

DESCRIPTION OF A NEW SPECIES OF *ALTHEPUS* (ARANEAE: OCHYRO CERATIDAE) FROM MAHARASHTRA STATE, INDIA**Mandar L. Kulkarni* and Nadine Dupérré****

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ABSTRACT: A new species of Ochyroceratidae, *Altheopus devraii* sp. nov. is described from the Western Ghats mountain range in Maharashtra State, India. The only other known species of *Altheopus* from India, *Altheopus incognitus* Brignoli, 1973 was re-examined and photographs of the holotype are presented.

KEY WORDS: Spider, Psilodercinae, western ghats, community conserved forest

The cosmotropical family Ochyroceratidae Fage, 1912 is a relatively small spider family composed of 20 genera, including 216 species (World Spider Catalog, 2018). The family was divided into three subfamilies, Psilodercinae, Ochyroceratinae and Theotiminae by Deeleman-Reinhold (1995) based on the tracheal stigma closer to the spinnerets, the carapace shape, the chelicerae promargin with lamina and 0-2 teeth and the genitalia. Though fairly diverse in Indo-Pacific region, Ochyroceratidae is one of the most overlooked spiders (Deeleman-Reinhold, 1995). Members of this family are irregular web spinners that, usually prefer dark places including caves, crevices and hollow tree trunks. (Deeleman-Reinhold, 1995). The Pholcid-like genus, *Altheopus* is the third most diverse genus of the family with 33 species described so far and occurs only in the Oriental region (Deeleman-Reinhold, 1995; World Spider Catalog, 2018). *Altheopus* is part of the Psilodercinae subfamily alongside three other oriental endemic genera; *Psilodermes*, *Merizocera* and *Leclercera* (Deeleman-Reinhold, 1995). Pérez et al. (2017) pointed out that Deeleman-Reinhold (1995) overlook that subfamily Psilodercinae had been already proposed by Machado (1951) including *Merizocera*, *Psilodermes* and *Altheopus*. *Altheopus* are small (~3–4 mm), 6-eyed (anterior median eyes missing), ecribellate, haplogyne spiders often with a purplish shine (Deeleman-Reinhold, 1995). The genus was revised by Deeleman-Reinhold in 1995 and recently received noticed and was studied by Wang & Li (2013); Li et al. (2014); Liu et al. (2017), describing more than 16 species from China, Laos, Malaysia, Myanmar and Thailand. In India, the genus was represented by one species described in 1973 by Brignoli, *Altheopus incognitus* Brignoli 1973. The only specimen known, the female holotype was collected at 'Connoor Hills', and deposited at the Muséum d'Histoire Naturelle in Geneva. The holotype was re-examined (Figs. 11-13) in an effort to distinguish from the new species presented here. Based on the female genitalia it is quite clear that these are two distinct species but we believe that a complete redescription of the holotype is not necessary since the description and morphological work of Pablo Marcello Brignoli is accurate.

In this paper, we present the description of the second Indian species of *Altheopus*, *Altheopus devraii* sp. nov., and some images of the carapace, abdomen and the internal genitalia of *Altheopus incognitus* Brignoli, 1973.

MATERIALS AND METHODS

Specimens were collected by random search method and examined in 70% ethanol. The specimens were studied and photographed under a Leica S8APo stereozoom microscope with camera attached. Leica photographic software was used for scaling and primary processing of the images. Multi-layer images were stacked and processed using Adobe Photoshop CS6. Photographs of live spiders were taken using Canon 100mm mounted on Canon 7D and 70D cameras. Female genitalia were excised using a sharp entomological needle, studied in 70% ethanol. All measurements are in millimeters and were made taken using Leica image software integrated with microscope. Morphological nomenclature follows: Li et al. (2014), Liu et al. (2017). The type specimens described in this paper are deposited in the Research Collections of the Museum and Field Stations Facility at National Centre for Biological Sciences, Bangalore, India. Since the specimen collected on private land and not a “scheduled” species under the Wildlife Protection Act 1972, of India, permission for collection was not required. Abbreviations: Genitalia (female): S: spermathecae. Genitalia (male): B: bulb; C: conductor; CL: cheliceral lamina; CP: cymbial protrusion; E: embolus; LA: lanceolate apophysis; PT: promarginal teeth; RT: retromarginal teeth; CL: SB: serrated bristles.

Taxonomy

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757
Family Ochyroceratidae Fage, 1912
Subfamily Psilodercinae Machado, 1951
Genus *Altheopus* Thorell, 1898

Altheopus devraii sp. nov.

