Palp-footed spiders of Sri Lanka with descriptions of six new species (Araneae: Palpimanidae)

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ABSTRACT

Palpimanidae Thorell, 1870 is a diverse family of nocturnal, leaf litter, or bark-dwelling spiders native to the tropics. In this paper, I describe six species new to science: *Boagrius silindui* **sp. nov.**, *Steriphopus ritigalensis* **sp. nov.**, *S. punchimenikae* **sp. nov.**, *S. woolfi* **sp. nov.**, *S. hinnihamiae* **sp. nov.**, and *S. spiralus* **sp. nov.** I also redescribe *Palpimanus vultuosus* Simon, 1897, *Sarascelis chaperi* Simon, 1887 and *Steriphopus macleayi* (O. Pickard-Cambridge, 1873). Further, the following taxonomic act is proposed: *Boagrius raffrayi* (Simon, 1893) **comb. nov.** (transferred from *Sarascelis*). A key is provided for all Sri Lankan species. I conclude that many of the new species live in disturbed or vulnerable habitats and should be prioritised for conservation.

Keywords: taxonomy, systematics, biodiversity, Arachnida, India, Ceylon

INTRODUCTION

Palpimanidae Thorell, 1870 is a relatively small family of spiders consisting of 173 described species placed in 21 genera (World Spider Catalog, 2024). Platnick (1975) accurately described the family, which is summarised below. Palpimanids can be easily recognized by the reduced number of spinnerets and the greatly enlarged first legs. All segments of leg I are modified. Further, the coxa and trochanter are elongated (Platnick, 1975: fig. 9) and frequently bear dorsal tubercles. The femur I is usually expanded dorsally to twice the height of femora II through IV (Platnick, 1975: fig. 11). The patella is extremely elongated and usually longer than the tibia (Platnick, 1975: fig. 81). The tibia, metatarsus, and tarsus bear thick prolateral scopulae composed of spade-shaped setae that may be receptors (Platnick ,1975: figs. 11, 15, 16). The metatarsus is much shorter than in most other spiders, and rarely is as long as the tarsus, which is typically widened at the tip (Platnick, 1975: fig. 85).

The following three subfamilies are recognised in Palpimanidae: Palpimaninae Thorell, 1870 (Africa and Eurasia), Otiothopinae Platnick, 1975 (almost entirely Neotropical), and Chediminae Simon, 1893 (mainly Paleotropical). Chediminae includes taxa with closely spaced or touching lateral eyes (Palpimaninae have widely spaced lateral eyes) and with tegular sclerites (lacking in Otiothopinae). The palps of Chediminae and Palpimaninae bear, in addition to the embolus, an elaborate conductor and often other terminal accessory sclerites; the internal female genitalia of these groups often include divided spermathecae and other elaborations (Platnick, 1975). Excellent illustrations of typical forms of many Chediminae may be found in Jezequel (1964), Zonstein & Marusik (2020), and Zonstein & Marusik (2022).

Palpimanidae remains one of the least studied families of spiders (except in the neotropics), while also being one of the most striking in terms of morphological diversity observed across genera and species. Among other things, the low number of specialists worldwide makes documentation of diversity and understanding of morphological traits difficult. Palpimanidae was previously represented in Sri Lanka by only a single species, *Steriphopus macleayi* (O. Pickard-Cambridge, 1873). This species was originally described as *Pachypus macleayi* by O. Pickard-Cambridge (1873). A single species of *Boagrius* (*B. tenuisus* Sankaran, 2022) is currently known from India. Two species of *Palpimanus* (*Palpimanus vultuosus* Simon, 1897, *P. narsinhmehtai* Prajapati, Hun & Raval, 2021) are also known from India. However, recent fieldwork in Sri Lanka suggests that palpimanidae (after Oonopidae and Tetrablemmidae) is the 3rd most diverse family present in the leaf litter. The current paper primarily describes and illustrates new and old forms of the family from Sri Lanka.

MATERIALS AND METHODS

Spiders were collected by litter sifting, beating vegetation and hand collecting. The collected specimens were preserved in either 70% or 100% ethanol. Specimens preserved in 70% alcohol were examined using an Olympus SZX7 stereomicroscope. Male palps (left) were dissected and immersed in Methyl salicylate, slide mounted, observed and illustrated with the aid of a drawing tube attached to an Olympus BX51 compound microscope. Highly sclerotized or darker areas of palps are shaded with an HB pencil. Due to the scarcity of specimens, and the destructive nature of female endogyne preparation, I have avoided the examination of internal female genitalia. For the same reason the use of a scanning electron microscope, ideal for fully documenting the anatomy of these minute specimens was also avoided. Digital images of the specimens were taken with a Leica MC170 HD camera mounted on a Leica M205C stereomicroscope using the software package Leica Application Suite, LAS version 4.6.2 (Leica Microsystems Limited, Germany). Acquired image stacks of different depths (15 to 50 images per stack) were assembled using Helicon Focus (version 6, Helicon soft Ltd.) to create a single image with the entire specimen in focus. Species descriptions were done according to Platnick, (1975). All measurements are given in millimetres. Body length was measured as carapace length plus abdomen length (excluding spinnerets). Types and other specimens were borrowed and examined from the following institutions: Muséum National d`Histoire Naturelle, Paris, France (MNHN), and Hope Entomological Collections, Oxford University Museum of Natural History, Oxford, UK (OUMNH). All types of the new species are deposited in the National Museum of Sri Lanka, Colombo, Sri Lanka (NMSL). The non-type specimens are deposited in the National Institute of Fundamental Studies, Kandy, Sri Lanka (NIFS).

Using the same terminology for the same characters can be difficult if homology is unclear (Zonstein & Marusik 2022). As seen here and elsewhere proposed terms have to change when more taxa are discovered (Zonstein & Marusik 2022). In a partial revision of Palpimanidae by Platnick (1975) the terms embolus, tegular apophysis and conductor were used (see also Platnick, 1979; Platnick and Forster, 1984). Since, then various terms have been used to denote the same structures, often by the same authors (Marusik & Zonstein 2018; Sankaran 2022; Zonstein & Marusik 2017, 2020, 2022). Structures of the embolic division are named by the position, for example basal bulge, prolateral branch, or retrobasal projection. This makes the interpretation of homologies difficult in novel taxa. The embolus is unambiguously interpreted aided by the presence of the sperm duct that

runs through it. Thus, the abbreviations used here are an amalgamation of the above references.

Abbreviations: AE anterior eye row; ALE anterior lateral eyes; AME anterior median eyes; B bulb; Bb basal bulge; Cy cymbium; E embolus; Fe Femur; FR forest reserve; LE lateral eyes, Mt metatarsus; Pa prolateral arm of embolic division; PE posterior eye row; PLE posterior lateral eyes; PME posterior median eyes; Pp pointed process of Pa; Pt patella; Rb retrobasal projection of cymbium; Ta tegular apophysis; Tb, tibia; Ti intermediate branch of tegular apophysis; Tp prolateral branch of tegular apophysis; Tr tarsus; Va ventral arm of the embolic division.

RESULTS

Taxonomy

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757
Family Palpimanidae Thorell, 1870
Subfamily Chediminae Simon, 1893

***Boagrius* Simon, 1893**

Type species: *Boagrius pumilus* Simon, 1893, by original designation and monotypy, from Singapore.

Diagnosis: AMEs separated by at least half of the width of AME, thoracic fovea inverted u-shaped (bipartite thoracic fovea in Zonstein & Marusik (2020), bulb rounded. In all other oriental chedimine genera, AMEs separated by much less than half of the width of AME, possess an irregular pit-like thoracic fovea, a stouter femur I, and a better-developed leg scopula (Zonstein & Marusik, 2020).

Composition and distribution: *Boagrius* currently includes six named species: *B. pumilus* Simon, 1893 (♂♀, Malaysia (Peninsula), Singapore, Indonesia (Sumatra), *B. qiong* Lin and Li, 2022 (♂, China, (Hainan), *B. raffrayi* (Simon, 1893) **comb. nov.** (♂, Singapore), *B. silindui* **sp. nov.** (♂♀, Sri Lanka), *B. simoni* Zonstein & Marusik, 2020 (♂♀, Malaysia (Borneo) and *B. tenuisus* Sankaran, 2022 (♂♀, India).

Remarks. This genus was recently revised by Zonstein & Marusik (2020) enabling placement of the two species dealt with here.

***Boagrius silindui* sp. nov. (Figs 1A–D, 2A–D, 3A, B)**
LSID: urn:lsid: zoobank.org:act:A148B212-DDF5-4BA2-B6EA-09B0DC19F8FA

Type material: Holotype ♂ (IFS_Pal_008): Sri Lanka, North Central Province, Anuradhapura District, Padaviya, 56m, 08°48'00"N, 80° 45'00"E, 10 January 2012, in leaf litter, leg. N. Athukorala. Paratypes. ♀ (IFS_Pal_010): same locality and collection data as the holotype. 1♂, 1♀ (IFS_Pal_009, 011): same locality and collection data as holotype. Other material examined. 1♂ (IFS_Pal_003): Eastern Province, Ampara District, Padiyathalawa, 18 Km from Padiyathalawa, 120m, 07°23'42"N, 81°05'15"E, 09 February 2010, leg. S.P. Benjamin and S. Batuwita. 1♀ (IFS_Pal_007): North Western Province, Puttalum District, Wanatha Villu, 30m, 08°10'15"N, 79°52'30"E, 24 May 2010, leg. S.

Batuwita, N. Athukorala. 2♀ (IFS_Pal_012, 014): same locality as above, 10 August 2010, leg N. Athukorala. 1♂ (IFS_Pal_019): Central Province, Kandy District, Knuckles Range, Site 1, 07°17'11"N, 08°37'93"E, 19 February 2015, leg. N. Athukorala. 1♂, 1♀, (IFS_Pal_019-039): Matale District, Bowatenna, Reservoir area, 252m, 70°39'37"N, 80° 41'18"E, 10 February 2016, leg. S.P. Benjamin *et al.*, Hand collection in thick forest along the road.

