

Notes on Australian Zodariidae (Araneae), I. New Taxa and Key to the Genera

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ABSTRACT. A key to the genera of Australian Zodariidae is provided. Four new genera are described. The first, *Australutica* n.gen., belongs in the subfamily Lachesaninae and is represented by the four new species: *A. moreton* (type species, ♂), *A. xystarches* (♀), *A. manifesta* (♂) and *A. quaerens* (♂). The three other new genera belong in the Zodariinae, they are *Australorena* n.gen. with *A. scenica* (Koch) (type species), *Chilumena* n.gen. with *C. reprobans* n.sp. (♂, type species) and *C. baehrorum* n.sp. (♀), and *Zillimata* n.gen. with *Z. scintillans* (Pickard-Cambridge) (type species). Two species, *Habronestes calamitosus* n.sp. (♂, ♀) and *Asceua expugnatrix* n.sp. (♂, ♀), are described in existing genera.

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The Australian Zodariidae is a speciose group. Before Jocqué's generic revision of the Zodariidae in 1991 (Jocqué, 1991) only c. 35 species had been described, but now it would seem that the family is probably as rich as it is in Africa, where almost 200 species are known and many more await description. The remarkable situation whereby almost all the Australian species were united in one genus arose when Pickard-Cambridge (1869: 52) "recognized at once" Walckenaer's genus *Storena*. However, *Storena* was very poorly described and not recognisable with certainty as no types had been designated. Koch (1872) tried to rearrange the situation by recombining all the known Australian species, except the type species *Storena cyanea* Walckenaer, in *Habronestes* Koch. This proved unworkable and complicated the situation even further. Later authors (Bradley, 1878; Dunn, 1951; Hickman, 1944; Rainbow, 1916, 1920; Simon, 1908; Strand, 1913; Thorell, 1881),

continued to describe new species in *Storena*. Finally several new genera had to be created (Jocqué, 1991) in order to accommodate this wide variety of taxa. This was done in a revision of the zodariid genera together with a new delimitation of its subfamilies. In a recent paper (Jocqué, 1992) the division between the Zodariinae and the Storeninae had to be abandoned for reasons already suggested by the cladistic analysis in the generic revision.

In the interim the genus *Storena* has been revised (Jocqué & Baehr, 1992) and now contains 32 species. During that study it appeared that a number of species, new as well as previously described, could not be accommodated in the genera described to date.

The first part of this paper on Australian Zodariidae clears the situation by creating a generic framework in which the majority of the Australian species of Zodariidae will fit. A key to the Australian genera of Zodariidae

is also provided. (In an earlier key to genera [Jocqué 1991: 30] a missprint can be corrected by inverting the sentences in couplet 43, so that "chilum clearly defined and double" keys to 44.)

Near the end of these studies it has become clear that even more genera will be needed to accommodate the entire Australian zodariid fauna. Unfortunately this is beyond the scope of the present study, nevertheless, the majority of Australian zodariid species can now be classified.

Methods

The format is similar to that used by Jocqué & Baehr (1992). All measurements are in millimetres. Drawings of palps always show the right one.

Abbreviations. ALE—anterolateral eyes; AME—anteromedial eyes; AS—anterior spinnerets; AW—anterior width; d—dorsal or diameter (see below); *dw*—distal whorl; *disp*—dispersed, not in obvious rows; F—femur; L—length; MOQ—median ocular quadrangle; Mt—

metatarsus; PLE—posterolateral eyes; PME—posteromedial eyes; *pl*—prolateral; P—patella; PW—posterior width; *rl*—retrolateral; t—tarsus; T—tibia; Tot—total; *v*—ventral; *w*—whorls (meaning a number of spines which stay in a whorl on a particular segment of the leg, though not always exactly on the section. It is often difficult to tell whether these spines are dorsal, ventral or lateral); *—spines in a row; **—spines in two rows.

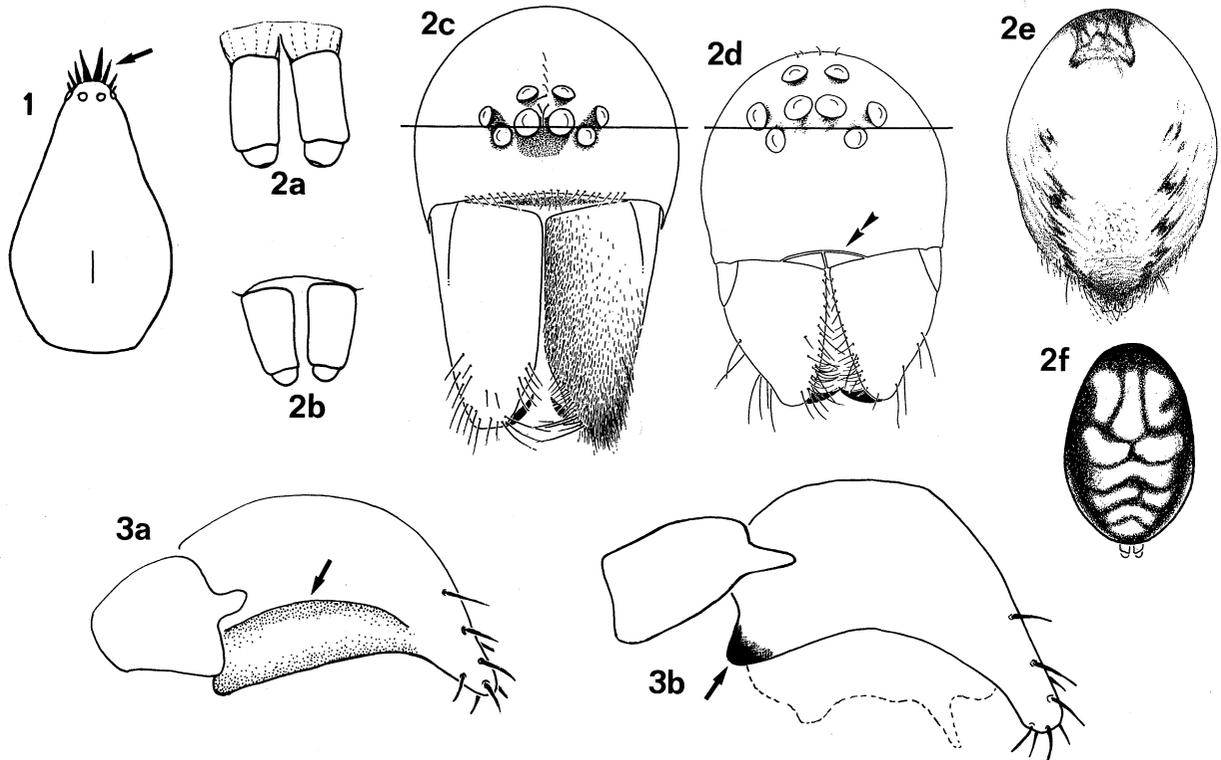
Abbreviations in connection with eye measurement and position: a, b, c and d—diameter, in millimetres, of AME, ALE, PME and PLE respectively; e—AME-AME; f—AME-ALE; g—PME-PME; h—PME-PLE.

Museums and institutions: CAS—California Academy of Sciences (W. Pulawski & D. Ubick); KBIN—Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels (L. Baert); QM—Queensland Museum, Brisbane (R. Raven); SAMA—South Australian Museum, Adelaide (D. Hirst); UMO—University Museum, Hope Entomology Collections (J. Lansbury); WAM—Western Australian Museum, Perth (M. Harvey); ZSM—Zoologische Sammlung des Bayerischen Staates, Munich (M. Baehr).

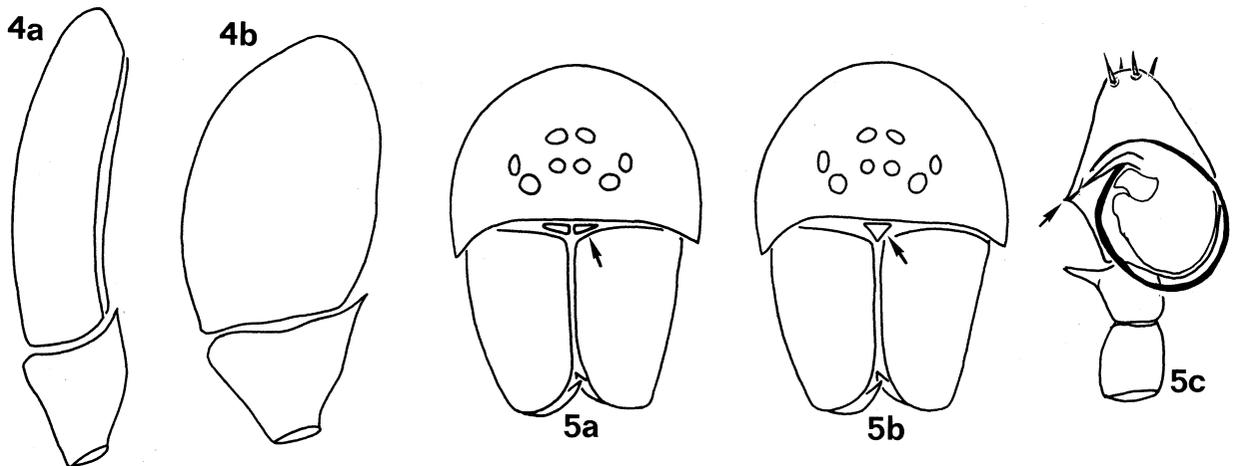
Key to the Australian Genera of Zodariidae *

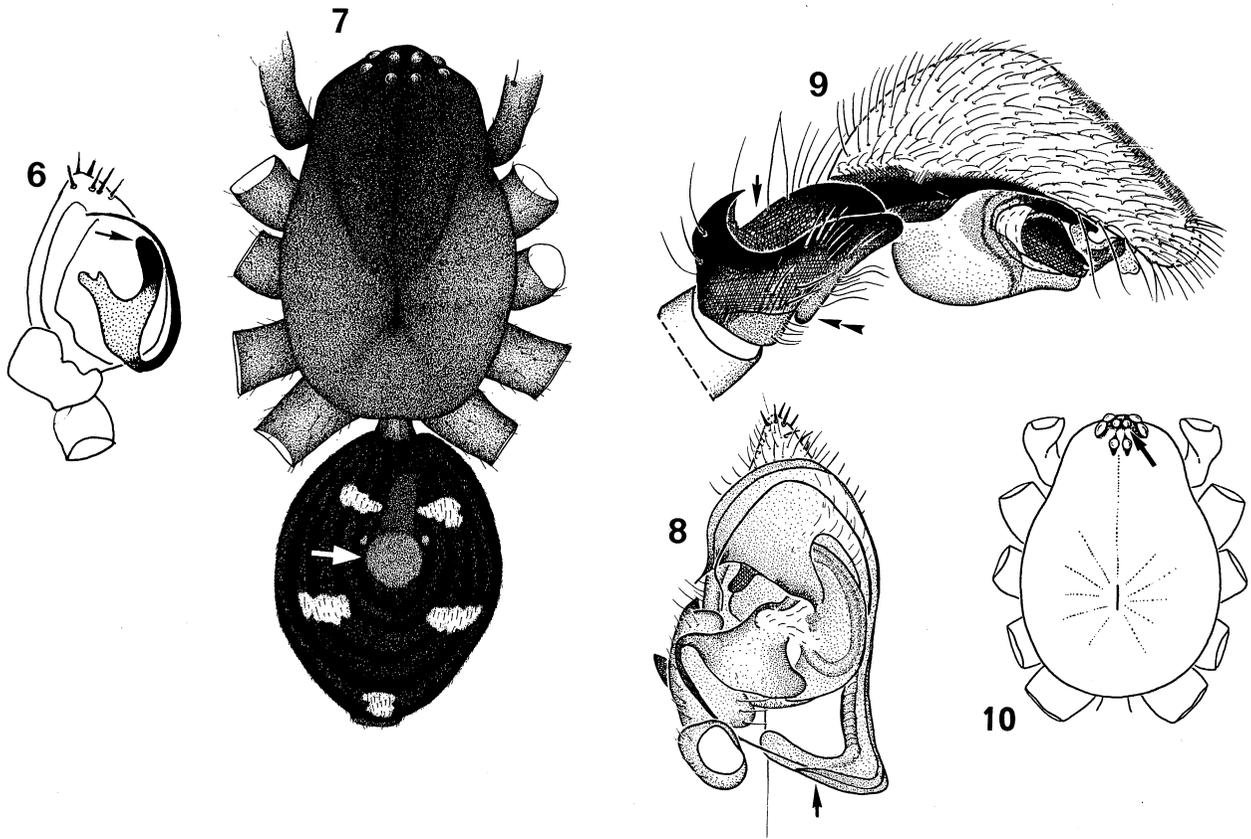
1. Carapace with a transverse row of spines in ocular area (Fig. 1)..... CYRIOCTEINAE *Cyrioctea*
- Carapace without a row of spines in ocular area 2
2. Anterior spinnerets cylindrical and retractile (Fig. 2a); anterior row of eyes not strongly procurved, so that line linking upper margin of ALE runs through AME (Fig. 2c); abdominal pattern if present consisting of poorly delimited dark patches on pale background (Fig. 2e) LACHESANINAE *Australutica*
- Anterior spinnerets conical and only partly retractile (Fig. 2b) anterior row of eyes strongly procurved, so that line linking upper margin of ALE does not run through AME (Fig. 2d) or if it does then dorsal abdominal pattern consisting of well delimited pale spots on dark background (Fig. 2f) ZODARIINAE 3
3. Cymbium of male palp with lateral fold (Fig. 3a), sometimes with pointed "exit"; fold may be restricted to basal half of cymbium 4
- Cymbium of male palp with lateral flange (Fig. 3b) or thickened lateral margin 7
4. Small spiders (<4.5 mm) with male palpal cymbium strip-like as seen from above (Fig. 4a), due to the enormous lateral fold; epigynum with superficial, wound ducts; spines reduced to a few on femora; no spines behind the tracheal opening *Asceua*
- Larger spiders, with normal oval cymbium (Fig. 4b); ducts usually not visible in uncleared epigyne; legs with numerous spines; sometimes with spines behind tracheal opening 5

* *Hetaerica* not included, known only from juvenile.



