveniles (QMB S49752); North Point, Kapalga (12°25'S, 132°22'E), July 19, 1979 (G. Monteith, D. Cook), 1 ♂ (QMB S49745); W Alligator, "mouth, WA2" (12°11'S, 132°16'E), Nov. 1979 (R. Raven), 1 ♂ 1 ♀ (QMB S49769); Kemp Airstrip (12°35'S, 131°20'E), rainforest, July 24–25, 1979 (G. Monteith, D. Cook), 2 ♂ 1 ♀ 1 juvenile (QMB S49768); same locality, Nov. 15–16, 1979 (R. Raven), 2 ♂ 2 ♀ 2 juveniles (QMB S49755); Litchfield National Park, Wangi Falls (13°09'S, 130°38'E), May 26, 1992 (M. S. Harvey, J. M. Waldock), 2 ♂ 1 ♀ 5 juveniles (WAM 99/1501–8).

***Micromerys yidin*, new species**

Figures 310–315

Micromerys gracilis: Deeleman-Reinhold, 1986b: 206–209, figs. 1–4 (male misidentified).

TYPE: Male holotype from Spear Creek (16°42'S, 145°24'E), Queensland, Australia; Nov. 3–10, 1975 (R. Raven, V. E. Davies), in QMB (S34685).

ETYMOLOGY: Named for the Idindji (also called Yidin), aboriginal rainforest dwellers from the Cairns area, northwestern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from congeners by the shape of the lobes distally on the main branch of the procursus (figs. 311, 312), and by the very short, slightly curved bulbal apophysis (fig. 313).

MALE (holotype): Total length 6.4, carapace width 0.71. Legs 1–3 missing, tibia 4:

5.9. Habitus and prosoma shape as in *M. gracilis* (cf. figs. 293, 294, 297, 298). Entire prosoma whitish ochre, only proximal part of clypeus light brown. Distance PME–PME 0.265; diameter PME 0.095; distance PME–ALE 0.035; AME missing, but distinct black spots present (fig. 310). Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur ventrodistally with distinct apophysis (fig. 314); procursus and bulb as in figs. 311–313. Legs pale ochre, patellae (and femora tips) and tibia–metatarsus joints darker; apparently without spines, without curved and vertical hairs (many hairs missing); retrolateral trichobothrium of tibia 1 at 2.0% (male in SAM N1999/878); tarsi without pseudosegmentation. Opisthosoma shape as in *M. gracilis* (cf. fig. 293), monochromatic pale ochre.

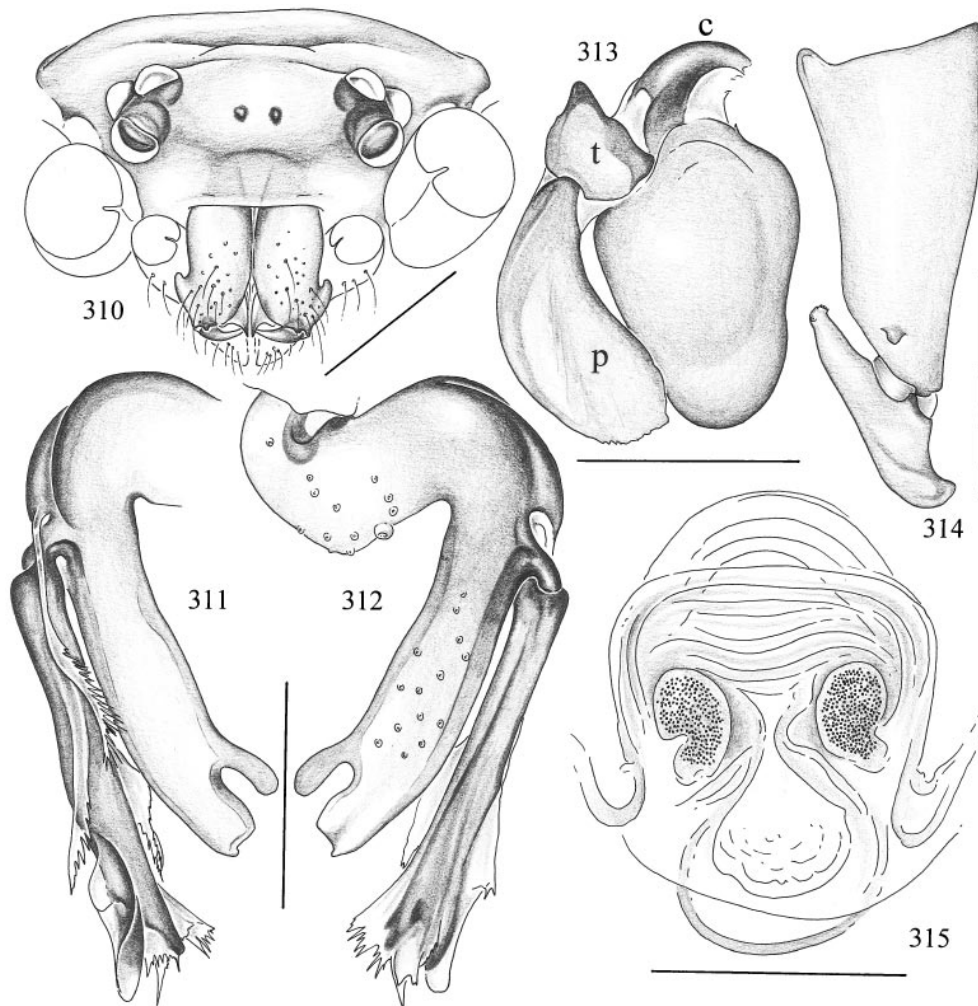
VARIATION: Tibia 1 in 8 males: 6.4–7.4 (\bar{x} = 6.8).

FEMALE: In general very similar to male, but clypeus proximally not darker. Tibia 1 (N = 3) 5.9–6.1. Epigynum very simple, unpigmented roundish plate; dorsal view as in fig. 315.

DISTRIBUTION: Known only from the Cape Tribulation area and one suspicious locality in New South Wales (map 15; see Note below).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Spear Creek: Male holotype above, with 1 ♂ (QMB S49740); Cape Tribulation National Park, near beach (16°05'S, 145°28'E), July 24, 1992 (J. Coddington, G. Hormiga), 3 ♂ 4 ♀ 2 juveniles (3 vials) (USNM); Fritz Creek N of Bloomfield (15°52'S, 145°21'E), Dec. 1975 (M. Gray), rainforest foliage, 1 ♂ 2 ♀ 5 juveniles (AMS KS457); Twelve Mile Scrub (15°50'S, 145°19'E), Nov. 22–27, 1975 (collector not given), complex mesophyll vine forest, 1 ♂ 1 juvenile (QMB S49739); Shiptons Flat (15°48'S, 145°15'E), Nov. 16–21, 1975 (R. Monroe, V. E. Davies), vine forest on basalt, 2 ♂ 1 ♀ (QMB S887, 891); Home Rule, Mt Hartley (15°44'S, 145°18'E), Nov. 11, 1974 (V. E. Davies, D.J.), on leaves, 2 ♂ 2 ♀ 1 juvenile (QMB S49742). *New South Wales*: Bruxner Park, Coffs Harbour (30°10'S, 153°05'E), May 18, 1979 (D. Hirst), 1 ♂ (SAM N1999/878), see Note below.

NOTE: The single record from New South



Figs. 310–315. *Micromerys yidin*. **310**. Male prosoma, frontal view. **311**, **312**. Left procursus, pro-lateral (311) and retrolateral (312) views. **313**. Left genital bulb, prolateral view; “c” = connecting piece between bulb and cymbium; “t” = triangular element; “p” = bulbal process. **314**. Left male palpal trochanter and femur, retrolateral view. **315**. Epigynum, dorsal view. Scale lines: 0.3 mm.

Wales might be based on some labeling error and should be cited with some reservation until further material is collected from there. Revealingly, the single male shared the vial with a *Micromerys* male of another species (*M. gurrana*) that is also otherwise only known from the Cape Tribulation area.

***Micromerys gurrana*, new species**

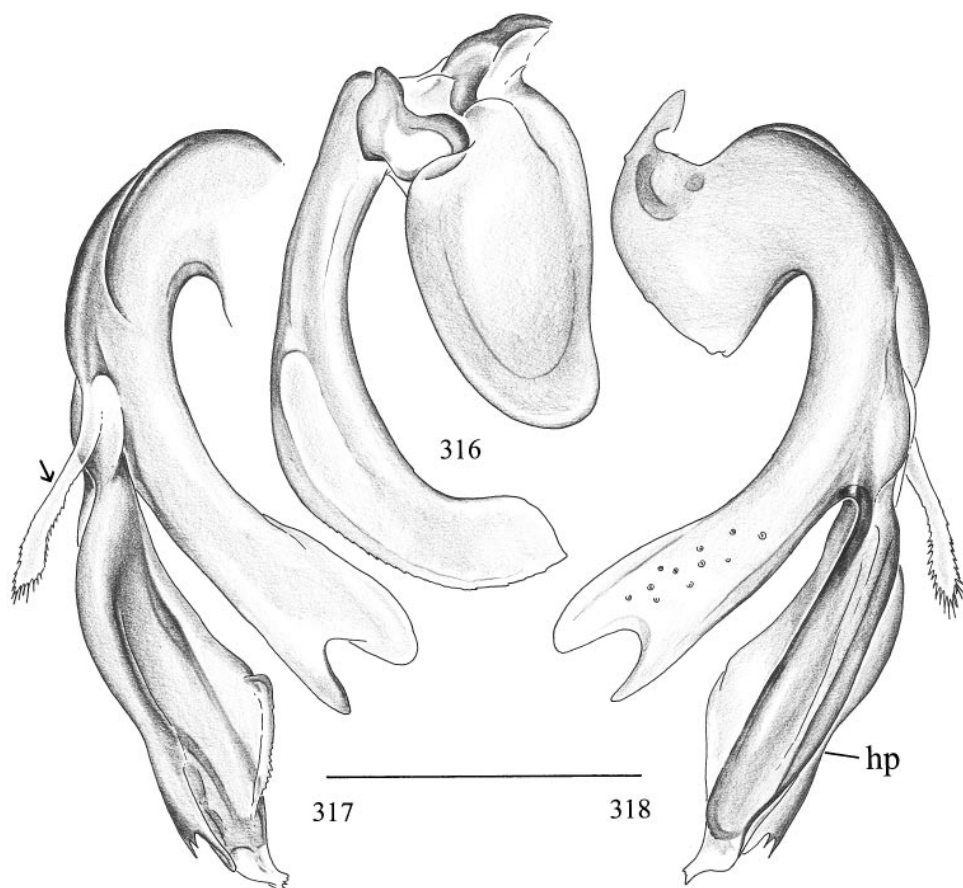
Figures 316–318

TYPE: Male holotype from Twelve Mile Scrub (15°50'S, 145°19'E), Queensland,

Australia; Nov. 22–27, 1975 (collector not given), complex mesophyll vine forest on granite), in QMB (S49763).

ETYMOLOGY: In Yidini, the aboriginal language of the Cairns-Yarrabah region, *gurrana* means “long”. This refers to the long bulbal apophysis in this species. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from congeners by the very long bulbal apophysis (fig. 316). *M. wigi* has a similar bulb, but the apophysis is closer to the globular part, and the distal



Figs. 316–318. *Micromerys gurrani*. **316.** Left genital bulb, prolateral view. **317, 318.** Left procursus, prolateral (317) and retrolateral (318) views; arrow: translucent fringed projection; “hp” = hinged process. Scale line: 0.5 mm (316–318).

lobes of the main branch of the procursus differ in shape (compare figs. 316–318 with 319–321).

MALE (holotype): Total length 8.1, carapace width 1.23. Leg 1: 33.2 (9.1 + 0.5 + 8.0 + 12.7 + 2.9), tibia 2: 6.4, tibia 3: 4.1, tibia 4: 7.2. Habitus and prosoma shape as in *M. gracilis* (cf. figs. 293, 294, 297, 298). Carapace ochre to light brown, proximal part of clypeus light brown; sternum whitish. Distance PME–PME 0.305; diameter PME 0.120; distance PME–ALE 0.045; ALE with distinct black spots, but without lenses. Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur ventrodistally with distinct hump; procursus and bulb as in figs. 316–318. Legs pale ochre, coxae, patella area and

tibia–metatarsus joints darker; apparently without spines, without curved and vertical hairs (many hairs missing); retrolateral trichobothrium of tibia 1 at 2.0%; tarsi without pseudosegmentation. Opisthosoma shape as in *M. gracilis* (cf. fig. 293), monochromous ochre-gray.

VARIATION: Tibia 1 in 4 other males: 6.8, 7.2, 7.3, 7.5.

FEMALE: Unknown.

DISTRIBUTION: Known only from the Cape Tribulation area and one suspicious locality in New South Wales (map 15; see Note under *M. yidin* description above).

MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Twelve Mile Scrub: Male holotype above; Black Mtn (15°41'S, 145°13'E), Dec. 17, 1971 (N. Clyde Coleman), 2♂

(QMB S49746); Koah Road (16°49'S, 145°31'E), Apr. 2, 1972 (N. Clyde Coleman), 1♂ (QMB S49750). *New South Wales*: Bruxner Park, Coffs Harbour (30°10'S, 153°05'E), May 18, 1979 (D. Hirst), 1♂ (SAM N1999/877), see Note under *M. yidin* description above.

***Micromerys wigi*, new species**

Figures 319–321

TYPE: Male holotype from Majors Mountain near Millaa Millaa (17°38'S, 145°32'E), Queensland, Australia; Apr. 14–20, 1978 (R. Raven, V. E. Davies), in QMB (S49753).

ETYMOLOGY: In Yidini, the aboriginal language of the Cairns-Yarrabah region, *wigi* means “big”. This refers to the larger size of this species compared to the closest known relative. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from congeners by the shape of the bulbal apophysis (fig. 319) and by the shape of the distal lobes of the main branch of the procurus (figs. 320–321). *M. gidil* is very similar in shape but has a notch on the bulbal apophysis, relatively and absolutely much smaller palps, and the PME are closer together.

MALE (holotype): Total length 5.9, carapace width ~1.0 (deformed). Leg 1: 28.0 (7.3 + 0.4 + 6.7 + 11.1 + 2.5), tibia 2: 5.3, tibia 3: 3.5, tibia 4: 6.2. Habitus and prosoma shape similar to *M. gracilis* (cf. figs. 293, 294, 297, 298), but carapace more roundish in dorsal view, as in *M. gidil*. Carapace ochre, clypeus light brown except distal rim, sternum whitish. Distance PME-PME 0.305; diameter PME 0.095; distance PME-ALE 0.040; with distinct black spots at AME position, but without lenses. Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur ventrodistally with distinct bulge; procurus and bulb as in figs. 319–321. Legs pale ochre, patella area and tibia–metatarsus joints darker; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 4%; tarsi without pseudosegmentation. Opisthosoma shape as in *M. gracilis* (cf. fig. 293), pale ochre.

FEMALE: Unknown.

DISTRIBUTION: Known only from type locality, S of Cairns, Queensland (map 16).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Majors Mountain: Male holotype above, with 2 juveniles in same vial.

***Micromerys gidil*, new species**

Figures 322–324

TYPE: Male holotype from Gordonvale (17°06'S, 145°47'E), Queensland, Australia; Feb. 1972 (N. Clyde Coleman), in QMB (S49772).

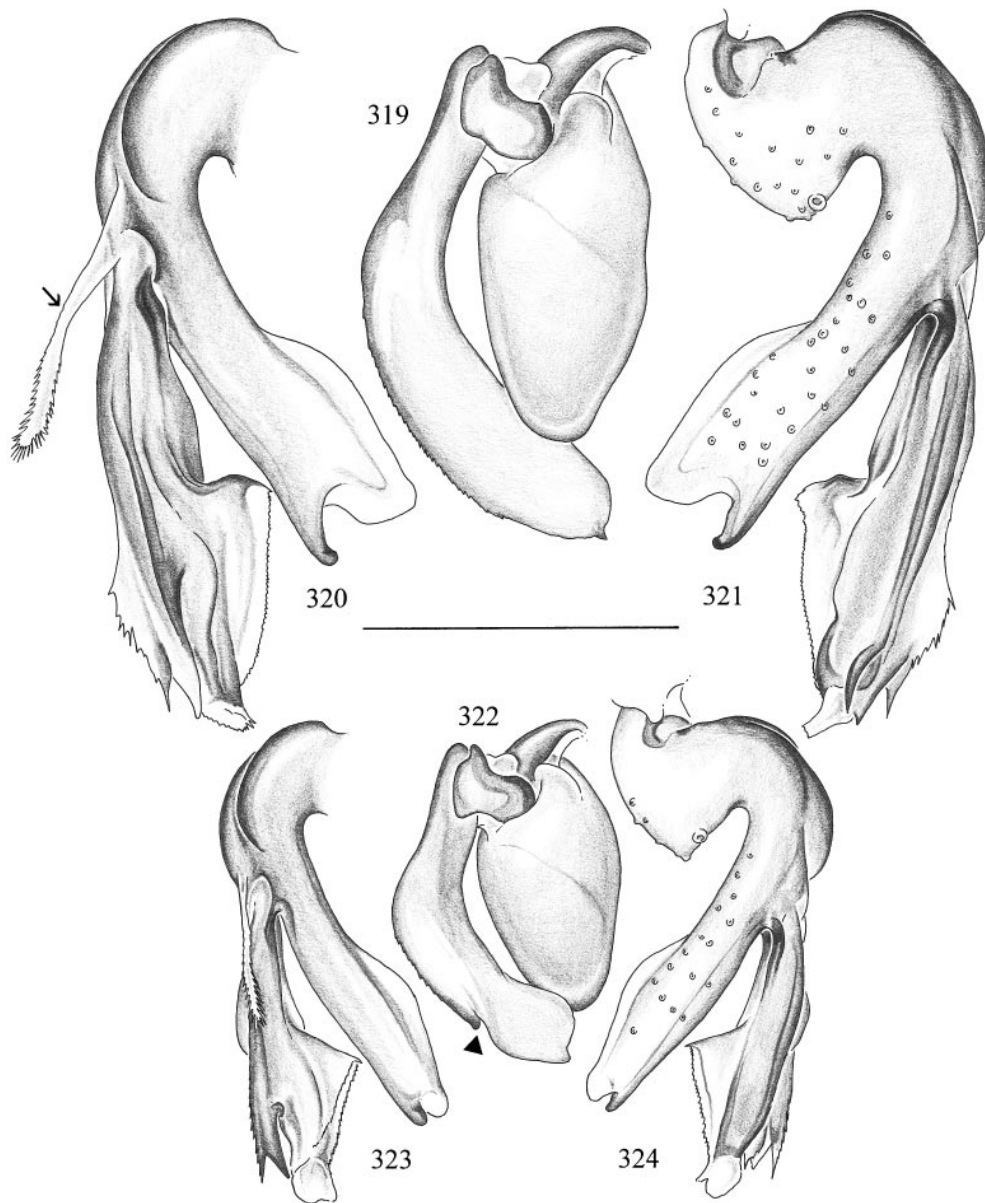
ETYMOLOGY: In Yidini, the aboriginal language of the Cairns-Yarrabah region, *gidil* means “small”. This refers to the small size of this species compared to the closest known relative. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from congeners by the shape of the bulbal apophysis with its notch (arrow in fig. 322) and by the shape of the distal lobes of the main branch of the procurus (figs. 323–324). *M. wigi* is very similar in shape but has relatively and absolutely much larger palps (note that figs. 319–324 are all drawn to the same scale), and the PME are farther apart.

MALE (holotype): Total length 6.1, carapace width 0.87. Leg 1: 24.7 (6.5 + 0.4 + 5.6 + 9.7 + 2.5), tibia 2: 4.4, tibia 3: 2.9, tibia 4: 4.9. Habitus and prosoma shape similar to *M. gracilis* (cf. figs. 293, 294, 297, 298), but carapace more roundish in dorsal view. Carapace ochre, proximal part of clypeus light brown; sternum whitish. Distance PME-PME 0.185; diameter PME 0.105; distance PME-ALE 0.035; with distinct black spots in AME position, but without lenses. Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur ventrodistally with distinct bulge; procurus and bulb as in figs. 322–324. Legs pale ochre, patella area and tibia–metatarsus joints darker; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 1.9%; tarsi without pseudosegmentation. Opisthosoma shape as in *M. gracilis* (cf. fig. 293), pale ochre.

VARIATION: Tibia 1 in 4 other males: 6.8, 7.2, 7.3, 7.5.

FEMALE: Very similar to male. Tibia 1 in



Figs. 319–324. *Micromerys wigi* (319–321), and *M. gidil* (322–324). **319, 322.** Left genital bulbs, prolateral views; unshafted arrow: diagnostic notch. **320, 323.** Left procursi, prolateral views; shafted arrow: translucent fringed projection. **321, 324.** Left procursi, retrolateral views. Scale line: 0.5 mm (319–324).

2 females: 5.9, 6.0. Epigynum extremely simple, unpigmented, roundish protruding plate (similar to *M. raveni*, cf. fig. 337); dorsal view similar to *M. daviesae* (cf. fig. 328).

