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Salticidae (Arachnida: Araneae) from Oriental, Australian and Pacific Regions: *Astilodes* and *Urogelides*, new genera from Australia

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Abstract
Astilodes mariae gen. et sp.n. and *Urogelides daviesae* gen. et sp.n. are diagnosed and described from eastern and south-eastern Queensland (Australia). Information on distribution and biota requirements for both generic type species are given. On the basis of morphological characters the genus *Astilodes* is temporarily classified within the Astioida clade, while *Urogelides* is placed in the Heliophaninae subfamily.

Keywords
Jumping spiders, Australasia, new genus, new species

Introduction

The Australian salticid fauna currently consists of 76 genera and 355 described species (Richardson & Żabka 2004; Żabka 2006, unpubl. data), but the list is far from being complete. New Australian endemic taxa and widely distributed Oriental genera are still being discovered, mostly in tropical parts of the continent. At the same time genera previously thought to be Australian endemics (e.g., *Adoxotoma* Simon, *Abracadabrella* Żabka, *Holoplatys* Simon, *Paraplatoides* Żabka) have been recorded from New Guinea, New Caledonia, New Zealand and adjacent areas (Patoleta & Żabka 1999; Patoleta 2002; Żabka 1993, 2001, 2002, 2004; Żabka & Pollard 2002). The two monotypic genera described here, *Astilodes* and *Urogelides*, possess a combination of morphological characters found in Australasian Astioida and widely distributed Heliophaninae, respectively. To confirm their subfamily/clade placements, morphological data should be combined with molecular analyses as proposed by Maddison & Hedin (2003) and Maddison et al. (2007, 2008). Also the present information on distribution is too limited to develop a reliable bioclimatic model of their distributions, as given for other Australian salticids (Richardson et al. 2006).

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Material and methods

Specimens examined in this study are lodged at the Queensland Museum, Brisbane (QM) and the Australian Museum, Sydney (AM). Methods of specimen examination are as described by Żabka (1991). Measurements are given in millimetres. The following abbreviations are used in the descriptions: AEW, anterior eyes width; AL, abdomen length; ALED, anterior lateral eyes diameter; AMED, anterior medial eyes diameter; CF, cymbial flange; CH, cephalothorax height; CL, cephalothorax length; CW, cephalothorax width; EFL, eye field length; L, leg length; LCH, lateral chambers, PEW, posterior eyes width.

Taxonomy

Astilodes gen.n.
Type species. *Astilodes mariae* sp.n.

Diagnosis. A pluridentate spider. The habitus similar to some unrelated Lyssomaninae (e.g., *Onomastus* Simon) but the eye pattern and genitalia typical for most Salticoida. Body slender and elongate, first legs much longer and thicker than others, tibiae and metatarsi with distinctive ventro-lateral spines. Male tegulum with furrow, embolus not coiled, sperm reservoir not meandering, cymbium with dorso-lateral flange. Epigyne poorly sclerotised, internal genitalia similar to Astieae, especially to *Sondra* Wanless.

Description. Spiders 4–5 mm long. ALE little behind AME, the latter 2.75 times larger than the former. Cephalothorax wider than PLE, moderately high. Posterior thoracic slope rather gentle, starting at the level of PLE. Fovea in the form of short line, located behind PLE. Abdomen slender, elongate, without distinctive apodemes. Chelicerae vertical, slightly inclined forwards, with anterior oblique depression, promargin with dense scopula, retromargin with pluridentate teeth. Female palps with no tarsal spurs. Maxillae and labium not distinctive, sternum cordate. Legs delicate, rather long, the first much longer than others with distinctive tibial and metatarsal spines. Leg formula: L1–L4–L3–L2. Male palpal cymbium with dorso-lateral flange (found in many genera), tegulum with longitudinal furrow. Embolus short, not coiled, set in a crater-like depression. Tibial apophysis hook-like. Epigyne poorly sclerotised, with two anterior pockets oriented towards each other. Internal structures very simple: insemination ducts short, not coiled, spermathecae pear-shaped with distinctive accessory glands.

Etymology. the generic name is derived from an arbitrary combination of letters and is masculine in gender.