5. Chilum double (Fig. 5a); cymbial fold, which opens ventrally, converges into a pointed "exit" (Fig. 5c); tegulum with double apophysis: one sclerotised, more or less straight, lying ventrad of a membranous one which is similar in form but less slender..... *Neostorena*
- Chilum single (Fig. 5b); lateral fold opens to the side, without pointed exit





- 6. Tegulum Y-shaped due to a curved sclerotised mesal excrescence (Fig. 6); tegulum with a distal membranous appendage; abdomen without row of short spines in front of tracheal opening *Habronestes*
- Tegulum of usual shape, with sclerotised appendages; row of short spines in front of tracheal opening *Mallinella*
- 7. Abdomen in the middle of dorsum with finely pitted shield in between three or five pale white dorsal spots (Fig. 7) *Storena*
- Abdomen in male sometimes with frontal scutum but without pitted shield 8
- 8. Tegulum with large, free-standing tegular apophysis developed in opposite direction of embolus (Fig. 8) (sometimes much smaller than on drawing) *Asteron*
- Tegular apophysis appressed against tegulum and developed in same direction as embolus 9
- 9. Male palpal tibia with dorsal concavity (Fig. 9) and ventral knob (Fig. 9); tegular apophysis small and membranous, embolus massive *Storosa*

- Male palpal tibia and tegulum without these characters 10
10. Tegument of carapace strongly and deeply reticulated; chelicerae without teeth 11
- Tegument of carapace smooth or finely granulated; chelicerae with 1 or 2 promarginal teeth 12
11. Margin of clypeus with central concavity accommodating high double chilum (width/height c. 1) *Chilumena*
- Margin of clypeus straight (Fig. 5a), chilum lower (width/height c. 3) *Zillimata*
12. AME the smallest; MOQ more than 1.5 times longer than wide (Fig. 10); sternum rebordered; male chelicerae swollen at base *Australorena*
- Eyes subequal; MOQ less than 1.5 times longer than wide; sternum not rebordered; male chelicerae normal *Nostera*

Taxonomy

Lachesaninae Jocqué

Australutica n.gen.

Diagnosis. Members of this genus are recognised by the combination of characters of the subfamily Lachesaninae (retractile AS, ovoid sternum) combined with the presence of two rows of long spines on the anterior metatarsi.

Etymology. This generic name is a contraction of Australia and *Lutica*, another genus in the Lachesaninae.

Description

Medium-size to large spiders (5.0–14.0 mm) with oval carapace, widest between coxae II and III and narrowed in front to about 0.6–0.7 times maximum width in both sexes. Carapace smooth with clear cervical grooves and deep fovea; rather elongate (L/W c. 1.4 in ♂♂, c. 1.6 in ♀♀). Profile with strongly raised cephalic part. Highest point of profile between PME and fovea. Finely haired or without hairs. A few stronger setae around fovea and on clypeus.

Colour: prosoma, including legs, yellow to orange; cephalic area sometimes with darker pattern.

Eyes in two rows; both rows more or less strongly procurved. AME dark and circular, remainder pale and circular. AME the largest, other eyes of similar size. MOQ longer than wide (up to 1.3 times) or subquadrangular. Clypeus straight, slightly retreating or slightly bulging; about 3 times as high as the diameter of an ALE. Chilum a wide, thinly haired sclerite, 4 to 5 times wider than high. Chelicerae normal; densely haired in front; with strong lateral condyle; anterior margin with one (♂) or two teeth (♀). Fangs rather long; length about three times width at base.

Endites roughly rectangular, tapering towards extremity and with basolateral extension, slightly converging, with dense anteromesal scopula.

Labium roughly rectangular, narrowed in front and at base, 1.2 to 1.4 times longer than wide. Sternum oval, without lateral extensions but with very small extensions between coxae.

Leg formula 4123 or 4312. Spination: number of spines very variable, always fewer on legs I and II than on posterior pairs of legs but Mt I and II with 2 rows of ventral spines which may be short. Femora in males with dense cluster of ventral hairs. Hinged hairs present on T and Mt. Tarsi with spiniform scopulae. No claw tufts. Three claws; paired claws with oblique row of teeth, varying between 8 on anterior and 18 on posterior tarsi; the most proximal teeth are implanted in the axis of the claw, the most distal ones clearly laterally, facing the other claw. Trichobothria in two dorsal rows on tibia, in a dorsal and a retrolateral row on Mt, and in a dorsal row on tarsi.

Abdomen oval without or with faint but complex pattern. Epiandrum poorly developed. Six spinnerets, surrounded by long, curved hairs; anterior pair long, retractable, cylindrical, clearly bi-articulate, with few (♂) or many (♀) large spigots. Posterior spinnerets only about half the length of the AS, cylindrical, faintly bi-articulate. Median pair conical, small in females, very small in males. Colulus represented by two groups of short setae. Tracheal spiracle narrow, with sclerotised rim.

Male palp with long tibial apophysis, usually widened at extremity. Cymbium with several strong distal spines and a basolateral flange. Embolus variable in length and direction; originating on promesal margin part of tegulum, very thin, reaching anterior tip of membranous tegular apophysis, here serving as conductor.

Female palp with long cylindrical tarsus and large toothed claw, turned inwards over c. 15°.

Epigyne quite simple with central entrance holes and widely separated large spermathecae.

Type species. *Australutica moreton* n.sp. (♂).

Other species included. *Australutica manifesta* n.sp. (♂) *Australutica quaerens* n.sp. (♂) *Australutica xystarches* n.sp. (♀); a few undescribed species.

Affinities. According to the definition of the Lachesaninae (Jocqué, 1991), *Australutica* belongs in that subfamily. It has the typical features (ovoid sternum, simple palpal conformation, eyes in two procurved rows, claw teeth in oblique row, endites with basolateral extension) of the subfamily including its single synapomorphy, that is its retractile AS. It can be questioned though whether the species here described do belong in one and the same genus. Since the taxonomy of the Zodariidae is for a large part based on palpal morphology, it would seem that *A. quaerens* should be placed in another genus. The conformation of its palp is indeed quite different from that of *A. moreton*. Mainly the fact that the embolus is coiled in the reverse direction, clockwise on the right palp, is a strong indication that *A. quaerens* represents a separate evolution line.

A solution to this problem awaits discovery of the alternate sex of at least a few of the species now placed in *Australutica*.

Australutica moreton n.sp.

Figs 11a–d, 12a,b

Type material. HOLOTYPE ♂: Australia, Moreton Island, Bulwer Swamp, 30 September 1982, W. Houston (QM S 12159). PARATYPES: 2♂♂: together with holotype (1♂ in KBIN).

Diagnosis. The male of this species is recognised by the abdominal and cephalothorax pattern, by the shape of the male palpal tibial apophysis which is gradually tapered to a sharp tip.

Etymology. *Moreton* is a noun in apposition taken from the type locality.

Description

Male (paratype measurements in brackets): total length 6.73 (5.53, 6.26) mm; carapace 3.45 (2.90, 3.49) mm long, 2.34 (1.87, 2.26) mm wide. Colour (Fig. 11a): carapace yellow with V-shaped pattern in front of fovea, clypeus and lateral sides of cephalic area dark. Chelicerae yellowish orange; sternum yellow; legs yellow, femora darkened. Abdomen with typical dorsal pattern (Fig. 11a). Venter with yellow epiandrum; remainder white except dark area around spinnerets.

Eyes: a, 0.16; b, 0.12; c, 0.11; d, 0.11; e, 0.05; f, 0.04; g, 0.11; h, 0.17. MOQ, AW = 1.15×PW; AW = 1.02×L.

Legs: measurements and spination are given in Tables 1 and 2. Femora III and IV with dense group of pro- and retroventral hairs.

Palp: see Fig. 12a,b.

Female. Unknown.

Other material examined. None.

Distribution. Known only from the type locality, Moreton Island.

Australutica manifesta n.sp.

Fig. 12d–f

Type material. HOLOTYPE ♂: South Australia, Dalhousie, 26°34'S 137°21'E, 27 August 1991, sand plain, W. Head (SAMA ARA 5323). PARATYPES: 1♂: South Australia, Maralinga, 12 km south-south-west, 30°16'S 131°33'E, 10–15 October 1987, sand dune, *Myoporum* vegetation, pitfall, Yellabina Survey (SAMA 5323); 2♂♂: South Australia, Purni Bore, 26°17'S 136°06'E, 24–29 August 1991, H. Ehmann (SAMA ARA 5323, 1♂ in KBIN).

Diagnosis. The male of this species is recognised by the abdominal pattern with two rows of small transversal stripes, by the shape of the male palpal tibial apophysis, which has a broad base with almost parallel sides and the tip of which the inferior margin is concave. The species is obviously strongly related to *A. moreton*.

Etymology. The word *manifesta* (Latin *manifestus* = evident) refers to the fact that this is a very typical representative of the genus.

Description

Male (paratype measurements in brackets): total length 8.70 (7.57–10.44) mm; carapace 4.26 (4.17–5.04) mm long, 3.04 (3.04–3.39) mm wide. Colour: carapace pale yellow, darker in cephalic area (Fig. 12d). Chelicerae yellow. Sternum pale yellow; legs pale yellow, Mt and t slightly darker. Abdomen very pale with typical dorsal pattern consisting of narrow central dark area in front, followed by two rows of six small transverse stripes. Venter with yellow epiandrum; remainder white.

Eyes: a, 0.21; b, 0.11; c, 0.15; d, 0.17; e, 0.04; f, 0.07; g, 0.11; h, 0.27. MOQ, AW = 1.09×PW; AW = 0.96×L.

Legs: Tarsi III and IV slightly curved upwards. Leg measurements and spination are given in Tables 1 and 2. Femora II, III and IV with dense group of pro- and retroventral hairs, groups denser and setae more rigid from II towards IV.

Palp: see Fig. 12e,f.

Female. Unknown.

