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New euophryine jumping spiders from Papua New Guinea (Araneae: Salticidae: Euophryinae)

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Abstract

Thirty-four new species and five new genera of euophryine jumping spiders from Papua New Guinea are described. The new genera are *Chalcolemia* (type species *C. nakanai* sp. nov.), *Phasmolia* (type species *P. elegans* sp. nov.), *Variratina* (type species *V. minuta* sp. nov.), *Viribestus* (type species *V. suyanensis* sp. nov.) and *Zabkattus* (type species *Z. brevis* sp. nov., plus new species *Z. furcatus* sp. nov., *Z. richardsi* sp. nov. and *Z. trapeziformis* sp. nov.). The other new species belong to the genera *Bathippus* (*B. directus* sp. nov., *B. gahavisuka* sp. nov., *B. korei* sp. nov., *B. madang* sp. nov.), *Canama*

(*C. extranea* sp. nov., *C. fimoi* sp. nov., *C. triramosa* sp. nov.), *Omoedus* (*O. brevis* sp. nov., *O. darleyorum* sp. nov., *O. meyeri* sp. nov., *O. omundseni* sp. nov., *O. papuanus* sp. nov., *O. swiftorum* sp. nov., *O. tortuosus* sp. nov.), *Paraharmochirus* (*P. tualapaensis* sp. nov.), *Sobasina* (*S. wanlessi* sp. nov.), *Thorelliola* (*T. aliena* sp. nov., *T. crebra* sp. nov., *T. joannae* sp. nov., *T. squamosa* sp. nov., *T. tamasi* sp. nov., *T. tualapa* sp. nov., *T. zabkai* sp. nov.) and *Xenocytaea* (*X. agnarssoni* sp. nov., *X. albomaculata* sp. nov., *X. proszynskii* sp. nov.). The genera *Pystira* and *Zenodorus* are both considered as junior synonyms of *Omoedus* because of their similar genital structure. Species of these two genera are therefore transferred to *Omoedus*. Diagnostic illustrations are provided for all new species, and photographs of living spiders are also provided when available.

Key words: Araneae, Salticidae, Euophryinae, new genera, new species, new synonym, new combination, jumping spider, Papua New Guinea

Introduction

Euophryine jumping spiders are unusually abundant and diverse in New Guinea (Maddison & Zhang 2011). In expeditions to Papua New Guinea in 2008 and 2009 organized by Conservation International, the majority of salticid species collected were euophryines, about 80 species. In addition to the high species diversity, the fauna of euophryines in Papua New Guinea is also remarkable for the presence of some unique body forms not seen in euophryines elsewhere. For instance, *Coccorchestes* closely resemble curculionid beetles; *Leptathamas* and *Athamas* have a very high carapace, and males of *Leptathamas* resemble piles of debris, holding legs in strange poses and walking in a jerky fashion (Maddison & Zhang 2011); spiders of *Sobasina* and *Paraharmochirus* are ant-like. Euophryines have also adapted to various microhabitats in New Guinea. On leaf litter can be found *Zabkattus*, *Sobasina* and some species of *Omoedus* and *Thorelliola*, on tree trunks can be found *Variratina*, *Paraharmochirus* and other *Thorelliola*, while on foliage are many genera including *Bathippus*, *Bulolia*, *Canama*, *Chalcolemia*, *Coccorchestes*, *Cytaea*, *Euryattus*, *Palpelius*, *Phasmolia*, *Viribestus*, *Xenocytaea* and other species of *Omoedus.*

In this paper, we report five new genera: *Chalcolemia* (one species), *Phasmolia* (one species), *Variratina* (one species), *Viribestus* (one species) and *Zabkattus* (four species). In addition, 26 species of the genera *Bathippus* (four species), *Canama* (three species), *Omoedus* (seven species), *Paraharmochirus* (one species), *Sobasina* (one species), *Thorelliola* (seven species) and *Xenocytaea* (three species) are also described. Here we consider the genera *Pystira* and *Zenodorus* as junior synonyms of *Omoedus* because of their similar genital structure. Species of these two genera are transferred to *Omoedus*. Most of the species described here were chosen in order to give names for the taxa included in a forthcoming molecular phylogenetic study on the subfamily Euophryinae.

Material and methods

During expeditions to Papua New Guinea in 2008 and 2009, jumping spiders from five areas were sampled (Maddison & Zhang 2011): Wanakipa (Southern Highlands Province), near Porgera (Enga Province), Mt. Gahavisuka (Eastern Highlands Province), Varirata National Park (Central Province), and Mts. Nakanai (New Britain). Multiple habitats ranging from the highland wet forest to the lowland rainforest and disturbed forest were explored. Collecting mainly involved beating foliage and visual inspection on ground and on tree trunks.

Photographs of living specimens were mostly taken with a Pentax Optio 33WR digital camera. For the macro capability, a small lens was glued to it. Living spider photographs of *Xenocytaea albomaculata* were taken by Piotr Naskrecki with a Canon 40D camera with a 100 mm macrolens. Photographs of preserved specimens were taken under a Leica MZ16 dissecting microscope with Leica Application Suite version 3.1.0. Preserved specimens were examined under both dissecting microscopes and a compound microscope with reflected light. Drawings were made with a drawing tube on a Nikon ME600L compound microscope.

Terminology is standard for Araneae. All measurements are given in millimeters. Descriptions of color pattern are based on the alcohol-preserved specimens. Carapace length was measured from the base of the anterior median eyes not including the lenses to the rear margin of the carapace medially; abdomen length to the end of the anal tubercle. The following abbreviations are used: ALE, anterior lateral eyes; AME, anterior median eyes; PLE, posterior lateral eyes; PME, posterior median eyes (the "small eyes"). Specimens are deposited in the Spencer Entomological Collection at the Beaty Biodiversity Museum, University of British Columbia (UBC-SEM).

Taxonomy

Genus *Bathippus* Thorell, 1892

Medium to large sized spiders. Males usually have elongate chelicerae. Female chelicera usually has a unident retromarginal tooth. First leg usually has three pairs of ventral macrosetae on tibia and four pairs on metatarsus. Male palpal bulb is oval, without proximal tegular lobe. Retrolateral tibial apophysis is long or short, and usually finger-like. Femur of male palp is more or less long and curved. Epigynum has a window, with the opening to the copulatory duct at the anterior or median of the vulva.

Thirty-two species have been described from Southeast Asia, Papua New Guinea, Pacific islands and Australia (Platnick 2012). The four new species are placed within this genus because of their similar morphology to the type species *Bathippus macrognathus* (Thorell) (see Prószyński 1976), such as the elongate male chelicerae and the less coiled embolus of the male palp. Their close relationship with *B. macrognathus* is indicated by unpublished molecular data.

FIGURES 1–4. *Bathippus directus* sp. nov. 1–2 male paratype; 3–4 female paratype.

***Bathippus directus* sp. nov.**
Figs 1–14

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1000–1100 m a.s.l., 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008 (UBC-SEM AR00077). Paratypes: 1 female, same data as holotype (UBC-SEM AR00078); 5 males and 3 females in three vials, same data as holotype; 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304–5.305° S, 142.510–142.512° E, elev. 1400–1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-012.

Etymology. Latin *directus*, referring to the male chelicerae projecting almost straight forward.

Diagnosis. Differs from other species by the presence of two cusps near the base of the male cheliceral fang (Figs 10–11), the long embolus and the abruptly narrowed distal end of the retrolateral tibial apophysis of the male palp (Figs 7–9), the large window of the epigynum (Fig. 13), and the large and spherical spermathecae of the vulva (Fig. 14). Female genitalia resembles that of *Euophrys evae* Żabka, 1981, but can be distinguished by the narrower copulatory duct and the larger spermatheca of the vulva (Fig. 14).

Description. *Male* (holotype, UBC-SEM AR00077). Carapace length 3.6 (variation 3.5–3.8, n=6); abdomen length 5.0. Chelicera (Figs 10–11): dark red brown; elongate and extending forward; promargin with four teeth and retromargin with one big tooth; fang with two cusps near the base. Palp (Figs 7–9): sandy yellow. Retrolateral loop of sperm duct wide, occuping about three quaters of the bulb width. Embolus coiled for about half a circle. Retrolateral tibial apophysis thick proximally and narrowed abruptly near distal end. Measurements of legs: I 13.7, II 9.0, III 10.7, IV 9.3. Color in alcohol (Fig. 5): carapace yellow orange with indistinct gray markings; abdomen gray brown, with yellow orange speckles and yellowish stripes; legs light yellow to brown.

Female (paratype, UBC-SEM AR00078). Carapace length 2.8 (variation 2.8–3.1, n=5); abdomen length 4.9. Chelicera (Fig. 12): with two promarginal teeth and one retromarginal tooth. Measurements of legs: I 6.3, II 5.7, III 7.5, IV 6.7. Epigynum (Figs 13–14): window large with a narrow median septum; opening to copulatory duct at anterior lateral edge of the window. Copulatory duct short and slightly curved; spermatheca large and spherical. Color in alcohol (Fig. 6): similar but lighter than that of male.

Natural history. Specimens were collected by beating forest understory vegetation.

***Bathippus gahavisuka* sp. nov.**
Figs 15–27

Type material. Holotype: male, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.015° S, 145.412° E, elev. 2320 m a.s.l., 1–2 August 2008, coll. W. Maddison, WPM#08-025 (UBC-SEM AR00079). Paratype: 1 female, same data as holotype (UBC-SEM AR00080).

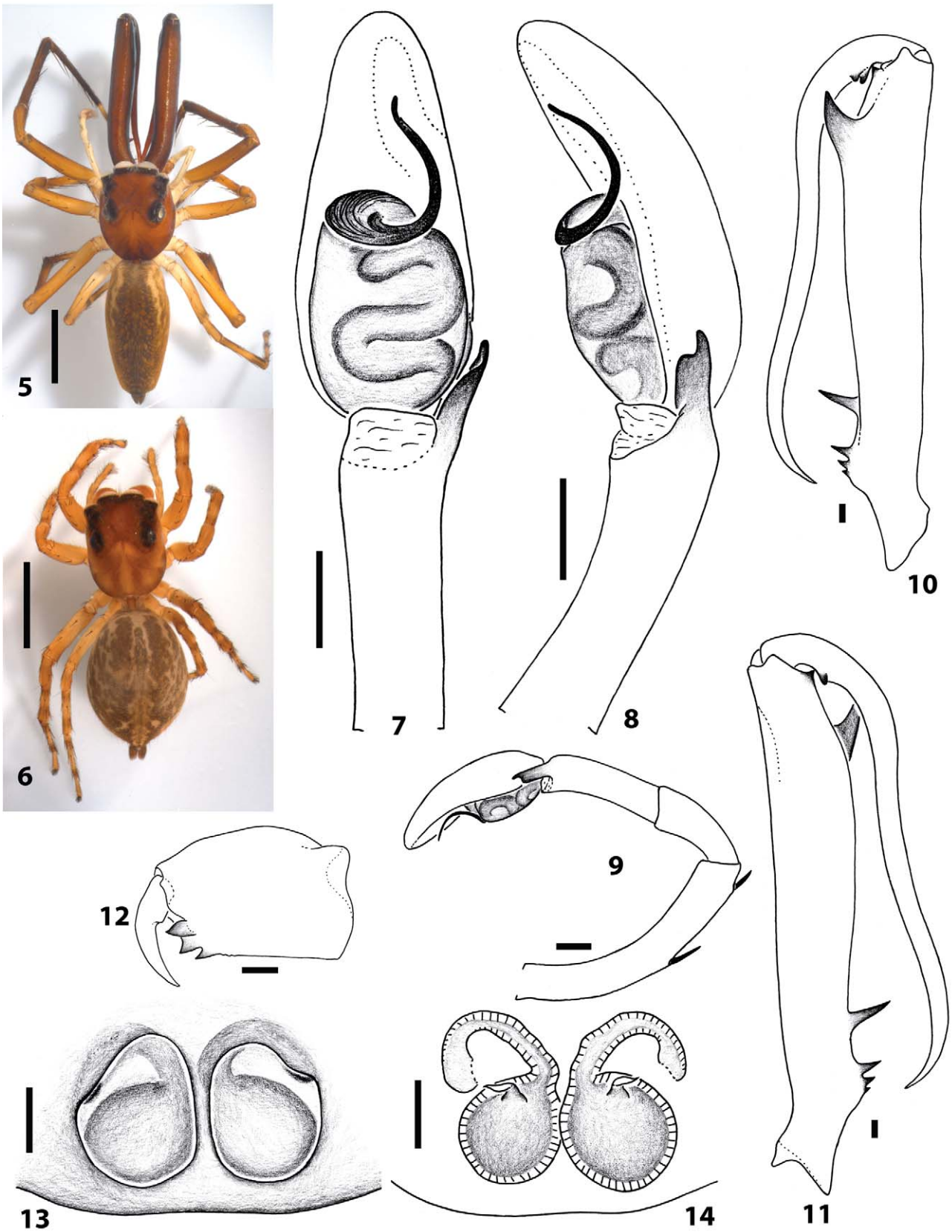
Etymology. A noun in apposition taken from the type locality.

Diagnosis. Similar in color pattern and markings to *B. korei*, but differs in the presence of a curved spur on the prolateral surface of the male chelicera (Fig. 21), the thinner embolus and the shorter retrolateral tibial apophysis of the male palp (Figs 23–25), and the wider median septum of the epigynum (Fig. 26).

Description. *Male* (holotype, UBC-SEM AR00079). Carapace length 2.9; abdomen length 3.8. Chelicera (Figs 21–22): dark red brown; promargin with three teeth and retromargin with one tooth; fang with a small cusp in the middle; prolateral surface with a curved spur. Palp (Figs 23–25): sandy yellow to red brown. Tegulum narrow. Embolus short and slightly curved. Retrolateral tibial apophysis thin and finger-like. Measurements of legs: I 8.9, II 7.2, III 7.8, IV 7.1. Color in alcohol (Fig. 19): carapace brown with two lateral cream stripes; abdomen grayish brown, with light yellow markings; legs yellowish to dark red brown.

Female (paratype, UBC-SEM AR00080). Carapace length 2.7; abdomen length 2.8. Chelicera: with two promarginal and one retromarginal tooth. Measurements of legs: I 6.0, II 5.4, III 6.7, IV 6.2. Epigynum (Figs 26–27): window occupying about half of the epigynal plate; median septum wide almost reaching the anterior margin of window. Copulatory duct short with an accessory gland; spermatheca relatively small and oval. Color in alcohol (Fig. 20): carapace light orange, with two lateral yellowish stripes; abdomen brownish, with yellowish speckles and a large leaf-like marking in the middle.

Natural history. Specimens were collected by beating forest understory vegetation.



FIGURES 5–14. *Bathippus directus* sp. nov. 5 male paratype, dorsal view; 6 female paratype, dorsal view; 7 male left palp, ventral view; 8 male left palp, retrolateral view; 9 male left palp (with patella and femur), retrolateral view; 10 male left chelicera, retrolateral view; 11 male left chelicera, prolateral view; 12 female left chelicera, back view; 13 epigynum, ventral view; 14 cleared epigynum, dorsal view. Scale bars: 5–6, 2.0 mm; 7–12, 0.2 mm; 13–14, 0.1 mm.

FIGURES 15–18. *Bathippus gahavisuka* sp. nov. 15–17 male holotype; 18 female paratype.

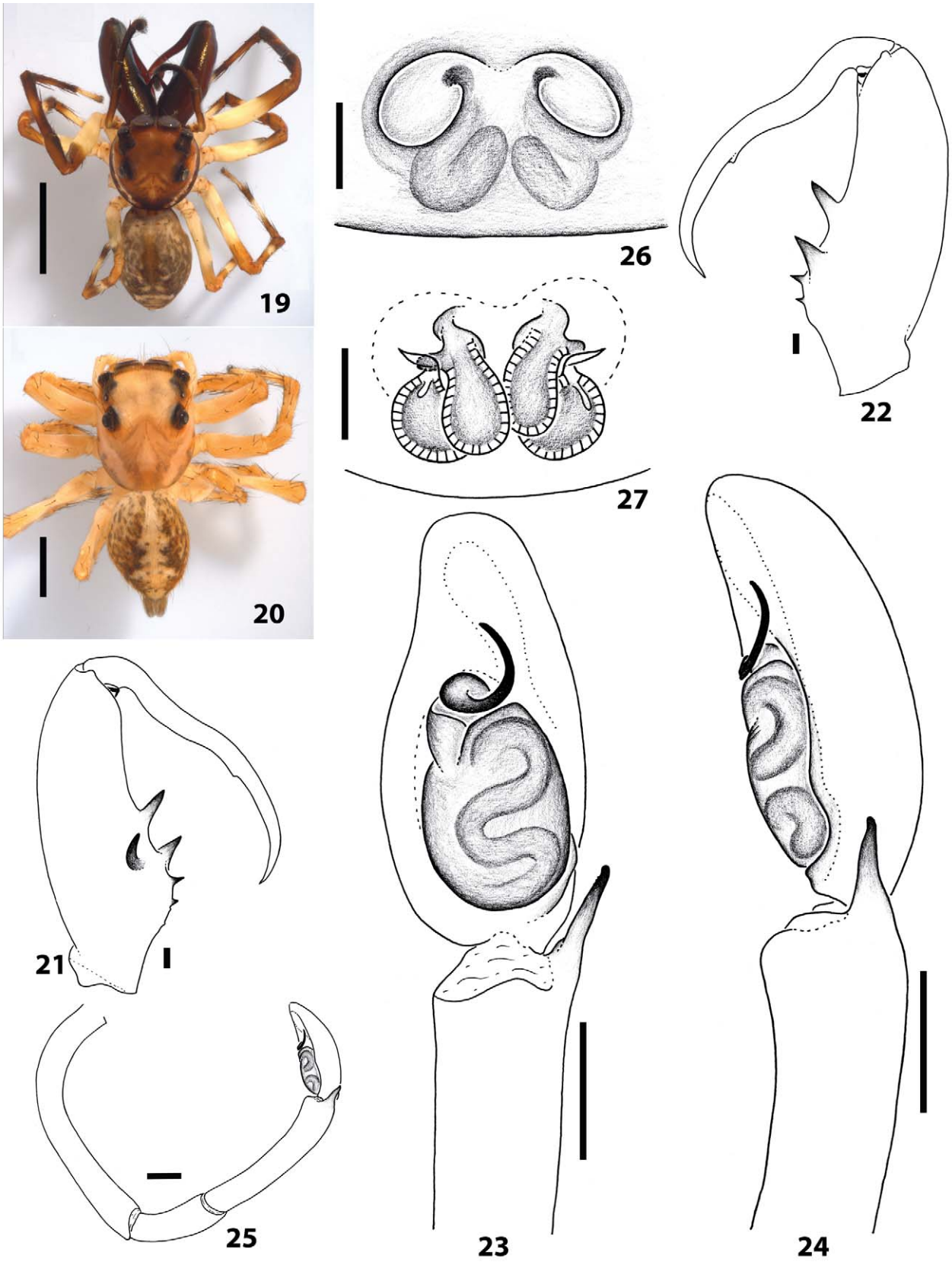
***Bathippus korei* sp. nov.**
Figs 28–41

Type material. Holotype: male, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00081). Paratypes: 1 female, same data as holotype (UBC-SEM AR00082); 2 males and 1 female in three vials, same data as holotype.

Etymology. The specific epithet is a patronym in honor of Mr. Agustus Kore, who participated in collecting specimens in Varirata National Park.

Diagnosis. Differs from other species by the presence of seven teeth on the promargin of female and male chelicerae (Figs 37–39), and the wider embolus of the male palp (Figs 34–36).

Description. *Male* (holotype, UBC-SEM AR00081). Carapace length 3.5 (variation 3.5–3.9, n=3); abdomen length 4.9. Chelicera (Figs 37–38): dark red brown; promargin with seven teeth and a small cusp near the fang base, retromargin without distinct tooth but with a big process at the base of the fang. Palp (Figs 34–36): light yellow. Tegulum narrow. Embolus relatively wide and slightly curved. Retrolateral tibial apophysis finger-like with a small cusp near the tip. Measurements of legs: I 12.2, II 9.5, III 10.8, IV 9.3. Color in alcohol (Fig. 32): carapace orange; abdomen grayish brown, with light yellow speckles and markings; legs sandy yellow to yellow brown.



FIGURES 19–27. *Bathippus gahavisuka* sp. nov. 19 male holotype, dorsal view; 20 female paratype, dorsal view; 21 male left chelicera, prolateral view; 22 male left chelicera, retrolateral view; 23 male left palp, ventral view; 24 male left palp, retrolateral view; 25 male left palp (with patella and femur), retrolateral view; 26 epigynum, ventral view; 27 cleared epigynum, dorsal view. Scale bars: 19, 2.0 mm; 20, 1.0 mm; 21–25, 0.2 mm; 26–27, 0.1 mm.

FIGURES 28–31. *Bathippus korei* sp. nov. 28–30 male paratype; 31 female paratype.

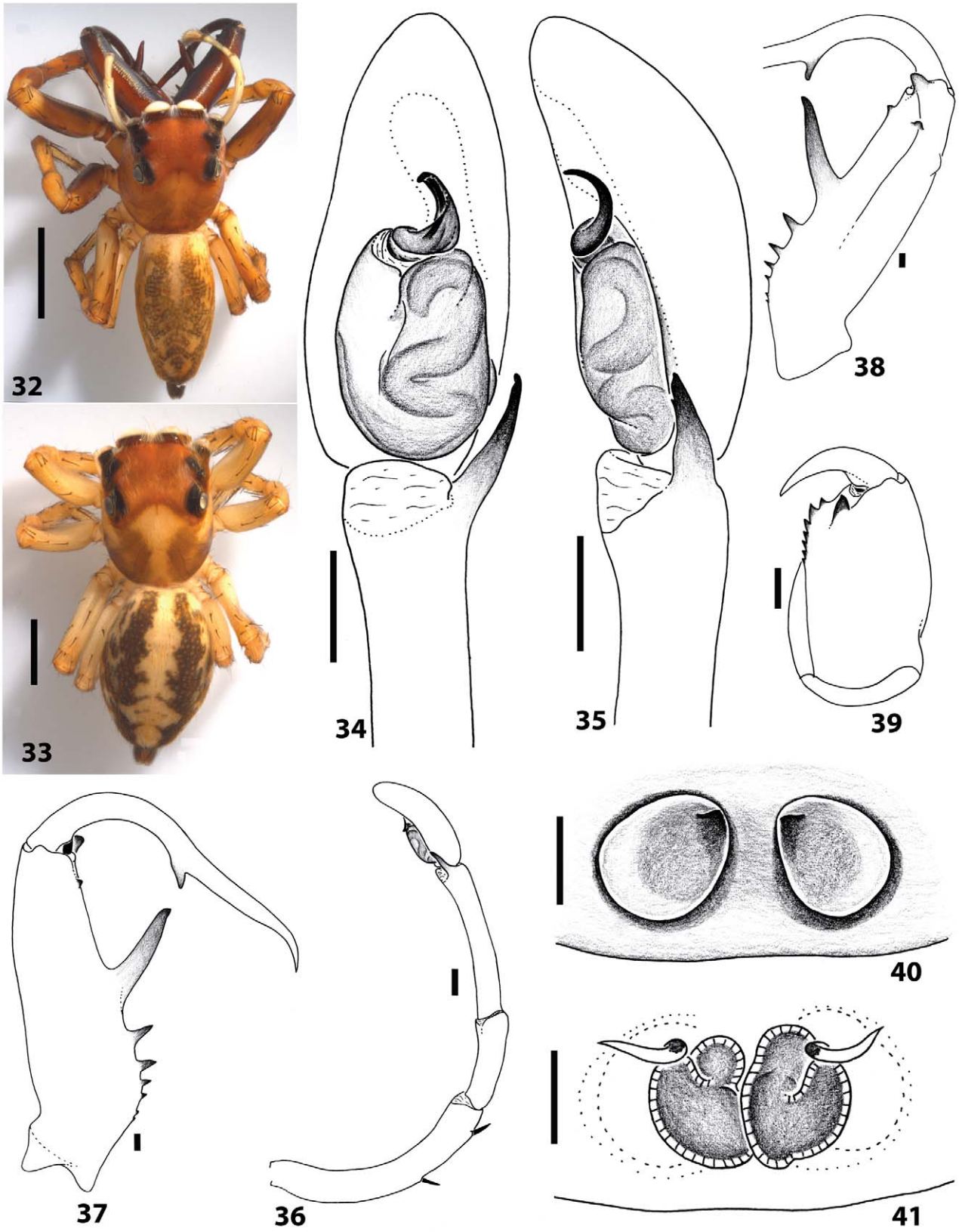
Female (paratype, UBC-SEM AR00082). Carapace length 2.9; abdomen length 4.5. Chelicera (Fig. 39): with seven promarginal and one retromarginal tooth. Measurements of legs: I 6.2, II 5.5, III 7.2, IV 6.5. Epigynum (Figs 40–41): window occupying almost three quaters of the epigynal plate; median septum relatively wide; opening to the copulatory duct at anterior edge of median septum. Copulatory duct short; spermatheca long oval. Color in alcohol (Fig. 33): carapace orange, with a light yellow stripe in thoracic area; abdomen brown, with a yellowish leaf-like marking in the middle; legs sandy yellow.

***Bathippus madang* sp. nov.**
Figs 42–47

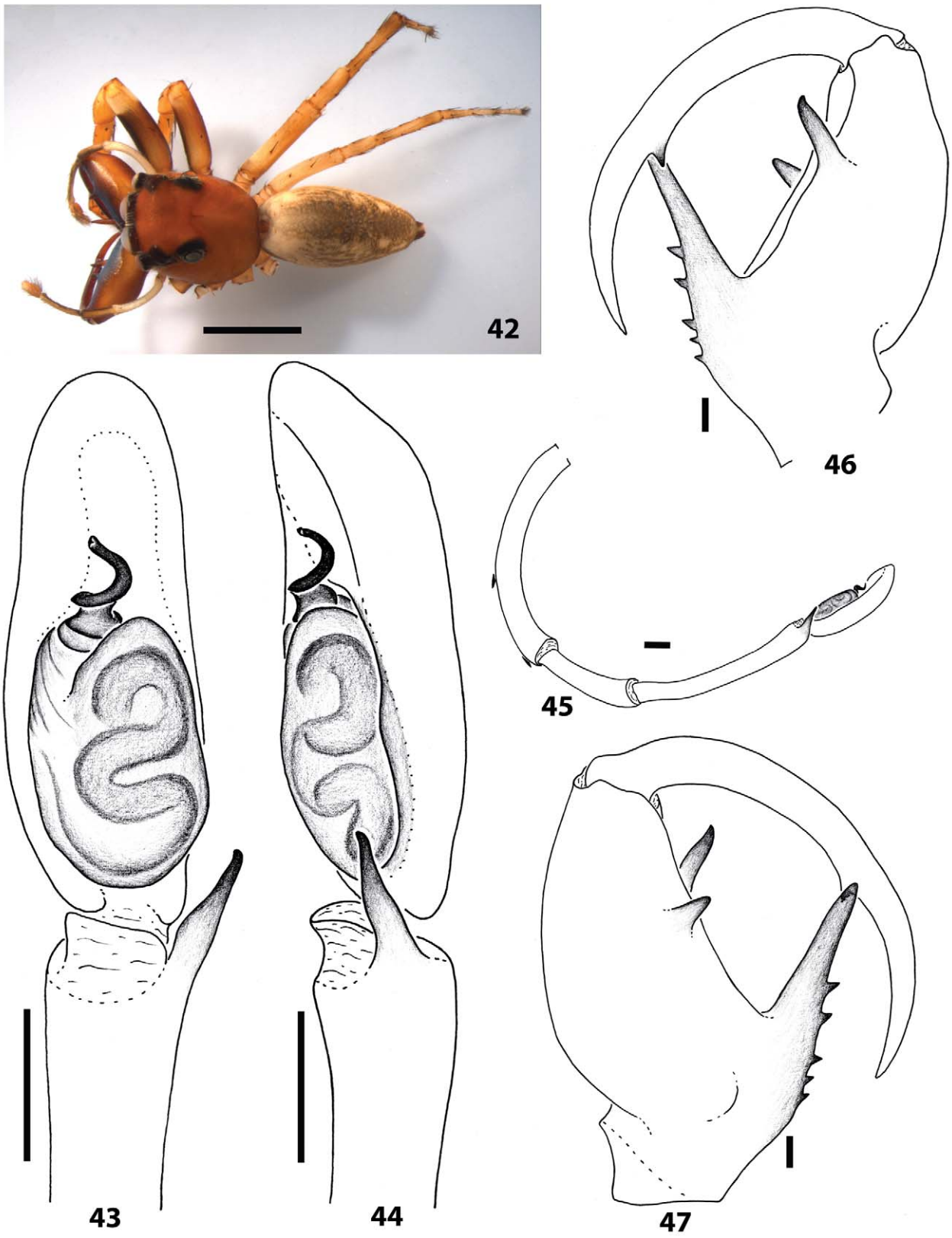
Type material. Holotype: male, PAPUA NEW GUINEA: Madang, Adalbert Mts., Sewan-Keki, 4.704° S, 145.419° E, elev. 700m, 4 May 2006, coll. Balke & Manaono (PNG 51, UBC-SEM AR00083).

Etymology. A noun in apposition taken from the type locality.

Diagnosis. Differs from the other species by the unique teeth pattern on the male chelicerae (Figs 46–47). Similar in male palp to *B. macrognathus* (Thorell) (see Prószyński 1976) and *B. dilanians* (Thorell) (see Prószyński 1984). It differs from *B. macrognathus* in the longer retrolateral tibial apophysis (Figs 43–45), and from *B. dilanians* in the straight and finger-like retrolateral tibial apophysis (Figs 43–45; retrolateral tibial apophysis hooked in *B. dilanians*).



FIGURES 32–41. *Bathippus korei* sp. nov. 32 male paratype, dorsal view; 33 female paratype, dorsal view; 34 male left palp, ventral view; 35 male left palp, retrolateral view; 36 male left palp (with patella and femur), retrolateral view; 37 male left chelicera, prolateral view; 38 male left chelicera, retrolateral view; 39 female left chelicera, back view; 40 epigynum, ventral view; 41 cleared epigynum, dorsal view. Scale bars: 32, 2.0 mm; 33, 1.0 mm; 34–39, 0.2 mm; 40–41, 0.1 mm.



FIGURES 42–47. *Bathippus madang* sp. nov. 42 male holotype, dorsal view; 43 male left palp, ventral view; 44 male left palp, retrolateral view; 45 male left palp (with patella and femur), retrolateral view; 46 male left chelicera, retrolateral view; 47 male left chelicera, prolateral view. Scale bars: 42, 2.0 mm; 43–47, 0.2 mm.