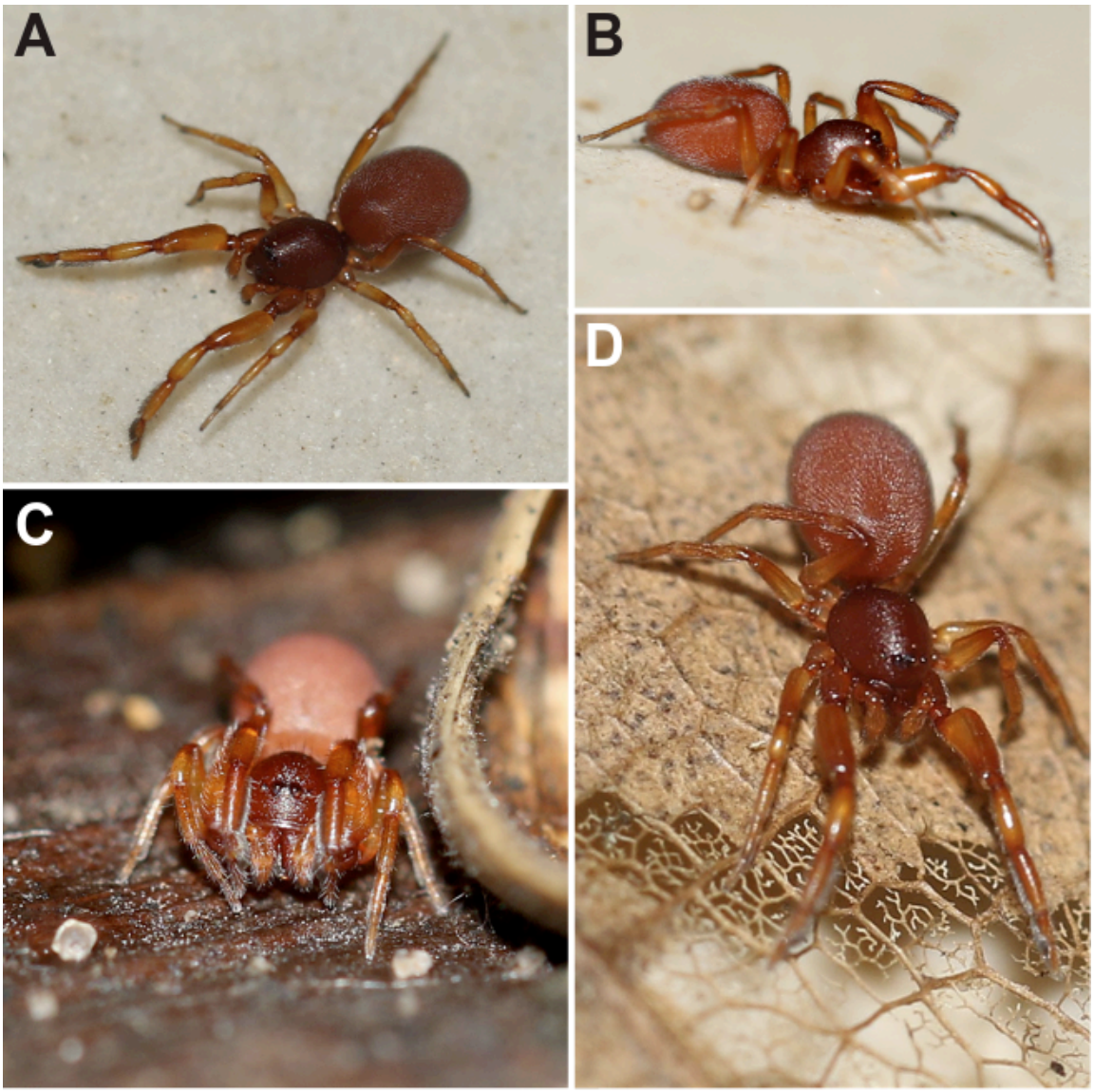

Figure 1 A–D. Photographs of live *Boagrius silindui* **sp. nov.** Female (A-D). from Ambalangoda, Sri Lanka. Specimen not preserved. Photos courtesy of Chathuri Jayatissa.

Diagnosis: Close to *B. tenuisus* Sankaran, 2022, from India, separated from it by details of the tegular apophysis: tegular apophysis (Ta) with a flat tip (arrow in 3A), prolateral and retrolateral branches equal in length, tip of prolateral branch hook-shaped. In *B. tenuisus* both arms of the tegular apophysis are tapered (Sankaran, 2022: fig. 6). In both *B. pumilus* and *B. simoni* the tegular apophysis does not have a prominent bifurcation (cf. Zonstein & Marusik 2020: fig. 4). Females might be separated by the pale yellow scutum that extends beyond the epigastral grove, see black arrow Fig. 2D.

Etymology: This species name, a noun in genitive case, is after Silindu the protagonist of the novel 'The Village in the Jungle' by Leonard Woolf, published in 1913, based on his experiences as a civil servant in Sri Lanka.

FIGURE 2 A–H. (A–D) *Boagrius silindui* **sp. nov.** (E–H) *Steriphopus punchimenikae* **sp. nov.** Male (A, B, E, F). Female (C, D, G, H). Dorsal view (A, C, E, G). Ventral view (B, D, F, H). Scale lines = 1.0 mm.

Description of holotype male: Total length 3.2: prosoma length 1.5, width 0.9; opisthosoma length 1.4, width 0.8. Prosoma reddish-orange with darkened border, sub oval, gently narrowed anteriorly, tuberculate, with numerous thin setae, fovea inverted u-shaped (Fig. 2A). Eight eyes in four groups, AE row moderately recurved, PE row moderately procurved, ALE and PLE contiguous, AMEs largest, AME, LE with dark rings, PME whitish, shiny, AME twice the diameter of ALEs, distance between AMEs 0.06. Clypeus height 3x width of AME. Chelicerae light-orange; proximal concavities absent; projections not visible; covered

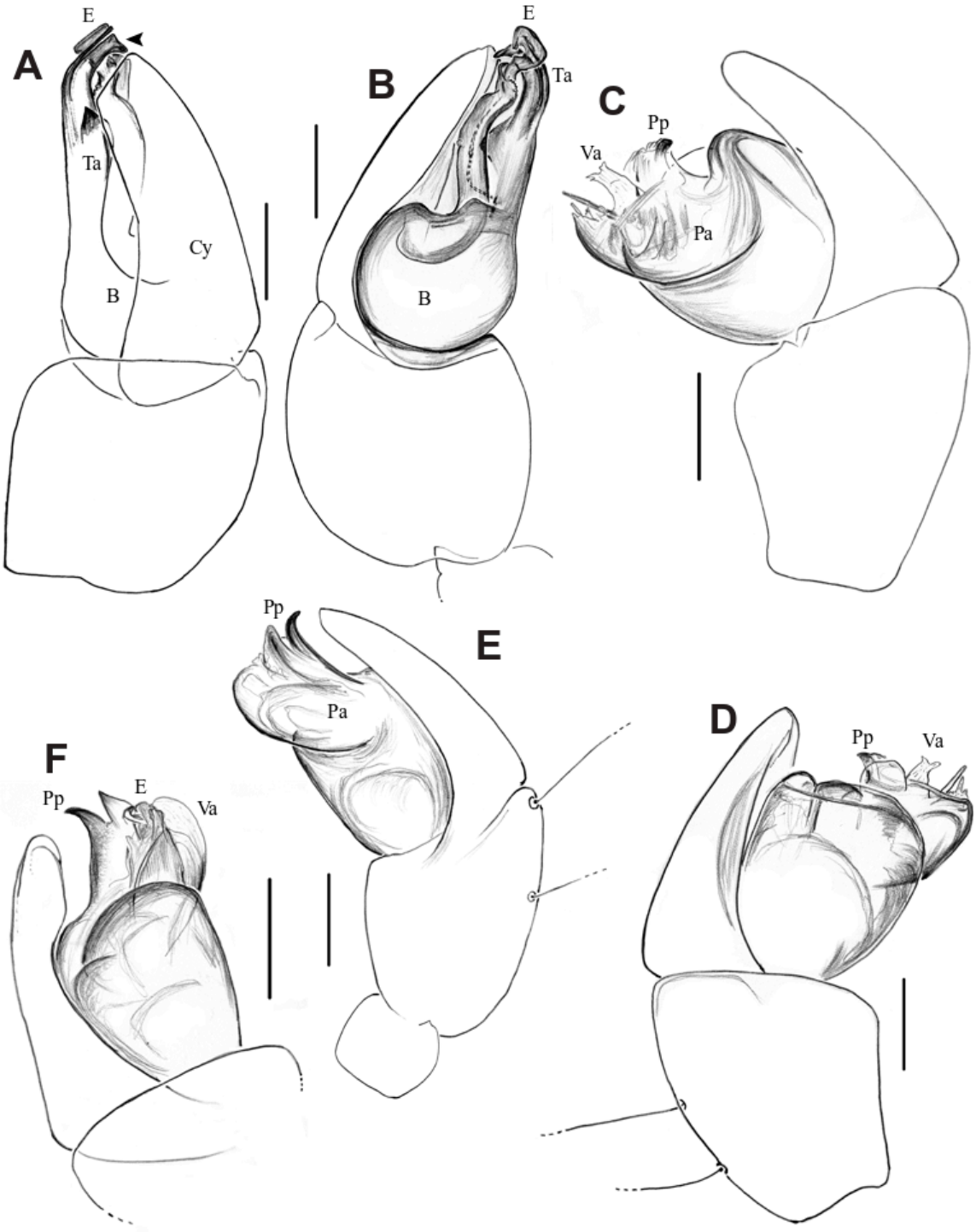

FIGURE 3 A–F. (A–B) *Boagrius silindui* **sp. nov.** (C–D) *Steriphopus punchimenikae* **sp. nov.** (E–F) *Steriphopus hinnihamiae* **sp. nov.** A, D, F, left palp, retrolateral view. B, C, E, same, prolateral view. Scale lines = 0.2 mm.

with setae; teeth not visible. Labium light reddish-orange, triangular, invaginated at tip. Endites orange, convergent, rounded distally, depressed along labium, with thick dark serrula at tip. Sternum orange, rebordered, extending around coxae II-IV, tuberculate not fused to petioles. Opisthosoma pale yellow with numerous dark setae; light yellow scutum extends beyond the petiole covering the anterior parts, see black arrow Fig. 2B. Two spinnerets, spinnerets and anal tubercle not surrounded by a sclerotized ring, preceded by

narrow tracheal spiracle. Leg formula 1423; Leg 1: Fe 0.3, Pa 0.6, Ti, 0.6, Mt 0.3, Ta 0.4. Anterior pair of legs light orange, other light yellow; legs without spines. Leg 1 with prolateral scopulae on Ti, Mt, and Ta; Ta with two claws and weak claw tufts; claw tufts reduced on leg I; Mt II-IV with distal preening combs. Palp with enlarged tibia, tegulum globose, embolic division longer than tegulum, with its elements extended distally (Figs 3A, B).