DISTRIBUTION: Known only from the Cairns area, Queensland (map 16).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Gordonvale: Male holotype above; Bellenden Ker Range, Cableway Base Stn (17°16'S, 145°54'E), 100 m elev., Oct. 17–24, 1981 (Earthwatch/QMB), 1♂ 1♀ 2 juveniles (QMB S27754).

Micromerys daviesae Deeleman-Reinhold,
1986

Figures 325–333

Micromerys daviesae Deeleman-Reinhold, 1986b:
209–210, figs. 10–17, 24, 59d, 60.

TYPE: Male holotype and female paratype from Finch Hatton (21°09'S, 148°38'E), Queensland, Australia; Apr. 10, 1975 (R. Kohout, V. E. Davies), tangled web under leaf, in QMB (S888), examined.

DIAGNOSIS: Easily distinguished from congeners by the single-pointed end of the main branch of the procursus (figs. 326, 327).

MALE (Rundle Range): Total length 6.0, carapace width 0.97. Leg 1: 26.5 (6.8 + 0.4 + 6.0 + 10.5 + 2.8), tibia 2: 4.9, tibia 3: 3.5, tibia 4: 5.6; tibia 1 l/d: 75. Habitus and prosoma shape similar to *M. gracilis* (cf. figs. 293, 294, 297, 298), but carapace more roundish in dorsal view. Entire prosoma pale ochre, proximal part of clypeus darker; sternum whitish. Distance PME-PME 0.280; diameter PME 0.105; distance PME-ALE 0.035; no trace of AME. Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur with ventrodistal bulge and procursus and bulb distinctive (figs. 325–327); tip of trochanter apophysis as in fig. 333; tip of hinged process as in fig. 331; palpal tarsal organ as in fig. 330. Legs pale ochre, patella area and tibia–metatarsus joints darker; apparently without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 3.5%; tarsi without pseudosegmentation (fig. 332). Opisthosoma shape as in *M. gracilis* (cf. fig. 293); monochromous pale ochre; gonopore with four epiandrous spigots (fig. 329).

VARIATION: Tibia 1 in 3 other males: 5.7, 6.7 (holotype), 6.9. (Note that the original measurements are mostly wrong, based on miscalibration and mismeasurement; e.g., tibia 1 is 8.1 instead of 6.7, tibia 1 is shorter than tibia 2; etc.)

FEMALE: In general very similar to male, but clypeus proximally not darker. Tibia 1 in female paratype: 6.0. Epigynum very simple, unsclerotized, similar to *M. raveni* in ventral view (cf. fig. 337); dorsal view as in fig. 328.

DISTRIBUTION: Widely distributed in midle-eastern Queensland (map 16).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Finch Hatton: Male holotype and female paratype above; Brandy Creek, E of Proserpine (20°21'S, 148°43'E), Apr. 24, 1975 (R. Monroe, V. E. Davies), 1♂ (QMB S889); Rundle Range (23°29'S, 150°59'E), on trees, Mar. 24–31, 1975 (R. Kohout, V. E. Davies), 3♂ 1♀ (QMB S49766); same data, 1♂ 1♀ (QMB S890).

Micromerys raveni, new species

Figures 334–338

TYPE: Male holotype from Stott's Island (28°14'S, 153°31'E), New South Wales, Australia; Nov. 18, 1978 (R. Raven), in QMB (S34684).

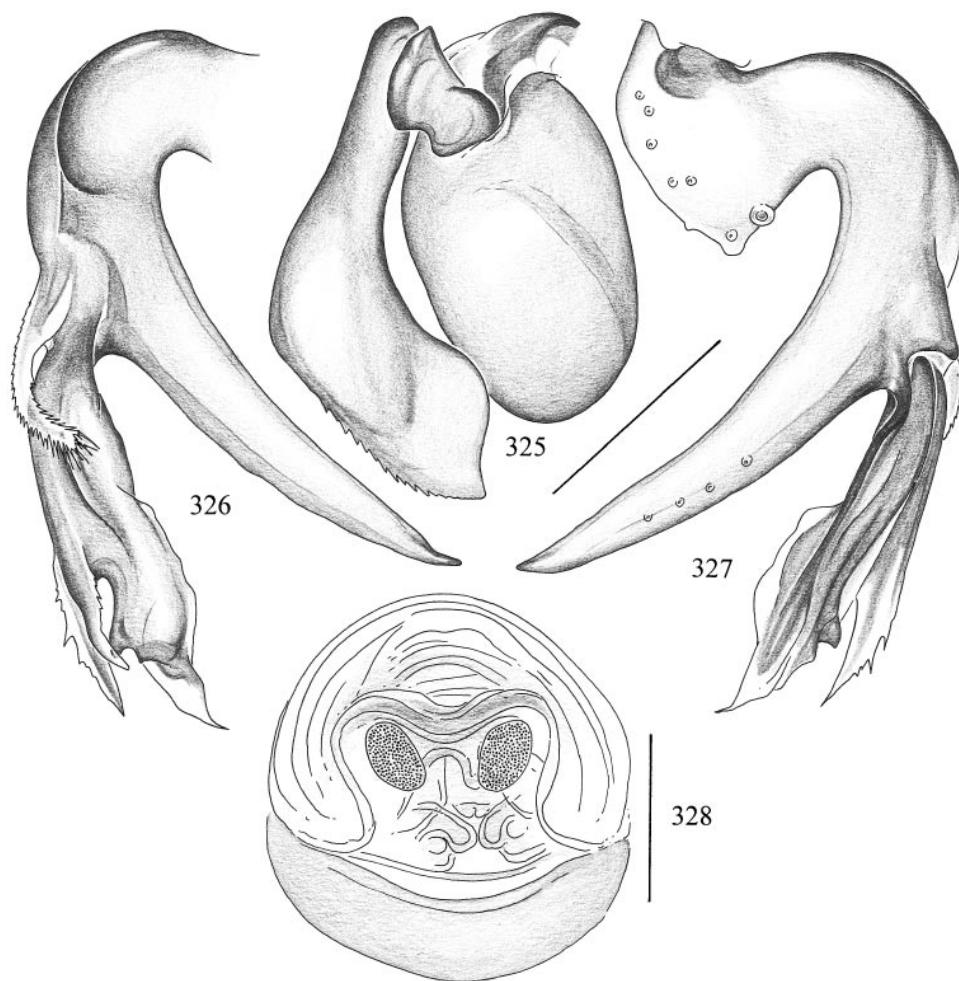
ETYMOLOGY: Named for the collector of the type material and of many more pholcids in the Queensland Museum in Brisbane.

DIAGNOSIS: Easily distinguished from congeners by the two pointed lobes distally on the main branch of the procursus (figs. 335, 336).

MALE (holotype): Total length 5.8, carapace width ~0.84 (deformed). Leg 1: 30.5 (7.9 + 0.4 + 7.2 + 11.9 + 3.1), tibia 2: 5.7, tibia 3: 3.9, tibia 4: 6.5; tibia 1 l/d: 83. Habitus and prosoma shape as in *M. gracilis* (cf. figs. 293, 294, 297, 298). Entire prosoma pale ochre, proximal part of clypeus light brown; sternum whitish. Distance PME-PME 0.280; diameter PME 0.100; distance PME-ALE 0.025; single black spot in area of AME. Chelicerae as in *M. gracilis* (cf. fig. 299). Palps in general as in *M. gracilis* (cf. figs. 295, 296), but femur ventrodistally with rounded bulge; procursus, bulb, and trochanter apophysis as in figs. 334–336. Legs pale ochre, patella area and tibia–metatarsus joints darker; apparently without spines, curved, and vertical hairs (many hairs missing); retrolateral trichobothrium of tibia 1 at 2.0%; tarsi without pseudosegmentation. Opisthosoma shape as in *M. gracilis* (cf. fig. 293); monochromous pale ochre.

VARIATION: Tibia 1 in 2 other males: 6.8, 6.9.

FEMALE: In general very similar to male, but clypeus proximally not darker. Tibia 1 in 2 females: 5.9, 6.0. Epigynum very simple, unpigmented roundish protruding plate (fig. 337); dorsal view as in fig. 338.



Figs. 325–328. *Micromerys daviesae*. **325.** Left genital bulb, prolateral view. **326, 327.** Left pro-cursus, prolateral (326) and retrolateral (327) views. **328.** Epigynum, dorsal view. Scale lines: 0.3 mm (325–328).

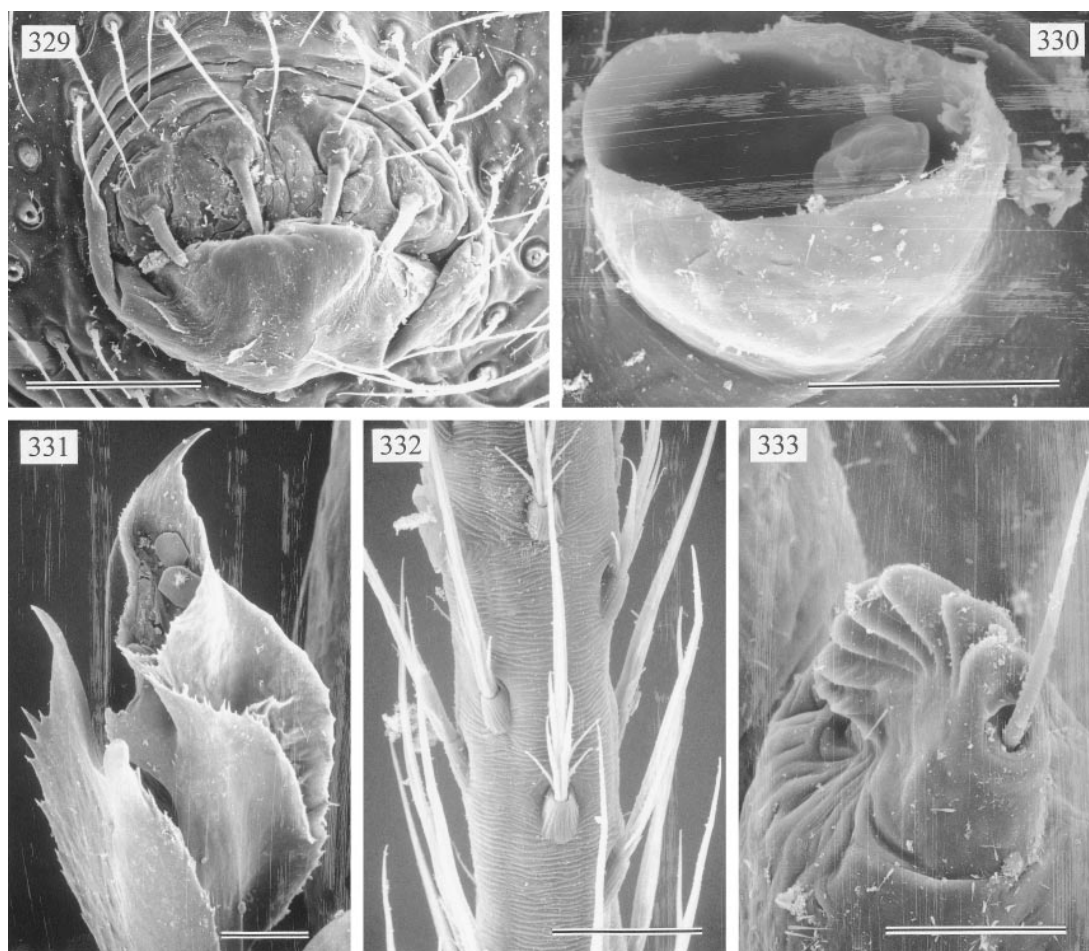
DISTRIBUTION: Known from southeastern Queensland and northeastern New South Wales (map 16).

MATERIAL EXAMINED: AUSTRALIA: *New South Wales*: Stott's Island: Male holotype above, with 1♂ 2♀ 2 juveniles (QMB S49765). *Queensland*: Searys Scrub, Cooloola (26°12'S, 153°03'E), Feb. 3, 1976 (R. Raven, V. E. Davies), 1♂ 1♀ 1 juvenile (QMB S49767).

PHOLCUS WALCKENAER, 1805

REMARKS: With currently 110 nominal species, *Pholcus* is by far the largest genus

in pholcids. At first, it might seem that this simply results from *Pholcus* being the type genus, to which species were assigned before the establishment of other genera, and to which species tend to be assigned by workers unfamiliar with the other genera. Surprisingly, however, this seems not to be the case. Most of the "old" species not closely related to the type species have been removed (58 species previously assigned to *Pholcus* have been synonymized or transferred to other genera), and among the remaining 110 species there are very few that are obviously (e.g., *P. everesti* Hu and Li) or probably



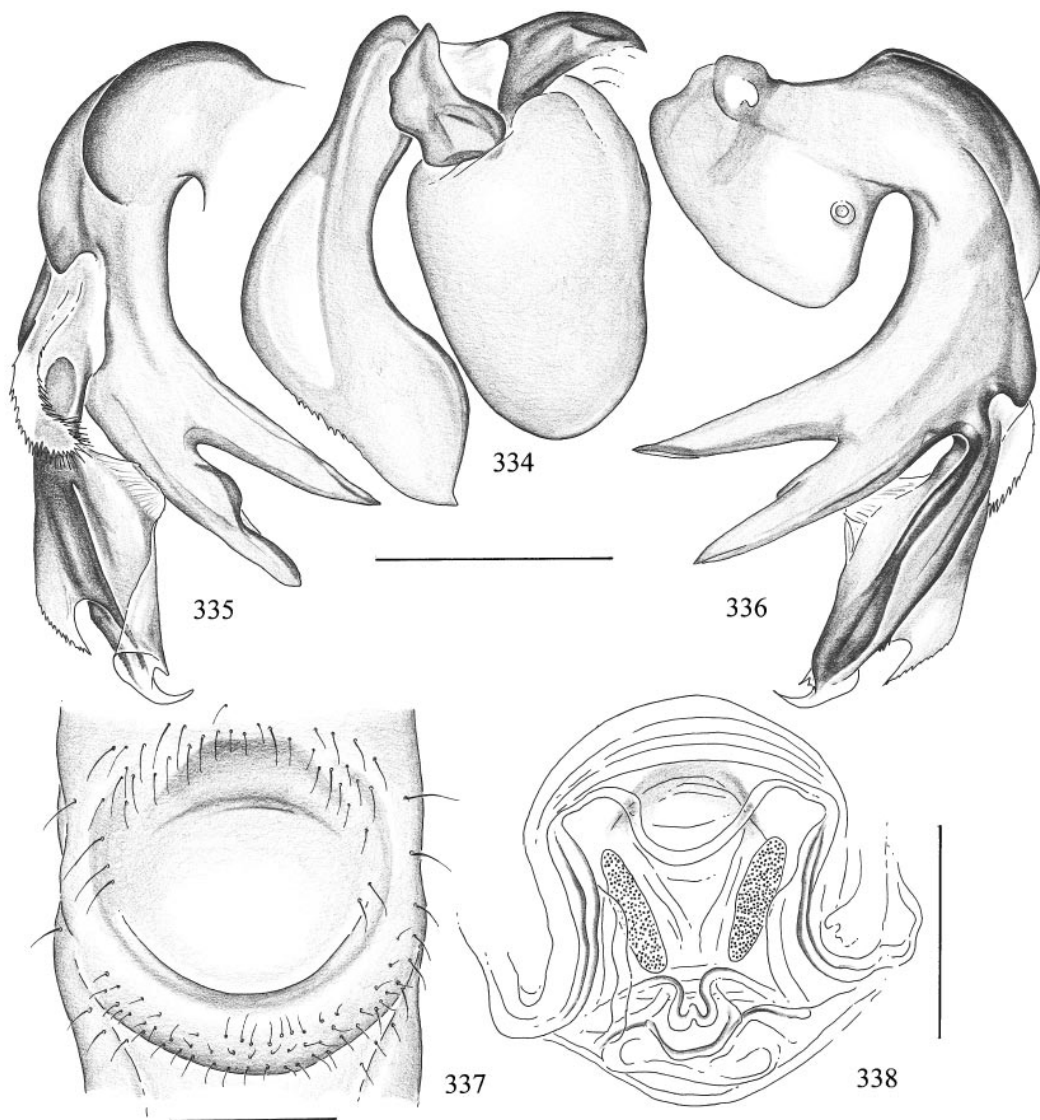
Figs. 329–333. *Micromerys daviesae*, male. **329.** Gonopore, showing four epiandrous spigots. **330.** Palpal tarsal organ. **331.** Tip of hinged process of right procursus, prolateral view. **332.** Male tarsus I near tip, showing absence of pseudosegmentation. **333.** Tip of male palpal trochanter apophysis. Scale lines: 50 μm (329, 331), 20 μm (330, 332, 333).

(e.g., *P. ciliatus* Lawrence) misplaced. At the same time, some species currently placed in other genera might actually be *Pholcus* (e.g., *Spermophora elongata* Yin and Wang; *S. longiventris* Simon; *S. faveauxi* Lawrence).

The characters most useful in distinguishing *Pholcus* from other genera seem to be the projections from the bulb, traditionally called uncus, appendix, and embolus (“u”, “a”, and “e” in figs. 358, 372). The uncus is usually large, rather flat, heavily sclerotized, and is provided with many teeth or scales. The appendix is smaller, usually hook-shaped, also sclerotized, and is either a single rod or split into two or even three parts. The em-

bolus lies between the uncus and appendix, is soft and transparent, and is thus easy to overlook. Other characters, not exclusive for *Pholcus*, are the conservative male chelicerae (a pair of dark frontal apophyses and a pair of light lateral apophyses; e.g., figs. 339, 369), the shape of the procursus (usually with ventral boss; e.g., figs. 343, 366), and the knob- or worm-shaped apophysis on the often roughly triangular or oval epigynum.

Most *Pholcus* species further share a cylindrical opisthosoma and eight eyes with lateral triads and small AME. The latter character is especially interesting, as eye position has traditionally been a key character for dis-



Figs. 334–338. *Micromerys raveni*. **334.** Left genital bulb, prolateral view. **335, 336.** Left procursus, prolateral (335) and retrolateral (336) views. **337, 338.** Epigynum, ventral (337) and dorsal (338) views. Scale lines: 0.3 mm (334–338).

tinguishing pholcid genera. However, a recent cladistic analysis (Huber, 2000) has suggested that AME have been lost many times independently, and thus it comes as no surprise that this has also happened in *Pholcus*. The new Australian species described below as *P. tagoman* has the unmistakable genitalia of a real *Pholcus*, but it lacks any trace of the AME. I strongly suspect that *Spermophora elongata* was assigned to *Spermophora*

simply because it lacks AME, but the genitalia and the long opisthosoma suggest it is also a six-eyed *Pholcus*.

The real taxonomic problem in *Pholcus* is its relationship to other genera of the *Pholcus* group, especially to *Leptopholcus* (Brignoli, 1980). This genus shares with *Pholcus* all details of the chelicerae (including the modified hairs imbedded in the frontal apophyses), has a bulbal projection that seems to be a ho-

mologue of the uncus, and has a soft transparent embolus, but apparently no appendix. Some Korean and northern Chinese *Pholcus* species seem indistinguishable in their genitalia from *Leptopholcus* (e.g., most or all of those described in Paik [1978] as well as *P. gaoi* Song and Ren, and *P. kwanaksaensis* Namkung and Kim). In fact, *Leptopholcus* might just be a polyphyletic group of pale, leaf-dwelling *Pholcus* species with a tendency to reduce the AME and the appendix.

More relevant for the present work is the presence of indigenous species of *Pholcus* in Australia. The only species previously recorded (except *P. phalangioides*) was *P. litoralis* Koch, 1867. It is thus not surprising that most *Pholcus* material in the collections had been identified as either *P. phalangioides* or *P. litoralis*. However, there is strong evidence that *P. litoralis* is a synonym of *P. phalangioides*; that is, the illustrations in Koch (1872) clearly resemble *P. phalangioides* rather than any of the species newly described herein, and at least two of the three putative syntypes in the ZMH are *P. phalangioides* (one male from Sydney and one female without locality information; the third specimen is a female from Queensland, but it lacks the opisthosoma; all were examined). All three vials carry labels presumably handwritten by Koch himself, and the last two could actually be types (the type localities are Brisbane and Rockhampton). Therefore, *P. litoralis* Koch, 1867 is here synonymized with *P. phalangioides* (Fuesslin, 1775) (NEW SYNONYMY).

A surprising fact is that *P. ancoralis* Koch, 1865, which is very widespread in the Pacific region, is absent from the Australian collections studied. I have seen the type material of this species (one male, two female prosomata from Upolu, Samoa Islands, in the ZMH) and numerous further specimens from the Samoa Islands (Sava'i), Fiji Islands, Moorea Islands (near Tahiti), New Hebrides (Espíritu Santo), and Loyalty Islands (Uréa) (all in AMNH). In contrast to the species newly described below, *P. ancoralis* is a representative of a mainly southeast Asian species group characterized by a pair of horns between the eye triads (including in addition at least *P. bicornutus* Simon from the Philippines and *P. dentifrons* Thorell from Burma).

