

CORRESPONDENCE

A new species of the trapdoor spider genus *Conothele* Thorell, 1878 (Araneae: Halonoproctidae) from Western Ghats, Kerala, India

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Abstract A new species of Halonoproctid spider *Conothele chinnarensis* **sp. nov.** is described from Chinnar Wildlife Sanctuary in Western Ghats of Kerala, India based on morphological characters. The new species *C. chinnarensis* **sp. nov.** resembles *C. varvarti*, *C. birmanica* and *C. vali* but can be distinguished from *C. varvarti* by the long stalk of the apical lobe which is not distally twisted, whereas in *C. varvarti*, the stalk is twisted distally and the burrow in *C. chinnarensis* **sp. nov.** is straight without any other chamber, while in *C. varvarti*, on the inner end of the burrow a second D-shaped hinged trapdoor exists, which opens into another chamber (Siliwal *et al.*, 2009); it differs from *C. birmanica* by the presence of curved spines on tibiae I–II which are absent in *C. birmanica*.

Key words *Conothele*, mygalomorph spiders, trapdoor spiders, tarantulas, Western Ghats.

In India, trapdoor spiders are represented by five families, namely Ctenizidae, Idiopidae, Barychelidae, Halonoproctidae, Nemesiidae (Siliwal *et al.*, 2005, 2009, 2015). *Conothele* Thorell, 1878 is a genus of trapdoor spiders that lives in underground silk-lined burrows. *Conothele* was earlier placed in the family Ctenizidae, but Godwin *et al.* (2018) transferred it to the family Halonoproctidae based on molecular phylogenetic evidence. The genus contains 30 described species and is widely distributed in Asia (China, India, Japan, Laos, Myanmar, Sumatra) and Australia (WSC, 2020). *Conothele* spiders build burrows with a hinged door in the ground or in tree trunks (Gravely, 1935; Pocock, 1900). They possess strong, stout spines (Rastellum) for digging burrows, line the burrow with silk and construct a hinged door composed of silk and soil at the entrance. *Conothele* spiders use their leg like pedipalp and first legs to hold the door tightly closed when disturbed. In this paper, one new species of *Conothele* Thorell, 1878 is described based on three female specimens collected from Chinnar Wildlife Sanctuary, Kerala (10°19'44.40"N, 77°13'30.36"E). No previous report about the occurrence of this genus exists from the Western Ghats of Kerala, India.

The specimens were examined and preserved in 70% alcohol. All measurements are given in millimetres (mm). Images of live spider were taken with a Canon EOS 600D Digital Camera, with EF10mm f/2.8 macro USM. Microphotographs were taken by Canon EOS 600D digital camera attached to a Labomed CZM6 Stereozoom microscope using Canon Utility Software. Spermathecae were dissected out and cleared in KOH. Measurements of legs were taken based on the left side. Length of palp and leg segments are given as femur, patella, tibia, metatarsus (except palp), tarsus (total). The eye measurements were taken by a calibrated ocular micrometre (µm). Claws are not included in the measurement of tarsi. Total body length excludes chelicerae.

The material examined is deposited in the Arachnology collections, Department of Zoology, Deva Matha College, Kuravilangad, Kerala. Abbreviations used in this text:

ALE—anterior lateral eyes;

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AME—anterior median eyes;
 PME—posterior median eyes;
 PLE—posterior lateral eyes;
 MOQ—median ocular quadrangle;
 PLS—posterior lateral spinnerets;
 PMS—posterior median spinnerets;
 PRE—Posterior row of eyes.

Family Halonoproctidae Pocock, 1901

Genus *Conothele* Thorell, 1878

Conothele Thorell, 1878: 303. Type species: *Conothele malayana* (Doleschall, 1859).

Diagnosis. The genus is distinguished from all other Halonoproctidae genera except *Ummidia* by the presence of a saddle depression on tibia III (Fig. 2E). It differs from *Ummidia* by their burrowing habits (Fig. 3). The *Conothele* constructs a short, superficial burrow, which lies parallel to the surface of ground; whereas the *Ummidia* digs a several centimetres long burrow in the soil (Haupt, 2006). Moreover, *Conothele* is restricted to Oriental and Australian Regions, while *Ummidia* has restricted to New World and Mediterranean Regions (Godwin *et al.*, 2018)

Conothele chinnarensis sp. nov. (Figs 1–3)

Type Materials. Holotype ♀ (13/143), Chinnar Wildlife Sanctuary (10°19'44.40"N, 77°13'30.36"E), Idukki, Kerala, India, 2 December 2013, coll. Sunil Jose K. Paratypes ♀ 14/156 & ♀ 14/157 Chinnar Wildlife Sanctuary (10°18'38.60"N, 77°11'7.40"E), Idukki, Kerala, India, 5 November 2014, coll. Sunil Jose K.

Etymology. The specific epithet is based after Chinnar wildlife sanctuary.

