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Three new and notes on two other jumping spider species of the genus *Stenaelurillus* Simon, 1886 (Salticidae: Aelurillina) from the Deccan Plateau, India

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Abstract

We describe three new species of *Stenaelurillus* Simon, 1886 from the Deccan Plateau of India, and report on populations of *S. sarojinae* Caleb & Mathai, 2014 and *S. marusiki* Logunov, 2001. One of the new species, *S. shwetamukhi* Marathe, Sanap, & Maddison, **sp. nov.**, has black-and-white markings, characteristic of several other Indian *Stenaelurillus* species. The other two new species, *S. tamravarni* Marathe & Maddison, **sp. nov.**, and *S. vyaghri* Sanap, Joglekar, & Caleb, **sp. nov.**, are colourful and with fringed male abdomens, like several other Indian species including *S. sarojinae*. The population of S. sarojinae from Mysuru, Karnataka, shows colours distinct from the population at the type locality. The female of *S. marusiki* is described for the first time.

Key words: Aelurillines, biodiversity research, Deccan peninsula, new species, scrublands, species discovery, taxonomy

Introduction

Stenaelurillus Simon, 1886, a ground-dwelling genus of aelurilline jumping spiders distributed in the Afrotropical, Madagascan, and Indomalaya regions, includes 50 species currently, 14 of which are known from the Indian subcontinent (World Spider Catalog 2021). Our knowledge of the group is increasing rapidly in India, where most of the species, eight out of 10, have been described over the past decade (Ali *et al.* 2018; Biswas & Biswas 1992; Caleb & Mathai 2014; Caleb & Mathai 2016; Kanesharatnam & Benjamin 2020; Logunov 2020; Logunov & Azarkina 2018; Prajapati *et al*. 2016; Reimoser 1934; Sebastian *et al.* 2015; Simon 1886; Vidhel *et al.* 2015; World Spider Catalog 2021). Recent collecting is revealing new forms, even close to large urban areas, suggesting that there may be many more species yet to be described. In this paper, we add three new species to *Stenaelurillus* from the Indian states, Andhra Pradesh, Karnataka, and Maharashtra. We also report a geographic variant of *S. sarojinae* Caleb & Mathai, 2014 and a new population of *S. marusiki* Logunov, 2001 with the first description of the female for the species.

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Material and methods

The specimens examined here are deposited in the Research Collections at National Centre for Biological Sciences (NCBS), Bengaluru, Karnataka, India (http://collections.ncbs.res.in). Individual specimens are identified by three-digit NCBS voucher codes prefixed with "IBC-BP" or "NRC-AA-"; some are also identified by code numbers starting "AS19." or "DDKM21.". Codes beginning with "WPM#19-" indicate a collecting event of location and date, and thus may apply to more than one specimen.

Ethanol (80% or 95%) preserved specimens were examined under stereo microscopes and a compound microscope. A drawing tube attached to a Nikon ME600L compound microscope was used to prepare illustrations. Clove oil was used for clear viewing of epigyna after digesting the internal epigynal soft tissues with pancreatin. Living specimens were photographed with an Olympus OM-D E-M10 II camera with a 60 mm macro lens. Preserved specimens were photographed using an Olympus OM-D E-M10 II mounted on an Olympus SZX12 stereoscope (for bodies) and a Nikon D7000 mounted on a Nikon ME600L compound microscope (for copulatory organs). Photographs were stacked using Helicon Focus 7.6.6 Pro.

Descriptions are based on photographs of living specimens and ethanol preserved specimens. Carapace length was measured from the anterior base of median eyes to the posterior margin of the carapace. The abdomen was measured from its anterior edge to the posterior end of the anal tubercle. All the measurements are in millimetres. Abbreviations used here as follows: **AME,** anterior median eye; **ECP,** epigynal coupling pocket; **PME,** posterior median eye; **PLE,** posterior lateral eye; **RTA,** retrolateral tibial apophysis.

Taxonomy

Salticidae Blackwall, 1841

Tribe Aelurillini Simon, 1901

Subtribe Aelurillina Simon, 1901

Stenaelurillus Simon, 1886

Stenaelurillus Simon, 1886: 351.

Philotheroides Strand, 1934: 275 (type *Philotherus setosus* Thorell, 1895: 381) synonymized by Prószyński, 1984: 138 (by transfer of type species).

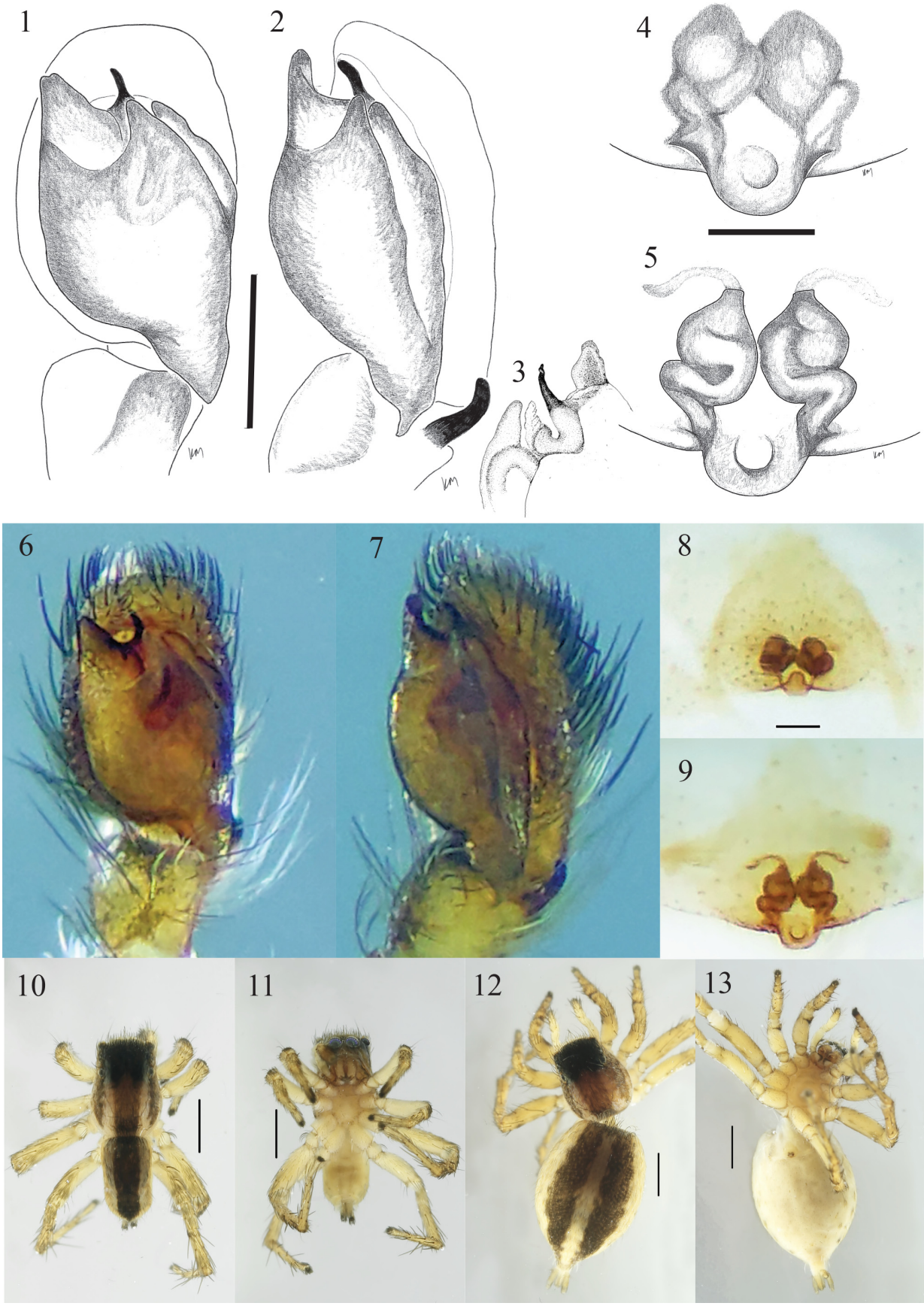
Microheros Wesołowska & Cumming, 1999 synonymized by Logunov & Azarkina, 2018: 4 (type *M. termitophagus* Wesołowska & Cumming, 1999).

Mashonarus Wesołowska & Cumming, 2002 synonymized by Logunov & Azarkina, 2018: 4 (type *M. guttatus* Wesołowska & Cumming, 2002).

Type species. *Stenaelurillus nigricaudus* Simon, 1886 (by subsequent designation by Simon (1903: 669)).

Diagnosis and definition. See Logunov and Azarkina (2018), whose terminology for components of the male palp we follow.

Remarks. No phylogeny has yet been proposed for *Stenaelurillus*, nor formal species groups, making it sometimes difficult to choose a focus of diagnostic comparisons for new species. As a provisional guide for identification, however, the species known from the Indian subcontinent can be sorted based on colour pattern. One set of species are primarily black and white, having a white male clypeus, striped carapace, abdomen (usually) with large white spots, and legs with a black background. These include *Stenaelurillus albus* Sebastian, Sankaran, Malamel & Joseph, 2015; *S. arambagensis* (Biswas & Biswas, 1992); *S. belihuloya* Logunov & Azarkina, 2018; *S. gabrieli* Prajapati, Murthappa, Sankaran & Sebastian, 2016; *S. jagannathae* Das, Malik & Vidhel, 2015; *S. mardanicus* Ali & Maddison, 2018; and *S. triguttatus* Simon, 1885. In contrast, a second set of *Stenaelurillus* in India are distinctive for having a male abdomen with lateral fringes, including *Stenaelurillus indicus* Logunov, 2020; *S. metallicus* Caleb & Mathai, 2016 and *S. sarojinae* Caleb & Mathai, 2014. These species also share a dark male clypeus, a colourful abdomen with spots smaller or absent, legs with a brown to orange background, and a palpal femur with a ventral process located distally near patella. One of the new species described below is among the black and white species, the others among the colourful fringed species. We also report on a new population of *S. marusiki*.