Description. *Male* (holotype, UBC-SEM AR00083). Carapace length 3.0; abdomen length 4.4. Chelicera (Figs 46–47): light orange to brown; promargin with two teeth, one of them really big with five cusps on one side;

retromargin with one tooth; fang with a central cusp. Palp (Figs 43–45): light yellow to yellowish brown. Tegulum narrow. Embolus short and spiral, with the plane of spiral perpendicular to the longitudinal axis of palpal bulb. Retrolateral tibial apophysis long and finger-like. Measurements of legs: I 9.7, II 8.3, III 9.4, IV 8.3. Color in alcohol (Fig. 42): carapace orange; abdomen grayish brown, with light yellow speckles and streaks; legs sandy yellow to brown.

Genus *Canama* Simon, 1903

Males of described species usually have elongate chelicerae, similar to *Bathippus* Thorell. Prószyński (1987) considered it as a junior synonym of *Bathippus* based on their similarities. But Davies and Żabka (1989) rejected this synonym, and suggested that it differed from *Bathippus* in cheliceral and epigynal structure. We agree with Davies and Żabka (1989) that they are distinct genera. Females of *Canama* have one bicuspid tooth on the retromargin of the chelicera; the spermatheca usually is not highly swollen, but rather coiled and continuous with the copulatory duct; males of *Canama* usually have a longer embolus and wider embolic spiral, with the plane of the embolic spiral usually perpendicular to the longitudinal axis of the tegulum. First leg usually has three pairs of ventral macrosetae on tibia and metatarsus each (but *C. triramosa* has two pairs of ventral macrosetae on first metatarsus).

Six species have been included in this genus (Platnick 2012). An additional three new species are described here. The placement of these species in *Canama* is based both on their similarities in morphology to the type species *Canama forceps* (Doleschall) (see Prószyński 1984, 1987) and their close relationship with *C. forceps* indicated by unpublished molecular data.

Canama extranea sp. nov.

Figs 48–61

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1100 m a.s.l., 13–22 July 2008, forest edge, coll. W. Maddison & Luc Fimo Tuki, WPM#08-010 (UBC-SEM AR00084). Paratypes: 1 female, same data as holotype (UBC-SEM AR00085); 1 female, same data as holotype; 1 male, PAPUA NEW GUINEA: Southern Highlands Province: Putuwé, junction of Lagaip & Uruwabwa Rivers, 5.231° S, 142.532° E, elev. 570 m a.s.l., 23–26 July 2008, coll. W. Maddison & Luc Fimo Tuki, WPM#08-019; 1 female, same data as previous.

Etymology. Latin *extranea* (strange), referring to the peculiar male palpal structure.

Diagnosis. Male chelicerae (Figs 57–58) are not as elongate as those of *C. forceps* (Doleschall) (see Prószyński 1984, 1987) and *C. hinnulea* (Thorell) (see Davies & Żabka 1989). Also differs from other species by the presence of dark markings in the eye area of male and female (Figs 48–53), the big and bowl-like embolic disc and the presence of proximal tegular lobe of the male palp (Figs 54–56), and the narrow and convoluted copulatory duct of the vulva (Fig. 61).

Description. *Male* (holotype, UBC-SEM AR00084). Carapace length 2.1 (variation 2.1–2.7, n=2); abdomen length 2.2. Chelicera (Figs 57–58): yellow brown; not very elongate; with two promarginal teeth and one long bicuspid tooth on retromargin (the paratype male with one big dagger-like retromarginal tooth). Palp (Figs 54–56): yellow brown. Cymbial distal groove more retrolateral. Proximal tegular lobe present. Embolic disc large and bowl-like. Retrolateral tibial apophysis finger-like with distal end hooked from ventral view. Femur of palp slightly curved. Measurements of legs: I 4.2, II 3.7, III 4.6, IV 4.1. Color in alcohol (Fig. 52): carapace light orange, with dark markings in eye area; abdomen anterior end light yellow, other part dark; legs light red brown to light yellow.

Female (paratype, UBC-SEM AR00085). Carapace length 2.3 (variation 2.2–2.3, n=3); abdomen length 2.9. Chelicera (Fig. 59): yellowish. Measurements of legs: I 3.4, II 3.5, III 4.1, IV 3.7. Epigynum (Figs 60–61): median septum relatively narrow; opening to the copulatory duct at posterior margin of window. Copulatory duct long and convoluted; spermatheca small and oval. Color in alcohol (Fig. 53): carapace light yellow, also with dark markings within eye area; abdomen yellowish, without distinct dark markings, legs light yellow. Body green when alive (Figs 50–51)

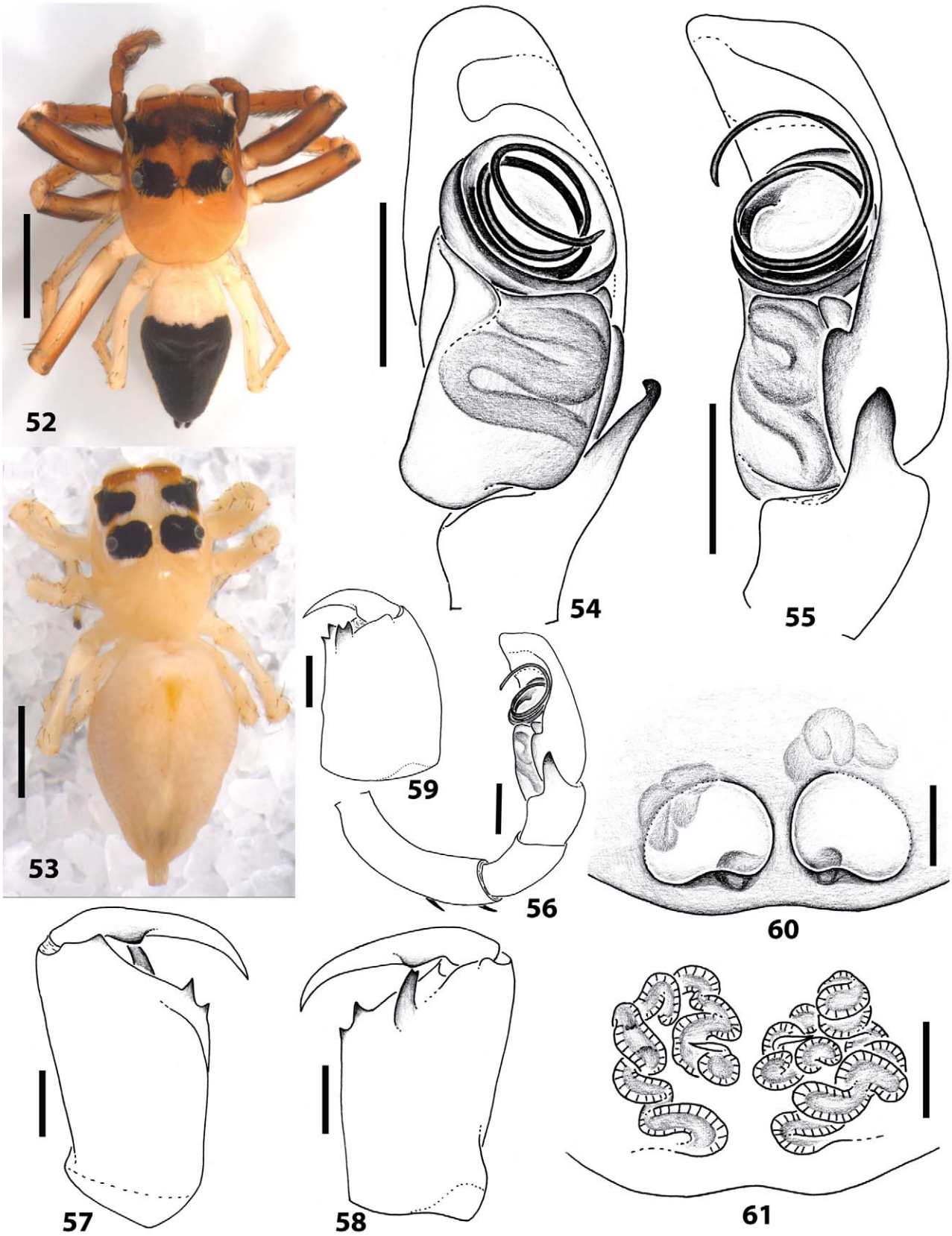
Natural history. Specimens were found beating vegetation in forest edge and disturbed forest.

FIGURES 48–51. *Canama extranea* sp. nov. 48–49 male paratype; 50–51 female paratype.

***Canama fimoi* sp. nov.**
Figs 62–76

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1000–1100 m a.s.l., 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008 (UBC-SEM AR00086); Paratypes: 1 female, same data as holotype (UBC-SEM AR00087); 4 females and 8 males in four vials, same data as holotype; 1 male and 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Putuwé, junction of Lagaip & Uruwabwa Rivers, 5.231° S, 142.532° E, elev. 570 m a.s.l., 23–26 July 2008, coll. W. Maddison & Luc Fimo Tuki, WPM#08-019; 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304–5.305° S, 142.510–142.512° E, elev. 1400–1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-012; 1 male and 2 females, PAPUA NEW GUINEA: Southern Highlands Province: trail from Tualapa to Umgé, 5.2912° S, 142.5006° E to 5.2918° S, 142.5001° E, elev. 1170 m a.s.l., 21 July 2008, coll. W. Maddison & Luc Fimo Tuki, WPM#08-018.

Etymology. The specific epithet is a patronym in honor of Mr. Luc Fimo Tuki, who helped in collecting specimens of this species.



FIGURES 52–61. *Canama extranea* sp. nov. 52 male holotype, dorsal view; 53 female paratype, dorsal view; 54 male left palp, ventral view; 55 male left palp, retrolateral view; 56 male left palp (with patella and femur), retrolateral view; 57 male left chelicera, prolateral view; 58 male left chelicera, retrolateral view; 59 female left chelicera, back view; 60 epigynum, ventral view; 61 cleared epigynum, dorsal view. Scale bars: 52–53, 1.0 mm; 54–59, 0.2 mm; 60–61, 0.1 mm.

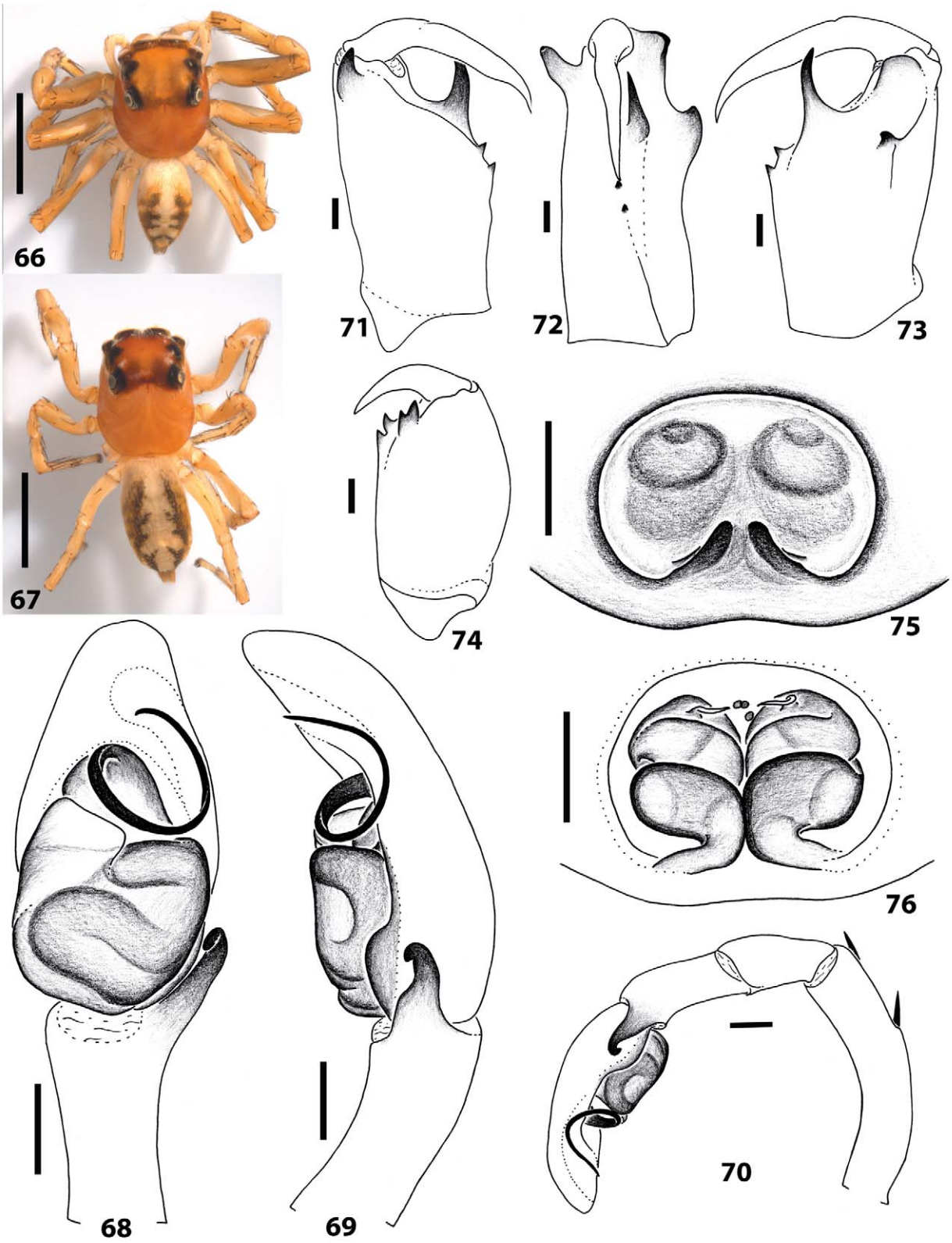
FIGURES 62–65. *Canama fimoi* sp. nov. 62–63 male paratype; 64–65 female paratype.

Diagnosis. Male chelicerae similar to those of *C. extranea* in being only slightly elongate, but unlike that species having additional projections on the front and back surfaces (Figs 71–73). Female differs from other species in the short median septum and the wide copulatory duct (Figs 75–76); male can be distinguished by the wide bulb and the less spiraled embolus of the palp (Figs 68–70).

Description. *Male* (holotype, UBC-SEM AR00086). Carapace length 3.3 (variation 2.9–4.1, n=11); abdomen length 3.6. Chelicera (Figs 71–73): light orange; robust but not very elongate; promargin with two teeth, retromargin with one large dagger-like tooth; front surface with a spur at the base of fang, back surface with a distal process and a median process. Palp (Figs 68–70): yellowish to yellow brown. Cymbial distal groove more retrolateral. Tegulum wide; proximal tegular lobe absent. Embolus long and coiled for less than a circle. Retrolateral tibial apophysis finger-like with distal end hooked. Femur of palp slightly curved. Measurements of legs: I 11.9, II 8.4, III 9.1, IV 8.2. Color in alcohol (Fig. 66): carapace orange, eye area slightly grayish; abdomen gray brown, with a medial yellowish leaf-like marking; legs light orange.

Female (paratype, UBC-SEM AR00087). Carapace length 3.2 (variation 3.1–3.5, n=9); abdomen length 3.5. Chelicera (Fig. 67): light orange. Measurements of legs: I 7.0, II 6.5, III 8.1, IV 7.6. Epigynum (Figs 75–76): window large; median septum short and not even reaching the center of window; opening to copulatory duct at posterior end of window. Copulatory duct wide and convoluted; spermatheca relatively large. Color in alcohol (Fig. 67): similar to that in male.

Natural history. Specimens were collected by beating in forest understory, especially suspended litter.



FIGURES 66–76. *Canama fimoi* sp. nov. 66 male paratype, dorsal view; 67 female paratype, dorsal view; 68 male left palp, ventral view; 69 male left palp, retrolateral view; 70 male left palp (with patella and femur), retrolateral view; 71 male left chelicera, front view; 72 male left chelicera, medial view; 73 male left chelicera, back view; 74 female left chelicera, back view; 75 epigynum, ventral view; 76 cleared epigynum, dorsal view. Scale bars: 66–67, 2.0 mm; 68–76, 0.2 mm.

***Canama triramosa* sp. nov.**
Figs 77–90

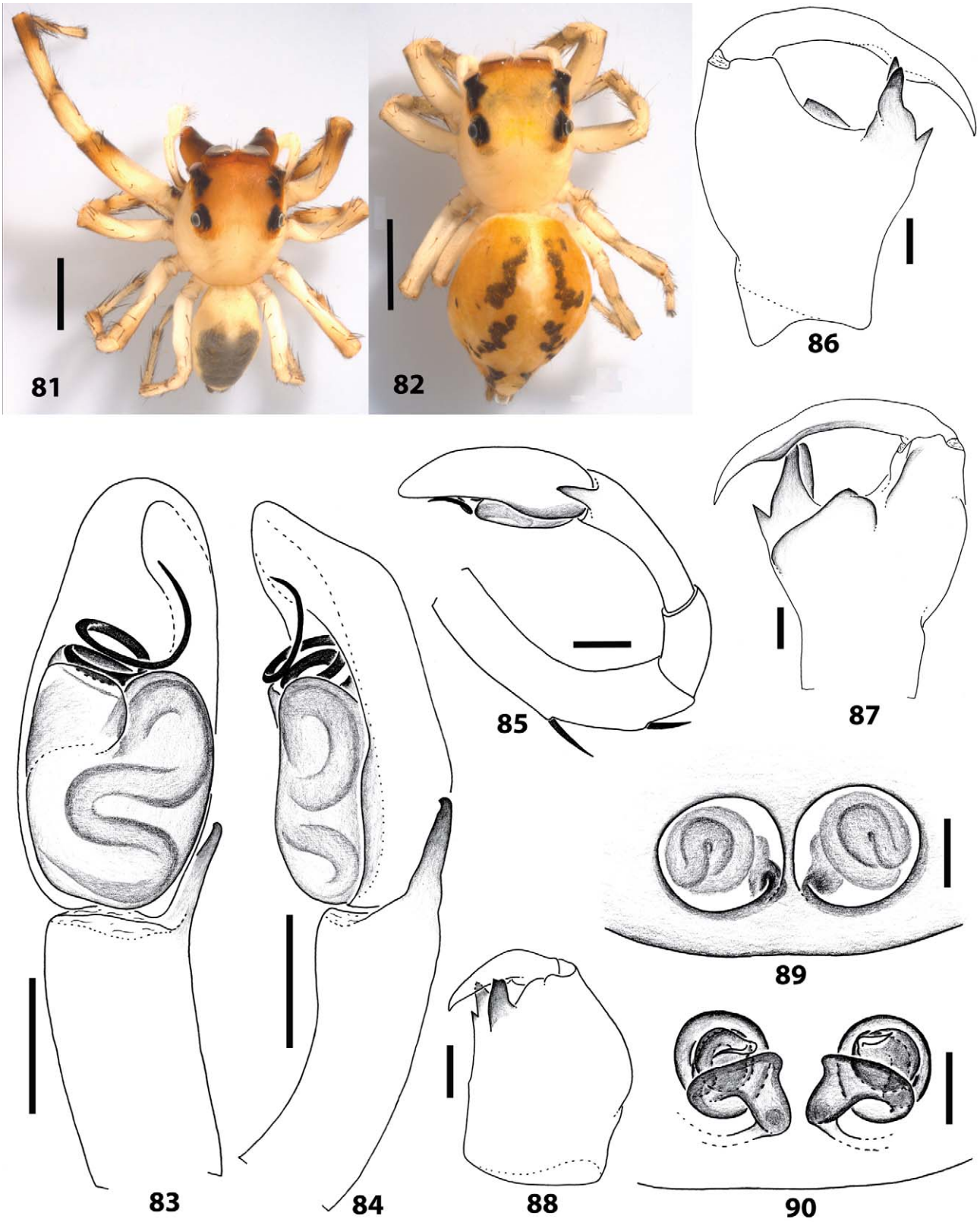
Type material. Holotype: male, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.016° S, 145.417° E to 6.017° E, 145.416° E, elev. 2450–2490 m a.s.l., 2 August 2008, coll. W. Maddison, WPM#08-027 (UBC-SEM AR00088). Paratypes: 1 female, same data as holotype (UBC-SEM AR00089); 1 female, same data as holotype; 1 female, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.015° S, 145.412° E, elev. 2320 m a.s.l., 1–2 August 2008, coll. W. Maddison, WPM#08-025.

FIGURES 77–80. *Canama triramosa* sp. nov. 77–79 male holotype; 80 female paratype.

Etymology. The specific epithet is from the combination of the prefix *tri-* (three) and the Latin *ramosa* (branched), and refers to the large three-forked tooth on the promargin of male chelicerae.

Diagnosis. Differs from other species by the unique three-branched promarginal tooth and the one large and wide retromarginal tooth on the male chelicera (Figs 86–87). Similar in male palpal structure to *Canama forceps* (Doleschall) (see Prószyński 1984, 1987), but can be easily distinguished by the shorter and wider male chelicera (Figs 86–87), the tooth pattern on the male chelicera (Figs 86–87), the wider palpal bulb and the shape of the

retrolateral tibial apophysis of the male palp (Figs 83–85). Female is similar to *C. extranea*, but differs in the absence of dark markings in the eye area (Figs 80, 82), the thicker and less convoluted copulatory duct of the vulva (Fig. 90).



FIGURES 81–90. *Canama triramosa* sp. nov. 81 male holotype, dorsal view; 82 female paratype, dorsal view; 83 male left palp, ventral view; 84 male left palp, retrolateral view; 85 male left palp (with patella and femur), retrolateral view; 86 male left chelicera, front view; 87 male left chelicera, back view; 88 female left chelicera, back view; 89 epigynum, ventral view; 90 cleared epigynum, dorsal view. Scale bars: 81–82, 1.0 mm; 83–88, 0.2 mm; 89–90, 0.1 mm.

Description. *Male* (holotype, UBC-SEM AR00088). Carapace length 2.1; abdomen length 2.5. Chelicera (Figs 86–87): yellow brown; robust with a tri-forked big tooth on promargin and an axe-like tooth on retromargin. Palp (Figs 83–85): yellowish to brownish. Cymbial distal groove more retrolateral. Proximal tegular lobe absent. Embolus long and coiled for about two circles. Retrolateral tibial apophysis finger-like. Femur of palp curved. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 6.5, II 5.1, III 5.6, IV 4.8. Color in alcohol (Fig. 81): carapace yellowish, eye area light orange; abdomen grayish without distinct markings; legs light yellow with yellow brown annuli. Body more greenish when alive (Figs 77–79).

Female (paratype, UBC-SEM AR00089). Carapace length 2.0 (variation 2.0–2.2, n=3); abdomen length 3.2. Chelicera (Fig. 88): with a long bicuspid retromarginal tooth. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 4.2, II 3.7, III 4.7, IV 4.4. Epigynum (Figs 89–90): window with a narrow median septum; opening at posterior end of window close to median septum. Copulatory duct long and convoluted with a gland-like process near the beginning. Color in alcohol (Fig. 82): similar to that of male, but eye area of carapace yellow, abdomen orange with symmetrical gray markings. Body more greenish when alive (Fig. 80).

Genus *Chalcolemia* new genus

Type species: *Chalcolemia nakanai* Zhang & Maddison, sp. nov.

Etymology. Chosen to resemble the name *Chalcolecta*; feminine in gender.

Diagnosis. Medium-sized spiders with narrow bodies and slender legs. First pair of legs with many ventral macrosetae. Similar in general body form, fissident retromarginal tooth on chelicera and two-chambered spermathecae to *Chalcolecta* Simon (see Gardzińska & Żabka 2005), but differs in the lateral margins of the carapace which are almost parallel instead of convex in *Chalcolecta* (Fig. 91); the thin femur, patella and tibia of the first pair of legs which are not much thicker than metatarsus and tarsus (Fig. 91); the presence of four pairs of ventral macrosetae on the female first metatarsus (three pairs in *Chalcolecta*); the presence of distinct median septum in the epigynum (Fig. 93) and the absence of accessory glands in the vulva (Figs 94–95). Unpublished molecular data also indicate *Chalcolemia* and *Chalcolecta* are distinct genera. *Chalcolemia* also resembles *Gambaquezonia* Barrion & Litsinger 1995 (also see Edwards 2009) in the delicate body and the presence of a fissident retromarginal tooth on the chelicera, but differs in the much slender legs and the narrower body (Fig. 91); the PLEs closer to the lateral margins of the carapace (Fig. 91); and the presence of large secondary spermatheca in addition to the primary spermatheca in the vulva (Figs 94–95).

Chalcolemia nakanai sp. nov.

Figs 91–95

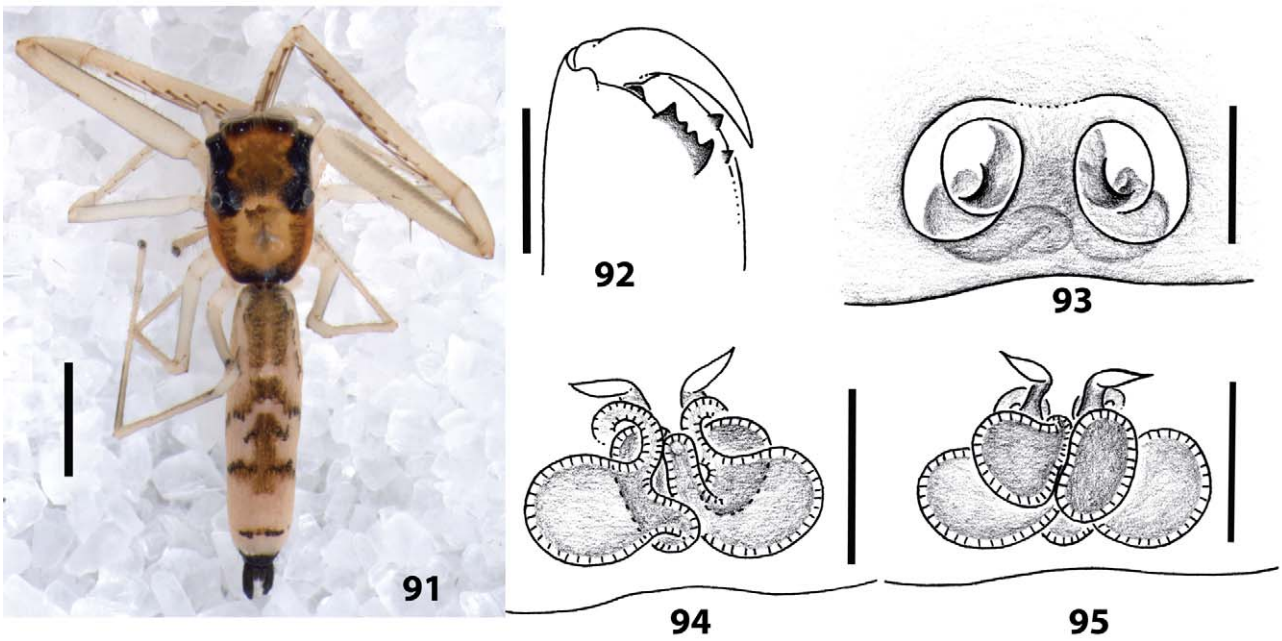
Type material. Holotype: female, PAPUA NEW GUINEA: New Britain, Nakanai Mts, Camp 1, Lamas, 3–8 April 2009, 5.614° S, 151.408° E, elev. 200 m, coll. I. Agnarsson (UBC-SEM AR00090).

Etymology. A noun in apposition taken from the type locality.

Diagnosis. The retromargin of chelicera has one fissident tooth of four cusps (Fig. 92); the opening to the copulatory duct is near the center of the window (Fig. 93); the primary spermatheca is smaller than the secondary spermatheca (Figs 94–95).

Description. *Female* (holotype, UBC-SEM AR00090). Carapace length 1.7; abdomen length 2.9. Chelicera (Fig. 92): light yellow; with two promarginal teeth and one retromarginal tooth of four cusps. Epigynum (Figs 93–95): median septum of window relatively wide; opening to copulatory duct close to the center of window. Copulatory duct without accessory gland; secondary spermatheca large and oval, primary spermatheca smaller. First pair of legs very long; tibia with nine proventral and eight retroventral macrosetae. Measurements of legs: I 7.4, II 3.9, III 4.7, IV 5.8. Color in alcohol (Fig. 91): carapace yellow brown, eye area gray brown with indistinct guanine deposit; posterior part of carapace with a "U"-shaped gray brown marking; abdomen light sandy brown, with brown to dark brown irregular markings in the middle; venter of abdomen and legs light sandy yellow.

Natural history. The specimen was collected by beating foliage in forest.



FIGURES 91–95. *Chalcolemia nakanai* sp. nov. 91 female holotype, dorsal view; 92 female right chelicera, back view; 93 epigynum, ventral view; 94 cleared epigynum, ventral view; 95 cleared epigynum, dorsal view. Scale bars: 91, 1.0 mm; 92, 0.2 mm; 93–95. 0.1 mm.

Genus *Omoedus* Thorell, 1881

Omoedus Thorell, 1881: 668, type species: *Omoedus niger* Thorell, 1881.
Zenodorus Peckham & Peckham, 1886: 287, type species: *Attus d'urvillii* Walckenaer, 1837. **New Synonym**
Pystira Simon, 1901: 656, type species: *Hadrosoma ephippigerum* Simon, 1885. **New Synonym**

Small to large spiders with various color patterns. First leg usually has three pairs of ventral macrosetae on tibia and two pairs on metatarsus. Male palp usually has long and highly coiled embolus, without proximal tegular lobe. Epigynum has a large window with a median septum of various shapes. Vulva is posterior to the window. Copulatory duct is usually long and convoluted. Spermatheca is not strongly swollen, but small and tubular, and not very distinctive from the copulatory duct.