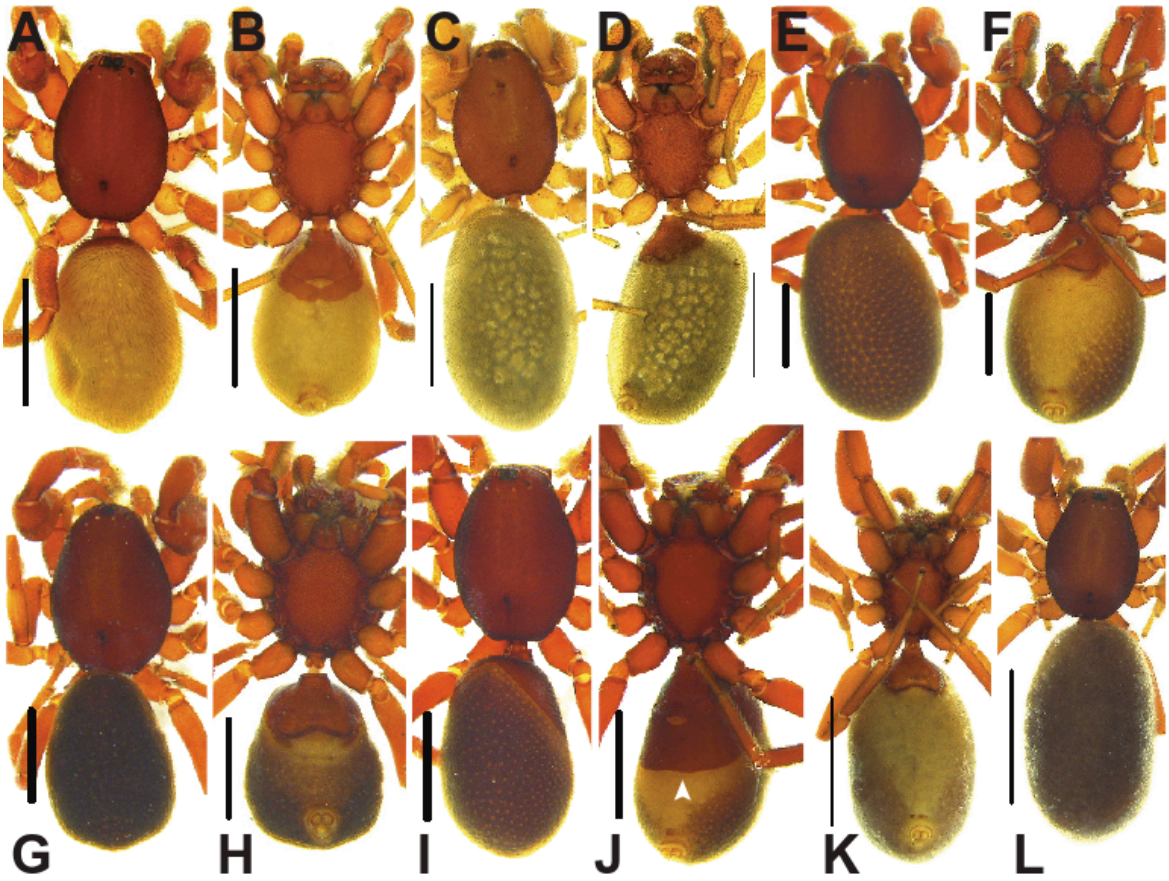

FIGURE 4 A–L. (A–D) *Steriphopus hinnihamiae* **sp. nov.** (E–H). *Steriphopus spiralus* **sp. nov.** (I–L). *Steriphopus woolfi* **sp. nov.** Male (A, B, E, F, I, J). Female (C, D, G, H, K, L). Dorsal view (A, C, E, G, I, L). Ventral view (B, D, F, H, J, K). Scale lines = 1.0 mm (A–J), 2.0 mm (K, L).

Description of paratype female (IFS_Pal_010): As in male except for the following: Total length 3.1: prosoma length 1.3, width 0.9; opisthosoma length 1.4, width 0.9. Opisthosomal scutum restricted to around petioles and epigastrict area (Fig. 2A). An additional pale yellow scutum is visible that extends beyond the epigastral grove, see black arrow Fig. 2D. Leg 1: Fe 0.5, Pa 0.2, Ti, 0.4, Mt 0.3, Ta 0.4. Internal genitalia not examined.

Distribution: Sri Lanka (North Central Province, Eastern Province, North Western Province, Central Province).

Steriphopus Simon, 1887

Pachypus O. Pickard-Cambridge 1873: 115. Junior homonym of *Pachypus* Dejean, 1821: 57 in Coleoptera, Scarabaeidae.

Steriphopus Simon 1887: 274 (replacement name for *Pachypus* O. Pickard-Cambridge 1873). Simon 1893: 404. Marusik & Zonstein 2018: 491.

Type species: *Pachypus macleayi* O. Pickard-Cambridge, 1873, by original designation.

Diagnosis: See Marusik & Zonstein (2018) for a detailed diagnosis. *Steriphopus* is distinguished from most other Palpimanidae genera by the compact distal portion of the bulb (Marusik & Zonstein 2018). It differs from *Hybosida* Simon, 1898 by the presence of 8 eyes, distance between AME–AME being half the diameter of AME, compact distal division of the bulb and the anterior median projections of the chelicerae in *Hybosida* (Platnick, 1979). Note that *Steriphopus hinnihamiae* **sp. nov.** has an embolic division that is probably convergently similar to that of *Hybosida lucida* Simon, 1898; distinguished from it and other *Hybosida* as given above (Platnick, 1979: fig. 7).

Composition and distribution: *Steriphopus* currently includes ten named species: *S. benjamini* Zonstein & Marusik, 2023 (♀, India), *S. crassipalpis* Thorell, 1895 (♂, Myanmar), *S. hinnihamiae* **sp. nov.** (♂♀, Sri Lanka), *S. lacertosus* Simon, 1898 (♀, Seychelles), *S. macleayi* (O. Pickard-Cambridge, 1873) (♂♀, Sri Lanka), *S. punchimenikae* **sp. nov.** (♂♀, Sri Lanka), *S. ritigalensis* **sp. nov.** (♂♀, Sri Lanka), *S. spiralus* **sp. nov.** (♂♀, Sri Lanka), *S. wangala* Kadam, Tripathi & Sankaran, 2024 (♀, India) and *S. woolfi* **sp. nov.** (♂♀, Sri Lanka).

Remarks: *Steriphopus macleayi* (O. Pickard-Cambridge, 1873) was redescribed by Marusik and Zonstein (2018) without direct examination of the type specimens. During the course of this study, I was able to secure a loan of the original type specimens for detailed examination. This investigation revealed that the specimens studied by Marusik and Zonstein (2018) are not conspecific with the original types of *S. macleayi*. The morphological discrepancies between these specimens and the type material have led to the conclusion that the specimens analysed by Marusik and Zonstein represent a distinct species. These findings are detailed below, where the newly identified species is formally described and named.

***Steriphopus hinnihamiae* sp. nov. (Figs 3E, F, 4A–D)**
LSID: urn:lsid:zoobank.org:act:DD30B2B7-84AE-40EF-95D7-17D9718B0C19

Type material: Holotype: ♂ (IFS_Pal_027): Sri Lanka, Uva Province, Monaragala District, Nilgala FR, 122m, 7011'08"N, 81°24'24"E, 23 January 2018, leg. S.P. Benjamin. Paratype. ♀ (IFS_Pal_026): same locality and collection data as the holotype. Other material examined. 1♂ (IFS_Pal_004): Eastern Province, Ampara District, Kokagala, 125m, 07°25'28"N, 81°13'27"E, 09 February 2010, leg. S.P. Benjamin and S Batuwita. 1♂ (IFS_Pal_0017): Uva Province, Badulla District, Diyaluma Falls, 660m, 06°43'57"N, 81°01'58"E, 04 July 2012, leg. S.P. Benjamin. 2♀ (IFS_Pal_028, 031): Monaragala District, Kataragama Peak, 06°23'20"N, 81°19'52"E, 23 November 2017, leg. S.P. Benjamin *et al.*

Diagnosis: Differs from other *Steriphopus* of Sri Lanka by the egg-shaped prolateral arm of embolic division (retrolateral view; rounded in other species) and the shape of the two short processes (Pp) on it (see Pa and Pp in Fig. 3E; longer in other species).

Etymology: This species name, a noun in genitive case, is after Hinnihami a deuteragonist of the novel 'The Village in the Jungle' by Leonard Woolf.

Description of holotype male: As in *B. silindui* **sp. nov.** (P. 3, above) except for the following. Total length 3.9: Prosoma length 1.4, width 0.9; Opisthosoma length 1.8, width 1 .1. Fovea irregular pit; distance between AMEs 0.04, chelicerae, endites and sternum

light-orange. Spinnerets and anal tubercle surrounded by a sclerotized ring. Leg 1: Fe 0.8, Pa 0.5, Ti, 0.6, Mt 0.3, Ta 0.4; all legs dark-orange. Palp with enlarged tibia, tegulum globose, with palpal elements relatively elongated, Ta truncate, origin of embolus not clear, probably surrounded by membranous supportive structures as in Figs 3E, F.