Therefore, *Pholcus* is currently represented in Australia by *P. phalangioides* and the four species newly described below. Three of the endemic species occur in northern Queensland and are closely related to each other. The QMB has another closely related species, represented by a single poorly preserved specimen from Horn Island, Torres Strait. The six-eyed *P. tagoman* is restricted to the tropical north of Northern Territory, to Kimberley in Western Australia, and possibly reaches into northwestern Queensland. Its closest known relative is an undescribed species (or maybe two species) from Malaysia (in WAM 99/1994–5) and (interestingly) the Seychelles (M. Saaristo, unpubl. ms). The male pholcid from Sumatra identified by Kritscher (1957) (possibly correctly) as *Spermophora longiventris* Simon also belongs in this group. In fact, the Malaysian specimens mentioned above might be "*Spermophora*" *longiventris*.

Pholcus jinwum, new species

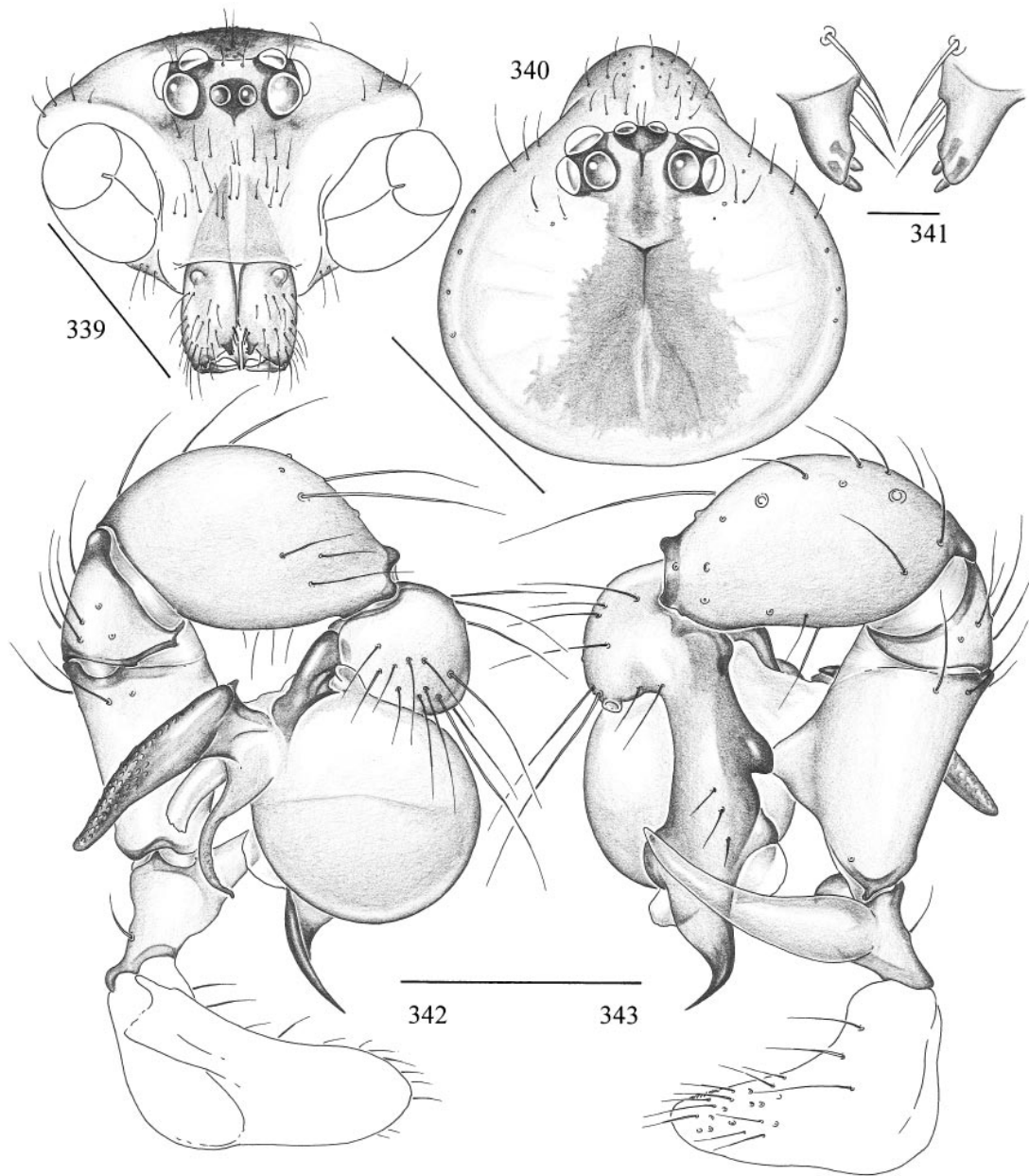
Figures 339–353

TYPE: Male holotype from of E Claudie Scrub, Iron Range (12°43'S, 143°18'E), Queensland, Australia; June 26, 1976 (collector unknown), in QMB (S34689).

ETYMOLOGY: Named for the Jinwum, an aboriginal tribe in the Iron Range area, northern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Similar to *P. dungara*, distinguished by the shape of the procurus (compare figs. 343 and 355) and by the dark pattern on the epigynum (compare figs. 347 and 356).

MALE (holotype): Total length 6.9, carapace width 1.9. Leg 1: 48.4 (12.0 + 0.8 + 11.9 + 20.9 + 2.8), tibia 2: 8.3, tibia 3: 6.1, tibia 4: 7.7; tibia 1 l/d: 66. Prosoma shape as in figs. 339 and 340. Carapace ochre, with brown mark broadly connecting to ocular area (fig. 340); ocular area brown, clypeus ochre, without marks; sternum ochre to light brown. Distance PME-PME 0.295; diameter PME 0.160; distance PME-ALE 0.025; diameter AME 0.120. Chelicerae as in fig. 339, with pair of black apophyses distally that are provided with two modified hairs each (fig. 341), and pair of unsclerotized rounded



Figs. 339–343. *Pholcus jinwum*, male. **339, 340.** Prosoma, frontal and dorsal views. **341.** Distal apophyses on chelicerae, with modified hairs. **342, 343.** Left palp, prolateral (342) and retrolateral (343) views. Scale lines. 1 mm (339, 340), 0.5 mm (342, 343), 0.05 mm (341).

apophyses proximolaterally. Palps as in figs. 342 and 343; procursus as in fig. 344. Tarsal organ capsulate. Legs ochre, distal ends of femora and tibiae whitish, without dark rings; without spines, without curved and vertical hairs; retrolateral trichobothrium of

tibia 1 at 4%; tarsal pseudosegments hardly visible in dissecting microscope, but regular in SEM (fig. 351). Opisthosoma shape as in figs. 345 and 346; pale ochre, dorsally with brown pattern as in fig. 345, ventrally with long brown line (fig. 346); gonopore in

scanned male with five epiandrous spigots (fig. 350); several piriform gland spigots on ALS (fig. 353).

VARIATION: Tibia 1 in 8 males: 8.0–14.5 (\bar{x} = 11.4). In some specimens the proximal cheliceral apophyses are slightly closer together.

FEMALE: In general very similar to male. Tibia 1 in 5 females: 8.7–10.8 (\bar{x} = 9.6). Tip of palpal tarsus as in fig. 352. Epigynum as in fig. 347, ochre with distinctive light brown pattern; with worm-shaped “knob” (arrows in figs. 347, 348). Dorsal view as in fig. 348, ventral cleared view as in fig. 349.

DISTRIBUTION: Known from several localities in northern Queensland (map 17).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: E of Claudie Scrub, Iron Range: Male holotype above, with 5♂ 3♀ 1 juvenile (QMB S49779); Portland Roads (12°35'S, 143°23'E), May 31–June 4, 1948 (Archbold Exped.), 1♀ assigned tentatively, in AMNH; Wenlock River Road Xing Moreton (12°03'S, 141°56'E), Sept. 11, 1985 (M. Bennie), 2♀ assigned tentatively, (QMB S49777); Prince of Wales Island (10°41'S, 142°09'E), July 3, 1976 (E. Cameron), 1♂ (QMB S50230); same locality, Feb. 11, 1975 (E. Cameron), 1♀ (QMB S50219); Horn Island, Torres Strait (10°37'S, 142°17'), Dec. 2–8, 1986 (J. Gallon), open forest, 1♂ 1♀ (QMB S12358); same locality, July 23, 1975 (H. Heatwole, E. Cameron), 2♀ (QMB S50220); Normandy Stn (15°23'S, 144°52'E), Sept. 13–17, 1984 (C. Fearnley), sandstone cliffs, 1♂ (QMB S49776).

***Pholcus dungara*, new species**

Figures 354–357

TYPE: Male holotype from Barron Gorge (16°50'S, 145°38'E), Queensland, Australia; Jan. 1981 (R. R. Jackson), in QMB (S34686).

ETYMOLOGY: Named for the Irukandji (also called Dungara), an aboriginal tribe from the Cairns area, northeastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Very similar to *P. jinwum*, distinguished only by the shape of the procurus (compare figs. 343 and 355) and by the dark pattern on the epigynum (compare figs. 347 and 356).

MALE (holotype): Total length 6.8, carapace width 1.8. Leg 1: 14.4 + 0.9 + 14.7, metatarsus and tarsus missing, tibia 2: 9.7, tibia 3: 6.7, tibia 4 missing; tibia 1 l/d: 79. Habitus and prosoma shape as in *P. jinwum* (cf. figs. 339, 340). Brown mark on carapace similar to *P. jinwum* (cf. fig. 340), but wider; ocular area brown, clypeus ochre, without marks; sternum pale ochre with small brown mark posteriorly. Distance PME-PME 0.265; diameter PME 0.120; distance PME-ALE 0.040; diameter AME 0.080. Chelicerae as in *P. jinwum* (cf. fig. 339), but with additional indistinct hump between proximal apophyses. Palps in general as in *P. jinwum* (cf. figs. 342, 343), only procurus distinctively different (figs. 354, 355). Legs light brown, distal ends of femora and tibiae lighter; without dark rings; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 4%; tarsus 2 distally with ~9 fairly distinct pseudosegments, proximally pseudosegments not visible in dissecting microscope. Opisthosoma shape as in *P. jinwum* (cf. fig. 345), with very similar brown pattern; four epiandrous spigots clearly visible in dissecting microscope.

FEMALE: In general very similar to male. Tibia 1 in 2 females: 12.7, 14.3. Epigynum as in fig. 356, ochre with distinctive light brown arch in front; worm-shaped “knob” not visible in ventral view. Ventral cleared view as in fig. 357 (arrow points to small knob).

DISTRIBUTION: Known only from type locality near Cairns, Queensland (map 17).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Barron Gorge: Male holotype above, with 1♂ 3♀ (QMB S49782).

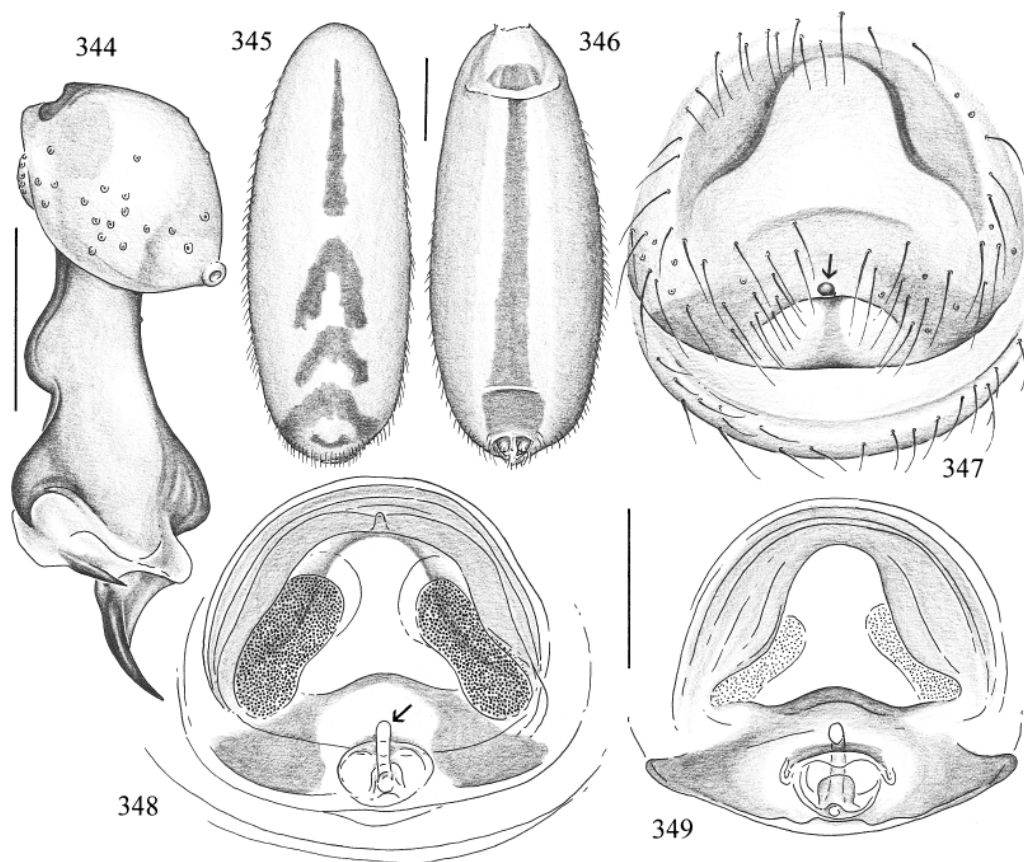
***Pholcus koah*, new species**

Figures 358–362

TYPE: Male holotype from Koah Road (16°49'S, 145°31'E), Queensland, Australia; Apr. 2, 1972 (N. Clyde Coleman), in QMB (S34690).

ETYMOLOGY: Named for the type locality. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from the similar *P. dungara* and *jinwum* by the shape of the procurus (simple tip with two distinctive pointed terminal apophyses; figs. 359, 360)



Figs. 344–349. *Pholcus jinwum*. **344.** Procursus, prolateral view. **345, 346.** Male opisthosoma, dorsal (345) and ventral (346) views. **347–349.** Epigynum, ventral (347), dorsal (348), and cleared ventral (349) views; arrows: worm-shaped “knob”. Scale lines: 1 mm (345, 346), 0.3 mm (344, 347–349).

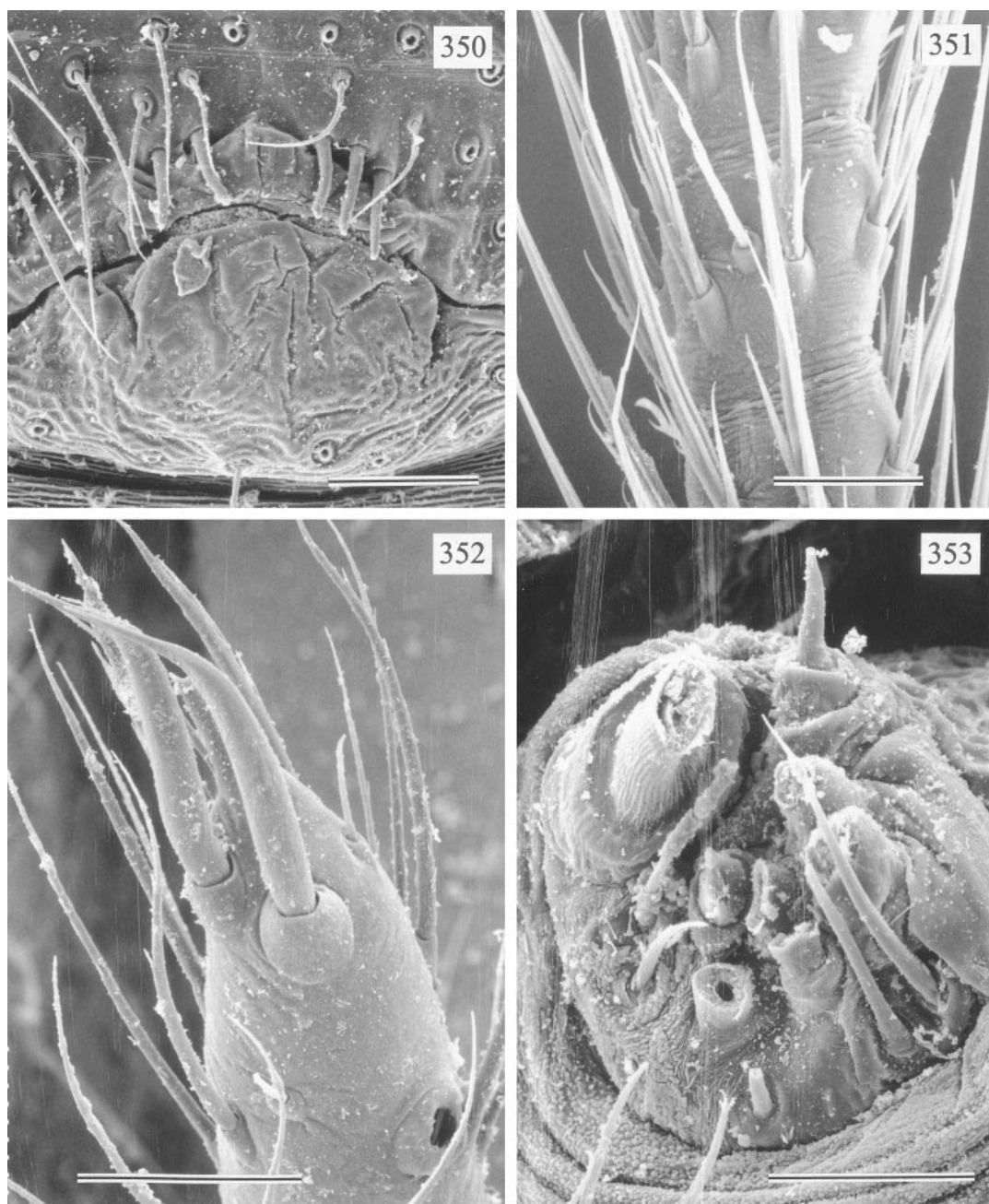
and from *P. jinwum* also by the dark pattern on the epigynum (compare figs. 347 and 361).

MALE (holotype): Total length 6.6, carapace width ~ 1.9 (deformed). Leg 1: 46.2 ($11.3 + 0.9 + 11.4 + 19.7 + 2.9$), tibia 2: 8.1, tibia 3 missing, tibia 4: 7.7; tibia 1 l/d: 59. Habitus and prosoma shape as in *P. jinwum* (cf. figs. 339, 340). Brown mark on carapace similar to *P. jinwum* (cf. fig. 340), but without connection to ocular area; ocular area brown, clypeus ochre, without marks; sternum light brown with ochre-yellow margins. Distance PME-PME 0.280; diameter PME 0.160; distance PME-ALE 0.040; diameter AME 0.135. Chelicerae similar to *P. jinwum* (cf. fig. 339), but proximal apophyses closer together, more pointed and directed upward. Palps in general as in *P. jinwum*

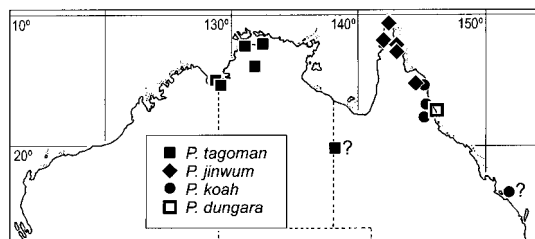
(cf. figs. 342, 343); bulb almost identical (fig. 358); ventral femur apophysis slightly more proximal; procurus distinctively different (figs. 359, 360). Legs light brown, distal ends of femora and tibiae lighter; without dark rings; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 3.5%; tarsus 1 with many pseudo-segments, but only ~ 13 distal ones distinct in dissecting microscope. Opisthosoma shape as in *P. jinwum* (cf. figs. 345, 346), with very similar brown pattern.

FEMALE: In general very similar to male. Tibia 1 in 4 females: 9.3, 9.5, 10.0, 10.0. Epigynum as in fig. 361; ochre with light brown arch in front, only tip of knob visible in ventral view. Dorsal view as in fig. 362 (arrows point to worm-shaped “knob”).

DISTRIBUTION: Known from three localities



Figs. 350–353. *Pholcus jinwum*. **350.** Male gonopore, with five epiandrous spigots. **351.** Pseudo-segmentation on male tarsus 2. **352.** Tip of female palp. **353.** Male ALS, with several piriform gland spigots. Scale lines: 60 μm (350, 352), 30 μm (351, 353).



Map 17. Distribution of the genus *Pholcus* in Australia (except *P. phalangioides*). ? = female specimens assigned tentatively.

in the Cairns area, northeastern Queensland, and possibly from Heron Island, southeastern Queensland (map 17).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Koah Road: Male holotype above, with 2♀ (QMB S49774); Amos Bay

(15°41'S, 145°20'E), May 14, 1973 (V. E. Davies), 1♀ assigned tentatively (QMB S49775); Mt. Garnet (17°41'S, 145°07'E), Feb. 24, 1972 (N. Clyde Coleman), 1♂ (QMB S49773); Heron Island (23°27'S, 151°55'E), July 31, 1976 (T. Newcomb), 2♀ assigned tentatively (QMB S49780).