Remarks. Despite general similarity to some Lyssomaninae, the genitalia and eye pattern are typical for the Salticoida (sensu Maddison et al. 2008) and reveal possible relationships with Australasian Astieae (sensu Wanless 1988). Short, not coiled insemination ducts, pear-shaped spermathecae and distinctive accessory glands are very similar to those found in *Sondra*, especially in *S. tristucula* (Simon), but the epigyne is poorly sclerotised and a caudal lobe is missing. The male palpal organ also has Astieae characteristics, except for the presence of a tegular furrow.

The group Astieae presently includes eight Australasian genera: *Astia* L. Koch, *Arasia* Simon, *Helpis* Simon, *Adoxotoma* Simon, *Jacksonoides* Wanless, *Megaloastia* Żabka, *Sondra* Wanless and *Tauala* Wanless. The latter four genera are known exclusively from Australia. The first three are also recorded on small adjacent islands and from New Guinea, while *Helpis* and *Adoxotoma* also occur in New Zealand (Wanless 1988; Żabka 1993, 1995, 2004; Gardzińska 1996; Patoleta & Żabka 1999; Żabka & Pollard 2002. As noted by Wanless (1988) *Aruana* Strand, *Lagnus* L. Koch and *Charippus* Thorell are of uncertain affinities and should not be included in Astieae.

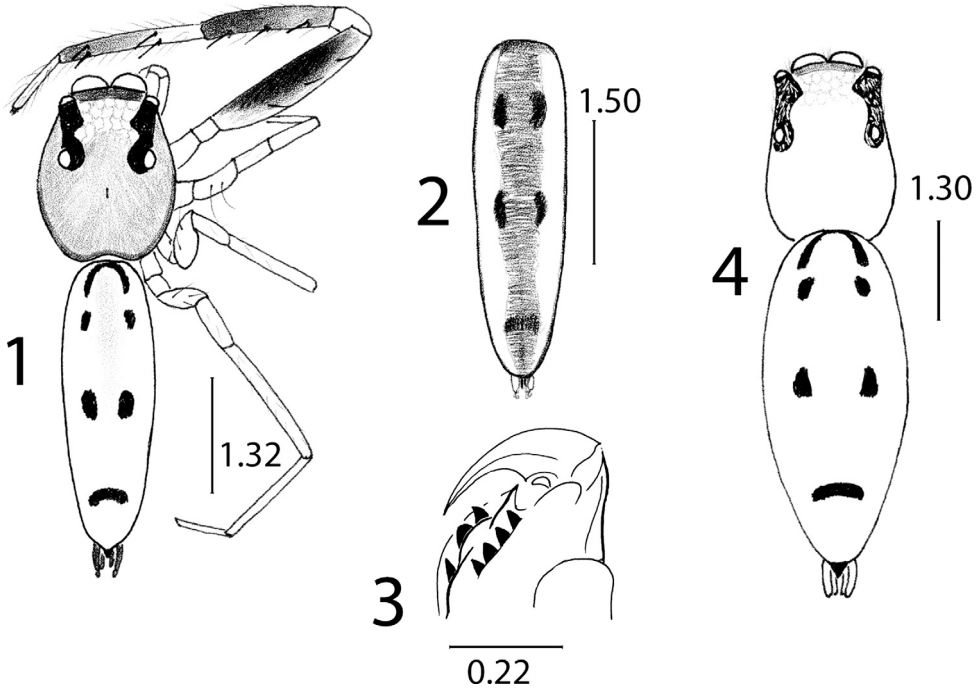
Astilodes mariae sp.n.

Diagnosis. As for generic diagnosis.

Etymology. The species is dedicated to my little daughter, Maria Żabka.