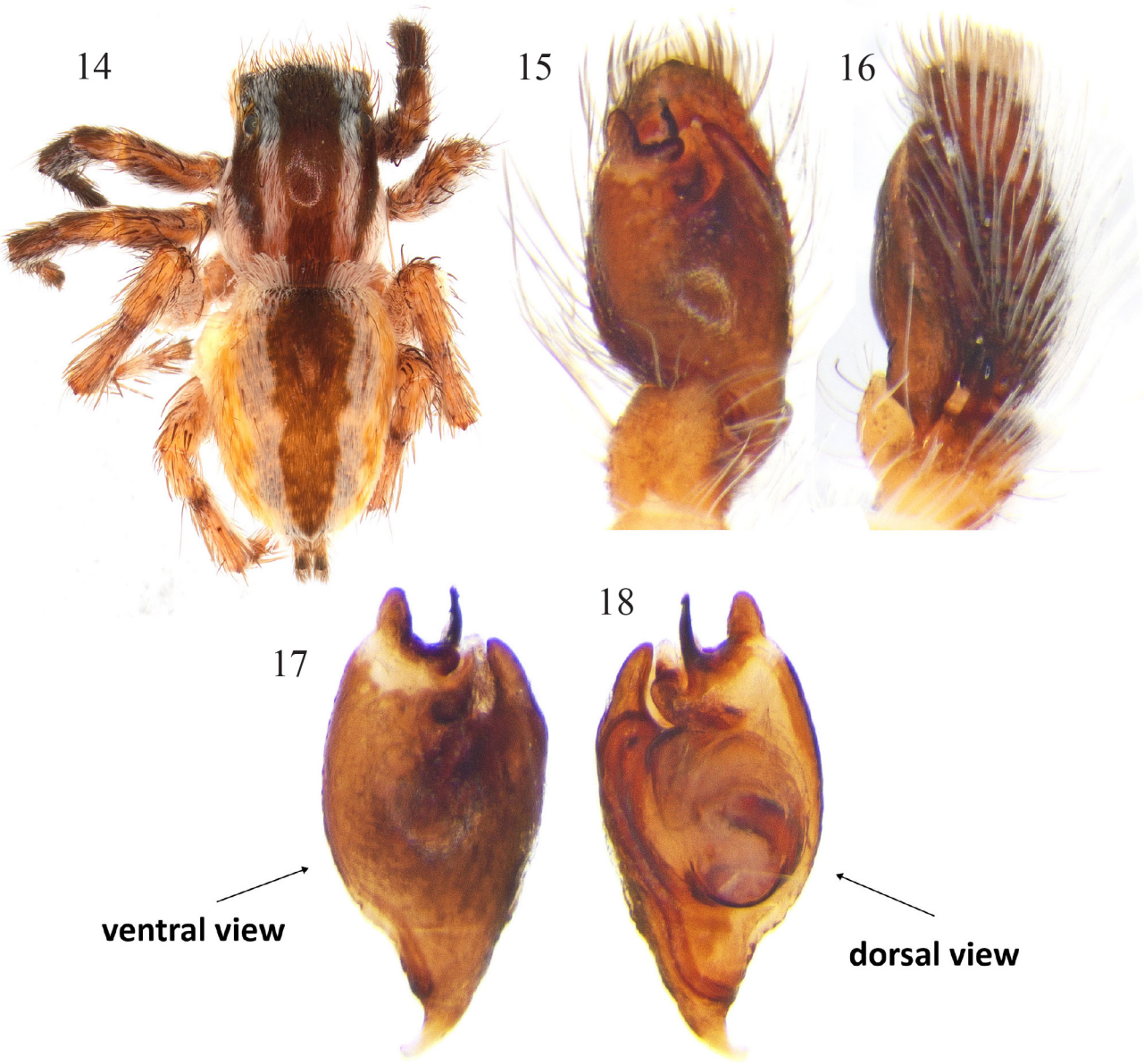
FIGURES 1–13. *Stenaelurillus marusiki*. **1, 6** male left palp, ventral view (NRC-AA-2067); **2, 7** same, retrolateral view; **3** embolus, dorsal view; **4, 8** epigyne, ventral view (NRC-AA-2072); **5, 9** vulva, dorsal view; **10** male, dorsal view; **11** same, ventral view; **12** female, dorsal view; **13** same, ventral view. Scale bars: 0.1 mm for genitalia and 1.0 mm for bodies.

***Stenaelurillus marusiki* Logunov, 2001**
Figs 1–27, 115

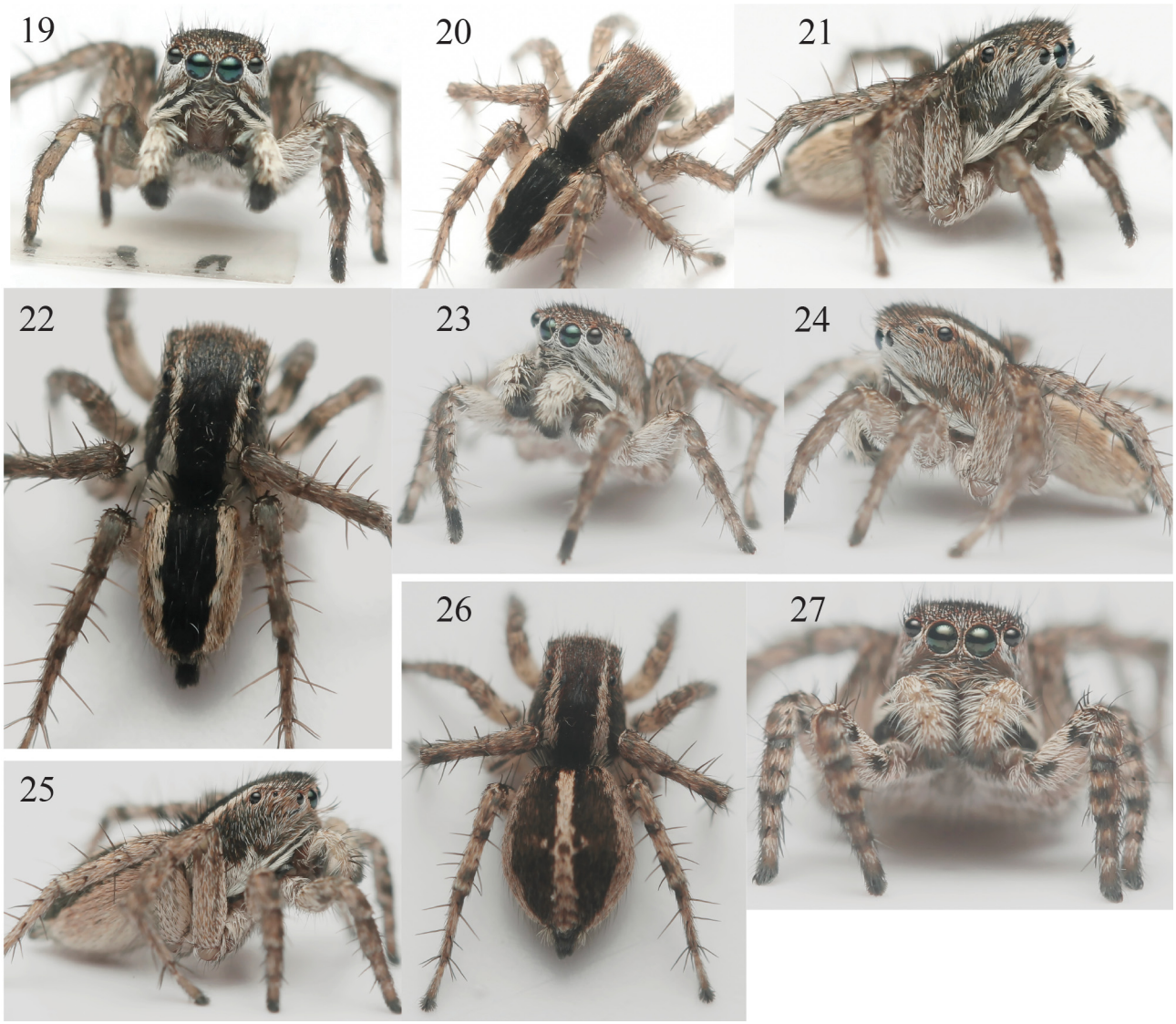
Stenaelurillus marusiki Logunov, 2001: 66, f. 27-30

Material examined. 5 ♂♂ & 3 ♀♀. INDIA: Maharashtra: Sinnar, 19.871°N 74.020°E, elev. 703 m asl, 2 July 2019, coll. R. Sanap & A. Joglekar. D. Logunov also kindly re-examined the holotype from Iran and provided images to us (Figs 14–18).

Geographic variation. This species, described by Logunov (2001) from Iran, is here reported from India. The male palps (Figs 14–18) are closely similar to those from Iran (Logunov 2001), but the distal process in the Indian population appears to be somewhat more conical and slightly higher than embolus, while that of the Iranian population is rounder and about as high as embolus (Figs. 1, 3 vs. Logunov 2001, fig. 29 and Figs. 15–18). The white stripes on the carapace are more limited in the Indian population, narrow and reaching forward only to the PMEs, while those of Iranian males are wide and reach to a broad white area behind the AMEs (Logunov 2001, fig. 30 and Fig. 14).



