On a collection of jumping spiders (Araneae: Salticidae) from the Shendurney Wildlife Sanctuary, India

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Abstract. Two new species, Habrocestum sahyadri sp. nov., and Irura shendurney sp. nov. are described from the Shendurney Wildlife Sanctuary, Kerala. The unknown female of Habrocestum kerala Asima, Caleb, Babu & Prasad, 2022 is described and three other species: Gelotia lanka Wijesinghe, 1991, Phintella accentifera (Simon, 1901) and Vailimia jharbari Basumatary, Caleb & Das, 2020 are recorded from the locality. Detailed descriptions, diagnosis and illustrations of the species are provided.

Keywords. Distribution, new species, taxonomy, Western Ghats, Kerala.

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forest to the southern subtropical hill forest. The diversity of salticids in the WG is represented by 86 species from 49 genera, with 43% (37 species) of them being endemic to the region (Sen & Sureshan 2020). Recent surveys in the SWS revealed the presence of 18 salticid species belonging to 16 genera (Sudhin et al. 2022a; Asima et al. 2022, 2023a, 2023b; Sudhin & Sen 2023).

The present study aims to provide an account of jumping species from the Shendurney Wildlife Sanctuary based on new collection efforts: (1) we provide the description of two new species, (2) description of the unknown female of *H. kerala* Asima, Caleb, Babu & Prasad, 2022 and (3) report the occurrence of *Gelotia lanka* Wijesinghe, 1991, *Phintella accentifera* (Simon, 1901) and *Vailimia jharbari* Basumatary, Caleb & Das, 2020 from the study area.

**Material and methods**

Specimens were hand collected and preserved in 70% alcohol. They were later examined and photographed under the Leica S8APO stereomicroscope. All images were then processed with the aid of Leica ver. 4.2 software. The male left palp was removed, examined in detail and photographed. The epigyne was dissected, cleared in 10% KOH and mounted on a temporary slide, and observed under an Olympus CX31 compound microscope. All measurements are in millimeters (mm). The measurements of legs are given as: total (femur, patella, tibia, metatarsus [except for palps], tarsus). The studied specimens are deposited in the reference section of the museum of the Department of Zoology, University of Kerala, Kariavattom, India (KUDZ).

**Abbreviations for taxonomical terms**

I–IV = 1\textsuperscript{st} to 4\textsuperscript{th} leg  
ALE = anterior lateral eye  
AME = anterior median eye  
D = description  
PLE = posterior lateral eye  
PME = posterior median eye  
RTA = retrolateral tibial apophysis

**Institutional abbreviations**

SWS = Shendurney Wildlife Sanctuary  
WG = Western Ghats

**Results**

**Taxonomy**

Class Arachnida Lamarck, 1801  
Order Araneae Clerck, 1757  
Family Salticidae Blackwall, 1841  
Genus *Gelotia* Thorell, 1890

*Gelotia lanka* Wijesinghe, 1991  
Figs 1–14

*Gelotia lanka* Wijesinghe, 1991: 275, figs 1–6 — Jose, Tripathi & Sudhikumar 2023: 4, fig. 2a–f (D.Ş).
Material examined

INDIA • 1 ♂; Kerala, Kulathoopuzha, Kattilappara, Shendurney Wildlife Sanctuary; 8.902778° N, 77.11325° E; 146 m a.s.l.; 22 Mar. 2022; A. Asima leg.; from vegetation, by beating; KUDZ 2022.XII.23a • 3 ♀♀; same collection data as for preceding; KUDZ 2022.XII.23b to 2022.XII.23e.

Description
For detailed description and diagnosis, see Wijesinghe (1991).

Distribution
Sri Lanka (Wijesinghe 1991) and India (Jose et al. 2023 and present study).