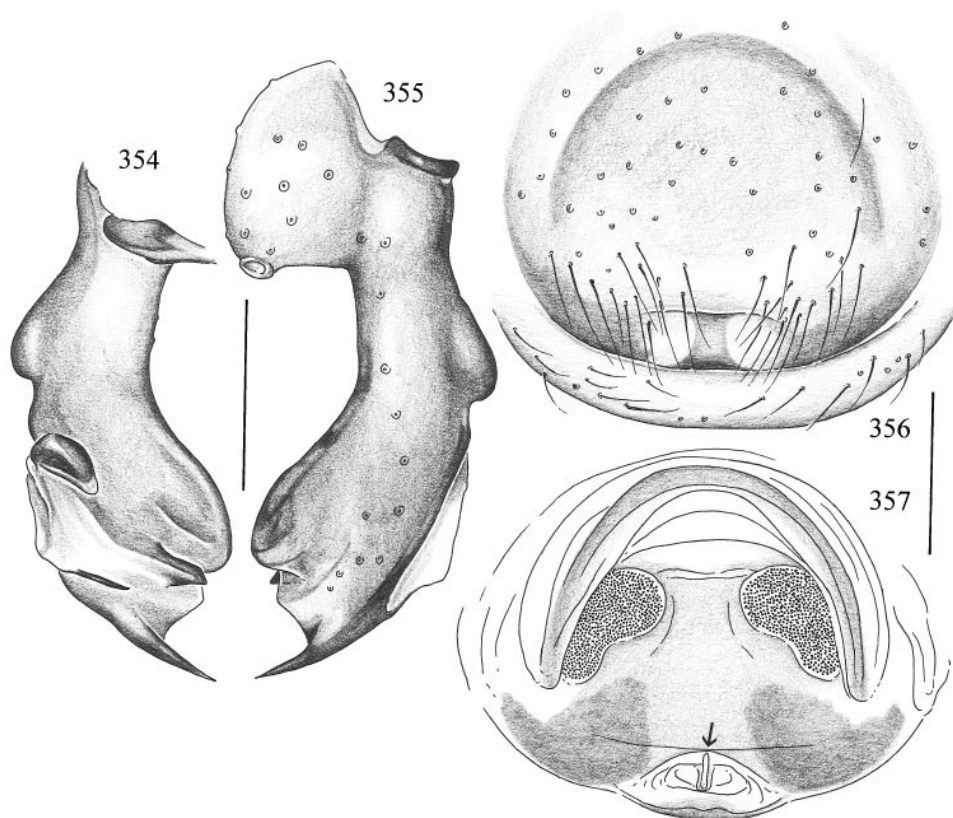
***Pholcus tagoman*, new species**

Figures 363–377

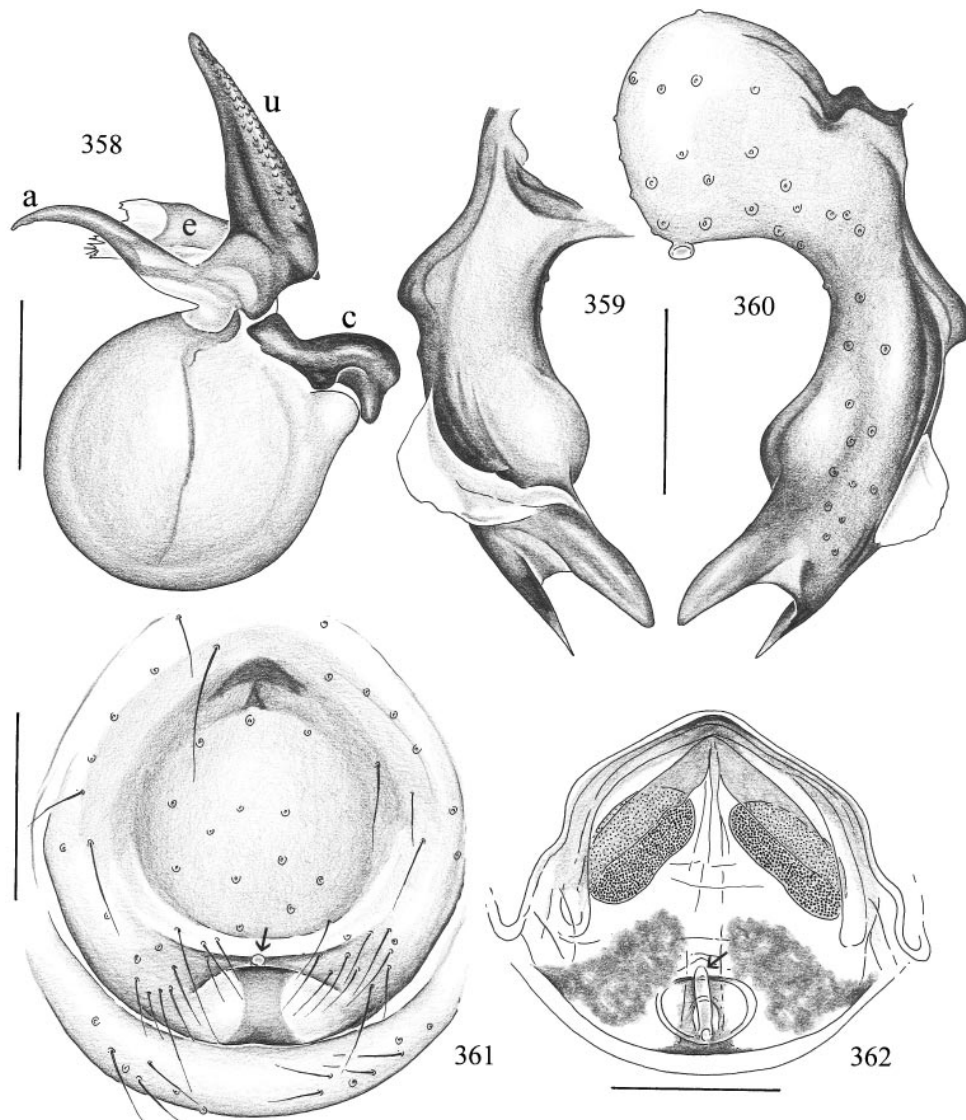
TYPE: Male holotype from Ningbing Cave, cave KNI-19 (15°18'S, 128°37'E), Western Australia; May 10, 1994 (R. D. Brooks), in WAM (99/2062).

ETYMOLOGY: Named for the Tagoman, an aboriginal tribe in the Daly River area in Northern Territory. The species name is a noun in apposition.

DIAGNOSIS: Easily distinguished from Aus-



Figs. 354–357. *Pholcus dungara*. **354, 355.** Left procurrus, prolateral (354) and retrolateral (355) views. **356, 357.** Epigynum, ventral (356) and cleared ventral (357) views; arrow: worm-shaped “knob”. Scale lines: 0.3 mm.



Figs. 358–362. *Pholcus koah*. **358**. Left genital bulb, prolateral view; “a” = appendix; “e” = embolus; “u” = uncus; “c” = connecting piece between bulb and cymbium. **359, 360**. Left procursus, prolateral (359) and retrolateral (360) views. **361, 362**. Epigynum, ventral (361) and dorsal (362) views; arrows: worm-shaped “knob”. Scale lines: 0.3 mm.

tralian congeners by the absence of AME; from other described species also by the shapes of the bulbal apophyses and the procursus (figs. 365, 366, 371, 372). A very similar species occurs on the Seychelles (M. Saaristo, unpubl. MS). It differs by having a broader uncus and an appendix ending in two tips. Two specimens from Malaysia (WAM 99/1494–5) and the male identified by

Kritscher (1957) (possibly correctly) as *Spermophora longiventris* Simon might be conspecific with the Seychellian specimens. Finally, a single female specimen from Christmas Island, Phosphate Hill (10°26'S, 105°42'E) in the WAM (99/1512) might be conspecific with any of these species.

MALE (holotype): Total length 3.8, carapace width 1.0. Leg 1: 37.3 (9.2 + 0.5 + 9.5

+ 16.8 + 1.3), tibia 2: 5.6, tibia 3: 3.6, tibia 4: 5.3; tibia 1 l/d: 101. Habitus and prosoma shape as in figs. 363, 364, and 367. Carapace ochre, with gray-brown median stripe; ocular area and clypeus without darker marks; sternum brown, shape as in fig. 368. Distance PME-PME 0.215; diameter PME 0.095; distance PME-ALE 0.025; AME absent. Chelicerae as in fig. 369, with pair of black apophyses distally (figs. 370, 376) and pair of unsclerotized rounded apophyses proximolaterally. Palps as in figs. 365 and 366, procursus and bulb as in figs. 371 and 372. Palpal tarsal organ capsulate (fig. 377), on conical projection of cymbium (fig. 366). Legs ochre-brown, with barely visible darker rings on femora (subdistally) and tibiae (proximally, subdistally); without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 2%; tarsus 1 with >13 pseudosegments (proximally they are difficult to count, distally they are quite distinct; fig. 375). Opisthosoma shape as in fig. 363; gray, with blackish spots except ventrally; genital plate not distinct. ALS with several piriform gland spigots.

VARIATION: Tibia 1 in 8 males: 6.8–9.7 (\bar{x} = 8.2). Opisthosoma in some males without dark spots.

FEMALE: In general very similar to male. Tibia 1 in 18 females: 5.5–8.5 (\bar{x} = 7.5). Epigynum as in fig. 373; gray as opisthosoma with darker structures shining through, only knob brown to black; dorsal view as in fig. 374, apparently with divided pore plate. (Using the light microscope I could not see whether both plates are actually pore plates.)

DISTRIBUTION: Apparently widely distributed in northern Northern Territory, extending into northeastern Western Australia and possibly into northwestern Queensland (map 17).

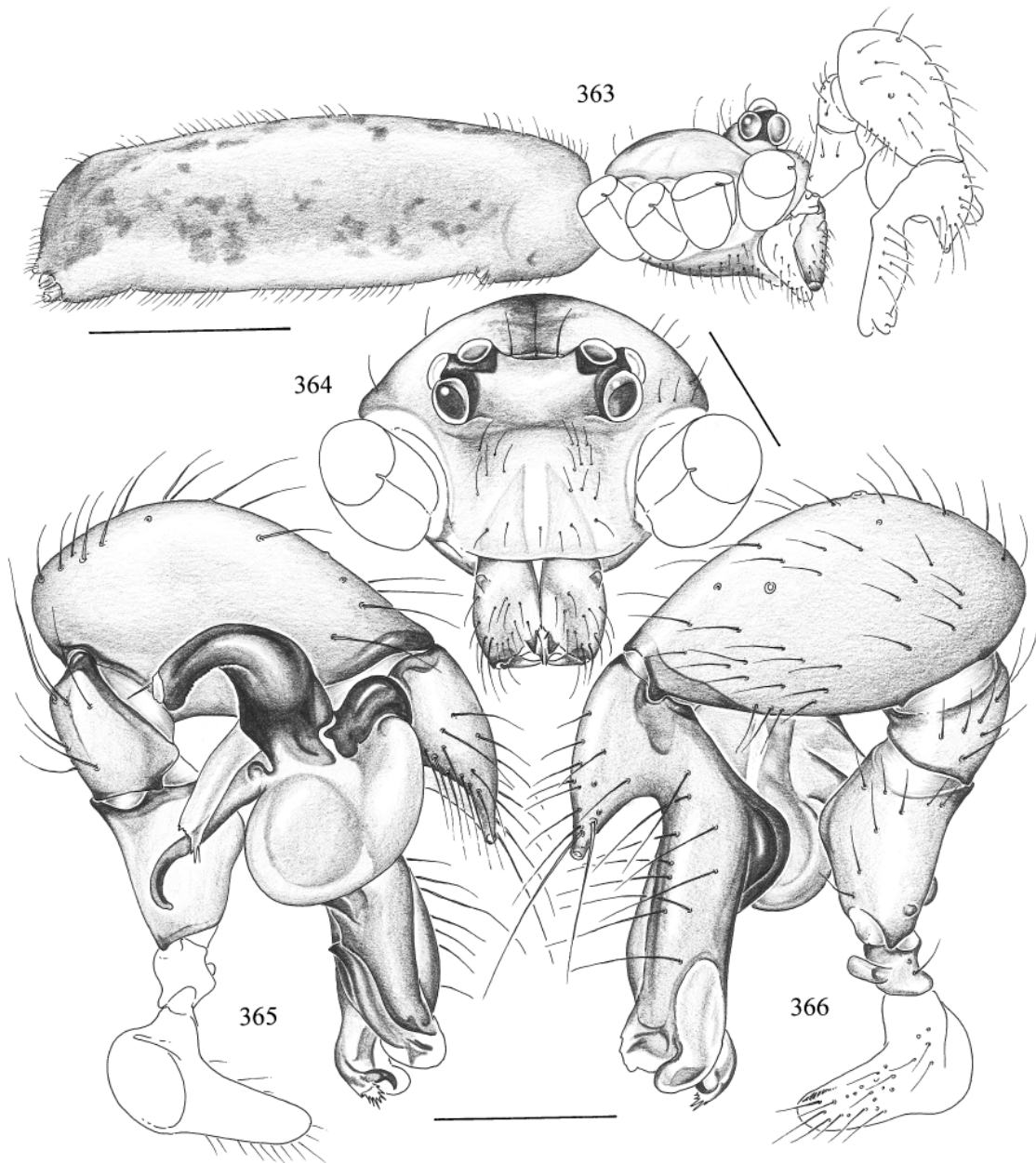
MATERIAL EXAMINED: AUSTRALIA: *Western Australia*: Ningbing Cave, cave KNI-19: Male holotype above, with 1 ♀ (WAM 99/2063); same data but May 7–June 21, 1994 (R. D. Brooks, B. Vine, W. Binks, K. Fear, C. Yeates, P. Fox, W. F. Humphreys), 1 ♂ 14 ♀ several juveniles (WAM 99/2048–53, 2064, 2067, 2070–87, 3196); Ningbing Cave, cave KNI-9 (15°17'S, 128°37'E), May 10, 1994 (R. D. Brooks), 1 ♀ (WAM 99/2065); Ningbing Cave, cave KNI-29 (15°16'S, 128°39'E), May 9, 1994 (R. D. Brooks), 1 ♂ 2 ♀ 5 juveniles

(WAM 99/2054–61); Ningbing Cave, cave KNI-27 (15°17'S, 128°41'E), May 16, 1994 (R. D. Brooks), 1 ♀ (WAM 99/2066); Jeremiah Hills, cave KJ8 (15°26'S, 128°44'E), May 17, 1994 (W. F. Humphreys), 1 ♂ 1 ♀ (WAM 99/2068–9); same locality, May 4, 1994 (B. Vine), 1 ♀ (WAM 99/2046); Point Spring Nature Reserve (15°25'S, 128°53'E), May 28–June 11, 1999 (M. Gray, G. Milledge, H. Smith), rainforest patch, 1 ♂ 1 ♀ (AMS KS56184–5); same data, under log, 1 ♂ 1 ♀ (AMS KS56186). *Northern Territory*: Cahills Crossing (12°25'S, 132°58'E), May 29, 1992 (M. S. Harvey, J. M. Waldo), 1 ♂ (WAM 99/1513); Cutta Cutta Cave, cave K-1 (14°35'S, 132°25'E), June 25, 1994 (B. Jones, W. Binks, R. D. Brooks), 2 ♂ 2 ♀ 6 juveniles (WAM 99/2035–44); Katherine, Cutta Cutta Guy Cave, 1988 (E. Holland), 1 ♂ (AMS KS22416); Kemp Airstrip (12°35'S, 131°20'E), rainforest, Nov. 15–16, 1979 (R. Raven), 1 ♂ (QMB S49805); Radon Creek (12°45'S, 132°53'E), rainforest, July 14–16, 1979 (G. Monteith, D. Cook), 1 ♀ 1 juvenile (QMB S49806). *Queensland*: Camooweal area, Great Nowranie Cave C-6 (~20°05'S, 138°10'E), 1996 (collector unknown), 1 ♀ (WAM 99/2106), assigned tentatively; same locality, Oct. 30, 1993 (S. Eberhard), 1 ♀ (AMS KS40772), assigned tentatively.

PANJANGE DEELEMEN-REINHOLD AND
DEELEMEN, 1983

REMARKS: I have seen only two of the six described species of the genus (*P. mirabilis* and *P. sedgwicki*), and can therefore only add a few details to what has been said before by Deelemen-Reinhold and Deelemen (1983), Deelemen-Reinhold (1986b), and Deelemen-Reinhold and Platnick (1986).

Several characters support the inclusion of *Panjange* in the *Pholcus* group of genera sensu Huber (1995). The ALS are provided with several piriform gland spigots (fig. 389), the tarsal organ is capsulate (fig. 388), and the male chelicerae are provided with proximal lateral apophyses (fig. 380). The knob-shaped apophysis at the tip of the epigynum (figs. 382, 383, 391) is here considered a homologue of a similar structure in *Pholcus* and a few related genera, but this may be wrong. In *Pholcus phalangioides* and *P. opilionoides*, this structure is grasped by the



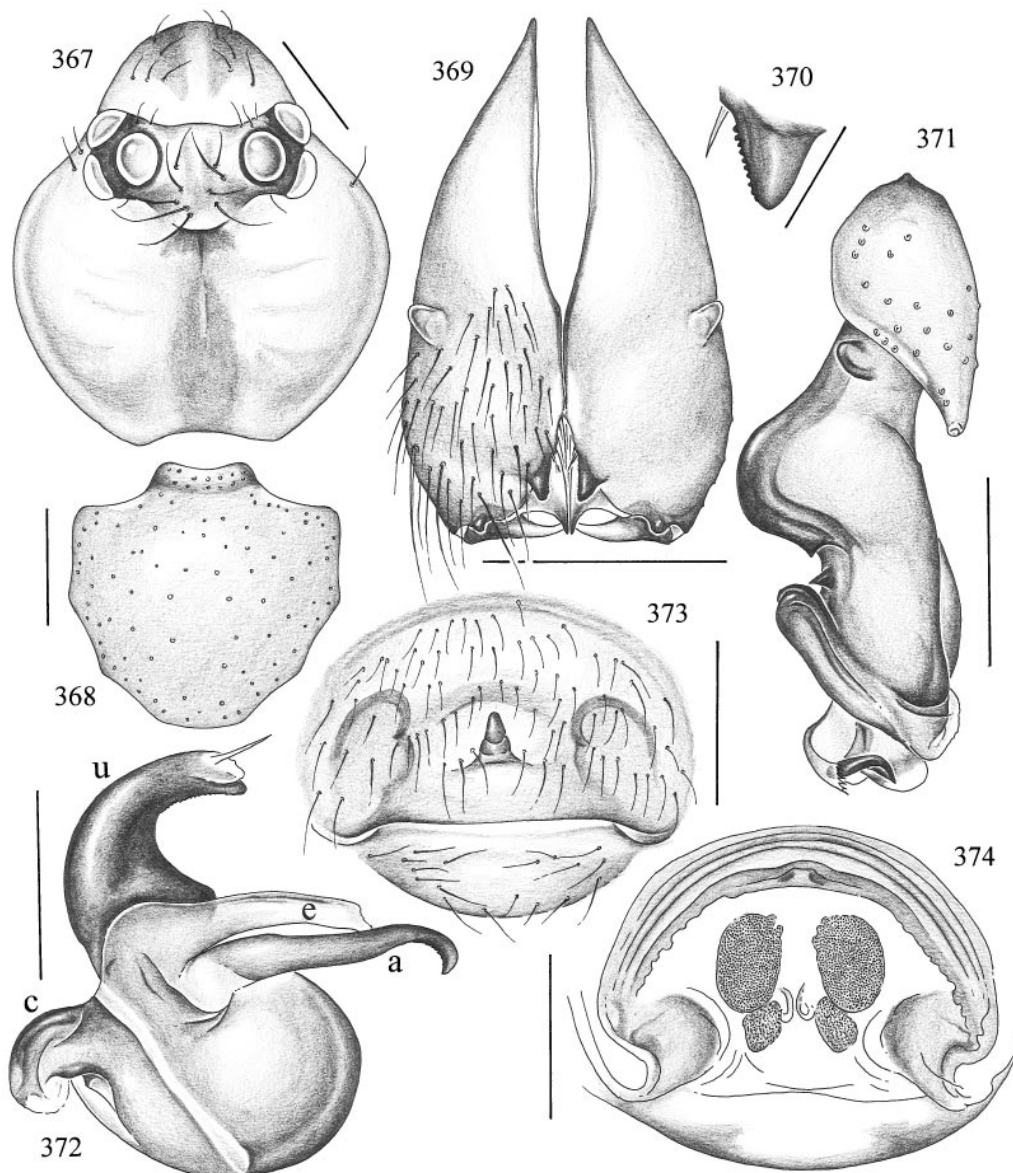
Figs. 363–366. *Pholcus tagoman*, male. **363.** Habitus. **364.** Prosoma, frontal view. **365, 366.** Left palp, prolateral (365) and retrolateral (366) views. Scale lines: 1 mm (363), 0.4 mm (364–366).

male frontal cheliceral apophyses during copulation (Uhl et al., 1995; Huber 1995); some *Panjange* species have these frontal apophyses, but the species redescribed herein lacks the apophyses but nevertheless has the female knob-shaped apophysis.