(Figs 1-10, 14)

Diagnosis. *Altheopus devraii* sp. nov. can be differentiated from other known *Altheopus*, by the sigmoid male palpal embolus that unites with L-shaped conductor (Fig. 5). Females are distinguished from *A. incognitus* and all known species by a pair of elongated and coiled spermathecae and a pair of short with bulbous end spermathecae (Fig. 8) short, bag-like spermathecae in *A. incognitus* (Fig. 13).

Etymology. The specific epithet is taken from the Marathi language name of Sacred Grove i.e. Devrai, near to which the type specimen was found.

Type material examined. Holotype. INDIA: ♂, Mulshi, Dist. Pune, Nandivali village (18° 33' 33.09" N 73° 29' 30.87" E), 29 October 2017, in crevices of boulders in stream (Voucher No.: NCBS-AL139). **Allotype.** ♀, same data. (Voucher No: NCBS-AL140).

Description

Male (Holotype)

MEASUREMENTS. Total length: 4.0; carapace length: 1.8; abdomen length 2.2; abdomen width: 1.8; sternum length 0.60; sternum length 0.75 width.

CEPHALOTHORAX. Carapace pale yellow with brown band medially narrowing into a triangular mark and brown bands marginally (Fig. 1). Clypeus longer than broad with no distinct markings. Six eyes surrounded by black. Labium brown. Sternum yellow with two diagonal brown bands (Fig. 3).

CHELICERAE. Pale yellow, promargin with two distinct teeth followed by a lamina, retromargin with two small teeth (Fig. 4).

LEGS. Brown, femora and tibiae with white rings.

OPISTHOSOMA. Elongated-oval with multiple transverse brown bands dorsally, getting closer towards posterior end (Fig. 1).

GENTHALIA. Tibia with one prolateral macroseta (Fig. 5). Cymbium with three slightly curved serrated bristles at the distal end of cymbial protrusion (Fig. 5), one sigmoid lanceolate apophysis pointing upwards arising from lateral protrusion (Fig. 6). Bulb dark brown, oval (Fig. 5). Embolus sigmoid, arises from distal tip of the bulb, uniting together with the L-shaped conductor (Fig. 5). Conductor brown roughly L-shaped, raises from proximal end of bulb (Figs. 5, 6).

Female (Allotype)

MEASUREMENTS. Total length: 3.8; carapace length: 1.7; abdomen length 2.1; abdomen width: 2.0; sternum length 0.60; sternum width 0.70.

CEPHALOTHORAX and CHELICERAE. As in male.

OPISTHOSOMA. Oval with complex pattern of transverse brown bands dorsally (Fig. 2).

GENTHALIA. Epigastric region with dark conical shape bands pointing towards anterior end, connecting to a small cup shaped structure with thin line (Fig. 7). Internal genitalia with pair of coiled spermathecae and a pair of short bulbous spermathecae (Fig. 8).

Natural history. *Althepus devraii* sp. nov. builds irregular web (Figs. 9, 10) in dark places such as hollow tree trunks, below boulders and crevices on earth talus in seasonal or perennial montane streams. Both male and female were observed hanging upside down in their webs (Figs. 9, 10).

Distribution. India: Maharashtra State: Pune, Satara, Sindhudurga administrative districts (Fig. 14).

DISCUSSION

The new species described here, more than three decades after the only other known *Althepus* in India, is known only from the mountain range of Western Ghats in Maharashtra state. Undeniably further studies are needed to evaluate its habitat preferences and the potential threats to the existing population. So far, we were able to observe a few other specimens at other localities but we were not able to collect them. Specimens were observed at: Taluka Mulshi, Dist. Pune, near Nive village (18°28'14.63"N 73°25'02.29"E), in streams; Taluka Patan, Dist. Satara, Nechal village, near Koyna Nagar (17°21'53.40"N 73°41'28.19"E) and Taluka Sawantwadi, Dist. Sindhudurga, Amboli (15°56'58.80"N 74°00'02.98"E). The male holotype and the female allotype were collected near the Devrai community conserved forest, the specific name was attributed to this new species

in an effort to raise awareness and promote the importance of Sacred Groves or community conserved forests in biodiversity conservation. As highlighted time to time by many workers, (Gadgil et al., 1975; Bhagwat et al., 2006; Boraiah et al., 2002; Jamir et al., 2003) community conserved areas or Sacred Groves are important refuge for many indigenous flora and fauna. For some species, Sacred Groves are last remaining breeding grounds (Bhagwat et al., 2005). Since the occurrence of *Althepus devraii* sp. nov. is more common in Sacred Groves, it is important that, these last important forests gain more attention by tourists and policy makers so as to strengthen the protection and restoration of these biodiverse areas.