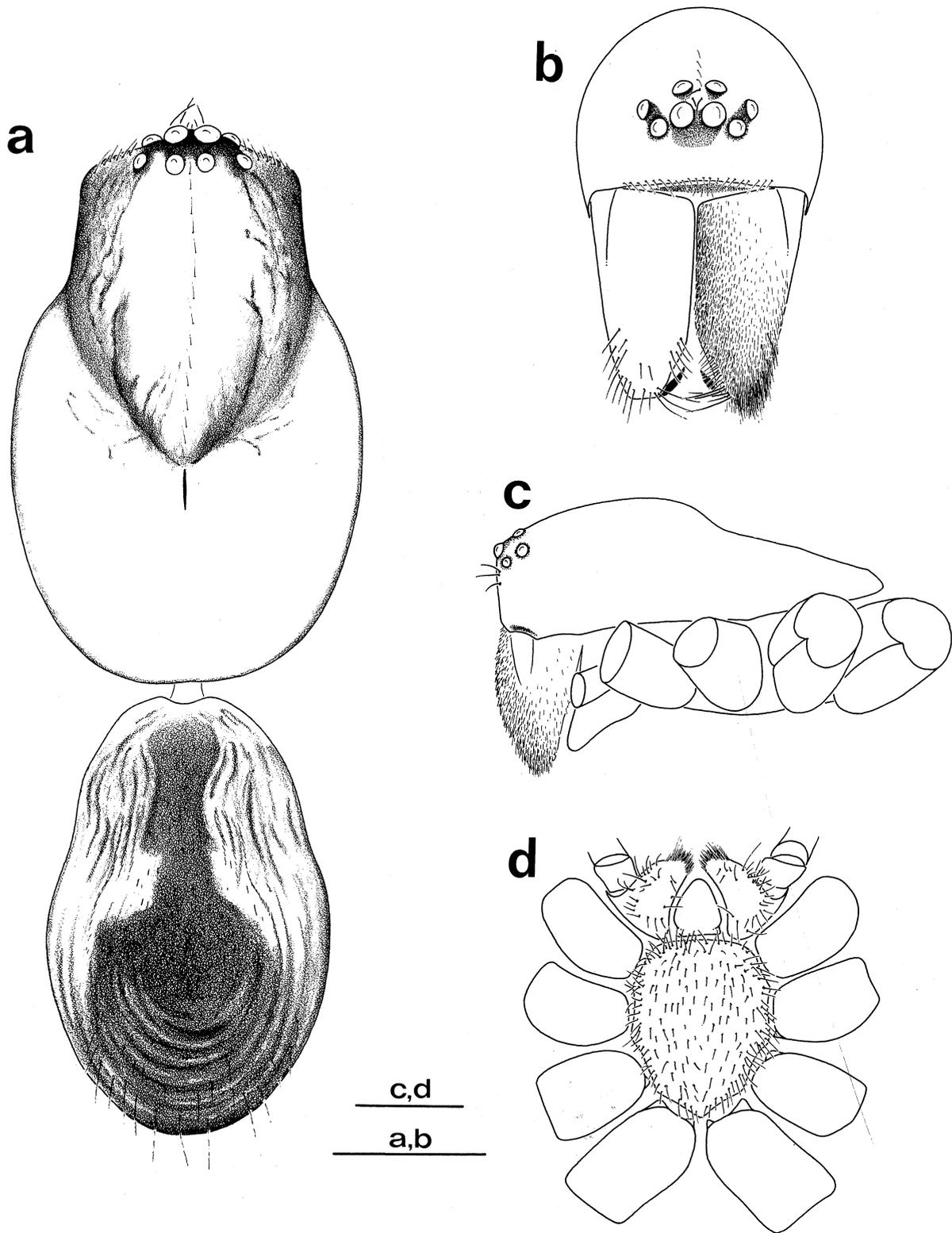


Fig. 11. *Australutica moreton* n.sp. **a**, habitus; **b**, carapace, frontal view; **c**, carapace, lateral view; **d**, sternum, labium and endites. Scales 1 mm.

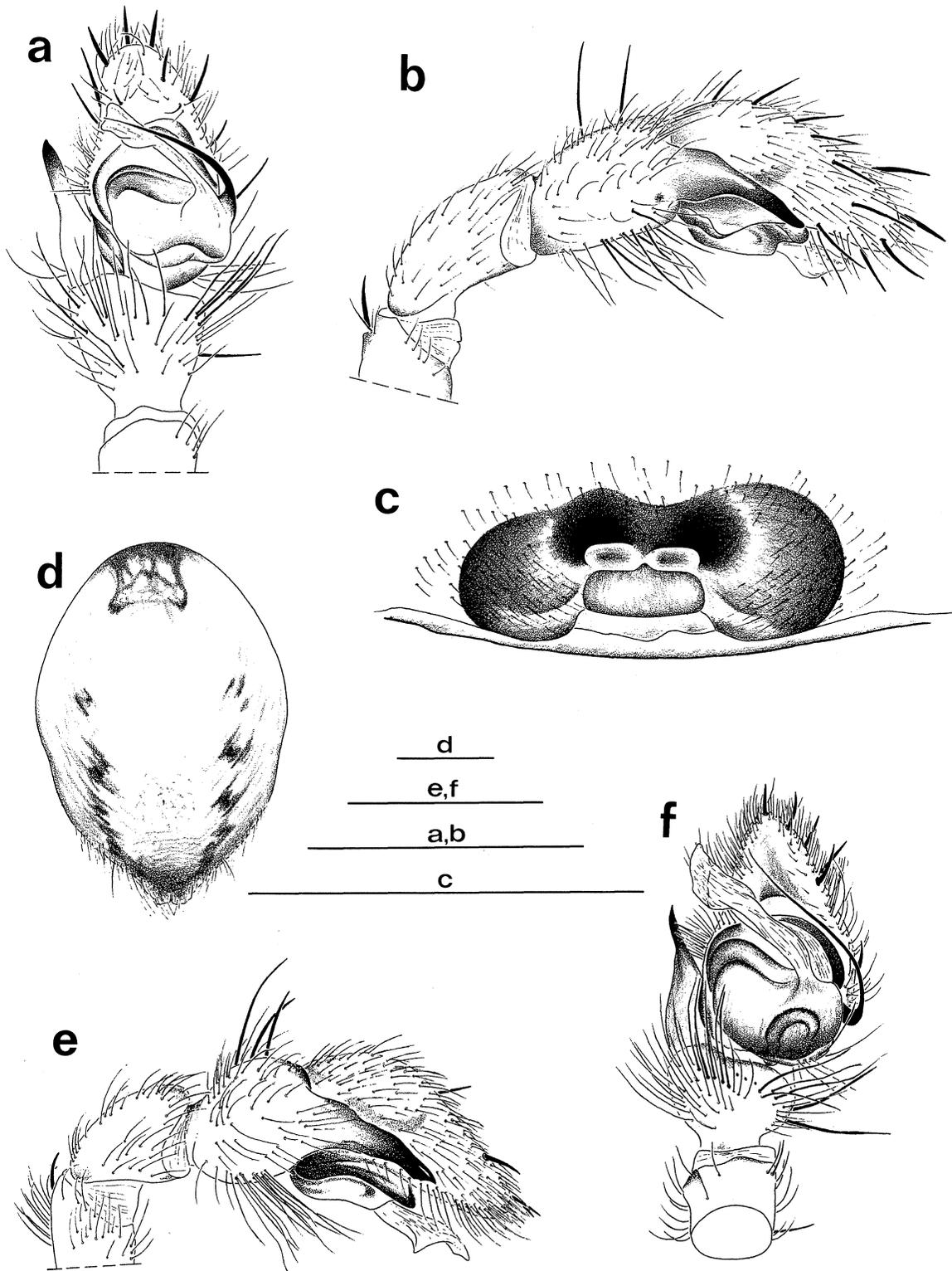


Fig. 12. *Australutica moreton* n.sp. **a**, male palp, ventral view; **b**, lateral view. *Australutica xystarches* n.sp. **c**, epigyne. *Australutica manifesta* n.sp. **d**, abdomen, dorsal view; **e**, male palp, lateral view; **f**, male palp, ventral view. Scales 1 mm.

Other material examined. None.

Distribution. South Australia.

Australutica xystarches n.sp.

Fig. 12c

Type material. HOLOTYPE ♀: Australia, South Australia, Lake Hart, 31°10'S, 136°25'E, under fallen fence posts on surface of lake, 24 June 1989, N.A. Locket (SAMA ARA 5323). PARATYPE: 1 subadult ♂, with same label-data as holotype.

Diagnosis. The species is so far the largest of the genus and the only one for which the female is known.

Etymology. The name is a noun in apposition; *xystarches* (Greek) meaning "leader of sport activities" and refers to the robust appearance of the specimens.

Description

Female. Total length 11.13 mm; carapace 5.92 mm long, 3.56 mm wide. Colour: prosoma including legs entirely yellow. Chelicerae and labium medium brown; sternum orange in front fading to yellow behind. Abdomen uniform pale greyish yellow.

Eyes: a, 0.20; b, 0.20; c, 0.15; d, 0.20; e, 0.08; f, 0.12; g, 0.13; h, 0.30. MOQ, AW = 1.11×PW; AW = 0.94×L.

Leg measurements and spination are given in Tables

1 and 2. Femora without groups of pro- and retroventral hairs.

Epigyne: see Fig. 12c.

Male. Only subadult male known; larger than female. Total length 14.79 mm; carapace 6.09 mm long, 3.65 mm wide. Otherwise very similar to female.

Other material examined. None.

Distribution. Known only from the type locality, Lake Hart, South Australia.

Australutica quaerens n.sp.

Fig. 13a,b

Type material. HOLOTYPE ♂: Australia, South Australia, Loxton, 22.5 km south-west, 34°33'S 140°22'E, 28 May 1991, pitfall, A.J. McArthur (SAMA ARA 5323). PARATYPES: 3♂♂; with same label-data as holotype (1♂ in KBIN).

Diagnosis. The male of this species is recognised by the abdominal and cephalothorax pattern, by the shape of the male palpal tibial apophysis and by the complex bulbus with embolus turning clockwise in right palp which is unusual in the family.

Etymology. The word *quaerens* is from the Latin *quaerere* which means "to search" referring to the doubtful attribution of this species to the genus *Australutica*.

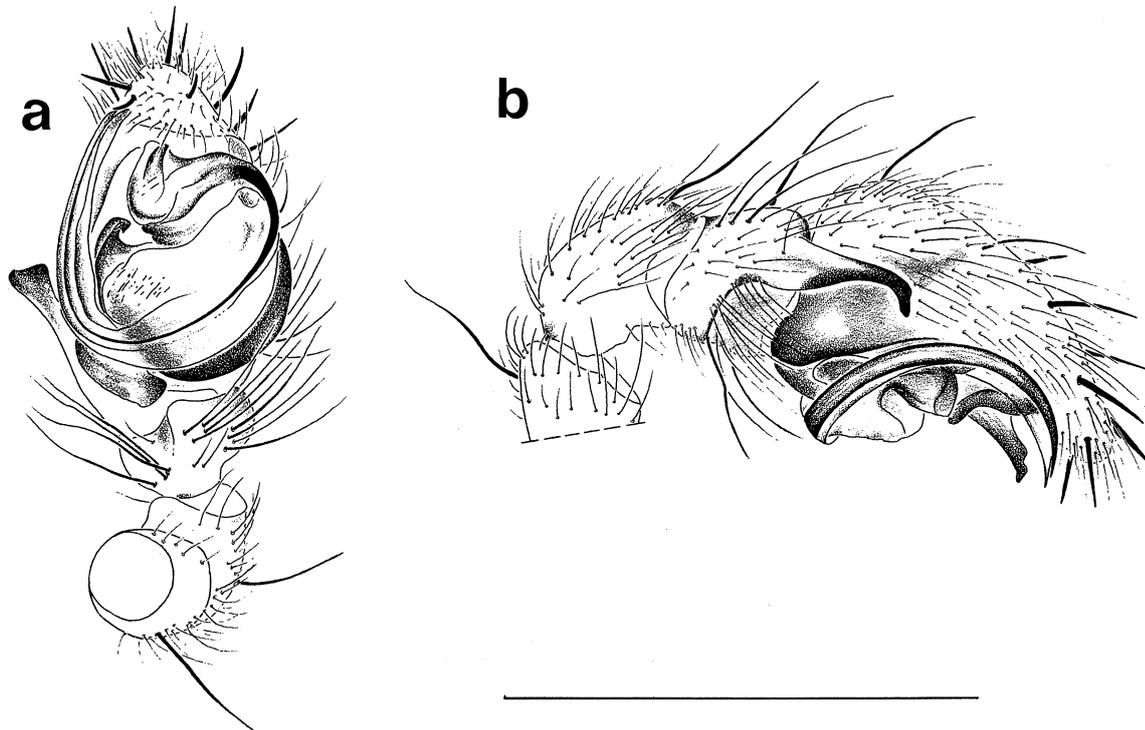


Fig. 13. *Australutica quaerens* n.sp. a, male palp, ventral view; b, lateral view. Scale 1 mm.

Description

Male (paratype range in brackets): total length 4.77 (4.90–5.32) mm; carapace 2.60 (2.34–2.73) mm long, 1.62 (1.58–1.66) mm wide. Colour: carapace pale yellow with V-shaped pattern in front of fovea, darker yellow in cephalic area. Chelicerae brownish yellow; sternum yellow darkened to orange on sides; legs yellow, femora slightly paler than remainder of legs. Abdomen with typical dorsal pattern: consisting of a dark sepia stripe on pale background: stripe wide in front, narrowed then widened near the centre to large chevron, narrowed again, finally ending in chevrons which are interrupted in the middle. Venter with pale, poorly developed epiandrum, remainder and spinnerets pale.

Eyes: a, 0.11; b, 0.11; c, 0.10; d, 0.11; e, 0.053; f, 0.03; g, 0.05; h, 0.09. MOQ, AW = 1.00×PW; AW = 0.80×L.

Leg measurements and spination are given in Tables 1 and 2. Femora without dense ventral groups of hairs.

Palp: see Fig. 13a,b.

Female. Unknown.

Other material examined. None.

Distribution. Known only known from the type locality, Loxton, South Australia.

Zodariinae Simon

Australorena n.gen.