Genus Habrocestum Simon, 1876

Habrocestum kerala Asima, Caleb, Babu & Prasad, 2022
Figs 15–23


Diagnosis
The epigyne of H. kerala is similar to that of H. hantaneensis Kanesharatnam & Benjamin, 2016 known from Sri Lanka but can be distinguished by the straight accessory gland without any special structures (curved with pin-like structures at the tip in H. hantaneensis); fertilization ducts arising from

anteroventral side of receptacles (vs arising from anterodorsal side of receptacles) (cf. Figs 19–23; Kanesharatnam & Benjamin 2016: figs 5e–f, 6c–d). The spermathecae of *H. kerala* is somewhat similar to that of *H. longispinum* Sankaran, Malamel, Joseph & Sebastian, 2019, but can be distinguished by conical spermathecae (vs globular) (cf. Figs 19–23; Sankaran *et al.* 2019: fig. 3h).

Material examined

**INDIA • 3 ♀♀; Kerala, Kulathoopuzha, Kattilappara, Shendurney Wildlife Sanctuary; 8.902778° N, 77.11325° E; 146 m a.s.l.; 11 May 2022; A. Asima leg.; from ground; by hand; KUDZ 2022.VII.6c to 2022.VII.6e • 2 ♂♂; same collection data as for preceding; KUDZ 2022.VII.6f to 2022.VII.6g.**

Description

**Female (KUDZ 2022.VII.6c; Figs 15–23)**

**General morphology.** Cephalothorax brown with pairs of white spots behind each posterior eyes and small vertical white band behind fovea; white patch of hairs present along lateral sides (Fig. 15). Chelicerae reddish-brown with two promarginal teeth and single bicuspid retromarginal tooth (Fig. 18). Sternum oval, dark brown. Leg I dark brown except yellow tarsus, white spot present on proximal portion of tibiae; Leg II dark brown, part of femora, patellae and tibiae sparsely covered with white hairs dorsally; legs III–IV light brown with dark annulations. Abdomen small, oval, dorsum brown with three horizontal white bands with the posterior one being discontinuous; median light brown chevron pattern (Fig. 15). Venter creamy yellow with black patches and lateral stripes. Spinnerets creamy yellow (Fig. 16).

**Measurements.** Body length: 3.94; carapace 2.10 long, 1.82 wide; abdomen 1.84 long, 1.30 wide. Eye diameters: AME 0.55, ALE 0.33, PME 0.06, PLE 0.21. Eye inter-distances: AME-AME 0.03, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.12, PLE-PLE 0.89. Clypeus height at AME 0.23, at ALE 0.81. Clypeus yellowish brown (Fig. 15). Measurement of legs: I 6.25 (1.57, 1.90, 1.32, 1.00, 0.46), II 4.50 (1.43, 0.66, 1.00, 0.90, 0.51), III 5.65 (2.00, 0.93, 1.18, 1.20, 0.34), IV 6.09 (1.62, 0.54, 0.97, 1.36, 0.60). Leg formula: 1432.

**Copulatory organ (Figs 19–23).** Copulatory openings mid-laterally placed, initial portion of copulatory ducts less sclerotized, narrow, tubular and straight; spermathecae elongated, conical, multi-chambered with thick walls, fertilization duct originates from anterior part of spermathecae, diverging from each other.

**Male**

See Asima *et al.* (2022).

Distribution

India (Asima *et al.* 2022 and present study).

**Habrocestum sahyadri** sp. nov.


Figs 24–35

**Diagnosis**

The male of *H. sahyadri* sp. nov. is very similar to *H. liptoni* Kanesharatnam & Benjamin, 2020 and can be distinguished by the narrow embolus directed at 1 o’clock position (vs broad, flattened and directed at 11 o’clock position), well developed posterior rounded bulbal process (vs irregular) and RTA with broad base, triangular (vs RTA narrow) (cf. Figs 26–27, 32–33; Kanesharatnam & Benjamin 2020: figs 1d, 3a, 3b).
The female of *H. sahyadri* is very similar to that of *H. dubium* Wesolowska & van Harten, 2002, but can be distinguished by the placement of the copulatory openings, placed mid-laterally (vs placed posteriorly), copulatory duct wide (vs narrow) (cf. Figs 30–31, 34–35; Wesolowska & van Harten 2002: figs 11–13).

Etymology
The specific epithet refers to the Sanskrit word for the Western Ghats, from where the species was collected.