Panjange mirabilis Deeleman-Reinhold, 1986

Figures 378–391

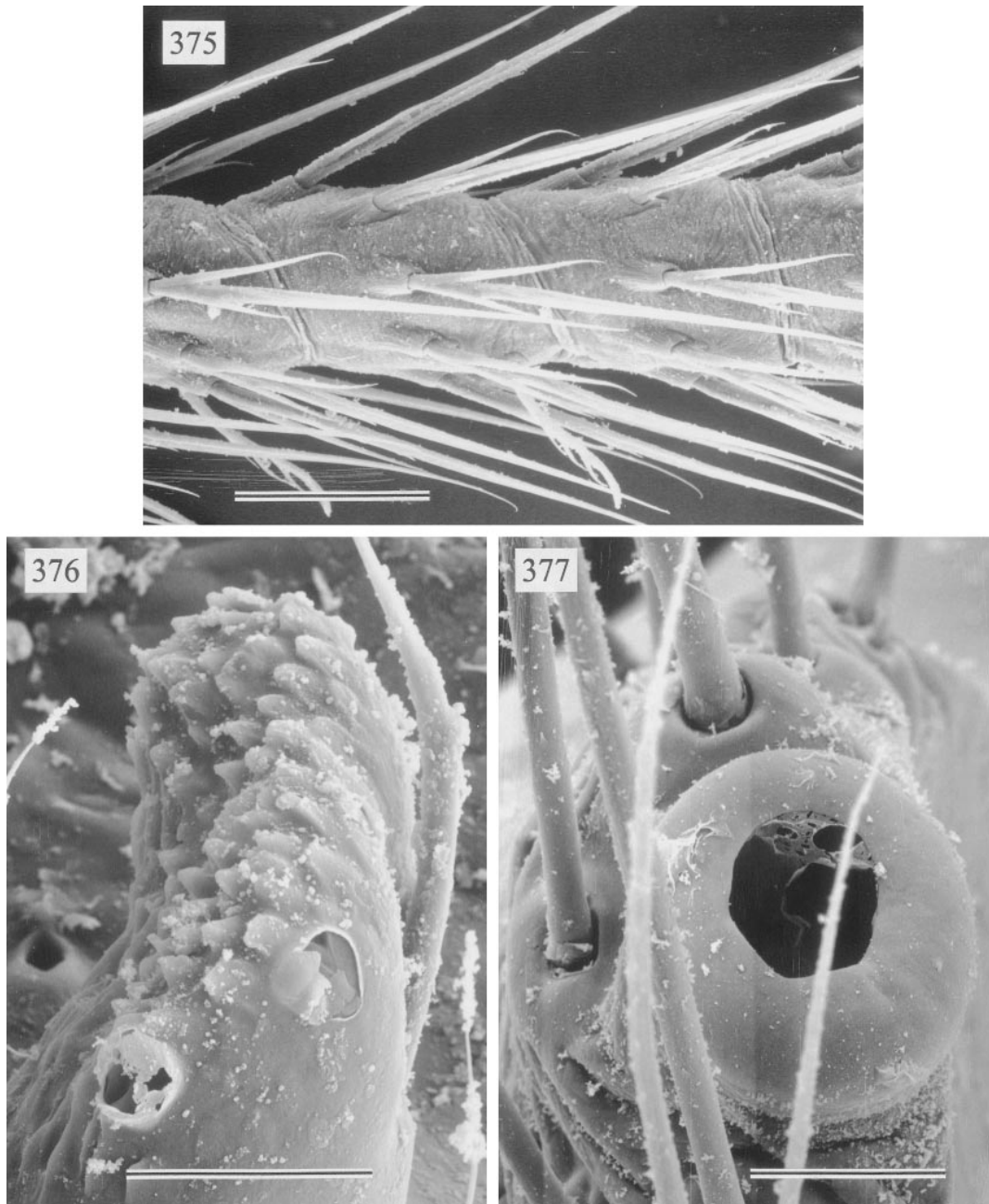
Panjange mirabilis Deeleman-Reinhold, 1986b: 220–222, figs. 45, 52–58, 59g.



Figs. 367–374. *Pholcus tagoman*. **367.** Male prosoma, dorsal view. **368.** Male sternum, ventral view. **369.** Male chelicerae, frontal view. **370.** Distal apophysis on male chelicera. **371.** Left procursus, dorsal view. **372.** Left genital bulb, retrolateral view; “a” = appendix; “e” = embolus; “u” = uncus; “c” = connecting piece between bulb and cymbium. **373, 374.** Epigynum, ventral (373) and dorsal (374) views. Scale lines: 0.3 mm (367–369, 371–374), 0.05 mm (370).

TYPE: Male holotype (QMB S883; right palp and chelicerae missing) and female paratype (QMB S884) from Gordon Creek, Iron Range (12°43'S, 143°19'E), Queensland, Australia; June 24–30, 1976 (R. Raven, V. E. Davies), mesophyll vine forest; examined.

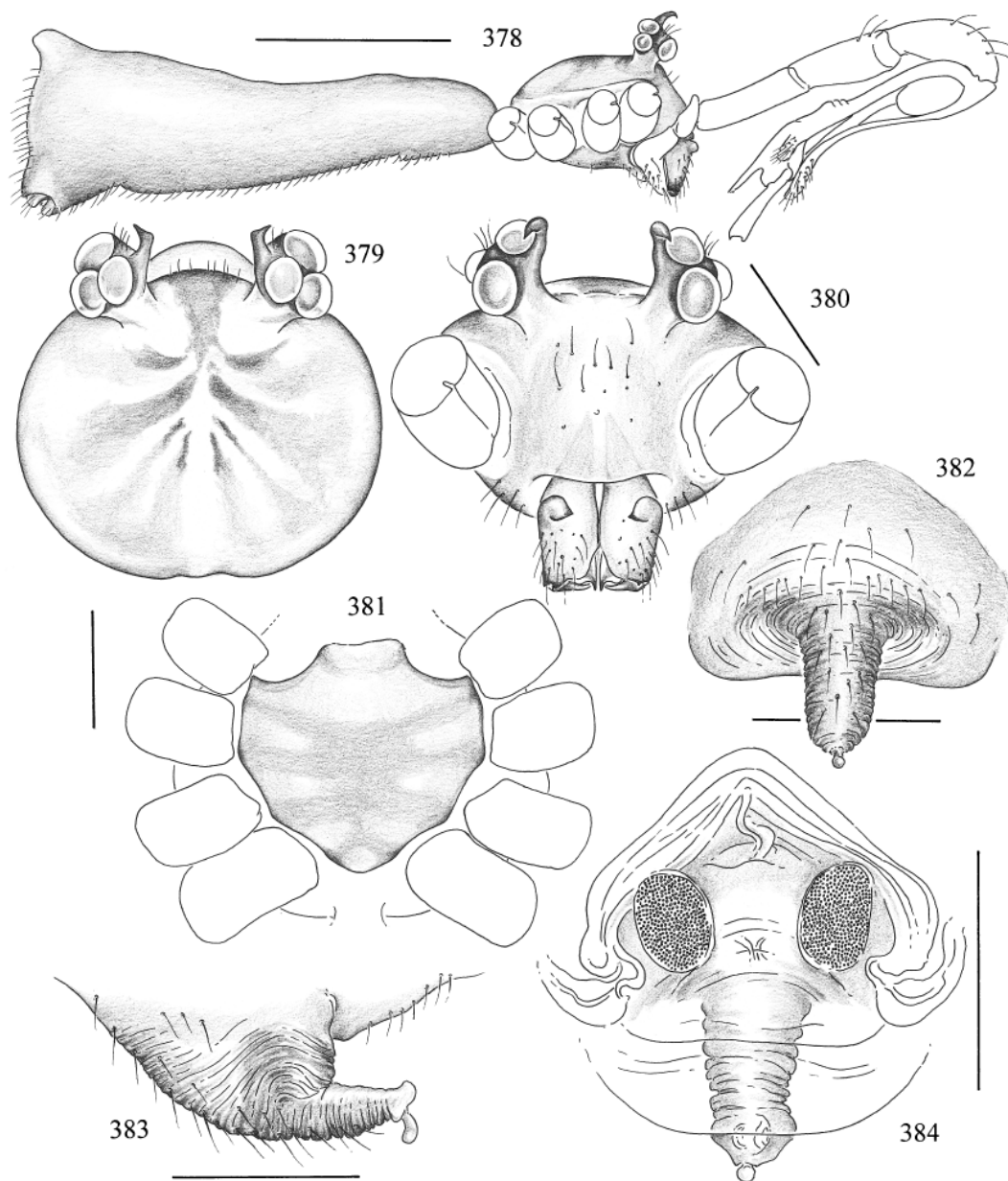
DIAGNOSIS: Distinguished from known congeners by the shapes of the bulbal and cymbial apophyses (figs. 385, 386) (compare figures of congeners in Deeleman-Reinhold and Deeleman [1983] and Deeleman-Reinhold and Platnick [1986]).



Figs. 375–377. *Pholcus tagoman*, male. **375.** Pseudosegmentation on tarsus 1. **376.** Tip of distal cheliceral apophysis. **377.** Palpal tarsal organ. Scale lines: 30 μm (375), 15 μm (376, 377).

MALE (type locality, QMB S49788): Total length 3.2, carapace width 0.93; all legs loose or missing. Habitus and prosoma shape as in figs. 378–381. Entire prosoma whitish, only carapace with light brown pattern (fig.

379), and sternum with pale ochre-yellow pattern. Eye triads elevated, with sclerotized spines (figs. 378–380); distance PME-PME 0.320; diameter PME 0.120; distance PME-ALE 0.030; AME absent. Sternum as in fig.

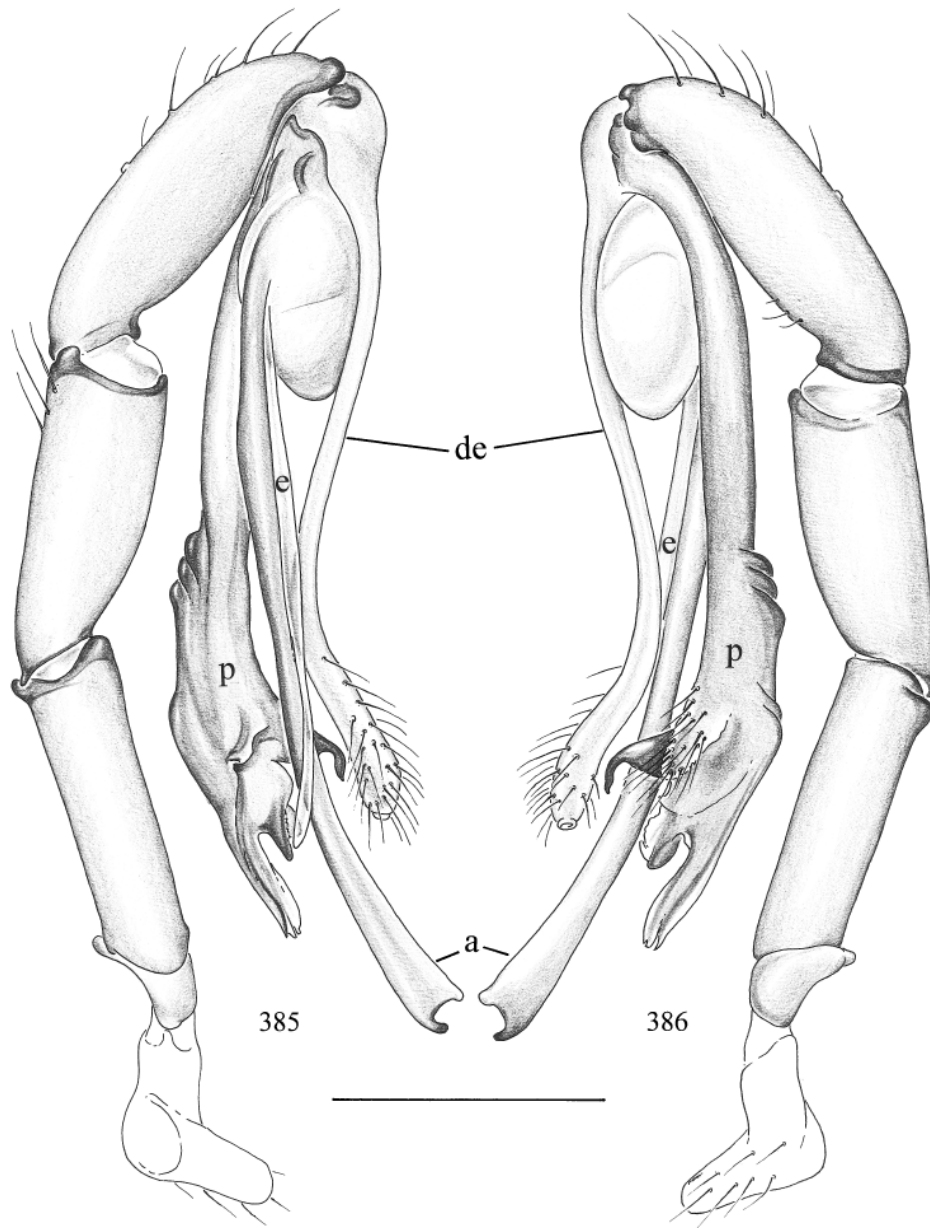


Figs. 378–384. *Panjange mirabilis*. **378.** Habitus, male. **379–381.** Male prosoma, dorsal, frontal, and ventral views. **382, 383.** Epigynum, ventral and lateral views. **384.** Epigynum, dorsal view. Scale lines: 1 mm (378), 0.3 mm (379–384).

381. Chelicerae whitish, with pair of pointed apophyses proximally, otherwise unmodified (fig. 380). Palps as in figs. 385 and 386, cymbium with complex procursus and simple dorsal elongation that bears the tarsal organ at its tip; bulb with simple tubular embolus

and extremely long apophysis that ends in clawlike tip. Legs whitish, only patella area and tibia–metatarsus joints darker; most hairs missing. Opisthosoma shape as in fig. 378, whitish.

VARIATION: Carapace width in holotype:

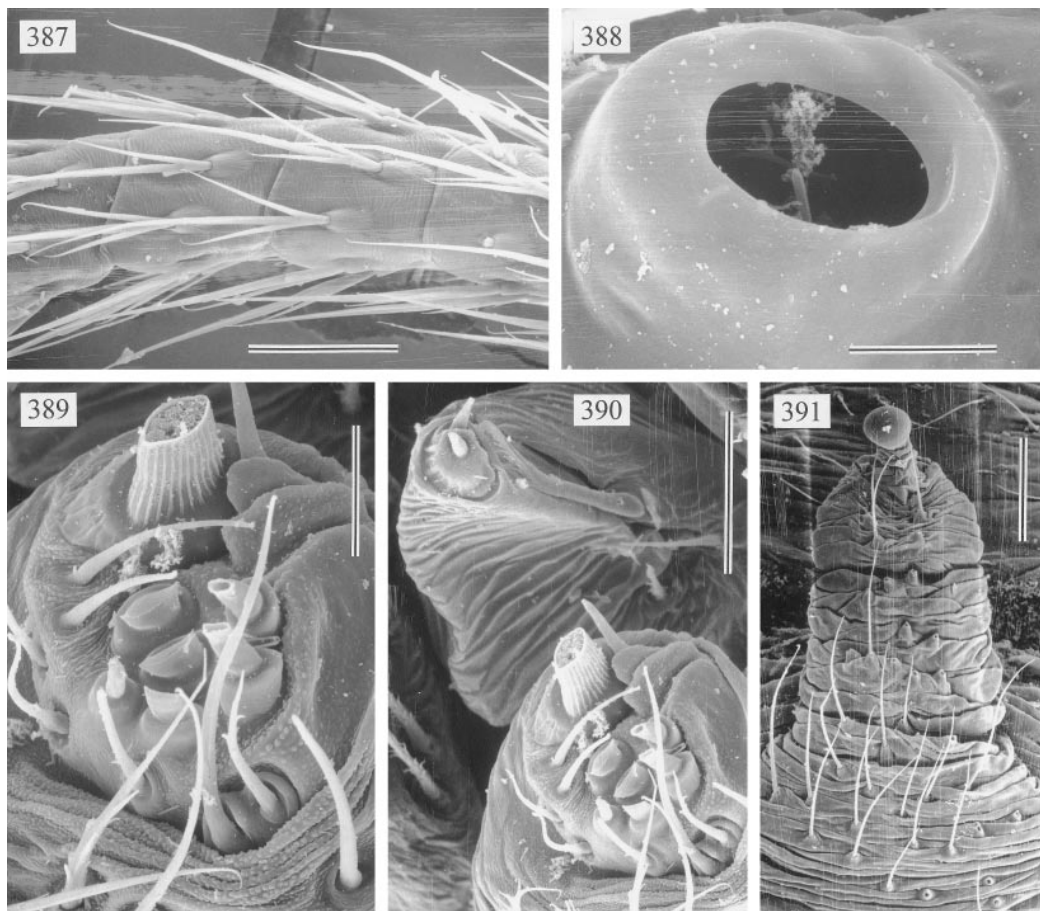


Figs. 385, 386. *Panjange mirabilis*, left male palp, prolateral (385) and retrolateral (386) views; "e" = embolus; "a" = bulbal apophysis; "de" = dorsal elongation of cymbium; "p" = procursus. Scale line: 0.5 mm.

0.84; tibia 2: 4.1, tibia 3: 2.5; the holotype has several dark spots on the opisthosoma.

FEMALE: In general very similar to male, but eyes not elevated and closer together. Females from West Claudie Range with very distinct brown pattern on carapace; sternum

mostly brown; coxae brown; opisthosoma with large brown and blackish spots. Tibia 1 in 5 females: 5.7–6.3 (\bar{x} = 6.0). Tarsal pseudosegments difficult to see in dissecting microscope, but distinct in SEM (fig. 387). Tarsal organ as in fig. 388. Epigynum as in figs.



Figs. 387–391. *Panjange mirabilis*, female. **387.** Pseudosegmentation of tarsus 1 near tip. **388.** Palpal tarsal organ. **389.** ALS, showing several piriform gland spigots. **390.** ALS (in front) and PMS (in back). **391.** Epigynal scape, ventral view. Scale lines: 60 μm (391), 30 μm (387, 390), 15 μm (389), 5 μm (388).

382, 383, and 391; dorsal view as in fig. 384. Several piriform gland spigots on ALS (figs. 389, 390).

DISTRIBUTION: Adults have only been collected at Iron Range, northern Queensland. The QMB has two juveniles from Lockerbie and 3 km E Lockerbie (10°48'S, 142°27'–28'E) that might be conspecific (QMB S4786–7) (map 19).

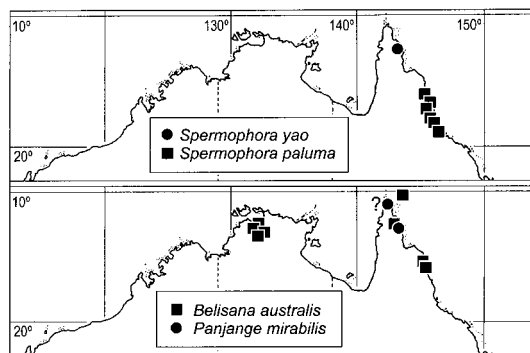
MATERIAL EXAMINED: AUSTRALIA: *Queensland:* Iron Range, Gordon Creek: Male holotype and female paratype above; same data, 1♂ 2♀ several juveniles, (QMB S49788); Iron Range, West Claudie Range (12°45'S, 143°14'E), Dec. 3–10, 1985 (G.

Monteith, D. Cook), rainforest, 50 m elev., 3♀ 1 juvenile (QMB S34664).

SPERMOPHORA HENTZ, 1841 AND
BELISANA THORELL, 1898

REMARKS: *Spermophora* is probably the most chaotic genus within pholcids, and I have seen too few of the 69 species currently included in *Spermophora* and its possible closest relatives (*Spermophorides* Wunderlich, *Belisana* Thorell, *Paramicromerys* Milot) to attempt a significant improvement at this point. A few remarks might prove helpful for future workers.

Traditionally, almost any small pholcid



Maps 18, 19. Distribution of the genus *Spermophora* in Australia (map 18, top), and of the genera *Panjange* and *Belisana* in Australia (map 19, bottom). Note that *Belisana australis* is also recorded from Ambon, not shown on this map.

with six eyes has been assigned to *Spermophora*. So far, the New World species have been either removed to *Metagonia* or *Anopsisus*, or synonymized with the synanthropic *S. senoculata* (Simon, 1893; Gertsch, 1939, 1971, 1977, 1982; Schmidt, 1971; Yaginuma, 1974; Brignoli, 1983; Huber, 2000). However, the remaining Old World species seem to be a highly heterogeneous group of rather small, six-eyed pholcids. Simon (1893: 471) noted that the genus “*n’est pas très homogène*”, and he distinguished two groups: one group (including the type species *S. senoculata*) consisting of pale species with eye triads far apart, the other group characterized by black patterns on prosoma and opisthosoma and eye triads closer together.