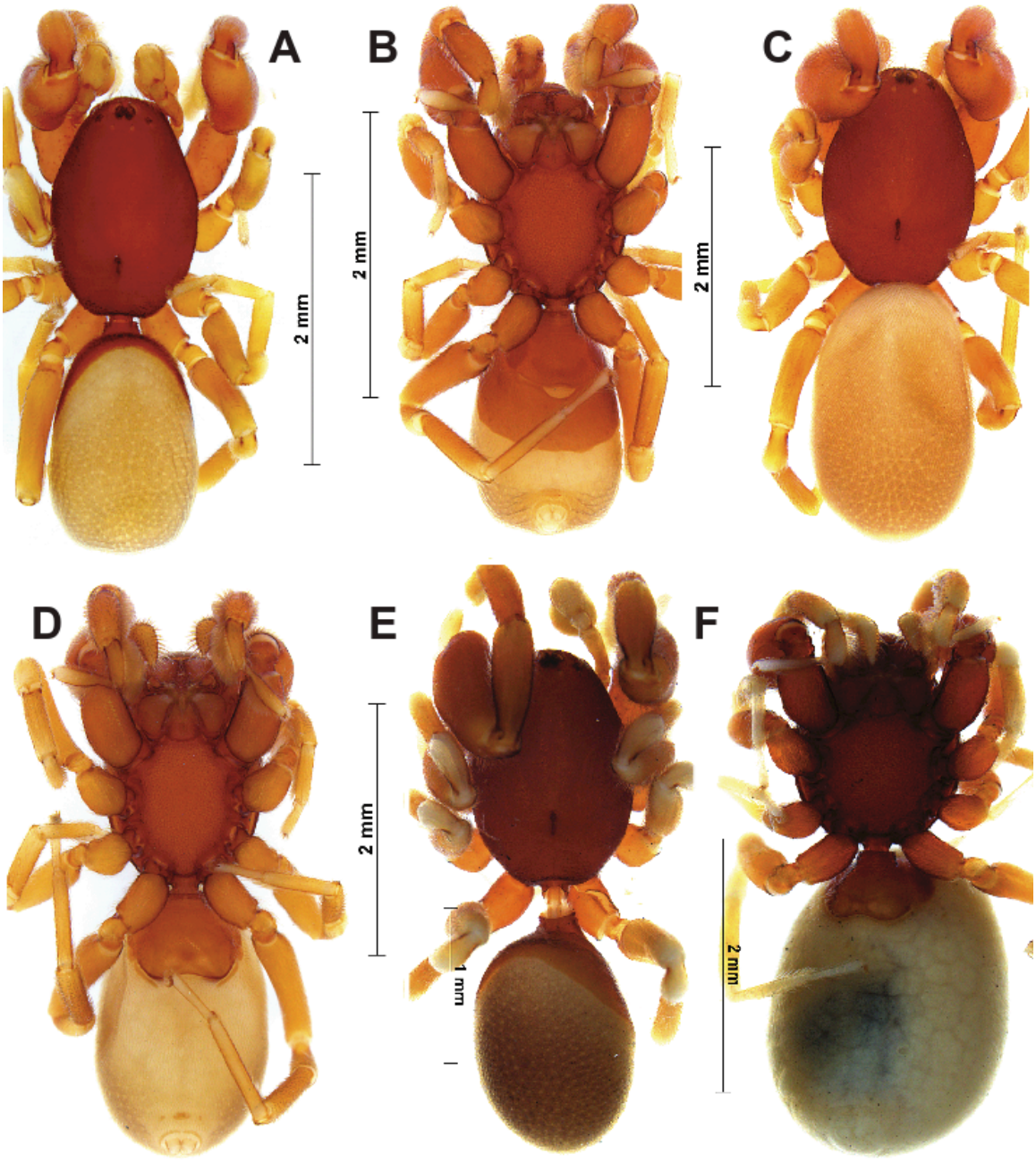

FIGURE 5 A–F. *Steriphopus macleayi* (O. Pickard-Cambridge, 1873). A–D. Syntypes (OUMNH). E, F, MNHN 15419. Male (A, B, E). Female (C, D, F). Scale lines = 1.0 mm (E), 2.0 mm (A–D, F).

Description of paratype female (IFS_Pal_026): Total length 2.9: Prosoma length 1.2, width 0.8; Opisthosoma length 1.4, width 1.0. Opisthomal scutum restricted to around petioles and epigastric area. Leg 1: Fe 0.8, Pa 0.5, Ti, 0.4, Mt 0.3, Ta 0.3. Epigastric region as in Fig. 4C. Internal genitalia not examined.

Distribution: Known from the Uva and Eastern Provinces of Sri Lanka.

***Steriphopus macleayi* (O. Pickard-Cambridge, 1873) (Figs 5A–F, 7C, D, 9E, F)**

Pachypus macleayi O. Pickard-Cambridge, 1873: 116, plate 16, fig 2.
Steriphopus macleayi Simon, 1887: 274.

Type material: Syntypes: 6♂ 6♀, Sri Lanka, leg. G.H.K.Thwaites, no more locality data given (OUMNH, examined).

Other material examined: 1♂ 1♀ 1 juv. Sri Lanka, Galle, Kandy, "Nahgale", no more locality data given (MNHN 15419).

Diagnosis: Close to *S. woolfi* **sp. nov.** and *S. punchimenikae* **sp. nov.** separated from them by the round bulb and the short compact embolic division. Prolaterally a screw-like conductor-embolus complex is visible at the tip (Fig 7D), which is absent in any other species of the genus.

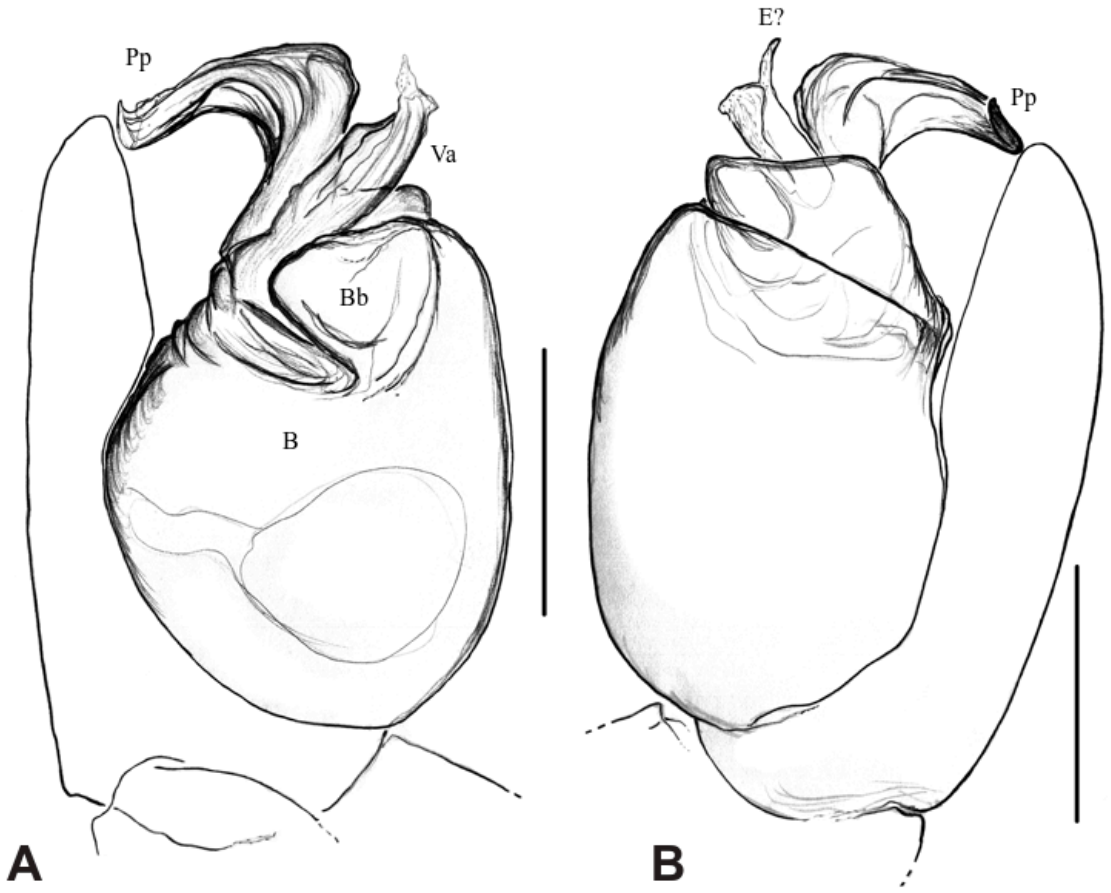

FIGURE 6 A–B. (A, B) *Steriphopus spiralus* **sp. nov.** A, left palp, retrolateral view. B, same, prolateral view. Scale lines = 0.2 mm.

Description of Syntype male: As in *B. silindui* **sp. nov.** (P. 3, above) except for the following. Total length 6.6: Prosoma length 3.0, width 2.1; Opisthosoma length 3.0, width 2.1. Fovea elongated, irregular pit; distance between AMEs 0.04, chelicerae, endites and sternum light-orange. Spinnerets and anal tubercle surrounded by a sclerotized ring. Leg 1: not measured; all legs dark-orange. Palp with enlarged tibia, tegulum globose, with palpal elements relatively short, membranous, origin of embolus not clear, probably surrounded by membranous supportive structures as in Figs 7C, D.

Description of Syntype female: Total length 8.4: Prosoma length 3.3, width 2.4; Opisthosoma length 5.1, width 3.3. Opisthomal scutum restricted to around petioles and epigastric area. Leg 1: Fe 0.8, Pa 0.5, Ti, 0.4, Mt 0.3, Ta 0.3. Epigastric region as in Fig. 5F. Internal genitalia not examined.

***Steriphopus punchimenikae* sp. nov. (Figs 2E–H, 3C, D)**
LSID: urn:lsid:zoobank.org:act:B2BB8B7E-832D-437D-95E1-EDF40F615C51

Type material: Holotype: ♂ (IFS_Pal_013): Sri Lanka, Uva Province, Badulla District, Ohiya, 1280m, 06°50'32"N, 80°53'05"E, 16 October 2011, leg. S.P. Benjamin; paratype 1♀ (IFS_Pal_006): same locality, 18 September 2009, leg. S. Batuwita.

Diagnosis: Close to *S. hinnihamiae* **sp. nov.** and *S. macleayi*. Separated from *S. macleayi* by the absence of the prolateral screw-like conductor-embolus complex tip (visible in Fig 7D) and from *S. hinnihamiae* **sp. nov.** by the oval prolateral arm of embolic division (Pa) and the shape of the two short processes (Pp) of the Va (see Pa and Va in Fig. 3C, D).

Etymology: This species name, a noun in a genitive case, is after Punchi Menika a deuteragonist of the novel 'The Village in the Jungle' by Leonard Woolf.

