

**FIRST REPORT OF *STEATODA CINGULATA* (THORELL, 1890)
(ARANEAE: THERIDIIDAE) FROM NANDA DEVI BIOSPHERE
RESERVE, WESTERN HIMALAYA**

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ABSTRACT: Here, the theriid species *Steatoda cingulata* (Thorell, 1890) is reported from Nanda Devi Biosphere Reserve, Western Himalaya, with the description of the female for the first time from India. In this paper, we provide detailed description of both male and female specimens.

KEY WORDS: Comb-footed spiders, tangled webs, new report, Himalaya

Steatoda, Sundevall 1833 are small to medium, sized ecribellate, entelegyne Theridiids. They are widely distributed, constituting a diverse group of spiders occurring in a variety of habitats. The genus *Steatoda* differs from other genera of the family theridiidae by their comparatively large body; male pedipalps with strongly sclerotized internal paracymbium; embolus long and sickle or screw-shaped (Wunderlich, 2008). They build irregular tangle web of sticky silken fibres which is used to wrap prey. The web usually consist of sparse, central, sheet like structure supported by partly viscous, sticky threads, running in all directions (Levy & Amitai, 1982). There are 125 species of the genus *steatoda* reported from the world (WSC, 2018). In India six species of the genus *Steatoda* are reported so far: *Steatoda triangulosa* Walckenaer, 1802, *Steatoda grossa* C. L. Koch, 1838, *Steatoda albomaculata* De Geer, 1778, *Steatoda albocathrata* Simon, 1897 and *Steatoda rufoannulata* Simon, 1899 (WSC, 2018). *Steatoda cingulata* (Thorell, 1890) is reported from China, Korea, Vietnam, Laos, Japan, Indonesia (WSC, 2018). It was first reported by Rajoria (2016) based on male specimens collected from Mahendri region of Satpuda Range, India, but it lacks detailed description. Here, we describe both the male and female specimens with detailed descriptions and SEM images of the genitalia.

MATERIAL AND METHODS

Specimens were collected from NDBR, which is located in the northern part of the Western Himalaya and comprises parts of Chamoli district in Garhwal, Bageshwar and Pithoragarh districts in Uttarakhand state. Adult specimens were collected by hand collection method. They were then preserved and examined under a stereomicroscope (MOTIC™). All measurements are taken in millimetres (mm) using an ocular micrometer. Epigyna were dissected and cleaned using Lactic acid. Photographs were taken with a Leica DFC 290 stereomicroscope. Type material was deposited in the public museum of Wildlife Information Liaison Development Society (WILD), Coimbatore, Tamil Nadu, India.

Abbreviations:

ALE = anterior lateral eye; AME = anterior median eye; Nanda Devi Biosphere Reserve =NDBR, PME= Posterior median eyes, PLE= Posterior lateral eyes; Fe=femur; Mt=metatarsus; MOQ= Median Ocular Quadrat; OQ= Ocular Quadrate; Pa=patella; SEM= scanning electron microscopy; Ta=tarsus; Ti=tibia; WILD = Wildlife Information Liaison Development Society.

TAXONOMY***Steatoda cingulata* (Thorell, 1890)****(Fig. A-1)**

Materials examined: 2 males, 3 females, Lata village, NDBR, Uttarakhand, India, N 30°41'56.3''- E 079°42'43.9'', 2089 m, 27 July 2009, 2 males WILD-09-ARA-1316, WILD-09-ARA-1317, 3 females WILD-09-ARA-1318, WILD-09-ARA-1319, WILD-09-ARA-1320 (Shazia Quasin).

Description.**Male: (WILD-09-ARA-1316)**

Colour: Specimen is decolourised. Spider in live jet black with white markings on the dorsal side of the abdomen. In alcohol decolourised and is pale yellow in colour. Abdomen blackish with white horizontal 5-6 lines dorsally.