Wunderlich (1992) formalized this distinction by creating the new genus *Spermophorides* for the second group, but unfortunately he treated representatives of the Canary Islands almost exclusively, ignoring even the Mediterranean species. These species (*S. huberti*, *mediterranea*, *mammata*, *petraea*, *simoni*, *valentiana*, all described by Senglet) are obviously close to the Canary Island species, but they formally remain in *Spermophora*. More serious than that, the characters separating the two groups seem to work for Canary Island (and Mediterranean) species versus *S. senoculata*, but may not work in a worldwide perspective. For example, the new species *S. yao* described below has the eye triads far apart and a ventral flap on the pro-

cursor like *S. senoculata*, but it has blackish spots like *Spermophorides*. The only way to solve this satisfactorily will be a worldwide revision of the genus.

Unfortunately, revising just *Spermophora* and *Spermophorides* will not suffice, as the species described below as *Belisana australis* demonstrates. *Belisana* has been a monotypic genus since its creation by Thorell (1898), and it is with some hesitation that I assign the Australian species to this genus. I have not been able to see the type species *B. tauricornis* Thorell, which Simon (1903) first synonymized with *Uthina* Simon, but later (Simon, 1909) suspected to be just another *Spermophora*. Therefore, I follow mainly the opinion of Deeleman-Reinhold (1986a: 47), who reestablished *Belisana* based on a collection of 28 morphospecies ranging from Sri Lanka to Queensland, and who kindly sent me some of the specimens identified by her as *Belisana*. Deeleman-Reinhold (1986a) characterized the genitalic structure of *Belisana* as “somewhat similar to that in *Spermophora*”, and she (1986b: 223) used the eye distance to separate the two genera (she indicated the distance between triads as being 1–2 d in *Spermophora*, 3 d or more in *Belisana*; this is a typing error, as the opposite is the case). Thus, *Belisana* seems to be something like a pale *Spermophorides*, or better, *Spermophorides* a dark *Belisana*! Again, the conclusion is that only a deep revision will clarify the issue, and this will have to include *Belisana* as well.

Several East-Asian *Spermophora* might actually belong to *Belisana* (if Deeleman’s interpretation proves right). For example, illustrations of the genitalia of the Chinese *S. anhuiensis* Xu and Wang, of *S. rollofoliolata* Wang, and of the Japanese *S. akebona* Komatsu suggest a closer affinity to *Belisana* than to *Spermophora*.

Some *Spermophora* species are too obviously misplaced to present a serious problem. For example, judging from the existing illustrations, *S. elongata* Yin and Wang and *S. faveauxi* Lawrence are very probably *Pholcus* (the latter is close to, or is a synonym of *Pholcus circularis* Kraus); *S. baso* Roewer from Sumatra and *S. tessellata* Simon from Malaysia are close relatives and certainly not *Spermophora* (types examined), but they

probably represent a new genus; *S. dubia* Kulczynski from New Guinea is a relatively large spider with long opisthosoma and an epigynum that is almost indistinguishable from that of *Panjange mirabilis* (cf. figs. 382, 383), but the slightly damaged, opisthosoma of the female holotype (examined) was apparently not pointed dorsoposteriorly as in typical *Panjange*; and *S. longiventris* from Sumatra was described from a juvenile, and is probably a six-eyed *Pholcus*, close to *P. tagoman*.

At least some *Spermophora* species from Madagascar seem to be misplaced and might end up in new genera (e.g., *S. andrei*, *impudica*), while some others (*S. ankaranae*, *combesi*, *imerinensis*, *megaceros*) resemble *Paramicromerys* in genitalic structure, a monotypic genus endemic in Madagascar. Millot (1946: 146) interpreted *Paramicromerys* as “*faisant transition entre les Spermophora et les Micromerys véritables*”, adding yet another genus to the task awaiting the future revisor of *Spermophora*.

***Spermophora yao*, new species**

Figures 392–405

TYPE: Male holotype from Gordon Creek, Lower Lamond Hill, Iron Range (12°43'S, 143°19'E), Queensland, Australia; June 15, 1976 (R. Raven, V. E. Davies), litter, in QMB (S34666).

ETYMOLOGY: Yao is an alternative name for the Pakadji, an aboriginal tribe in north-eastern Queensland. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from congeners by the shape of procursus and bulbal apophyses (figs. 396, 397), and by the shape of the epigynum (fig. 399).

MALE (holotype): Total length 1.1, carapace width 0.55. Leg 1: 4.34 (1.13 + 0.19 + 1.15 + 1.26 + 0.61), tibia 2: 0.74, tibia 3: 0.61, tibia 4: 1.10; tibia 1 l/d: 18. Habitus and prosoma shape as in figs. 392–395. Carapace and sternum ochre to light brown with blackish speckles, ocular area and clypeus without speckles (figs. 393–395). Eye triads hardly elevated; distance PME–PME 0.215; diameter PME 0.050; distance PME–ALE 0.010; AME absent. Chelicerae as in fig. 398, with pair of simple pointed apophyses dis-

tally and pair of rounded light apophyses proximolaterally. Palps as in figs. 396 and 397, with complex procursus; bulb with semitransparent projection (embolus?) and sclerotized serrate apophysis with distal hook. Legs ochre-yellow, without rings; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 15%; tarsus 1 with ~10 fairly distinct pseudosegments. Opisthosoma globular (fig. 392); pale ochre gray, with some indistinct large spots dorsally. ALS with several piriform gland spigots, as in female.

VARIATION: Tibia 1 in 6 males: 1.05–1.23 (\bar{x} = 1.12).

FEMALE: In general very similar to male. Tibia 1 in 18 females: 0.87–1.13 (\bar{x} = 0.98). Tarsal pseudosegments as in fig. 402. Palpal tarsal organ and tip as in figs. 403 and 405. Epigynum as in figs. 399 and 401; frontally brown plate with pair of pockets, posteriorly dark ridges, and short, transparent scape (arrow in fig. 401) with pocket (“p” in fig. 399) between epigynum and spinnerets (scape hardly visible in dissecting microscope); dorsal view as in fig. 400. Several piriform gland spigots on ALS (fig. 404).

DISTRIBUTION: Known only from Iron Range, northern Queensland (map 18).

MATERIAL EXAMINED: AUSTRALIA: Queensland: Iron Range, Gordon Creek: Male holotype above, with 4♂ 12♀ several juveniles (QMB S50172); Iron Range, West Claudie Range (12°45'S, 143°14'E), sieved litter in rainforest, 50 m elev., Dec. 4, 1985 (G. Monteith), 2♂ 10♀ several juveniles (QMB S33856).

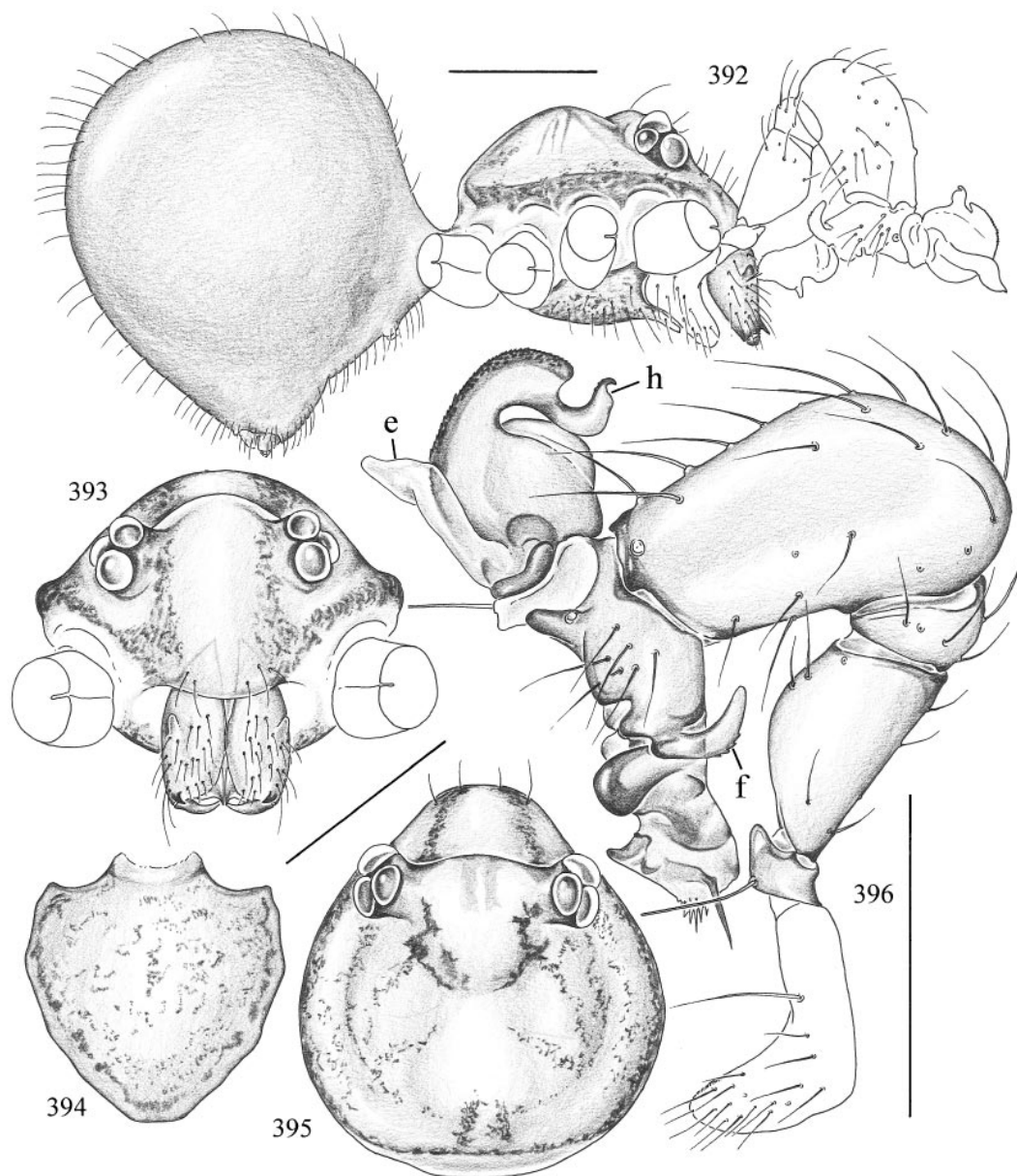
***Spermophora paluma*, new species**

Figures 406–415

TYPE: Male holotype from Paluma SF (19°01'S, 146°13'E), Queensland, Australia; Sept. 2, 1988 (R. Raven, T.C., J. Gallon), in QMB (S14092).

ETYMOLOGY: Named for the type locality. The species name is a noun in apposition.

DIAGNOSIS: Distinguished from known congeners by the shape of procursus and bulbal apophyses (figs. 408–410), and by the shape of the epigynum (fig. 412). The AMS has a very close undescribed relative from Lord Howe Island (31°33'S, 159°05'E)

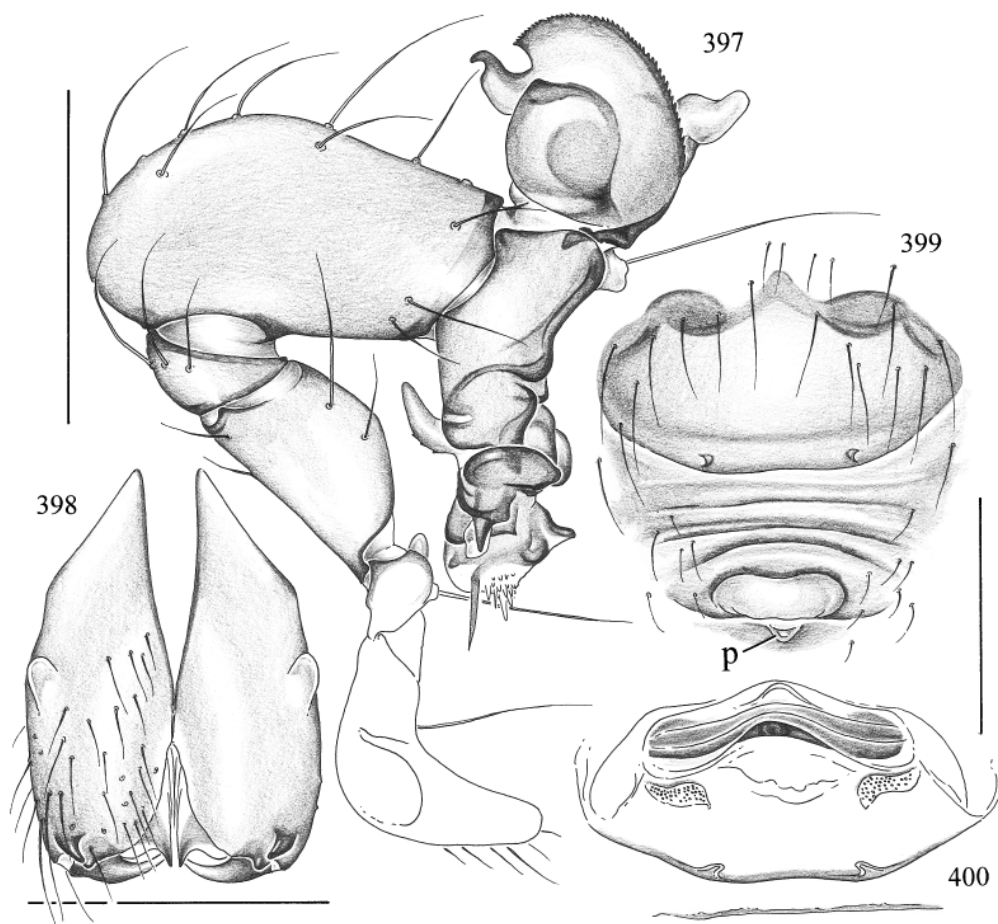


Figs. 392–396. *Spermophora yao*, male. **392.** Habitus. **393.** Prosoma, frontal view. **394.** Sternum, ventral view. **395.** Prosoma, dorsal view. **396.** Left palp, retrolateral view; “e” = putative embolus; “h” = bulbal apophysis with hooked tip; “f” = ventral flap. Scale lines: 0.3 mm.

(KS56205, 56217) that is significantly larger (total length 2–2.1; carapace width 0.8; tibia 1: 4.5–4.6) and has only one tip on the putative embolus (instead of two as in figs. 408, 409); chelicerae and procursus are almost identical to *S. paluma*.

MALE (holotype): Total length 1.4, cara-

pace width ~0.56 (deformed). Leg 1: 17.2 (4.3 + 0.3 + 4.1 + 7.3 + 1.2), tibia 2: 2.6, tibia 3: 1.6, tibia 4: 2.7; tibia 1 l/d: 68. Prosoma shape as in figs. 406 and 407; entire prosoma pale ochre; sternum whitish. Eye triads hardly elevated; distance PME-PME 0.185; diameter PME 0.070; distance PME-



Figs. 397–400. *Sperophora yao*. **397**. Left male palp, prolateral view. **398**. Male chelicerae, frontal view. **399**. Epigynum with posterior pocket (“p”), ventral view. **400**. Epigynum, dorsal view. Scale lines: 0.3 mm (397), 0.2 mm (398–400).

ALE 0.010; AME absent. Chelicerae as in fig. 411, with pair of simple pointed apophyses distally and pair of rounded light apophyses proximolaterally. Palps as in fig. 408, with complex procursus; bulb with two simple projections, one of them (putative embolus) ending in two black tips (figs. 408 and 409); procursus as in figs. 408–410. Legs pale ochre-yellow, patella area slightly darker, ventroproximal margin dark brown; without spines, without curved and vertical hairs; retrolateral trichobothrium of tibia 1 at 3%; tarsus 1 distally with ~10 fairly distinct pseudosegments, proximally possibly more. Tarsal organ as in fig. 414. Opisthosoma pale gray, shape similar to *S. yao* (cf. fig. 392), but slightly longer (0.93 long, 0.67 high);

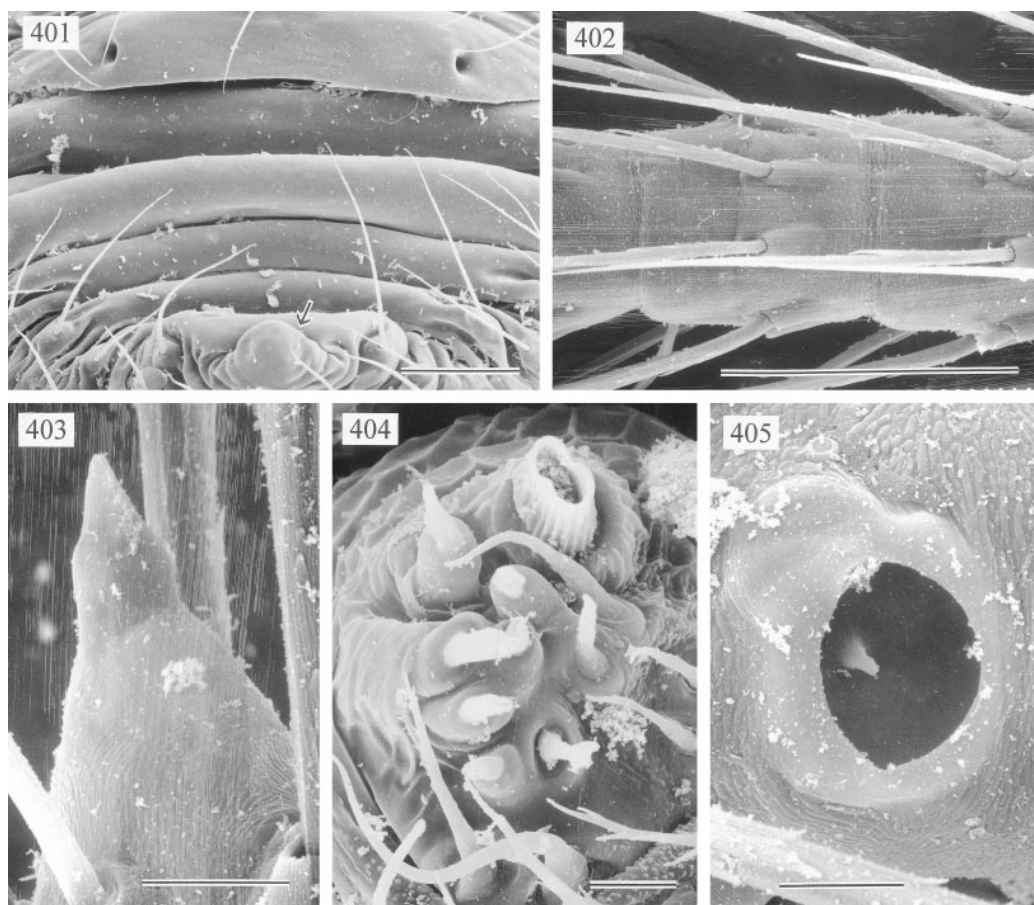
gonopore with four epiandrous spigots (fig. 413); several piriform gland spigots on ALS (fig. 415).

VARIATION: Tibia 1 in 10 males: 3.5–4.1 (\bar{x} = 3.8). Some males with large blackish spots on opisthosoma.

FEMALE: In general very similar to male. Epigynum as in fig. 412; extremely pale, with pair of pockets in frontal plate and unpaired pocket on short, transparent posterior scape between epigynum and spinnerets (“p” in fig. 412).

DISTRIBUTION: Known from several localities in northeastern Queensland (map 18).

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Paluma SF: Male holotype above, with 2♂ (QMB S14092); Wallaman Falls via



Figs. 401–405. *Sperophora yao*, female. **401.** Epigynum and posterior scape (arrow), ventral view. **402.** Pseudosegmentation of tarsus (unidentified leg). **403.** Tip of palp. **404.** ALS, showing several piriform gland spigots. **405.** Palpal tarsal organ. Scale lines: 40 μ m (401, 402), 5 μ m (403–405).