Remarks. Although the carapace of *Omoedus* and *Pystira* usually is higher than that of typical *Zenodorus* and has a shallow concavity at the posterior end, their genitalia do share the same pattern with those of *Zenodorus*, such as the absence of proximal tegular lobe and the highly coiled embolus of the male palp, the long and convoluted copulatory duct and the small and tubular spermatheca of the vulva. Unpublished molecular data indicate *Omoedus*, *Pystira* and *Zenodorus* form a clade, with *Omoedus* and *Pystira* embedded within *Zenodorus*. Hence, we merge them as one genus and consider *Pystira* and *Zenodorus* as junior synonyms of *Omoedus*. Five species once placed in *Pystira* and 23 species in *Zenodorus* (Platnick 2012) are therefore transferred into *Omoedus*:

Omoedus cyanothorax (Thorell, 1881) (from *Pystira*, **New Combination**)
Omoedus ephippigerus (Simon, 1885) (from *Pystira*, **New Combination**)
Omoedus karschi (Thorell, 1881) (from *Pystira*, **New Combination**)
Omoedus nigripalpis (Thorell, 1877) (from *Pystira*, **New Combination**)
Omoedus versicolor (Dyal, 1935) (from *Pystira*, **New Combination**)
Omoedus albertisi (Thorell, 1881) (from *Zenodorus*, **New Combination**)
Omoedus arcipluvii (Peckham & Peckham, 1901) (from *Zenodorus*, **New Combination**)
Omoedus asper (Karsch, 1878) (from *Zenodorus*, **New Combination**)
Omoedus danae (Hogg, 1915) (from *Zenodorus*, **New Combination**)
Omoedus durvillei (Walckenaer, 1837) (from *Zenodorus*, **New Combination**)

Omoedus formosus (Rainbow, 1899) (from *Zenodorus*, **New Combination**)
Omoedus jucundus (Rainbow, 1912) (from *Zenodorus*, **New Combination**)
Omoedus juliae (Thorell, 1881) (from *Zenodorus*, **New Combination**)
Omoedus lepidus (Guérin, 1834) (from *Zenodorus*, **New Combination**)
Omoedus marginatus (Simon, 1902) (from *Zenodorus*, **New Combination**)
Omoedus metallescens (L. Koch, 1879) (from *Zenodorus*, **New Combination**)
Omoedus microphthalmus (L. Koch, 1881) (from *Zenodorus*, **New Combination**)
Omoedus niger (Karsch, 1878) (from *Zenodorus*, **New Combination**)
Omoedus obscurofemoratus (Keyserling, 1883) (from *Zenodorus*, **New Combination**)
Omoedus orbiculatus (Keyserling, 1881) (from *Zenodorus*, **New Combination**)
Omoedus ponapensis (Berry, Beatty & Prószyński, 1996) (from *Zenodorus*, **New Combination**)
Omoedus pupulus (Thorell, 1881) (from *Zenodorus*, **New Combination**)
Omoedus pusillus (Strand, 1913) (from *Zenodorus*, **New Combination**)
Omoedus rhodopae (Hogg, 1915) (from *Zenodorus*, **New Combination**)
Omoedus syrinx (Hogg, 1915) (from *Zenodorus*, **New Combination**)
Omoedus variatus (Pocock, 1899) (from *Zenodorus*, **New Combination**)
Omoedus varicans (Thorell, 1881) (from *Zenodorus*, **New Combination**)
Omoedus wangillus (Strand, 1911) (from *Zenodorus*, **New Combination**)

In addition, seven new species from Papua New Guinea are described here.

***Omoedus brevis* sp. nov.**
Figs 96–100

Type material. Holotype: male, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00124). Paratype: 1 male, same data as holotype.

Etymology. Latin *brevis* (short), referring to the short embolus of male palp.

Diagnosis. Can be easily distinguished from other species by the short embolus and the presence of tibial ventral bump of the male palp (Figs 99–100).

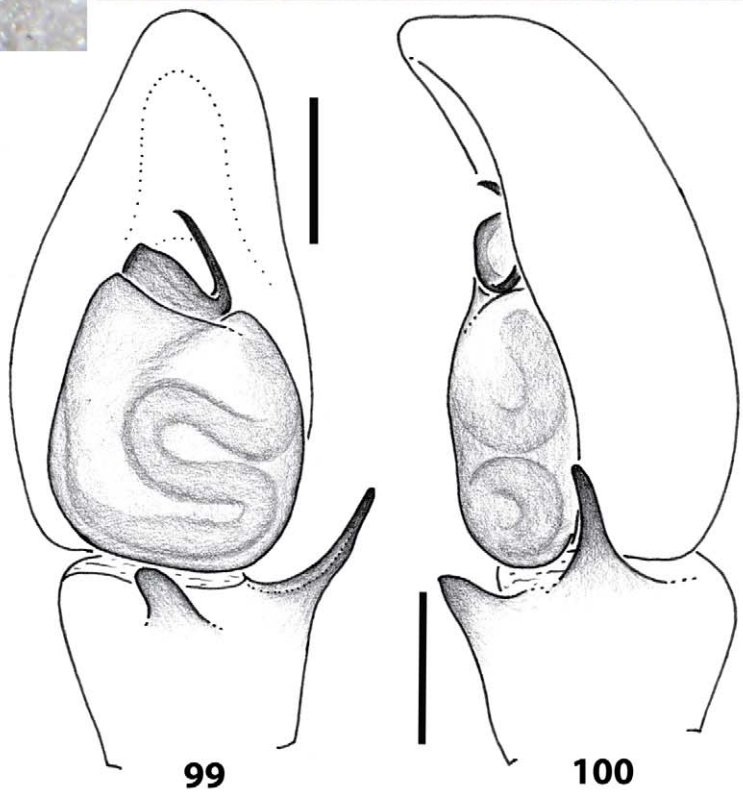
Description. *Male* (holotype, UBC-SEM AR00124). Carapace length 1.6 (variation 1.6–1.7, n=2); abdomen length 1.4. Chelicera: dark red brown; with two promarginal teeth and one retromarginal tooth. Palp (Figs 99–100): dark yellow brown with gray pigments. Retrolateral sperm duct loop about three quaters of tegulum width. Embolus very short and not coiled. Retrolateral tibial apophysis relatively short and finger-like. Tibial ventral bump big. Measurements of legs: I 3.8, II 2.6, III 3.1, IV 3.0. Color in alcohol (Fig. 98): carapace dark brown, with iridescent scales behind PLEs and AMEs; dorsal abdomen dark brown, anterior margin with a wide band composed of golden iridescent scales, posterior part with a few transverse light yellow bands; ventral abdomen gray brown with brownish speckles; first pair of legs cream on tarsi, other segments dark brown; other legs dark brown on coxae, trochanters and femora, other segments cream.

Natural history. Specimens were found on leaf litter in forest.

***Omoedus darleyorum* sp. nov.**
Figs 101–111

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1100 m a.s.l., 13–22 July 2008, forest edge, coll. W. Maddison & Luc Fimo Tuki, WPM#08-010 (UBC-SEM AR00127). Paratypes: 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1100 m a.s.l., 11–22 July 2008, old clearing (former garden), coll. W. Maddison, WPM#08-009 (UBC-SEM AR00128); 1 male, same data as previous.

Etymology. Named in honour of Merrick and Lorraine Darley, important supporters of Conservation International's efforts to document biodiversity.



FIGURES 96–100. *Omoedus brevis* sp. nov. 96–97 male holotype; 98 male paratype, dorsal view; 99 male left palp, ventral view; 100 male left palp, retrolateral view. Scale bars: 98, 0.5 mm; 99–100, 0.1 mm. FIGURES 96–97 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.

Diagnosis. Similar in color pattern and markings to *Omoedus brevis*, but can be easily distinguished by the long and highly coiled embolus (Figs 107–108) and the paler legs (Figs 101–106). Median septum of the epigynum is relatively wide (Fig. 110), distinct from that in other species.

Description. *Male* (holotype, UBC-SEM AR00127). Carapace length 1.6 (variation 1.6–1.8, n=2); abdomen length 1.7. Chelicera (Fig. 109): dark; with two promarginal teeth and one retromarginal tooth. Palp (Figs 107–108): pale yellow. Retrolateral sperm duct loop about three quarters of bulb width. Embolus long and coiled for more than five circles. Retrolateral tibial apophysis long and gradually narrowed towards the tip. Tibia of first leg with six proventral and three retroventral macrosetae; metatarsus with five proventral and three retroventral

macrosetae. Measurements of legs: I 5.8, II 3.6, III 4.1, IV 3.9. Color in alcohol (Fig. 105): carapace dark brown to red brown, with iridescent scales in front of and behind PLEs; abdomen brown, anterior end light brown, covered with iridescent scales, posterior part with a pair of brownish markings; legs pale yellow without distinct markings.

Female (paratype, UBC-SEM AR00128). Carapace length 1.4; abdomen length 1.8. Chelicera: with two promarginal teeth and one retromarginal tooth. Tibia of first leg with four proventral and three retroventral macrosetae; metatarsus with three pairs of ventral macrosetae. Measurements of legs: I 2.9, II 2.5, III 2.9, IV 3.0. Epigynum (Figs 110–111): window large; anterior end of median septum relatively wide. Color in alcohol (Fig. 106): similar to that of male.

Natural history. Specimens were found beating understory vegetation.

FIGURES 101–104. *Omoedus darleyorum* sp. nov. 101–102 male paratype; 103–104 female paratype.

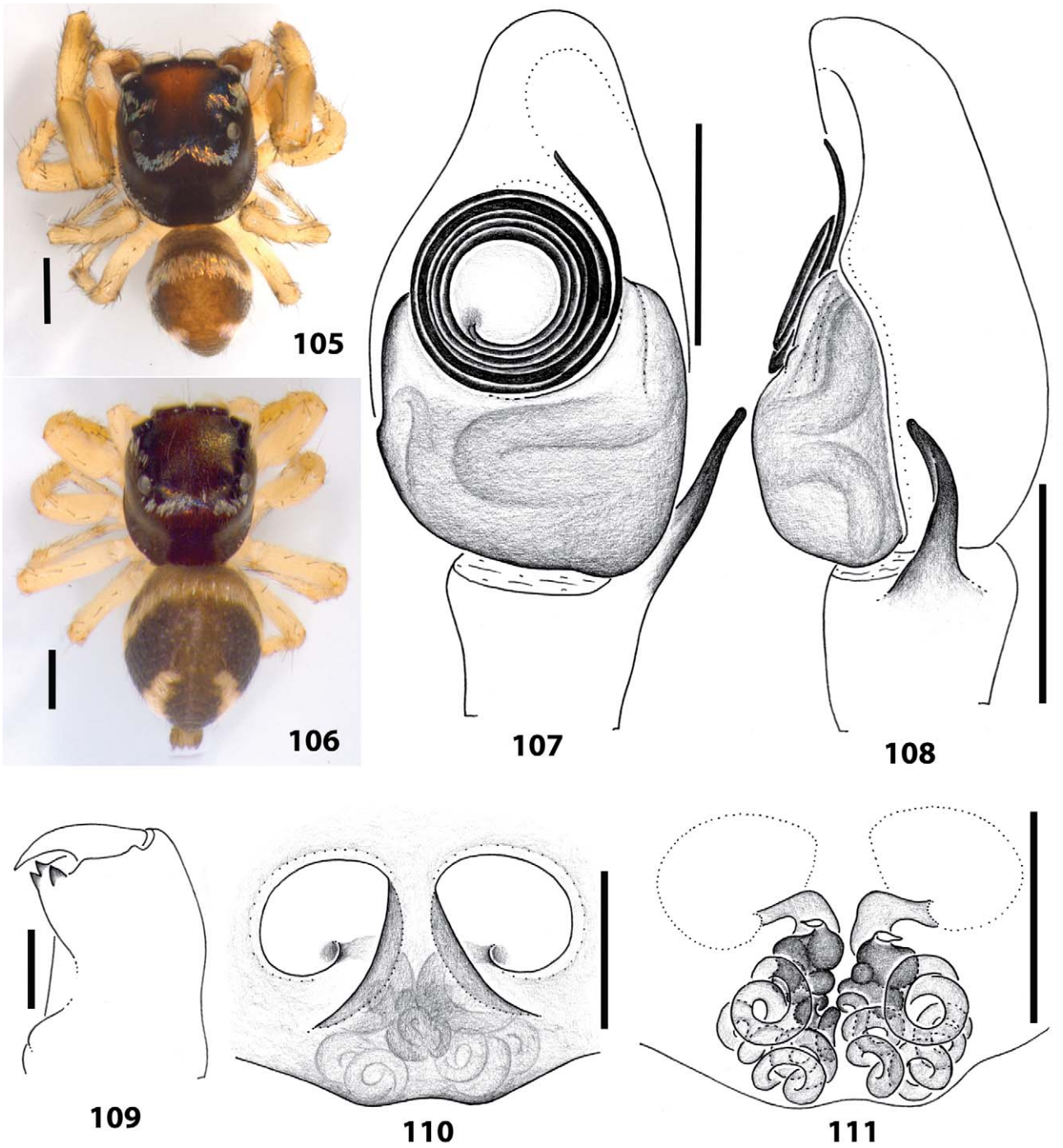
***Omoedus meyeri* sp. nov.**
Figs 112–124

Type material. Holotype: male, PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.574° S, 143.048° E, elev. 3315 m a.s.l., 5–8 July 2008, coll. W. Maddison,WPM#08-004 (UBC-SEM AR00125). Paratypes: 1 female, same data as holotype (UBC-SEM AR00126); 3 males in three vials, same data as holotype; 3 males in three vials,

PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.579° S, 143.053° E, elev. 3240 m a.s.l., 7–9 July 2008, coll. W. Maddison & Manisé Kulé, WPM#08-005.

Etymology. Named for George Meyer, an important supporter of Conservation International's efforts in Papua New Guinea.

Diagnosis. Similar in body form to *Omoedus omundseni*, but differs in the presence of dark patches on the dorsum of abdomen (Figs 112–119); the narrower bulb and embolic spiral of the male palp (Figs 120–121); and the narrower window of the epigynum (Fig. 123). This species can be distinguished from *O. papuanus* by the presence of guanine deposits in the eye area (Figs 118–119); the markings on the abdomen (Figs 118–119); the thinner and more coiled embolus (Figs 120–121; four circles in *O. meyeri*; three circles in *O. papuanus*); and the wider median septum of the epigynum (Fig. 123).



FIGURES 105–111. *Omoedus darleyorum* sp. nov. 105 male paratype, dorsal view; 106 female paratype, dorsal view; 107 male left palp, ventral view; 108 male left palp, retrolateral view; 109 male left chelicera, back view; 110 epigynum, ventral view; 111 cleared epigynum, dorsal view. Scale bars: 105–106, 0.5 mm; 107–111, 0.2 mm.

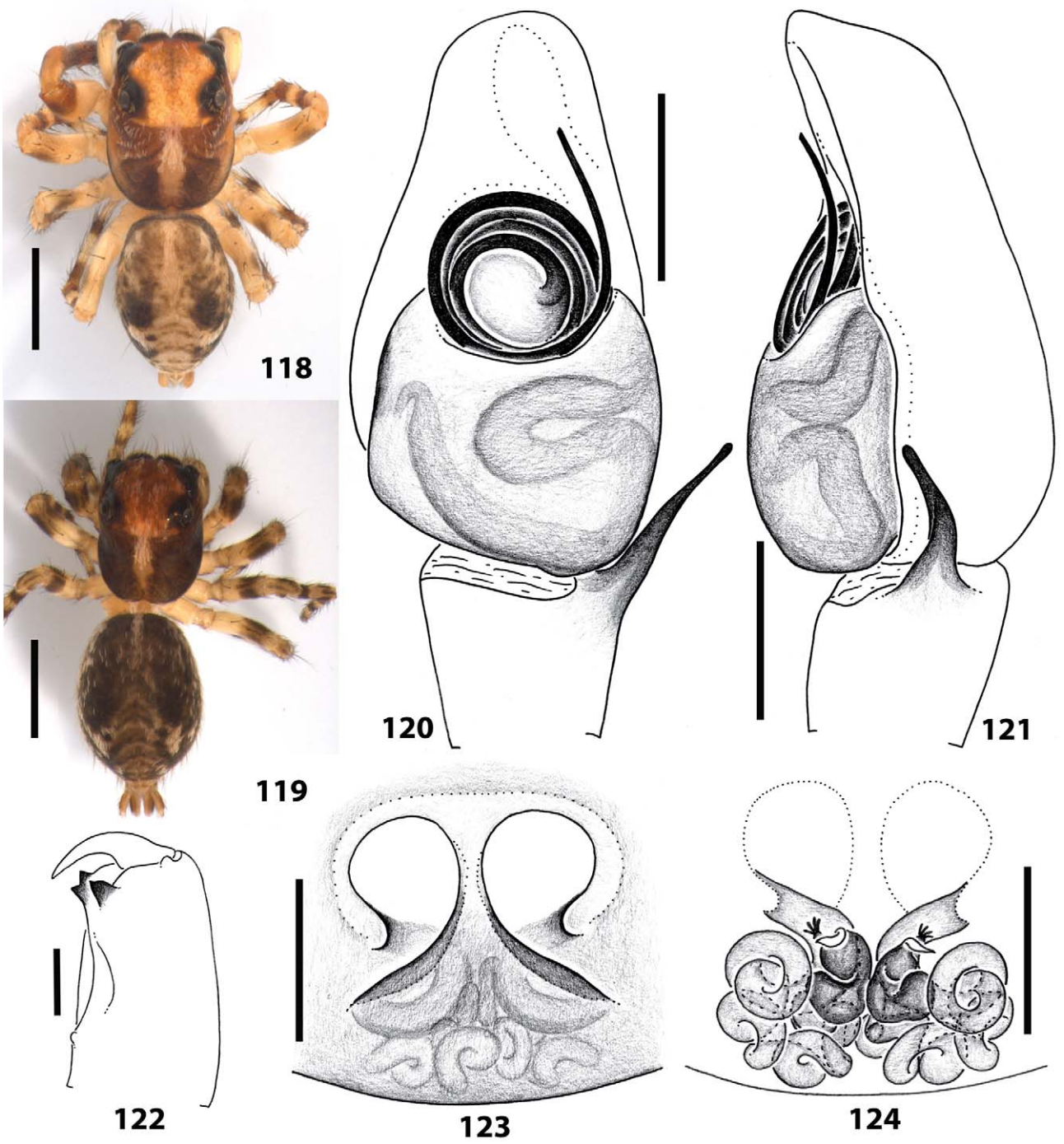
FIGURES 112–117. *Omoedus meyeri* sp. nov. 112 male holotype; 113–114 male paratype (lighter color form as holotype); 115–116 male paratype (darker color form); 117 female paratype.

Description. *Male* (holotype, UBC-SEM AR00125). Carapace length 1.8 (variation 1.8–2.2, n=7); abdomen length 2.3. Chelicera (Fig. 122): dark; with one bicuspid promarginal tooth and one retromarginal tooth. Palp (Figs 120–121): tibia and cymbium dark brown, other segments pale yellow. Retrolateral sperm duct loop about two

thirds of tegulum width. Embolus long, coiled for more than four circles. Retrolateral tibial apophysis relatively thin. Measurements of legs: I 4.8, II 3.9, III 4.1, IV 4.1. Color in alcohol (Fig. 118): eye area with guanine deposit, carapace dark brown, with a medial light yellow brown stripe behind fovea, lateral margins light yellow brown; abdomen brown, with brownish markings and a pair of large dark patches near the center; legs light brown with dark borwn annuli. Some specimens darker in color (Figs 115–116).

Female (paratype, UBC-SEM AR00126). Carapace length 1.7; abdomen length 2.5. Chelicera: with one tooth on promargin and retromargin each. Measurements of legs: I 3.5, II 3.2, III 3.8, IV 4.1. Epigynum (Figs 123–124): window large, with opening to copulatory duct close to its posterior end. Color in alcohol (Fig. 119): similar to that of male except carapace and abdomen a bit darker in color.

Natural history. Specimens were found beating trees at forest edge and grassland bushes, at high elevation.



FIGURES 118–124. *Omoedus meyeri* sp. nov. 118 male paratype, dorsal view; 119 female paratype, dorsal view; 120 male left palp, ventral view; 121 male left palp, retrolateral view; 122 male left chelicera, back view; 123 epigynum, ventral view; 124 cleared epigynum, dorsal view. Scale bars: 118–119, 1.0 mm; 120–124, 0.2 mm.

***Omoedus omundseni* sp. nov.**
Figs 125–135

Type material. Holotype: male, PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.579° S, 143.053° E, elev. 3240 m a.s.l., 7–9 July 2008, coll. W. Maddison & Manisé Kulé, WPM#08-005 (UBC-SEM AR00122). Paratypes: 1 female, same data as holotype (UBC-SEM AR00123); 3 females in two vials, same data as holotype; 7 males and 2 females, PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.574° S, 143.048° E, elev. 3315 m a.s.l., 5–8 July 2008, coll. W. Maddison, WPM#08-004.

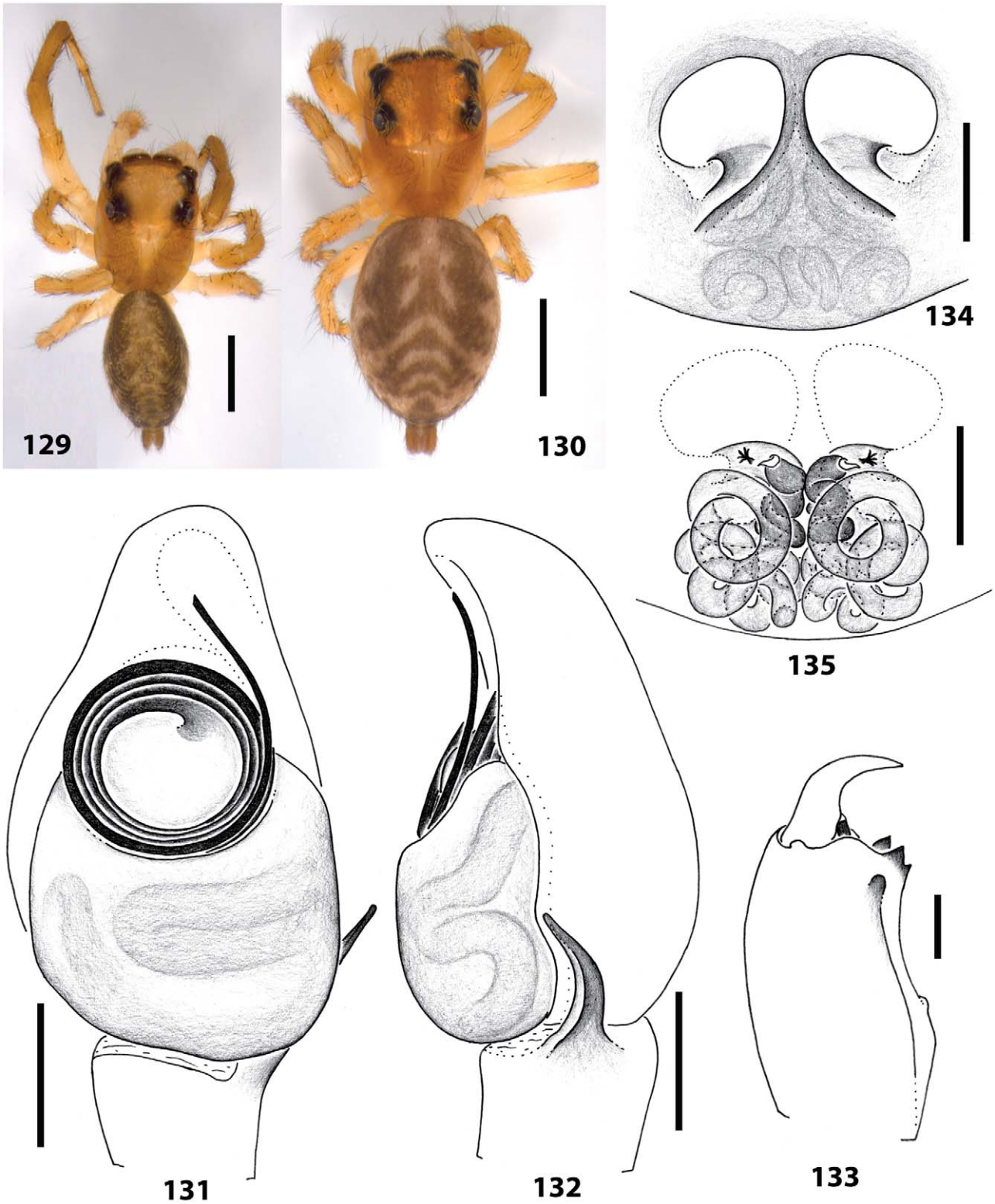
Etymology. Named after Tim Omundsen, for his assistance facilitating the 2008 expedition to Papua New Guinea.

Diagnosis. Similar to *Omoedus meyeri* in the presence of guanine deposits in the eye area and the genitalic structures, but differs in the markings on the abdomen (Figs 125–130), the wider male palpal bulb (Figs 131–132) and the wider window of the epigynum (Fig. 134).

FIGURES 125–128. *Omoedus omundseni* sp. nov. 125–126 male paratype; 127–128 female paratype.

Description. *Male* (holotype, UBC-SEM AR00122). Carapace length 2.1 (variation 1.9–2.7, n=8); abdomen length 2.5. Chelicera (Fig. 133): yellow brown; with one bicuspid promarginal tooth and one retromarginal tooth; front surface with a longitudinal ridge and a small process. Palp (Figs 131–132): light brown. Retrolateral sperm

duct loop about three quarters of bulb width. Embolus long and coiled for four circles. Palpal bulb wide. Retrolateral tibial apophysis long and thin. Measurements of legs: I 6.3, II 4.8, III 5.1, IV 4.9. Color in alcohol (Fig. 129): carapace yellow brown, eye area with guanine deposit, lateral margins and around fovea light yellow brown; dorsal abdomen dark brown, with sandy yellow medial markings, ventral abdomen sandy yellow, with grayish brown markings; legs light yellow to yellow brown.



FIGURES 129–135. *Omoedus omundseni* sp. nov. 129 male holotype, dorsal view; 130 female paratype, dorsal view; 131 male left palp, ventral view; 132 male left palp, retrolateral view; 133 male left chelicera, front view; 134 epigynum, ventral view; 135 cleared epigynum, dorsal view. Scale bars: 129–130, 1.0 mm; 131–135, 0.2 mm.

Female (paratype, UBC-SEM AR00123). Carapace length 2.1 (variation 2.0–2.3, n=6); abdomen length 3.0. Chelicera: with one bicuspid promarginal tooth and one retromarginal tooth. Measurements of legs: I 4.3, II 3.8, III 4.3, IV 4.4. Epigynum (Figs 134–135): window large; median septum almost triangular with anterior part very narrow; opening to copulatory duct close to posterior end of window. Color in alcohol (Fig. 130): similar to that of male, except the light colored markings on abdomen more distinctive.

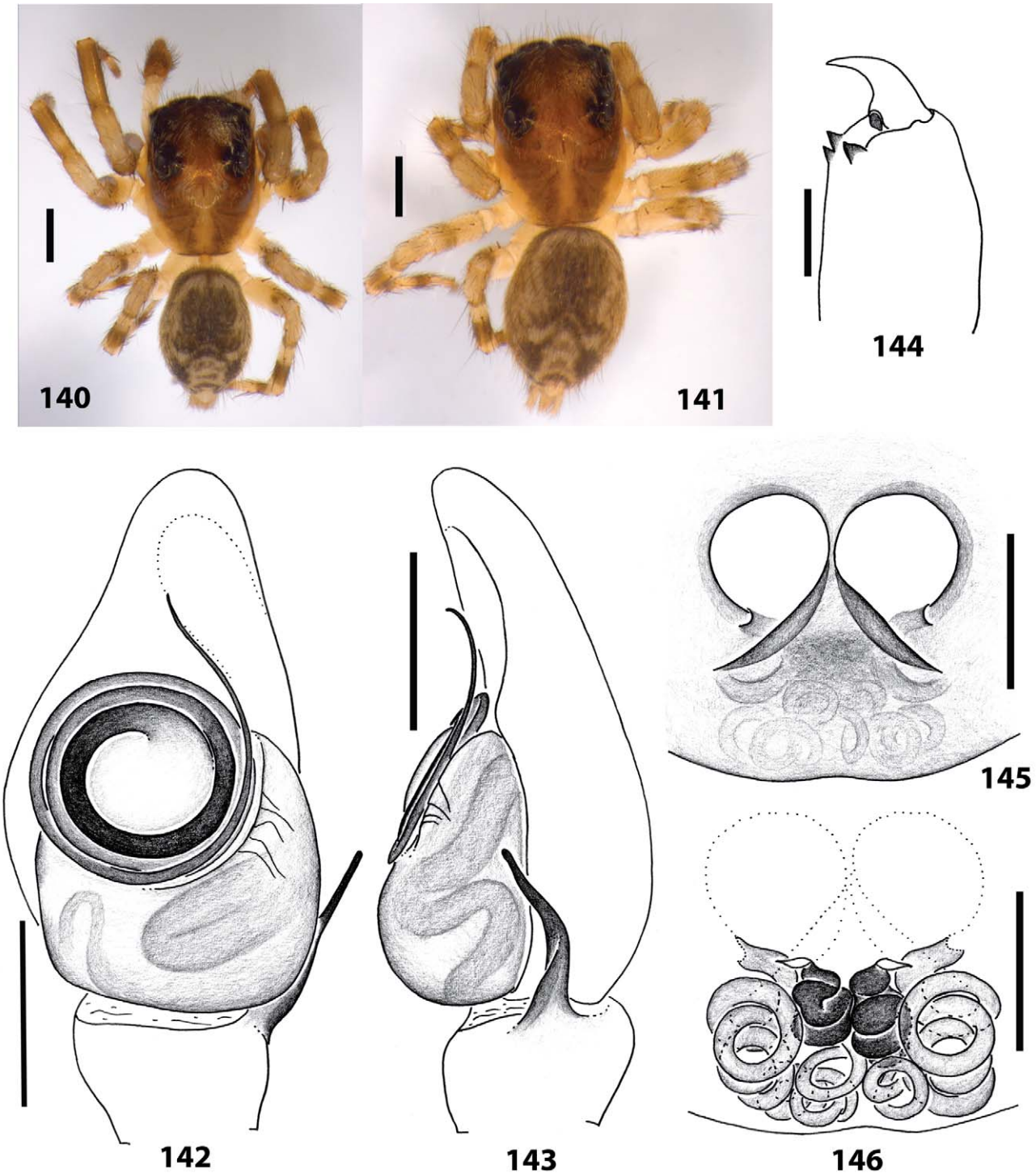
Natural history. Specimens were found beating trees at forest edge, especially those with dark lichen-covered branches.

FIGURES 136–139. *Omoedus papuanus* sp. nov. 136–138 male paratype; 139 female paratype.

***Omoedus papuanus* sp. nov.**
Figs 136–146

Type material. Holotype: male, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.015° S, 145.412° E, elev. 2320 m a.s.l., 1–2 August 2008, coll. W. Maddison, WPM#08-025 (UBC-SEM AR00129). Paratypes: 1 female, same data as holotype (UBC-SEM AR00130); 1 female and 2 males in two vials,

same data as holotype; 1 male and 3 females, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.016° S, 145.417° E to 6.017° S, 145.416° E, elev. 2450–2490 m a.s.l., 2 August 2008, coll. W. Maddison, WPM#08-027.



FIGURES 140–146. *Omoedus papuanus* sp. nov. 140 male holotype, dorsal view; 141 female paratype, dorsal view; 142 male left palp, ventral view; 143 male left palp, retrolateral view; 144 male left chelicera, back view; 145 epigynum, ventral view; 146 cleared epigynum, dorsal view. Scale bars: 140–141, 0.5 mm; 142–146, 0.2 mm.

Etymology. The specific epithet refers to the country where the species is found.

