

Four new species of jumping spider (Araneae: Salticidae: Aelurillinae) with the description of a new genus from South India

John T. D. Caleb^{1,2}, Soriephy Mungkung^{1,3} and Manu Thomas Mathai^{1,4}

¹ Department of Zoology, Madras Christian College, Tambaram, Chennai-59, Tamil Nadu

² email caleb87woodgate@gmail.com

³ email soreim88@gmail.com

⁴ email manuthomasmcc@gmail.com

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Abstract: Six species of jumping spider are described from South India. A new genus, *Phanuelus* gen.nov. is proposed to accommodate a new species, *Phanuelus gladstone* sp.nov. Four new species namely, *Langona albolinea* sp.nov., *Mashonarus davidi* sp.nov., *Phanuelus gladstone* sp.nov., and *Phlegra prasanna* sp.nov., are described. *Aelurillus kronestedti* Azarkina, 2004 and the genus *Mashonarus* Wesołowska & Cumming, 2002 are new records to India. Males of *Stenaelurillus sarojinae* Caleb & Mathai, 2014 are described for the first time.

Introduction

Salticids are known by 603 genera and 5810 species worldwide to date (WSC, 2015). Although Aelurillinae is a large subfamily, only a few species are known from the Oriental region (Wesołowska, 2014a). Aelurillinae in India are known by 11 species, grouped under 4 genera. Included are *Aelurillus* Simon, 1884 with 3 species, *Langona* Simon, 1901 with 4 species, *Phlegra* Simon, 1876 with 1 species and *Stenaelurillus* Simon, 1886 with 3 species (WSC, 2014; Sebastian *et al.*, 2015).

The study of salticids has been seriously neglected in India. Due to lack of dedicated surveys and studies, the salticid fauna of India is poorly documented. This paper includes the description of four new species and a new genus from Chennai, South India. They are *Phanuelus* gen.nov. with one new species, *Phanuelus gladstone* sp.nov., along with three other new species namely *Langona albolinea* sp.nov., *Mashonarus davidi* sp.nov., and *Phlegra prasanna* sp.nov. *Aelurillus kronestedti* Azarkina, 2004 is a new record to India. Genus *Mashonarus* Wesołowska & Cumming, 2002 is recorded in India for the first time. Males of *Stenaelurillus sarojinae* Caleb & Mathai, 2014 are described for the first time from Kadapa, Andhra Pradesh.

Materials and methods

Specimens were collected as part of a spider diversity study from various places in and around Chennai city, Tamil Nadu and Kadapa, Andhra Pradesh. Live spiders were photographed using a Nikon D60 (18-55mm) DSLR. Specimens were preserved in 70% alcohol and later examined using a Leica S8APO stereoscopic microscope. Photographs were obtained using a Leica MC120 HD camera with LAS core software. Male palps were detached and examined. Female genitalia were excised using a fine surgical scalpel and cleared in 10% KOH. All specimens are deposited in the National Centre for Biological Sciences (NCBS), Bangalore, Karnataka, India. Descriptions are based on fresh specimens unless otherwise stated. All measurements are in millimeters.

Abbreviations used: ALE - anterior lateral eyes, AME - anterior medial eyes, BH - Basal hematodocha, C - cymbium, CD - copulatory duct, CO - copulatory opening, E - embolus, PLE - posterior lateral eyes, PME - posterior medial eyes, RTA - retrolateral tibial apophysis, S - spermathecae, SD - sperm duct, T - tegulum.

Taxonomy

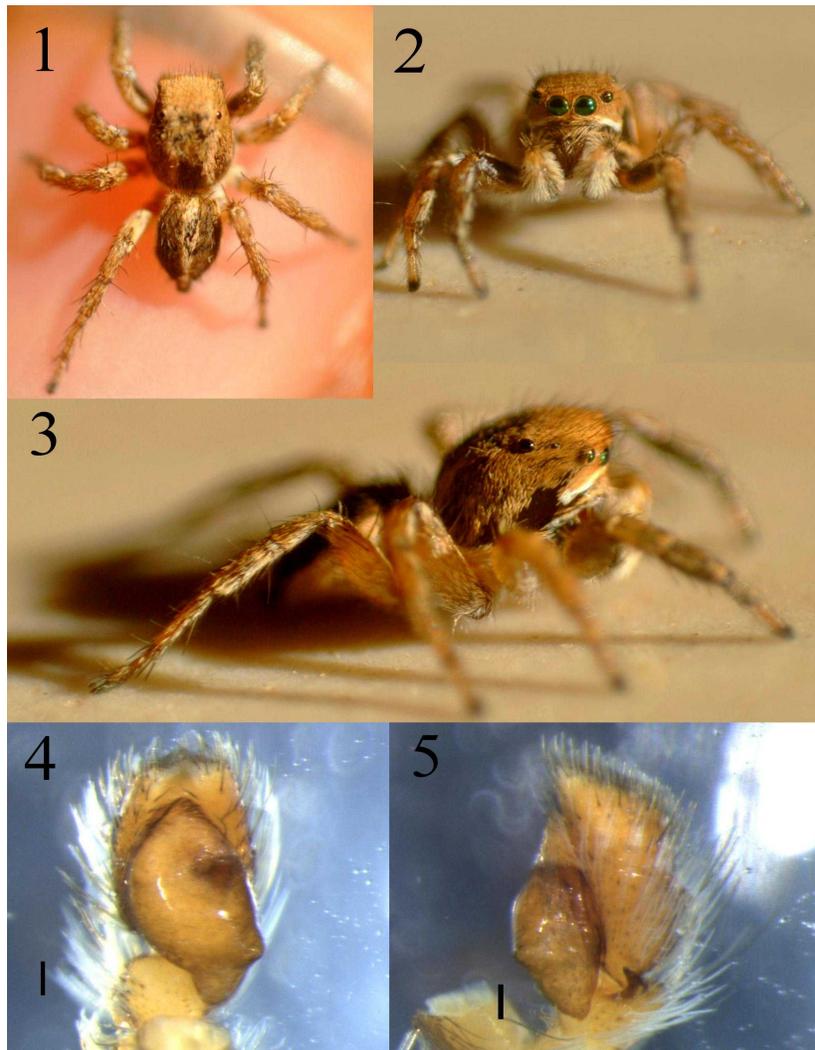
Aelurillus kronestedti Azarkina, 2004

(Figs. 1-5)

Specimens examined. 1 male, scrub regions, near Araabath Lake, Thirumullaivoyal, Tamil Nadu, India (13°12'41.22" N, 80°13'72.16" E, 21.73m, 5 JUN 2013, coll. John Caleb T. D., NCBS-QA484); 2 males (same GPS data, 18 AUG 2013, coll. John Caleb T. D., NCBS-QA485, NCBS-QA486).

Description of male. See Azarkina (2004). Habitus is shown in Figs. 1-3, male palp in Figs. 4, 5. Total length 5.04; carapace 2.64 long, 2.01 wide; abdomen 2.4 long, 1.5 wide.

Distribution. Hambantota, Sri Lanka; Chennai, India (new record).



Figures 1-5. Male *Aelurillus kronestedti* Azarkina, 2004. **1,** Dorsal view. **2,** Front view. **3,** Lateral view, **4,** Left male palp, ventral view. **5,** Left male palp, retrolateral view. Scale bars for Figures 4 & 5, 0.1mm.

***Langona albolinea* sp. nov. Caleb & Mathai**

(Figs. 6-15)

Holotype. Male, scrub jungle regions, Madras Christian College, Tamil Nadu, India (12°91'55.17" N, 80°11'56.08" E, 32m, 12 AUG 2013, coll. John Caleb T. D., NCBS-QA455).

Etymology. The species name refers to the 'white line' pattern on a dark background (as noun in apposition based on juxtaposition of Latin verb *albo* with Latin noun *linea*).