FIGURES 14–18. *Stenaelurillus marusiki.* **14** holotype, male, dorsal; **15, 17** male left palp, ventral view; **16** male left palp, retrolateral view; **18** male left palp, dorsal view. Photographed and figure prepared by Dmitri Logunov (Manchester Museum, UK).



FIGURES 19–27. *Stenaelurillus marusiki,* habitus photographs. **19–24** male; **25–27** female.

Although far from the Iranian type locality, we recognize the Indian population as *S. marusiki* in this study. The observed morphological differences between these two populations are slight, and variation in each population has not been thoroughly studied. However, a closer examination of morphology along with genetic evidence may eventually suggest otherwise, i.e., that these two populations are separate species.

Diagnosis. See Logunov (2001).

Description. *Male* (based on specimen NRC-AA-2067). Measurements: Carapace 1.99 long, 1.48 wide. Abdomen length 1.77, width 0.99. Leg measurements: I—2.40 (0.84, 0.41, 0.54, 0.34, 0.27); II—2.57 (0.91, 0.46, 0.50, 0.37, 0.33); III—4.50 (1.41, 0.67, 0.92, 1.11, 0.39); IV—4.50 (1.29, 0.56, 0.96, 1.19, 0.50). Leg formula III-IV-II-I. ***Carapace*** somewhat wider than abdomen. Anteriorly including ocular area black, covered with black scales and hairs, and brown medially. Two yellow longitudinal stripes running down behind PMEs. Two white bands along the lateral margins. ***Clypeus*** brown, covered with yellow hairs. ***Chelicerae*** vertical, narrow, brown. ***Palp*** (Figs. 1, 2, 3, 6, 7): Cymbium yellowish. Embolus short. Distal projection conical, about as high as embolus. RTA slightly curved with blunt tip. ***Legs*** mostly yellow with some black, sparsely covered with black scales. Tarsi I black. ***Abdomen*** with black median longitudinal band flanked by cream white stripes. Spinnerets yellow with dark brown apices.

Female (based on specimen NRC-AA-2072). Measurements: Carapace 1.95 long, 1.55 wide. Abdomen length 3.44, width 2.40. Leg measurements: I—2.55 (0.89, 0.46, 0.54, 0.40, 0.26); II—2.84 (1.04, 0.55, 0.54, 0.39, 0.32); III—5.38 (1.69, 0.86, 1.12, 1.27, 0.44); IV—5.19 (1.54, 0.66, 1.07, 1.35, 0.57). Leg formula III-IV-II-I. ***Carapace*** as

in male. ***Clypeus*** brown, sparsely covered with yellow hairs. ***Chelicerae*** as in male. ***Legs*** as in males. ***Abdomen*** with central cream white longitudinal band flanked by black area. Laterally creamish-white. Spinnerets yellow. ***Epigyne*** (Figs. 4, 5, 8, 9): ECP medially located on the triangular epigynal plate, deep, flanked by copulatory openings.

Natural history. *Stenaelurillus marusiki* shares its habitat with *S. vyaghri* **sp. nov.** in Sinnar, but *S. marusiki* is common during monsoon (July and August) while *S. vyaghri* **sp. nov.** appears during late winter and continue to be active throughout the summer. The spiders were often observed moving actively around open small grass tufts, but occasionally were found beneath small bushes.

Stenaelurillus sarojinae Caleb & Mathai, 2014

Figs. 28–51, 115.

Stenaelurillus sarojinae Caleb & Mathai, 2014: 64, f. 24–30. Holotype in Zoological Survey of India, Chennai, India; not examined.

Stenaelurillus sarojinae Caleb, Mungkung & Mathai, 2015: 12, f. 57–61, 63–81. Male in NCBS; not examined.

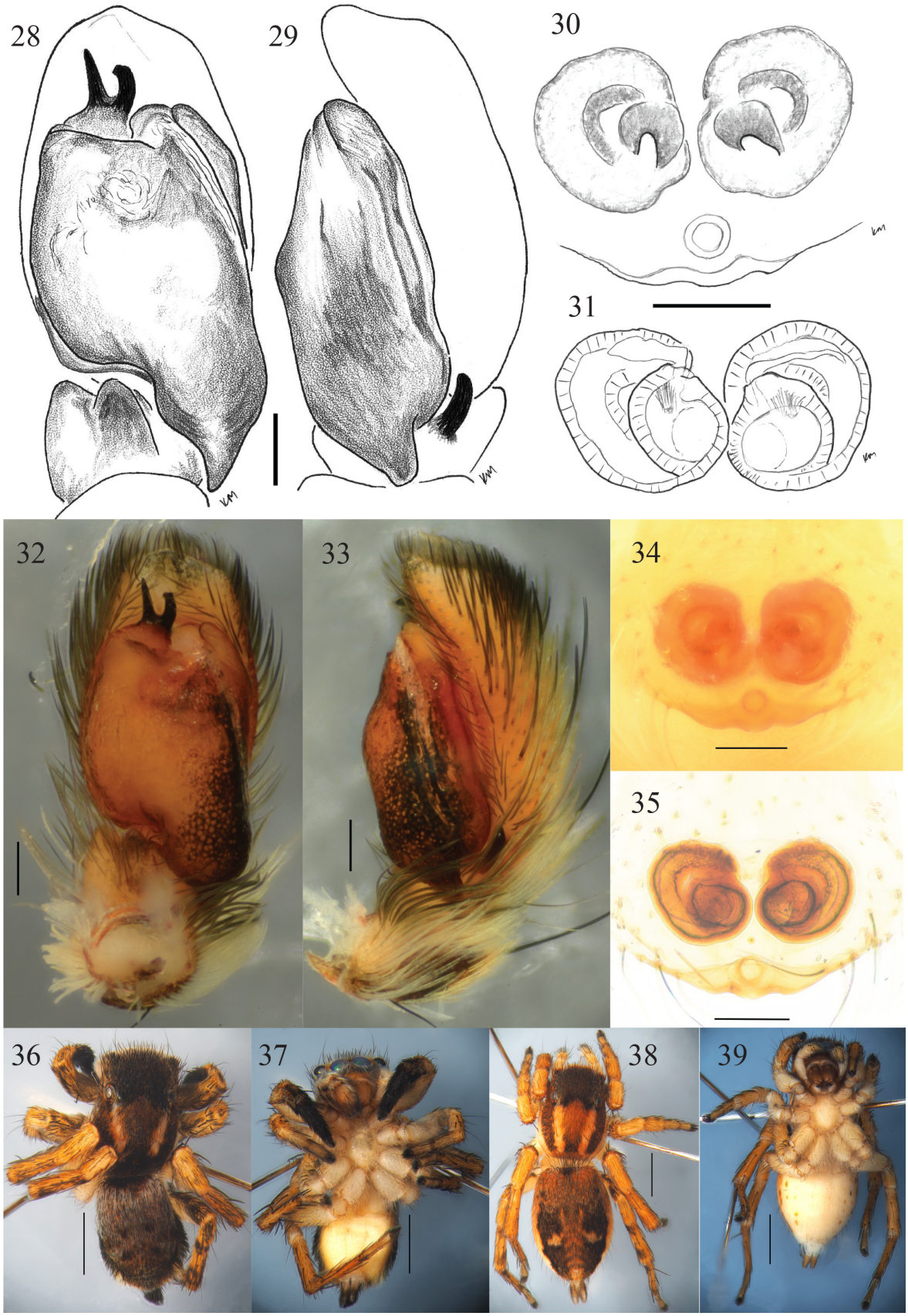
Material examined. 11 ♂♂ & 3 ♀♀. INDIA: Karnataka: Mysuru: south of Mysuru, grassland, 12.215 to 12.216 °N 76.625 °E, elev. 763 m asl, 4 July 2019, coll. K. Marathe, W. Maddison, S. Javagal, & Abhijith APC, WPM#19-104 and WPM#19-106.

Geographic variation. The Mysuru population differs in several respects from that at the type locality in Kadapa, about 400 km NE of Mysuru (Caleb & Mathai 2014; Caleb *et al.* 2015). Mysuru males have the dorsum of the abdomen a matte grey, made from a mix of bluish-grey and brown scales, with the balance shifting to dark brown in the posterior quarter. The four major muscle attachment points appear as dark spots. In contrast, Kadapa males have the posterior two-thirds of the abdomen covered uniformly with glossy dark metallic blue scales. Despite this striking difference in markings, the palpal structure is similar enough between these two populations that we are considering them geographic variants. *Females* of the Mysuru population are rusty coloured, especially the carapace and anterior end of the abdomen, and the white spots on the abdomen are rounder; in contrast, the Kadapa population appear to be brown coloured, and the white areas on the abdomen broader extending horizontally.

Diagnosis. Among the Indian *Stenaelurillus* with fringed-abdomen, *S. sarojinae* males uniquely have an embolic process, a bluish-grey or glossy metallic dark blue abdomen, and lateral abdominal fringes that are restricted to the posterior half. *S. sarojinae* females are similar to others in the groups in having a general drab appearance but pronounced longitudinal bands on the carapace, and a central chevron on the abdomen flanked with white spots medially separates females of this species from others.