Diagnosis. The new species *C. chinnarensis* sp. nov. resembles *C. varvarti*, *C. birmanica* and *C. vali*. It can be distinguished from *C. varvarti* by the long stalk of the apical lobe which is not distally twisted, and the burrow straight without any other chamber, while in *C. varvarti*, the stalk is twisted distally, and the inner end of the burrow a second D-shaped hinged trapdoor exists, which opens into another chamber (Siliwal *et al.*, 2009). The new species differs from *C. birmanica* by the presence of curved spines on tibiae I–II which are absent in the latter. It also differs from *C. vali* by the nature of the stalk of apical lobe (not bent in *C. chinnarensis* sp. nov. vs bent and twisted distally in a zig-zag manner in *C. vali*).

C. chinnarensis sp. nov. can be separated by other species in the genus by the spermathecae with two receptacles (Fig. 2E), and the distal end bowl-shaped, with its proximal half darker. The new species is also distinguished by paired claws on all legs with 2–3 unequal teeth, leg III with three teeth (1 primary and 2 secondaries), secondary teeth reduced in leg IV. Burrow consists of a single chamber, up to 10–13 cm deep.

Description. Female. Total body length 36.16. Carapace length 14.92, width 14.13. Abdomen length 19.8, width 14.16. Spinnerets: PMS length 1.63, width 0.98, 0.51 apart; PLS length 3.11, width 3.32. Eye diameter: ALE 0.54, AME 0.5, PLE 0.48, PME 0.33. Distance between eyes: AME–AME 0.24, PME–PLE 0.22, AME–ALE 0.37, PME–PME 0.78. MOQ length 1.34; front width 1.24; back width 1.41; eye group occupies 3.51 of head width. Maxillae length 5.81 in front, 7.19 long in back, width 3.83. Labium 2.02 long, 2.59 wide. Measurements of legs. Chelicerae 7.94 long. Sternum 8.59 long, 7.71 wide. Leg formula 4132. Measurements of legs and palp: I 8.75+5.7+5.81+3.4+1.55 (25.21), II 7.78+5.4+4.75+3.28+2.23 (23.44), III 8.1+5.66+5.34+3.12+2.94 (25.16), IV 9.98+6.13+5.63, 5.48+2.03 (29.25), Palp 9.1+5.16+5.65+4.6 (24.51).

Carapace reddish brown, anterior region pale reddish-brown, with a triangular white patch below caput, and a yellowish-white band on margin. Caput with a distinct mount between fovea and eyes (Figs 1D, 3). A dark brown line between posterior margin of eye tubercle and peak region of mount. Fovea deep, procurved and 'U' shaped (Fig. 1A). Clypeus wide, white in colour, margin of carapace also white. Caput with a three-branched median white line between anterior peak portion and posterior margin of eye tubercle. Eight eyes in two rows (Fig. 1C), both rows procurved, but anterior row procurved, posterior row slightly curved. Maxillae (Figs 2A, C) with poorly developed anterior lobe, 39 and 45 cuspules on right and left maxillae, respectively. Prolateral region with numerous setae like hairs above suture and 1–2 rows of 11 curved setae below suture. Retrolateral side not glabrous. Labium triangular, labiosternal groove slightly concave; anteromedial nine cuspules arranged in three rows. (5+3+1). Chelicerae with intercheliceral spines (Figs 1E–F) and cheliceral lyra absent. Right chelicerae with six large and two small promarginal teeth and eight large, 15 small retromarginal teeth. Left chelicerae with five large and four small promaginal teeth and eight retromarginal teeth. Dorsally anterior region

of chelicerae bears strong rastellum arranged in a low mound. Sternum (Fig. 1B) reddish-brown, broader posteriorly; sigilla large, irregular and centrally placed.

Legs with coxae, trochanter brown and tibia, metatarsus, tarsus dark brown. Tibia III with a saddle-shaped depression on dorsal side (Fig. 2E). A few hairless bands running on dorsal side, two bands on femur, tibia, patella and a single band on metatarsus. Trochanter of palp, leg I–II notched (Fig. 2E). Lateral sides of tibia, metatarsus and tarsus contain a band of short