Type material

Holotype
INDIA • ♂; Kerala, Kulathupuzha, Pandimotta, Shendurney Wildlife Sanctuary; 8.827582° N, 77.217172° E; 1235 m a.s.l.; 11 May 2022; A. Asima leg.; from ground, by hand; KUDZ 2023.VI.23a.

Paratype
INDIA • 4 ♀; same collection data as for holotype; 25 Apr. 2023; KUDZ 2023.VI.23b to KUDZ 2023.VI.23e.

Description

Male (holotype, KUDZ 2023.VI.23a; Figs 24–27, 32–33)
General morphology. Carapace brown with black eye field, sparsely covered with light hairs (Fig. 24). Anterior eyes surrounded with reddish-orange orbital setae. Clypeus black. Chelicerae reddish brown; promargin with two closely spaced teeth; retromargin with single bifurcated tooth. Sternum dark brown. Legs I–IV yellow brown with black annulations near joints (Figs 24–25). Femur I–IV sparsely covered with white hairs. Abdomen oval, dorsum brownish with chevron shaped markings (Fig. 24). Venter

dark brown (Fig. 25). Spinnerets yellow in dorsal view and with dark brown patches in ventral view (Figs 24–25).

**MEASUREMENTS.** Body length 3.50; carapace 2.00 long, 2.53 wide; abdomen 1.50 long, 1.21 wide. Eye sizes and interdistances: AME 0.49, ALE 0.30, PME 0.041, PLE 0.20; AME-AME 0.04, AME-ALE 0.07, PME-PME 0.10, PME-PLE 0.13, PLE-PLE 0.97. Clypeus height at AME 0.20, at ALE 0.82. Measurement of palp and legs: palp 1.76 (0.38, 0.32, 0.17, 0.89), I 3.45 (1.03, 0.45, 0.80, 0.67, 0.50), II 3.15 (1.00, 0.40, 0.66, 0.50, 0.59), III 3.79 (1.19, 0.43, 1.00, 0.65, 0.52), IV 3.98 (1.38, 0.30, 0.81, 0.98, 0.51). Leg formula 4312.

**PALP** (Figs 26–27, 32–33). Yellowish with dark brown femur, patella, tibia and cymbium; RTA short and hook shaped with pointed tip; cymbium short with broad anterior end, covered with dark hairs dorsally and white hairs prolaterally (Figs 26–27); tegulum long with well-developed proximal lobe, oval bulbous, part of sperm duct is clearly visible at distal tegular region, apicomedial tegular lobe present near base of embolus; embolus long, originate from under tegular ledge, directed above sperm duct and then curved towards the cymbial groove.

**Female** (Paratype, KUDZ 2023.VI.23b; Figs 28–29, 34–35)

**GENERAL MORPHOLOGY.** Similar to male in colour except having venter yellowish brown (Figs 28–29).

**MEASUREMENTS.** Body length 5.13; carapace 2.76 long, 2.00 wide; abdomen 2.37 long, 2.30 wide. Eye sizes and interdistances: AME 0.82, ALE 0.48, PME 0.12, PLE 0.40; AME-AME 0.09, AME-ALE 0.07, PME-PME 2.17, PME-PLE 0.40, PLE-PLE 1.96. Clypeus height at AME 0.27, ALE 0.76. Measurements of palp and legs: palp 3.94 (1.38, 0.82, 0.73, 1.01), I 4.46 (1.32, 0.88, 1.00, 0.76, 0.50), II 8.03 (2.54, 1.62, 1.68, 1.21, 0.98), III 9.10 (3.30, 1.55, 1.83, 1.70, 0.72), IV 8.15 (2.53, 1.18, 1.70, 1.78, 0.96).

**COPULATORY ORGAN** (Figs 30–31, 34–35). Moderately sclerotized; initial portion of copulatory ducts membraneous, joins at posterior region of spermathecae; long, multi-chambered spermathecae with thick walls; fertilization duct arise from anterior end of spermathecae, diverging from each other.

**Distribution**

Known only from the type locality.