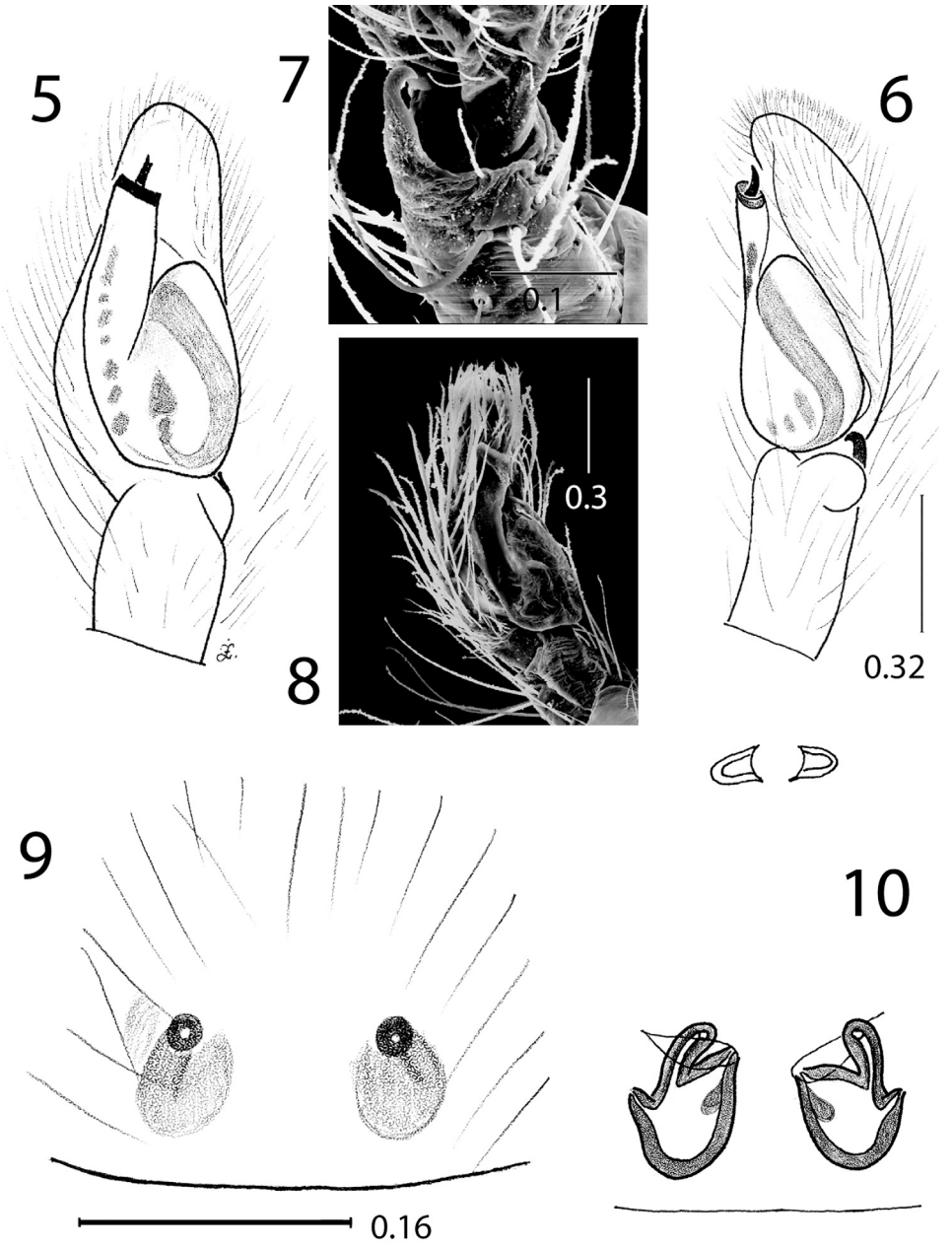
Type material. Queensland: 1♂ holotype, 2♀♀ paratypes, Sunshine Coast, Tewantin State Forest, 24°26' S, 153°00' E, under palm frond, 30 December 2002, M. Rix, QM S60676; 1♂ paratype, same locality, 12 January 2001, M. Rix, QM S60675; 1♀ paratype, Gheerulla State Forest, 26°34' S, 152°47' E, under palm frond, 13 January 2004, M. Rix, QM S60677; 1♂ paratype, Mt. Molloy, 16°41' S, 145°20' E, 3 October 1971, R.E. Mascord, AM KS18329.