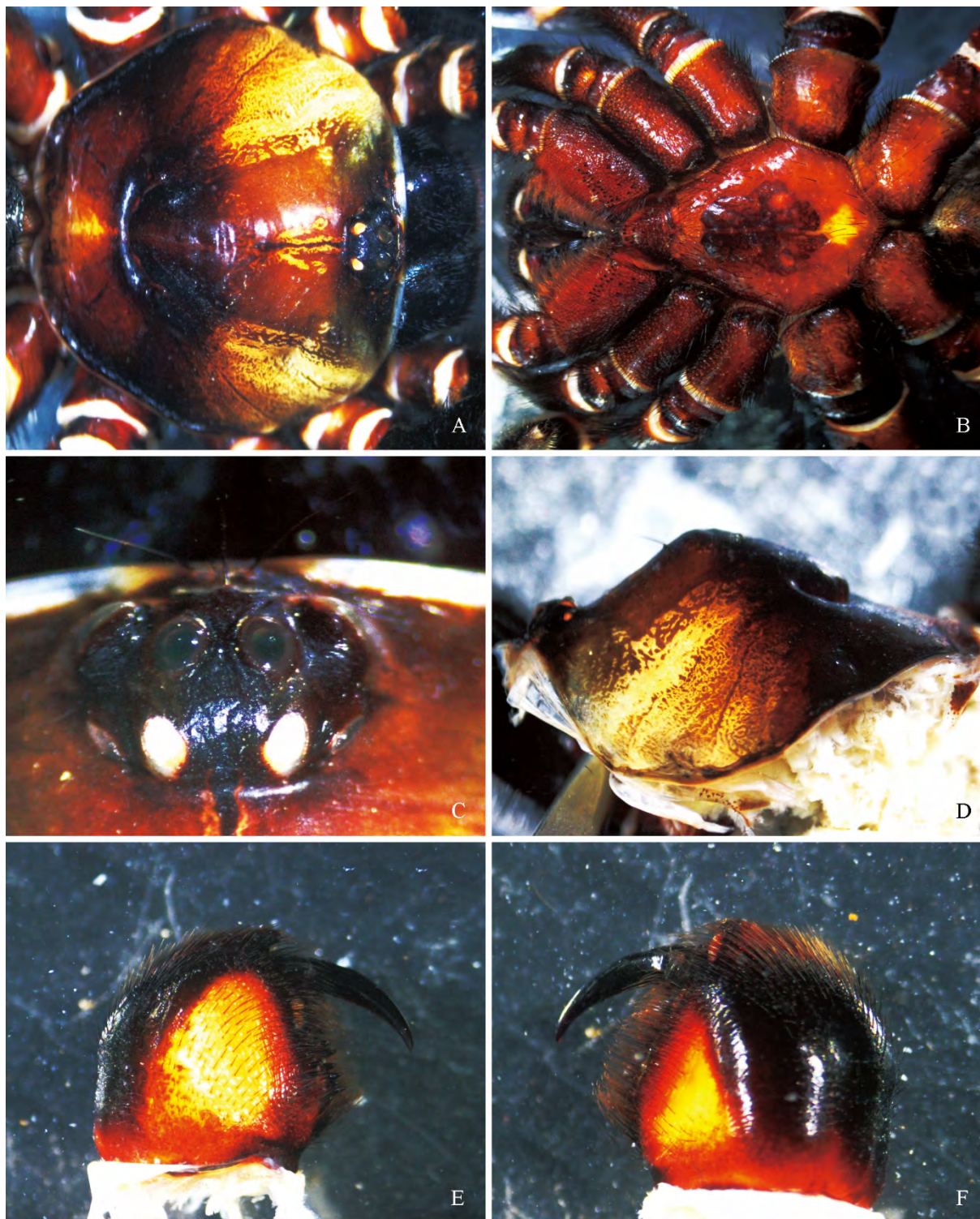


Figure 1. *Conothele chinnaensis* sp. nov., carapace and chelicerae. A. Carapace; B. Sternum, labium, maxillae; C. Eye; D. Lateral view of carapace; E. Prolateral view of chelicerae; F. Retrolateral view of chelicerae.

thick curved spines. Distal half of femur I laterally flattened and slightly curved. Femur with a dorsal depression on basal side. Ventral side of trochanter I with a distinct notch. Leg I–IV with three claws, two superior and one inferior, all claws with a primary tooth. Palp contains a single claw with a tooth. One of superior claws in prolateral side of leg I–II contains small secondary teeth near base of primary teeth. Leg III prolaterally contains small secondary teeth near primary teeth and



Figure 2. *Conothele chinnarensis* sp. nov., legs and spermatheca. A. Prolateral view of maxillae; B. Prolateral view of rastellum; C. Ventral view of maxillae; D. Spinnerets; E. Saddle like depression of tibia III; F. Spermathecae.

another one on dorso-median region of primary. Leg IV retrolaterally contains normal primary teeth, secondary teeth reduced. Prolateral claw smaller than retrolateral, teeth highly reduced.

Abdomen slightly wrinkled, covered with short and long hairs. Small spine-like setae present along with hairs but not thickly packed. Hairs provided with black surround at base, giving a warty appearance on abdomen. Spinnerets short, thick, covered with brown hairs; PLS with apical segment dome-shaped; PMS digitiform. Short or long brown spine-like setae on PLS and PMS. Spermathecae with two receptacles (Fig. 2F), distal end bowl-shaped, pale yellowish with dark brown dots; proximal portion darker. Spermathecal stalks long and twisted.

Biology. Spiders were found in dry, scrub forests of Chinnar Wildlife Sanctuary. They build vertical burrows on the ground among grasses. The burrows are 10 to 14 cm deep, and 2.5 to 3.5 cm wide with a single entrance characterized by D shaped trap door (13 mm wide). Trap door (Fig. 3) is thin, more or less straight and well camouflaged with soil and bits of dried leaves and moss. Usually during the day, when the spider is not active, the lid is kept closed. It is also kept closed during harsh weather, egg-laying and when the spider sheds its skin (Dippenaar-Schoeman, 2002).

Distribution. India (Kerala).



Figure 3. *Conothele chinnarensis* sp. nov., habit, showing burrow and trap door.

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