Diagnosis. Representatives of *Australorena* are recognised by the small AME, the elongate MOQ and the flat carapace; males by the swelling of the chelicerae, the rebordered sternum and the ventral single row of strong spines on tibia II; male palp with an anterior, a median and a posterior lateral apophysis; females by the large touching spermathecae near the posterior margin.

Type species. *Habronestes scenicus* Koch.

Affinities. The type species of this new genus has several somatic features in common with *Hetaerica aresca*, the only species of *Hetaerica*, known only from a juvenile specimen. The main resemblance is the size of the AME and the shape of the MOQ which match. Both species might thus well be congeneric but as the majority of the Australian genera is based on characters of the genitalia, *Hetaerica* is likely to remain *incertae sedis*. *Australorena* is probably the sister-group of *Storosa* with which it shares the general shape of the carapace, the double chilum and the dorsolateral concavity of the male palpal tibia; the vulva is also very similar with entrance ducts opening in front and spermathecae touching, situated near the posterior margin. Important differences are the differences in the eye arrangement and the absence of a ventrolateral knob on the male palpal tibia as well as the tegular apophysis and membrane in the palp of *Australorena*.

Etymology. *Australorena* is a contraction of Australia and *Storosa*. The gender is feminine.

Description. Medium-size spiders (7.0–13.0 mm). Carapace fairly low and level, in profile hardly raised in front; widest point at the level of coxae II; narrowed in front to about 0.5 (males) or 0.6 times the maximum width. Tegument reticulate with faintly marked median groove between eyes and fovea; without hairs. Clypeus retreating. Colour: prosoma dark reddish brown with sternum and legs somewhat paler. Abdomen dark sepia with simple pale pattern. Eyes in a close group, in two strongly procurved rows; the ALE can be considered a third row in front of both the others; AME dark, remainder pale and circular, subequal. AME the smallest. MOQ longer than wide (c. 1.7 times). Clypeus about three times as high as the diameter of an ALE, slightly convex and retreating. Chilum a high, double sclerite, width/height ratio of each triangle >3. Chelicerae in males with lateral swelling or frontal boss at about half their length; not haired; one or two teeth on promargin. Fangs short and broad. Endites strongly converging; with distomesal scopula. Labium triangular with narrowed base. Sternum triangular, truncated in front; rebordered laterally; in males more strongly so towards back; rebordering less strong in females. Without lateral excrescences or intercoxal sclerites. Legs: formula 4123. Coxae strongly bulging in males, overhanging sternum; less strongly bulging in females. Spination: males with T I with a row or without spines, T II with a row of 3 to 5 ventral spines; in females T I spinate and not more than 2 ventral spines on T II. Mt I and II with some short ventral spines; posterior leg pairs with numerous spines. Tarsal scopula spiniform. Mt II–IV distally swollen and with distoventral group of hairs. Hinged hairs present. Superior pair of tarsal claws with 9–12 lateral teeth. Trichobothria in two rows on T and Mt, in one row on t. Hinged hairs few on anterior leg pairs. Abdomen oval, without scutum; with two poorly developed muscle apodemes. Six spinnerets, median and posterior pairs small, slightly larger in females than in males. Colulus represented by a few setae. Tracheal spiracle narrow, semicircular, procurved, just in front of spinnerets. Epiandrum present. Male palp: tibia prolaterally concave, with three ventrolateral or lateral apophyses; without ventrolateral back-pointing knob. Cymbium with elongate flange. Embolus broad or slender, originating posterolaterally on tegulum which is extended in front into a wide, curved, conductor-like appendage or long apophysis, which has a central membranous part. Female palp with elongate and tapering tarsus, claw turned inwards over c. 30°.

Other species included. One undescribed from Lake Broadwater, Queensland.

Distribution. Queensland and New South Wales.

Australorena scenica (Koch) **n.comb.**

Figs 14a–d, 15a–d

Habronestes scenicus Koch, 1872: 301, 316 (description of ♂).
Storena scenica.—Simon, 1893: 427.—Rainbow, 1911: 151.—
 Davies, 1985: 121.

Type material examined. HOLOTYPE ♂: Australia, Queensland, Bowen (MZH).

Diagnosis. Males are recognised by the scopula on F III, the relatively short embolus and tegular apophysis.

Description

Male. Total length 6.66 mm; carapace 3.53 mm long, 2.51 mm wide.

Colour: type specimen bleached; fresh specimens have dark reddish brown carapace, reddish brown chelicerae and sternum with darker rebordered margins; legs with dark reddish brown femora and patellae with paler dorsal and retrolateral stripes, reddish brown coxae and yellowish brown tibia, metatarsi and tarsi; abdomen dark sepia, dorsum with two parallel series of longitudinal pale spots and one spot in front of spinnerets, sometimes united to large central pale patch (Fig. 14a); venter dark sepia with three longitudinal pale patches. Chelicerae laterally bulging near middle; anterior margin with one tooth.

Eyes: a, 0.06; b, 0.13; c, 0.13; d, 0.12; e, 0.05; f, 0.07; g, 0.03; h, 0.12; AL-AL, 0.14. MOQ, AW = 0.61×PW; AW = 0.53×L. Clypeus straight, 0.42 high or 3.2 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2. Hinged hairs: T I and II, *d1r1l*; Mt I and II, *d1*. Femora III with ventral scopula.

Male palpus: Fig. 15a,b. Distal narrowed part of tegulum with many, tiny teeth. Embolus rather slender, distally hidden.

Female. Total length 8.46 mm; carapace 3.58 mm long, 2.37 mm wide.

Colour: as in the male; abdominal ventral pattern with only two faint longitudinal pale stripes. Chelicerae laterally not bulging. Anterior margin with one tooth.

Eyes: a, 0.10; b, 0.14; c, 0.12; d, 0.15; e, 0.05; f, 0.12; g, 0.05; h, 0.12; AL-AL, 0.12; MOQ, AW = 0.78×PW; AW = 0.62×L. Clypeus straight, 0.40 high or 2.9 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2. Hinged hairs as in male. Femora III without scopula.

Epigyne (Fig. 15c,d): simple, with shallow longitudinal central depression ending in entrance opening, situated near anterior margin; structures of vulva (Fig. 15c) shining through; two large entrance copulatory ducts converging towards spermathecae situated near posterior margin.

Variation. Male total length 6.04–6.69 mm; carapace length 2.93–3.35 mm; width 2.14–2.28 mm. The number of ventral spines on Mt II may vary from 1-2-2 to 1-2-1-3; on T II from 3* to 5*. Female total length 6.04–8.46 mm; carapace length 2.79–3.58 mm; width 1.86–2.37 mm.

Other material examined. QUEENSLAND (2JJ): Brisbane, Rochedale State Forest, (QM S3729); 1J (QM S3719); 1J (QM S4344); 1J, 1K & 1 juvenile: Homevale, 6 April 1975, sclerophyll woodland near creek, with ants *Rhytidoponera* (QM S3681); 7JJ, 3KK & 4 juveniles: 40 Mile Scrub, south-west Mount Garnet, 10 April 1978, males pitfalls, females litter, R. Raven & V. Davies (QM S4487); 19JJ, 2KK: Lake Broadwater, via Dalby, 25 February–22 April 1986, pitfalls, QM & M. Bernie, (QM S15735); 2KK: Lake Broadwater, via Dalby, 3 January–25 February 1986, pitfalls, QM & M. Bernie, (QM S15727); 1J, 1K: Bluff Downs, 95 km north-west Clarkin Towers, in ground, 19 April 1974, Archer & Elliott (QM S4354); 2JJ: Wongabel, 8 km south of Atherton, 21 January 1989, malaise trap, A. & H. Howden (AM KS27935).

Distribution. Eastern Queensland, Australia.

***Chilumena* n.gen.**

Diagnosis. Representatives of *Chilumena* are recognised by the deep reticulation of the carapace and the concavity of the clypeus accommodating the chilum.

Affinities. The genus is apparently strongly related to *Storosa* with which it shares the high double chilum and the structure of the palp. It shares the deep reticulation of the carapace with *Zillimata* but in that genus there is no clypeal concavity and the embolus runs clockwise on the right palp, which is very unequal and so far only found in *Australutica quaerens*.

Etymology. *Chilumena* is a contraction of *chilum* and *Storena* and refers to the importance of the size of the chilum which is accommodated in a concavity of the clypeus. The gender is feminine.

Description. Medium-size spiders (5.0–7.0). Carapace domed, without cervical grooves; profile sharply falling from cephalic area towards posterior margin. Widest point between coxae II and III; sides parallel, hardly narrowed in front. Tegument deeply reticulated and with faint metallic lustre, finely haired. Colour: prosoma reddish brown with sternum and legs somewhat paler. Abdomen sepia with simple pale pattern. Eyes in a close group, in two strongly procurved rows; the ALE can be considered a third row in front of both the others; AME dark, remainder pale and circular, subequal. AME the largest. MOQ longer than wide (c. 1.2 times). Clypeus strongly retreating, 4 to 5 times as high as the diameter of an ALE. With central concavity accommodating chilum. Chilum high, double, width/

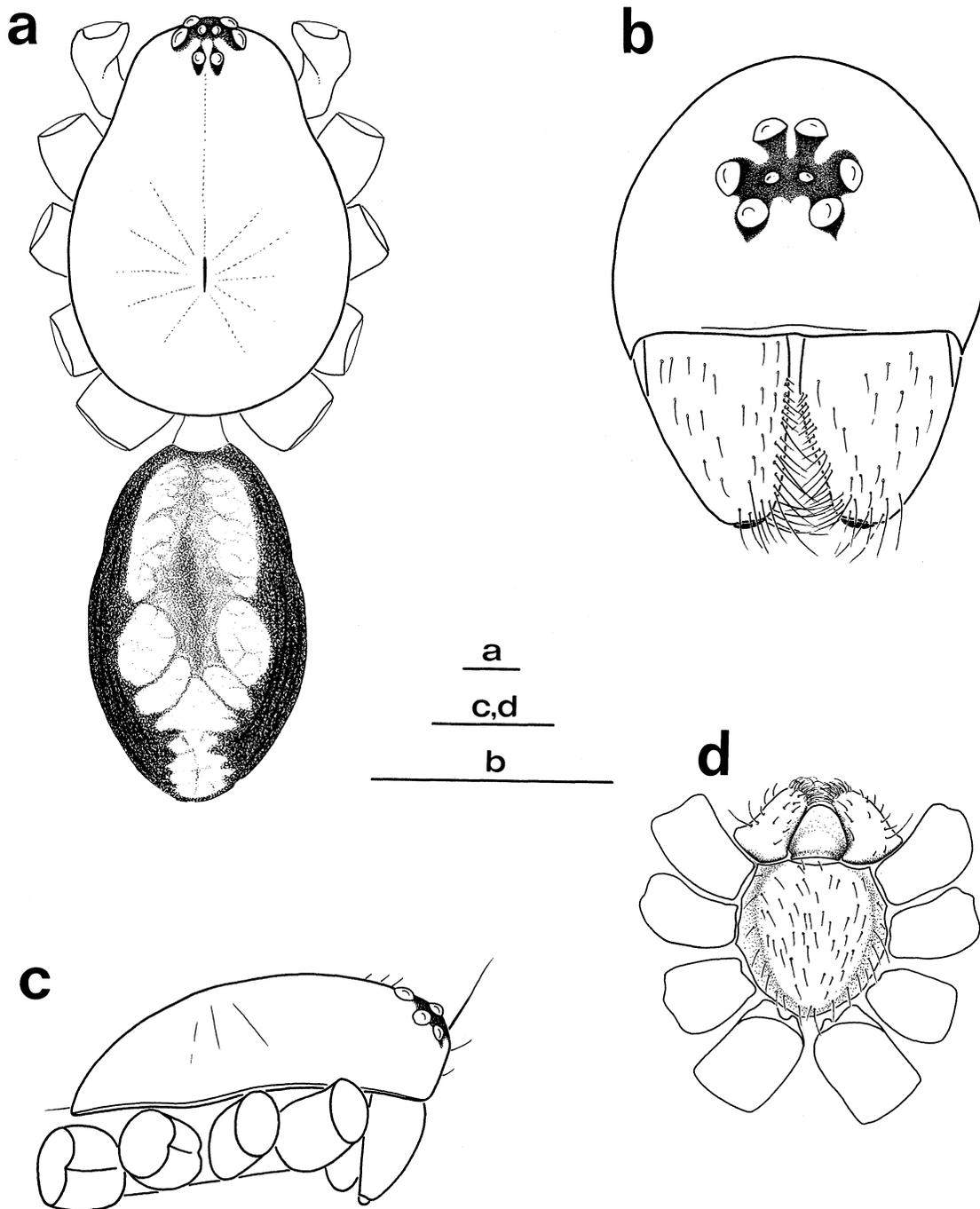


Fig. 14. *Australorena scenica* (Koch) a, habitus; b, carapace, frontal view; c, carapace, lateral view; d, sternum, labium and endites. Scales 1 mm.

height ratio of each triangle c. 1. Chelicerae slender, lateral condyle extended into lateral ridge; without teeth. Fangs short and broad. Endites strongly converging; with poorly developed distomesal scopula. Labium triangular with base hardly narrowed. Sternum triangular, truncated in front; slightly longer than wide. Small triangular extensions fitting in coxal concavities and small intercoxal extensions.