Description. Male (Fig. 1). Cephalothorax pale, yellowish-orange, its lower margin darker. Eye field with translucent white guanine crystals. ALE, PME and PLE surroundings black. Abdomen slender, whitish, with anal tubercle and a pattern of black spots. Spinnerets grey,



Figs 1–4. *Astilodes mariae* sp.n. (1) Male holotype general appearance, (2) male paratype abdominal pattern, (3) male holotype cheliceral dentition, (4) female paratype general appearance.

posterior medians darkest. Clypeus narrow, pale-yellow. Chelicerae vertical, yellow-orange, with 3 promarginal and 4 retromarginal teeth (Fig. 3). Maxillae and labium yellow-orange. Sternum and venter pale-whitish. Femur I orange, its sides with longitudinal dark stripes. Similar stripes on retrolateral patella, distal tibia and sides of tarsus. Tibia and metatarsus with 3 and 2 pairs of ventro-lateral spines, respectively. Similar spination on leg 2. Other



Figs 5–10. *Astilodes mariae* sp.n. (5–8) Male holotype palpal organ, (9, 10) female epigyne and internal genitalia. Figures 7 and 8 by M. Rix.

legs pale, spines less distinctive. All legs, especially ventral femora and tibiae, with long white hairs. Palpal organ (Figs 5–8): tibia with single hook-like apophysis and ventrolateral lobe. Tegulum divided with longitudinal furrow, embolus short, not coiled, set in crater-like depression. Dimensions: CL 1.50, EFL 0.57, CW 1.09, AEW 0.98, AMEW 0.83, PLE 0.98, CH 0.78, AL 2.70, AW 0.78, L1 8.00 (2.60+0.99+2.34+2.02+0.52), L2 4.87 (1.56+0.62+1.14+1.14+0.41), L3 5.03 (1.56+0.62+1.09+1.35+0.41), L4 5.61 (1.87+0.52+1.30+1.45+0.47).

Female (Fig. 4). Cephalothorax more slender than in the male, body colour lighter, with male-like pattern. Chelicerae with 3 promarginal and 3 retromarginal teeth. Legs pale white. Retrolateral patella, tibia and metatarsus with black distal spots. Spination on legs 1 and 2 as in the male, but spines more massive and relatively longer. Epigyne (Fig. 9) poorly sclerotised, with two anterior pockets oriented towards each other and with distinctive, well separated copulatory openings. Insemination ducts short, spermathecae pear-shaped, accompanied with accessory glands (Fig. 10). Dimensions: CL 1.40, EFL 0.57, CW 1.09, AEW 0.91, AMED 0.44, ALED 0.16, PEW 0.91, CH 0.57, AL 3.01, L1 4.96 (1.56+0.72+1.24+0.98+0.46), L2 4.04 (1.30+0.52+0.98+0.83+0.41), L3 4.40 (1.30+0.62+0.93+1.09+0.46), L4 4.70 (1.45+0.46+1.19+1.19+0.41).

Remarks. Live animals (Fig. 21) are greenish in colour, and one of the male paratypes (S69675) has an additional orange central stripe on the abdomen (Fig. 2).

Habitat and remarks on biology. Specimens of *A. mariae* were found in open, subtropical rainforest (Fig. 22) with an understory of broad-leaved piccabeen palms (probably *Archontophoenix cunninghamiana*) and large, emergent *Eucalyptus*. The spiders were collected on the underside of broad palm fronds where they hunted and built thin retreats between the "ribs" of the fronds. Eggs were green and laid loosely within the maternal retreat, and the light-green spiders were well camouflaged on the green background of the palms.