Diagnosis. Can be distinguished by general body size (smaller than other known *Langona* species) and coloration, white stripes on the carapace, and dorsal pattern on the abdomen (Figs. 6, 7, 10). Male palp shows a thin embolus, RTA with broad base, step like indentation half way and ends in a tooth like tip (Figs. 12, 13).

Description of male. Total length 3.42; carapace 1.72 long, 1.22 wide; abdomen 1.70 long, 1.12 wide. Cephalothorax blackish with white stripes dorsally extending from base of AME to the posterior region (Figs. 6, 10). White hairs surround the base of the anterior eyes (Fig. 9). Base of carapace lined by white stripe of hairs. Clypeus with brownish hairs. Chelicerae reddish brown, sternum light brown, covered with pale yellow hairs uniformly along the edges (Fig. 11), legs brownish yellow, short and moderately spined (Figs. 6-11). Abdomen oval, white median stripe laid on black background, outer margin lined by thin white stripe of hairs (Figs. 6, 9). Palp dark, with white hairs dorsally on the femur, patella, tibia, and curving out retrolaterally on cymbium (Figs. 7, 8, 9). Three long black setae emerge from near the base of RTA (Figs. 13, 15).

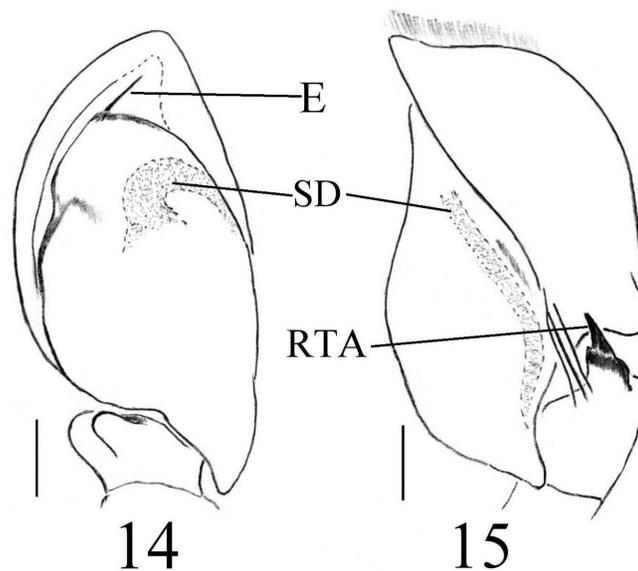
Distribution. Chennai, India.



Figures 6-9. Male *Langona albolinea* sp.nov. **6**, Dorsal view. **7**, Lateral view. **8-9**, Front view.



Figures 10-13. Male *Langona albolinea* sp.nov. **10**, Dorsal view. **11**, Ventral view. **12**, Left male palp, ventral view. **13**, Left male palp, retrolateral view. Scale bars for Figs. 10-11, 1 mm. Scale bars for Figs. 12-13, 0.1 mm.



Figures 14-15. Left male palp, *Langona albolinea* sp.nov. **14**, Ventral view. **15**, Retrolateral view. Scale bars 0.1 mm.

***Mashonarus davidi* sp. nov. Caleb, Mungkung & Mathai**
(Figs. 16-25)

Holotype. Male, scrub jungle regions, Madras Christian College, Tamil Nadu, India (12°91'75.65" N, 80°12'29.64" E, 32m, 4 OCT 2014, coll. Soreiphy Mungkung and John Caleb T.D., NCBS-QA483).

Etymology. Specific epithet is a patronym after the first author's father, Thathapudi David.

Diagnosis. Species differs from other congeners in having comparatively shorter and thicker RTA. Pedipalps dark, devoid of any white hairs on the cymbium (Figs. 18, 19, 22, 23). Abdominal pattern unique, with two median white spots, one placed on the centre, other placed posteriorly, near the spinnerets. Outer margin of abdomen lined by white patch of hairs, with two emerging spots laterally in line with the median spot (Figs. 16, 20).

Description of male. Total length 7.8; carapace 4.0 long, 2.9 wide; abdomen 3.8 long, 2.1 wide. Cephalothorax dark with brownish anterior region (Fig. 16). Anterior eyes surrounded by reddish brown hairs, clypeus filled with light brownish hairs (Figs. 18, 19). Short white patch extends from beside the PLE and ends near the slope. Broad white patches line the outer margins of the carapace. Chelicerae blackish, unidentate. Sternum oval, lined by pale hairs (Fig. 21). Legs dark, covered with numerous hairs and spines. Proximal region of femur, patella, tibia, tarsus and mid region of metatarsus on Leg II, III, IV with white hairs dorsally (Fig. 16). Abdomen elongate, almost oval, with a median white spot mid-dorsally and another spot posteriorly near spinnerets. Two white spots emerge from mid-lateral region in line with mid-dorsal spot. White hairs marginally surround abdomen (Figs. 16, 17, 20). Spinnerets dark (Fig. 16). Palp dark, white hairs cover the tibia, patella and femur (Figs. 18, 19).

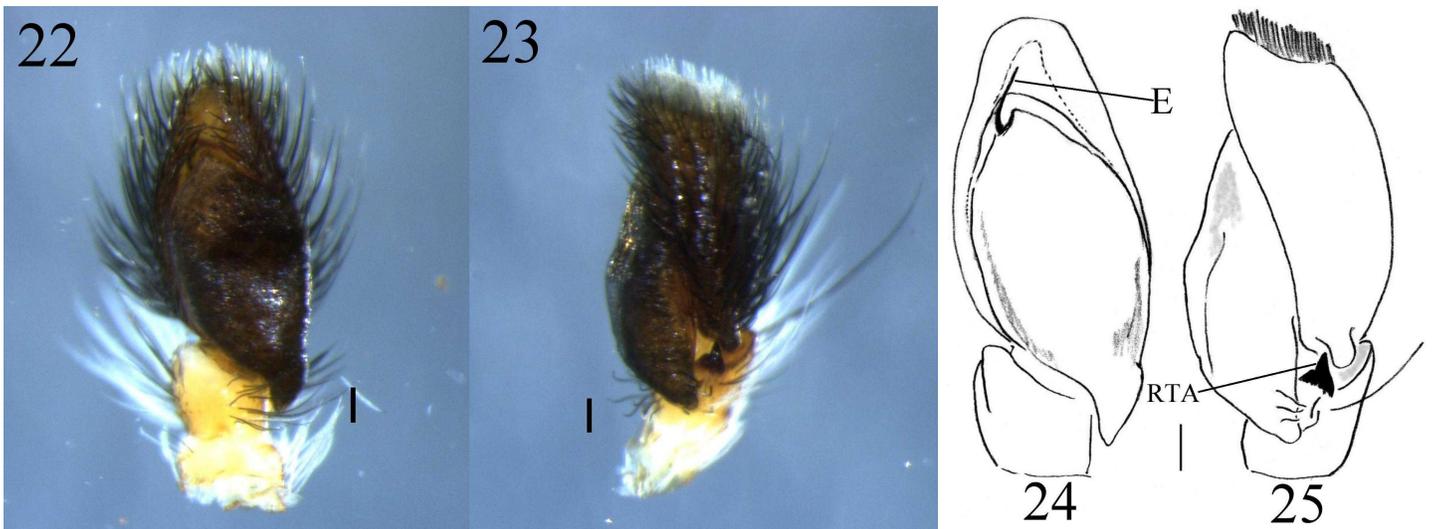
Distribution. Chennai, India.



Figures 16-17. Male *Mashonarus davidi* sp.nov. **16**, Dorsal view. **17**, Lateral view.



Figures 18-21. Male *Mashonarus davidi* sp.nov. **18-19,** Front view. **20,** Dorsal view. **21,** Ventral view. Scale bars 1 mm.