Description. *Male* (based on specimen IBC-BP312/ DDKM21.009). Measurements: Carapace 1.63 long, 1.16 wide. Abdomen length 1.65, width 1.2. Leg lengths: I—3.2 (1.1, 0.5, 0.8, 0.5, 0.3); II—3.4 (1.2, 0.6, 0.8, 0.6, 0.3); III—5.6 (1.8, 0.4, 1.6, 1.3, 0.5); IV—4.5 (1.3, 0.5, 1.1, 1.0, 0.6). Leg formula: III-IV-II-I. ***Carapace*** narrow, about as wide as abdomen. Anteriorly black, covered with black scales and hairs, and rust coloured medially. Two yellowish-white longitudinal stripes running down behind PLEs. Two yellowish-white bands on lateral margins. ***Clypeus*** yellowish, sparsely covered with white hairs. ***Chelicerae*** vertical, narrow, yellowish-brown, sparsely covered with white hairs. ***Palp*** (Figs. 28, 29, 32, 33): Cymbium yellowish with some black. Embolus accompanied with apophysis (appears as a 2-prong fork). Tegular process round. Femur with a distally located ventral process. ***Legs*** robust, yellowish orange, except tarsus and metatarsus I black, and tibia I black below and dusky above. Legs covered with cream to orange scales, except first leg, with black setae under patella and more distally. ***Abdomen*** with black spot anteriorly with somewhat long black setae, rest covered with greyish-blue setae dorsally; four somewhat black spots medially located. Posterior edge fringed with black and yellowish setae. Spinnerets black.

Female (based on specimen IBC-BP313/ AS19.6591). Measurements: Carapace 1.38 long, 1.04 wide. Abdomen length 1.97, width 0.97. Leg lengths: I—3.2 (1.2, 0.6, 0.6, 0.4, 0.3); II—3.4 (1.3, 0.6, 0.6, 0.6, 0.4); III—6.2 (1.9, 0.9, 1.4, 1.3, 0.6); IV—5.2 (1.4, 0.6, 1.3, 1.3, 0.7). Leg formula: III-IV-II-I. ***Carapace*** slightly narrower than abdomen. Anteriorly dark brown, covered with black scales and hairs, white scales along PMEs and PLEs, remaining dominantly reddish-brown covered with black scales. Two white longitudinal stripes running down behind PLEs. Two white bands on lateral margins. ***Clypeus*** reddish brown, sparsely covered with white setae. ***Chelicerae*** as in males. ***Legs*** robust, yellowish orange, sparsely covered with black, orange, and white scales. ***Abdomen*** dominantly brownish black with medial longitudinal yellowish-brown chevron flanked by two white spots medially. Yellowish-white band on sides encompasses central brownish-black area. Spinnerets brownish black with white tips.



FIGURES 28–39. *Stenaelurillus sarojinae*, Mysuru population. **28, 32** male left palp, ventral view (IBC-BP312/ DDKM21.009); **29, 33** same, retrolateral view; **30, 34** epigyne, ventral view (IBC-BP313/ AS19.6591); **31, 35** vulva, dorsal view; **36** male, dorsal view; **37** same, ventral view; **38** female, dorsal view; **39** same, ventral view. Scale bars: 0.1 mm for genitalia and 1.0 mm for bodies.

FIGURES 40–51. *Stenaelurillus sarojinae*, Mysuru population, habitus photographs. **40–42** male (AS19.6479); **43** male (AS19.6532); **44–46** male (AS19.6532); **47–48** male (AS19.6544); **49–51** female (AS19.6583). Scale bars: 1.0 mm.

Epigyne (Figs. 30, 31, 34, 35): What we interpret as the ECP is small and circular, hidden in a sclerotized fold projecting over the epigastric furrow. Copulatory openings inverted U shaped, located anterior to ECP.

Natural history. *Stenaelurillus sarojinae* was locally common in open grassland, rarely in shaded areas, often actively moving amid grass tufts, on the dirt and on rocks. We (KM & Abhijith APC) noticed a male on a pebble lifting and shaking its fringed blue abdomen in a pose reminiscent of the mating displays of *Maratus* species (Girard

et al. 2011) and *Habronattus* species (e.g., Elias *et al*. 2012), raising the possibility that these and other *Stenaelurillus* may have complex courtship worthy of further investigation. The male was displaying, surprisingly, simultaneously to at least 5 females standing side by side, all of which were collected subsequently and found to be immature.

***Stenaelurillus shwetamukhi* Marathe, Sanap & Maddison, sp. nov.**
Figs. 52–72, 115.

Type material. INDIA: Andhra Pradesh: NW of Kuppam: Agastya Foundation campus, 12.825 to 12.826 °N 78.252 to 78.253 °E, elev. 800 m asl, 6 July 2019, coll. W. Maddison & K. Marathe, WPM#19-108. ***Holotype*:** ♂, IBC-BP287/ DDKM21.005. ***Paratypes***: 6 ♂♂ (IBC-BP289–IBC-BP291, IBC-BP297–IBC-BP299), 5 ♀♀ (IBC-BP288/ DDKM21.035; IBC-BP292; IBC-BP293/AS19.7059; IBC-BP-294–IBC-BP296).
Additional material. 2 ♂ from INDIA: Karnataka: Kamalapura: near Camp Shristi, 13.2166 °N, 77.1913 °E, elev. 885 m, 24 October 2019, coll. R. Sanap.

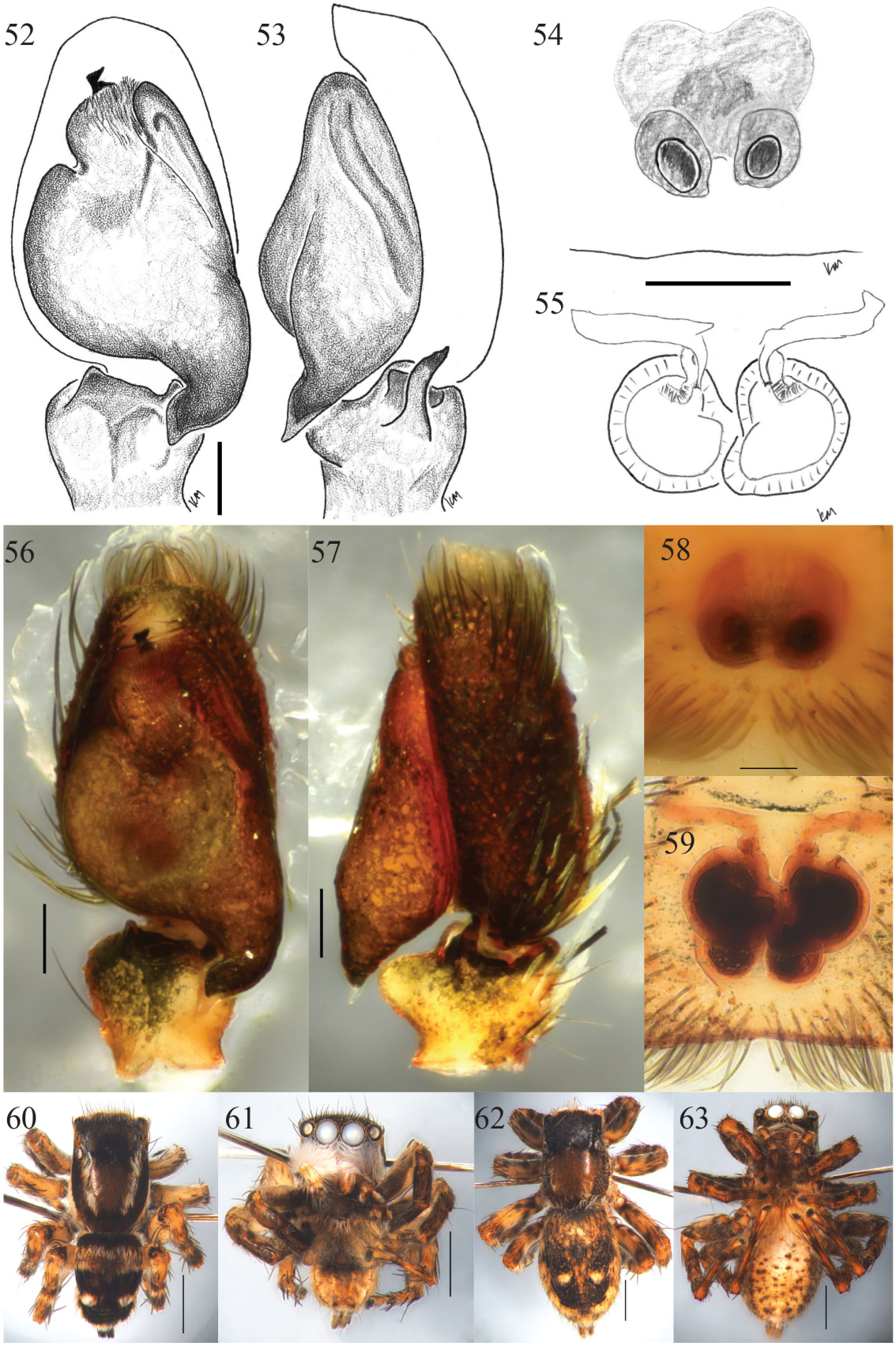
Etymology. The name is derived from Sanskrit, *shweta* meaning white, *mukhi* meaning faced, referring to the male's white face.

Diagnosis. One of the black and white species. A short, stout, hook-shaped embolus twisted retrolaterally near the pointy tip distinguishes *S. shwetamukhi* **sp. nov.** from other species, and most notably the similar *S. albus*, whose embolus is narrower, more extended, and with a blunt tip (Sebastian *et al.* 2015; figs. 2E, G). *S. shwetamukhi* **sp. nov.** differs from *S. albus* also in having prominent white spots on the male abdomen (*S. albus*, dark and spotless). *S. shwetamukhi* **sp. nov.** is also distinctive among the black and white species for the roundness of the TP, and the indentation on the prolateral edge of the salticid radix (at about 10 o' clock).