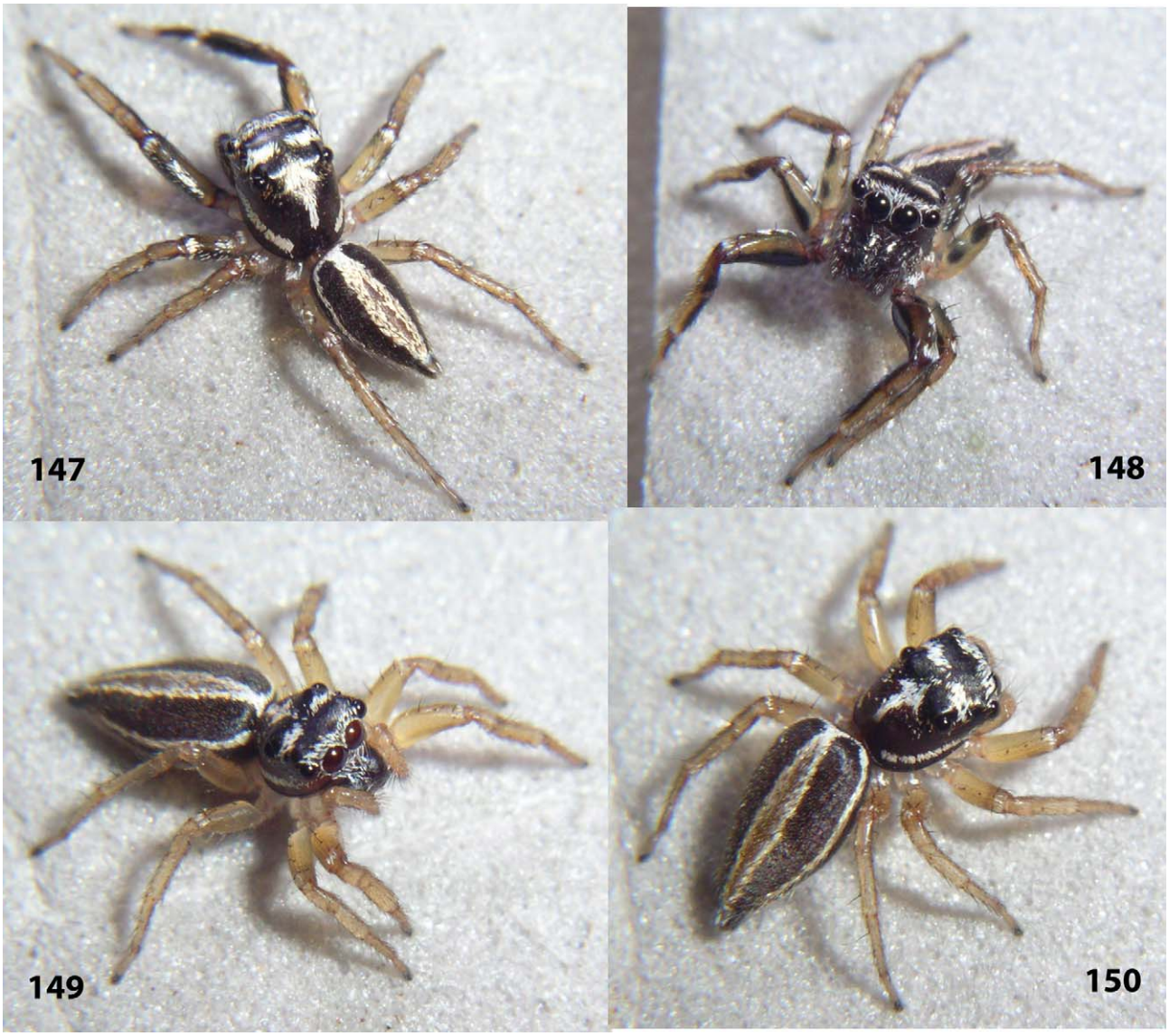
Diagnosis. Similar in markings on the abdomen to *Omoedus microphthalmus* (L. Koch) (see Berry *et al.* 1996), but can be distinguished by the wider spirals of the embolus and the wider bulb of the male palp (Figs 142–143), and the shape of the epigynum (Fig. 145).

Description. *Male* (holotype, UBC-SEM AR00129). Carapace length 1.9 (variation 1.8–2.0, n=4); abdomen length 1.8. Chelicera (Fig. 144): dark brown; with two promarginal teeth and one retromarginal tooth. Palp (Figs 142–143): cymbium yellow brown, other segments cream. Retrolateral sperm duct loop about two thirds of bulb width. Embolus long and coiled for three circles. Retrolateral tibial apophysis long and thin. Measurements of legs: I 4.2, II 3.6, III 3.9, IV 4.3. Color in alcohol (Fig. 140): carapace dark yellow brown, with many white scales, lateral margins light yellow brown, with a light yellow brown stripe medially behind fovea; dorsal abdomen dark brown, anterior end and most of lateral margins light yellow, posterior end with a few paralleled chevron-like markings; ventral abdomen light yellow, with an indistinct middle stripe; legs light yellow with yellow brown annuli.

Female (paratype, UBC-SEM AR00130). Carapace length 1.9 (variation 1.8–1.9, n=5); abdomen length 1.9. Chelicera: also with two promarginal teeth and one retromarginal tooth. Measurements of legs: I 3.5, II 3.3, III 3.7, IV 4.2. Epigynum (Figs 145–146): window large; median septum almost triangular with anterior part very narrow. Color in alcohol (Fig. 141): similar to that of male.

Natural history. Specimens were found beating forest understory.

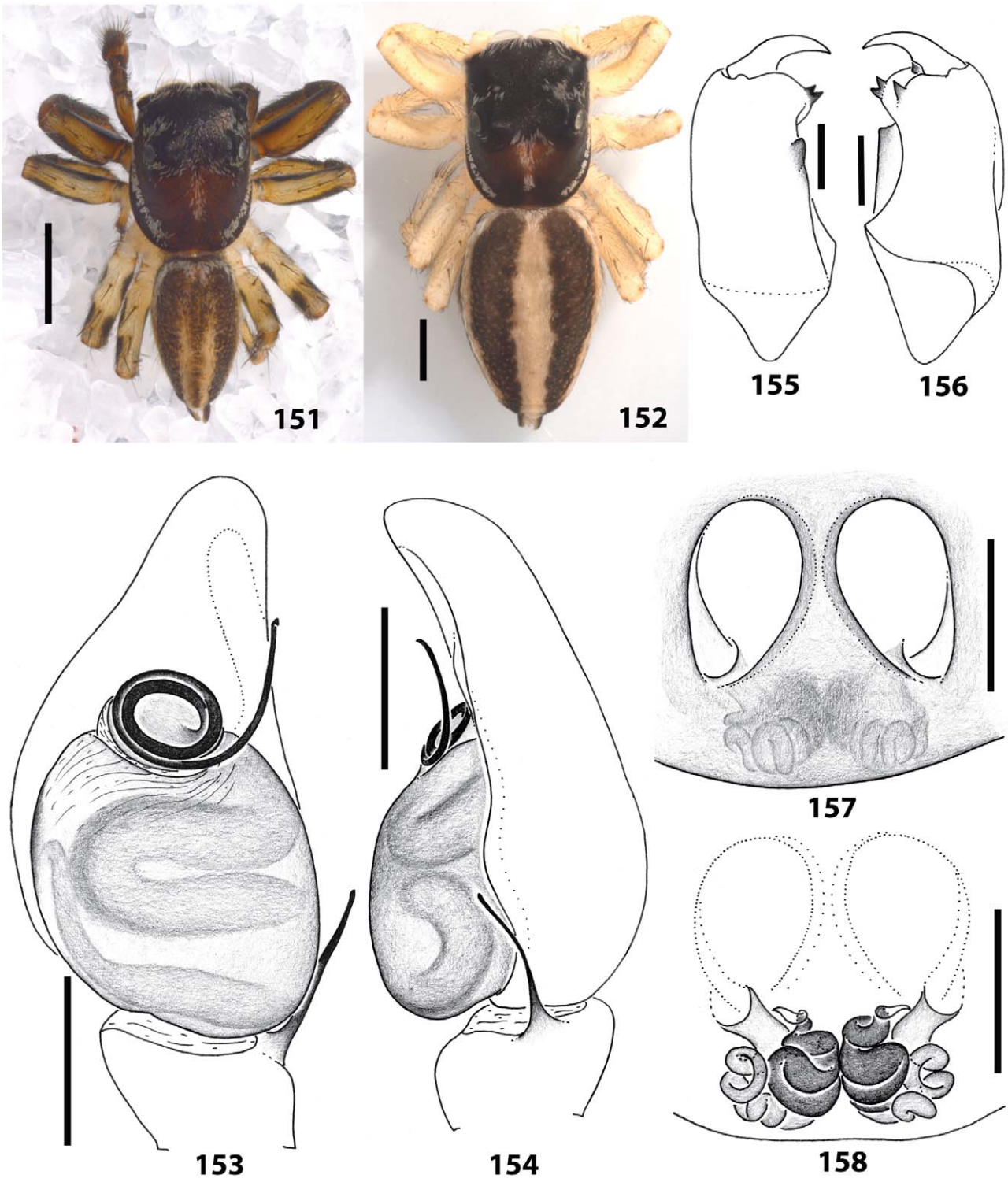
***Omoedus swiftorum* sp. nov.**
Figs 147–158



FIGURES 147–150. *Omoedus swiftorum* sp. nov. 147–148 male paratype; 149–150 female paratype. FIGURES 147–150 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.

Type material. Holotype: male, PAPUA NEW GUINEA: National Capital District: Port Moresby, 9.443° S, 147.179° E, elev. 75 m a.s.l., 3–4 July 2008, coll. W. Maddison WPM#08-002 (UBC-SEM AR00120). Paratypes: 1 female, same data as holotype (UBC-SEM AR00121); 2 females and 1 male in three vials, same data as holotype.

Etymology. In honor of Kristin Swift and John Swift, who have generously supported Conservation International's work in New Guinea.



FIGURES 151–158. *Omoedus swiftorum* sp. nov. 151 male paratype, dorsal view; 152 female paratype, dorsal view; 153 male left palp, ventral view; 154 male left palp, retrolateral view; 155 male left chelicera, front view; 156 male left chelicera, back view; 157 epigynum, ventral view; 158 cleared epigynum, dorsal view. Scale bars: 151, 1.0 mm; 152, 0.5 mm; 153–158, 0.2 mm.

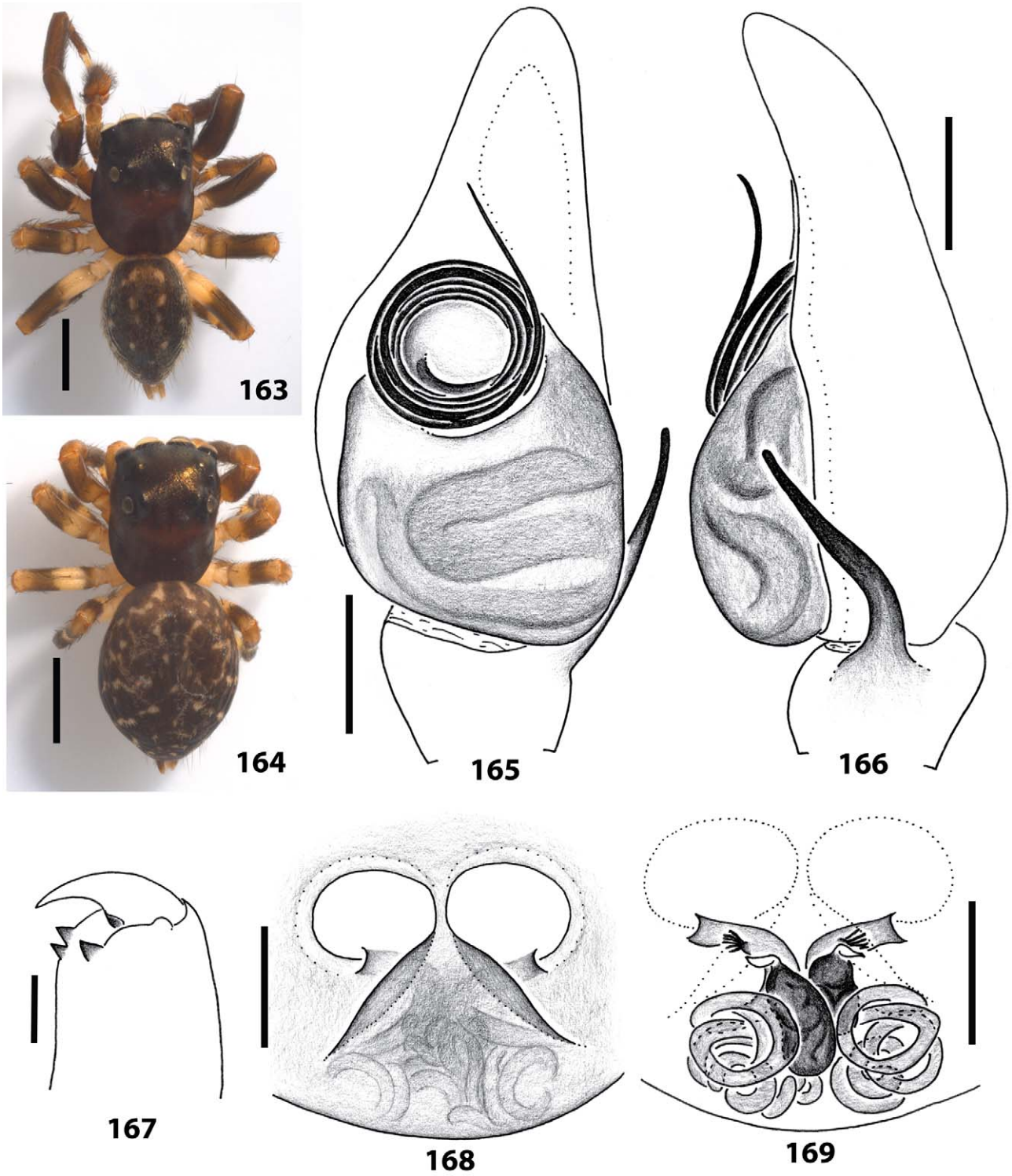
Diagnosis. Distinguished from other species by the light colored longitudinal stripes on the body (Figs 147–152), the narrow embolic spiral of the male palp (Figs 153–154) and the shape of the epigynal window (Fig. 157).

Description. *Male* (holotype, UBC-SEM AR00120). Carapace length 1.8 (variation 1.8–2.0, n=2); abdomen length 2.1. Chelicera (Figs 155–156): red brown; with one bicuspid promarginal tooth and one retromarginal tooth; inner margin concaved; front surface with a longitudinal ridge and a small process. Palp (Figs 153–154): brown. Retrolateral sperm duct loop almost as wide as bulb. Embolus long and coiled for more than two circles with narrow spirals. Retrolateral tibial apophysis very thin. Measurements of legs: I 4.0, II 3.5, III 3.8, IV 4.2. Color in alcohol (Fig. 151): eye area dark, other region of carapace red brown, with a medial stripe behind PLEs and two lateral stripes composed of white scales; abdomen dark brown, margins sandy yellow, with a wide medial light yellow longitudinal stripe containing a brown marking in the middle; ventral abdomen pale yellow with gray brown longitudinal markings; first pair of legs reddish brown to gray brown, other legs cream to gray brown.

Female (paratype, UBC-SEM AR00121). Carapace length 2.0 (variation 1.8–2.0, n=3); abdomen length 3.0. Chelicera: also with one bicuspid promarginal tooth and one retromarginal tooth. Measurements of legs: I 3.7, II 3.3, III 3.8, IV 4.3. Epigynum (Figs 157–158): window large; median septum almost triangular; opening to the copulatory duct at posterior end of window. Color in alcohol (Fig. 152): similar to that of male except the brownish marking in the middle of light yellow stripe on dorsal abdomen not obvious and legs cream lacking obvious markings.

Natural history. Specimens were found on low bushes in an open disturbed area.

FIGURES 159–162. *Omoedus tortuosus* sp. nov. 159–161 male holotype; 162 female paratype. FIGURES 159–162 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.



FIGURES 163–169. *Omoedus tortuosus* sp. nov. 163 male paratype, dorsal view; 164 female paratype, dorsal view; 165 male left palp, ventral view; 166 male left palp, retrolateral view; 167 male left chelicera, back view; 168 epigynum, ventral view; 169 cleared epigynum, dorsal view. Scale bars: 163–164, 1.0 mm; 165–169, 0.2 mm.

***Omoedus tortuosus* sp. nov.**
Figs 159–169

Type material. Holotype: male, PAPUA NEW GUINEA: Enga Province: Paiam Forest, near Suyan Village, 5.495° S, 143.144° E, elev. 2400 m a.s.l., 10 July 2008, coll. W. Maddison, Pingisa Saiké, Yainé Ribson, S. Soté, &

N. Soté, WPM#08-007 (UBC-SEM AR00131). Paratypes: 1 female, same data as holotype (UBC-SEM AR00132); 1 male and 2 females, same data as holotype; 2 females, PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.574° S, 143.048° E, elev. 3315 m a.s.l., 5–8 July 2008, coll. W. Maddison, WPM#08-004; 1 male, PAPUA NEW GUINEA: Enga Province: Kai-ingri, 5.579° S, 143.053° E, elev. 3240 m a.s.l., 7–9 July 2008, coll. W. Maddison & Manisé Kulé, WPM#08-005.

Etymology. Latin *tortuosus* (twisting), referring to the convoluted copulatory duct of vulva.

Diagnosis. Resembles *Omoedus papuanus* in body form, but differs from it by the color pattern (Figs 159–164), the shape of the median septum of the epigynum (Fig. 168), the thicker retrolateral tibial apophysis and the narrower but more spiraled embolus of the male palp (Figs 165–166).

Description. *Male* (holotype, UBC-SEM AR00131). Carapace length 2.5 (variation 2.2–2.5, n=3); abdomen length 2.7. Chelicera (Fig. 167): dark brown; with two promarginal teeth and one retromarginal tooth. Palp (Figs 165–166): yellow brown. Retrolateral sperm duct loop occupying about three quarters of bulb width. Embolus long and coiled for more than seven circles. Retrolateral tibial apophysis long and finger-like. Tibia of first leg with four proventral and three retroventral macrosetae; metatarsus with two pairs of ventral macrosetae. Measurements of legs: I 7.2, II 5.2, III 5.4, IV 6.1. Color in alcohol (Fig. 163): eye area dark, other regions of carapace red brown; abdomen dark brown, with some brownish spots; legs light yellow proximally and dark brown distally.

Female (paratype, UBC-SEM AR00132). Carapace length 2.2 (variation 2.1–2.3, n=5); abdomen length 2.6. Chelicera: with two promarginal teeth and one retromarginal tooth. Measurements of legs: I 4.1, II 3.8, III 4.5, IV 5.1. Epigynum (Figs 168–169): window large; margins of median septum slightly convex. Color in alcohol (Fig. 164): similar to that of male except the brownish spots on dorsal abdomen more irregular.

Natural history. Specimens were found in suspended leaf litter in forest.

Genus *Paraharmochirus* Szombathy, 1915

Ant-like jumping spiders. Tibia, patella and femur of first pair of legs are robust; tibia has ventral fringes; metatarsus and tarsus are much thinner. Lateral margins of carapace are convex at PLEs and carapace has many punctures. Abdomen has a constriction dorsally. Epigynum has window, which is typical in Euophryinae. However, the male palp is quite distinctive from other euophryines in that embolus coils clockwise (left palp ventral view) instead of anti-clockwise as seen in most other euophryines. The inclusion of this genus within the subfamily Euophryinae here is mainly based on unpublished molecular data.

Only one species, *Paraharmochirus monstrosus* Szombathy, 1915 (from New Guinea), has been reported (Platnick 2012), of which the type specimen may have been lost (Tamás Szűts, personal communication). The species recently collected from Papua New Guinea is similar to *P. monstrosus* in the shape of carapace and first pair of legs, and the presence of punctures on the carapace. However, it is not congruent with the original description of *P. monstrosus* Szombathy in the male palpal structure and the tooth pattern of chelicera, and therefore is described here as a new species.

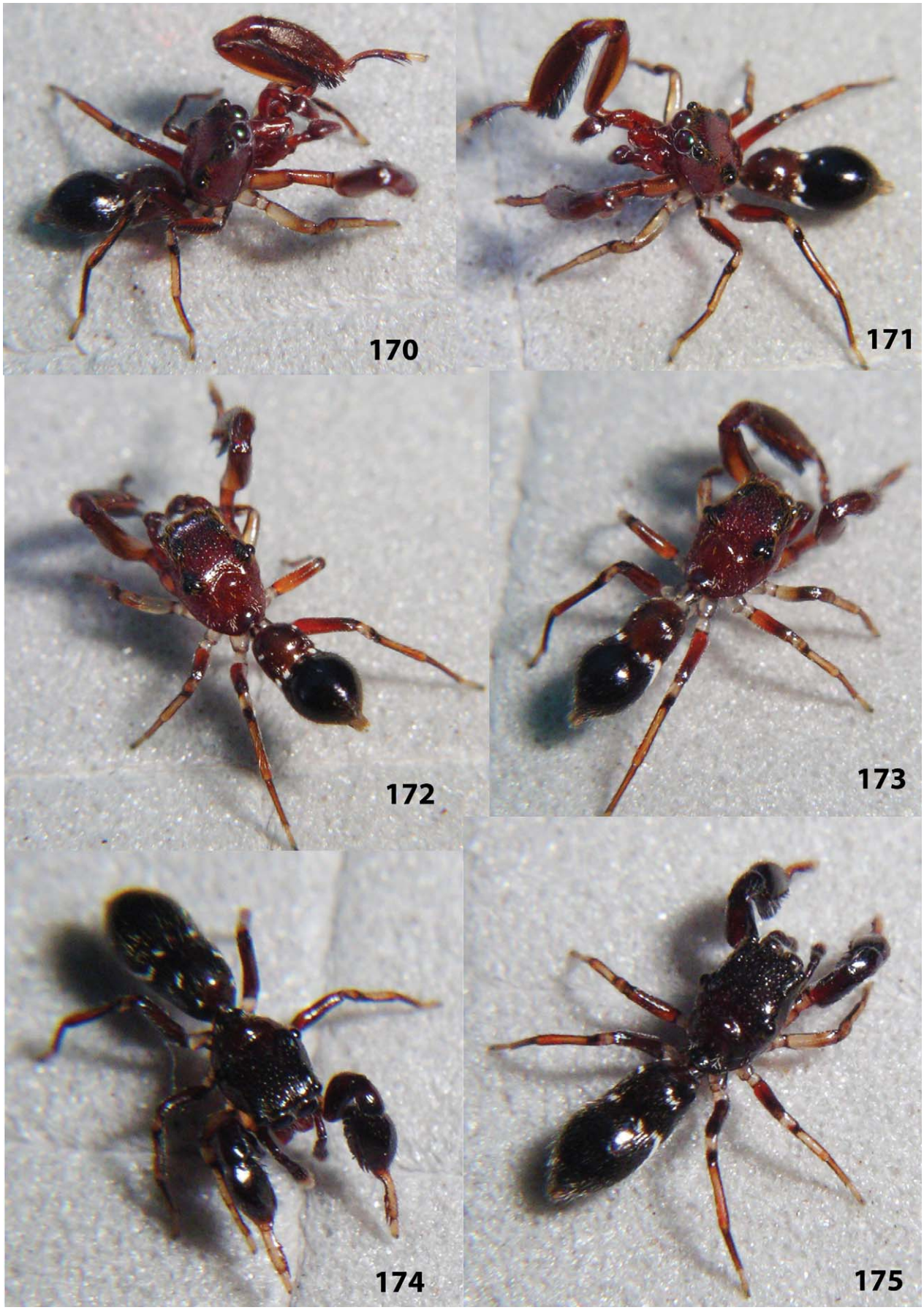
Paraharmochirus tualapaensis sp. nov.

Figs 170–182

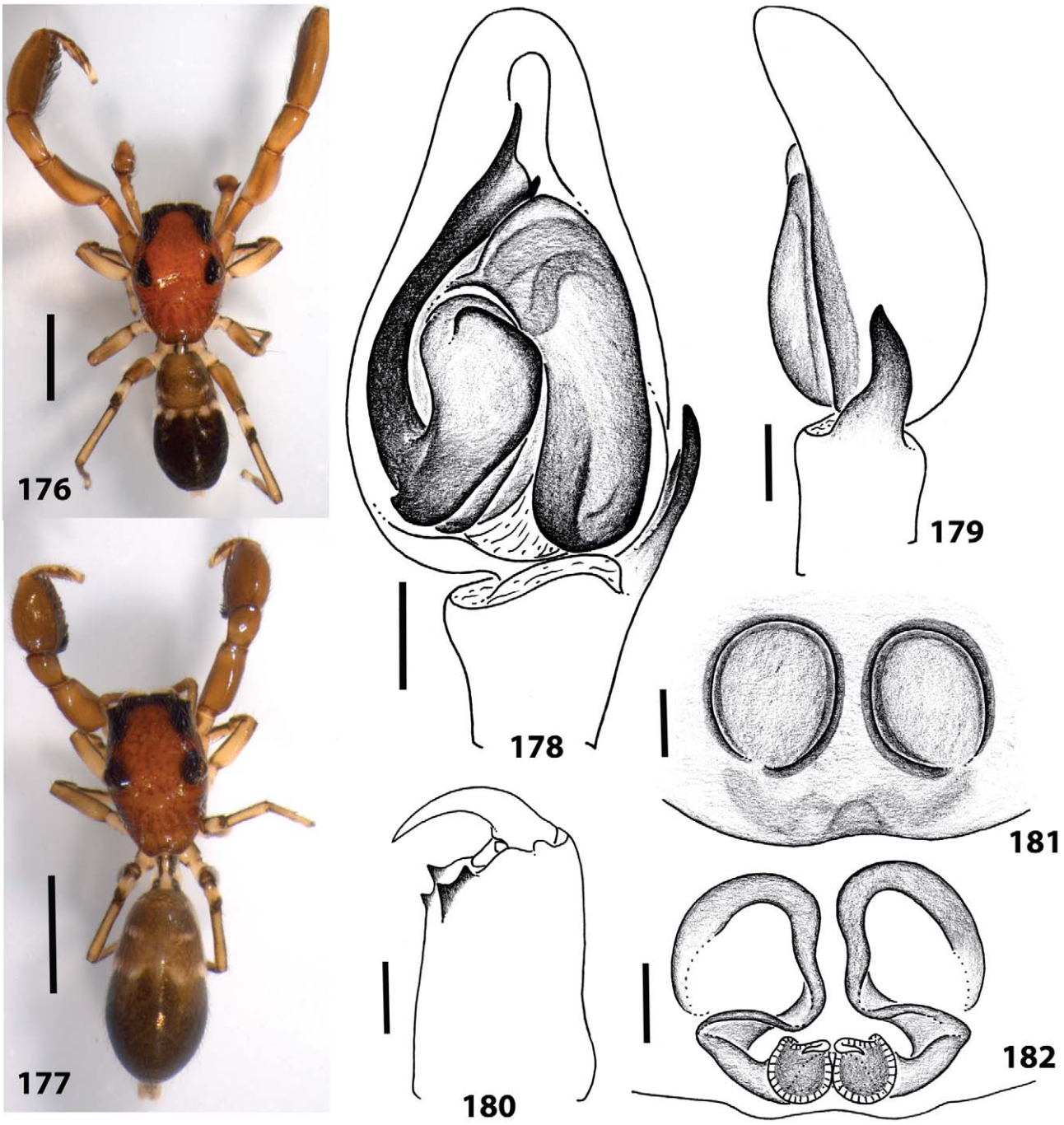
Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1100 m a.s.l., 13–22 July 2008, forest edge, coll. W. Maddison & Luc Fimo Tuki, WPM#08-010 (UBC-SEM AR00091). Paratypes: 1 female, same data as holotype (UBC-SEM AR00092); 1 female, same data as holotype; 2 female and 1 male in three vials, PAPUA NEW GUINEA: Southern Highlands Province: Putuwé, junction of Lagaip & Uruwabwa Rivers, 5.231° S, 142.532° E, elev. 570 m a.s.l., 23–26 July 2008, coll. W. Maddison & Luc Fimo Tuki, WPM#08-019.

Etymology. The specific epithet refers to the type locality.

Diagnosis. Resembles *P. monstrosus* Szombathy, 1915 in general body form and color pattern, but differs in the presence of two promarginal teeth on the male chelicera (no promarginal tooth in *P. monstrosus*), and the embolus of the male palp coiling no more than one circle (Fig. 178; 1.5 circles in *P. monstrosus*). Epigynum has a large window with a median septum (Fig. 181), and the spermathecae are round and relatively small (Fig. 182).



FIGURES 170–175. *Paraharmochirus tualapaensis* sp. nov. 170–173 male holotype; 174–175 female paratype. FIGURES 170–175 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.



FIGURES 176–182. *Paraharmochirus tualapaensis* sp. nov. 176 male holotype, dorsal view; 177 female paratype, dorsal view; 178 male left palp, ventral view; 179 male left palp, retrolateral view; 180 female left chelicera, back view; 181 epigynum, ventral view; 182 cleared epigynum, dorsal view. Scale bars: 176–177, 1.0 mm; 178–182, 0.1 mm.

Description. *Male* (holotype, UBC-SEM AR00091). Carapace length 1.8; abdomen length 1.9. Carapace with many small punctures, and widest at PLEs. Chelicera: yellow brown; with two promarginal teeth and one bicuspid retromarginal tooth. Palp (Figs 178–179): light yellow brown. Embolus long and wide, coiled clockwise (left palp ventral view); embolic disc at prolateral side of palpal bulb; retrolateral sperm duct loop at distal end of tegulum; tegular lobe absent. Retrolateral tibial apophysis robust and pointed at tip. First pair of legs long and robust; with fringe on ventral tibia; tibia with seven proventral and six retroventral macrosetae; metatarsus with three pairs of ventral macrosetae. Measurements of legs: I 4.8, II 2.8, III 2.8, IV 3.5. Color in alcohol (Fig. 176): carapace orange, with some white setae; dorsal abdomen constricted at 1/3 from anterior end, with white markings within the constriction; abdomen light brown anterior to the constriction and dark brown posterior to the constriction; first pair of legs light orange, other legs light yellow to gray brown. Some specimens darker in color.

Female (paratype, UBC-SEM AR00092). Carapace length 1.5 (variation 1.5–1.8, n=4); abdomen length 1.9. Chelicera (Fig. 180): with two promarginal teeth and one bicuspid retromarginal tooth. Tibia of first leg with six pairs of ventral macrosetae; metatarsus with three pairs. Measurements of legs: I 2.7, II 2.0, III 2.1, IV 2.6. Epigynum (Figs 181–182): window relatively big. Copulatory duct long and sac-like, without accessory gland; spermatheca small and spherical. Color in alcohol (Fig. 177): similar to that of male.

Natural history. Specimens were collected from tree trunks at forest edge.

Genus *Phasmolia* new genus

Type species: *Phasmolia elegans* Zhang & Maddison, sp. nov.

Etymology. The generic name is derived from the Latin *phasma* (ghost), referring to the ghost-like appearance of the species; feminine in gender.