Figures 22-25. Left male palp, *Mashonarus davidi* sp.nov. **22,** Ventral view. **23,** Retrolateral view. **24,** Ventral view. **25,** Retrolateral view. Scale bars 0.1 mm.

***Phanuelus* gen. nov. Caleb & Mathai**

Type species. *Phanuelus gladstone* sp.nov.

Etymology. The proposed name is for the late Dr. G. J. Phanuel (Professor, Dept. of Zoology, MCC) who worked extensively on the spiders of Madras in the early 1960s. His work has been of great significance for later workers. The name is masculine in gender.

Diagnosis. Small spiders characterized by short, very high cephalothorax, high and reduced thoracic region; abdomen round, nearly spherical. Leg III distinctly longer. Two RTAs (compared to usually two RTAs, sometimes with one RTA in *Aelurillus*, and two peaks, separated by a V or U shaped slit in *Phlegra*). Differs from *Langona* Simon in lacking a bunch of stiff hairs projecting from the base near RTA. Differs from *Stenaelurillus* Simon due to the absence of an anterior tegular apophysis. Embolus longer and thinner than in *Stenaelurillus*. Epigynum highly sclerotized, convex surface, with copulatory openings postero-laterally (whereas these are antero-median in *Aelurillus*, or hidden in circular grooves in *Phlegra*).

Description. Spiders with small body (3-4 mm), carapace short and very high, short longitudinal fovea in a rounded, pit-like shallow depression in the centre just behind PLE line midway (Figs. 26, 32). Carapace widest at beginning of posterior slope; posterior slope very steep. PME closer to PLE than ALE. Clypeus vertical, moderately high (Figs. 28, 36). Male chelicerae without any tooth. Leg III longer than leg IV (Figs. 27, 37). Abdomen small, rounded with pairs of white spots arranged in the median, lighter lateral regions seen on females (Figs. 26, 33). Male palp with enlarged bulbus, tegulum leathery, embolus thin, two RTA, one long and bent at tip which is inconspicuous, other conspicuous, short and thick (Figs. 38, 39). Epigynum highly sclerotized, copulatory openings laterally placed apart, with meandering copulatory ducts (Figs. 40, 43, 44).

Affinities. Species show clear affinity to subfamily Aelurillinae in genital structures and general morphology.

***Phanuelus gladstone* sp. nov. Caleb & Mathai**

(Figs. 26 - 46)

Type material. Holotype: male, scrub jungle regions, Madras Christian College, Tamil Nadu, India (12°92'04.28" N, 80°12'38.75" E, 32m, 13 SEP 2013, coll. John Caleb T.D., NCBS-QA474). Paratypes from same location: 1 female allotype (13 SEP 2013, coll. John Caleb T.D., NCBS-QA475), 1 male (27 JUN 2013, coll. John Caleb T.D., NCBS-QA476), 1 male (27 OCT 2014, coll. John Caleb T.D., NCBS-QA477); 1 male (28 OCT 2014, coll. John Caleb T.D., NCBS-QA478).

Etymology. The specific epithet is a noun in apposition, a patronym after Late Dr. M. Gladstone (former Head, Dept. of Zoology and Principal, MCC).

Diagnosis. Species can be recognized by general body color, size and abdominal pattern (Figs. 26, 32). Palpal femur with distal white patch dorsally in both sexes (Figs. 27, 37), palpal organ with thin embolus, two RTA one long and bent at tip, other short, thick. Epigynum with copulatory openings placed laterally (Figs. 40, 43), copulatory ducts rising upward and bending inwards forming a loop, leading to spermathecae (Fig. 44).

Description of male. Total length 3.03; carapace 1.80 long, 1.44 wide; abdomen 1.23 long, 1.50 wide. Cephalothorax high, dark with reddish brown hairs and blackish scutum (Figs. 26, 27). Anterior region of

AME lined by a thick curved patch of white hairs, median region of clypeus black, front edge of cephalothorax covered with white hairs. Sparse white hairs cover the regions below ALE and cheek region (Figs. 28, 29). Eye measurements: AME 0.33, ALE 0.21, PME 0.07, PLE 0.17, PME-PLE 0.14, PME-ALE 0.30. Clypeus height 0.27. Chelicerae small, toothless, promargin slightly protruding outward with 5 long hairs. Posterior slope of cephalothorax steep. A pair of white hairs remain at the posterior edge of the cephalothorax. Chelicerae blackish, sternum oval. Legs short, reddish brown with sparse white hairs intermittently, leg III longest (Fig. 27). Abdomen small, round, covered with reddish brown hairs with white spots near mid-dorsal region and one posteriorly, near spinnerets. Long black hairs present at anterior region (Figs. 26, 30). Palp with white patch of hairs on distal region of femur dorsally (Fig. 27).

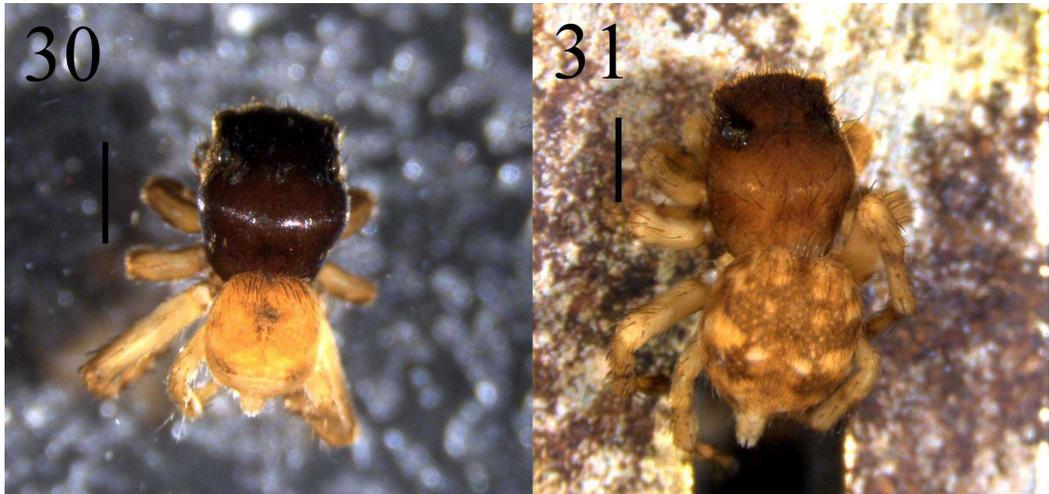
Description of female. Total length 4.05; carapace 2.03 long, 1.8 wide; abdomen 2.02 long, 2.0 wide. Coloration as in male but differs in the following: Anterior eyes surrounded by reddish brown hairs. Clypeus devoid of any white hairs (Figs. 35, 36). Eye measurements: AME 0.41, ALE 0.23, PME 0.09, PLE 0.19, PME-PLE 0.16, PME-ALE 0.36. Clypeus height 0.44. Abdomen round, faint chevron-shaped markings on mid-dorsal region. Lighter regions near lateral sides adjacent to white spots in mid-dorsal region. Another pair of white spots placed posteriorly, one median white spot at posterior tip of abdomen (Figs. 32, 33). Epigynum placed on a sclerotized plate (Figs. 40, 43), internal view as in Fig 44.

Distribution. Chennai, India.