Description of holotype male: As in *B. silindui* **sp. nov.** (P. 3, above) except for the following. Total length 3.1: Prosoma length 1.3, width 0.9; Opisthosoma length 1.3, width 1.0. Fovea irregular pit; distance between AMEs 0.03, chelicerae dark-orange; endites light orange; sternum dark-orange. Scutum extends beyond the epigastric slit (Fig. 2F). Spinnerets and anal tubercle surrounded by a sclerotized ring. Leg 1: Fe 1.0, Pa 0.4, Ti, 0.6, Mt 0.2, Ta 0.4; all legs dark-orange. Palp with enlarged tibia, tegulum globose, with membranous palpal elements, flattened on the tegulum, embolus surrounded by membranous supportive structures as in Figs 3C, D.

Description of paratype female: Total length 3.8: Prosoma length 1.3, width 1.0; Opisthosoma length 1.8, width 1.2. Opisthomal scutum restricted to around petioles and epigastric area. Leg 1: Fe 1.2, Pa 0.4, Ti, 0.7, Mt 0.4, Ta 0.5. Internal genitalia not examined.

Distribution: Known only from the type locality.

***Steriphopus ritigalensis* sp. nov.**
LSID: urn:lsid:zoobank.org:act:13FF0CA7-3E7E-451D-9288-7B55EF7BF382

Steriphopus macleayi (O. Pickard-Cambridge, 1873): Marusik & Zonstein, 2018: 492, figs. 1–27 (misidentification).

Type material: Holotype: ♂ (no number): Sri Lanka, Central Province: Anuradhapura District, Ritigata Strict Natural Reserve, 8°07′02.5″N 80°39′58″E, hand collecting and litter sifting in shaded forest, 25 December 2011, leg. Y.M. Marusik; paratype 1♀: same locality and collection data as the holotype. Both types are deposited in the Manchester Museum, University of Manchester, UK. Not examined.

Diagnosis: Close to *S. spiralus* **sp. nov.** Separated from it by the shorter prolateral arm of embolic division and ventral arm of the embolic division (see figs 14–18: Zonstein & Marusik, 2018). The corresponding projecting elements of the embolic division in *S. spiralus* **sp. nov.** are longer (Figs 6A, B).

Etymology: This species name is an adjective in the nominative singular, after its type locality.

Description: See Marusik & Zonstein (2018).

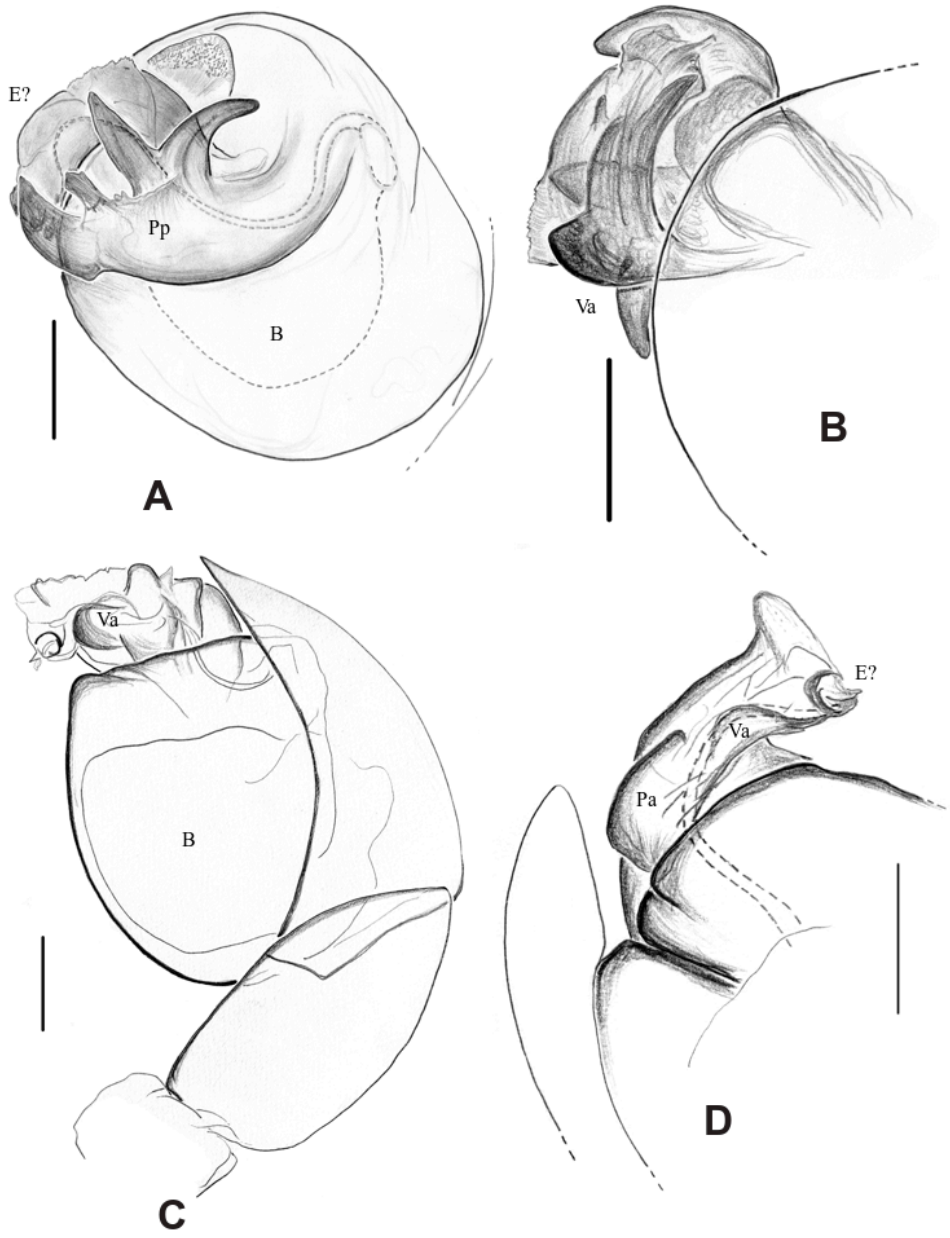

FIGURE 7 A–D. (A, B) *Steriphopus woolfi* **sp. nov.** (C, D) *Steriphopus macleayi* (O. Pickard-Cambridge, 1873). A, top view. B, C left palp, retrolateral view. D, same, prolateral view. Scale lines = 0.1 mm (B, D), 0.2 mm (A, C).

Remarks: This species is adequately illustrated and described by Marusik & Zonstein (2018) as *S. macleayi*. However, they failed to examine the type material of *S. macleayi*. My examination of the type material of *S. macleayi* listed above reveals that Marusik & Zonstein's redescription of *S. macleayi* was in fact based on material of an undescribed species which is described here.

Distribution: Known only from the type locality.

***Steriphopus spiralus* sp. nov. (Figs 4E–H, 6A–B)**
LSID: urn:lsid:zoobank.org:act:C0E05AD7-F881-4485-9F19-AAAA45626EB1

Type material: Holotype ♂ (IFS_Pal_020): Sri Lanka: *Central Province:* Kandy District, Deltota, Loolkondera Estate, 1480m, 70°08'45"N, 80°41'53"E, 15 September 2017, leg. N. Athukorala. Paratype. 1♀ (IFS_Pal_022): same locality and collection data as the holotype. Other material examined. 1♀ (IFS_Pal_001): same locality as the holotype, 23 March 2010, leg. S. Batuwita and P.M.H. Sandamali. 1♂ 2♀ (IFS_Pal_021, 023, 024): same locality and collection data as the holotype.

Diagnosis: Close to *S. ritigalensis* **sp. nov.** Separated from it by the longer prolateral and ventral arm of the embolic division (Figs 7A, B). The corresponding projecting elements of the embolic division in *S. ritigalensis* **sp. nov.** are shorter (see figs 14–18: Marusik & Zonstein, 2018).

Etymology: This species name refers to the spiral-like longer prolateral and ventral arm of the embolic division.

Description of holotype male: As in *B. silindui* **sp. nov.** (P. 3, above) except for the following. Total length 4.1: Prosoma length 1.5, width 1.1; Opisthosoma length 2.2, width 1.5. Fovea irregular pit; distance between AMEs 0.04, chelicerae, endites and sternum dark-orange. Spinnerets and anal tubercle surrounded by a sclerotized ring. Leg 1: Fe 0.7, Pa 0.4, Ti, 0.6, Mt 0.3, Ta 0.4; all legs dark-orange. Palp with enlarged tibia, tegulum globose, with palpal elements relatively elongated, Pp longest, spiraled, E membranous, origin not clear (Figs 6A, B).

Description of paratype female (IFS_Pal_022): As in male except for the following: Total length 3.1: Prosoma length 1.2, width 1.1; Opisthosoma length 1.9, width 1.3. Opisthosomal scutum restricted to around petioles and epigastric area. Leg 1: Fe 1.2, Pa 0.2, Ti, 0.4, Mt 0.3, Ta 0.4. Internal genitalia not examined.

Distribution: Known only from the type locality.

***Steriphopus woolfi* sp. nov. (Figs 4I–L, 7A, B)**
LSID: urn:lsid:zoobank.org:act:322A8FE5-2F00-46E1-ABE3-D7CF91829222

Type material: Holotype: ♂ (IFS_Pal_025): Sri Lanka, Central Province, Kandy District, Loolkondera Estate, Deltota, 1480m, 07°08'45"N, 80°41'53"E, 23 March 2010, leg. S. Batuwita and P.M.H. Sandamali. Paratype. ♀ (IFS_Pal_005), same locality as the holotype, 25 January 2011, leg. S.P. Benjamin & S. Batuwita. Other material examined. ♀, Kandy District, Meemure, 890m, 07°14'14"N, 80°38'19"E, 20 April 2010, leg. S. Batuwita (IFS_Pal_015). This female is relatively smaller than the paratype; provisionally placed here.

Diagnosis: Close to *S. ritigalensis* **sp. nov.** separated from it by the presence of four projections of the prolateral arm of embolic division (Figs 7A, B). Prolateral arm of *S. ritigalensis* **sp. nov.** without projection. The epigastric region as in Fig. 4K. Internal genitalia not examined.

Etymology: This species name, a noun in a genitive case, is after Leonard Sidney Woolf (25 November 1880 – 14 August 1969) the author of 'The Village in the Jungle' (1913). The novel was based on his experiences as a civil servant in Sri Lanka. He was married to author Virginia Woolf.