**Genus Irura** Peckham & Peckham, 1901

**Irura shendurney** sp. nov.

urn:lsid:zoobank.org:act:27627C82-1031-459E-AF9E-8EC30CA494A3

Figs 36–39, 43–45

**Diagnosis**

*Irura shendurney* sp. nov. is similar to *I. bidenticulata* Guo, Zhang & Zhu, 2011, but can be distinguished by the relatively longer embolus arising at 9 o’clock position (vs 11 o’clock position); conical RTA in retrolateral view (vs subquadrate) and relatively shorter retrolateral cymbial process (vs curved and longer) (cf. Figs 39–45; Guo *et al.* 2011: figs 8–10; Logunov 2022: figs 7–8). The new species is also similar to *I. uniprocessa* Mi & Wang, 2016, but can be distinguished by the presence of palpal tibia with membraneous RTA (vs palpal tibia without distinct apophysis); basal cymbial process broad and triangular, directed ventrad in retrolateral view (vs narrow and finger-like directed dorsally) (cf. Figs 39–45; Mi & Wang 2016: figs 1c–e, 2a–b).
**Etymology**

The specific epithet refers to the Shendurney Wildlife Sanctuary from where the species was collected.

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Type material

Holotype
INDIA ♂; Kerala, Kulathoopuzha, Kallar, Shendurney Wildlife Sanctuary; 8.913028° N, 77.102833° E; 1235 m a.s.l.; 10 Nov. 2022; A. Asima leg.; from vegetation, by beating; KUDZ 2022.VI.20.

Description

Male (Holotype, KUDZ 2022.VI.20; Figs 36–45)
GENERAL MORPHOLOGY. Carapace brown, covered with metallic pink recumbent scales; square, pair of black patches behind AMEs (Fig. 36); anterior eyes covered with yellowish brown orbital setae; black colour around eyes except AMEs. Clypeus covered with dense white hairs; outer rim of carapace with row of white scales (Fig. 38). Sternum yellowish brown. Labium and endites reddish brown (Fig. 37). Chelicerae reddish brownish. Leg I robust and longer than rest, brownish red, covered with black and white hairs; legs II–IV coxae, trochanter and femora brownish red, remaining segments yellow with brown annulations near joints, sparsely covered with black and white hair. Abdomen oval, flat; dorsum brown with yellowish orange markings, covered sparsely with metallic green recumbent scales; patch of pinkish scales present mid anterior region followed by three pairs posteriorly (Fig. 36). Venter dark brown with lateral creamy white longitudinal stripes. Spinnerets brown (Fig. 37).

Figs 43–45. Irura shendurney sp. nov., holotype, ♂ (KUDZ 2022.VI.20). 43–44. Left palp. 43. Ventral view. 44. Retrolateral view. 45. Bulb and embolus, ventral view. Scale bars: 43–44 = 0.5 mm. Arrow indicates the retro-dorsal extension on the palpal tibia.
Measurements. Body length 4.20. Carapace 2.00 long, 2.37 wide. Abdomen 2.20 long, 1.80 wide. Eye diameter and interdistances. AME 0.42, ALE 0.26, PME 0.13, PLE 0.21; AME-AME 0.05, AME-ALE 0.07, PME-PME 0.16, PME-PLE 0.11. Measurement of palp and legs: palp 2.18 (0.81, 0.34, 0.42, 0.61), I 5.06 (1.50, 1.00, 1.04, 0.80, 0.72), II 3.20 (1.18, 0.50, 0.61, 0.50, 0.41), III 3.00 (1.00, 0.36, 0.58, 0.48, 0.58), IV 3.29 (1.04, 0.44, 0.92, 0.50, 0.39). Leg formula 1423.

Palp (Figs 39–45). Reddish brown; ventro-distal portion of tibia with membranous area; cymbium with retrolateral ledge extended, with large, conical basal cymbial process; tibia with membranous RTA; short, conical, spine-like retro-dorsal extension present just beyond RTA (Figs 41, 44); tegulum flat and oval; tegular lobe absent; sperm duct clearly visible; embolus thin, long, originates at about 9 o’clock position.

Female
Unknown.

Distribution
Known only from the type locality.