Description. *Male* (based on holotype, specimen IBC-BP287/ DDKM21.005). Measurements: Carapace 1.63 long, 1.12 wide. Abdomen length 1.43, width 0.95. Leg lengths: I—2.9 (0.9, 0.6, 0.6, 0.5, 0.4); II—3.2 (1.2, 0.5, 0.6, 0.5, 0.4); III—4.0 (1.1, 0.6, 1.0, 0.8, 0.5); IV—3.7 (0.9, 0.6, 0.9, 0.8, 0.5). Leg formula: III-IV-II-I. ***Carapace*** narrow, about as wide as abdomen. Anteriorly black, sparsely covered with orange scales and black hairs. Medially brown. Two longitudinal white stripes running back behind PMEs. Two broad white bands along lateral margins. ***Clypeus*** densely covered with white hairs. ***Chelicerae*** vertical, narrow, brownish, covered densely with white hairs just below the clypeus. ***Palp*** (Figs. 52, 53, 56, 57): Femur, patella, tibia yellowish covered with white and black hairs. Cymbium brownish, covered with white and black setae. Embolus short, hook shaped. RTA somewhat translucent and curved. ***Legs*** robust, brownish black, with the first two pairs darker, especially the first, which is fully black from patella to tarsus. Legs covered with patches of white, orange, and black scales. ***Abdomen*** with broad anterior white basal band dorsally extending posteriorly on sides to encompass black central area. Two white spots in posterior half. Spinnerets black.

Female (based on paratype, specimen IBC-BP288/ DDKM21.035). Measurements: Carapace 1.53 long, 1.08 wide. Abdomen length 1.91, width 1.28. Leg lengths: I—3.0 (1.3, 0.4, 0.4, 0.5, 0.5); II—3.3 (1.5, 0.5, 0.4, 0.5, 0.5); III—6.0 (1.7, 1.1, 1.2, 1.3, 0.8); IV—5.6 (1.6, 0.9, 1.0, 1.4, 0.8). Leg formula: III-IV-II-I. ***Carapace*** slightly narrower than abdomen. Anteriorly black, sparsely covered with brown hairs. Remaining brownish. Two longitudinal whitish-brownish stripes running down behind PLEs. Two narrow white bands on lateral margin. ***Clypeus*** with two narrow bands of white hairs. Orange scales around PMEs. ***Chelicerae*** vertical, narrow, brownish black. ***Legs*** robust, brownish black, covered with white and black scales. Femur I black prolaterally. ***Abdomen*** with narrow black area with white hairs and broad yellowish area more posteriorly. Yellowish-white band on sides to encompass central black area. Two creamy yellow spots located medially. ***Epigyne*** (Figs. 54, 55, 58, 59): No distinct ECP visible. Copulatory openings are round.

Natural history. *Stenaelurillus shwetamukhi* **sp. nov.** specimens in Kuppam were found on dry leaf litter in small depressions or on rocks in gully bottoms within dry scrubland habitat (Figs. 116–118). Unlike other aelurillines in the area, these were not found in direct sunlight, but in shade of trees. Where they were found in leaf litter, they were apparently beneath the litter, for they showed up on the surface only when the leaf litter was disturbed.



FIGURES 52–63. *Stenaelurillus shwetamukhi* **sp. nov. 52, 56** male left palp, ventral view (holotype IBC-BP287/ DDKM21.005); **53, 57** same, retrolateral view; **54, 58** epigyne, ventral view (paratype IBC-BP288/ DDKM21.035); **55, 59** vulva, dorsal view; **60** male, holotype, dorsal view; **61** same, ventral view; **62** female, paratype, dorsal view; **63** same, ventral view. Scale bars: 0.1 mm for genitalia and 1.0 mm for bodies.

FIGURES 64–72. *Stenaelurillus shwetamukhi* **sp. nov.**, habitus photographs. **64–68** male (AS19.6988); **69** male (AS19.7020); **70–71** female (AS19.7049); **72** female (AS19.7059). Scale bars: 1.0 mm.

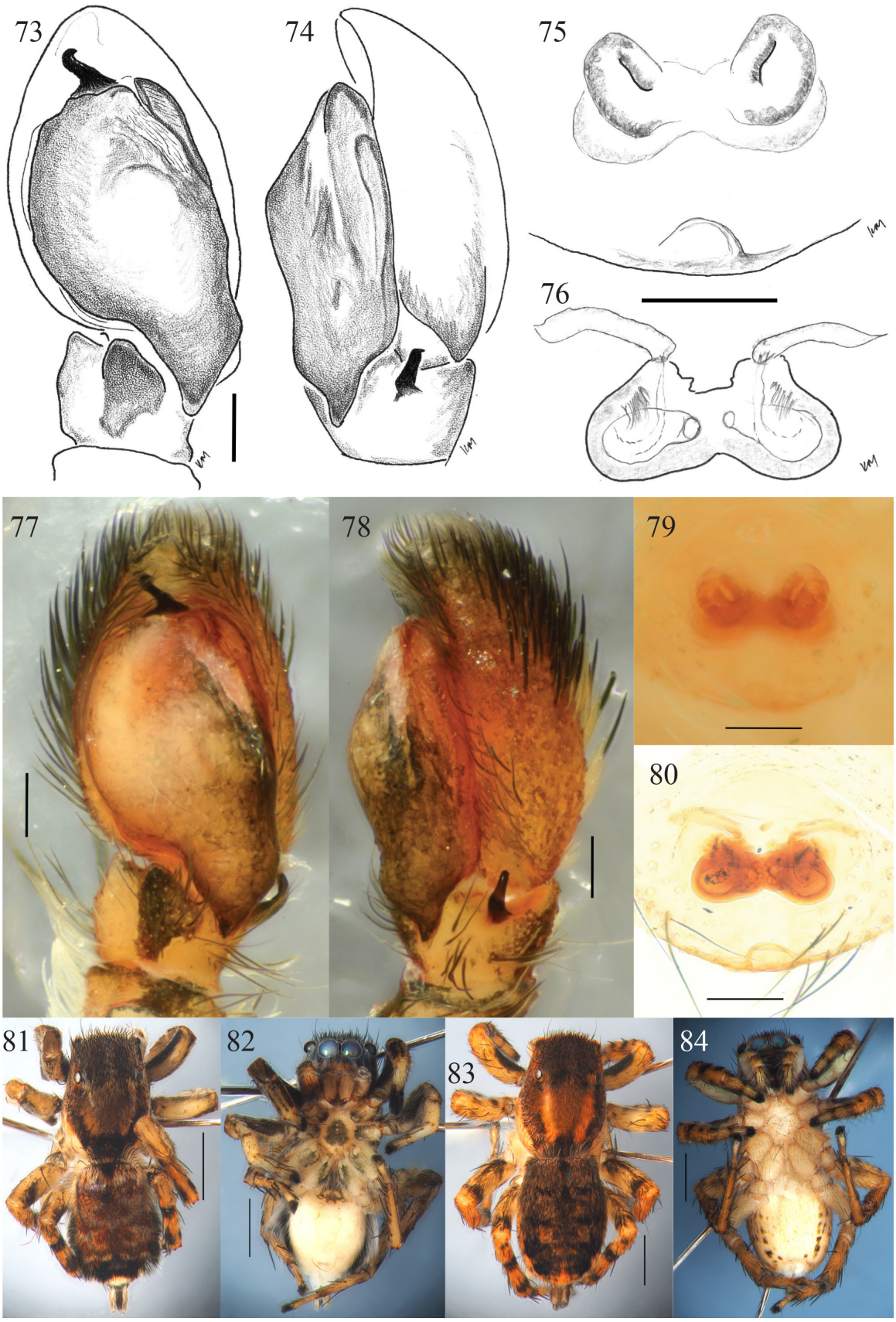
Stenaelurillus tamravarni Marathe & Maddison, sp. nov.

Figs. 73–93, 115.

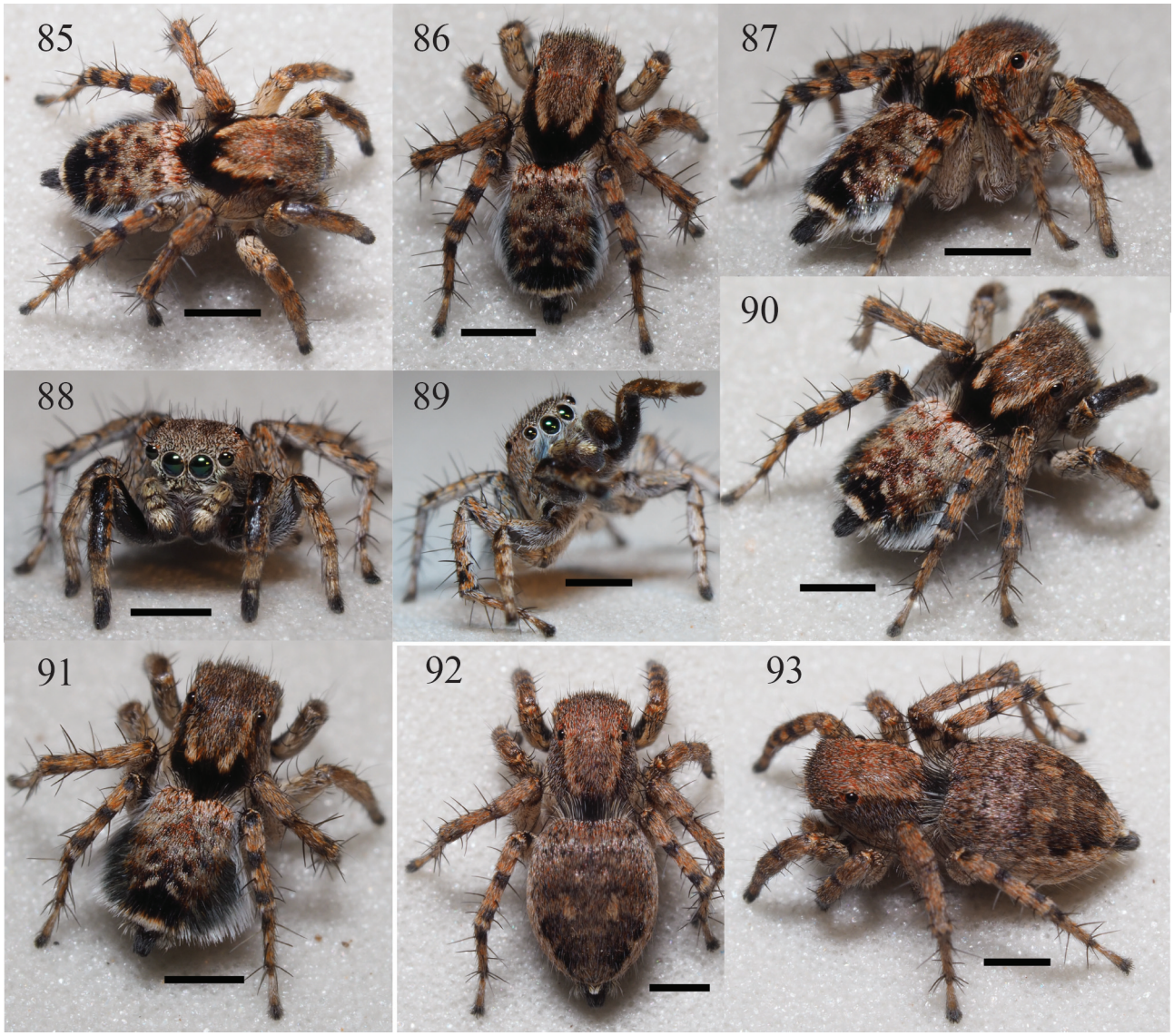
Type material. INDIA: Andhra Pradesh: NW of Kuppam: Agastya Foundation campus. 12.825 to 12.826 °N 78.252 to 78.253 °E, elev. 800 m asl, 6 July 2019, coll. W. Maddison & K. Marathe, WPM#19-108. ***Holotype*:** ♂, IBC-BP300/ AS19.6878. ***Paratypes*:** 9 ♂♂ IBC-BP302/ AS19.6907; IBC-BP304 AS19.6921; IBC-BP305/ DDKM21.003; IBC-BP306–IBC-BP311 & 2 ♀♀ IBC-BP301/ AS19.6947; IBC-BP303/ AS19.6937.