Description of holotype male: Male as in *B. silindui* sp. nov. (P. 3, above) except for the following: Total length 3.6: Prosoma length 1.4, width 1.0; Opisthosoma length 1.7, width 1.1. Fovea elongated, slit-like; distance between AMEs 0.04, chelicerae, endites and sternum dark-orange; opisthosoma dark brown, setae relatively longer; spinnerets and anal tubercle surrounded by a sclerotized ring. A red brown scutum is visible that extends beyond the epigastric area, see white arrow Fig. 4J. Leg 1: Fe 0.9, Pa 0.5, Ti, 0.6, Mt 0.2, Ta 0.6; all legs dark-orange. Palp with enlarged tibia, tegulum globose, with palpal elements compact, resting on the apex of tegulum, Pp sclerotized, with four distal tooth-like projections, projections more or less of equal size, embolus membranous, origin not clear, probably surrounded by membranous supportive structures as in Figs 7A, B.

Description of paratype female (IFS_Pal_005): Female. As in male except for the following. Total length 5.4: Prosoma length 1.8, width 1.2; Opisthosoma length 1.8, width 0.3. Opisthosomal scutum restricted to around petioles and epigastric area. Leg 1: Fe 0.8, Pa 0.4, Ti, 0.7, Mt 0.4, Ta 0.5. Epigastric region as in Fig. 4K. Internal genitalia not examined.
Distribution and habitat. Known only from the type locality.

Notes on other palpamanids

***Boagrius raffrayi* (Simon, 1893) comb. nov. (Figs 8A–C, 9C, D, 11A–B)**

Sarascelis raffrayi Simon, 1893: 313.
Sceliraptor raffrayi (Simon, 1893): Sankaran, Tripathi & Kadam, 2024: 99, f. 3A-H. Erroneous transfer.
Sarascelis raffrayi Wood et al., 2024: 23 (transfer from *Sceliraptor* back to *Sarascelis*).

Type material: Holotype: ♂ (MNHN 13803): Singapore, no more locality data given examined).

Diagnosis: Close to *B. pumilus* and *B. simoni*, distinguished from them by the mesial cymbium flange (Rb), globose tegulum, straight and wide-tipped tegulum (Figs 9C, D, 11A, B).

Redescription of holotype male: Total length 12.6: Prosoma length 6.9, width 4.5; Opisthosoma length 6.6, width 2.7. Fovea inverted u-shaped. Distance between AMEs 0.08, chelicerae, endites and sternum light-orange. Leg 1: Fe 6.0, Pa 4.8, Ti, 4.2, Mt 1.8, Ta 1.8. Palp with enlarged tibia, cymbium with mesial flange, tegulum globose, with palpal elements relatively elongated, Ta well sclerotized, long, almost the length of tegulum, straight, tip wide, curved; origin of embolus not clear, probably surrounded by membranous supportive structures as in Figs 11A, B.

Female: Unknown.

Distribution: Singapore.

Remarks: The haphazard transfer of this species to a predominantly African genus: *Sceliraptor* Zonstein & Marusik, 2022 by Sankaran, Tripathi & Kadam, 2024 is rejected.

Fortunately, *Sceliraptor* was subsequently relegated to a junior synonym of *Sarascelis* based on molecular genomic data presented by Wood et al. (2024) while this paper was under peer review.
Wood et al. (2024) included three terminals each for *Boagrius* and *Sarascelis* in their analysis. All three terminals of *Boagrius* were from Asia, while all three of *Sarascelis* were from Africa. Aside from *S. namratae* (Pillai, 2006), which is most likely misidentified or misplaced, *Sarascelis* has not been recorded anywhere between the African continent and Singapore. Furthermore, extensive sampling conducted in Sri Lanka for this study also failed to detect the presence of this genus on the island. More importantly, all diagnostic characters of *Boagrius*, as outlined above, are present in *B. raffrayi*, thereby justifying its transfer to this species.

***Palpimanus vultuosus* Simon, 1897 (Figs 10A–D, 11C, D)**
Palpimanus vultuosus Simon, 1897: 291.

Type material: Syntypes: 2♀ (MNHN 18546): India, Matheran, no more locality data given. (The vial also contained a male with a dissected left palp and the bulbus removed from the cymbium). Matheran is a hill station and a municipal council in the Raigad District in the Indian state of Maharashtra.

Diagnosis: Similar to *P. narsinhmehtai* Prajapati, Hun & Raval the only other known species of this genus from South Asia. Differ from it by the apical tip of the bulb which is longer and tapered in this species (Fig. 11D; shorter and flattened in *P. narsinhmehtai*, Prajapati Hun & Raval, 2021: fig. 18). Further, the proapical extension marked by an arrow in fig. 17 of Prajapati *et al.* (2021) is also absent in this species.

Description of male: Total length 15.9: Prosoma length 10.8, width 5.4; Opisthosoma length 9.6, width 6.0. Prosoma dark brown, conical, well sclerotized, wider towards an abrupt posterior margin, widest point posterior to the midpoint, posterior border rounded, with numerous thin setae, fovea not visible (Fig. 10C). Eight eyes, AE row procurved, PE row straight, ALE and PLE separate, AMEs largest, AME 4x the diameter of ALEs, distance between AMEs 0.02, ALE=PLE less than 0.5 times AME, PME whitish, shiny, distance between PME 9x diameter of PME. Clypeus height 1x width of AME. Chelicerae dark brown; proximal concavities absent; projections not visible; covered with setae; teeth not visible. Labium dark brown, triangular, invaginated at tip. Endites dark brown, convergent, rounded distally, depressed along labium. Sternum dark brown, rebordered, extending around coxae II-IV. Opisthosoma pale brown with dark brown spots and numerous dark setae; brown scutum extends beyond the petiole covering the epigastric region (Fig. 9D). Two spinnerets, spinnerets and anal tubercle surrounded by a fine sclerotized ring, preceded by narrow tracheal spiracle, surrounded a fine sclerotized ring. Leg formula 1423; Leg 1: Fe 6.0, Pa 4.5, Ti, 3.9, Mt 1.5, Ta 1.2. Anterior pair of legs dark brown, other lighter; legs without spines. Leg 1 with prolateral scopulae on Ti, Mt, and Ta; Ta with two claws and well-developed claw tufts; claw tufts reduced on leg I; Mt II-IV with distal preening combs. Palp, tibia smooth, bulb elongated, 1.5x tibia, anterior half of bulb partly membranous, terminating in a short prong, prong (sensu Prajapati *et al.* 2021) straight (Figs 11C, D).

Description of syntype female: As in male except for the following: Total length 18.6: Prosoma length 6.9, width 5.1; Opisthosoma length 12.6, width 7.5. Leg 1: Fe 4.8, Pa 3.3, Ti, 2.4, Mt 1.5, Ta 1.2. Epigastral grove as in Fig. (9B). Internal genitalia not examined.

Distribution: India.

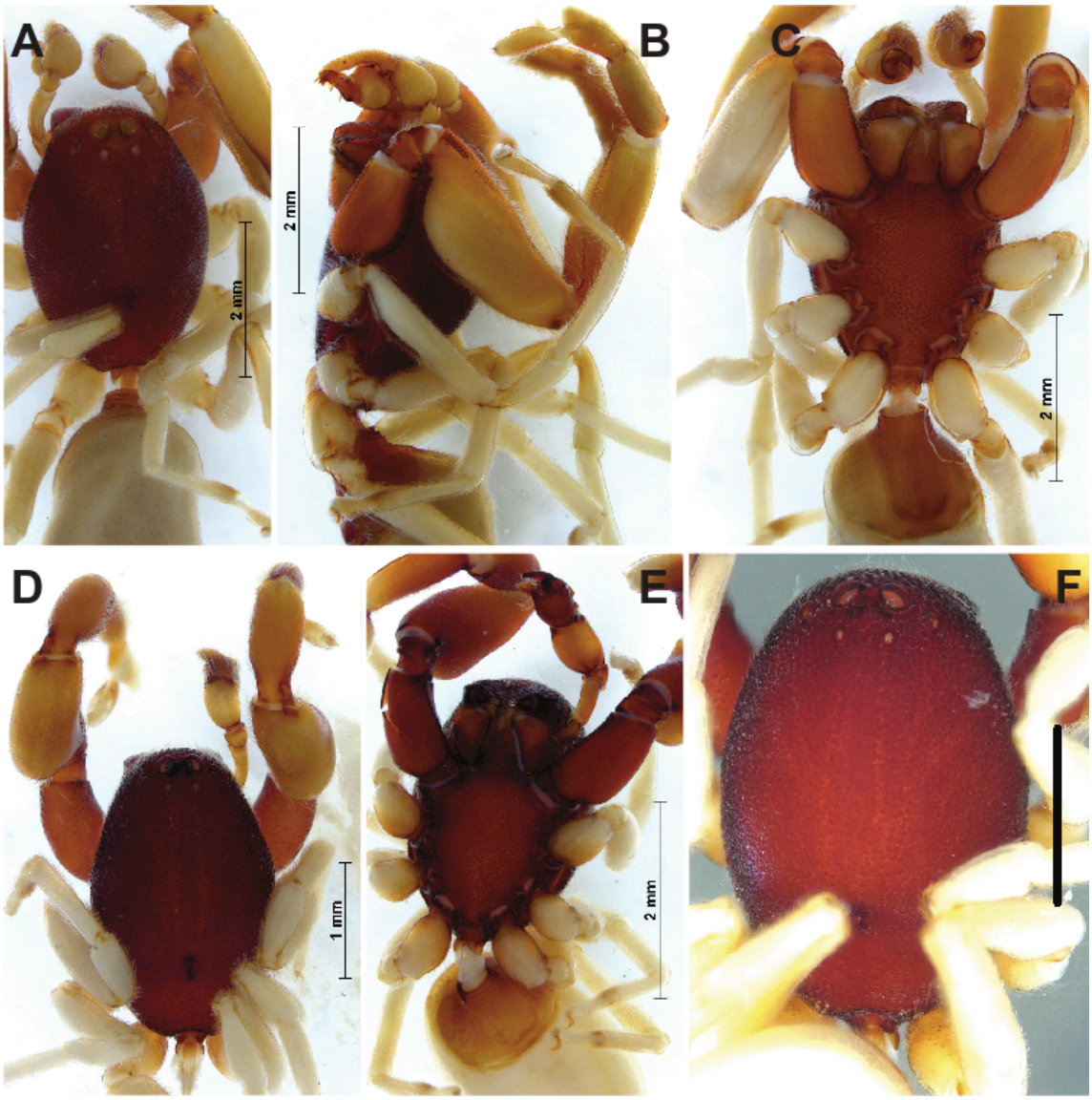

FIGURE 8 A–D. (A–C), *Boagrius raffrayi* (Simon, 1893) **comb. nov.** (D–F) *Sarascelis chaperi* Simon, 1887. Male (A–E). Female (F). Dorsal view (A, D, F). Lateral view (B). Ventral view (C, E). Scale lines = 1.0 mm (D), 2.0 mm (A–C, E, F).