Genus Phintella Strand, 1906

Phintella accentifera (Simon, 1901)
Figs 46–49, 52–56, 59–62


Diagnosis
The species can be recognized by the short simple spine-like embolus; triangular lamellar process and conical RTA bent at the tip. Females can be readily distinguished by the placement of copulatory openings which are closely placed to each other (Figs 52–56, 59–62).

Material examined
INDIA • 1 ♂; Kerala, Kulathoopuzha, Pandimotta, Shendurney WildlifeSanctuary; 8.827582° N, 77.217172° E; 1235 m a.s.l.; 11 May 2022; A. Asima leg.; from ground, by hand; KUDZ 2022.VI.20a • 2 ♀♀; same collection data as for preceding; KUDZ 2022.VI.20b to KUDZ 2022.VI.20c.

Description

Male (KUDZ 2022.VI.20a; Figs 46–47, 52–53, 59–60)

General morphology. Carapace brown with patch of white scales laterally and behind fovea; black longitudinal band behind each PLEs (Fig. 46). Anterior eyes surrounded by white orbital setae. Eye field dark, decorated with white band on anterior margin of prosoma behind AME; bracket-shaped white scales lateral to PLEs. Lateral sides of prosoma with white belts. Clypeus brown with white hairs at margin. Chelicerae light brown. Sternum oval, cream with black patch. Legs I–IV light yellow with black annulations. Abdomen moderately long and slightly narrower than prosoma, tapering posteriorly, dorsum brownish with pale yellow median band delimited by narrow yellow lateral bands extending longitudinally from anterior to posterior end (Fig. 46). Venter brownish (Fig. 47). Spinnerets black (Figs 46–47).
MEASUREMENTS. Body length 2.84; prosoma 1.37 long, 1.30 wide; abdomen 1.47 long, 0.80 wide. Eye sizes and inter distances: AME 0.32, ALE 0.14, PME 0.09, PLE 0.02; AME-AME 0.02, AME-ALE 0.03, PME-PME 0.74, PME-PLE 0.18, PLE-PLE 0.93. Clypeus height at AME 0.08, at ALE 0.33. Measurement of palp and legs: palp 2.77 (0.73, 0.62, 0.40, 1.02) I 6.19 (1.77, 0.90, 1.77, 1.07, 0.68), II 4.94 (1.41, 0.34, 1.56, 1.00, 0.63), III 5.33 (1.62, 0.57, 1.12, 1.38, 0.64), IV 5.39 (1.66, 0.51, 1.30, 1.42, 0.50).

PALP (Figs 52–53, 59–60). Dark brown femur, patella, tibia, and cymbium; tibia short, RTA small, claw-like, curving inwards at tip; cymbium long, narrowing towards apex, covered with dark hairs dorsally and prolateral; tegulum long with long posterior lobe; embolus beak-like arising at 10 to 11 o’clock position, curving apically at 12 o’clock position, tapering toward tip; embolus accompanied with broad and flat lamellar process; sperm duct clearly visible at shoulder of tegulum.

**Female** (KUDZ 2022.VI.20b; Figs 48–49, 54–56, 61–62)

**General morphology.** Carapace creamy yellow with patch of white scales above fovea; black longitudinal dark band behind each PLEs (Fig. 48). Anterior eyes surrounded by white orbital setae. Eye field dark. Clypeus yellow with white hairs at margin. Chelicerae yellow. Sternum oval, creamy white with black patches on laterally (Fig. 49). Legs I–IV creamy white. Abdomen wide, tapering posteriorly, dorsum creamy yellow with two submarginal broad streaks with dark scales along edges (Fig. 48). Venter creamy

**Figs 52–58.**

- **52–53.** *Phintella accentifera* (Simon, 1901), ♂ (KUDZ 2022.VI.20a).
- **54–56.** *Phintella accentifera* (Simon, 1901), ♀ (KUDZ 2022.VI.20b).

**52–53.** Left palp. **52.** Ventral view. **53.** Retrolateral view. **54–55, 57.** Epigyne, ventral view. **56, 58.** Vulva, dorsal view. Scale bars: 52–53 = 0.35 mm; 54–58 = 0.2 mm.
white with irregularly arranged dark patches (Fig. 49). Posterior spinnerets greyish, anterior spinnerets yellowish brown with distinct pair of dark wedge-shaped lines above spinnerets (Fig. 49).