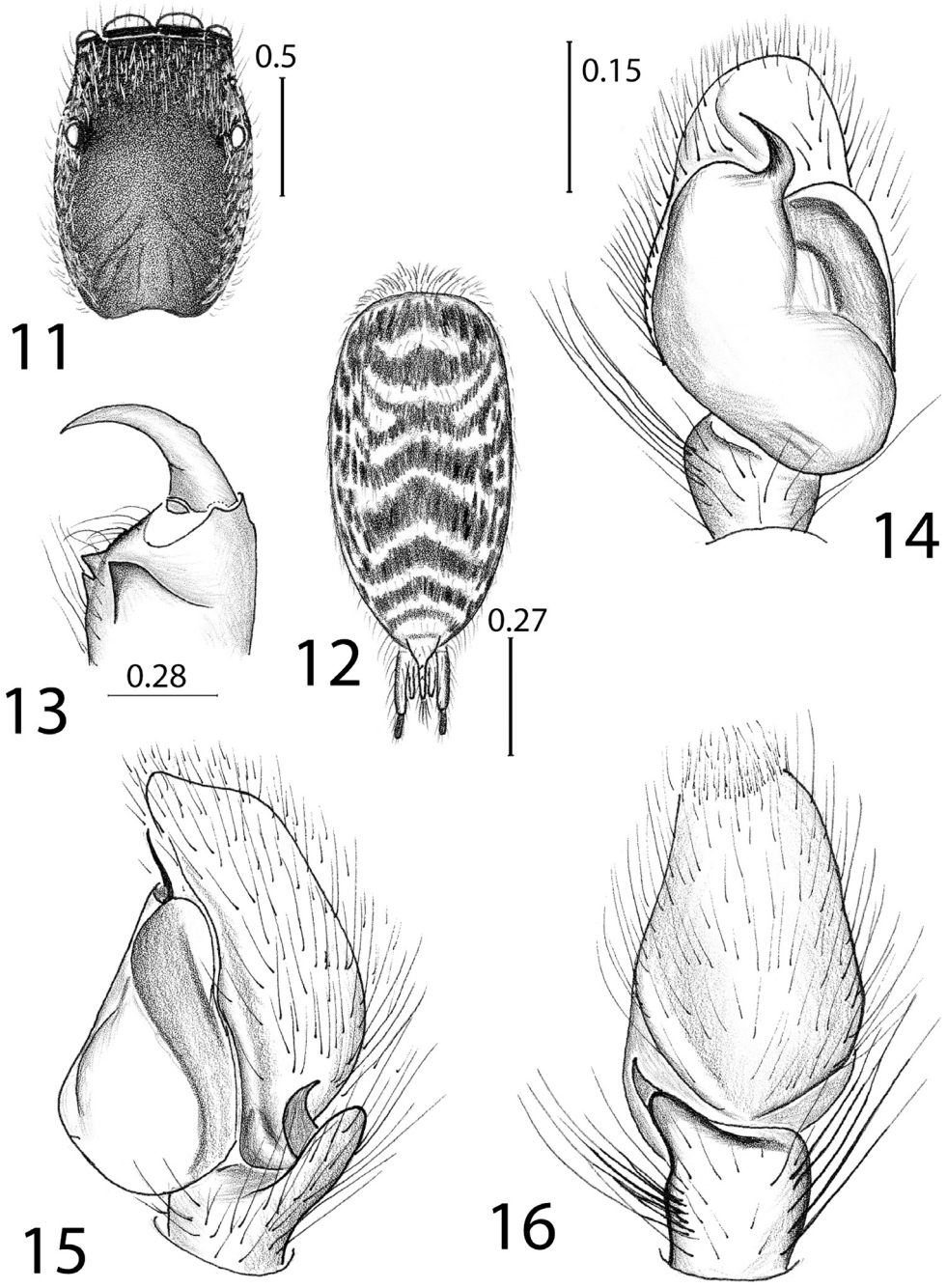
Distribution. Known from scattered localities in eastern and south-eastern Queensland.

Urogelides gen.n.
Type species. *Urogelides daviesae* sp.n.

Diagnosis. Tiny unidentate spiders, sharing a combination of characters found in several unrelated genera. Anal tubercle and posterior spinnerets are exceptionally long and make a kind of movable "tail" as in *Uroballus* Simon, but cheliceral dentition of unidentate pattern (*versus* fissidentate in *Uroballus*), cephalothorax not distinctive (versus square and robust) and the legs not massive. Female internal genitalia *Synagelides*-like, with lateral chambers and anterior pockets, but the body form and leg spination are completely different. Male palpal organ similar to some species of *Synagelides* Strand in Bösenberg et Strand and *Phintella* Strand in Bösenberg et Strand.

Etymology. the generic name refers to long, tail-like spinnerets (Greek ουρά = tail) and to the genus *Synagelides* Strand (possible relative). The name is masculine in gender.

Diagnosis. Spiders, 2–3 mm long, body elongate with movable "tail" made of anal tubercle and spinnerets. Abdominal pattern made of transverse and diagonal light and dark-grey stripes. Male palpal organ with hook-like embolus, lobe-like and hook-like tibial apophyses.



Figs 11–16. *Urogelides daviesae* sp.n. male holotype. (11) Cephalothorax, (12) abdomen, (13) cheliceral dentition, (14–16) palpal organ.