Legs formula 1423. Tarsi of leg I considerably longer than those of other legs. Tarsi cylindrical slightly widened towards extremity. Coxae strongly bulging in males, overhanging sternum; less strongly bulging in females. Spination: few spines on anterior legs, more numerous on posterior pairs. Tarsal scopula spiniform. Mt II-IV distally swollen and with distoventral group of supposedly chisel-shaped hairs. Hinged hair present

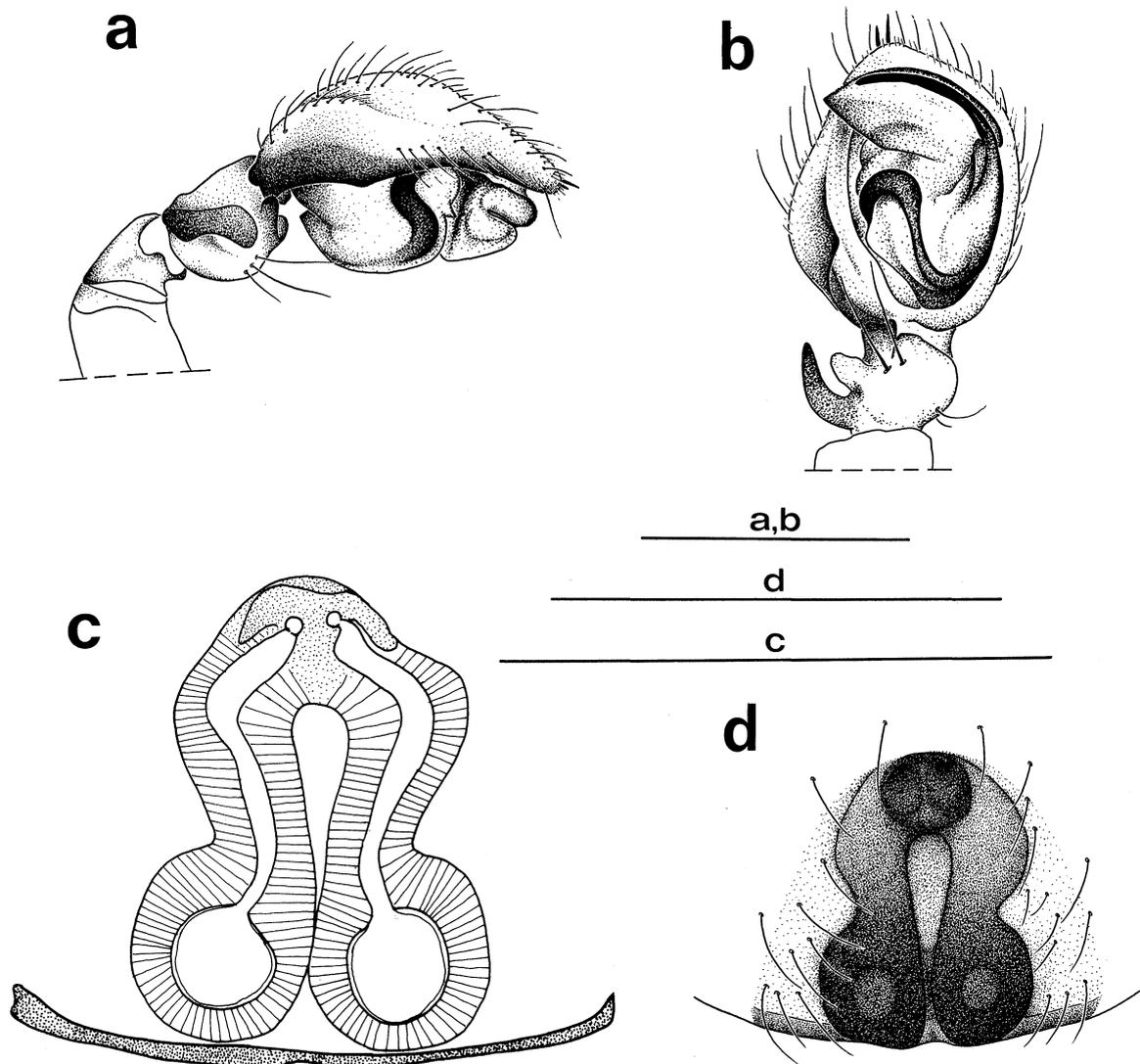


Fig. 15. *Australorena scenica* (Koch) **a**, male palp, lateral view; **b**, male palp, ventral view; **c**, epigyne, cleared, dorsal view; **d**, epigyne, ventral view. Scales 1 mm.

on T I. Superior pair of tarsal claws with 8–10 lateral teeth. Trichobothria in two rows on T, in one row on Mt and t. Abdomen oval, with narrow scutum in male, without scutum in ♀; with two poorly developed muscle points. Six spinnerets in female, only four in males or median pair very small. Colulus represented by a few setae. Tracheal spiracle narrow, just in front of spinnerets. Epiandrum present.

Male palp. Tibia with dorsolateral apophysis; ventrally with two shallow ridges separated by a membranous cleft. Embolus short and broad, originating posterolaterally on tegulum which is extended in front into a slender, spine-shaped, conductor-like appendage; other extremity of tegulum with hook-like apophysis on membranous support, converging with distal conductor. Female palp with strongly tapering almost conical tarsus, claw turned inwards over c. 30°. Epigyne a simple triangular plate with central membranous part.

Type species. *Chilumena reprobans* n.sp.

Other species included. *Chilumena baehrorum* n.sp.

Distribution. South-east Queensland, Western Australia, Northern Territory.

Chilumena reprobans n.sp.

Fig. 16a–f

Type material. HOLOTYPE ♂: Western Australia, Wyndham, 15°30'S 128°09'E, 20 October 1962, E. Ross & D. Cavagnaro (CAS).

Diagnosis. The male of this species is recognised by the shape of the male apophysis and of the tegular appendages.

Etymology. *Reprobans* (Latin for rejecting) refers to the impossibility to include this species in the same genus as *Zillimata scintillans*.

Description

Male. Total length 5.62 mm; carapace 3.06 mm long, 1.79 mm wide.

Colour: carapace, chelicerae and sternum uniform reddish brown with faint metallic hue; legs orange with pale ring on extremity of first tibia. Abdomen pale sepia, dorsum with five transversal bars, two in front, two in the middle and one above the spinnerets; a narrow pale brown scutum in between the anterior pair of bars, lateral sides with large pale spot in front, above epigastric fold. Sparsely covered with fairly long, rigid, dark brown setae. Carapace strongly reticulated.

Eyes: a, 0.20; b, 0.15; c, 0.15; d, 0.17; e, 0.02; f, 0.06; g, 0.10; h, 0.22. MOQ, AW = 1.05×PW; AW = 0.87×L. Clypeus 0.62 mm high or 4.1 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2. Femora densely granulated.

Male palpus: see Fig. 16e,f.

Female. Unknown.

Other material examined. None.

Distribution. Known only known from the type locality, Wyndham, Western Australia.

Chilumena baehrorum n.sp.

Fig. 16g

Type material. HOLOTYPE ♀: c. 125 km N of Hall's Creek, 17°30'S 127°40'E, 5 November 1984, M. & B. Baehr (WAM).

Diagnosis. The female of this species is recognised by the central triangular membranous structure in the epigyne.

Affinities. Although the coloration and habitus of this species is very similar to those of *C. reprobans* this female is considered to belong to another species on the base of the differences in eye position and spination.

Etymology. *Baehrorum* is a patronym in honour of Barbara and Martin Baehr who collected the type specimen, in esteem for their fieldwork in Australia.

Description

Female. Total length 6.90 mm; carapace 3.41 mm long, 1.92 mm wide.

Colour: carapace, chelicerae and sternum uniform reddish brown with faint metallic hue; legs orange with

pale ring on extremity of first tibia. Abdomen pale sepia, dorsum with five transversal bars, two in front, two in the middle and one above the spinnerets; lateral sides with large pale spot in front, above epigyne; venter with large uniform sepia triangle between epigyne and spinnerets, remainder mottled. Carapace strongly reticulated. Entire abdomen sparsely covered with fairly long, rigid, dark brown setae.

Eyes: a, 0.18; b, 0.14; c, 0.16; d, 0.15; e, 0.03; f, 0.10; g, 0.13; h, 0.15. MOQ, AW = 0.89×PW; AW = 0.70×L. Clypeus 0.75 high or 5.3 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2. Femora finely granulated.

Epigyne (Fig. 16g): membranous centre in the shape of an inverted triangle with concave lateral sides.

Male. Unknown.

Other material examined. None.

Distribution. Known only from the type locality, Hollow Creek, Northern Territory.

Zillimata n.gen.

Diagnosis. Representatives of *Zillimata* are recognised by the deep reticulation of the carapace in the absence of a concavity of the clypeus accommodating the chilum; the embolus is directed in a clockwise direction in the right palp.

Affinities. The genus is very similar to *Chilumena* as far as its habitus is concerned, it shares the deep reticulation of the almost parallel-sided carapace but lacks the concavity of the clypeus margin accommodating the chilum. More important though is the difference in male palpal conformation. *Australutica quaerens* and *Z. scintillans* are the only zodariids with a clockwise directed embolus (in the right palp). This means that the long thin extremity of the embolus lies on the lateral side of the bulbus.

Etymology. *Zillimata* is an arbitrary combination of letters. The gender is feminine.

Description

Small to medium-sized spiders (5.0–10.0 mm). Carapace domed, without cervical grooves; profile gradually falling from cephalic area towards posterior margin. Widest point between coxae II and III; sides parallel, hardly narrowed in front. Tegument deeply reticulated and with metallic lustre, finely haired. Colour: prosoma dark chestnut brown with sternum and legs somewhat paler. Abdomen sepia with simple pale pattern. Eyes in a close group, in two strongly procurved rows; the ALE can be considered a third row in front of both the others; AME dark, remainder pale and circular, subequal. AME

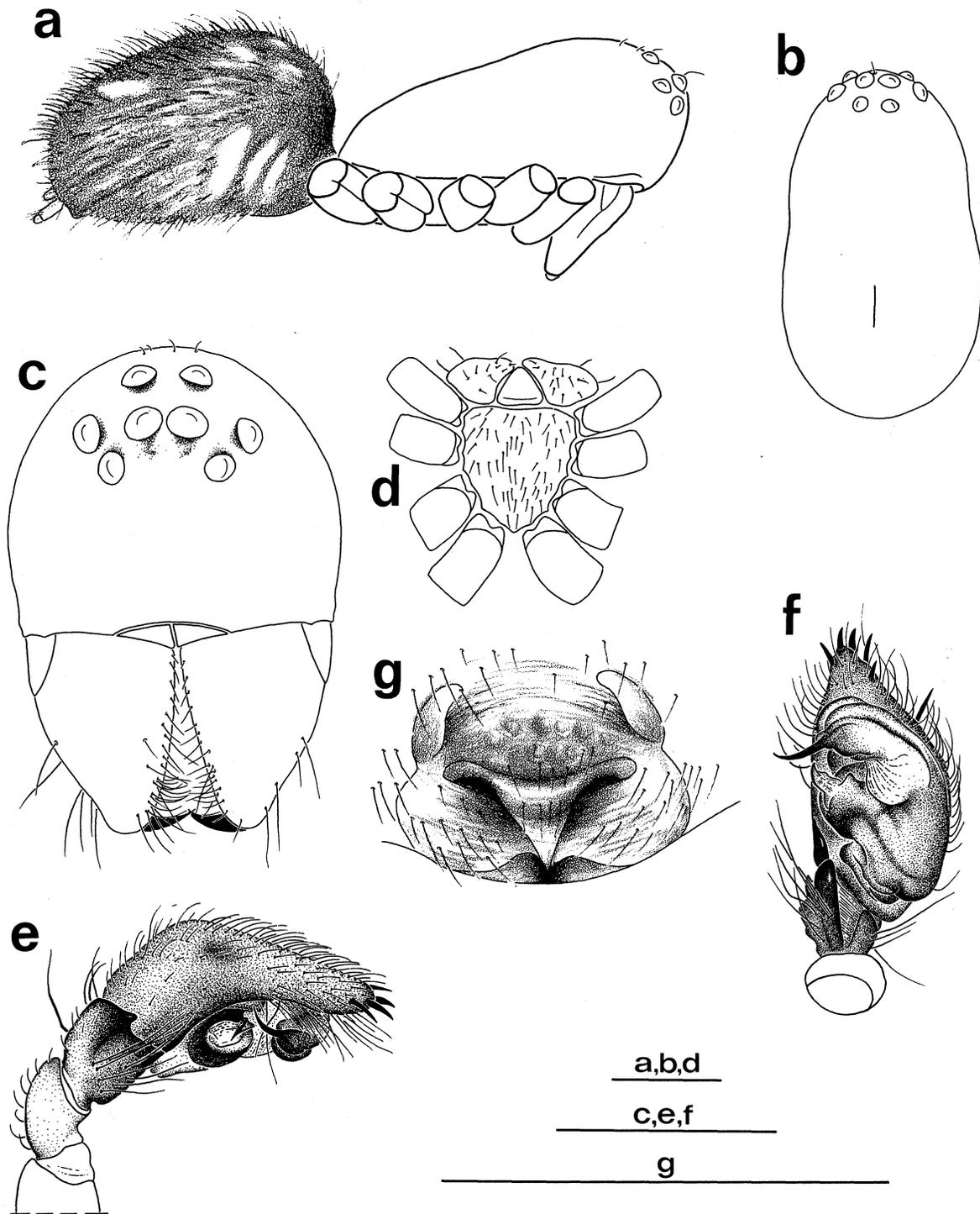


Fig. 16. *Chilumena reprobans* n.sp. a, habitus, lateral view; b, carapace, dorsal view; c, carapace, frontal view; d, sternum, labium and endites; e, male palp, lateral view; f, male palp, ventral view. *Chilumena baehrorum* n.sp. g, epigyne, ventral view. Scales 1 mm.