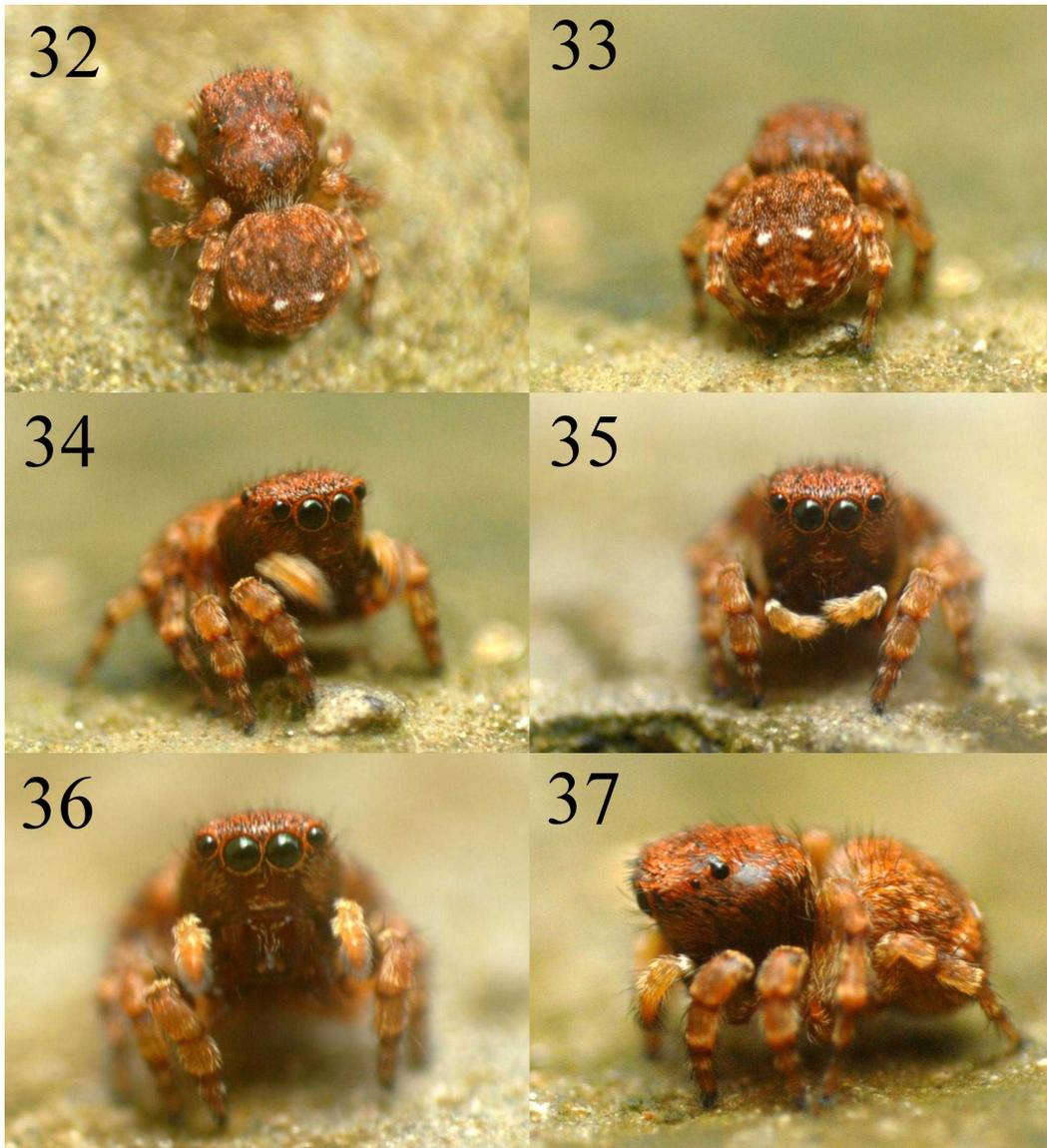
Natural history. This species is a cryptically coloured, tiny, active jumping spider found near dry regions in the scrub jungle floor of Madras Christian College campus.



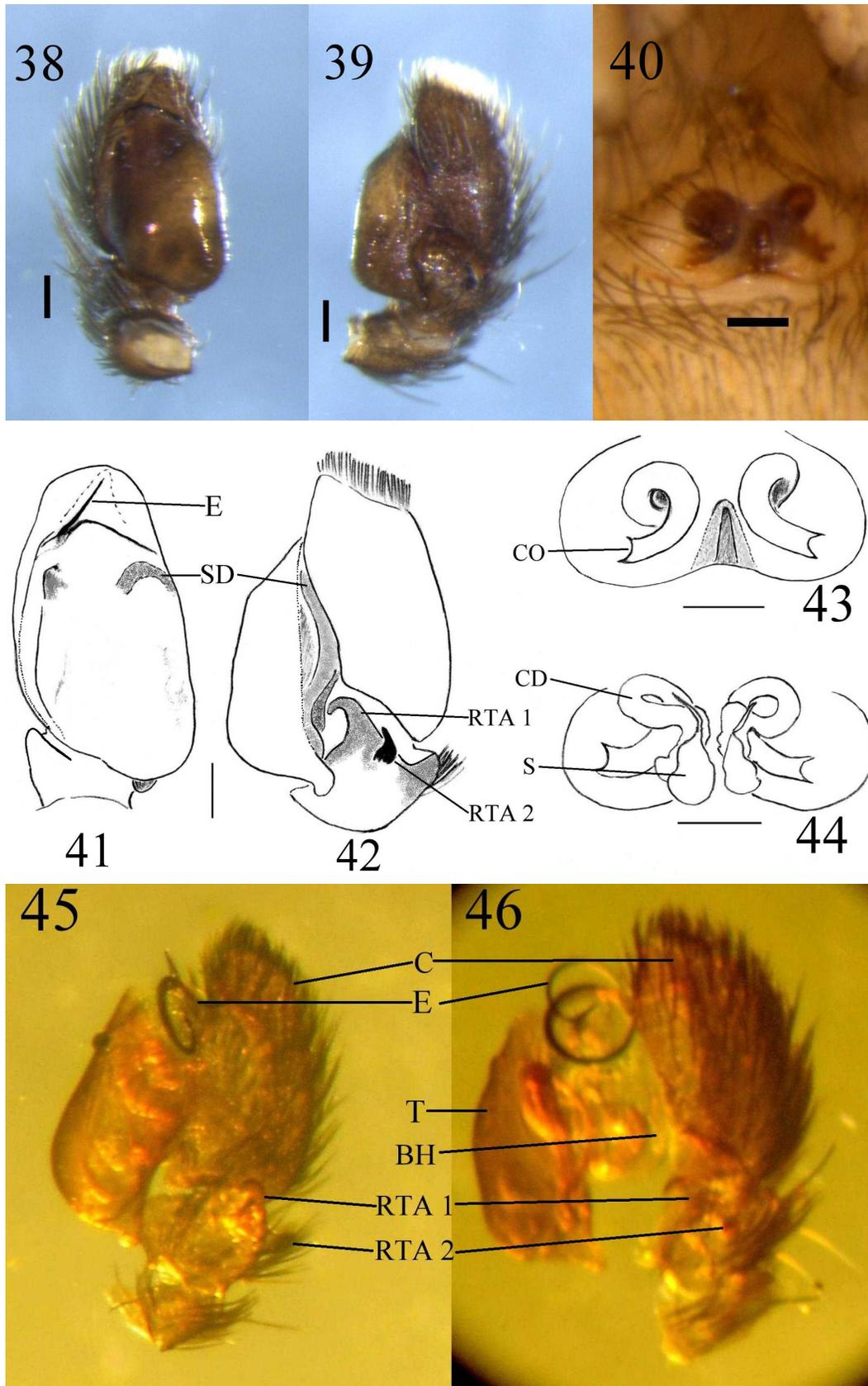
Figures 26-29. Male *Phanaeus gladstone* sp.nov. 26, Dorsal view. 27, Lateral view. 28-29, Front view.



Figures 30-31. *Phanielus gladstone* sp.nov. 30, Dorsal view of male. 31, Dorsal view of female. Scale bars 1 mm.



Figures 32-37. Female *Phanielus gladstone* sp.nov. 32, Dorsal view. 33, Abdomen. 34-36, Front view. 37, Lateral view.