***Sarascelis chaperi* Simon, 1887 (Figs 8D–F, 9A, B)**

Sarascelis chaperi Simon, 1887: 275.
Sarascelis chaperi: Simon, 1907: 241.
Sarascelis chaperi: Zonstein & Marusik, 2022: figs 25-26. Probably not conspecific, see remarks below.

Type material: Syntypes: 2 ♀. Label: Assine (Chaper) current day Republic of Côte d'Ivoire, on the southern coast of West Africa. 1 ♂ in the same vail as the two females. (left palp of the male was already dissected and the opisthosoma missing when I received the types). Deposited in MNHN. Examined.

Diagnosis: Separated from *S. chaperi* (sensu Zonstein & Marusik 2022: figs 25, 26), *S. junquai* Jézéquel, 1964, *S. lamtoensis* Jézéquel, 1964 and *S. rebiereae* Jézéquel, 1964 by the smooth, curved ventral margin (arrow in Figs 9A, B) and the smooth, tapered tip of the Ta (sharply bent at about midpoint, irregular margins, minute projection just before broad tip; Jézéquel, 1964: figs 7. 9. 11, Zonstein & Marusik 2022: figs 25, 26). Differs from

Scelidocteus vuattouxi Jézéquel, 1964 by the presence of a Ta that is shorter than B (longer in *S. vuattouxi*; Jézéquel, 1964: fig. 4, Zonstein & Marusik 2022: fig. 27). Differs from *Sceliraptor murphyorum* Zonstein & Marusik, 2022 by the unbranched Ta (branched in *S. murphyorum*; Zonstein & Marusik 2022: figs 28-30). See also Jézéquel (1964) for additional characters for the separation of these and other related species.

Description of male: Total length not measured: Prosoma length 5.1, width 3.0; Opisthosoma not measured. Prosoma reddish-orange with darkened border, sub oval, gently narrowed anteriorly, tuberculate, with numerous thin setae, fovea irregular slit (Figs 8D). Eight eyes in four groups, AE row moderately recurved, PE row procurved, ALE and PLE contiguous, AMEs largest, AME, LE with dark rings, PME whitish, shiny, AME twice the diameter of ALEs, distance between AMEs 0.1. ALE 2x PLE, PME whitish, shiny, distance between PME 3x diameter of PME. Clypeus height 3x width of AME. Chelicerae light-orange; proximal concavities absent; projections not visible; covered with setae; teeth not visible. Labium light reddish-orange, triangular, invaginated at tip. Endites orange, convergent, rounded distally, depressed along labium, with thick dark serrula at tip. Sternum orange, rebordered, extending around coxae II-IV, tuberculate not fused to petioles. Leg formula 1423; Leg 1: Fe 3.3, Pa 2.1, Ti, 1.8, Mt 0.9, Ta 0.9. Anterior pair of legs light orange, other light yellow; legs without spines. Leg 1 with prolateral scopulae on Ti, Mt, and Ta; Ta with two claws and weak claw tufts; claw tufts reduced on leg I; Mt II-IV with distal preening combs. Palp as in Figs 9A, B), with modified patella, enlarged, oval tibia, cymbum with mesial flange (Rb in Fig. 9B), oval tegulum, bottom widest, with elements extended distally, distal elements, fused, shorter than tegulum.
Female. As in male except for the following: Total length 11.4: Prosoma length 5.4, width 3.6; Opisthosoma length 5.1, width 3.6. Opisthosoma pale yellow with numerous translucent setae; Opisthomal scutum restricted to around petioles and epigastric area. Two spinnerets, spinnerets and anal tubercle, preceded by narrow tracheal spiracle, sclerotized rings not visible. Leg 1: Fe 3.6, Pa 3.0, Ti, 1.8, Mt 0.9, Ta 0.9. Internal genitalia not examined.

Remarks: The single male specimen from Gambia identified by Zonstein & Marusik (2022: figs 25, 26) as *Sarascelis chaperi* might be a new species, as it can be readily separated as per the diagnosis above. The types listed above were not examined for their study; see list of examined comparative material given in Zonstein & Marusik (2022: 257).

Distribution: Cote d'Ivoire.

Key to the male Palpimanidae of Sri Lanka (NB: females are currently indistinguishable without reference to their locality data)

1. AMEs separated by at least half of the width of AME, thoracic fovea inverted u-shaped, bulb rounded, other palpal elements longer than bulb (Figs 3A, B)….. *Boagrius silindui* **sp. nov.**

AMEs separated by much less than half of the width of AME, thoracic fovea irregular pit, bulb oval, other palpal elements shorter and compact than the bulb (Figs 3F, E)……2

2. Distal palpal elements elongated, Pp twisted (Figs 6A, B)….. *Steriphopus spiralus* **sp. nov.**

Distal elements much shorter, Pp not twisted……3

3. Distal extensions (Pp) of the Pa bends towards Cy (Fig. 3E) *Steriphopus hinnihamiae* **sp. nov.**

Pp and Pa straight 4

4. Pa membranous 5
Pa sclerotized, with two or more projections 6
5. Conductor-embolus complex with screw-like tip (Figs 7C, D) *Steriphopus macleayi* (O. Pickard-Cambridge, 1873)
Conductor-embolus complex tips separate, tapered (Figs 3C, D) *Steriphopus punchimenikae* **sp. nov.**
6. Pp with four projections, fovae elongated (Figs 7A, B) *Steriphopus woolfi* **sp. nov.**
Pp with three projections, fovea shorter *Steriphopus ritigalensis* **sp. nov.**

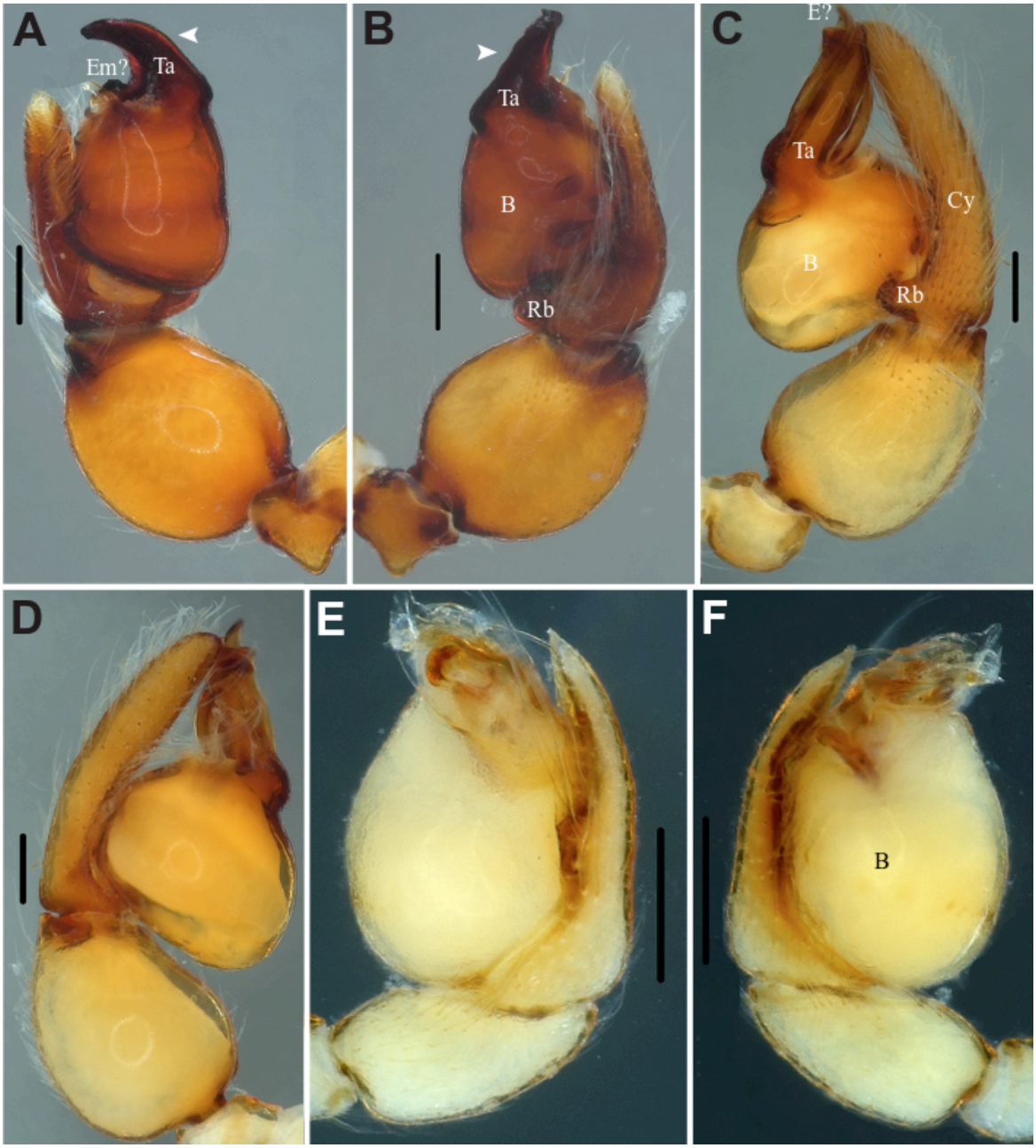

FIGURE 9 A–D. (A, B) *Sarascelis chaperi* Simon, 1887. (C, D) *Boagrius raffrayi* (Simon, 1893) **comb. nov.** (E, F) *Steriphopus macleayi* (O. Pickard-Cambridge, 1873). prolateral view (A, D, F). Retrolateral view (B, C, E). Scale lines = 0.2 mm.