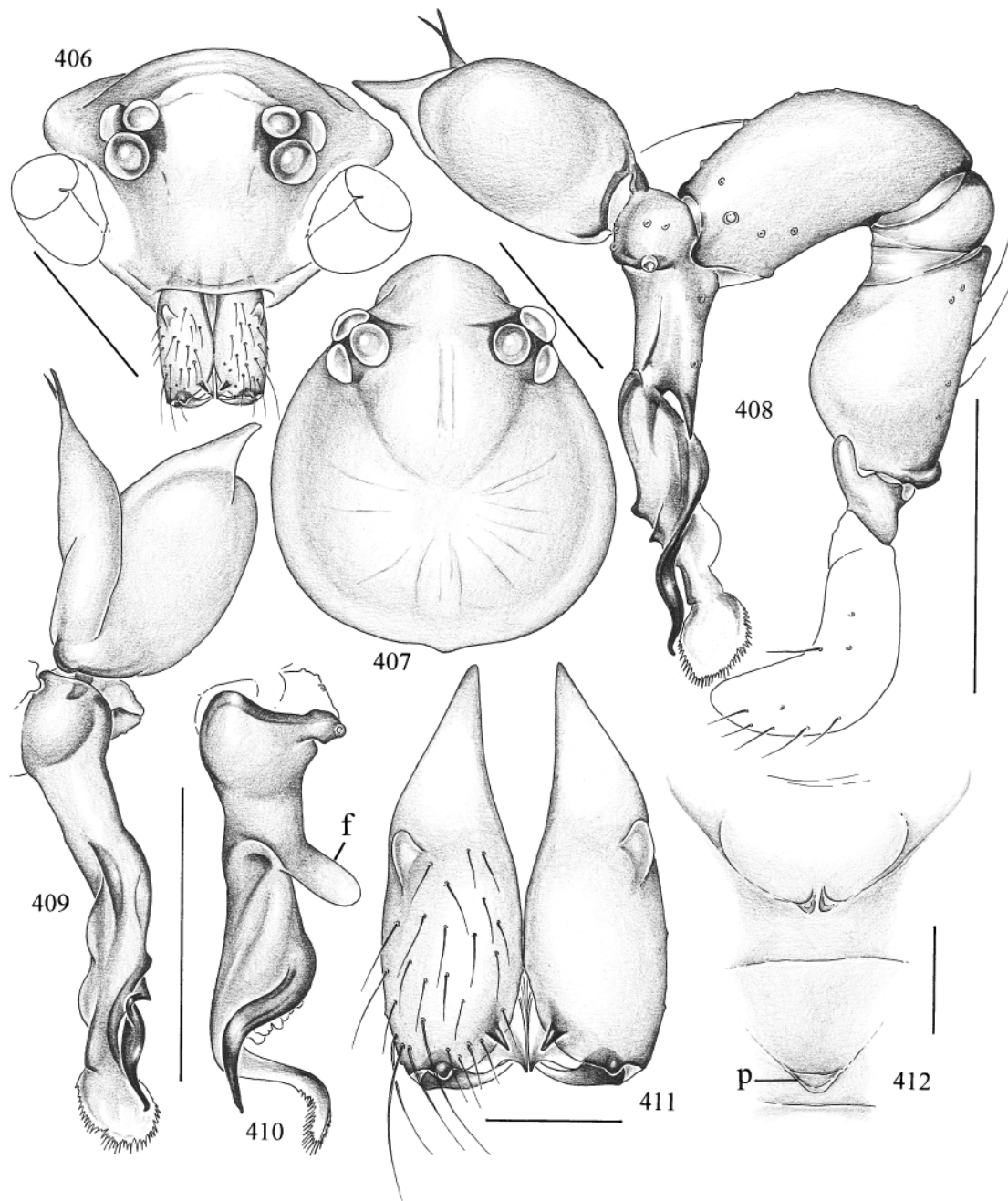
Ingham (18°36'S, 145°48'E), rainforest, 500 m elev., Oct. 1, 1980 (G. Monteith), 1♂ 3 juveniles (QMB S50247); Mt. Graham (18°23'S, 145°52'E), Dec. 26–30, 1986 (S. Hamlet), rainforest, 600–700 m elev., 1♂ 3 juveniles (QMB S18422); Kirrama Range (18°12'S, 145°45'E), Douglas Creek Road, 800 m elev., Dec. 9–12, 1986 (G. Monteith, G. Thompson, S. Hamlet), 1♂ (QMB S49803); Kirrama Range via Kennedy (~18°09'S, 145°43'E), rainforest, 500 m elev., Oct. 2, 1980 (G. Monteith), 1♂ 1 juvenile (QMB S49760); Boonjee (17°24'S, 145°44'E), Apr. 3–6, 1978 (V. E. Davies, R. Raven), 2♂ 1 juvenile (QMB S50270); Windin Falls, via Butchers Creek (17°19'S, 145°45'E), rainforest, Oct. 9, 1980 (G. Mon-

teith), 3♂ 3 juveniles (QMB S50241); 3 km N of Kuranda, Kuranda State Forest (~16°47'S, 145°38'E), rainforest, 360 m elev., June 25–Oct. 3, 1982 (S. & J. Peck), 1♂ (AMNH); 20 km SW of Mossman, Mt. Lewis (~16°35'S, 145°15'E), rainforest, 900 m elev., June 26–Oct. 1, 1982 (S. & J. Peck), 1♂ (AMNH); Fritz Creek, N of Bloomfield (15°52'S, 145°21'E), rainforest foliage, Dec. 1975 (M. Gray), 1♂ (AMS KS65695).

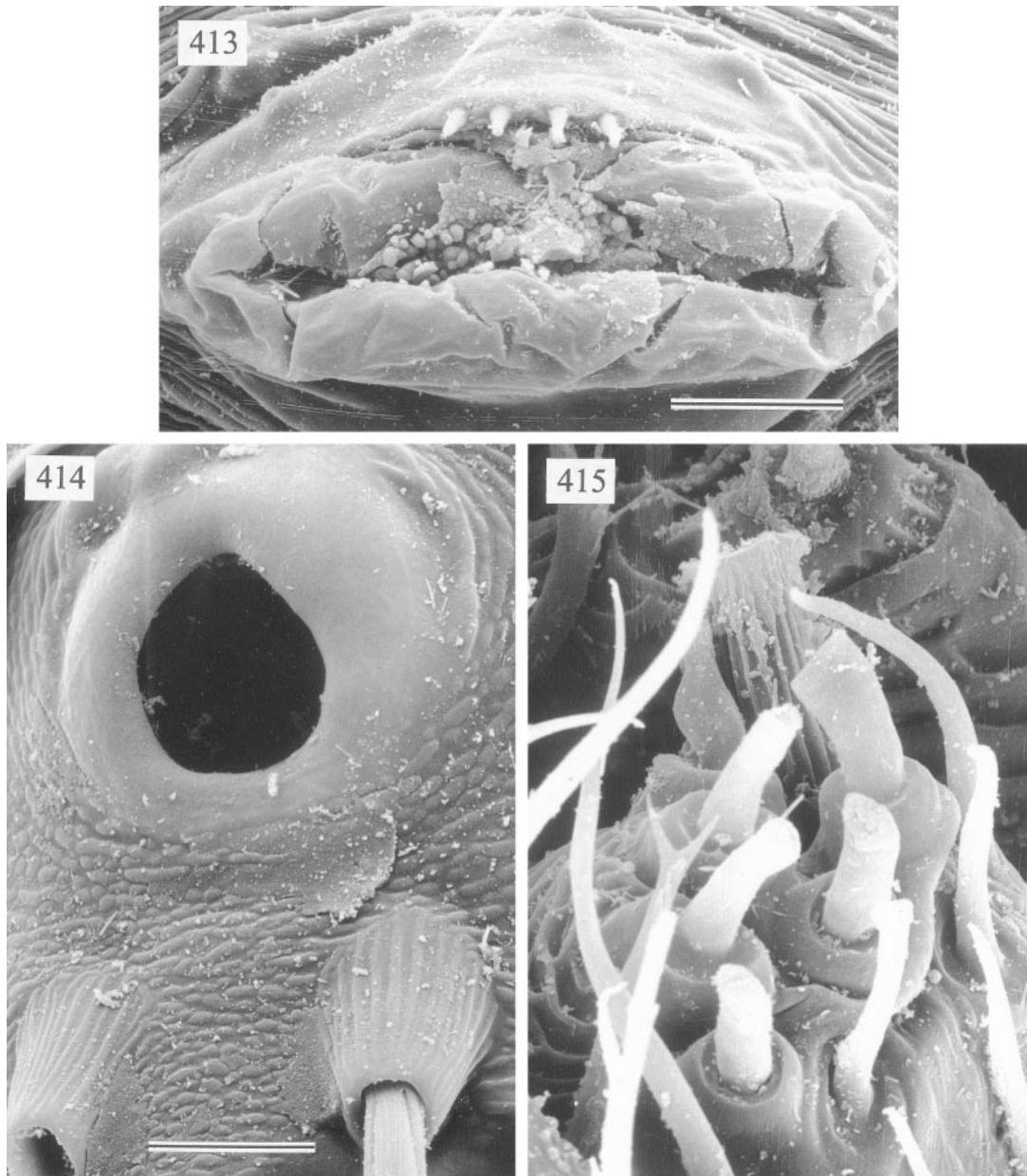
***Belisana australis*, new species**

Figures 416–429

TYPE: Male holotype from Home Rule (15°44'S, 145°18'E), Queensland, Australia; Oct. 28–Nov. 18, 1974 (V. E. Davies), litter, in QMB (S50273).



Figs. 406–412. *Sperophora paluma*. **406, 407.** Male prosoma, frontal and dorsal views. **408.** Left male palp, retrolateral view. **409.** Left procursus and genital bulb, prolateral view. **410.** Left cymbium and procursus, dorsal view; “f” = ventral flap. **411.** Male chelicerae, frontal view. **412.** Epigynum, ventral view; “p” = pocket. Scale lines: 0.3 mm (406–410), 0.1 mm (411, 412).



Figs. 413–415. *Sperophora paluma*, male. **413.** Gonopore, showing four epiandrous spigots. **414.** Tarsal organ on tarsus 2. **415.** ALS, showing several piriform gland spigots. Scale lines: 20 μm (413), 5 μm (414).

ETYMOLOGY: The species name (Latin *australis*, “southern”) refers to the geographic distribution of this southernmost *Belisana* species.

DIAGNOSIS: Tiny six-eyed pholcid with globular opisthosoma; distinguished from all

described pholcids where the male is known by the huge apophysis on the male palpal trochanter (fig. 419). The collection CLD has a male of a probably undescribed species from Thailand with a similar apophysis, but with very different chelicerae.

MALE (holotype): Total length 1.2, carapace width 0.52. Leg 1: 8.65 (2.19 + 0.19 + 2.24 + 3.03 + 1.00), tibia 2: 1.42, tibia 3: 0.87, tibia 4: 1.34; tibia 1 l/d: 48. Habitus and prosoma shape as in figs. 416, 417, and 420. Carapace light ochre, with slightly darker bands posteriorly and around ocular area (fig. 420); ocular area and clypeus without markings; sternum pale ochre. Ocular area not elevated; distance PME-PME 0.105; diameter PME 0.070; distance PME-ALE 0.020; AME absent. Chelicerae as in fig. 423, with pair of simple pointed apophyses distally and pair of rounded light apophyses proximolaterally. Palps as in figs. 418 and 419, with huge trochanter apophysis and small apophysis on femur retrolaterodorsally; procurus and bulb relatively simple (figs. 421, 422). Legs light ochre, without rings; without spines, curved, and vertical hairs; retrolateral trichobothrium of tibia 1 at 18%; tarsus 1 distally with ~14 fairly distinct pseudosegments (fig. 427), proximally pseudosegmentation difficult to see in dissecting microscope. Opisthosoma almost globular (fig. 416), ochre-gray; ALS with several piriform gland spigots; gonopore with four epiandrous spigots in two groups.

VARIATION: Tibia 1 in 5 males: 1.7–2.5 (\bar{x} = 2.13).

FEMALE: In general very similar to male. Palpal tarsus tip as in fig. 429. Epigynum as in fig. 424, with distinctive scape provided with distal pair of pockets (fig. 425); dorsal view as in fig. 426. Several piriform gland spigots on ALS (fig. 428).

DISTRIBUTION: Known from several localities in Australia (northern Northern Territory and northern Queensland; map 19) and from Ambon, Moluccas.

MATERIAL EXAMINED: AUSTRALIA: *Queensland*: Home Rule: Male holotype above, with 1 ♀ (epigynum lost) in same vial; Clifton Beach (16°46'S, 145°40'E), 1971–1972 (N. Clyde-Coleman), 1 ♀ (QMB S50284); West Claudie Range, Iron Range (12°45'S, 143°14'E), Dec. 3–10, 1985 (G. Monteith, D. Cook), rainforest, 3 ♂ 3 juveniles (QMB S34660); Murray Island, Torres Strait (9°56'S, 144°04'E), Aug. 1974 (H. Heatwole, E. Cameron), 1 ♂ 1 juvenile (QMB S50231). *Northern Territory*: West Alligator River, “mouth, WA2” (12°11'S,

132°16'E), rainforest, Nov. 12, 1979 (R. Raven), 3 ♀ 2 juveniles (QMB S50173); same locality, Jan. 1979 (R. Raven), 1 ♀ 2 juveniles (QMB S50180); West Alligator River, “mouth, WA1” (12°12'S, 132°13'E), Nov. 12, 1979 (R. Raven), 1 ♂ 1 ♀ 5 juveniles (QMB S50175); East Alligator Xing (12°25'S, 132°58'E), sieved litter in rainforest, July 18, 1979 (G. B. Monteith), 2 ♂ 6 juveniles (QMB S50179); North Point, Kapalga (12°25'S, 132°22'E), rainforest, Nov. 11, 1979 (R. Raven), 1 ♂ 1 ♀ (QMB S50171); Radon Creek (12°45'S, 132°53'E), Nov. 14, 1979 (R. Raven), litter, wet rainforest, 2 ♂ 3 juveniles (QMB S50177). INDONESIA: Moluccas: Ambon, Jan. 17, 1995 (C. L. & P. R. Deeelman), 1 ♂ (CLD).

INTRODUCED SPECIES

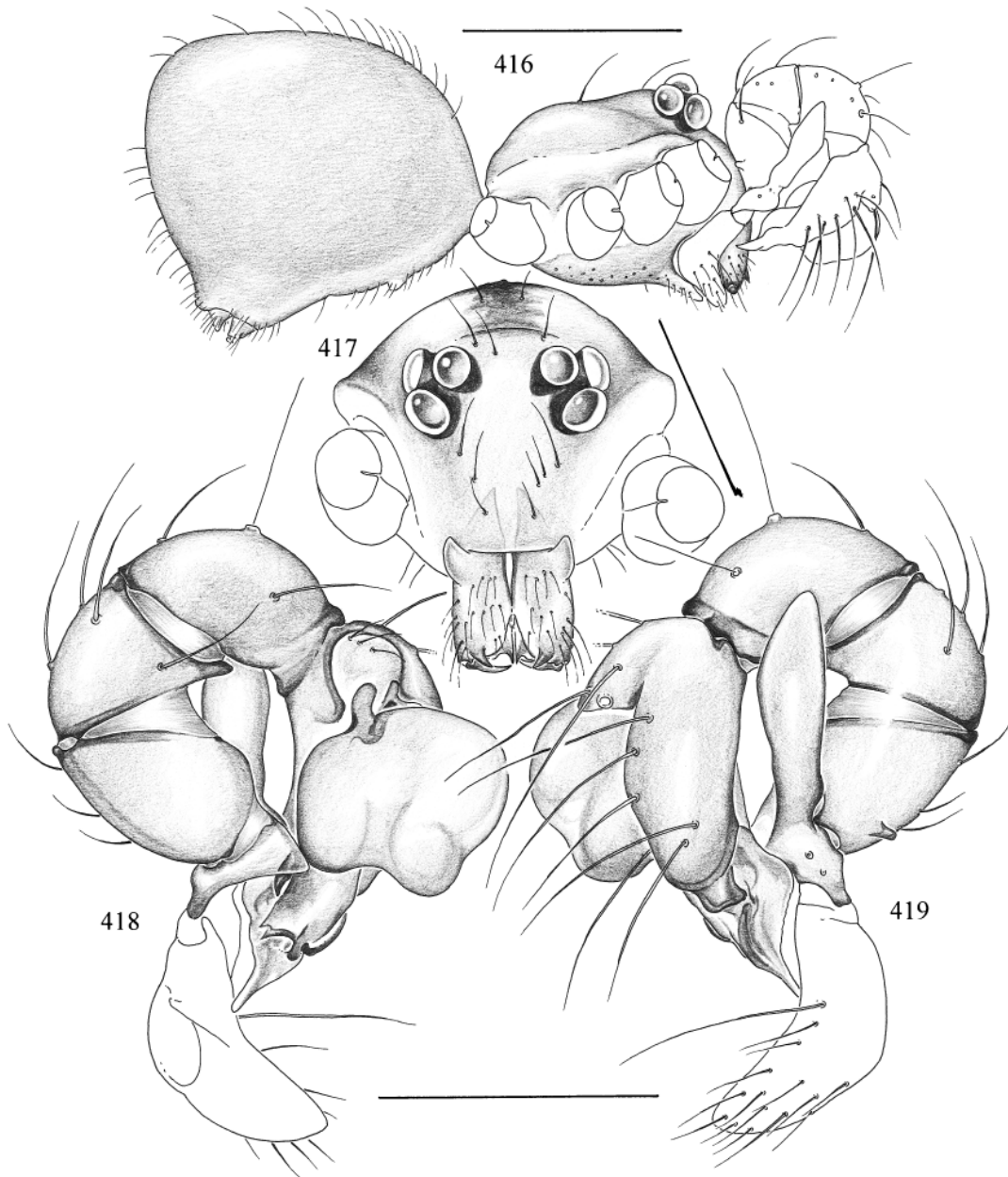
Pholcids are among the most common spiders in houses throughout the world, and most of the synanthropic species have been found in Australia. Synanthropics make up a substantial fraction of most collections. Because the priority of this work was to establish the diversity of the endemic fauna, I have rather neglected the introduced species, and in some cases I have even asked curators not to send me the reliably identified ones. Nevertheless, they are all included in the key above, and a few additional notes might prove useful for future workers.

For practical purposes, the nine introduced pholcid species of Australia can be divided into two groups: the common species (the first six below), living usually in or around houses; and the rare ones (three), found just in one or a few occasions, apparently not so closely associated with humans. Following is a list of all species, sorted roughly from common to rare, with references to published illustrations useful for identification and to their probable geographic origin.

Pholcus phalangioides (Fuesslin, 1775)

Illustrations: Wiehle, 1953: figs. 102–107; Uhl et al., 1995: figs. 2, 3, 5.

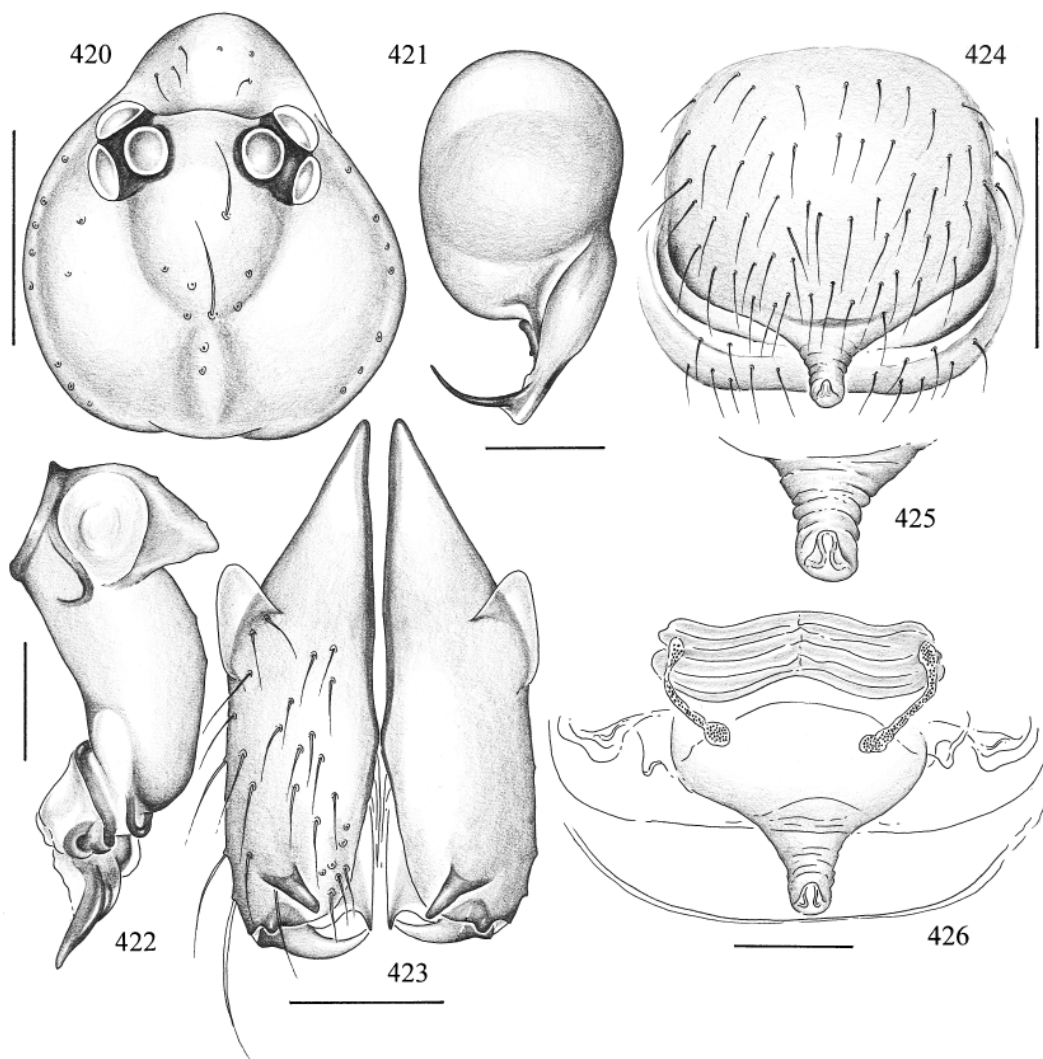
This species is commonly seen as an originally European species, but the illustrations of Chinese and Japanese *Pholcus* species (e.g., Zhu et al., 1986; Zhu and Gong, 1991; Irie, 1997; Song et al., 1999) suggest that the



Figs. 416–419. *Belisana australis*, male. **416.** Habitus. **417.** Prosoma, frontal view. **418, 419.** Left palp, prolateral (418) and retrolateral (419) views. Scale lines: 0.5 mm (416), 0.3 mm (417–419).

closest relatives might as well be East Asian. Whatever the origin, *P. phalangioides* is quite different from the eight-eyed Australian *Pholcus* species and is thus easily distinguished; that is, Australian species have a

narrow uncus (figs. 342, 358), and their epigynum is roundish and weakly sclerotized (figs. 347, 356, 361) rather than triangular and more heavily sclerotized, as in *P. phalangioides*.