Figures 38-46. *Phanelus gladstone* sp.nov. **38**, Left male palp, ventral view. **39**, Left male palp, retrolateral view. **40**, Epigynum. **41**, Left male palp, ventral view. **42**, Left male palp, retrolateral view. **43**, Epigynum. **44**, Vulva, dorsal view. **45**, Expanded male palp, ventrolateral view. **46**, Expanded male palp, retrolateral view. Scale bars 0.1 mm.

***Phlegra prasanna* sp. nov. Caleb & Mathai**

(Figs. 47-56)

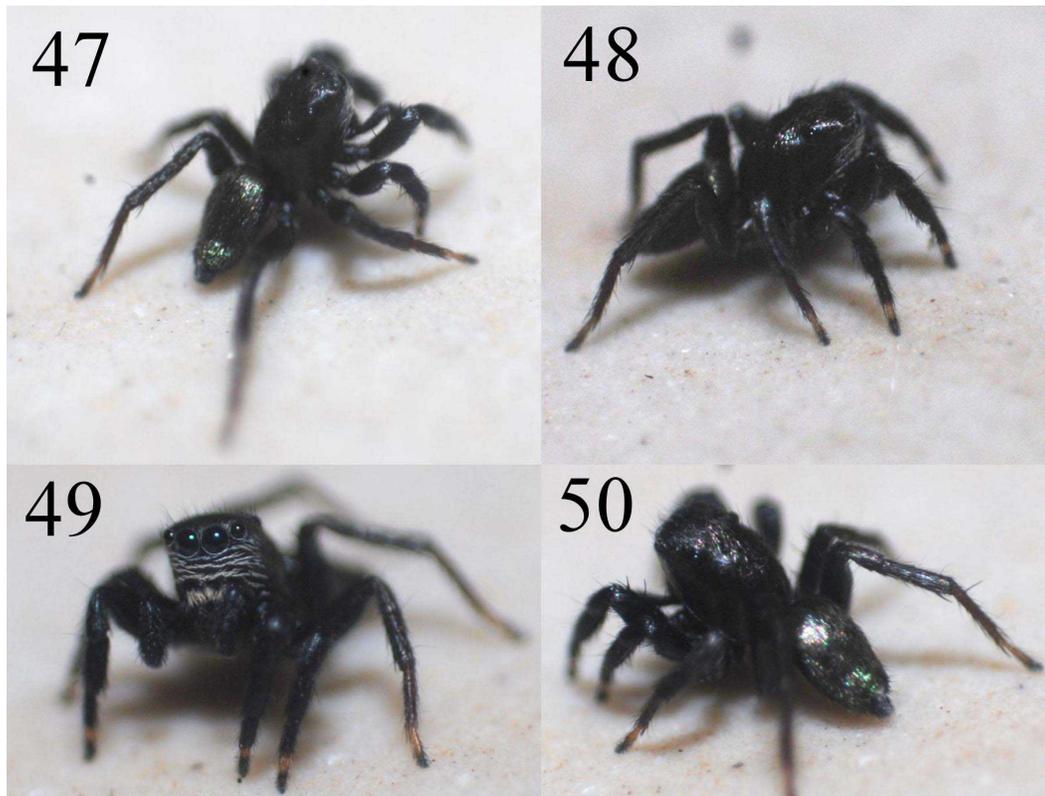
Type material. Holotype: male, scrub jungle regions, Madras Christian College, Tamil Nadu, India (12°91'97.51" N, 80°12'24.72" E, 32m, 20 MAR 2014, coll. John Caleb T. D., NCBS-QA481). Paratypes: 1 male from same location (06 OCT 2014, coll. John Caleb T.D., NCBS-QA482) and 1 male, Kadapa, Andhra Pradesh, India (14°45'10.50" N, 78°79'38.68" E, 138 m, 14 JAN 2015, coll. Samson, NCBS-AL062).

Etymology. Specific epithet is a noun in apposition, a patronym after the first author's mother, Udaya Prasanna.

Diagnosis. Species can be differentiated from other *Phlegra* species by the dark coloration of the body covered by metallic dark green iridescent hairs (Figs. 47, 50). Palp with long embolus (Figs. 53, 55), RTA with two peaks separated by a V-shaped depression (Figs. 54, 56).

Description of male. Total length 4.11; carapace 2.32 long, 1.57 wide; abdomen 1.79 long, 1.03 wide. Cephalothorax dark, eye region covered with forward projecting hairs, inconspicuous pair of white stripes on the dorsal surface, eye field darker (Figs. 48, 51). Three white transverse stripes traverse across the clypeus extending into the cheek region. Anterior eyes surrounded by white scales anteriorly (Fig. 49). Chelicerae blackish, thick transverse stripe of white hairs at the proximal region. Sternum oval, covered with pale hairs (Fig. 52). Legs dark, proximal half of tarsus brownish yellow on all legs (Figs. 48, 49). Abdomen narrow, dark with greenish, iridescent hairs (Fig. 50). Palp with dark cymbium, long, slender embolus (Figs. 53, 55), RTA with two peaks separated by a V-shaped depression (Figs. 54, 56).

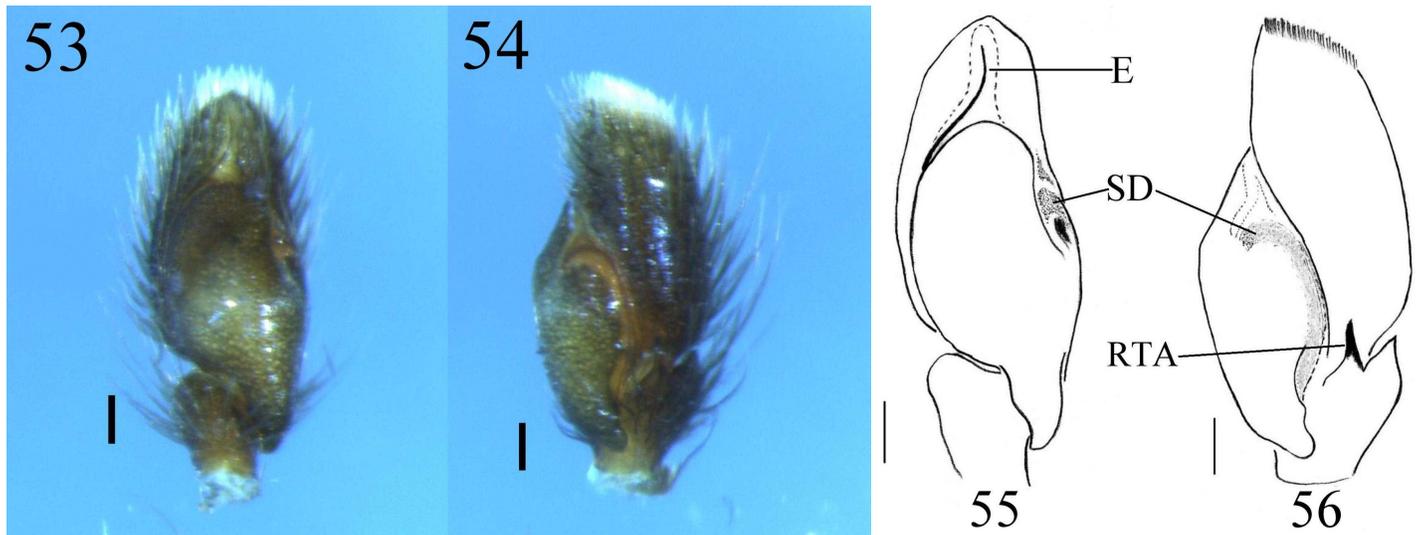
Distribution. Chennai, India.



Figures 47-50. Male *Phlegra prasanna* sp. nov. 47, Dorsal view. 48, Lateral view. 49-50, Front view.