Total length 3.53. Carapace 2.1 long, 1.47 wide. Abdomen 2.16 long, 1.42 wide. Carapace oval, longer than wide, rough covered with warts more dense laterally and towards margins; margins serrated row of tubercles. Fovea pit like recurved broad. Posterior eyes larger than anterior eyes. Caput absent or very negligibly raised and covered with few small pallid hairs. Cervical and radial grooves distinct. Eyes eight AER is distinctly recurved, PER slightly recurved. Eyes: AME= 0.12, PME=0.11, ALE 0.12, PLE 0.14. Distance between eyes: PME-PLE= 0.07, ALE-PLE=adjacent, AME-ALE=0.06, AME-AME= 0.11, PME-PME= 0.09, OQ=0.22 long, 0.7 wide, MOQ (0.28 long and 0.3 wide). Clypeus 0.38 high. Chelicerae with two promarginal teeth and no retromarginal tooth. Endite, sternum and chelicerae tubercles present, Sternum 0.92 wide 1.2 long. Sternum broader between anterior legs and narrowing down between the posterior legs and extending like a pedicle beyond coxa IV. Endites 0.21 wide 0.32 long, longer than broad; facing prolaterally; labium perfectly fits between the endites. Labium 0.32 wide 0.2 long, roughly rectangular; slightly longer than wide. Five pairs of sigilla; Chelicerae with two promarginal teeth and no retromarginal tooth. Legs: all legs with row of ventral tubercles, very distinct on femur and tibia of anterior legs. Leg measurements (femur, patella, tibia, metatarsus, tarsus, total length): 2.5, 0.7, 2.0, 1.9, 1.0, 8.1; Leg II: 1.9, 0.7, 1.5, 1.5, 0.8, 6.3; Leg III: 1.6, 0.6, 1.1, 1.2, 0.7, 5.2; Leg IV 2.3, 0.7, 1.7, 1.8, 0.9, 7.4; Leg formula 1432. Abdomen sub-oval with collar like sclerotised ring around pedicle and extending ventrally as scutum covering the book lungs and epigastric furrow. A single row of tubercles on dorsal and lateral sides of sclerotised ring. Two colulus large. Abdomen laterally having several striulatory ridges or folds more prominent posterior-laterally. Ventrally abdomen with few broad folds mottled with white spots. Spinnerets three pairs, integument around spinnerets with yellow spots. Colulus large.

Palp: Tibia is cup shaped broader distally with broad DTA with rounded margin distally. Cymbium covered with long bristles and stiff hairs. Embolic base longer with distal embolus which emerges as screw-like apical tip. Supported by long flap like conductor for length of embolus on the right side. Median

apophysis, broad long loosely curling to form hollow tube with outer distal end triangular pointed.

Female (WILD-09-ARA-1318)

Colour: Orangish yellow carapace, legs, endites and sternum. Abdomen greyish brown with white horizontal and mid dorsal lines.

Total length 8.10. Carapace 3.0 long, 2.45 wide. Abdomen 5.1 long, 4.55 wide. Carapace with reticulation markings on lateral and posterior side. Caput not raised; Carapace as long as wide. Cervical and radial grooves distinct. Eye: posterior row straight AER recurved, Eyes: AME= 0.16, PME=0.16, ALE 0.18, PLE 0.16. Distance between eyes: PME-PLE= 0.06, ALE-PLE=adjacent, AME-ALE=0.06, AME-AME= 0.08, PME-PME= 0.06, OQ=0.36 long, 0.92 wide, MOQ (0.38 long and 0.4 wide). Clypeus 0.4 high. Chelicerae with two promarginal teeth and no retromarginal tooth. Endites 0.27 wide 0.82 long, longer than wide, widely spaced anteriorly; Labium 0.45 wide 0.27 long, wider than long; Sternum 1.73 wide 2.18 long, sternum same as male; warts on sternum, endites, and labium present but smaller in size in comparison to males. Warts on legs resembling male. Integument like broad ring band surrounding spinnerets outer side. Leg measurements (femur, patella, tibia, metatarsus, tarsus, total length): 2.6, 0.7, 2.1, 2.1, 1.1, 8.6; Leg II: 2.0, 0.6, 1.5, 1.5, 0.9, 6.5; Leg III: 1.6, 0.5, 1.8, 1.1, 0.7, 5.7; Leg IV 2.5, 0.7, 2.0, 1.8, 1.0, 8.0; Leg formula 1432. Abdomen: globular, ventral side with few yellow patches, book lungs and Epigyne covered sclerotised plate. Three horizontal lines connected laterally, mid-dorsal discontinuous line; five pairs sigilla.