Figs. 420–426. *Belisana australis*. **420.** Male prosoma, dorsal view. **421.** Left genital bulb, dorsal view. **422.** Left procursus, prolateral view. **423.** Male chelicerae, frontal view. **424.** Epigynum, ventral view. **425.** Epigynal scape, ventral view. **426.** Epigynum, dorsal view. Scale lines: 0.3 mm (420, 424), 0.1 mm (421–423, 426).

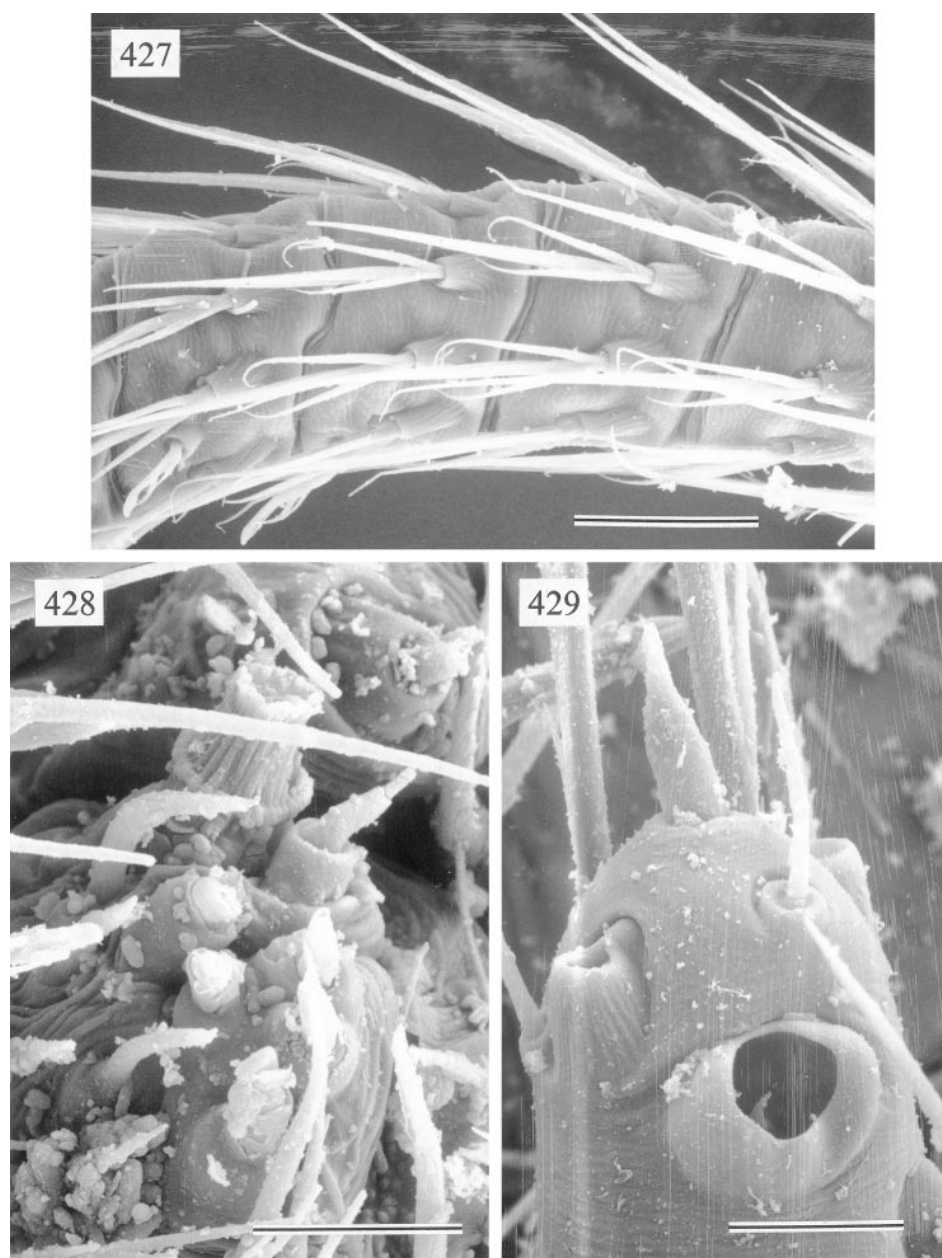
Smeringopus pallidus (Blackwall, 1858)

Figures 431, 434–436

Further illustrations: Millot, 1941: figs. 7A–I (as *S. elongatus*); Kraus, 1957: figs. 1–6; Saaristo, 1978: figs. 23–26, 31–38.

Smeringopus is an African (perhaps only sub-Saharan) genus. Only *S. pallidus* has previously been known to have been introduced to other continents. The discovery of the superficially very similar *S. natalensis*

in Australia (see below) suggests that some old records of *S. pallidus* might actually result from misidentifications. However, in Australia, *S. pallidus* is incomparably more common, and, in contrast to *S. natalensis*, is closely associated with humans. It is easily distinguished from *S. natalensis* and other congeners by the bulbal apophyses (figs. 434, 435), the tip of the procursus (fig. 431), and the shape of the epigynum (fig. 436).



Figs. 427–429. *Belisana australis*. **427.** Pseudosegmentation of male tarsus 1. **428.** Female ALS, showing several piriform gland spigots. **429.** Tip of female palp, with tarsal organ. Scale lines: 20 μm (427), 10 μm (428, 429).

Artema atlanta Walckenaer, 1837

Illustrations: Millot, 1941: figs. 1A–I (as *A. mauriciana*), 1946: fig. 1 (as *A. mauriciana*); Brignoli, 1981: figs. 1–7.

This possibly biggest of all pholcid species is easily distinguished from other Australian pholcids by its large size. Both the procursus (Millot, 1941: figs. 1A, C) and the epigynum

(Millot, 1946: fig. 1) are unique. It probably originated from the Middle East. Its (poorly known) congeners are from Iran, Afghanistan, Turkmenistan, and Tadzhikistan.

Crossopriza lyoni (Blackwall, 1867)

Illustrations: Millot, 1946: figs. 29A, B, 30B, 31A, B (as *C. francoisi* and *C. stridulans*).

This species probably originated from northern Africa, the Mediterranean region, or the Middle East. It is most easily distinguished by the two pairs of distinctive apophyses on the male chelicerae (Millot, 1946: fig. 29A) and by the shape of the epigynum (Millot, 1946: fig. 31B).

Physocyclus globosus (Taczanowski, 1874)

Illustrations: Brignoli, 1981: figs. 14–18, 21–24; Huber and Eberhard, 1997: figs. 1, 2, 7A, B, 9.

Physocyclus has a much more restricted distribution (western USA to Costa Rica) than previously thought, and *P. globosus* is probably the only species found all over the world in tropical and subtropical climates. *Physocyclus* appears to be closely related to the Australian genus *Trichocyclus*, but *P. globosus* is easily distinguished from *Trichocyclus* species and other Australian pholcids by the bulbal apophysis, the shape of the procursus, and the epigynum (Huber and Eberhard, 1997: figs. 1, 7).

Holocnemus pluchei (Scopoli, 1763)

Illustrations: Brignoli, 1971: figs. 1–6; Timm, 1976: figs. 1, 2; Huber, 1995: figs. 1A, 2A, B, 4A, B.

Holocnemus is closely related to (possibly a synonym of) *Crossopriza*, and shares the northern African and Mediterranean distribution. The only cosmopolitan species, *H. pluchei*, is easily distinguished from other Australian pholcids by the bulbal apophyses and the small cheliceral apophyses (Huber, 1995: figs. 2B, 4A).

Smeringopus natalensis Lawrence, 1947

Figures 430, 432, 433, 437

Further illustrations: Lawrence, 1967: figs. 3–5.

This species has previously been known only from eastern South Africa (Natal). It is

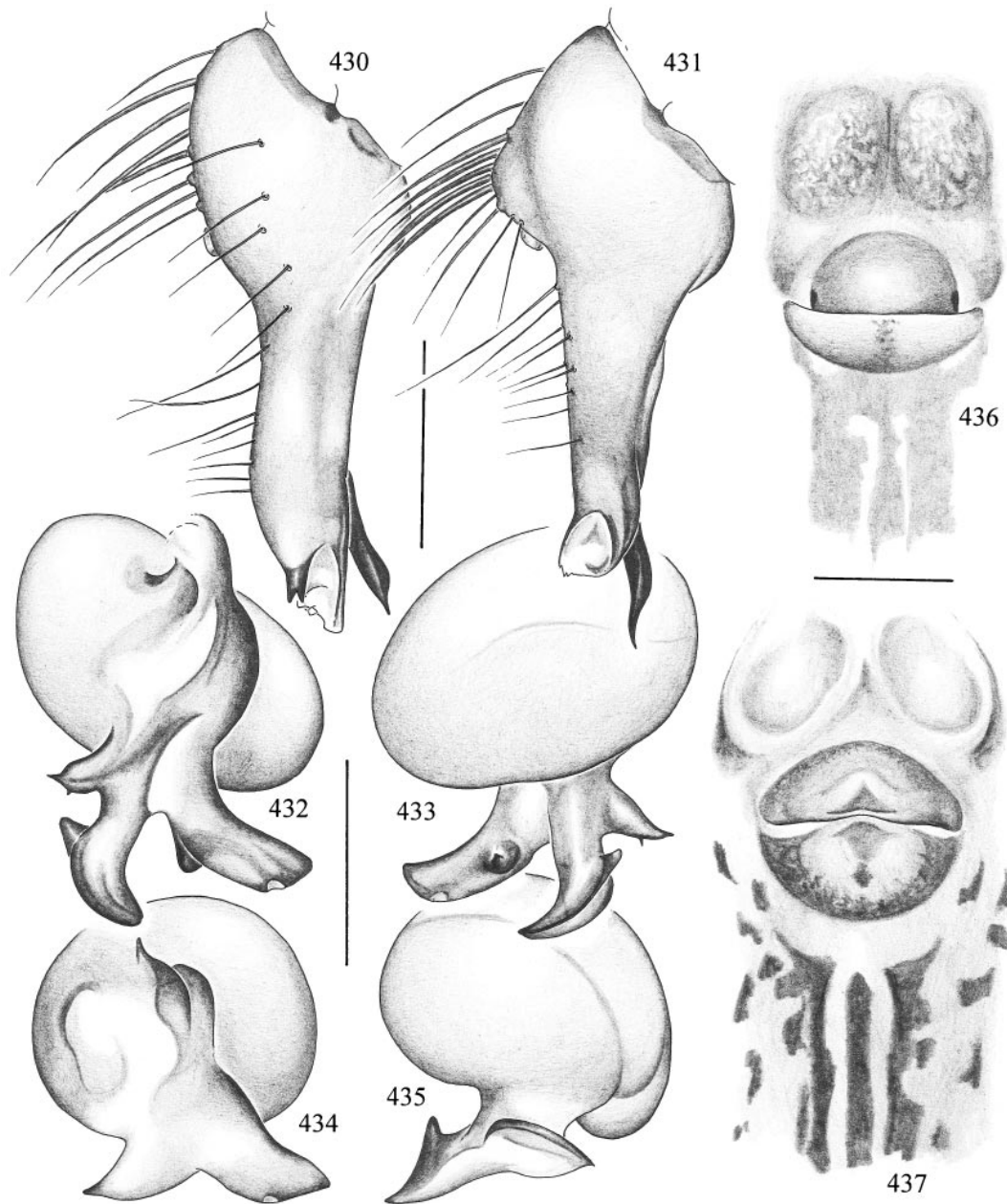
interesting to note that even there it is a “semi-domesticated species” (Lawrence, 1967: 299), “common in buildings . . . in various rooms and outhouses” (Lawrence, 1947: 15). Given this apparent preadaptation to live with humans, it seems surprising that this species has not been found on other continents before. However, as mentioned above, some records of *S. pallidus* might actually result from misidentifications of *S. natalensis*. In Australia, *S. natalensis* has been collected at various localities, some of them densely populated urban areas (M. Gray, personal commun.), but apparently never in houses. It is easily distinguished from *S. pallidus* as shown in figs. 430–437.

MATERIAL EXAMINED: SOUTH AFRICA: Zululand, Kosi Bay Reserve, Kosi Lakes (27°00'S, 32°24'E), June 5–15, 1995 (E. & R. Kyle, R. A. Cooper), 1♂ 3♀ (WAM 99/1482–7). AUSTRALIA: Western Australia: Tuart Hill near Perth (31°53'S, 115°51.5'E), Sept. 24, 1993–May 21, 1994 (M. S. Harvey, J. M. Waldock), 3♂ 4♀ ~10 juveniles (WAM 99/2117–2135). New South Wales: Ashford, Ashford Cave (29°12'S, 151°00'E), Jan. 31, 1995 (S. Eberhard), 1♂ 1 juvenile (AMS KS49265); Malabar (33°58'S, 151°15'E), June 26 and Sept. 28, 1966 (R. E. Mascord), 3♀ (AMS KS48725, 56197); Penrith (33°45'S, 150°42'E), Aug. 25, 1979 (A. Johnson), 1♀ (AMS KS65700).

Micropholcus fauroti (Simon, 1887)

Illustrations: Millot, 1946: figs. 2A, B (as *Pholcus chavaneii*); Deeleman-Reinhold and Prinsen, 1987: figs. 1–9.

Since *Micropholcus* is a monotypic genus, and the sister group is not known, the origin of the pantropical *M. fauroti* is obscure. The species is new for Australia, and is represented in the collections studied by only two females from Western Australia, Broome, Cable Beach (17°57'S, 122°12'E), July 9, 1981 (D. Hirst), “on rocks, base of which are at high tide mark”, in SAM (N1999/862–3). Males of this species are easily distinguished by their long dorsal hinged process on the procursus (Millot, 1946: fig. 2A). Females are much more difficult to identify, but have a characteristic triangular structure in the internal genitalia (Deeleman-Reinhold and Prinsen, 1987: fig. 7).



Figs. 430–437. *Smeringopus natalensis* (430, 432, 433, 437), *S. pallidus* (431, 434–436). **430, 431.** Left procursi, retrolateral views. **432, 434.** Left genital bulbs, retrolateral views. **433, 435.** Left genital bulbs, prolateral views. **436, 437.** Epigyna, ventral views. Scale lines: 0.3 mm (430–435), 0.5 mm (436, 437).

Modisimus culicinus (Simon, 1893)

Illustrations: Huber, 1997a: figs. 2–4, 1997b: fig. 1.

Modisimus is a New World genus, and

short-legged representatives similar to *M. culicinus* (mostly undescribed) are diverse on the Antilles and in Florida. Outside this area, *M. culicinus* has been recorded from various

countries in the Americas and from the Congo, the Seychelles, and Micronesia; it is new to Australia. The collections studied contain a male from Queensland, Rose Bay near Bowen (20°00'S, 148°16'E), July 27–Dec. 2, 1992 (R. Raven, P. & E. Lawless, M. Shaw), in QMB (S24958); a male from Queensland, Mt. Molloy (16°44'S, 145°19'E), 400 m elev., “riparian/woodland”, 1992–1993 (S. Burnett), in QMB (S33178); and a female from Papua New Guinea, Central Province, Sept. 1, 1985 (D. Court) in the CLD collection. Males of this species are easily distinguished by the cuticular lobe on the clypeus (Huber, 1997b: fig. 1).

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Additions to the Matrix in Huber (2000)

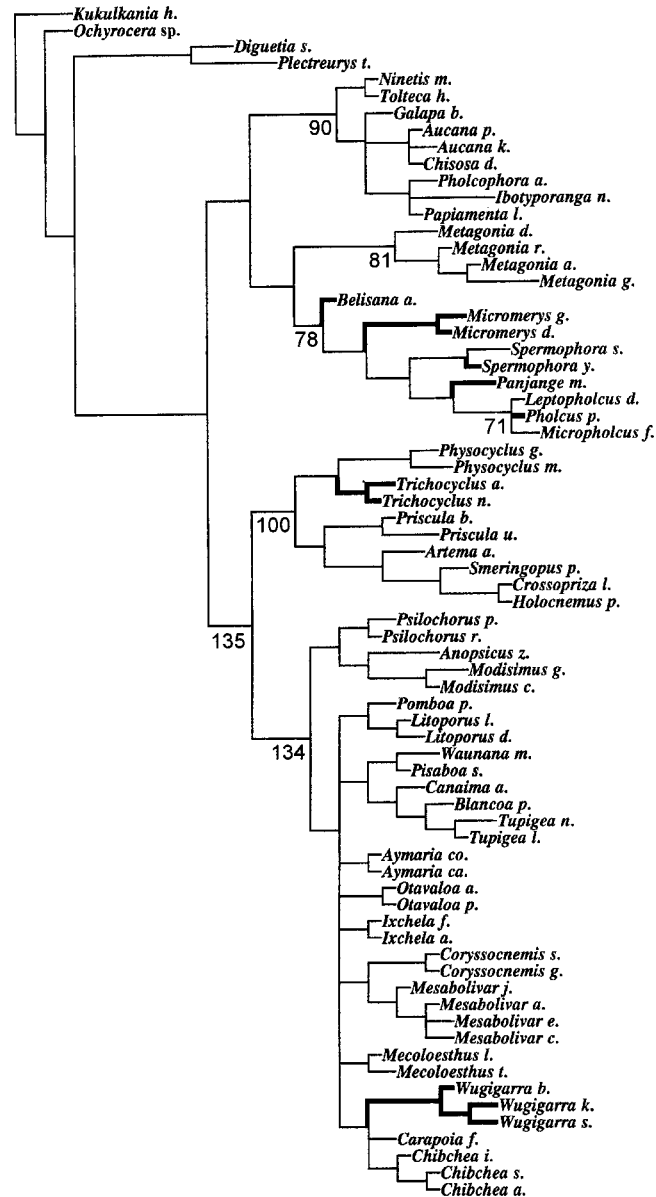
	10	20	30	40	50	60	
62. <i>Trichocyclus a.</i>	0101010101	0010100000	1000001100	1111011100	0000-00000	0101111002	-0100
63. <i>Trichocyclus n.</i>	0101010101	0010100000	1000001100	1111011100	0000-00000	01011??002	-0100
64. <i>Wugigarra k.</i>	0101010101	0011100100	1000001101	1111011000	0000-00000	010100-002	-1000
65. <i>Wugigarra s.</i>	0111010101	0011100100	1000001101	1111011000	0000-00000	010110-002	-1000
66. <i>Wugigarra b.</i>	0111010101	0011100000	1000001101	1111011000	0000-00000	010100-002	-1--0
67. <i>Micromerys g.</i>	1000000100	01111?0000	1100000100	110--10001	0000-00000	1110010002	-0000
68. <i>Micromerys d.</i>	1000000100	01111?0000	1000000100	110--10001	0000-00000	1110010002	-0000
69. <i>Panjange m.</i>	1002000101	0?10101010	1?0000?100	11???10001	0000-00001	1100010001	00000
70. <i>Spermophora y.</i>	1000000101	0110100000	1000001100	1111010001	0000-00000	1100010001	10011
71. <i>Belisana a.</i>	1100000100	0110100000	1000001100	1111010001	0000-00000	0100010002	-0000

See text for codings of newly added characters (62–65) for taxa 1–61. (“.” = nonapplicable: “?” = unknown).

APPENDIX 2

Preferred Most Parsimonious Cladogram Found by NONA

Cladogram found by NONA using the matrix of Huber (2000) with the additional data in appendix 1 (length = 180; CI = 38; RI = 77). Only clades discussed in the text are numbered. Bold lines indicate Australian taxa. See Relationships for detailed discussion.



APPENDIX 3

Preferred Most Parsimonious Cladogram Found by Pee-Wee

Cladogram found by Pee-Wee using the matrix of Huber (2000) with the additional data in appendix 1 (length = 184; CI = 37; RI = 76). Only clades discussed in the text are numbered. Bold lines indicate Australian taxa. See Relationships for detailed discussion.