the largest. MOQ longer than wide (1.3–1.5 times). Clypeus strongly retreating, about 7 times as high as the diameter of an ALE. Without central concavity accommodating chilum. Chilum double, width/height ratio of each triangle c. 3. Chelicerae slender, lateral condyle extended into lateral ridge; without teeth. Fangs short and broad. Endites strongly converging; with poorly developed distomesal scopula. Labium triangular with base hardly narrowed. Sternum triangular, truncated in front; slightly wider than long. Small triangular extensions fitting in coxal concavities and small intercoxal extensions.

Leg formula 4123 or 1423. Tarsi fusiform. Coxae strongly bulging, overhanging sternum. Spination: few spines on anterior legs, more numerous on posterior pairs. Tarsal scopula spiniform. Mt II–IV distally swollen and with distoventral group of supposedly chisel-shaped hairs. Hinged hair present on T I. Superior pair of tarsal claws with 8–10 lateral teeth. Trichobothria in two rows on T, in one row on Mt and t. Abdomen oval, without scutum; with two poorly developed muscle points. Six spinnerets in female, only four in males or median pair very small. Colulus represented by a few setae. Tracheal spiracle narrow, just in front of spinnerets. Epiandrum present.

Male palp: tibia several small dorsolateral apophyses; ventrally with one ridge. Embolus long originating on promesal side of tegulum, running in clockwise direction on right palp so that slender end is laying on lateral side of palpus; distal extremity of tegulum near base of embolus with hook-shaped extension; basal end of tegulum with rounded plate-like base near which is inserted an elongate membrane serving as conductor. Female palp with tibia widened towards distal end and strongly tapering almost conical tarsus, claw turned inwards over c. 30°. Epigyne a simple triangular plate with central membranous part. Entrance ducts thick-walled, ending in large touching spermathecae situated at posterior margin of epigyne.

Type species. *Storena scintillans* Pickard-Cambridge.

Zillimata scintillans (Pickard-Cambridge) **n.comb.**

Fig. 17a–d

Storena scintillans Pickard-Cambridge, 1869: 54.–Rainbow, 1911: 151.–Davies, 1985: 121.

Habronestes scintillans.–Koch, 1872: 302, 303.–Hogg, 1896: 311, 322.

Type material. HOLOTYPE ♀: Australia, Western Australia, Swan river (UMO) (examined).

Description

Female (holotype). Total length 5.63 mm; carapace 2.84 mm long, 1.71 mm wide.

Colour: carapace and chelicerae medium brown with strong bluish metallic sheen; sternum and legs pale brown, except distal third of T I and basal rings of Fe II–IV white. Abdomen: dorsum pale sepia with 5 white patches; two narrow transversal ones in front of the spinnerets; entire dorsum with dispersed shiny hairs; venter pale sepia with a butterfly-shaped pale pattern between epigyne and spinnerets. Carapace strongly reticulated. Femora granulated. Chilum well developed, double. Leg spines few and short on legs I and II, numerous and short on III and IV.

Female from Jerdacuttup. Total length 6.91 mm; carapace 3.07 mm long, 1.83 mm wide.

Colour: carapace and chelicerae dark brown with strong bluish metallic lustre; sternum and legs pale brown, further as holotype.

Eyes: a, 0.13; b, 0.10; c, 0.11; d, 0.12; e, 0.03; f, 0.07; g, 0.13; h, 0.24. MOQ, AW = 0.83×PW; AW = 0.66×L. Clypeus 0.77 high or 7.0 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2.

Epigyne (Fig. 17c,d) with butterfly-shaped central membranous area. Copulatory ducts start just in front of central area, run dorsad and forward to anterior margin of epigyne, thence back and inwards, out and forwards again, to turn finally backwards where to join large touching spermathecae near posterior rim.

Variation among other females. Total lengths 4.81–7.24 mm; carapace length range 2.39–3.19 mm, 1.45–1.87 mm wide. Female from Darlington has white femoral rings only on legs III and IV.

Male. Total length 4.86 mm; carapace 2.60 mm long, 1.49 mm wide.

Colour: as in female but with narrow dark brown dorsal in front of abdomen; ventral white pattern restricted to a triangle on either side of the epiandrum.

Eyes: a, 0.14; b, 0.09; c, 0.11; d, 0.11; e, 0.01; f, 0.05; g, 0.08; h, 0.18. MOQ, AW = 0.97×PW; AW = 0.71×L. Clypeus 0.62 high or 7 times the diameter of an ALE.

Leg measurements and spination are given in Tables 1 and 2.

Other material examined. WESTERN AUSTRALIA: 1K, Jerdacuttup, 9 May 1989, A. Winchester, under limestone rock in paddock with ant (*Rhytidoponera* sp.) (WAM 90/271); 1K, Weomanie Rock, October 1981, R. MacMillan (WAM 90/392); 1K, Darlington, March 1978, G. Lowe (WAM 90/328); 1J, Darlington, 150 m, 5 September 1962, E. Ross & D. Cavagnaro (CAS); SOUTH AUSTRALIA: 2KK, Vanilla Forest Reserve, 28 March 1987, *Eucalyptus* plantation, D. Lee & D. Hirst (SAM ARA 5323); QUEENSLAND: 1K, south-east Queensland, Lake Broadwater via Dalby, 3 January–25 February 1986, pitfalls, QM & M. Bernie (QM S15724).

Distribution. Western Australia, South Australia and south-east Queensland.

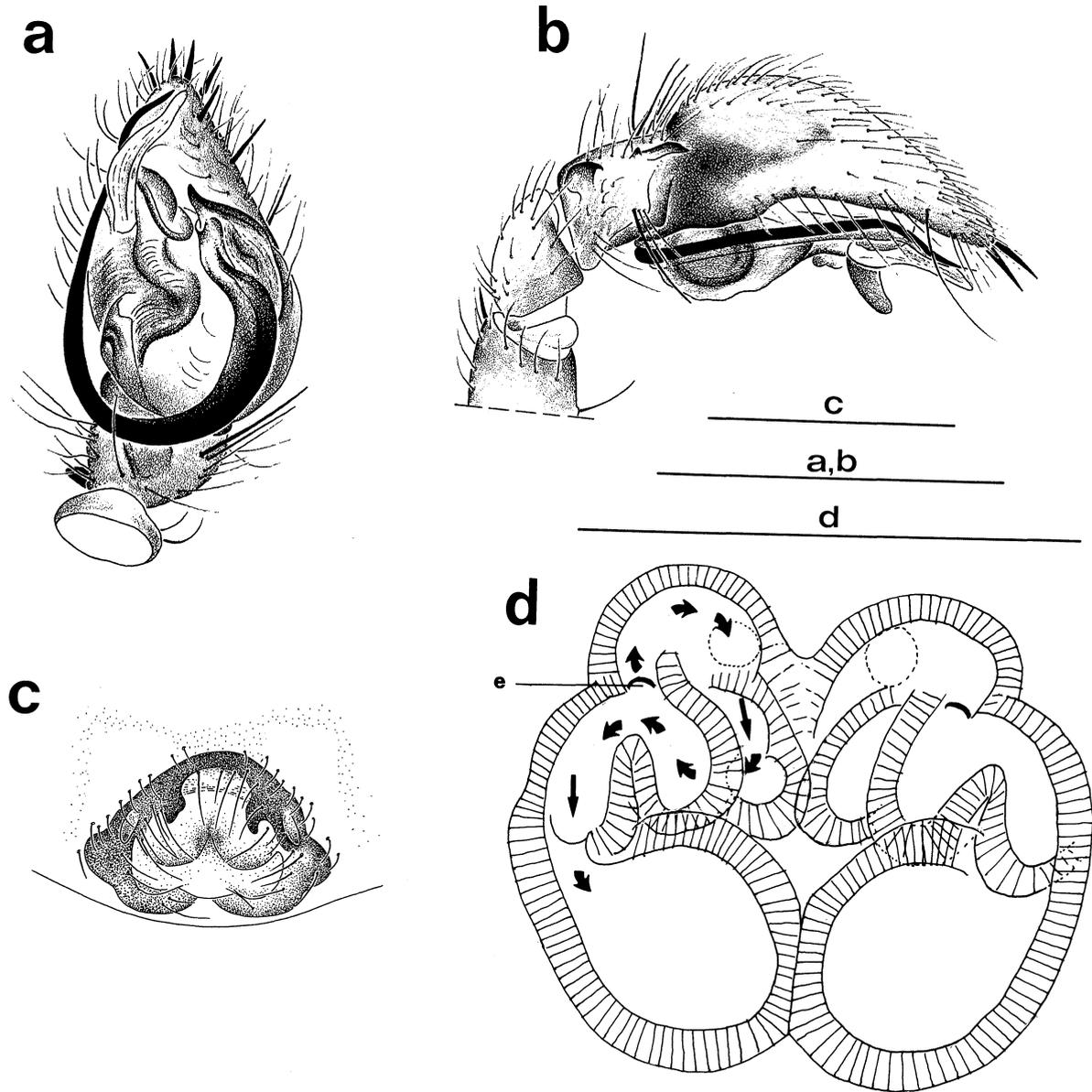


Fig. 17. *Zillimata scintillans* n.sp. **a**, male palp, ventral view; **b**, male palp, lateral view; **c**, epigyne, ventral view; **d**, epigyne, cleared, dorsal view; **e**, entrance opening, arrows indicate course of entrance ducts. Scales 1 mm.

Habronestes Koch

Habronestes calamitosus n.sp.

Fig. 18a–d

Type material. HOLOTYPE ♀: Australia, Queensland, 26 miles south-west of Sarina, 220 m, 19 November 1962, E.S. Ross & D.Q. Cavagnaro (CAS).

Diagnosis. This species is very similar to *H. striatipes* Koch, the type species. Males of the present species

were initially mistaken for those of *H. striatipes* which had poorly been described prior to Jocqué (1991). The male is easily recognised by the dorsal tibial apophysis of the palp, with a row of lateral teeth near the dorsal tip whereas it is a single tooth and a ridge in *H. striatipes*; the female is also similar to the type species of the genus, the epigyne differs by the fact that the converging margins of the central depression are not widened in *H. calamitosus*. It should be mentioned that other, similar species exist in the region of north-east Queensland.