Epigyne: Externally the atrium with small round opening. Internally two large round spermathecae with copulatory ducts emerging posterior-laterally and fusing before opening in the atrium, fertilization ducts small and just above copulatory ducts.

Distribution. Spider specimens were collected from stony beds of Lata Village, NDBR along the river banks of Rishi Ganga, with low and sparse vegetation.

Habitat: Specimens were collected from under stones; the species prefers open dry areas, stony or sandy fields with low and scattered vegetation. They built irregular tangled web of white threads, females carried the egg sac which consists of a dense round centre, surrounded by loosely woven silk threads giving it a fluffy appearance; egg-sacs were light pink in colour. The spider was observed to prey on grasshoppers, moths, beetles and ants.

Conflicts of interest

The authors declare that there is no conflict of interest.

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Figure 1. A, C, external epigynum; B, internal epigynum; D, female habitus; E, female with egg sac; F, typical tangled webs build under rocks. Scale bar = 0.5 mm.

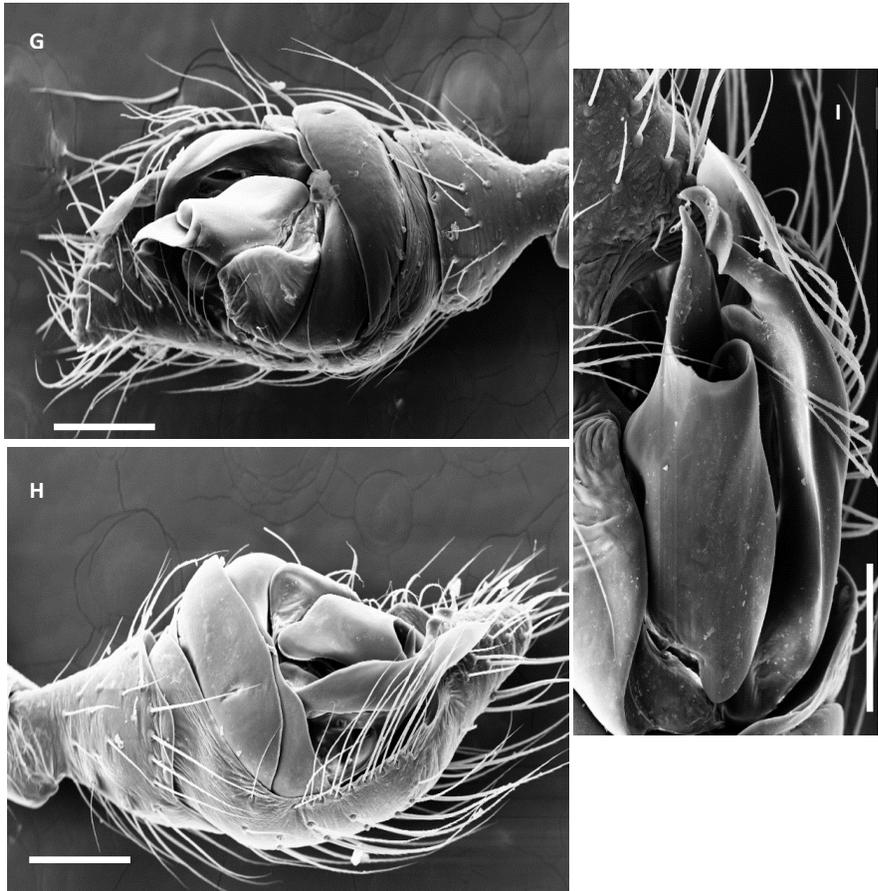


Figure 2. G-I, SEM image of male palp, scale bar: 100 μ m.