Diagnosis. Resembles *Lakarobius* Berry, Beatty & Prószyński, 1998 and *Bindax* Thorell (see Prószyński 1984) in body form and color pattern, but differs from them by the absence of a proximal tegular lobe and retrolateral sperm duct loop in the male palp (Figs 191–192). This genus can also be distinguished from *Lakarobius* by the chelicera with three promarginal teeth (Fig. 193; two in *Lakarobius*) and one bicuspid retromarginal tooth (Fig. 193; four cusps in *Lakarobius*), and the median septum of female epigynum, which is not continuous with the anterior rim of the window (Fig. 194). Also similar to *Athamas* O. P.—Cambridge (see Jendrzejewska 1995), *Bulolia* Żabka, 1996 and *Leptathamas* Balogh, 1980a (see Szűts 2003) in the ALEs, which are posterior to the AMEs, but can be easily distinguished from them by the shape of the genitalic organs (Figs 191–192, 194–195).

Phasmolia elegans sp. nov.

Figs 183–195

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1100 m a.s.l., 13–22 July 2008, forest edge, coll. W. Maddison & Luc Fimo Tuki, WPM#08-010 (UBC-SEM AR00093). Paratypes: 1 female, same data as holotype (UBC-SEM AR00094); 6 males and 2 females in three vials, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1000–1100 m a.s.l., 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008; 1 female, PAPUA NEW GUINEA: Southern Highlands Province: trail from Tualapa to Umgé, 5.2933° S, 142.4999° E, elev. 1210 m a.s.l., 19 July 2008, coll. W. Maddison, WPM#08-015.

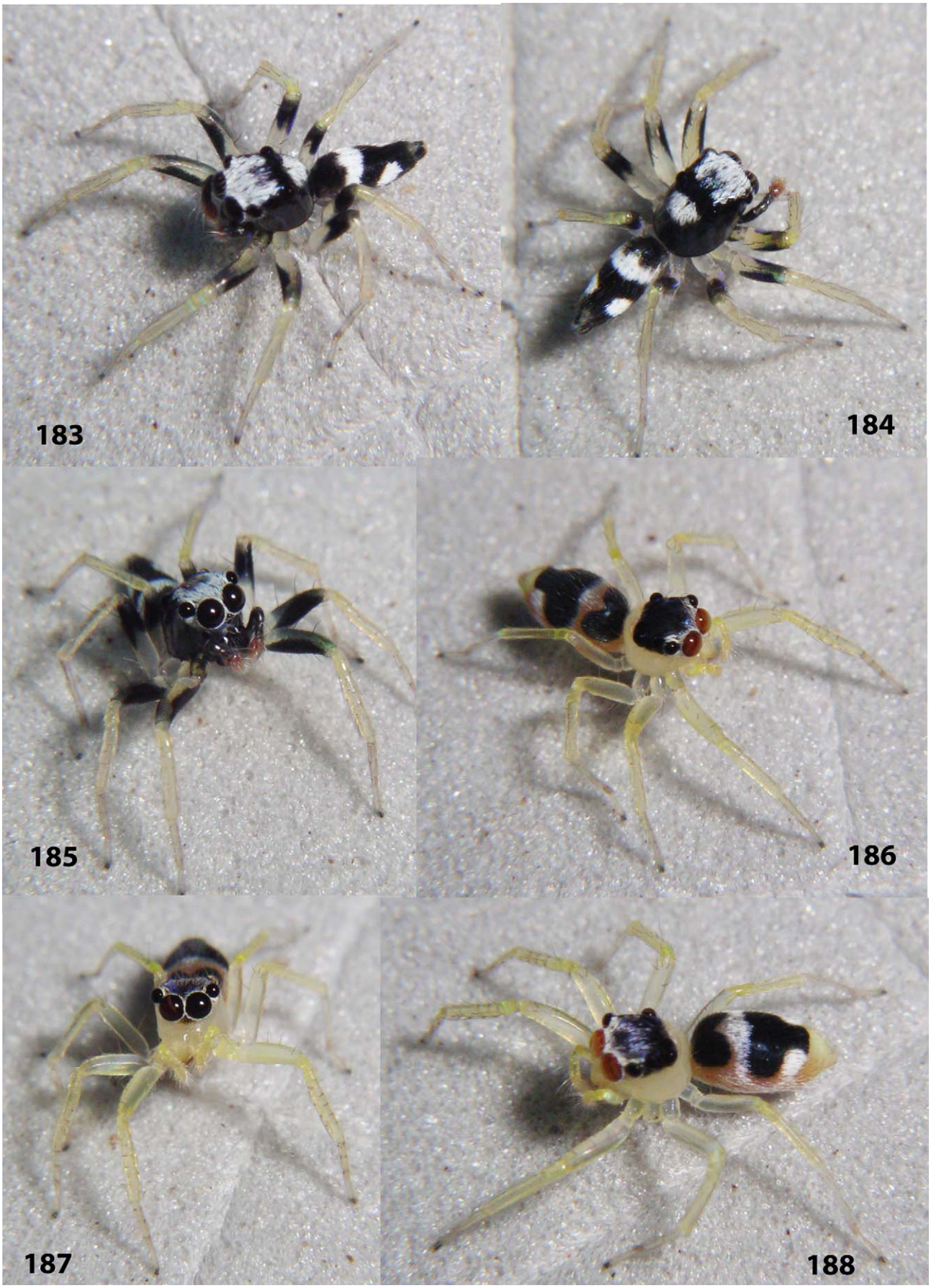
Etymology. Latin *elegans*, referring to the elegant body form.

Diagnosis. See the diagnosis of the genus.

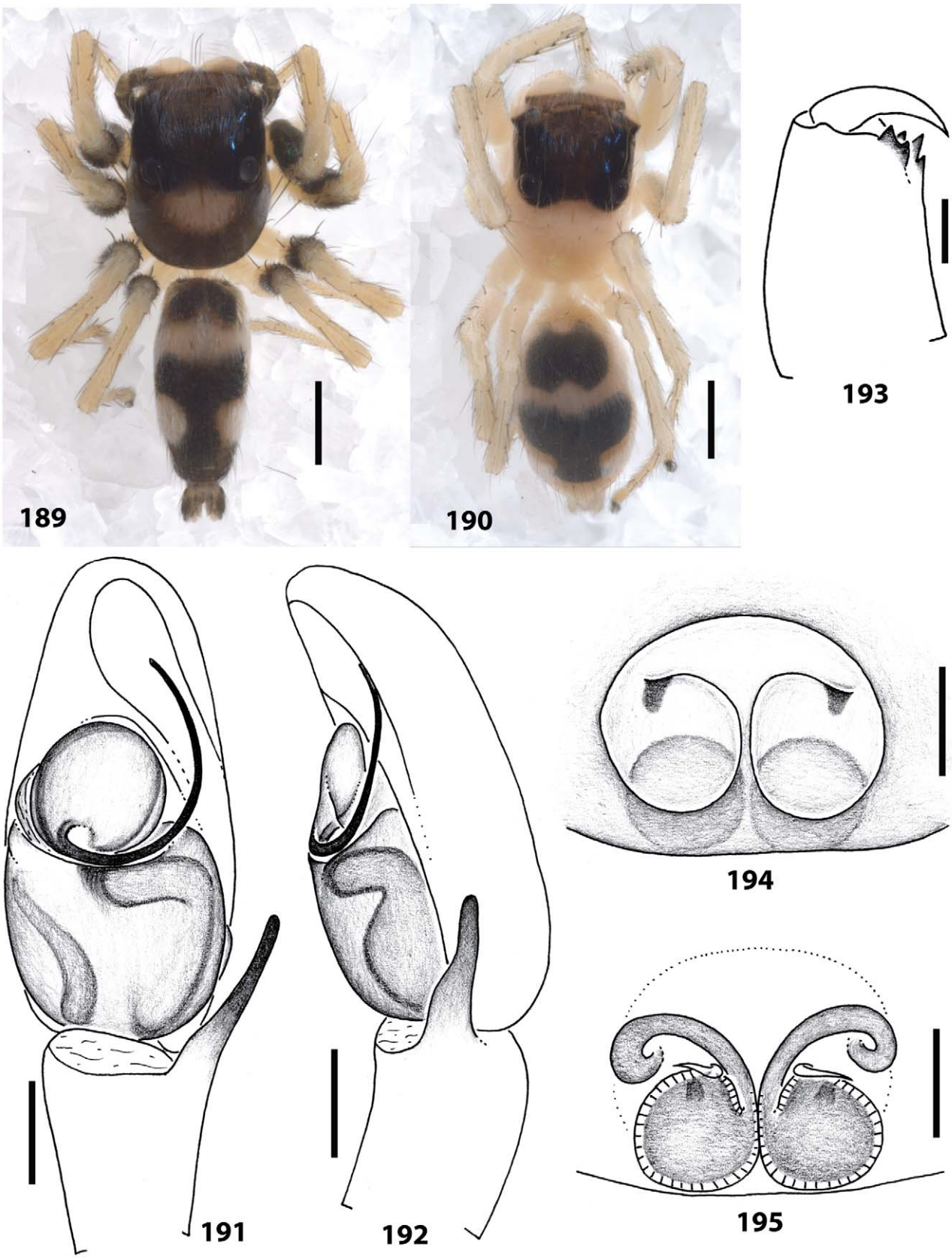
Description. *Male* (holotype, UBC-SEM AR00093). Carapace length 1.5 (variation 1.5–1.7, n=7); abdomen length 1.8. ALEs relatively posterior to AMEs. Chelicera: gray brown. Palp (Figs 191–192): cymbium light yellow, and other segments gray brown. Embolic disc almost round; embolus slender and curved for about half a circle. Retrolateral tibial apophysis long and finger-like. Tibia of first leg with four pairs of ventral macrosetae; metatarsus with three pairs. Measurements of legs: I 3.4, II 3.3, III 3.8, IV 3.4. Color in alcohol (Fig. 189): carapace dark brown with a large light brown marking behind PLEs; eye area covered with gray white long scales between ALEs and PMEs; abdomen dark gray, with one anterior light yellow band and two lateral round light yellow patches near the middle; legs light yellow, all femora with distinct dark gray markings.

Female (paratype, UBC-SEM AR00094). Carapace length 1.5 (variation 1.5–1.7, n=4); abdomen length 1.9. Chelicera (Fig. 193): light yellow. Tibia of first leg with five pairs of ventral macrosetae; metatarsus with three pairs. Measurements of legs: I 3.2, II 3.0, III 3.4, IV 3.5. Epigynum (Figs 194–195): window relatively large; opening to copulatory duct near anterior edge of the window; median septum narrow. Copulatory duct relatively narrow and not convoluted; spermatheca almost spherical. Color in alcohol (Fig. 190): eye area dark, other regions light yellow; abdomen dark with a light yellow transverse band near the middle and two lateral light yellow patches at posterior end; legs light yellow without dark markings.

Natural history. Specimens were collected by beating forest understory vegetation.



FIGURES 183–188. *Phasmolia elegans* sp. nov. 183–185 male paratype; 186–188 female paratype.



FIGURES 189–195. *Phasmolia elegans* sp. nov. 189 male paratype, dorsal view; 190 female paratype, dorsal view; 191 male left palp, ventral view; 192 male left palp, retrolateral view; 193 female right chelicera, back view; 194 epigynum, ventral view; 195 cleared epigynum, dorsal view. Scale bars: 189–190, 0.5 mm; 191–195, 0.1 mm.

Genus *Sobasina* Simon, 1898

Ant-like jumping spiders. Wanless (1978) revised the genus and indicated that it is distinctive from the other Oriental ant-like salticids by the structure of the genitalia, the strongly recurved anterior eye row in frontal view, the scalloped sternum, and the elongate coxa and trochanter of the first leg. Another ant-like salticid genus, *Paraharmochirus* Szombathy, 1915 from Papua New Guinea shares some similarities to *Sobasina*, such as the scalloped sternum, the elongate coxa and trochanter of the first leg, and the presence of punctures on the carapace. But *Sobasina* can be distinguished from it by the elongate carapace which is not strongly convex at PLEs, the short embolus, the absence of the retrolateral sperm duct loop in the male palp, the absence of a window in the epigynum, and the indistinctive spermatheca.

Placement of *Sobasina* in the subfamily Euophryinae is based on unpublished molecular data. Fourteen species of this genus have been described from the Pacific Islands and Malaysia (Wanless 1978; Berry *et al.* 1998; Edmunds & Prószyński 2001; Platnick 2012). One new species from Papua New Guinea is described here.

Sobasina wanlessi sp. nov.

Figs 196–204

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev.1000–1100 m a.s.l., 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008 (UBC-SEM AR00095). Paratypes: 1 female, same data as holotype (UBC-SEM AR00096); 7 males in two vials, same data as holotype.

Etymology. The specific epithet is a patronym in honor of Dr. F. R. Wanless, who made great contributions in the study of jumping spider systematics, and revised this genus.

Diagnosis. Similar to *Sobasina cutleri* Berry, Beatty & Prószyński, 1998 and *S. platypoda* Berry, Beatty & Prószyński, 1998, but differs from *S. cutleri* in the presence of ventral fringes on the male first leg (Fig. 201), the relatively wider palpal bulb (Fig. 202), and the shape of the vulva (Fig. 204); and from *S. platypoda* in the shape of the epigynum and vulva (Figs 203–204).

Description. *Male* (holotype, UBC-SEM AR00095). Carapace length 1.2 (variation 1.2–1.5, n=8); abdomen length 1.1. Carapace with many small punctures, and a hump at posterior part. Chelicera (Fig. 200): yellow brown; with two promarginal teeth and one bicuspid retromarginal tooth. Palp (Fig. 202): light yellow brown. Embolus not coiled. Retrolateral tibial apophysis finger-like. First pair of legs robust, with fringes on ventral tibia; tibia with four proventral and five retroventral macrosetae (some specimens with five pairs of ventral macrosetae on first tibia); metatarsus with three proventral and two retroventral macrosetae (some specimens with three pairs of ventral macrosetae on first metatarsus). Measurements of legs: I 2.0, II 1.5, III 1.5, IV 1.9. Color in alcohol (Fig. 198): carapace dark brown to red brown; dorsal abdomen slightly constricted at 1/3 from anterior end; abdomen brown with a sandy yellow band at constriction; first pair of legs yellow brown, with tarsus and metatarsus light yellow; other legs light yellow to light brown.

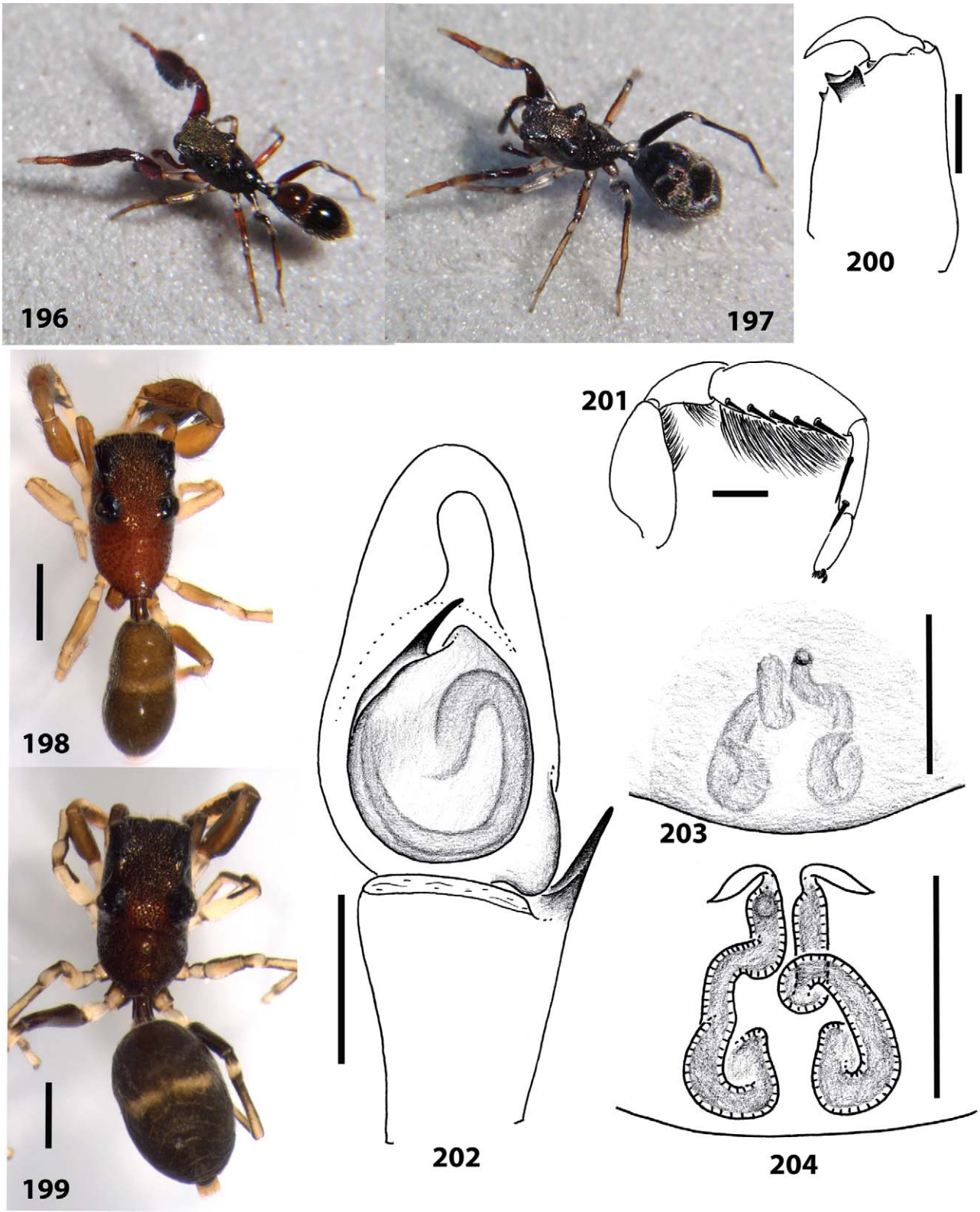
Female (paratype, UBC-SEM AR00096). Carapace length 1.5; abdomen length 1.5. Chelicera: with two promarginal teeth and one bicuspid retromarginal tooth. Tibia of first leg with four proventral and five retroventral macrosetae; metatarsus with three pairs of ventral macrosetae. Measurements of legs: I 2.7, II 2.1, III 2.2, IV 3.1. Epigynum (Figs 203–204): without window. Copulatory duct long and tubular, without accessory gland; spermatheca tubular. Color in alcohol (Fig. 199): darker than that of male.

Natural history. Specimens were collected by beating forest understory, possibly with suspended litter.

Genus *Thorelliola* Strand, 1942

Small to medium sized spiders. Carapace is usually high. Males of some species have setae enlarged into “horns” on the clypeus and some of them have a truncus for the “horns” on the clypeus (Gardzińska & Patoleta 1997; Szűts & De Bakker 2004). Chelicera has a fissident retromarginal tooth. Many species have a process distally on the front surface of the male chelicera. Epigynum has a big window without median septum. Some species have a pair of secondary

spermathecae in addition to the primary spermathecae. Male palp of many species has prominent macrosetae on the tibia and also on the femur in some species; tegulum lacks proximal lobe; embolus is long or short.



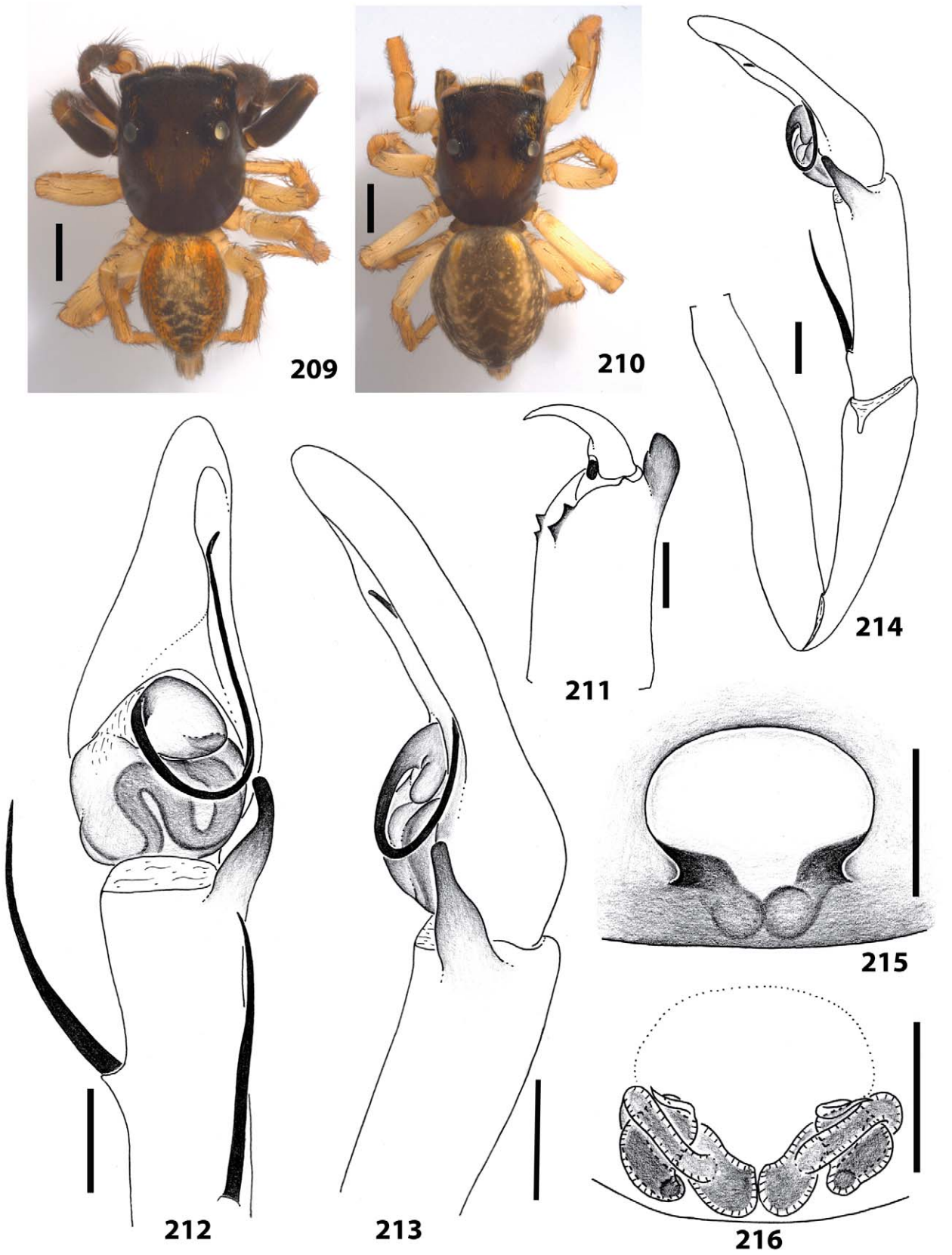
FIGURES 196–204. *Sobasina wanlessi* sp. nov. 196 male; 197 female paratype; 198 male holotype, dorsal view; 199 female paratype, dorsal view; 200 male left chelicera, back view; 201 male right leg I, retrolateral view; 202 male left palp, ventral view; 203 epigynum, ventral view; 204 cleared epigynum, dorsal view. Scale bars: 198–199, 0.5 mm; 201, 0.2 mm; 200, 202–204, 0.1 mm. FIGURES 196–197 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.

In total, 12 species have been reported from Southeast Asia, Papua New Guinea and the Pacific Islands (Platnick 2012). Some of the new species described here are not congruent with the described species in the appearance and in that males only have ordinary setae rather than robust "horns" on the clypeus. However, unpublished molecular data indicate that they fall into a clade with the typical *Thorelliola* species including the type species *Thorelliola ensifera* (Thorell). *Thorelliola mahunkai* Szűts has "horns" not robust but more like ordinary setae (Szűts 2002). Thus, using the "horns" on the male clypeus to define the genus *Thorelliola* may be too restricting. Here we expand the delimitation of the genus *Thorelliola* (see above) to comprise more species and to avoid erecting more new genera for jumping spiders.

FIGURES 205–208. *Thorelliola aliena* sp. nov. 205–207 male holotype; 208 female paratype.

***Thorelliola aliena* sp. nov.**
Figs 205–216

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304° S, 142.512° E, elev. 1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-013 (UBC-SEM AR00097). Paratypes: 1 female, same data as holotype (UBC-SEM AR00098); 2 females and 2 males, same data as holotype.



FIGURES 209–216. *Thorelliola aliena* sp. nov. 209 male paratype, dorsal view; 210 female paratype, dorsal view; 211 male left chelicera, back view; 212 male left palp, ventral view; 213 male left palp, retrolateral view; 214 male left palp (with patella and femur), retrolateral view; 215 epigynum, ventral view; 216 cleared epigynum, dorsal view. Scale bars: 209–210, 0.5 mm; 211–216, 0.2 mm.

Etymology. Latin *aliena* (foreign or incongruous), referring to the atypical male palpal structure and body form.

Diagnosis. This new species resembles other species of *Thorelliola* in the absence of a median septum in the epigynum. It can be easily distinguished by the presence of longitudinal stripes on the dorsum of abdomen (red in male and yellow in female; Figs 205–210), and the unusually long tibia and patella of the male palp (Fig. 214). It also differs in the long embolus of the male palp, the sperm duct loop located at the proximal side instead of retrolateral side of the bulb, the absence of an apophysis on the femur of male palp (Figs 212–214), the presence of a pair of secondary spermathecae in addition to the primary spermathecae in the vulva (Fig. 216), and the absence of guanine deposits in the carapace (Figs 209–210).

Description. *Male* (holotype, UBC-SEM AR00097). Carapace length 1.9 (variation 1.8–2.2, n=3); abdomen length 2.0. Clypeus with only ordinary fine setae. Chelicera (Fig. 211): with two promarginal teeth and one bicuspid retromarginal tooth; with a ectal protrusion at distal end. Palp (Figs 212–214): dark brown. Embolus long and spiral; sperm duct loop proximal and pointing towards center of bulb. Tibia of palp with one prolateral and one ventral macrosetae. Retrolateral tibial apophysis finger-like. Tibia and metatarsus of first leg with four pairs of ventral macrosetae each. Measurements of legs: I 4.6, II 3.4, III 4.4, IV 4.1. Color in alcohol (Fig. 209): carapace dark brown, scattered with orange scales; abdomen yellowish brown, with gray markings and two orange stripes laterally; first pair of legs dark brown, other legs yellowish brown.

Female (paratype, UBC-SEM AR00098). Carapace length 1.8 (variation 1.8–2.0, n=3); abdomen length 2.0. Chelicera: with two promarginal teeth and one bicuspid retromarginal tooth. Tibia and metatarsus of first leg with four pairs of ventral macrosetae each. Measurements of legs: I 3.5, II 2.7, III 3.5, IV 3.6. Epigynum (Figs 215–216): with a big window. Copulatory duct thick at the beginning and then divided, with one leading to secondary spermatheca and the other to the kidney-shaped primary spermatheca with rather thin connecting duct; without accessory gland. Color in alcohol (Fig. 210): similar to that of male, but carapace a bit lighter in color, stripes on dorsal abdomen yellow, and the first pair of legs yellowish brown.

Natural history. Specimens were found on leaf litter in a mid-elevation forest.

***Thorelliola crebra* sp. nov.**
Figs 217–229

Type material. Holotype: male, PAPUA NEW GUINEA: Enga Province: Suyan Camp, Porgera, 5.4833° S, 143.1337° E, elev. 2300 m a.s.l., 28–29 July 2008, coll. W. Maddison, WPM#08-022 (UBC-SEM AR00099). Paratypes: 1 female, same data as holotype (UBC-SEM AR00100); 1 male and 2 females, same data as holotype.

Etymology. Latin *crebra* (thick), referring to the thick patella and tibia of the male palp.

Diagnosis. Can be easily distinguished from *Thorelliola aliena* and previously reported species by the rough mottled apprearance of bark (Figs 217–220), the presence of guanine deposits in the eye area of the carapace (Figs 221–222), and the femoral protuberance of the male palp (Fig. 225). Similar in male palp to *T. zabkai*, but differs in the male chelicera with a triangular process near the fang base on the front surface (Fig. 226); the male endite with two lateral bulges (Fig. 226); the shorter embolus, the much wider retrolateral sperm duct loop and the oval embolic disc of the male palp (Figs 223–225). The new species has similar color pattern and epigynal shape as *T. squamosa*, but can be distinguished by the large dark patches at the posterior part of the dorsal abdomen (Figs 221–222) and the spherical secondary spermathecae which are further behind the posterior end of the window (Figs 228–229).

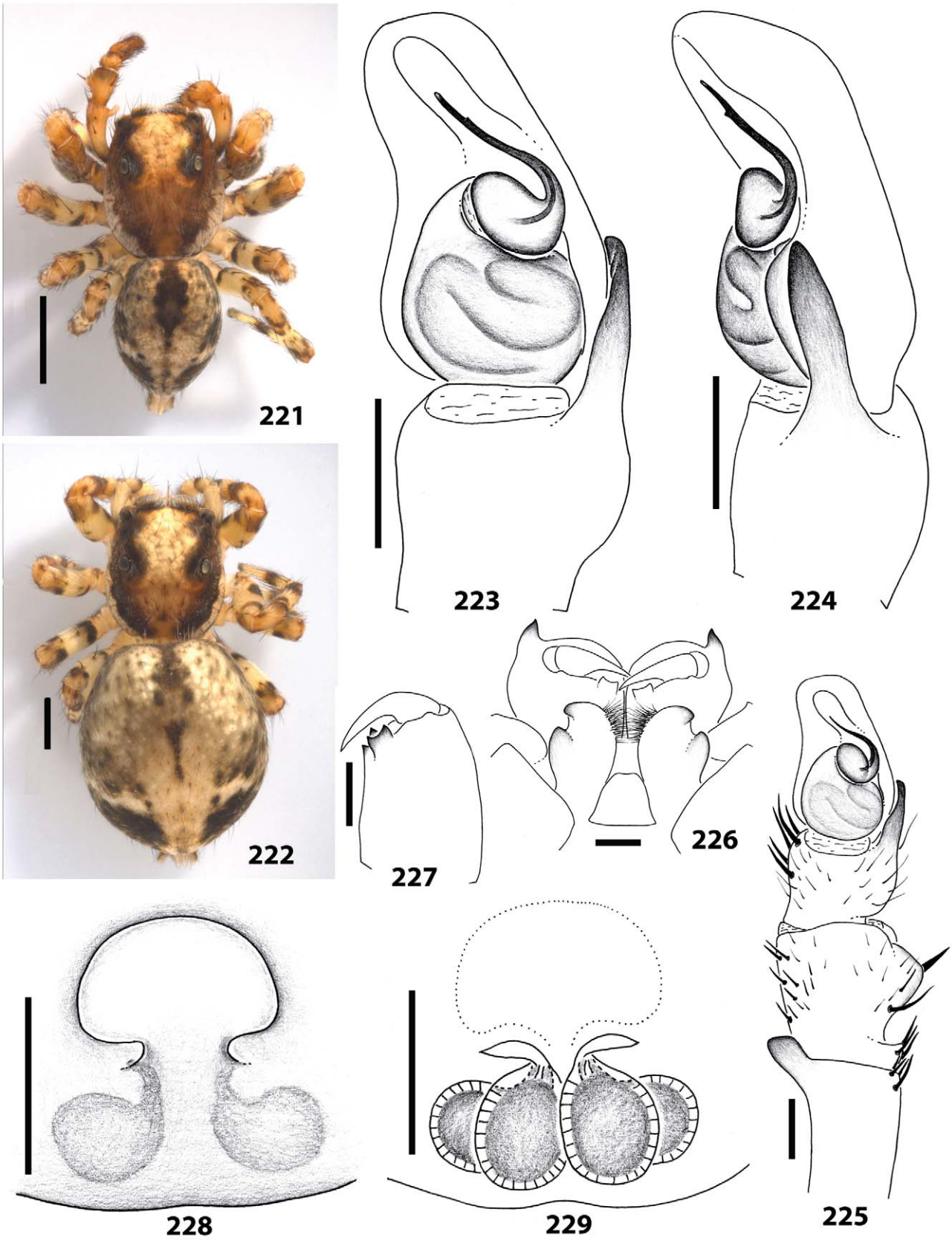
Description. *Male* (holotype, UBC-SEM AR00099). Carapace length 1.9 (variation 1.9–2.2, n=2); abdomen length 2.2. Clypeus with only ordinary fine setae. Chelicera (Fig. 226): dark brown; with two promarginal teeth and one bicuspid retromarginal tooth; with a triangular process near the base of the fang on front surface. Endite (Fig. 226): grey brown; with two lateral bulges, one at distal end and the other near middle. Palp (Figs 223–225): yellow brown. Embolic disc oval; embolus long with a tiny cusp near the end; loop of sperm duct wide almost occupying the whole width of bulb. Tibia, patella and femur of palp with multiple macrosetae; femur with a big distal protuberance prolaterally; patella with a retrolateral lump and a thick macroseta at its top. Retrolateral tibial apophysis finger-like reaching the proximal edge of embolic

disc. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 5.1, II 4.1, III 4.5, IV 4.6. Color in alcohol (Fig. 221): carapace yellow brown, eye area with white guanine deposit, with white stripes laterally behind eye area composed of white scales; abdomen light yellow with a few symmetrical dark gray markings, heart mark also dark gray, almost rhomboid; legs light yellow to yellowish brown, with dark gray markings.