Figures 51-52. Male *Phlegra prasanna* sp.nov. 51, Dorsal view. 52, Ventral view. Scale bars 1 mm.



Figures 53-56. Left male palp, *Phlegra prasanna* sp.nov. 53, Ventral view. 54, Retrolateral view. 55, Ventral view. 56, Retrolateral view. Scale bars 0.1 mm.

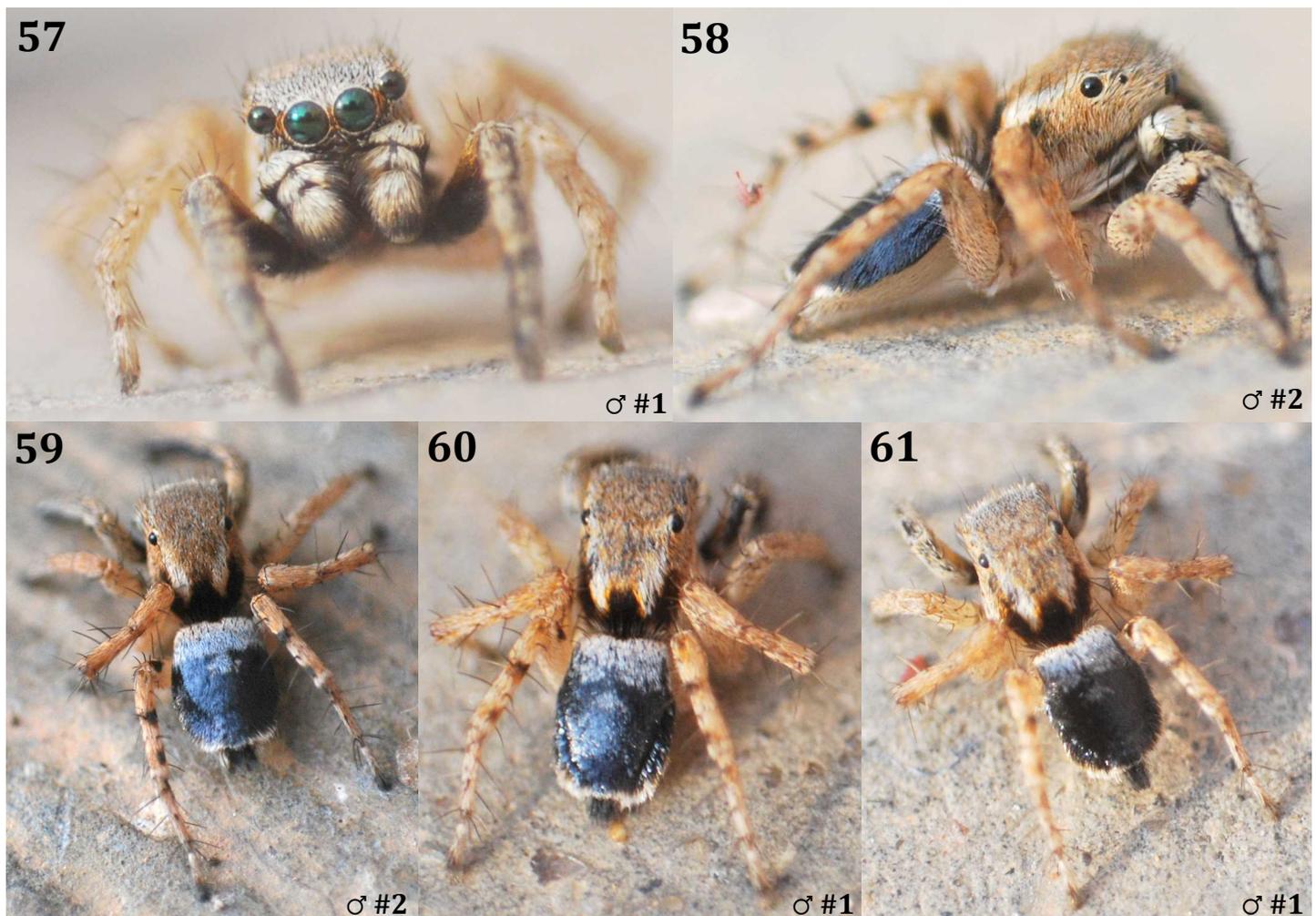
Stenaelurillus sarojinae Caleb & Mathai, 2014

(Figs. 57-81)

Specimens examined. 2 male paratypes, Kadapa, Andhra Pradesh, India (14°45'10.50" N, 78°79'38.68" E, 138 m, 14 JAN 2015, coll. Samuel A. M. and John Caleb T.D., NCBS-AL054, ♂ #1, and AL055, ♂ #2), 4 male paratypes (same locality and date, coll. John Caleb T.D., NCBS-AL056 to AL059).

Diagnosis. The males differ from other *Stenaelurillus* species by lacking a colorful clypeal region (Fig. 57), different from the contrasting colored pattern in *S. lesserti* Reimoser, 1934, and by having only a single, median, broad white spot on the abdomen (Figs. 59-61), different from the three white spots in *S. lesserti*. The palpal femur has a well-defined ventral process (Figs. 67, 68) which differs from the small bump in *S. uniguttatus* Lessert, 1925.

Description of male. Cephalothorax with whitish and brownish hairs on the anterior region. Anterior eye row with a transverse band of reddish brown hairs between the anterior eyes, clypeus filled with light brownish and grey hairs (Fig. 57). A pair of longitudinal white patches extend from beside the ALEs and end at the rear. Posterior region covered by dark hairs, almost black (Figs. 63, 73). Carapace rim lined by white hairs. Two more thin white stripes just above the white rim extend backwards from the cheek region (Fig. 58). Chelicerae blackish, unidentate (Fig. 65). Sternum oval with a variably pigmented, dark median region and covered by pale yellow hairs. Legs yellowish brown, covered with numerous hairs and spines. Leg I with dark ventral region (Figs. 64, 74). Abdomen elongate, almost oval, with a broad transverse anterior white patch and a median broad white (cross shaped) spot just below the white patch. Dark dorsally, covered with short, dark bluish-black, shiny, light reflecting hairs. White hairs marginally surround the posterior edge of the abdomen (Figs. 59-62, 75). Long shiny scales cover the fringes of the abdomen (Figs. 60, 61, 63). Ventral region of the abdomen pale yellow (Fig. 58, 64, 74). Spinnerets dark dorsally (Fig. 59, 60, 63, 73) and yellowish ventrally (Fig. 64, 74). Palp covered with yellowish-white hairs (Figs. 57). Palp as in Figs. 67-72 & 76-79; embolus accompanied by dark slightly thick and bent apophysis. Posterior tegular apophysis large; RTA single, thick and pointed; palpal femur with a ventral process (Figs. 67, 68).