Description. Cephalothorax flat with posterior slope at 3/4 of its length. PEW distinctly wider than AEW. Fovea not visible. Abdomen elongate. Clypeus very low with protruding bristles, 3 central ones bent dorsally. Chelicerae vertical with two promarginal teeth and unidentate retromarginal tooth. Maxillae not distinctive, female labium with transverse furrow, sternum ellipsoidal. Leg formula: L1–L2–L4–L3. Male palpal organ simple, with bag-like bulbus, hook-like embolus and small cymbial flange (Fig. 15). Tibia with 2 apophyses. Epigyne poorly sclerotised, with translucent internal structures, the latter with anterior pocket and distinctive lateral membranous chambers. Both sexes similar in appearance.

Remarks. Long spinnerets resemble those found in *Uroballus*, other characters however (habitus, legs, chelicerae, genitalia) show that both genera belong to different subfamilies. The analysis of male palpal organ suggests relationships with some Heliphaninae genera, such as *Synagelides*, *Agorius* Thorell and *Phintella* (Bohdanowicz 1979, 1987; Żabka 1985, Logunov & Hereward 2006; Prószyński 2008), while female genitalia show a highly advanced, *Synagelides*-like pattern, including unique membranous lateral chambers. Until molecular data are available, the placement of *Urogelides* within the Heliophaninae should be treated as provisional.

Uroballus daviesae sp.n.

Etymology. the species is dedicated to Dr. Valerie Todd Davies, distinguished Australian Arachnologist (Queensland Museum).

Material. Queensland: 1♂ holotype, 1♀ paratype, North Stradbroke Island, Enterprise, 27°37' S, 153°27' E, scribbly gum, #2, 120 m, 10 January 2002, C.J. Burwell, sweeping, QM S56264; 1♂ paratype, Ransome Reserve, Brisbane, 27°29' S, 153°11' E, 10 m, 23 April 2003, E. Volschenk, sweeping, QM S66700; 1♀, 1 juvenile paratype, Brisbane, Burbank, J.S. Trotter Memorial Park, 27°33'20" S, 153°10'05" E, beating bushes, 27 February 2005, M. Rix, M. Żabka, QM S83834; 1♀ paratype, same locality, in *Allocasuarina* leaf litter built-up in the fork of a tree near lake, 25 September 2001, M. Rix, QM S60667.

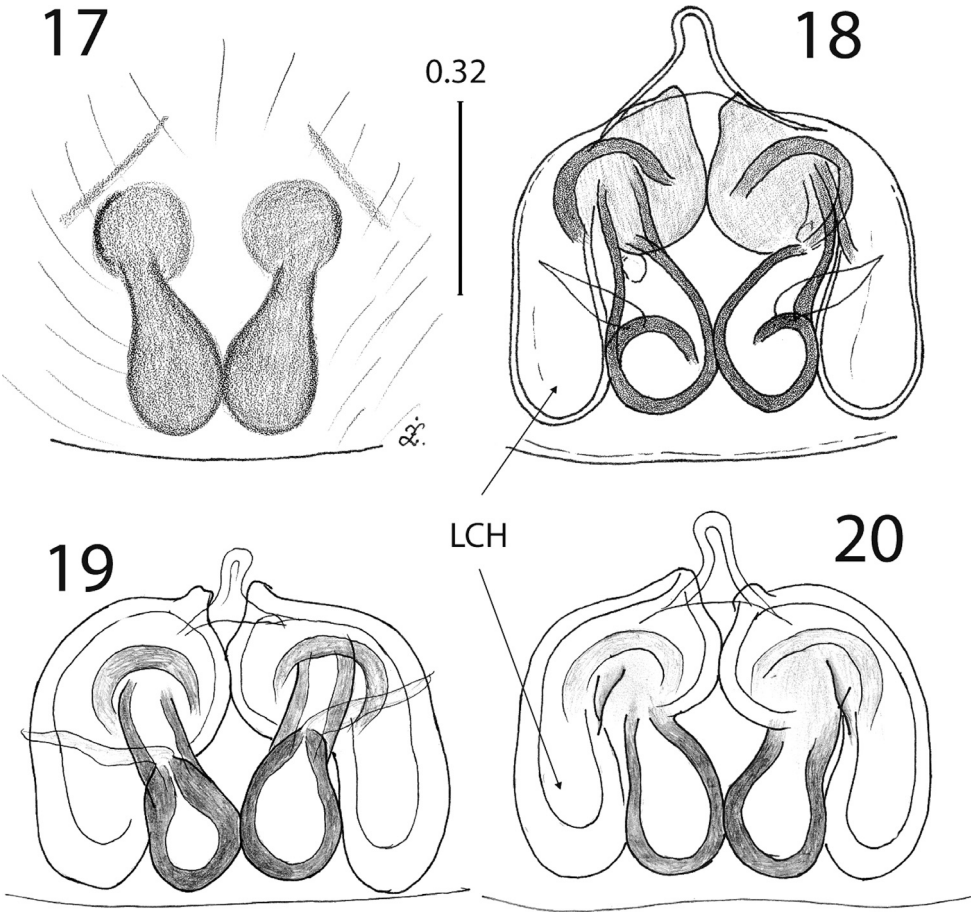
Diagnosis. As for generic diagnosis.