Etymology. The name is derived from Sanskrit, *tamra* meaning copper, *varni* meaning coloured, referring to the cupreous sheen on some of the body's scales.

Diagnosis. Of the fringed-abdomen species, *Stenaelurillus tamravarni* **sp. nov.** is unique for the muted colour of the male's abdomen and the prolaterally-leaning embolus. The male abdomen appears as a brindled greyish brown in the anterior half, composed of a mix of cream and copper scales, much less colourful than the orange of *S. metallicus* and *S. vyaghri* **sp. nov.**, and with longer fringes. The embolus differs from *S. metallicus* in being thicker, especially basally, and from *S. vyaghri* **sp. nov.** in leaning prolaterally and lacking a basal retrolateral cusp. The RTA of *S. tamravarni* **sp. nov.** is longer than that of *S. metallicus*, more pointed than that of *S. vyaghri* **sp. nov.**. The female of *S. tamravarni* **sp. nov.** has markings with less contrast than those of *S. metallicus* and *S. vyaghri* **sp. nov.** with abdominal spots quite indistinct.



FIGURES 73–84. *Stenaelurillus tamravarni* **sp. nov. 73, 77** male left palp, ventral view (holotype IBC-BP300/ AS19.6878); **74, 78** same, retrolateral view; **75, 79** epigyne, ventral view (paratype IBC-BP301/ AS19.6947); **76, 80** vulva, dorsal view; **81** male, holotype, dorsal; **82** same, ventral; **83** female, paratype, dorsal view; **84** same, ventral view. Scale bars: 0.1 mm for genitalia and 1.0 mm for bodies.



FIGURES 85–93. *Stenaelurillus tamravarni* **sp. nov.**, habitus photographs. **85–87** male (AS19.6837); **88–90** male (AS19.6878); **91** male (AS19.6921). **92–93** female (AS19.6933). Scale bars: 1.0 mm.

Description. *Male* (based on holotype, specimen IBC-BP300/ AS19.6878). Measurements: Carapace 1.52 long, 1.06 wide. Abdomen length 1.8, width 0.92. Leg lengths: I—2.9 (1.1, 0.5, 0.5, 0.5, 0.4); II—3.2 (1.2, 0.5, 0.5, 0.6, 0.4); III—5.8 (1.8, 0.9, 1.2, 1.3, 0.5); IV—4.8 (1.5, 0.7, 0.8, 1.3, 0.6). Leg formula: III-IV-II-I. ***Carapace*** narrow, about as wide as the abdomen. Anteriorly somewhat black, covered with black and white scales. Orange scales on the sides, more densely around AMEs and ALEs. Medially brown and rust coloured. Posteriorly black. Two longitudinal creamy stripes running down behind PLEs. Two broad yellowish-white bands along the lateral margins. ***Clypeus*** brownish, sparsely covered with white hairs. ***Chelicerae*** vertical, narrow, yellowish brown, sparsely covered with white hairs. ***Palp*** (Figs. 73, 74, 77, 78): Cymbium yellowish with brown. Embolus short, slightly prolaterally leaning with bent tip. Femur with a distally located ventral process (see figs. 67–68, 78–79 in Caleb et al. 2015). RTA curved apically. ***Legs*** robust, yellowish with some black. First leg darkest, with black from femur to tarsus. Femur I–II conspicuously black prolaterally. Legs covered with a mix of white, cream, and black scales. ***Abdomen*** with mosaic of reflective cream and copper-coloured scales in anterior half with long black hairs near anterior edge, darkening posteriorly to a patch of black scales that reflects green in alcohol. Lateral edge fringed with lustrous black and white hairs. Spinnerets somewhat long, black and yellow.

Female (based on paratype, specimen IBC-BP301/ AS19.6947). Measurements: Carapace 1.58 long, 1.15 wide. Abdomen length 1.92, width 1.15. Leg lengths: I—3.4 (1.3, 0.6, 0.7, 0.5, 0.4); II—3.6 (1.3, 0.7, 0.6, 0.6, 0.4);

III—6.7 (2.1, 0.9, 1.4, 1.6, 0.7); IV—6.1 (1.9, 0.9, 1.2, 1.5, 0.7). Leg formula: III-IV-II-I. ***Carapace*** narrower than abdomen. Anteriorly black, covered with black scales and hairs. Medially reddish-brown. Black on sides. Two longitudinal brownish stripes running down behind PLEs. Two cream-coloured bands on lateral margins. ***Clypeus*** brownish, three narrow transverse bands of white hairs including anterior to ALEs. ***Chelicerae*** vertical, narrow, black with some brown. ***Legs*** robust, yellowish orange with black, covered with black, orange, and few white scales. Femur I black prolaterally. Black near III–IV joints. ***Abdomen*** melange of rust colour and black with two faint creamish-white spots posteriorly. Anterior edge with white and black hairs. ***Epigyne*** (Figs. 75, 76, 79, 80): ECP broad and shallow. Copulatory openings are slit shaped.

Natural history. Within dry scrubland habitat, they were found on open sunny rocky or grassy patches (Figs. 116–118). We often observed them perching on small rocks (Fig. 112) or grass blades. They appear to be locally common.

Stenaelurillus vyaghri **Sanap, Joglekar & Caleb, sp. nov.**
Figs. 94–115.

Type material. INDIA: Maharashtra: Sinnar, 19.871°N 74.020°E, elev. 703 m asl, 2 July 2019, coll. R. Sanap & A. Joglekar. ***Holotype*****:** ♂, (NRC-AA-2061). ***Paratypes***: 2 ♂♂ (NRC-AA-2062 & NRC-AA-2063) & 3 ♀♀ (NRC-AA-2064–NRC-AA-2066).