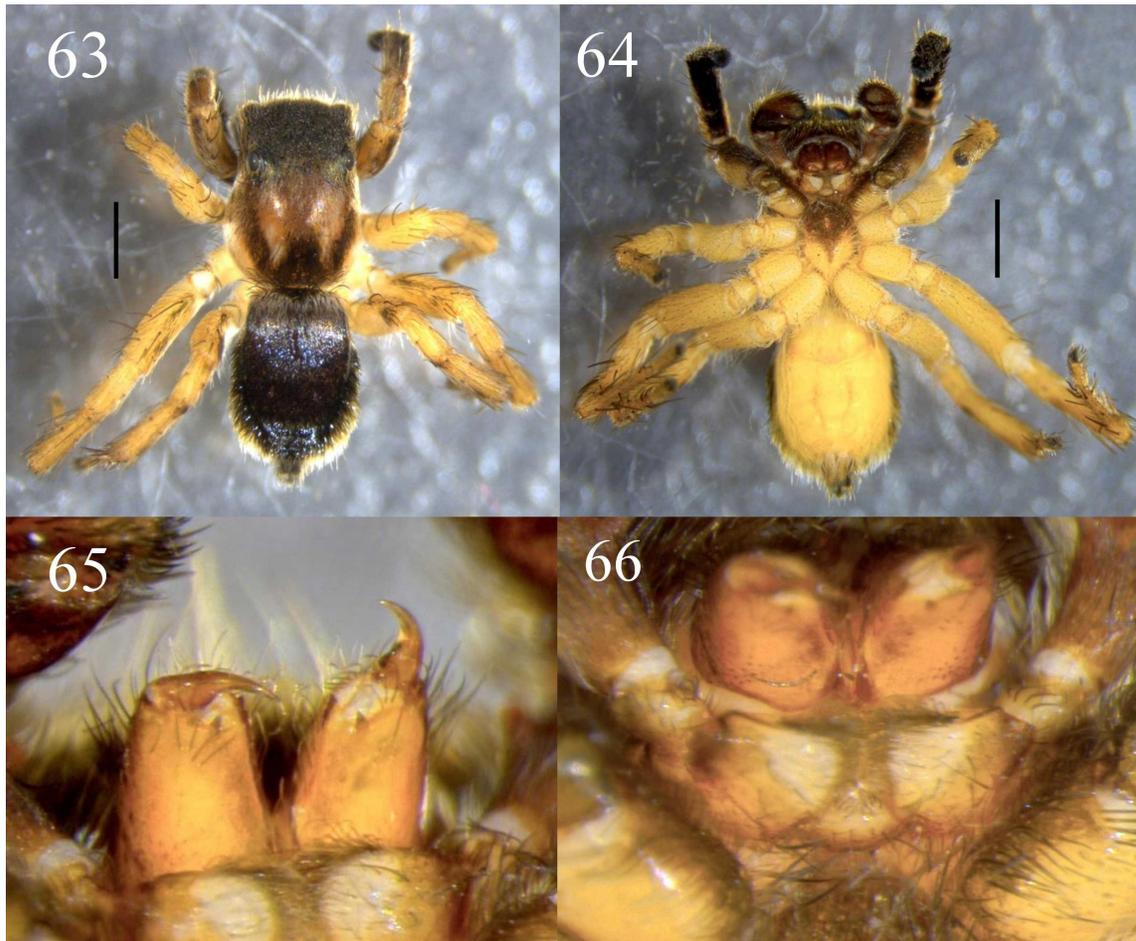


Figures 57-61. Male *Stenaelurillus sarojinae*. 57, Front view (♂ #1). 58, Lateral view (♂ #2). 59, Dorsal view (♂ #2). 60-61, Dorsal view (♂ #1).

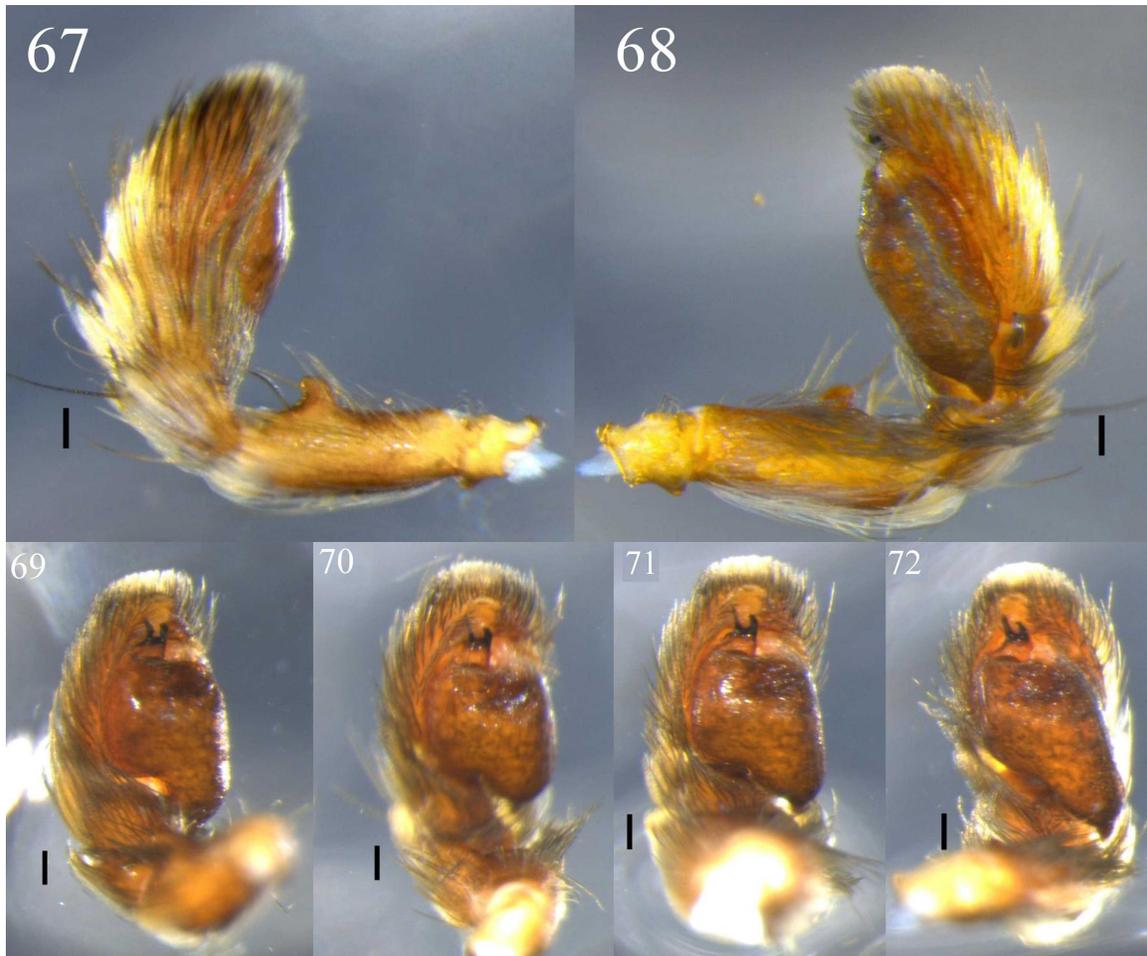
A subadult female from the same locality is shown in Figure 62.



Figure 62. Dorsal view of a subadult female *Stenaelurillus sarojinae*.



Figures 63-66. *Stenaelurillus sarojinae* (♂ #1, paratype NCBS-AL054). **63**, Dorsal view. **64**, Ventral view. **65**, Chelicerae. **66**, Maxillae. Scale bars for Figs. 63-64, 1 mm.