Description. Male holotype (Figs 11, 12). Cephalothorax flat, rectangular, generally dark orange, darkening anteriorly, with narrow median line. Eye surroundings black, eye field with 2 black patches. Thoracic part with radial darker markings. Whole cephalothorax covered with whitish hairs, more numerous anteriorly. Abdomen with light and grey herringbone pattern. Its anterior edge with numerous strong, white and grey bristles. Anal tubercle exceptionally long with a brush of dark bristles. Anterior and median spinnerets rather long and light, posterior ones dark, two-segmented, with long bristles, making a kind of movable "tail". Clypeus dark brown, very narrow, with dark protruding bristles. Chelicerae (Fig. 13) vertical, orange brown, with two promarginal teeth and a large, blunt, unidentate retromarginal tooth. Maxillae and labium orange, sternum ellipsoidal, venter beige with irregular darker markings. Leg 1 rather short and stout, especially femora. Anterior part of ventro-lateral femora and tibiae, and joint areas dark, other podomeres and legs pale yellowish, darker at very distal

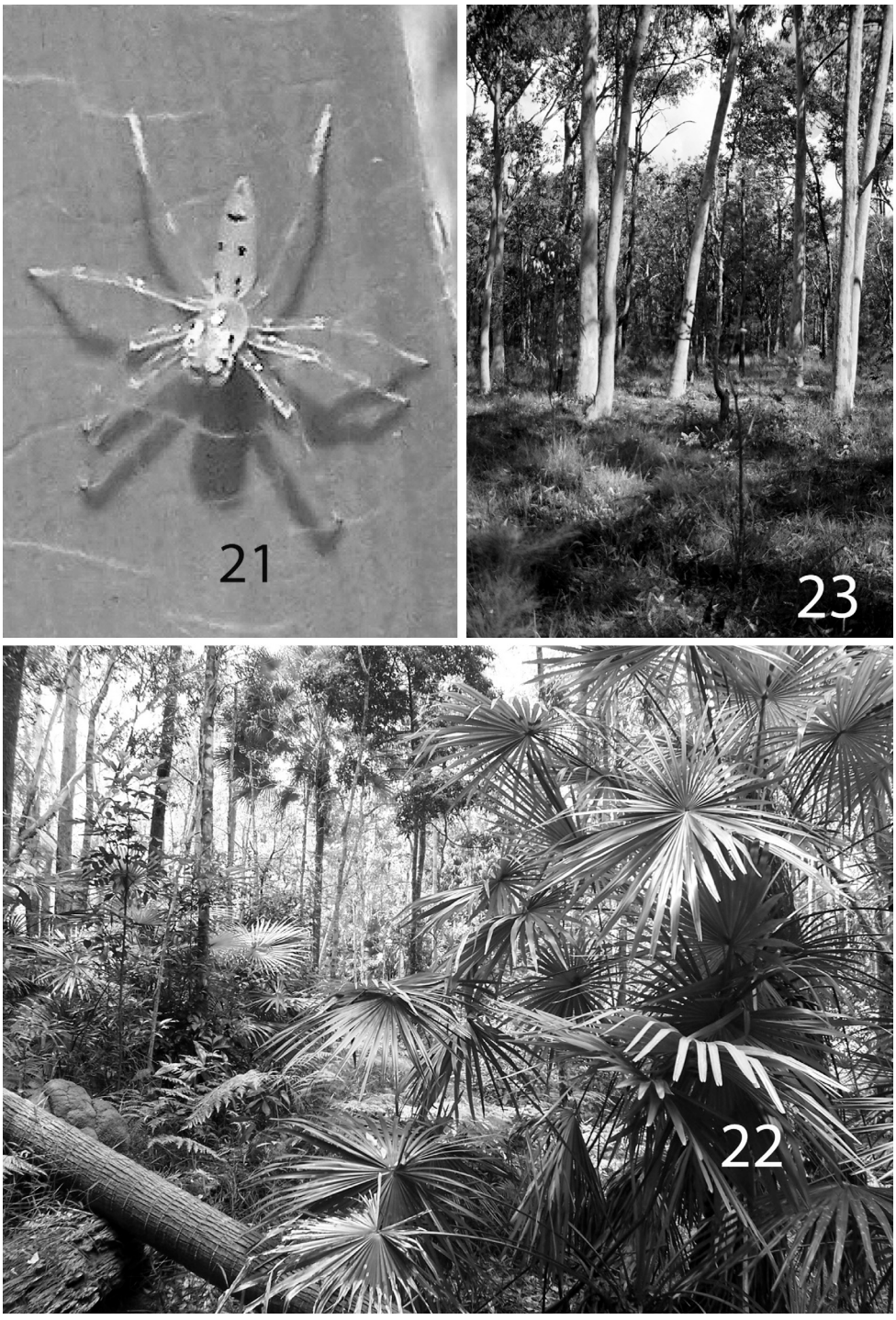
areas. Tibia with single retrodistal spine and metatarsus with two pairs of massive spines. Palpal organ (Figs 14–16) with bag-like bulbus and hook-like embolus. Tibial apopysis distinctive, with lobe-like external and hook-like part adjacent cymbium. Dimensions: CL 1.10, EFL 0.42, AEW 0.59, PEW 0.67, CH 0.39, AL 1.28, AW 0.62. L1 1.56 (0.49+0.39+0.30+0.21+0.17), L2 1.28 (0.35+0.26+0.17+0.25+0.25), L3 0.96 (0.32+0.14+0.17+0.14+0.19) L4 1.26 (0.42+0.17+0.25+0.21+0.21).