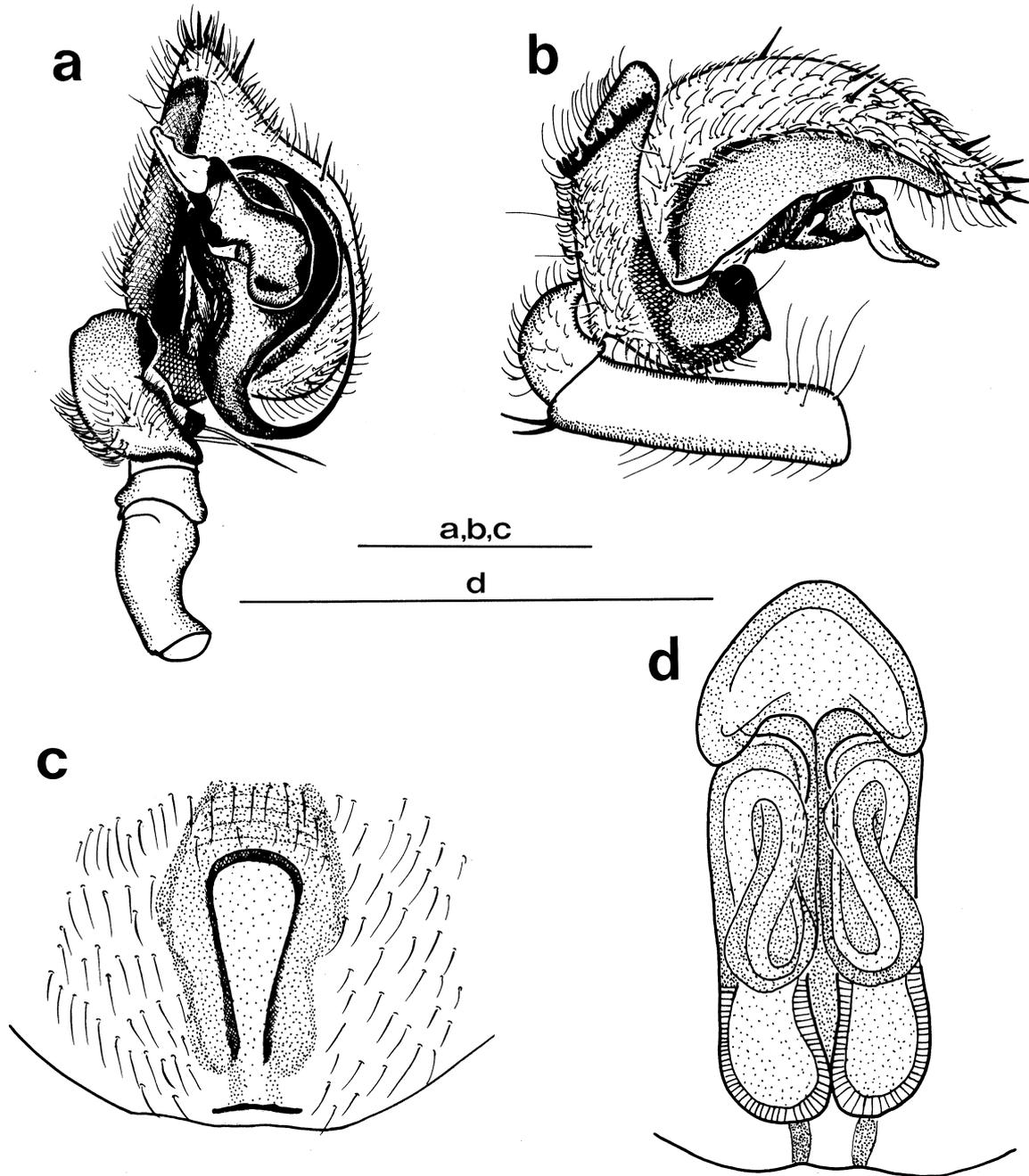


Fig. 18. *Habronestes calamitosus* n.sp. a, male palp, ventral view; b, male palp, lateral view; c, epigyne, ventral view; d, epigyne, cleared, dorsal view. Scales 0.5 mm.

Etymology. The name *calamitosus* means “disastrous” and refers to the fact that specimens had initially been misidentified as the type species of the genus.

Description

Male. Total length 5.79 mm; carapace 3.04 mm long, 2.25 mm wide.

Colour: carapace, chelicerae and sternum chestnut brown; coxae pale, trochanters dark. F I entirely chestnut brown; F II with pale dorsal patch in proximal part, F III with proximal pale ring, F IV with wider proximal pale ring. P I and II and T I and II yellow with brown lateral stripes, Mt and t of anterior pairs pale brown. T III and IV with paler dorsolateral stripe, Mt III and IV medium brown, t III and IV pale brown. Abdomen dark sepia; dorsum with central lyriform pattern, preceded

by two white spots followed by a few white spots on central line in front of spinnerets; sides with two oblique pale stripes; venter with median longitudinal stripe followed by two large pale spots in front of spinnerets.

Eyes: a, 0.09; b, 0.13; c, 0.10; d, 0.12; e, 0.05; f, 0.18; g, 0.26; h, 0.13; i, 0.13; AME-AME = 0.10. MOQ, AW = 1.48×PW; AW = 0.69×L.

Leg measurements and spination are given in Tables 1 and 2.

Male palp (Fig. 18a,b): large, with high dorsal apophysis provided with row of teeth near dorsal margin.

Female. Total length 8.08 mm; carapace 3.41 mm long, 2.33 mm wide.

Colour as in the male but more white on femora; F I with ventral and dorsal dark brown stripe extending to half length of otherwise white femur; rings on F II, III and IV extending resp. to 1/4, 1/3 and half femur's length. Abdominal pattern more strongly contrasted.

Eye pattern as in male.

Leg spination as in male. Leg measurements given in Table 2.

Epigyne: see Fig. 18c,d.

Other material examined. QUEENSLAND: 4♂♂, 2♀♀, together with type (1♂, 1♀ in KBIN); 1♂, 3♀♀: Homevale, 1–7 April 1975, litter, V. Davies & R. Raven (QM S3683); 3♂♂, 2♀♀: MEQ, Homevale, 1–7 April 1975, riverine forest, (QM S3705).

Distribution. Coastal region of Queensland.

Asceua Thorell

Asceua expugnatrix n.sp.

Fig. 19a–d

Type material. HOLOTYPE ♂: Australia, Northern Territory, Kemp Airstrip, 12°35'S, 131°20'E 15 November 1979, rain forest litter, R. Raven, (QM S 3831). PARATYPES: 1♀, with label data "as holotype" (QM S 3838); 1♀ and 1 juvenile: north Queensland, Iron Range, West Claudie River, 3–10 December 1985, rainforest, pyrethrum knock-down, G. Monteith & D. Cook (QM S 3797) (together with juvenile *Mallinella* sp.).

Diagnosis. Males of this species are recognised by the lateral tibial apophysis of the palp which is widened towards the strongly truncated tip; females have a semicircular lip near the anterior margin of the epigyne in which one sees diagonal ducts shining through.

Etymology. The name *expugnatrix* means "conqueror" and refers to the recent "invasion" of *Asceua* into the northern tip of the Australian continent (Jocqué, 1993).

Description

Male. Total length 3.34 mm; carapace 1.48 mm long, 1.17 mm wide.

Colour: carapace, chelicerae and sternum pale brown; legs yellow with dark pro- and retrolateral stripes on Fe III and IV. Abdomen dark sepia with five dorsal white spots (Fig. 19a), paler on narrow dorsal scutum; sides with two oblique pale stripes enlarged to large white patch in anterior part of venter, narrowing towards spinnerets.

Eyes: a, 0.10; b, 0.10; c, 0.09; d, 0.10; e, 0.02; f, 0.02; g, 0.08; h, 0.09. MOQ, AW = 0.81×PW; AW = 0.72×L.

Chilum an equilateral triangle.

Leg measurements given in Table 2. Spination: all femora with one dorsal spine; all metatarsi with a distal whorl of six small spines.

Male palp (Fig. 19b,c). Tibia with large lateral apophysis, widened towards tip which is indented; ventral prong distally with poorly defined knob; cymbium with typical huge lateral fold; distal end with recurved lip, proximal end near inferior margin with distinct ridge; tegulum with large terminal membranous appendage, widening towards extremity; two short lateral prongs at base of latter.

Female (values for Iron Range female in brackets). Total length 3.71 (2.66) mm; carapace 1.44 (1.26) mm long, 0.97 (0.95) mm wide.

Colour as in the male but more white on anterior femora also with dark stripes; no scutum on abdomen.

Eyes: a, 0.11; b, 0.10; c, 0.10; d, 0.10; e, 0.02; f, 0.02; g, 0.05; h, 0.10; MOQ, AW = 0.92×PW; AW = 0.82×L.

Leg spination as in male. Leg measurements given in Table 2.

Epigyne (Fig. 19d). Anterior margin with semicircular lip. Copulatory ducts visible through integument, with marked diagonal part.

Other material examined. None.

Distribution. Northern coastal regions of Queensland and the Northern Territory.

Discussion

Some of the conclusions presented in this paper may have important phylogenetic and biogeographical consequences. One of them is the inclusion of *Australutica* in the Lachesaninae. This is based on two apomorphies: the presence of well-developed pairs of spines on the anterior metatarsi but mainly the presence of elongate, retractable, cylindrical AS, a character it shares with the three other genera of the subfamily viz. *Lachesana*, *Lutica* and *Antillorena*. Besides that, *Australutica* has a number of plesiomorphies which are absent in all other

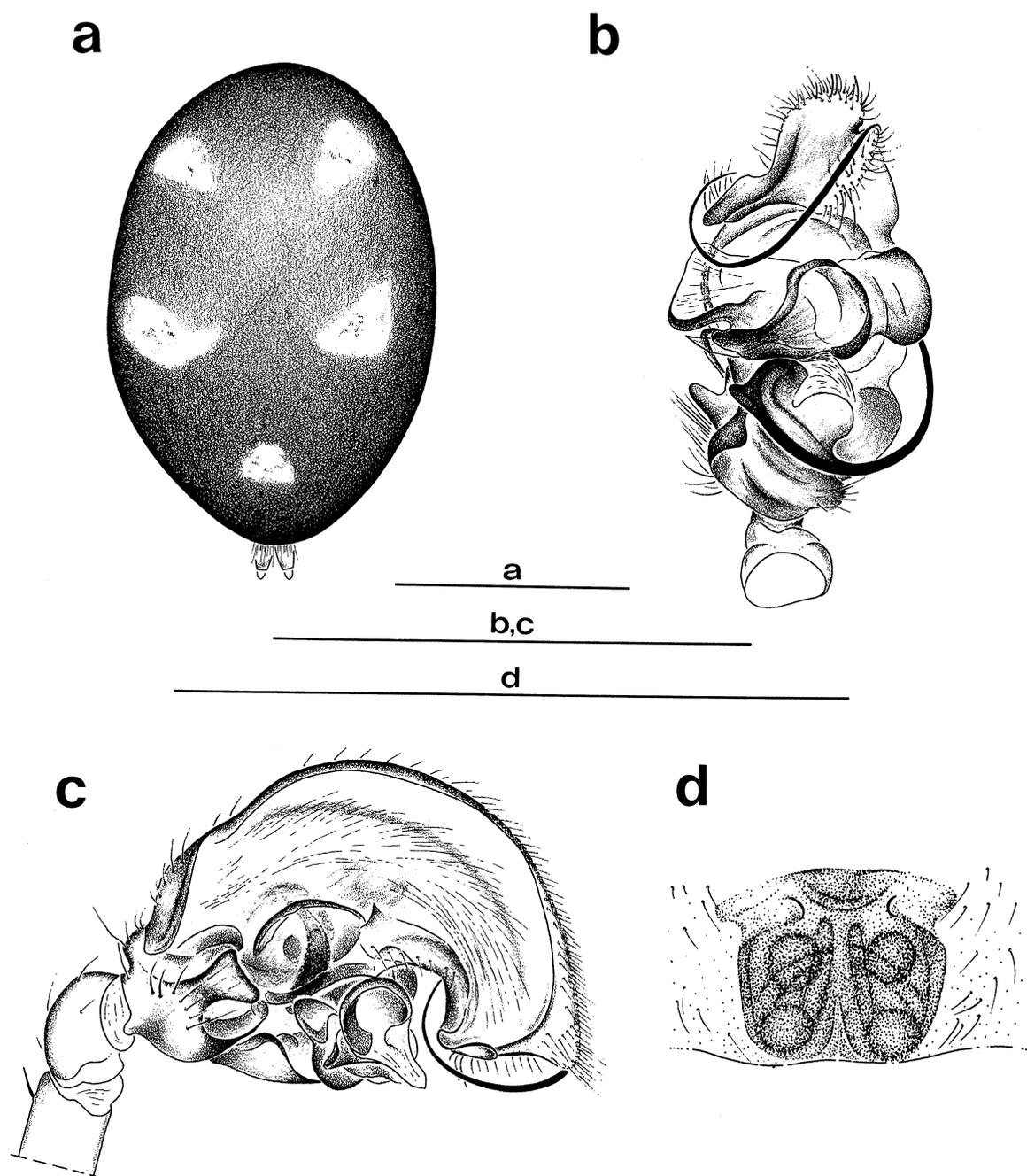


Fig. 19. *Asceua expugnatrix* n.sp. a, abdomen, dorsal view; b, male palp, ventral view; c, male palp, lateral view; d, epigyne, ventral view. Scales 1 mm.