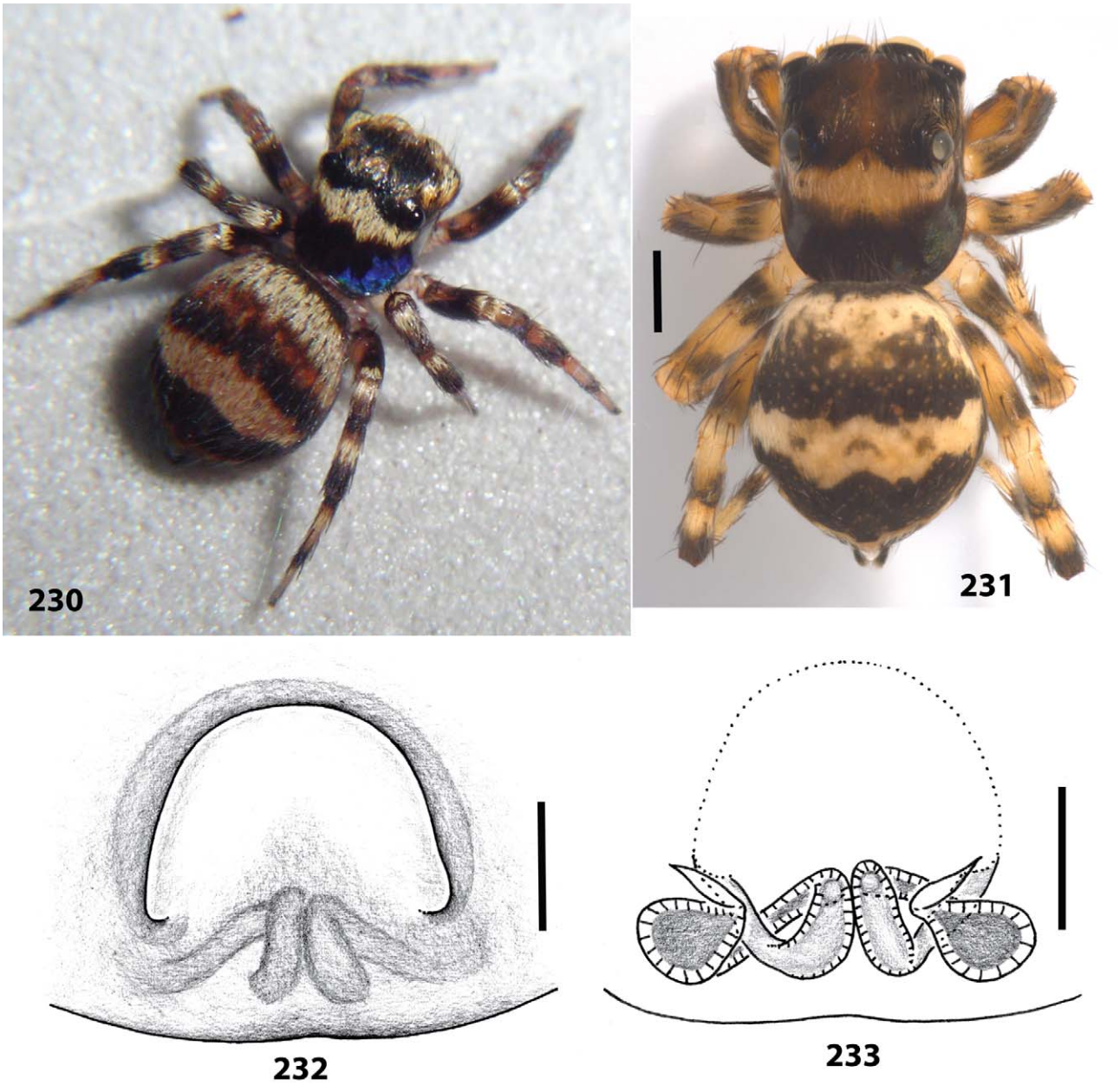
FIGURES 217–220. *Thorelliola crebra* sp. nov. 217–219 male holotype; 220 female paratype.

Female (paratype, UBC-SEM AR00100). Carapace length 1.8 (variation 1.8–1.9, n=3); abdomen length 2.5. Chelicera (Fig. 227): with two promarginal teeth and one bicuspid retromarginal tooth. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.4, II 3.3, III 3.5, IV 4.0. Epigynum (Figs 228–229): window almost semicircular with opening to copulatory duct at its posterior end. Copulatory duct short, without accessory gland; secondary and primary spermatheca oval. Color in alcohol (Fig. 222): similar to that of male.

Natural history. Specimens were found on bark of *Casuarina* tree trunks.



FIGURES 221–229. *Thorelliola crebra* sp. nov. 221 male paratype, dorsal view; 222 female paratype, dorsal view; 223 male left palp, ventral view; 224 male left palp, retrolateral view; 225 male left palp (with patella and femur), ventral view; 226 male chelicerae, endites and labium, ventral view; 227 female left chelicera, back view; 228 epigynum, ventral view; 229 cleared epigynum, dorsal view. Scale bars: 221, 1.0 mm; 222, 0.5 mm; 223–229, 0.2 mm.

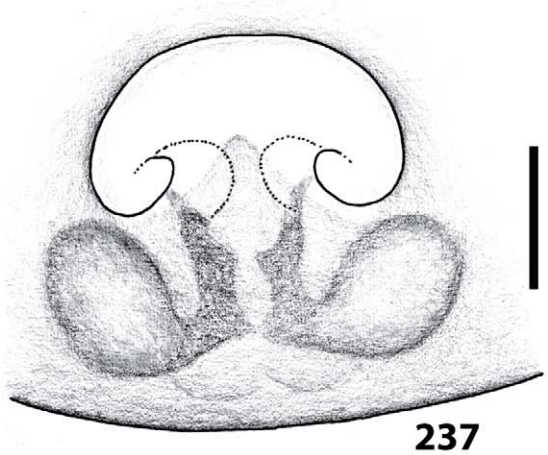


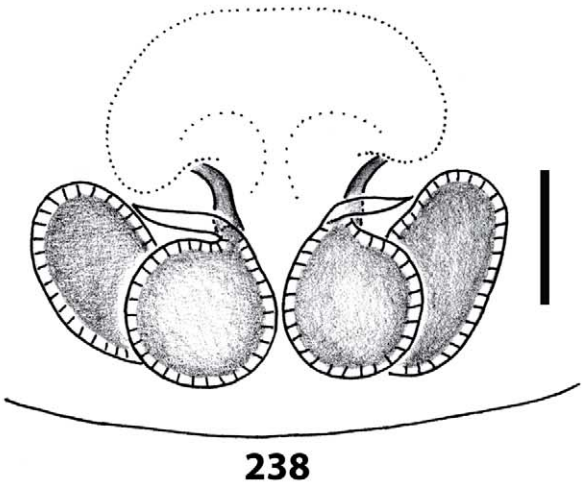
FIGURES 230–233. *Thorelliola joannae* sp. nov. 230 female holotype; 231 female paratype, dorsal view; 232 epigynum, ventral view; 233 cleared epigynum, dorsal view. Scale bars: 231, 0.5 mm; 232–233, 0.1 mm. FIGURE 230 is copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.

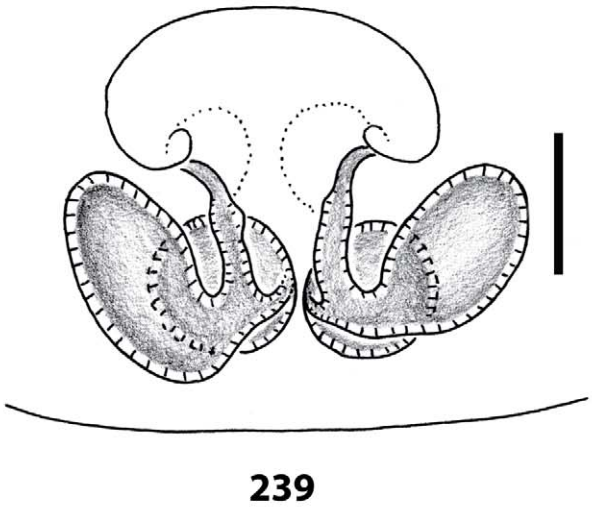
***Thorelliola joannae* sp. nov.**
Figs 230–233

Type material. Holotype: female, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1000–1100 m a.s.l. 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008 (UBC-SEM AR00101). Paratypes: 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Putuwé, junction of Lagaip & Uruwabwa Rivers, 5.231° S, 142.532° E, elev. 570 m a.s.l. 23–26 July 2008, coll. W. Maddison & Luc Fimo Tuki, WPM#08-019; 1 female, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304–5.305° S, 142.510–142.512° E, elev. 1400–1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-012.

Etymology. The specific epithet is a patronym in honor of Dr. Joanna Gardzińska, who has contributed much to the taxonomy of this genus.







FIGURES 234–239. *Thorelliola squamosa* sp. nov. 234–235 female holotype; 236 female paratype, dorsal view; 237 epigynum, ventral view; 238 cleared epigynum, dorsal view; 239 cleared epigynum, ventral view. Scale bars: 236, 0.5 mm; 237–239, 0.1 mm.

Diagnosis. Differs from other described species (Gardzińska & Patoleta 1997; Gardzińska 2009) and *T. tualapa* by the vulva located posterior to the window (Figs 232–233). The absence of guanine deposits in the eye area can distinguish the species from *T. creba*, *T. zabkai* and *T. squamosa* (Fig. 231). Differs from *T. aliena* by the absence of bright stripes on the abdomen (Figs 230–231) and the epigynal shape (Figs 232–233).

FIGURES 240–243. *Thorelliola tamasi* sp. nov. 240–243 male holotype.

Description. *Female* (holotype, UBC-SEM AR00101). Carapace length 1.8 (variation 1.8–1.9, n=3); abdomen length 2.0. Chelicera: red brown; with two promarginal teeth and one retromarginal tooth of five cusps. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.5, II 3.4, III 4.4, IV 4.7. Epigynum (Figs 232–233): window big; vulva posterior to window. Copulatory duct long and coiled, without accessory gland; spermatheca small. Color in alcohol (Fig. 231): carapace dark brown with a yellow brown

marking behind PLEs; abdomen dark brown, scattered with small brownish speckles, with a wide yellowish brown band at anterior end and in the middle each; venter of abdomen sandy yellow with gray patches; legs yellow brown with gray brown annuli.

***Thorelliola squamosa* sp. nov.**
Figs 234–239

Type material. Holotype: female, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00102). Paratype: 1 female, same data as holotype.

Etymology. Latin *squamosa*, referring to the scale-like markings on the dorsal abdomen.

Diagnosis. Differs from *T. crebra* and *T. zabkai* by the posterior end of lateral rims of the epigynal window curving anteriorly (Figs 237–239); and also from *T. zabkai* in the presence of guanine deposits in the eye area (Fig. 236).

Description. *Female* (holotype, UBC-SEM AR00102). Carapace length 1.9 (variation 1.8–1.9, n=2); abdomen length 2.1. Chelicera: red brown; with two promarginal teeth and one bicuspid retromarginal tooth. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.3, II 3.2, III 3.5, IV 3.8. Epigynum (Figs 237–239): lateral rims of window curved anteriorly. Copulatory duct short and divided, with one leading to the long and oval secondary spermatheca and the other leading to the spherical primary spermatheca; accessory gland not obvious. Color in alcohol (Fig. 236): carapace yellow brown, eye area with distinct white guanine deposits, eyes with dark surroundings; abdomen covered with squamous markings and a few grayish markings, heart mark also grayish; legs light yellow with gray markings.

Natural history. Specimens were found on tree trunks in an artificial clearing (a picnic area).

***Thorelliola tamasi* sp. nov.**
Figs 240–248

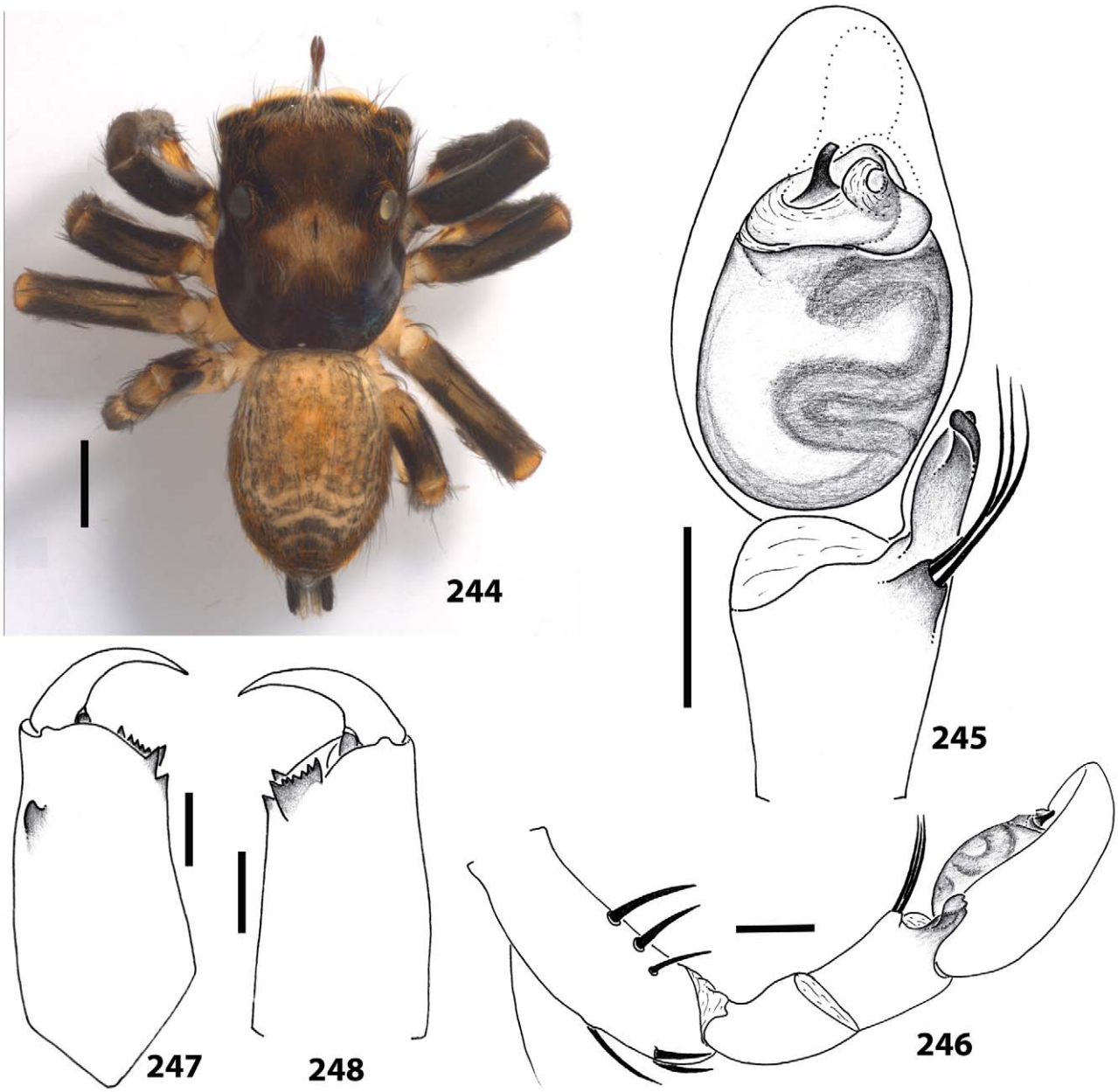
Type material. Holotype: male, PAPUA NEW GUINEA: Eastern Highlands Province: Mt. Gahavisuka Provincial Park, 6.016° S, 145.417° E to 6.017° S, 145.416° E, elev. 2450–2490 m a.s.l., 2 August 2008, coll. W. Maddison, WPM#08-027 (UBC-SEM AR00103). Paratypes: 4 males in three vials, same data as holotype.

Etymology. The specific epithet is a patronym in honor of Dr. Tamás Szűts, who has contributed much to the taxonomy of this genus.

Diagnosis. Resembles *Thorelliola dumicola* Berry, Beatty & Prószyński, 1997 in the absence of macrosetae on the tibia of male palp, but differs by the presence of a truncus on the male clypeus equipped with two ”horns”, and the short embolus (Figs 245–246). Can also be distinguished from other species that have the clypeal truncus by the combination of following chatacters: embolus is short; retrolateral sperm duct loop occupies about half of the bulb width; tibia of male palp lacks prolateral macroseta (Figs 245–246).

Description. *Male* (holotype, UBC-SEM AR00103). Carapace length 2.2 (variation 1.8–2.3, n=5); abdomen length 2.3. Truncus in the middle of clypeus and armed with two horn-like macrosetae with bases fused together. Chelicera (Figs 247–248): dark brown to red brown; with two promarginal teeth and one retromarginal tooth of six or seven cusps; with a small projection on the front surface. Palp (Figs 245–246): dark brown. Embolus very short; sperm duct loop occupying about half of the bulb width. Macroseta absent on the prolateral side of palpal tibia. Tibia of palp with a clump of long setae retrolaterally in front of retrolateral tibial apophysis. Retrolateral tibial apophysis relatively thick. Tibia and metatarsus of first leg with three pairs of ventral macrosetae each. Measurements of legs: I 6.3, II 4.6, III 4.9, IV 5.2. Color in alcohol (Fig. 244): carapace dark brown, area around fovea yellow brown; abdomen gray brown, with many irregular sandy yellow speckles, posterior part with 3–4 parallel yellowish bands; first two pairs of legs dark brown proximally and sandy yellow distally, last two pairs of legs gray brown proximally and sandy yellow distally.

Natural history. Specimens were collected from suspended litter.



FIGURES 244–248. *Thorelliola tamasi* sp. nov. 244 male paratype, dorsal view; 245 male left palp, ventral view; 246 male left palp (with patella and femur), retrolateral view; 247 male left chelicera, front view; 248 male left chelicera, back view. Scale bars: 244, 0.5 mm; 245–248, 0.2 mm.

***Thorelliola tualapa* sp. nov.**
Figs 249–260

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Tualapa, near Wanakipa, 5.283° S, 142.498° E, elev. 1000–1100 m a.s.l., 11–22 July 2008, forest interior and river side, coll. W. Maddison & Luc Fimo Tuki, WPM#08-008 (UBC-SEM AR00104). Paratypes: 1 female, same data as holotype (UBC-SEM AR00105); 5 males and 2 females in three vials, same data as holotype.

Etymology. A noun in apposition taken from the type locality.

Diagnosis. Differs from other species with a truncus on the male clypeus by the wide retrolateral sperm duct loop, the shape of the embolus and the embolic disc of the male palp (Figs 255–256). Resembles *Thorelliola pallidula* Gardzińska, 2009 in female epigynum, but can be distinguished by the opening to the copulatory duct which is far anterior to the epigynal groove (Figs 259–260).

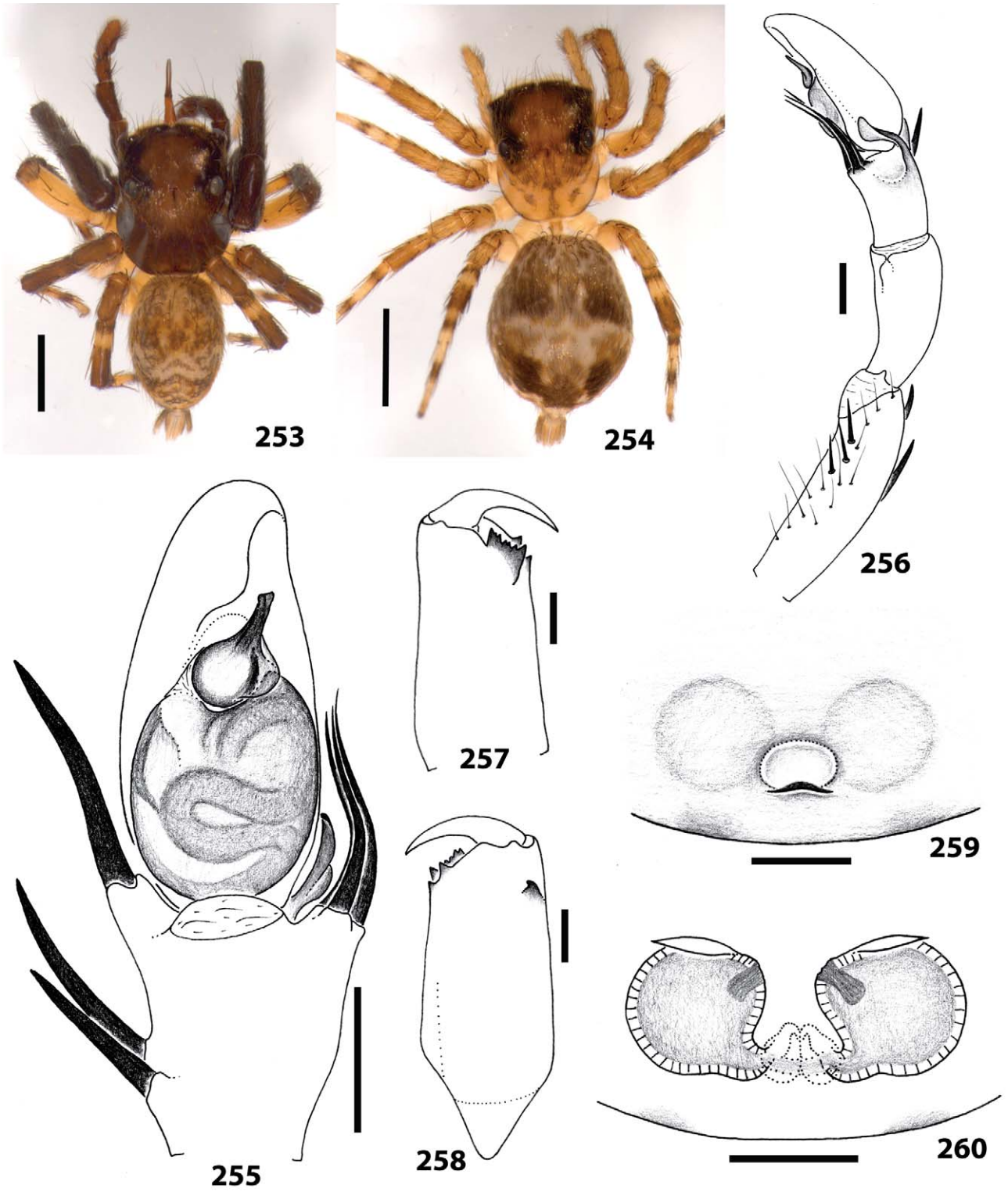
FIGURES 249–252. *Thorelliola tualapa* sp. nov. 249–251 male holotype; 252 female paratype.

Description. *Male* (holotype, UBC-SEM AR00104). Carapace length 2.4 (variation 1.8–2.4, n=6); abdomen length 2.5. Clypeus with a long truncus in the middle armed with two relatively short macrosetae at the tip. Chelicera (Figs 257–258): dark brown, distal end red brown; with two promarginal teeth and one retromarginal tooth of six or seven cusps; with a distal process on front surface. Palp (Figs 255–256): dark red brown. Bulb and embolic disc oval; embolus short and not curved; retrolateral sperm duct loop about three quarters of bulb width. Tibia of palp with multiple macrosetae, the prolateral distal macroseta of tibia on top of a protuberance. Palpal tibia with a clump of long and curved stiff setae retrolaterally in front of retrolateral tibial apophysis. Retrolateral tibial apophysis relatively wide and flap-like with a curved longitudinal ridge. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 7.8, II 5.3, III 5.8, IV 6.1. Color in alcohol (Fig. 253): carapace dark red brown; abdomen sandy yellow, with gray and dark brown markings, anterior part with long and stiff setae; ventral abdomen pale yellow with irregular gray brown markings; first pair of legs dark red brown, other legs dark brown to light yellow brown.

Female (paratype, UBC-SEM AR00105). Carapace length 1.8 (variation 1.7–1.8, n=3); abdomen length 2.6. Chelicera: with two promarginal teeth and one retromarginal tooth of four or five cusps. Tibia of first leg with three

pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.6, II 3.3, III 3.9, IV 4.2. Epigynum (Figs 259–260): window not obvious; opening to copulatory duct far away from the epigynal groove. Copulatory duct short and thin, without accessory gland; spermatheca almost spherical. Color in alcohol (Fig. 254): similar to that of male, but dorsal abdomen with two pairs of dark brown patches, carapace and legs paler.

Natural history. Specimens were collected by beating forest understory.



FIGURES 253–260. *Thorelliola tualapa* sp. nov. 253 male holotype, dorsal view; 254 female paratype, dorsal view; 255 male left palp, ventral view; 256 male left palp (with patella and femur), retrolateral view; 257 male right chelicera, back view; 258 male right chelicera, front view; 259 epigynum, ventral view; 260 cleared epigynum, dorsal view. Scale bars: 253–254, 1.0 mm; 255–258, 0.2 mm; 259–260, 0.1 mm.

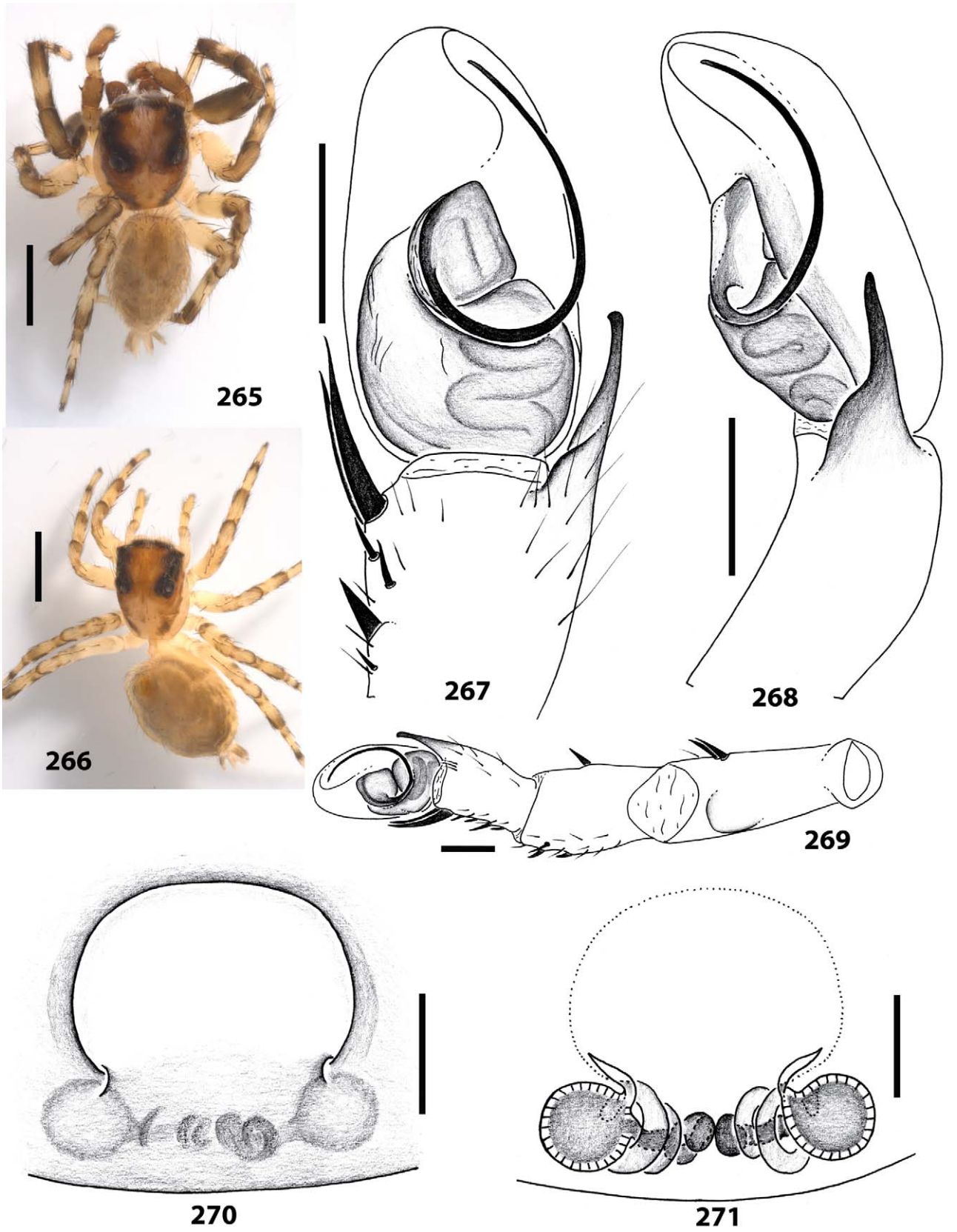
***Thorelliola zabkai* sp. nov.**
Figs 261–271

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304° S, 142.512° E, elev. 1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-013 (UBC-SEM AR00106). Paratype: 1 female, same data as holotype (UBC-SEM AR00107).