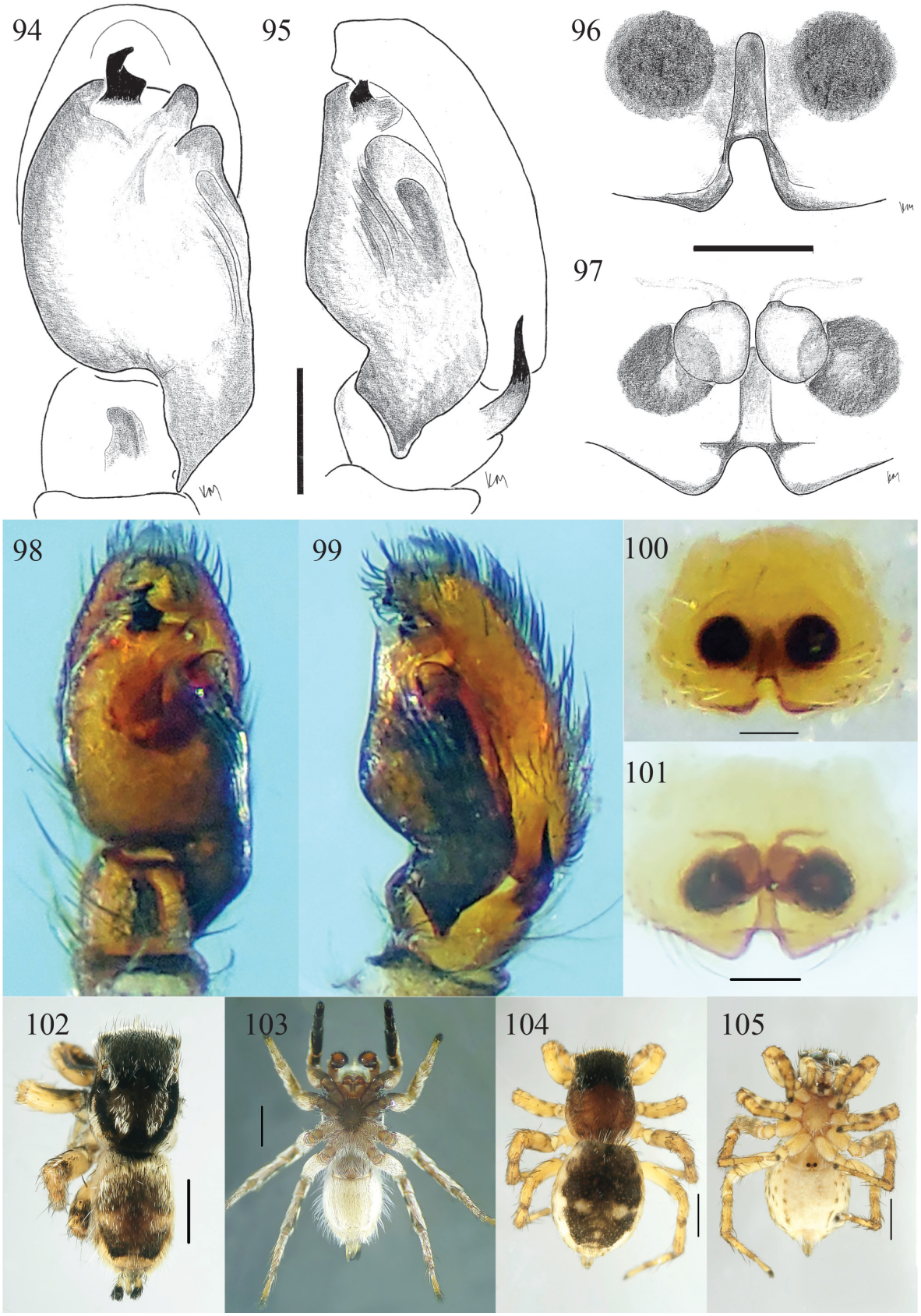
Etymology. The name is derived from the Sanskrit root word vyaghra. We call this species *vyaghri*, meaning "like a tiger", as the male spider's orange and black body colouration resembles that of a tiger.

Diagnosis. *Stenaelurillus vyaghri* **sp. nov.** males have an orange abdomen, like *S. metallicus*, but lacks the latter's pair of black spots and the bright orange-red laterally and medially. *S. vyaghri* **sp. nov.** further differs from *S. metallicus* and *S. tamravarni* **sp. nov.** in the short, thick embolus with a broad base having a retrolateral cusp, and in the inconspicuous TP. The females can be distinguished by the globular spermathecae (bean-shaped in *S. sarojinae*; globular and double-chambered in *S. metallicus*) and a well-developed, narrow, and deep epigynal pocket.

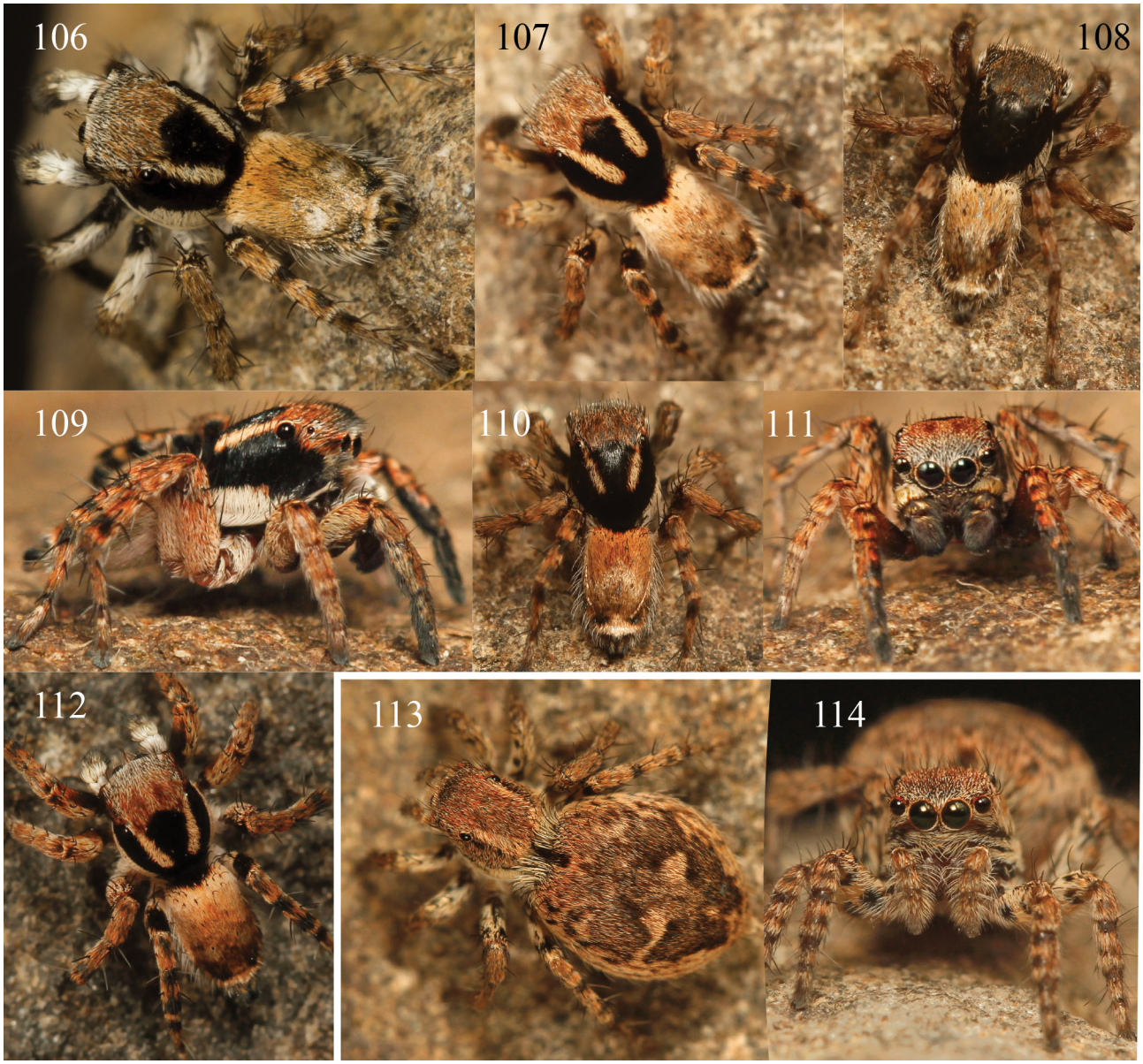
Description. *Male* (based on holotype, specimen NRC-AA-2061). Measurements: Carapace 2.00 long, 1.50 wide. Abdomen length 2.01, width 1.35. Leg measurements: I—2.93 (1.01, 0.55, 0.64, 0.40, 0.33); II—2.83 (0.98. 0.53, 0.59, 0.41, 0.32); III—4.67 (1.53, 0.72, 0.93, 1.02, 0.47); IV—4.10 (1.22, 0.54, 0.86, 1.00, 0.48). Leg formula III-IV-I-II. ***Carapace*** narrow, as wide as abdomen. Anteriorly black covered with black and white scales and black hairs. Remaining black with some rusty brown to orange medially. Two longitudinal yellowish white stripes running down behind PLEs. Two yellowish-white bands on lateral margins. AMEs surrounded by white scales. ***Clypeus*** brownish, covered with white hairs. ***Chelicerae*** vertical, narrow, dark brown short brown hairs. ***Palp*** (Figs. 94, 95, 98, 99): Cymbium yellowish with brown. Embolus short, hook shaped. Femur with a distally located ventral process. RTA long with pointy tip. ***Legs*** robust, yellow with orange tint, covered with black and white scales. Tarsus, metatarsus I black. Tibia, patella I black ventrally. Femur I–II black prolaterally. ***Abdomen*** with orange and black scales. Anteriorly covered with white scales and mix of black and white hairs. Two yellowish white spots mid-dorsally. Two iridescent black spots posteriorly, just anterior to edge of abdomen. Lateral margins fringed with long white hairs. Spinnerets long, yellow with black tips.

Female (based on paratype, specimen NRC-AA-2064). Measurements: Carapace 2.24 long, 1.72 wide. Abdomen length 2.78, width 2.20. Leg measurements: I—2.97 (1.10, 0.60, 0.61, 0.40, 0.26); II—3.06 (1.04, 0.59, 0.61, 0.43, 0.39); III—5.24 (1.73, 0.89, 1.09, 1.13, 0.40); IV—4.91 (1.54, 0.65, 1.02, 1.21, 0.49). Leg formula III-IV-II-I. ***Carapace*** narrower than abdomen. Anteriorly black, covered with black scales and hairs. Two longitudinal yellow stripes running down behind PLEs. AMEs surrounded by yellowish-orange scales. ***Clypeus*** brownish with two narrow transverse bands of white hairs. ***Chelicerae*** vertical, narrow, yellowish-brown, sparsely covered with white to brown hairs. ***Legs*** robust, yellow with some black, covered with white and black scales. I–II with dark brown annulations near joints. ***Abdomen*** brownish black, with two large yellow spots posteriorly. Anterior edge covered with white and black hairs. Sides yellow. Spinnerets yellowish brown. ***Epigyne*** (Figs. 96, 97, 100, 101): Posterior edge deeply incised with a notch, in front of which is a narrow and deep ECP. Copulatory openings are round.

Natural history: *Stenaelurillus vyaghri* **sp. nov.** was mostly found inhabiting rocky patches in a scrub forest (Fig. 119). Both males and females were observed perching on or resting underneath rocks. Although the spiders were observed largely throughout the year, the maximum number of adult individuals was found in May and June (~30–40 males and ~10–12 females from 9:00 to 11:00 AM). The spiders were observed feeding on termites.