Australian Zodariidae except *Nostera*. It is puzzling that *Australutica* indeed shares the simple palp conformation and the ovoid sternum with some of the species of *Nostera*. It could be argued that the palpal conformation found both in *Nostera*, as redefined by Jocqué (1995) and *Australutica*, is the plesiomorphic state although it is not clear at present what the plesiomorphic zodariid male palp should look like. The main reason is that the place of the Zodariidae in the Entelegynae is not yet clear (Coddington & Levi, 1991). This makes the

inclusion of *Australutica* in the Lachesaninae somewhat doubtful. Moreover, the validity of that heterogeneous subfamily can be questioned. The presence of the special AS on which the taxon is mainly based (Jocqué, 1991), is apparently an adaptation to life in dry sandy habitats and may have developed several times. But this could probably also be said of a large number of taxa recognised today. It is a fact that homoplasy is a very common event occurring with high frequency as is particularly clear from studies of large data-sets

(Coddington & Levi, 1991; Scharff & Coddington, pers. comm.). This makes one wonder whether one of the premises for the use of cladism is indeed fulfilled, more precisely that the quantity of homoplasy does not exceed the number of synapomorphies (Platnick, 1978). It would indeed seem that the number of morphological solutions for adaptive problems to which evolving creatures are faced is limited, and that similar answers evolve over and over again. It is not unlikely that, when in a group, the conditions are present to develop a morphological answer to a particular problem, that adaptation is easily acquired in several evolutionary lines.

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Table 1. Leg spination; *d*—dorsal, *disp*—dispersed, not in obvious rows, *dw*—distal whorl, *pl*—prolateral, *rl*—retrolateral, *v*—ventral.

	femur	patella	tibia	metatarsus
<i>Australutica moreton</i> n.sp.				
I	<i>pl1d3rl1</i>	—	<i>pl2rl1v2-2-2</i>	<i>pl1v11**</i>
II	<i>pl1d2rl2</i>	—	<i>pl3v2-2-2</i>	<i>pl1v19**</i>
III	<i>pl1d3*,2</i>	<i>16disp</i>	<i>pl3d3rl2v8</i>	<i>9disp dw6</i>
IV	<i>pl1d1-2-1-2</i>	<i>16disp</i>	<i>pl3d3rl3v8</i>	<i>11disp dw6</i>
<i>Australutica manifesta</i> n.sp.				
I	<i>pl2*d1-1-2rl1</i>	—	<i>pl4*rl1v2-2-2</i>	<i>pl1-1v16**</i>
II	<i>pl2*d1-1-2rl2*</i>	<i>pl1</i>	<i>pl4*v2-1-2-2</i>	<i>pl2v11**</i>
III	<i>pl2*d1-1-2rl2*</i>	<i>pl15d4</i>	<i>pl4*d3*rl2-1-1v2-2-2</i>	<i>pl2rl2v8dw6</i>
IV	<i>pl2*d1-1-2rl2*</i>	<i>pl12d1</i>	<i>pl2-2-1d3*rl2-2-1-1v1-1-2-2</i>	<i>pl4rl2v8dw6</i>
<i>Australutica xystarches</i> n.sp.				
I	<i>pl1d3</i>	—	<i>v2-2-1</i>	<i>pl2v8**</i>
II	<i>pl1d2</i>	—	<i>pl2v2-2-2</i>	<i>pl1v6** dw5</i>
III	<i>pl2d2rl1</i>	<i>pl2d1rl1</i>	<i>pl4d2d3rl2v3-3-2</i>	<i>14disp dw6</i>
IV	<i>pl2d2rl1</i>	<i>pl2d1rl1</i>	<i>pl2d2rl2v2-4-2</i>	<i>10disp dw6</i>
<i>Australutica quaerens</i> n.sp.				
I	<i>pl1d2</i>	—	<i>v2-2-2</i>	<i>v2-2-3</i>
II	<i>pl1d2rl1</i>	—	<i>pl1v3*</i>	<i>pl1v2-2-3</i>
III	<i>pl1d1rl1</i>	<i>14disp</i>	<i>pl3*d2-1-1rl2*v2-1-2</i>	<i>10disp dw6</i>
IV	<i>pl1d2rl1</i>	<i>11disp</i>	<i>pl3d2rl2v2-2-2</i>	<i>13disp dw6</i>
<i>Australorena scenica</i> (Koch) n.comb. ♂				
I	<i>pl1d1</i>	—	—	<i>v2-2-2-3</i>
II	<i>pl1d1</i>	—	<i>v3*</i>	<i>v1-2-2</i>
III	<i>pl1d1</i>	<i>pl1rl1</i>	<i>pl2d2rl2v2-2-2</i>	<i>8disp dw6</i>
IV	<i>pl1d3</i>	<i>pl1rl1</i>	<i>pl3d2rl2v1-2-2</i>	<i>10disp dw6</i>
<i>Australorena scenica</i> (Koch) n.comb. ♀				
I	<i>pl1d1</i>	—	—	<i>v2-2-2-3</i>
II	<i>pl1d1</i>	—	<i>v2*</i>	<i>v2-2-3</i>
III	<i>pl2d3rl1</i>	<i>pl1d1rl1</i>	<i>pl2d2rl2v2-2-2</i>	<i>8disp dw6</i>
IV	<i>pl1d2</i>	<i>pl1d1rl1</i>	<i>pl3d2rl2v2-2-2</i>	<i>10disp dw6</i>
<i>Chilumena reprobans</i> n.sp.				
I	<i>d1-1v1</i>	—	<i>pl1v1-1</i>	<i>v2-1-2</i>
II	<i>d1-1v3*</i>	—	<i>v1-1-2</i>	<i>v2-2</i>
III	<i>d4*v3*</i>	<i>d1rl1</i>	<i>pl3d2rl2v2-1-2</i>	<i>8disp dw6</i>
IV	<i>d4*v1</i>	<i>pl1d1rl1</i>	<i>pl3d2rl3v2-1-2</i>	<i>10disp dw6</i>
<i>Chilumena baehrorum</i> n.sp.				
I	<i>pl1d1-1</i>	—	<i>d1v2-1</i>	<i>v1-2</i>
II	<i>d2v2</i>	—	<i>d1v1-1</i>	<i>v2-1-2 dw4</i>
III	<i>d2v1</i>	<i>pl1d1rl1</i>	<i>pl2d2rl3v2-2-2</i>	<i>8disp dw6</i>
IV	<i>d4v3</i>	<i>pl1d1rl1</i>	<i>pl3d2rl3v1-1</i>	<i>10disp dw6</i>
<i>Zillimata scintillans</i> (Pickard-Cambridge) n.comb. [Jerdacuttup ♀]				
I	<i>pl1d3*</i>	—	<i>pl1d1v1-1</i>	<i>v1-2</i>
II	<i>pl1d2*</i>	—	<i>pl2rl1v1-1-2</i>	<i>v2-1-2 dw4</i>
III	<i>d3*rl1</i>	<i>pl2d1rl2</i>	<i>pl2d2rl3v2-1-2</i>	<i>8disp dw6</i>
IV	<i>d3*rl1v3</i>	<i>pl1d2rl2</i>	<i>pl3d3rl3v2-1-2</i>	<i>10disp dw6</i>
<i>Zillimata scintillans</i> (Pickard-Cambridge) n.comb. ♂				
I	<i>pl1d2*</i>	—	<i>v1</i>	—
II	<i>d3*rl1</i>	—	<i>pl2v1-1-2</i>	<i>v1-1-1 dw3</i>
III	<i>pl1d3*rl1</i>	<i>d1rl1</i>	<i>pl3d3rl2v2-1-2</i>	<i>10disp dw6</i>
IV	<i>d3*rl1</i>	<i>pl1d1rl1</i>	<i>pl2d3rl2v2-1-2</i>	<i>12disp dw6</i>
<i>Habronestes calamitosus</i> n.sp. ♂				
I	<i>pl1d3*</i>	—	<i>v2-2-2</i>	<i>v16</i>
II	<i>pl1d3*</i>	—	<i>pl1v2-2-2</i>	<i>pl1v1-2-2-2</i>
III	<i>pl1-1d3*rl1</i>	<i>pl1d-1rl1</i>	<i>pl3*d4*rl2*v2-2-2</i>	<i>12disp dw6</i>
IV	<i>pl1-1d3*rl1</i>	<i>pl1d1-1rl1</i>	<i>pl3*d4*rl2*v2-2-2</i>	<i>12disp dw6</i>

Table 2. Leg measurements. F—femur; P—patella; T—tibia; Mt—metatarsus; t—tarsus; Tot—total.

	F	P	T	Mt	t	Tot
<i>Australutica moreton</i> n.sp.						
I	2.85	1.06	2.25	2.30	1.49	9.95
II	2.76	1.06	2.04	2.39	1.41	9.66
III	2.43	1.06	1.58	2.77	1.53	9.37
IV	3.06	0.98	2.34	3.88	1.75	12.01
<i>Australutica manifesta</i> n.sp.						
I	3.83	1.32	2.72	2.85	1.75	12.47
II	3.58	1.32	2.26	2.81	1.83	11.80
III	3.19	1.28	1.83	3.32	1.87	11.49
IV	3.83	1.41	2.56	4.38	2.39	26.06
<i>Australutica xystarches</i> n.sp.						
I	3.66	1.62	3.07	2.77	1.62	12.44
II	3.62	1.62	2.55	2.85	1.58	12.22
III	3.32	1.49	1.87	2.64	1.49	10.81
IV	3.92	1.79	2.81	4.05	1.83	14.40
<i>Australutica quaerens</i> n.sp.						
I	1.79	0.70	1.34	1.38	0.82	6.03
II	1.75	0.70	1.17	1.23	0.80	5.65
III	1.63	0.68	0.99	1.73	1.03	6.06
IV	2.00	0.72	1.50	2.10	1.13	7.45
<i>Australorena scenica</i> (Koch) n.comb. ♂						
I	2.14	0.93	1.63	1.72	1.58	8.00
II	1.81	0.74	1.39	1.58	1.11	6.65
III	1.72	0.84	1.07	1.67	0.93	6.23
IV	2.46	0.93	1.49	2.70	1.35	8.93
<i>Australorena scenica</i> (Koch) n.comb. ♀						
I	2.23	1.07	1.67	1.53	1.25	7.76
II	1.86	0.88	1.39	1.39	1.17	6.69
III	1.63	0.74	1.11	1.63	1.16	6.28
IV	2.32	0.98	1.77	2.56	1.39	9.02
<i>Chilumena reprobans</i> n.sp.						
I	2.00	0.55	2.13	1.92	1.53	8.13
II	1.57	0.55	1.36	1.53	0.94	5.93
III	1.41	0.68	1.15	1.49	0.68	5.41
IV	1.87	0.72	1.62	2.13	0.85	7.19
<i>Chilumena baehrorum</i> n.sp.						
I	1.92	0.77	1.70	1.75	1.40	7.54
II	1.53	0.68	1.15	1.36	0.77	5.49
III	1.40	0.77	1.02	1.32	0.77	5.28
IV	1.83	0.72	1.49	1.96	0.81	6.81
<i>Zillimata scintillans</i> (Pickard-Cambridge) n.comb. [Jerdacuttup ♀]						
I	1.58	0.64	1.53	1.45	1.23	6.43
II	1.40	0.64	1.10	1.23	0.89	5.26
III	1.32	0.68	0.98	1.40	0.85	5.23
IV	1.79	0.68	1.32	1.83	1.10	6.72
<i>Zillimata scintillans</i> (Pickard-Cambridge) n.comb. ♂						
I	1.62	0.55	1.36	1.32	1.15	6.00
II	1.45	0.55	0.89	1.15	0.81	4.85
III	1.11	0.55	0.77	1.19	0.72	4.84
IV	1.45	0.64	1.19	1.70	0.89	5.87

Continued...

Table 2. Continued.

	F	P	T	Mt	t	Tot
<i>Habronestes calamitosus</i> n.sp. ♂						
I	2.67	0.91	2.46	2.33	1.75	10.13
II	2.33	0.91	1.83	2.00	1.37	8.46
III	2.21	0.91	1.71	2.42	1.17	8.42
IV	2.83	1.04	2.46	3.83	1.42	11.59
<i>Habronestes calamitosus</i> n.sp. ♀						
I	2.33	0.95	1.79	1.96	1.46	8.51
II	2.08	0.87	1.46	1.63	1.25	7.29
III	1.88	0.96	1.41	2.08	1.08	7.42
IV	2.50	1.08	2.00	3.04	1.37	10.01
<i>Asceua expugnatrix</i> n.sp. ♂						
I	0.99	0.41	0.88	0.86	0.62	3.76
II	0.86	0.35	0.74	0.74	0.51	3.20
III	0.84	0.37	0.68	0.80	0.41	3.10
IV	1.05	0.37	0.88	1.03	0.51	3.84
<i>Asceua expugnatrix</i> n.sp. ♀						
I	0.89	0.33	0.72	0.74	0.62	3.30
II	0.82	0.33	0.62	0.20	0.51	3.00
III	0.82	0.35	0.60	0.76	0.43	2.96
IV	0.95	0.35	0.84	0.95	0.54	3.63