FIGURES 261–264. *Thorelliola zabkai* sp. nov. 261–263 male holotype; 264 female paratype.

Etymology. The specific epithet is a patronym in honor of Dr. Marek Żabka, who has made great contributions to the study of jumping spider systematics and biodiversity.

Diagnosis. Female of this species can be distinguished from *T. crebra* and *T. squamosa* by the more obscure guanine deposits in the eye area (Figs 265–266) and the indistinctive secondary spermatheca (Fig. 271). Male of this species differs from *T. crebra* in the longer embolus, the shape of the embolic disc, the narrower sperm duct loop, the thinner retrolateral tibial apophysis and the bump-like protuberance on the palpal femur (Figs 267–269).



FIGURES 265–271. *Thorelliola zabkai* sp. nov. 265 male holotype, dorsal view; 266 female paratype, dorsal view; 267 male left palp, ventral view; 268 male left palp, retrolateral view; 269 male left palp (with patella and femur), ventral view; 270 epigynum, ventral view; 271 cleared epigynum, dorsal view. Scale bars: 265–266, 1.0 mm; 267–269, 0.2 mm; 270–271, 0.1 mm.

Description. *Male* (holotype, UBC-SEM AR00106). Carapace length 2.0; abdomen length 2.1. Clypeus with only ordinary fine setae. Chelicera: red brown; with two promarginal teeth and one bicuspid retromarginal tooth; without distal process on front surface. Endite: grayish brown; without lateral bulge. Palp (Figs 267–269): yellow brown. Embolic disc almost rectangular with the retrolateral margin almost straight; embolus long and curved; loop of sperm duct almost half as wide as bulb. Tibia, patella and femur of palp with multiple macrosetae; femur with a hump near distal end pro-ventrally. Retrolateral tibial apophysis long and finger-like. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 4.8, II 4.1, III 4.8, IV 5.0. Color in alcohol (Fig. 265): carapace gray brown, with lateral margins and posterior eye area light yellow, guanine deposit in eye area not obvious; abdomen light yellow, markings not distinct in the preserved specimen; legs light yellow with dark gray markings, first pair of legs darker than others.

Female (paratype, UBC-SEM AR00107). Carapace length 1.8; abdomen length 2.6. Chelicera: with two promarginal and one bicuspid retromarginal tooth. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.5, II 3.4, III 3.8, IV 4.4. Epigynum (Figs 270–271): window large; opening to copulatory duct at posterior end of window laterally. Copulatory duct long and convoluted; secondary spermatheca not obvious, primary spermatheca small and spherical. Color in alcohol (Fig. 266): similar to that of male, but lighter.

Natural history. Specimens were collected on tree trunks in forest.

Genus *Variratina* new genus

Type species. *Variratina minuta* Zhang & Maddison, sp. nov.

Etymology. The generic name is a reminiscent of "Varirata", the name of the National Park where the species was first found.

Diagnosis. Small tree-trunk dwelling jumping spiders. Resembles *Bulolia* Żabka, 1996, *Leptathamas* Balogh, 1980a (also see Szűts 2003) and *Coccorchestes* Thorell (see Balogh 1980b) in the sperm duct of the male palp forming a loop at the prolateral side of the bulb, but can be easily distinguished by the body form and color pattern (Figs 272–277). ALEs and AMEs are in typical salticid configuration (Figs 272–277), unlike *Bulolia* and *Leptathamas* whose ALEs are posterior to the AMEs. Also differs from *Coccorchestes* in its carapace lacking crenellated posterior margin overlying the abdomen (Figs 272–277).

Variratina minuta sp. nov.

Figs 272–281

Type material. Holotype: male, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00108). Paratype: 1 female, same data as holotype (UBC-SEM AR00109).

Etymology. The specific epithet refers to the small size of the spider.

Diagnosis. See diagnosis of the genus. Embolus of the male palp is slender with the plane of its spiral almost perpendicular to the longitudinal axis of the bulb (Figs 278–279). Epigynal window is large (Fig. 280), and copulatory duct is convoluted (Fig. 281).

Description. *Male* (holotype, UBC-SEM AR00108). Carapace length 0.9; abdomen length 0.8. Chelicera: with two promarginal teeth and one retromarginal tooth. Palp (Figs 278–279): cream. Embolus long and spiral. Retrolateral tibial apophysis finger-like. Tibia of first leg with three ventral macrosetae; first metatarsus with two pairs. Measurements of legs: I 1.4, II 1.4, III 1.7, IV 1.9. Color in alcohol (Fig. 276): carapace covered with pale yellow setae, eye area dark, with a medial stripe composed of white setae extending to posterior part of carapace; behind eye area grey brown, with medial and lateral cream stripes; abdomen with a medial white stripe and some symmetrical dark markings; legs pale yellow, with indistinct grey marking at distal end of each segment.

Female (paratype, UBC-SEM AR00109). Carapace length 1.0; abdomen length 1.4. Chelicera: with two promarginal teeth and one retromarginal tooth. Tibia of first leg with three pairs of ventral macrosetae; first metatarsus with two pairs. Measurements of legs: I 1.6, II 1.6, III 2.0, IV 2.2. Epigynum (Figs 280–281): window wide. Copulatory duct convoluted; spermatheca small. Color in alcohol (Fig. 277): similar to that of male.

Natural history. Specimens were found on tree trunks.

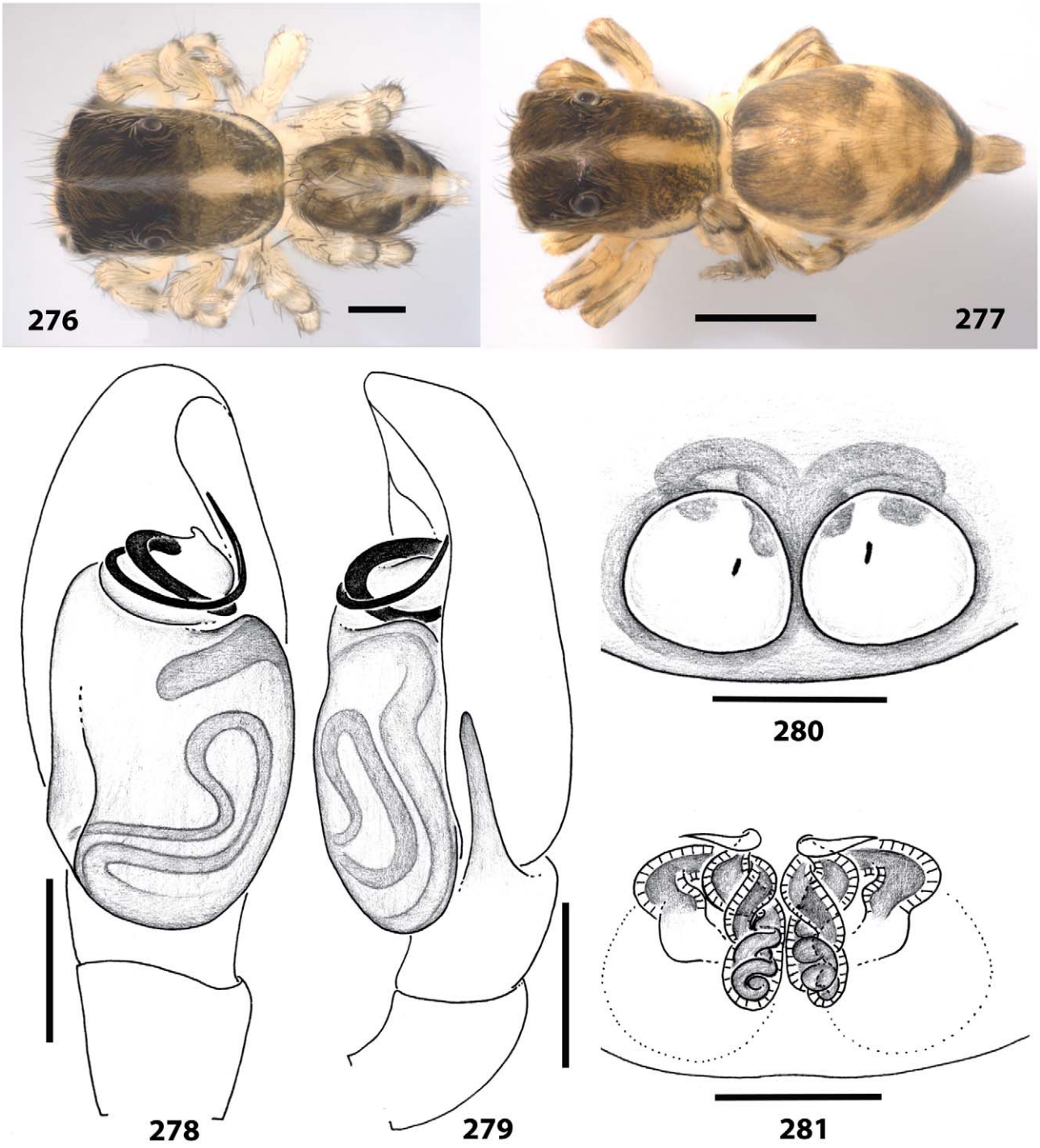
FIGURES 272–275. *Variratina minuta* sp. nov. 272–273 male holotype; 274–275 female paratype.

Genus *Viribestus* new genus

Type species: *Viribestus suyanensis* Zhang & Maddison, sp. nov.

Etymology. The generic name is from the combination of *virilis* (virile) and *bestia* (animal), referring to the masculine nature of the male spider; masculine in gender.

Diagnosis. Similar in body form and presence of a lamella accompanying the embolus to *Colyttus* Thorell, but differs in the flat protrusion on the front surface of the male chelicera (Fig. 287), the absence of proximal tegular lobe and the forked retrolateral tibial apophysis of the male palp (Figs 288–289). Also differs from *Canama* Simon and *Bathippus* Thorell in the wide carapace (Fig. 286), the wide palpal bulb (Figs 288–289), the presence of a flat protrusion on the front surface of the male chelicera (Fig. 287), the presence of a lamella right beside the embolus and the forked retrolateral tibial apophysis of the male palp (Figs 288–289).



FIGURES 276–281. *Variratina minuta* sp. nov. 276 male holotype, dorsal view; 277 female paratype, dorsal view; 278 male left palp, ventral view; 279 male left palp, retrolateral view; 280 epigynum, ventral view; 281 cleared epigynum, dorsal view. Scale bars: 276, 0.5 mm; 277, 0.2 mm; 278–281, 0.1 mm.

***Viribestus suyanensis* sp. nov.**
Figs 282–289

Type material. Holotype: male, PAPUA NEW GUINEA: Enga Province: Suyan Camp, Porgera, 5.4833° S, 143.1337° E, elev. 2300 m a.s.l., 28–29 July 2008, coll. W. Maddison, WPM#08-022 (UBC-SEM AR00110).

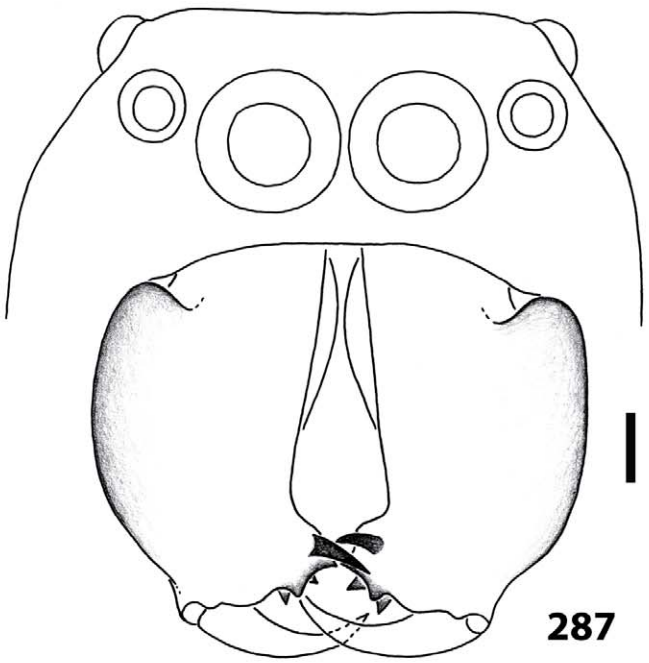
Etymology. The specific epithet refers to the type locality.

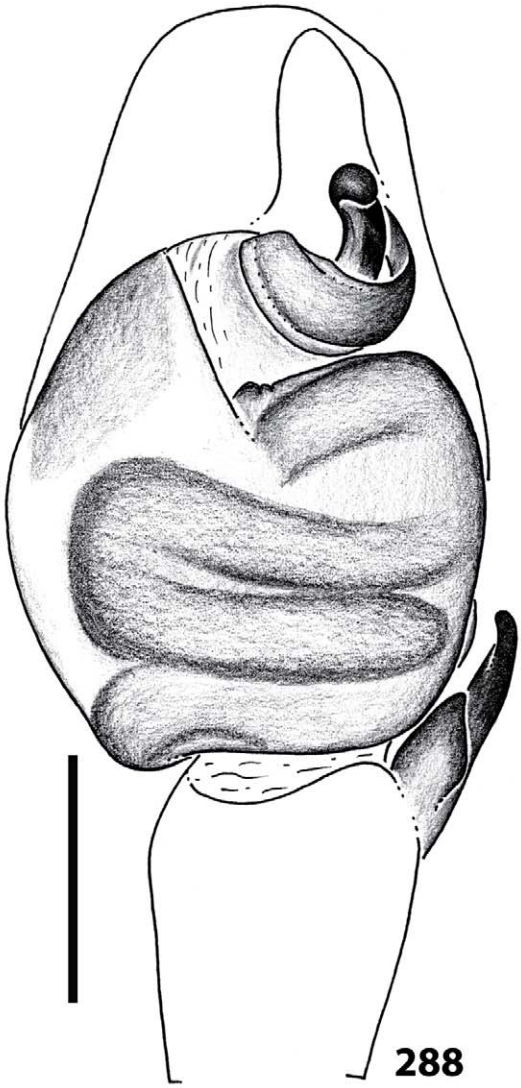
FIGURES 282–285. *Viribestus suyanensis* sp. nov. 282–285 male holotype.

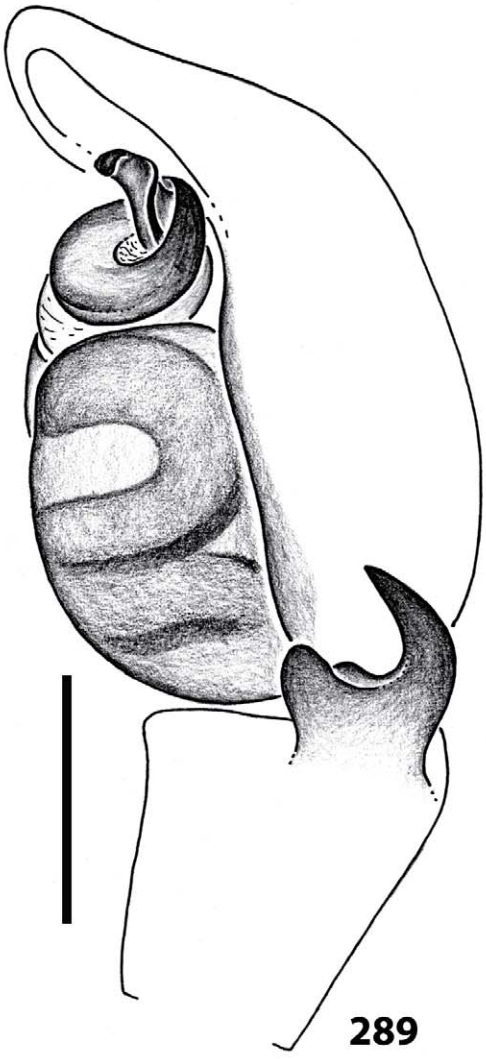
Diagnosis. Male has a unique flat lateral extension on the front surface of the chelicera (Fig. 287). Palpal bulb is wide; embolus is short, thick and slightly curved, with a lamella beside it; retrolateral tibial apophysis is large and forked (Figs 288–289).

Description. *Male* (holotype, UBC-SEM AR00110). Carapace length 2.0; abdomen length 3.0. Chelicera (Fig. 287): red brown; with two promarginal teeth and one bicuspid retromarginal tooth; front surface with a flat extension laterally. Palp (Figs 288–289): light yellow to reddish brown. Bulb wide with retrolateral sperm duct loop almost occupying its whole width. Embolus short and lightly curved, with a distinct lamella beside it. Retrolateral tibial apophysis with two branches, tip of ventral branch round and tip of dorsal branch pointed from retrolateral view. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 4.8, II 3.9, III 4.1, IV 4.2. Color in alcohol (Fig. 286): carapace pale yellow, area between PLEs light orange, with white scales in eye area; abdomen pale yellow without distinct markings; first legs yellow brown, other legs pale yellow, coxa, trochanter, femur and patella of first leg and femur of second leg with dark markings prolaterally. Body greenish when alive (Figs 282–285).

Natural history. The holotype was found beating vegetation in a distrubed area.





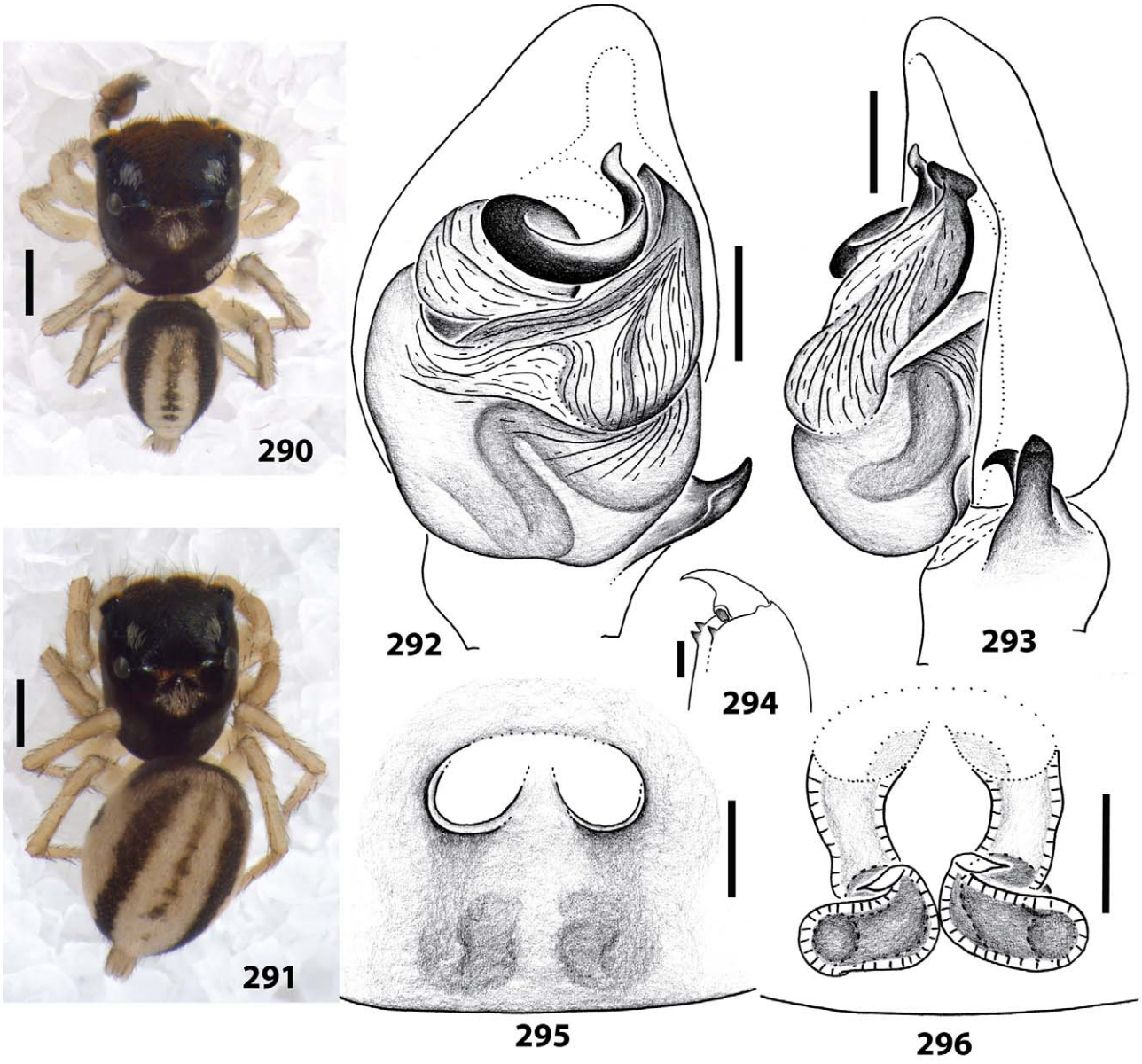


FIGURES 286–289. *Viribestus suyanensis* sp. nov. 286 male holotype, dorsal view; 287 male cephalothorax, front view; 288 male left palp, ventral view; 289 male left palp, retrolateral view. Scale bars: 286, 1.0 mm; 287–289, 0.2 mm.

Genus *Xenocytaea* Berry, Beatty & Prószyński, 1998

Small to medium-sized spiders. Chelicera usually has two promarginal teeth and one bicuspid or unident retromarginal tooth. First tibia has two or three pairs of ventral macrosetae and first metatarsus has two pairs of ventral macrosetae. Epigynum usually has a large anterior arch and lacks distinct window. Embolus is coiled and palpal bulb is usually wide. Retrolateral tibial apophysis is long and finger-like or wide with multiple branches. Some species have a protrusion on the distal end of the tegulum.

Nine species have been reported from the Pacific Islands (Berry *et al.* 1998; Patoleta 2011). An additional three new species are described here from Papua New Guinea.



FIGURES 290–296. *Xenocytaea agnarssoni* sp. nov. 290 male holotype, dorsal view; 291 female paratype, dorsal view; 292 male left palp, ventral view; 293 male left palp, retrolateral view; 294 female left chelicera, back view; 295 epigynum, ventral view; 296 cleared epigynum, dorsal view. Scale bars: 290–291, 0.5 mm; 292–296, 0.1 mm.

***Xenocytaea agnarssoni* sp. nov.**
Figs 290–296

Type material. Holotype: male, PAPUA NEW GUINEA: New Britain: Nakanai Mts, Camp 1, Lamas, 5.614° S, 151.408° E, elev. 200 m, 3–8 April 2009, coll. I. Agnarsson (UBC-SEM AR00111). Paratypes: 1 female, same data as holotype (UBC-SEM AR00112); 2 female, same data as holotype; 1 male, PAPUA NEW GUINEA: New Britain: Nakanai Mts, Camp 2, Vouvou, 5.446° S, 151.464° E, elev. 859 m, 10–18 April 2009, coll. I. Agnarsson.

Etymology. The specific epithet is a patronym in honor of Dr. Ingi Agnarsson, who collected specimens of this species and provided other material for this study.

Diagnosis. Differs from other species by the absence of obvious anterior arch of the epigynum (Figs 295–296); the presence of a large protrusion at the distal end of the tegulum, the narrower embolic spiral, and the shape of the retrolateral tibial apophysis of the male palp (Figs 292–293).

Description. *Male* (holotype, UBC-SEM AR00111). Carapace length 1.6 (variation 1.6–1.8, n=2); abdomen length 1.5. Chelicera: dark brown; with two promarginal teeth and one unident retromarginal tooth. Palp (Figs 292–293): cream to light brown, with dark pigments. Embolus relatively wide and slightly coiled; retrolateral sperm duct loop present and wide; proximal tegular lobe absent. Retrolateral tibial apophysis with two branches near the tip. First pair of legs with three pairs of ventral macrosetae on tibia. Measurements of legs: I 2.9, II 2.4, III 3.9, IV 3.8. Color in alcohol (Fig. 290): carapace dark brown, with two white patches within eye area and one white patch right behind fovea composed of white scales; lateral margins with white stripes also composed of white scales; abdomen pale yellow, with two wide lateral stripes and one narrow medial stripe, all dark brown in color, ventral abdomen pale yellow with a wide dark stripe medially; legs cream without distinct markings.

Female (paratype, UBC-SEM AR00112). Carapace length 1.8 (variation 1.6–1.8, n=3); abdomen length 2.2. Chelicera (Fig. 294): with two promarginal teeth and one unident retromarginal tooth. Tibia of first leg with five ventral macrosetae. Measurements of legs: I 2.9, II 2.8, III 3.9, IV 3.7. Epigynum (Figs 295–296): window relatively small, at anterior part of epigynal plate; opening to copulatory duct at posterior rim of the window. Copulatory duct wide and not coiled; spermatheca long and kidney-like. Color in alcohol (Fig. 291): similar to that of male except without white stripes at lateral margins of carapace.

***Xenocytaea albomaculata* sp. nov.**
Figs 297–302

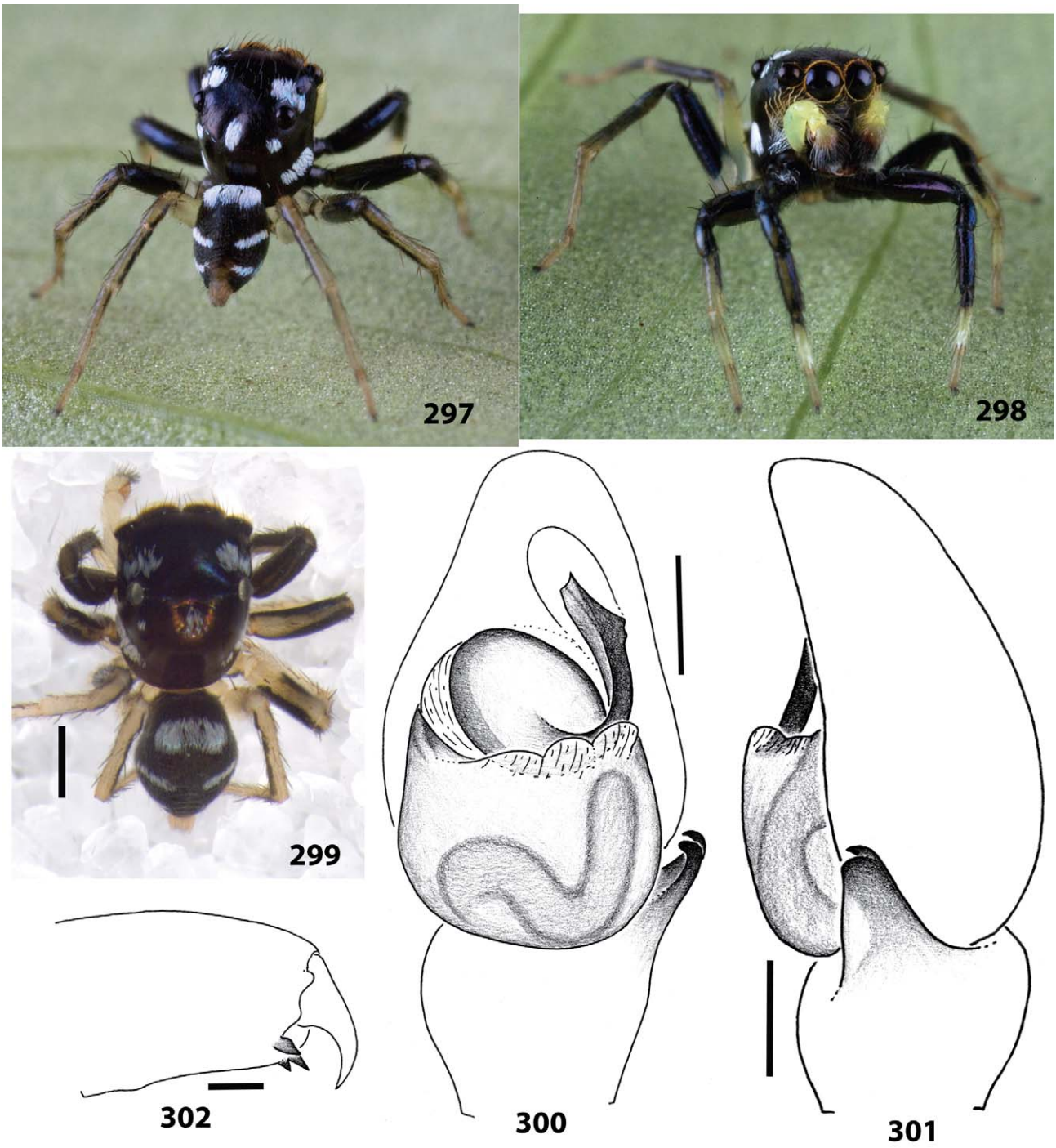
Type material. Holotype: male, PAPUA NEW GUINEA: New Britain: Nakanai Mts, Camp 1, Lamas, 5.614° S, 151.408° E, elev. 200 m, 3–8 April 2009, coll. I. Agnarsson (UBC-SEM AR00113). Paratypes: 4 males in three vials, same data as holotype.

Etymology. The specific epithet refers to the white markings on the carapace and abdomen.

Diagnosis. Can be easily distinguished from other species by the short and thick embolus and the shape of the retrolateral tibial apophysis of the male palp (Figs 300–301).

Description. *Male* (holotype, UBC-SEM AR00113). Carapace length 1.4 (variation 1.4–1.5, n=5); abdomen length 1.2. Chelicera (Fig. 302): dark yellow brown; with two promarginal teeth and one unident retromarginal tooth. Palp (Figs 300–301): light yellow. Embolus wide and short, slightly coiled; sperm duct with a loop at the proximal side of bulb, retrolateral sperm duct loop absent; proximal tegular lobe absent. Retrolateral tibial apophysis finger-like, with tip beak-like. First pair of legs with three pairs of ventral macrosetae on tibia. Measurements of legs: I 2.8, II 2.6, III 3.5, IV 3.3. Color in alcohol (Fig. 299): carapace dark brown with two white patches before PLEs and a white patch around fovea composed of white scales; lateral margins with white stripes composed of white scales too; abdomen dark, anterior margin covered with white scales, and with a pair of posterior markings composed of white scales; first pair of legs light yellow on metatarsi and tarsi, other segments brown or dark brown, other legs light yellow to gray brown with dark stripes.

Natural history. Specimens were collected by beating foliage in forest.



FIGURES 297–302. *Xenocytaea albomaculata* sp. nov. 297–298 male paratype (copyright to P. Naskrecki, with permission); 299 male paratype, dorsal view; 300 male left palp, ventral view; 301 male left palp, retrolateral view; 302 male right chelicera, back view. Scale bars: 299, 0.5 mm; 300–302, 0.1 mm.