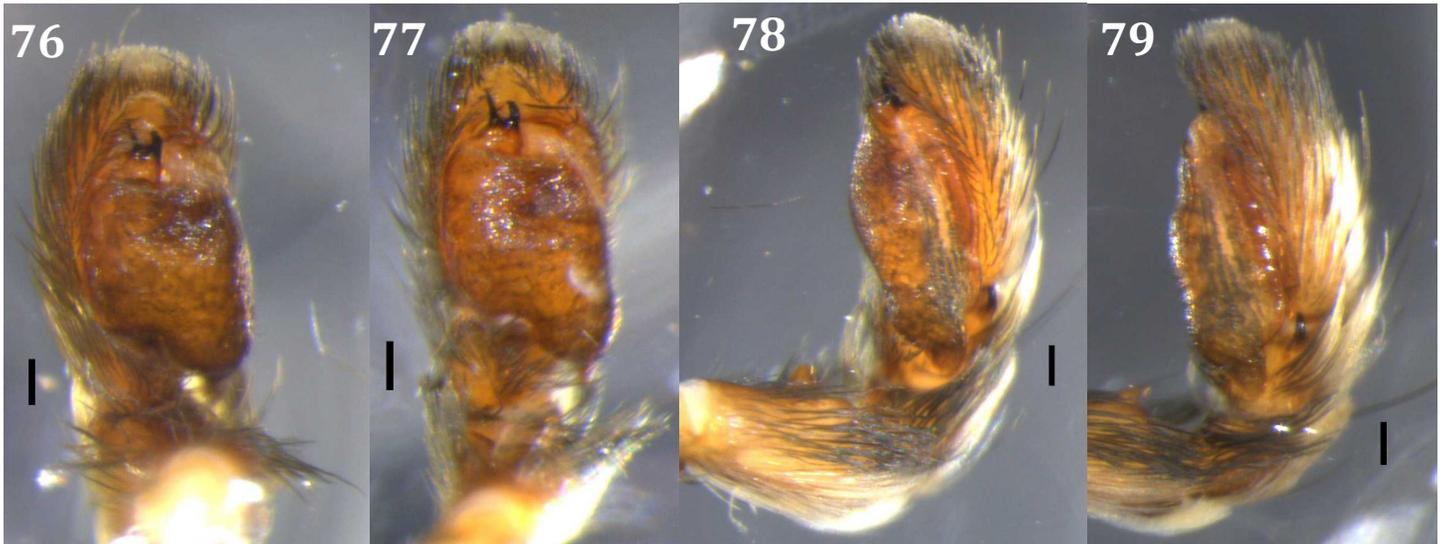
Figures 67-72. Left palp of *Stenaelurillus sarojinae* (♂ #1, Paratype NCBS-AL054). 67, Prolateral view. 68, Retrolateral view. 69-72, Ventral views. Scale bars 0.1 mm.



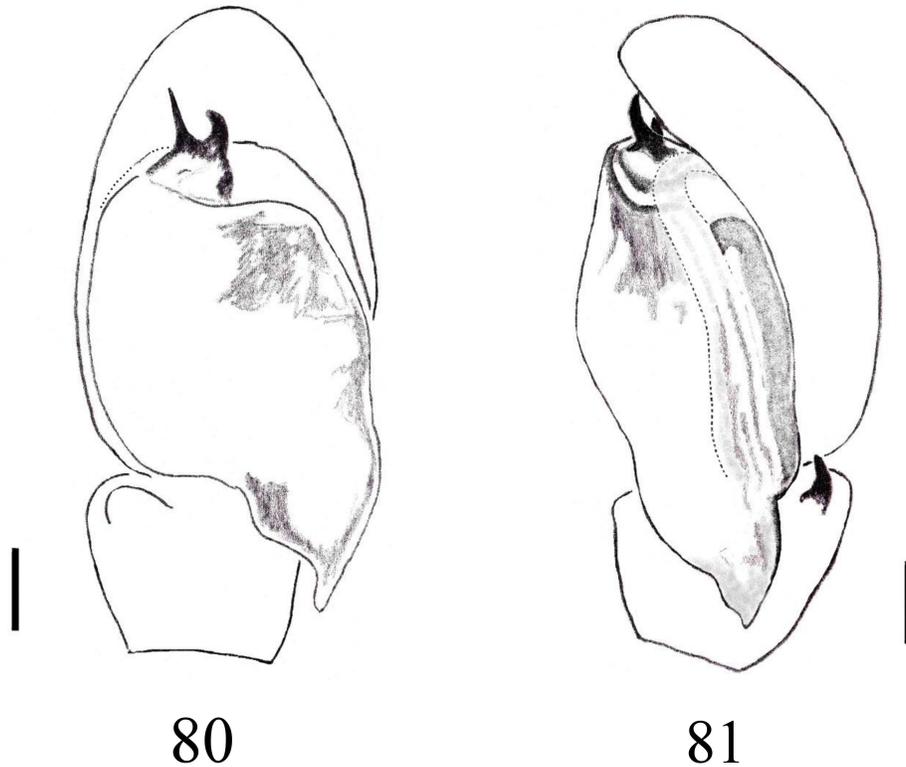
Figures 73-74. *Stenaelurillus sarojinae* (♂ #2, Paratype NCBS-AL055). 73, Dorsal view. 74, Ventral view. Scale bars 1 mm.



Figure 75. *Stenaelurillus sarojinae* (♂ #2, Paratype NCBS-AL055), dorsal view of abdomen. Scale bar 1 mm.



Figures 76-79. Left palp of *Stenaelurillus sarojinae* (♂ #2, Paratype NCBS-AL055). 76-77, Ventral views. 78-79, Retrolateral views. Scale bars 0.1 mm.



Figures 80-81. Left palp of *Stenaelurillus sarojinae* (♂ #2, Paratype NCBS-AL055). **80**, Ventral view. **81**, Retrolateral view. Scale bars 0.1 mm.

Measurement of paratypes. NCBS-AL054: Total length 4.79; carapace 2.49 long, 1.75 wide; abdomen 2.30 long, 1.44 wide. NCBS-AL055: Total length 4.83; carapace 2.48 long, 1.72 wide; abdomen 2.35 long, 1.75 wide.

Distribution. Kadapa, Andhra Pradesh, India.

Discussion. An abdomen with lustrous dorsal hairs is also seen in some species of genus *Stenaelurillus* (Wesołowska, 2014b). Light reflecting hairs on the abdomen are also seen in two Israeli species belonging to genus *Aelurillus*, *A. politiventris* (O. Pickard-Cambridge, 1872) and *A. gershomi* Prószyński, 2000, while other known species have normal pattern. Another unusual similarity is the resemblance in the abdominal pattern of the unrelated species *Maratus anomalus* (Karsch, 1878) from Australia, an analogous adaptation as this species is not related to *S. sarojinae* Caleb & Mathai.

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References

- Azarkina, G. 2004.** Two new species of the genus *Aelurillus* Simon, 1884 from Pakistan, and Sri Lanka (Araneae: Salticidae). Bulletin of the British Arachnological Society 13 (2):49-52.
- Caleb, T. D. J. and M. T. Mathai. 2014.** Description of some interesting jumping spiders (Araneae: Salticidae) from South India. Journal of Entomology and Zoology Studies 2(5): 63-71.
- Prószyński, J. 1992.** Salticidae (Araneae) of India in the collection of the Hungarian National Natural History Museum in Budapest. Annales Zoologici, Warszawa 44: 165-277.
- Prószyński, J. 2013.** Salticidae (Araneae) of the world. *Online at:* <http://www.peckhamia.com/salticidae/> (accessed on 5 September, 2014).
- Sebastian, P. A., P. M. Sankaran, J. J. Malamel, & M. M. Joseph. 2015.** Description of new species of *Stenaelurillus* Simon, 1886 from the Western Ghats of India with the redescription of *Stenaelurillus lesserti* Reimoser, 1934 and notes on mating plug in the genus (Arachnida, Araneae, Salticidae). ZooKeys 491: 63-78.
- Simon, E. 1876.** Les arachnides de France. Paris. 3: 1-364.
- Simon, E. 1901.** Histoire naturelle des araignées. Paris. 2:381-668.
- Wesołowska, W. 2014a.** A review of the Asian species of the spider genus *Stenaelurillus* (Araneae: Salticidae). Oriental Insects 47(4): 246-254.
- Wesołowska, W. 2014b.** Further notes on the genus *Stenaelurillus* Simon, 1885 (Araneae, Salticidae) in Africa with descriptions of eight new species. Zoosystema 36(3): 595-622.
- Wesołowska, W. and M. Cumming. 2002.** *Mashonarus guttatus*, gen. and sp. n., the second termitivorous jumping spider from Africa (Araneae: Salticidae). Bulletin of the British Arachnological Society 12 (4): 165-170.
- WSC. 2015.** World Spider Catalog. Natural History Museum Bern. *Online at:* <http://wsc.nmbe.ch>, version, 16 (accessed on 13 April, 2015).