**Measurements.** Body length 3; prosoma 1.25 long, 0.96 wide; abdomen 1.75 long, 1.28 wide. Eye sizes and inter distances: AME 0.26, ALE 0.13, PME 0.01, PLE 0.10; AME-AME 0.02, AME-ALE 0.03, PME-PME 0.64, PME-PLE 0.14, PLE-PLE 0.65. Clypeus height at AME 0.03, at ALE 0.18. Leg measurements: I 3.1 (1.01, 0.41, 0.74, 0.51, 0.43), II 2.9 (1.01, 0.30, 0.76, 0.43, 0.40), III 3.78 (1.18, 0.47, 0.81, 0.90, 0.42), IV 4.28 (1.32, 0.52, 1.00, 1.01, 0.43).

**Copulatory organ** (Figs 54–56, 61–62). Copulatory openings antero-medially placed, copulatory ducts broad, tubular and straight; spermathecae oval, conical, fertilization duct originates from anterior part of spermathecae, diverging from each other.

**Distribution**

India: Tamil Nadu (Simon 1901) and Kerala (present study). The species was originally described from Tamil Nadu (Simon 1901). The specimens identified as *P. accentifera* from Northeast India, China and Vietnam were misidentified and have been assigned to a different species by Sudhin *et al.* (2024). *P. accentifera* is thus known only from southern India.

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Genus *Vailimia* Kammerer, 2006

*Vailimia jharbari* Basumatary, Caleb & Das, 2020

Figs 50–51, 57–58


**Material examined**

INDIA • 1 ♀; Kerala, Kulathoopuzha, Kallar, Shendurney Wildlife Sanctuary; 8.915889° N, 77.102278° E; 146 m a.s.l.; 2 Dec. 2021; A. Asima leg.; from vegetation, by beating; KUDZ 2022.VI.21.

**Description**

For detailed description and diagnosis, see Basumatary *et al.* (2020).

**Distribution**

Assam (Basumatary *et al.* 2020) and Kerala (new record).

**Discussion**

The salticid fauna of the Western Ghats (WG) unfolds a rich diversity nestled within this biodiverse region. Recent studies have added many new discoveries of salticids from the WG in Kerala (e.g., Sebastian *et al.* 2015; Sudhin *et al.* 2017; 2019a, 2019b; 2021; 2022; 2023; Asima *et al.* 2022; 2023a, 2023b; Jose & Sudhikumar 2022). The present study adds five more species of jumping spiders to the diversity of the Shendurney Wildlife Sanctuary: *Habrocestum sahyadri* sp. nov., *Gelotia lanka* Wijesinghe, 1991, *Irura shendurney* sp. nov., *Phintella accentifera* (Simon, 1901), and *Vailimia jharbari* Basumatary, Caleb & Das, 2020. The genera *Irura* and *Vailimia* are represented for the first time in Kerala. *Phintella accentifera* known earlier from Tamil Nadu State is recorded for the first time in Kerala. Further explorations and research into the salticid fauna of the Western Ghats promises to unravel more species, which will add to our understanding of their diversity. This knowledge will be useful to undertake conservation measures by governmental bodies to ensure the continued existence of these remarkable species within the fragile ecosystem of the WG.

**Acknowledgements**

We thank the Council of Scientific and Industrial Research (CSIR), New Delhi, for providing funding support as Senior Research Fellowship to the first author. Thanks to the Chief Wildlife Warden of Kerala for issuing the collecting permit (KFDHQ-2846/2020-CWW/WL10) and the Wildlife warden and field watchers of the Shendurney Wildlife Sanctuary for their support. Merin Elizabeth George, Muhammad Suhail, Rahul Krishnan and Christopher John Isaac are thanked for their assistance during the field collection. Our sincere thanks go to the two anonymous reviewers and the Section editor, Dr Arnaud Henrard for the constructive suggestions which improved the manuscript.

**References**

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