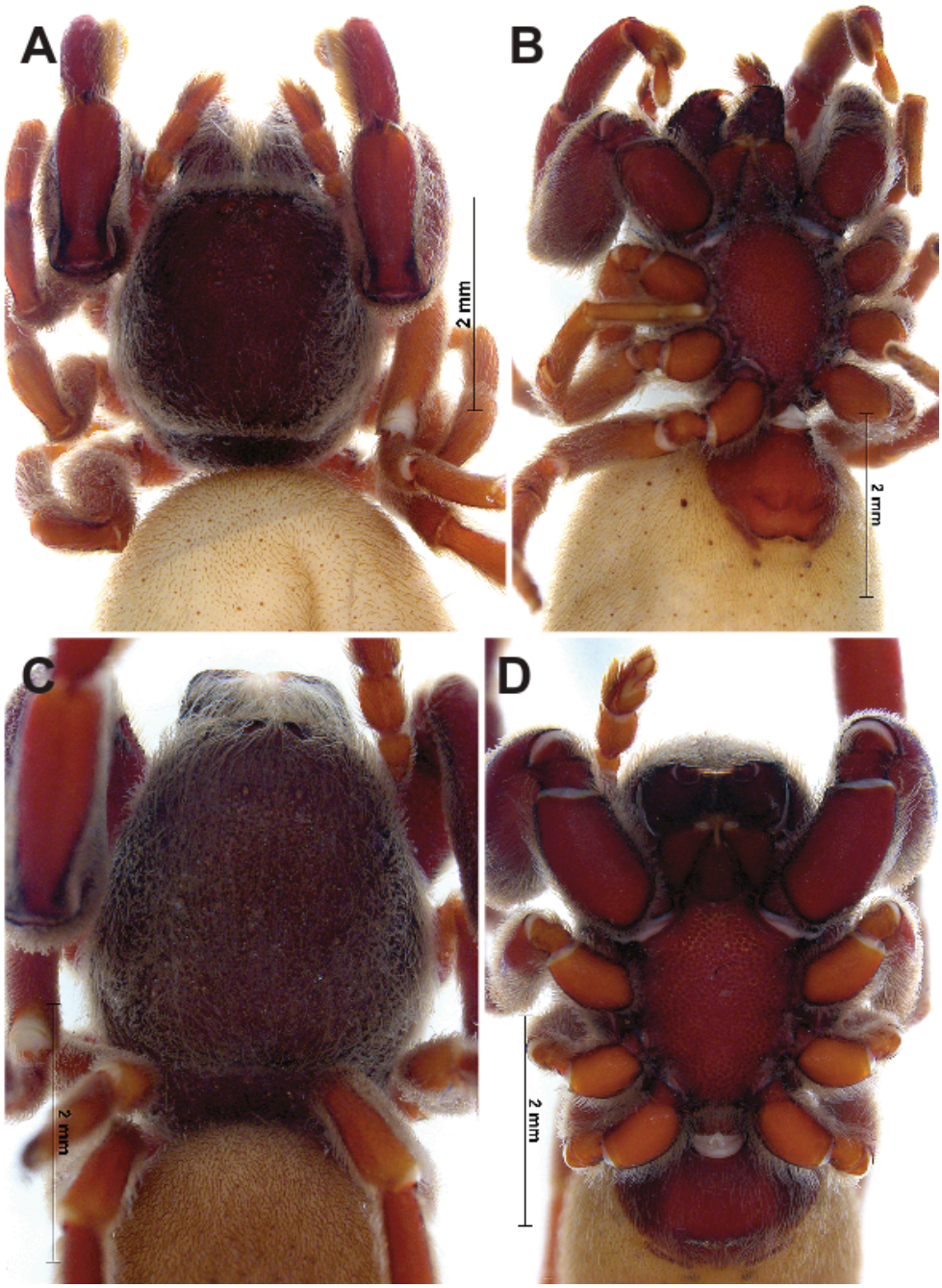

FIGURE 10 A–D. *Palpimanus vultuosus* Simon, 1897. Female (A, B). Male (C, D). Dorsal view (A, C). Ventral view (B, D). Scale lines = 2.0 mm.

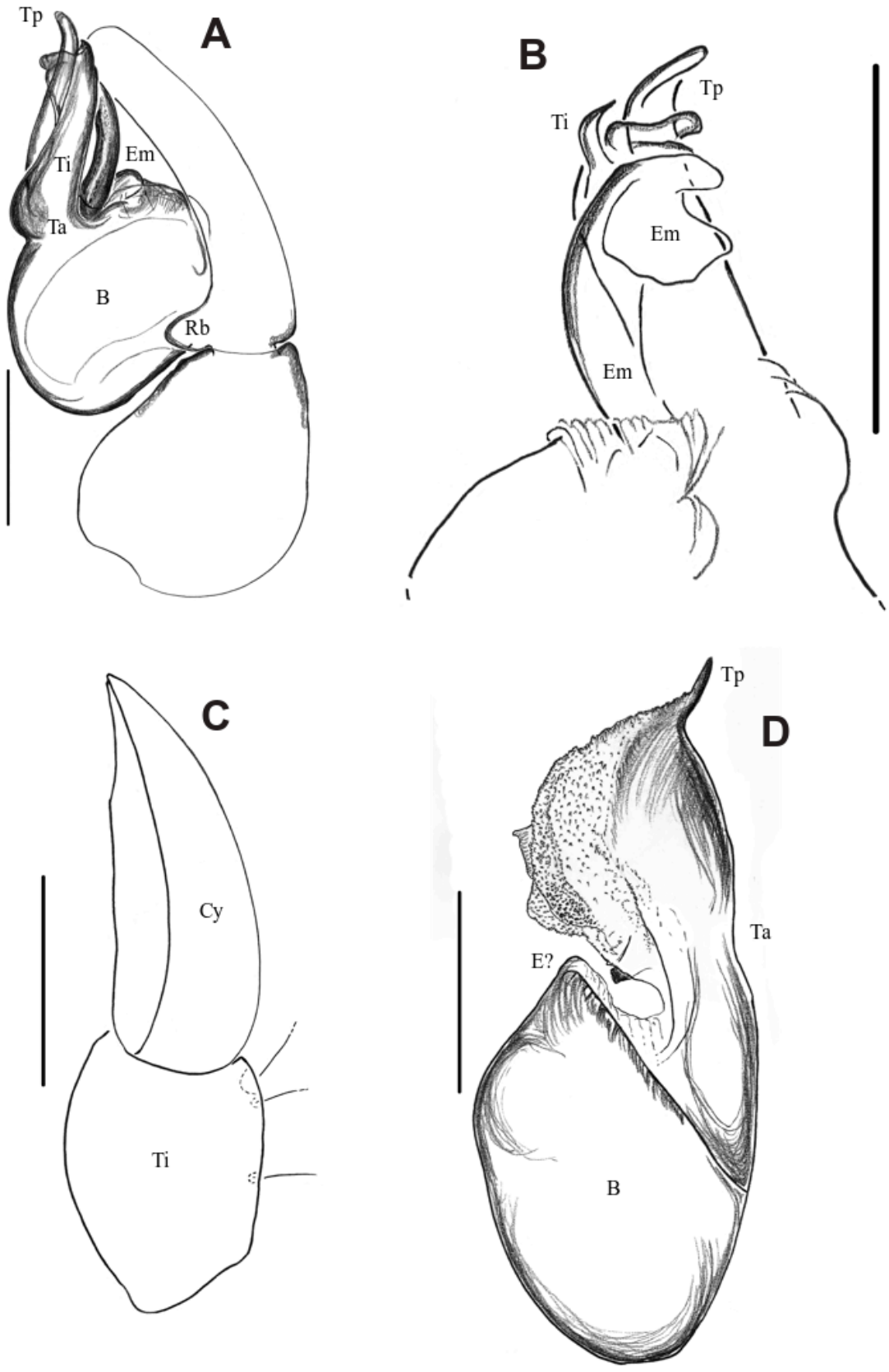

FIGURE 11 A–D. (A, B) *Boagrius raffrayi* (Simon, 1893) **comb. nov.** (C, D) *Palpimanus vultuosus* Simon, 1897. Left palp, retrolateral view (A). same, prolateral view (B–D). Scale lines = 0.4 mm.

DISCUSSION

This study updates the taxonomy of four Old World Palpimanidae genera and describes six new species from Sri Lanka. *Steriphopus*, which currently contains ten known species, seems to be the most diverse genus in the Oriental region. Palpimanidae was previously represented in Sri Lanka by only a single species, *S. macleayi*. This again highlights the extremely diverse spider fauna of the island. A similar serendipitously high diversity was found in other recently studied spider families: Oonopidae (Ranasinghe & Benjamin, 2018a, 2018b) Tetrablemmidae (Benjamin, in prep.), Pholcidae (Huber, 2019; Huber and Benjamin, 2005), Salticidae (Benjamin, 2010; Benjamin & Kanesharatnam 2016; Kanesharatnam & Benjamin 2019; Bopearachchi & Benjamin, 2021; Satkunanathan & Benjamin, 2022), Theridiidae (Tharmarajan & Benjamin, 2022), and Thomisidae (Ileperuma-Arachchi & Benjamin, 2019).

Palpimanus vultuosus and *P. narsinhmehtai*, the only other known species of this genus from South Asia, probably should be transferred to *Tibetima* Lin & Li, 2020. This assessment is based on the comparison of the generic description of *Tibetima* with the syntypes of the first species; shared characters include tegular apophasis separated from the embolus, slightly curved, not bifurcated, embolus short, hook-shaped, with a membranous terminus. However, it is considered prudent to await the examination type specimens of *P. narsinhmehtai* prior to any taxonomic change.

Steriphopus punchimenikae **sp. nov.**, *S. ritigalensis* **sp. nov.**, *S. spiralus* **sp. nov.**, and *S. woolfi* **sp. nov.** are known from relatively few individuals and are restricted to mid and high-altitude cloud forest (900–1800 m) in the Central Province of Sri Lanka. Most known localities are within protected areas. Conservation status assessment using the IUCN criteria (IUCN, 2012) results in a recommendation of listing their status as vulnerable 'VU D2'. This is based on an estimated <20 km2 range and number of locations less than 5.

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