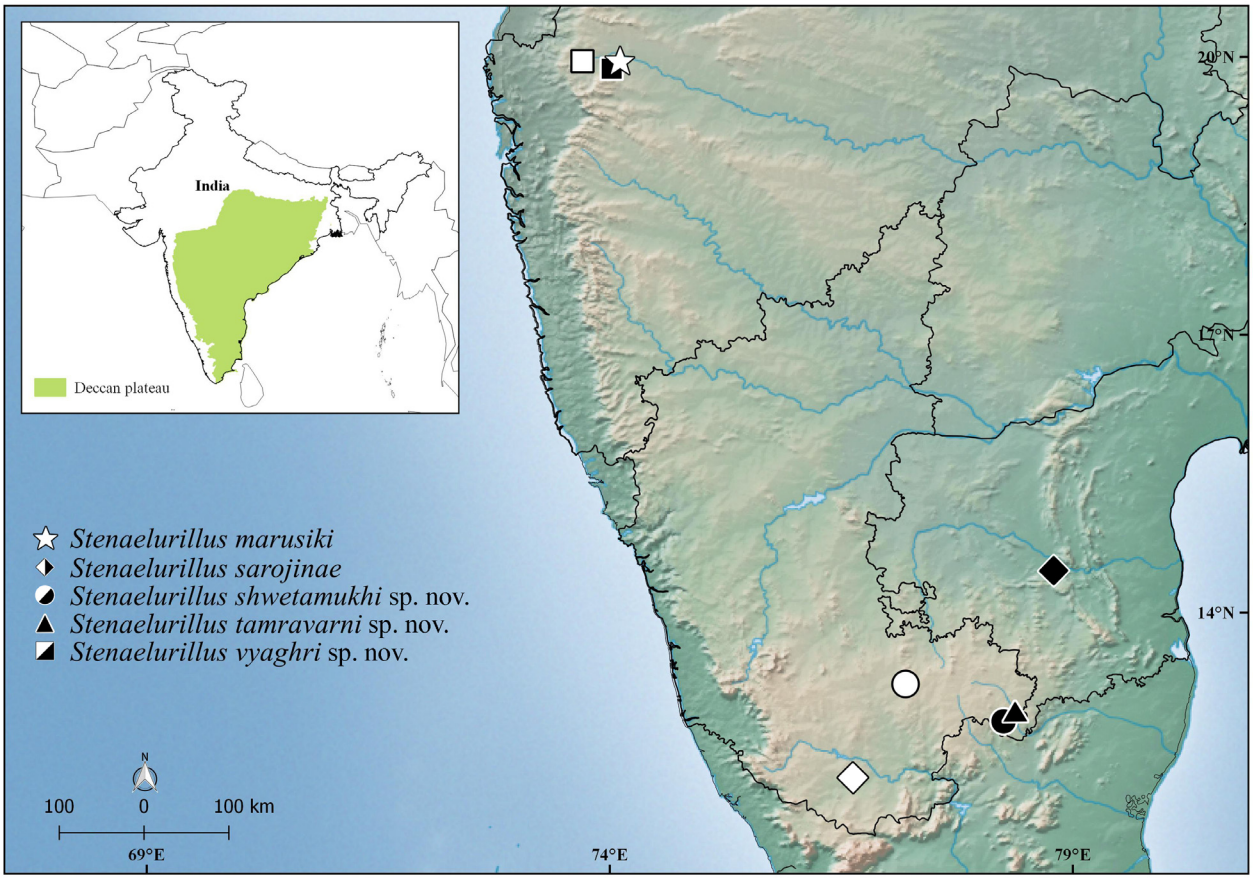
FIGURES 94–105. *Stenaelurillus vyaghri* **sp. nov. 94, 98** male left palp, ventral view (holotype NRC AA-2061); **95, 99** same, retrolateral view; **96, 100** epigyne, ventral view (paratype NRC-AA-2064); **97, 101** vulva, dorsal view; **102** male, holotype, dorsal view; **103** same, ventral view; **104** female, paratype, dorsal view; **105** same, ventral view. Scale bars: 0.1 mm for genitalia and 1.0 mm for bodies.



FIGURES 106–114. *Stenaelurillus vyaghri* **sp. nov.**, habitus photographs. **106–112** male; **113–114** female.

Discussion

With these new species and the range extension of *Stenaelurillus marusiki*, 18 species are now known from the Indian subcontinent. Eight have the white face/black body colour pattern, while five have fringed abdomens in the male. We do not know whether either of these colour groups is monophyletic within the Indian fauna. The other five species in the subcontinent show different colouration. *Stenaelurillus marusiki* is the only known Indian *Stenaelurillus* having such a distinctly striped colour pattern. *S. ilesai* Kanesharatnam & Benjamin, 2020 and *S. lesserti* Reimoser, 1934 may represent a sister species pair, united by their red clypeus, legs with a yellow background, and distinctive horizontally-pointing distal projection of the palp, but otherwise they are similar to the black and white species. *Stenaelurillus tettu* Logunov, 2020 has spots on the abdomen like the black and white species, but otherwise has the dark face and pale legs similar to the *lesserti* group or the fringed species. *Stenaelurillus wandae* Logunov, 2020 resembles the fringed species in several respects (brown legs, dark face, no white spots on abdomen) but appears to lack lateral fringes on the male abdomen. It is unique within the genus in having a long, bifurcated RTA (Logunov 2020).



FIGURES 115. The type localities (solid black) and distribution records (solid white) of *Stenaelurillus* species studied in this work.

Acknowledgements

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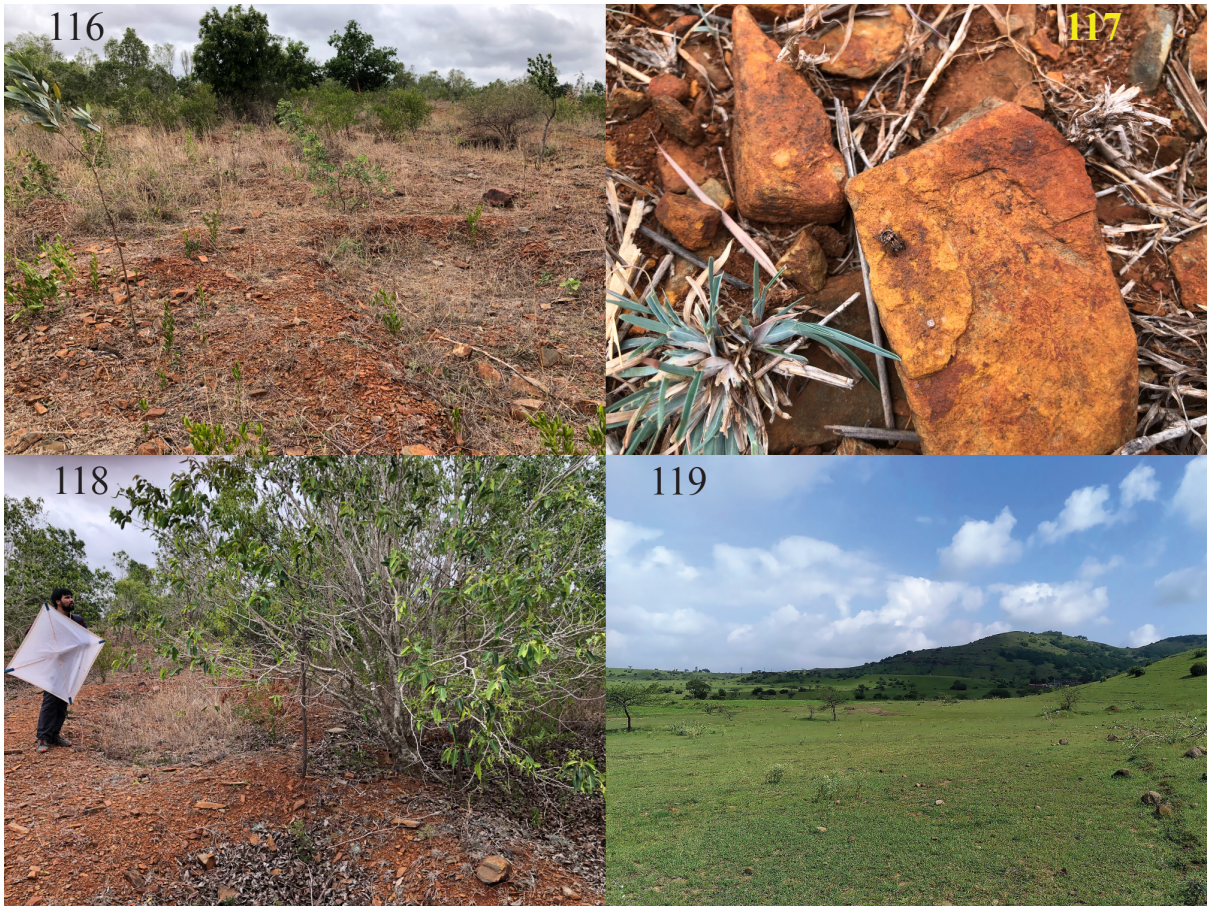

FIGURES 116–119. Photographs showing microhabitats of *Stenaelurillus shwetamukhi* **sp. nov.** and *S. tamravarni* **sp. nov.** (Figs. 116–118); *S. marusiki* and *S. vyaghri* **sp. nov.** (Fig. 119). These grassland and scrubland habitats offer a variety of microhabitats suitable for aelurillines. We have documented a considerable diversity of *Langelurillus*, *Langona*, *Phanuelus*, *Phlegra* and other species of *Stenaelurillus*.

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