Female. Body form, shape and colour as in male, only first legs not so massive and retromarginal unidentate tooth small. Epigyne (Fig. 17) with single anterior pocket, insemination ducts short, spermathecae simple, accessory glands not distinctive (Figs. 18–20). Dimensions: CL 0.96, AEW 0.36. AEW 0.57, PEW 0.67, CW 0.68, CH 0.44, AL. 1.30, L1 0.96 (0.33+0.23+0.20+0.13+0.13), L2 0.94 (0.28+0.23+0.17+0.13+0.13), L3 0.83 (0.28+0.18+0.13+0.11+0.13), L4 0.90 (0.28+0.18+0.18+0.14+0.12).

Habitat and remarks on biology. *U. daviesae* lives in open sclerophyll forests (Fig. 23), dwelling in leaf litter, on vegetation and on *Allocasuarina* trees, where the fallen leaves



Figs 17–20. *Urogelides daviesae* sp.n. female paratype. (17) Epigyne, (18) internal genitalia, general view, (19) dorsal aspect, (20) ventral aspect. LCH, lateral chambers.



Figs 21–23. *Astilodes mariae* sp.n. (21) Live juvenile, (22) type locality in Tewantin State Forest. (23) *Urogelides daviesae* sp.n., type locality in the Ransome Reserve. Figures 21 and 22 by M. Rix, Fig. 23 by M. Żabka. This figure is published in colour in the online edition of this journal, that can be accessed *via* http://www.brill.nl/ise

accumulated in the fork of a trunk. Females with egg sacs were found in retreats constructed between fallen leaves, which were wedged between the leaves of an outer branch (rather than in a branching fork) (M. Rix, pers. obs.). When walking *Urogelides* "waves" the prominent spinnerets up-and-down at regular intervals (M. Rix, pers. obs.). Because of the tiny size and movement pattern (including spinneret waving), the spiders appear similar to certain Collembola.

Distribution. Known from scattered localities in south-eastern Queensland.

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