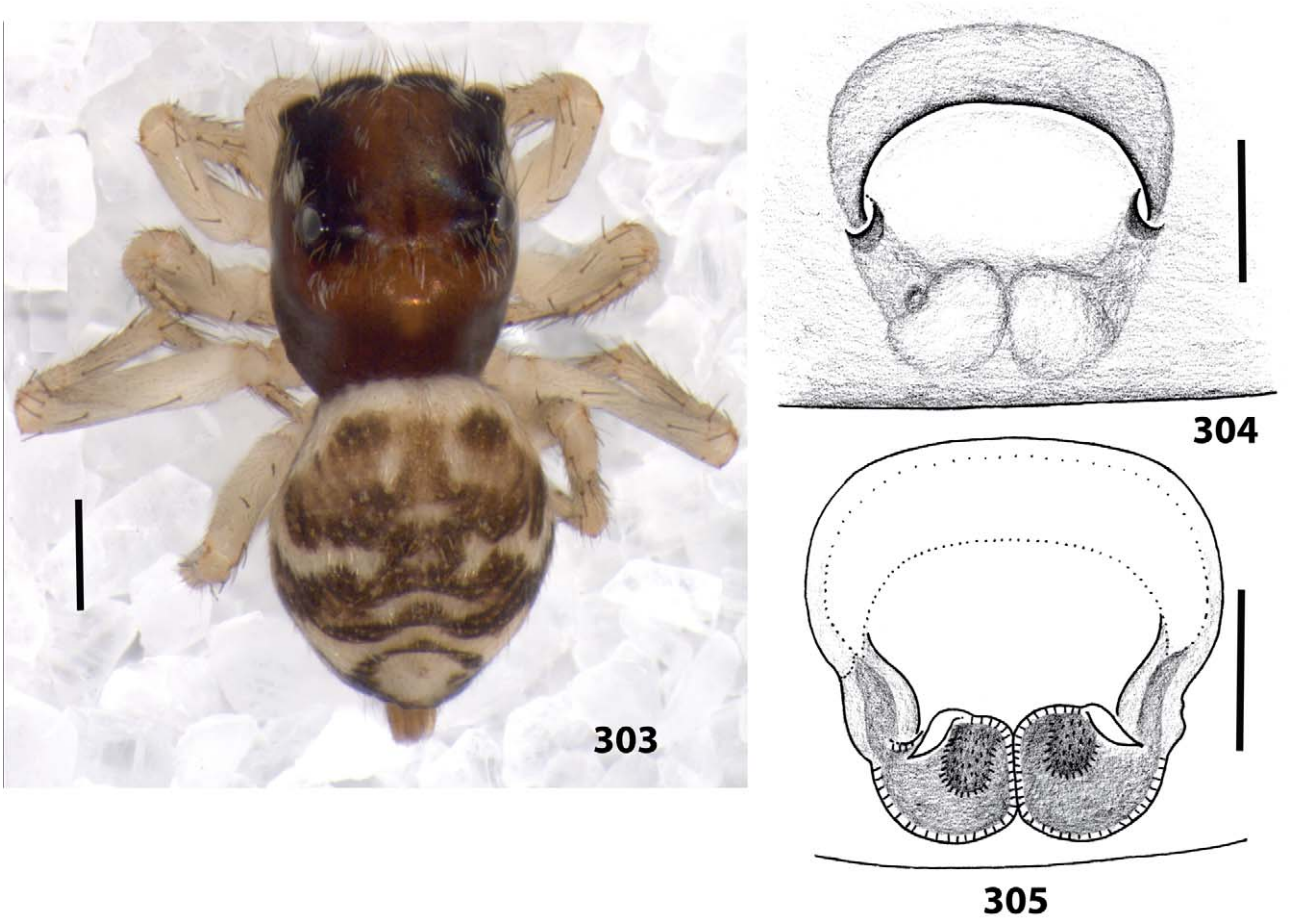
***Xenocytaea proszynskii* sp. nov.**
Figs 303–305

Type material. Holotype: female, PAPUA NEW GUINEA: New Britain: Nakanai Mts., near Camp 3, Tompoi, 5.343° S, 151.315° E, elev. 1590 m, 20 April 2009, coll. D. Gassmann & K. Sagatasame (UBC-SEM AR00114).

Etymology. The specific epithet is a patronym in honor of Dr. J. Prószyński, who has made great contributions to the study of jumping spider systematics and biodiversity.

Diagnosis. Resembles *Xenocytaea triramosa* Berry, Beatty & Prószyński, 1998 and *X. stanislawi* Patoleta, 2011 in lacking the posterior pocket of the epigynum, but differs in the spermatheca closer to the epigynal groove and the shape of the anterior arch of the epigynum (Figs 304–305). Also similar in epigynal shape to *X. zabakai* Berry, Beatty & Prószyński, 1998, but can be distinguished by the spherical spermatheca (Fig. 305).

Description. *Female* (holotype, UBC-SEM AR00114). Carapace length 1.6; abdomen length 1.7. Chelicera: red brown; with two promarginal teeth and one unident retromarginal tooth. Epigynum (Figs 304–305): with a convex arch anteriorly; opening to copulatory duct at posterior end of the arch. Copulatory duct relatively short, without accessory gland; spermatheca spherical. First pair of legs with three pairs of ventral macrosetae on tibia. Measurements of legs: I 2.9, II 2.8, III 3.7, IV 3.8. Color in alcohol (Fig. 303): carapace dark red brown, with some white scales; abdomen light yellow with brown to brownish markings; venter with two brownish stripes behind genital groove; legs light yellow.



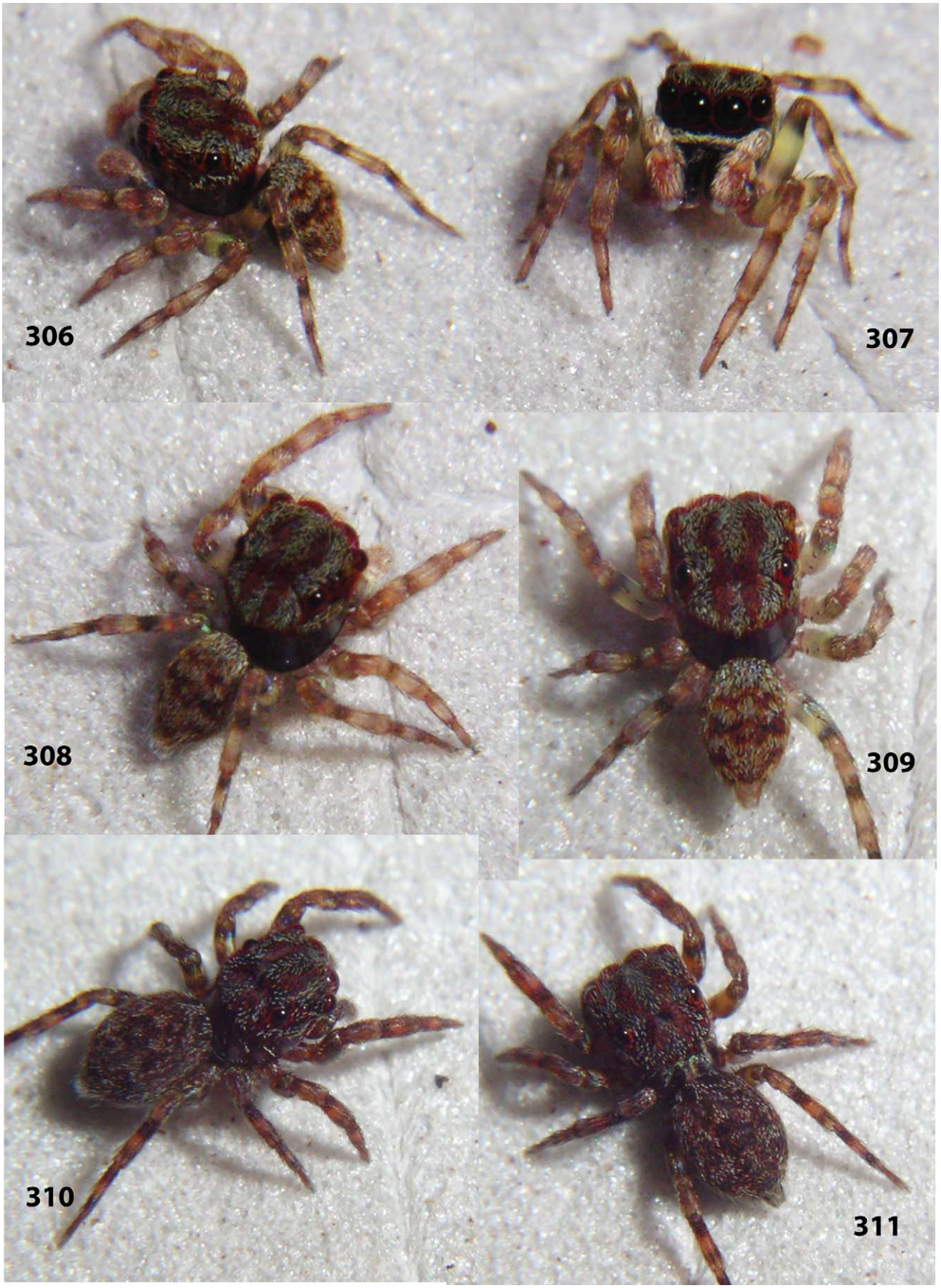
FIGURES 303–305. *Xenocytaea proszynskii* sp. nov. 303 female holotype, dorsal view; 304 epigynum, ventral view; 305 cleared epigynum, dorsal view. Scale bars: 303, 0.5 mm; 304–305, 0.1 mm.

Genus *Zabkattus* new genus

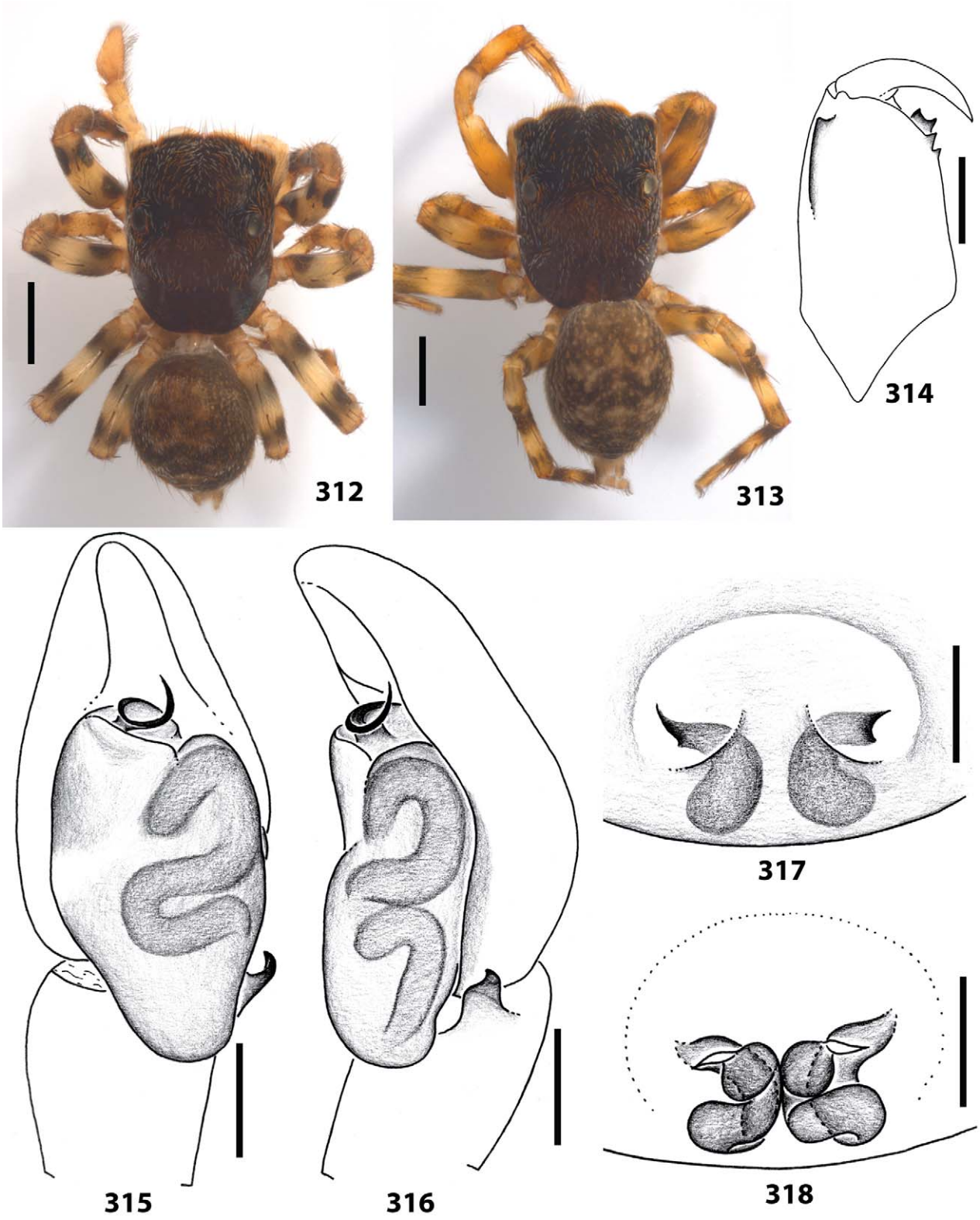
Type species: *Zabkattus brevis* Zhang & Maddison, sp. nov.

Etymology. The generic name combines “zabk” in honor of Dr. Marek Żabka, who has made great contributions in the study of jumping spider systematics and biodiversity, with “attus”, often used as an ending for salticid genera; masculine in gender.

Diagnosis. Small to medium sized leaf litter dwelling spiders. Body is usually dark brown or brown. Chelicera has two promarginal teeth and one bicuspid retromarginal tooth. Male chelicera usually has a protrusion of varied shape on the front surface. Epigynum has a window with median septum. Spermatheca is usually relatively small. Resembles another leaf litter dwelling genus, *Laufeia* Simon (Bohdanowicz & Prószyński 1987) in body form, but differs in the shape of genitalia and the presence of a protrusion on the front surface of the male chelicera.



FIGURES 306–311. *Zabkattus brevis* sp. nov. 306–309 male holotype; 310–311 female paratype.



FIGURES 312–318. *Zabkattus brevis* sp. nov. 312 male holotype, dorsal view; 313 female paratype, dorsal view; 314 male left chelicera, front view; 315 male left palp, ventral view; 316 male left palp, retrolateral view; 317 epigynum, ventral view; 318 cleared epigynum, dorsal view. Scale bars: 312–313, 0.5 mm; 314, 0.2 mm; 315–318, 0.1 mm.

***Zabkattus brevis* sp. nov.**
Figs 306–318

Type material. Holotype: male, PAPUA NEW GUINEA: Southern Highlands Province: trail from Tualapa to Umgé, 5.2933° S, 142.4999° E, elev. 1210 m a.s.l., 19 July 2008, coll. W. Maddison, WPM#08-015 (UBC-SEM AR00115). Paratypes: 1 female, same data as holotype (UBC-SEM AR00116); 2 males and 2 females in three vials, PAPUA NEW GUINEA: Southern Highlands Province: Umgé, 5.304–5.305° S, 142.510–142.512° E, elev. 1400–1450 m a.s.l., 15–19 July 2008, coll. W. Maddison & Aislan Tama Wanakipa Indiaf, WPM#08-012.

Etymology. Latin *brevis* (short), referring to the short embolus of male palp.

Diagnosis. Male can be easily distinguished from other species by the very short embolus (Figs 315–316) and the long protrusion on the front surface of the chelicera (Fig. 314). Female differs from *Zabkattus trapeziformis* in the median septum of the epigynum, which is not continuous with the edge of the window anteriorly (Fig. 317), and the thicker and shorter copulatory duct (Fig. 318).

Description. *Male* (holotype, UBC-SEM AR00115). Carapace length 1.4 (variation 1.3–1.4, n=3); abdomen length 1.1. Chelicera (Fig. 314): red brown; front surface with a long protrusion at the distal half part laterally. Palp (Figs 315–316): light yellow. Proximal tegular lobe present. Embolus short and slightly curved. Retrolateral tibial apophysis short with distal end hawk-beak shaped. Tibia of first leg with three pairs of ventral macrosetae; first metatarsus with two pairs. Measurements of legs: I 3.0, II 2.4, III 2.7, IV 2.8. Color in alcohol (Fig. 312): carapace dark red brown with orange and white scales; abdomen gray brown with irregular light yellow markings, covered with orange and white scales; legs light yellow, with distinct gray brown markings.

Female (paratype, UBC-SEM AR00116). Carapace length 1.2 (variation 1.2–1.5, n=3); abdomen length 1.5. Tibia of first leg with three pairs of ventral macrosetae; first metatarsus with two pairs. Measurements of legs: I 2.3, II 2.2, III 2.5, IV 2.7. Epigynum (Figs 317–318): window wide and oval; median septum not reaching anterior edge of the window. Copulatory duct well sclerotized and thick; spermatheca small. Color in alcohol (Fig. 313): similar to that of male.

Natural history. Specimens were found on leaf litter in forest.

***Zabkattus furcatus* sp. nov.**
Figs 319–324

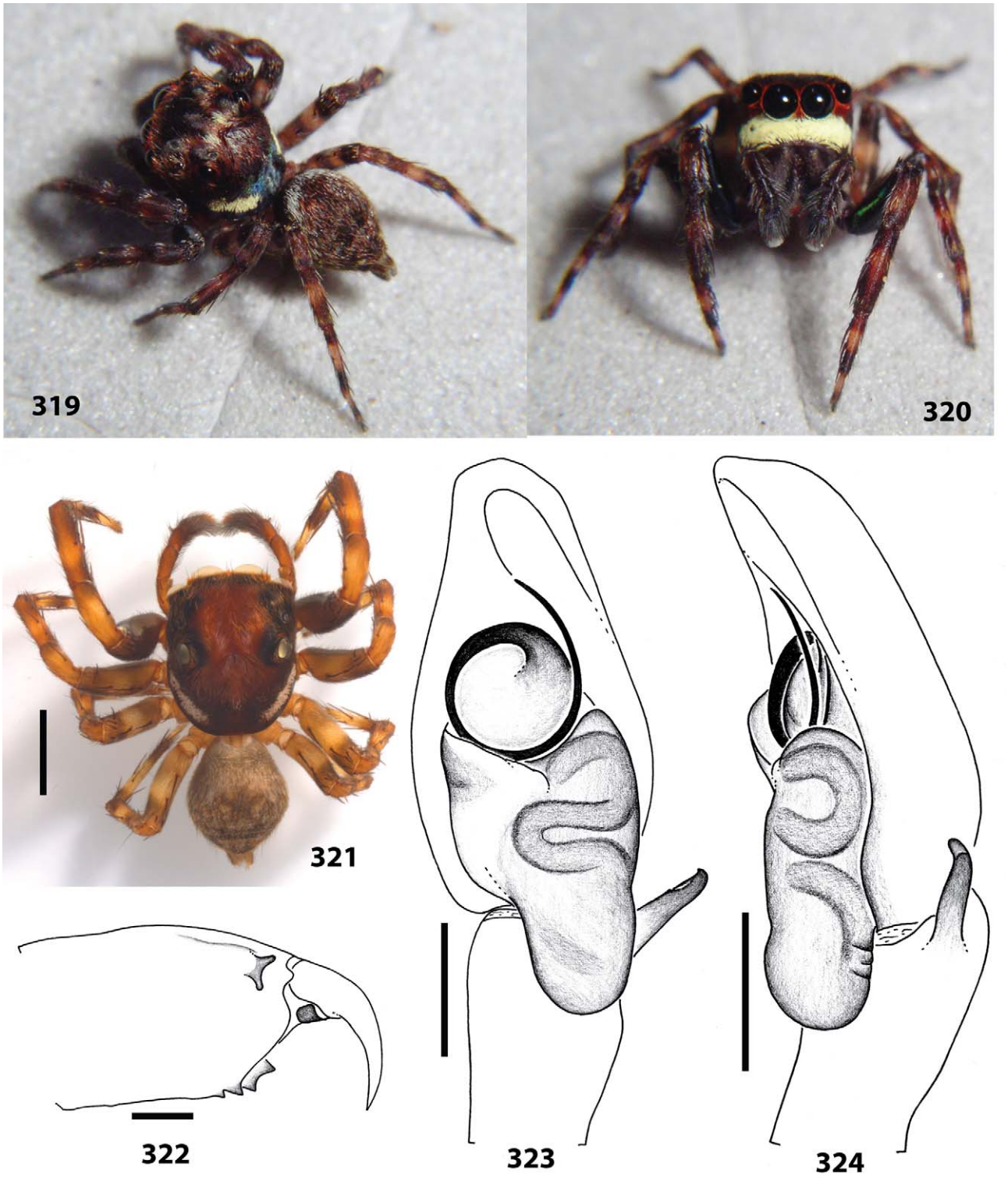
Type material. Holotype: male, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00117).

Etymology. Latin *furcatus* (forked), referring to the forked protrusion on the front surface of male chelicera.

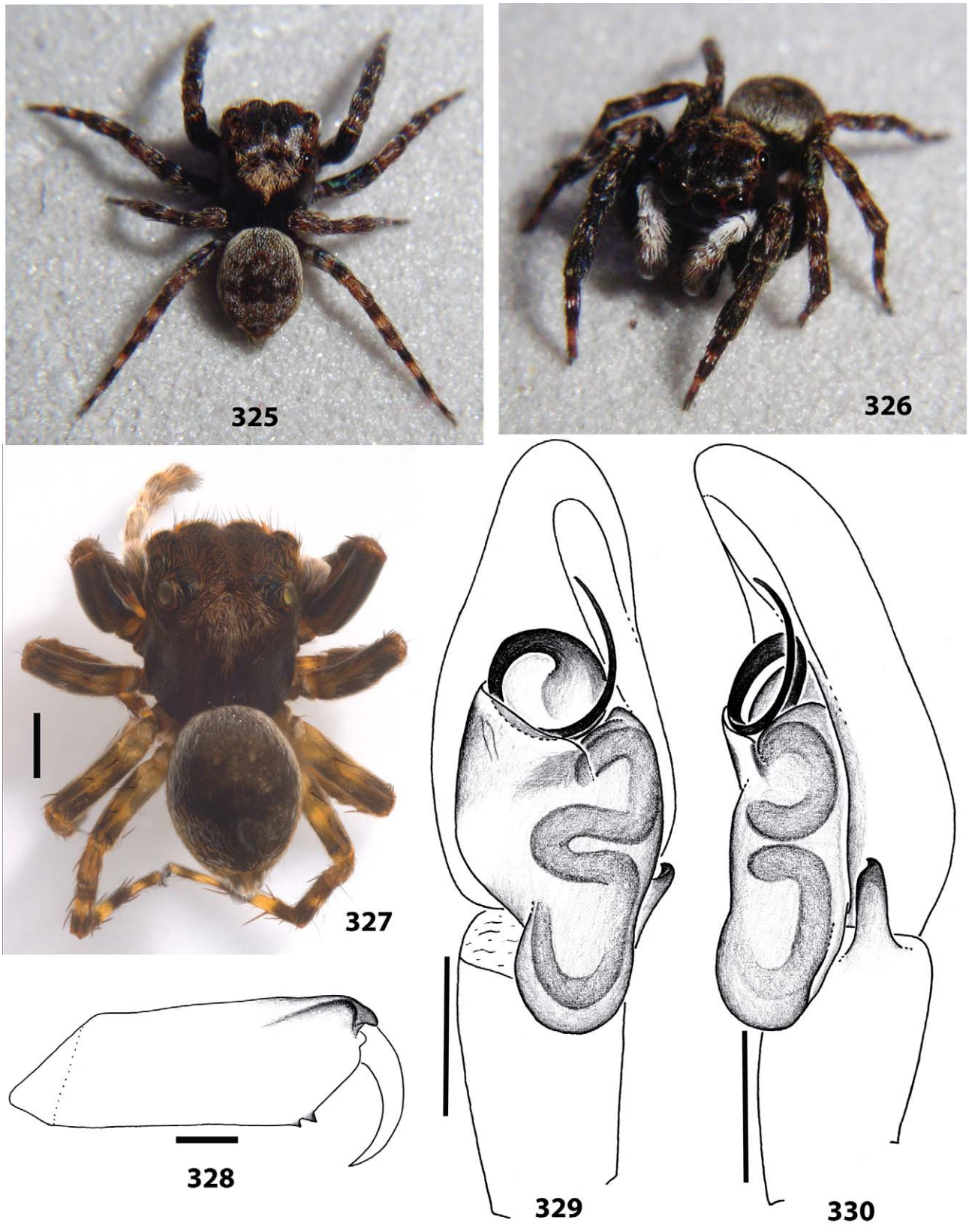
Diagnosis. Differs from other species of the genus in the presence of two lateral white stripes on the carapace (Fig. 321), the small and forked cheliceral protrusion (Fig. 322), and the round tip of the retrolateral tibial apophysis from retrolateral view (Fig. 324).

Description. *Male* (holotype, UBC-SEM AR00117). Carapace length 2.5; abdomen length 2.2. Clypeus and cheeks covered with white scales. Chelicera (Fig. 322): red brown; front protrusion near distal end, small and forked. Palp (Figs 323–324): yellow brown. Proximal tegular lobe big. Embolus long and spiral. Retrolateral tibial apophysis relatively long, with distal end round from retrolateral view. Tibia and metatarsus of first leg with three pairs of ventral macrosetae each. Measurements of legs: I 5.1, II 4.2, III 4.9, IV 4.5. Color in alcohol (Fig. 321): carapace red brown, with orange and white scales, with lateral stripes composed of white scales behind eye area; abdomen grayish brown, with irregular light yellow markings; femur of first leg red brown, other segments and legs yellowish with gray brown markings.

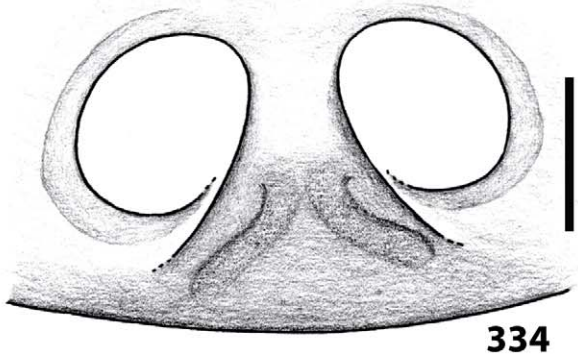
Natural history. Specimens were found on leaf litter in forest.

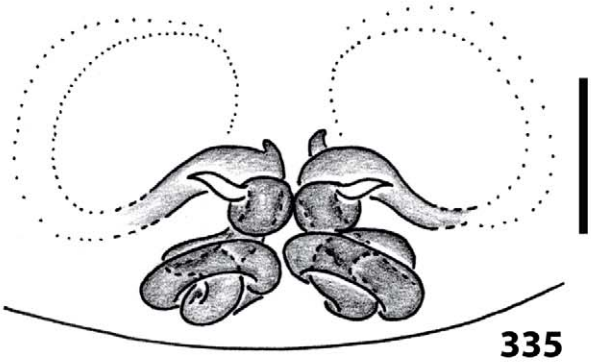


FIGURES 319–324. *Zabkattus furcatus* sp. nov. 319–320 male holotype; 321 male holotype, dorsal view; 322 male left chelicera, front view; 323 male left palp, ventral view; 324 male left palp, retrolateral view. Scale bars: 321, 1.0 mm; 322–324, 0.2 mm.



FIGURES 325–330. *Zabkattus richardsi* sp. nov. 325–326 male holotype; 327 male paratype, dorsal view; 328 male left chelicera, front view; 329 male left palp, ventral view; 330 male left palp, retrolateral view. Scale bars: 327, 0.5 mm; 328–330, 0.2 mm. FIGURES 325–326 are copyright © 2012 W. P. Maddison, released under a Creative Commons Attribution (CC–BY) 3.0 license.





FIGURES 331–335. *Zabkattus trapeziformis* sp. nov. 331–332 female holotype; 333 female holotype, dorsal view; 334 epigynum, ventral view; 335 cleared epigynum, dorsal view. Scale bars: 333, 0.5 mm; 334–335, 0.1 mm.

***Zabkattus richardsi* sp. nov.**
Figs 325–330

Type material. Holotype: male, PAPUA NEW GUINEA: Eastern Highlands Province: Goroka, 6.07° S, 145.40° E, elev. 1650 m a.s.l., 31 July–1 August 2008, coll. W. Maddison, WPM#08-024 (UBC-SEM AR00118). Paratype: 1 male, same data as holotype.

Etymology. The specific epithet is a patronym in honor of Dr. S. Richards, who designed and executed the successful expeditions to Papua New Guinea, during which this species was first found.

Diagnosis. Resembles *Zabkattus furcatus* in male palp, but can be easily distinguished by the body form and the color pattern (Figs 325–327), the big and hooked cheliceral protrusion on the front surface (Fig. 328), and the pointed distal end of the retrolateral tibial apophysis of the male palp (Fig. 330).

Description. *Male* (holotype, UBC-SEM AR00118). Carapace length 2.0 (variation 1.8–2.0, n=2); abdomen length 1.7. Chelicera (Fig. 328): red brown; front surface with a hooked protrusion at the distal end laterally. Palp (Figs 329–330): light yellow with gray markings. Proximal tegular lobe big and round. Embolus long and coiled for about one circle. Retrolateral tibial apophysis short with distal end pointed. Tibia of first leg with three pairs of ventral macrosetae; first metatarsus with two pairs. Measurements of legs: I 4.4, II 3.7, III 4.0, IV 3.8. Color in alcohol (Fig. 327): carapace dark brown, covered with orange and white scales; abdomen gray brown, without distinct markings; legs dark brown, with light yellow annuli.

Natural history. Specimens were found on leaf litter in forest.

Zabkattus trapeziformis sp. nov.

Figs 331–335

Type material. Holotype: female, PAPUA NEW GUINEA: Central Province: Varirata National Park, 9.436° S, 147.364° E, elev. 740 m a.s.l., 4 August 2008, coll. W. Maddison, A. Kore & J. Kore, WPM#08-029 (UBC-SEM AR00119).

Etymology. The specific epithet refers to the trapezoid-shaped median septum of the epigynum.

Diagnosis. This species differs from *Zabkattus brevis* by the median septum, which is continuous with the anterior margin of the window (Fig. 334), the long and convoluted copulatory duct (Fig. 335), and the presence of small accessory gland near the beginning of copulatory duct (Fig. 335).

Description. *Female* (holotype, UBC-SEM AR00119). Carapace length 1.5; abdomen length 1.5. Chelicera: red brown. Tibia of first leg with three pairs of ventral macrosetae; metatarsus with two pairs. Measurements of legs: I 3.2, II 2.6, III 3.1, IV 3.1. Epigynum (Figs 334–335): median septum continuous with the anterior edge of the window, with posterior end wider than anterior end. Copulatory duct long and convoluted, with an accessary gland near the beginning; spermatheca small and oval. Color in alcohol (Fig. 333): carapace dark brown, covered with many white and a few orange scales; abdomen grayish brown, scattered with light yellow dots; legs grayish brown, with some yellowish markings.

Natural history. Specimens were found on leaf litter in forest.

Acknowledgements

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