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LITERATURE CITED

- Bhagwat, S., Kushalappa, C., Williams, P. & Brown, N.** 2005. The role of informal protected areas in maintaining biodiversity in the Western Ghats of India. *Ecology and Society*, 10 (1): 8.
- Bhagwat, S. & Rutte, C.** 2006. Sacred Groves: potential for biodiversity management. *Frontiers in Ecology and Environment*, 4 (10): 519-524.
- Boraiah, K. T., Vasudeva, R., Bhagwat, A. & Kushalappa, C.** 2002. Do informally managed Sacred Groves have higher richness and regeneration of medicinal plants than state managed reserved forests? *Current Science*, 84 (6): 804-808.
- Brignoli, P. M.** 1973. Un Nuovo *Althepus* dell' India meridionale (Arachnida, Araneae, Ochyroceratidae). *Revue Suisse Zoology*, 8 (2): 587-593.
- Deeleman-Reinhold, C. L.** 1995. The Ochyroceratidae of Indo-Pacific Region (Araneae). *The Raffles Bulletin of Zoology*, Suppl. 2: 1-10.
- Jamir, A. & Pandey, H.** 2003. Vascular plant diversity in the sacred groves of Jaintia Hills in north east India. *Biodiversity and Conservation*, 12 (7): 1497-1510.
- Li, F., Li, S. & Jaeger, P.** 2014. Six new species of spider family Ochyroceratidae Fage 1912 (Arachnidae: Araneae) from Southeast Asia. *Zootaxa*, 3768 (2): 119-138.
- Liu, C., Li, F., Wongprom, P., Zheng, G. & Li, S.** 2017. Eleven new species of spider genus *Althepus* Thorell, 1898 (Araneae: Ochyroceratidae) from Thailand. *Zootaxa*, 4350 (3): 469-499.
- Machado, A. de B.** 1951. Ochyroceratidae (Araneae) de l'Angola. *Publicações Culturais da Companhia de Diamantes de Angola*, 8: 1-88.
- Pérez-González, A., Rubio, G. D. & Ramírez, M. J.** 2016. Insights on vulval morphology in Ochyroceratinae with a rediagnosis of the subfamily and description of the first Argentinean species (Araneae: Synspermiata: Ochyroceratidae). *Zoologischer Anzeiger*, 260: 33-44.
- Wang, C. X. & Li, S. Q.** 2013. Four new species of the subfamily Psilodercinae (Araneae: Ochyroceratidae) from southwest China. *Zootaxa*, 3718: 39-57.
- World Spider Catalog**, 2018. World Spider Catalog. Natural History Museum Bern, online at <http://wsc.nmbe.ch>, version 19.0, accessed on (28 February 2018).



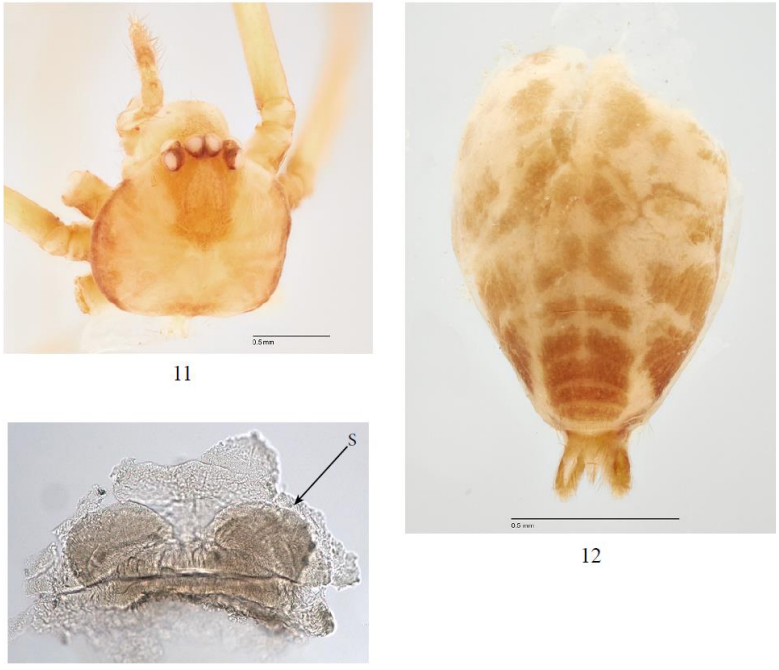
Figures 1-4. *Althepus devraii* sp. nov. 1) Male habitus, dorsal view. 2) Female habitus, dorsal view. 3) Male sternum, ventral view. 4) Male chelicerae, posterior view.



Figures 5-8. *Althepus devraii* sp. nov. 5) Male palp, prolateral view. 6) Male palp, retrolateral view. 7) Female epigastric region, ventral view. 8) Female internal genitalia, dorsal view.



Figures 9, 10. *Althepus devraii* sp. nov. 6) Male in web. 7) Female in web.



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 Figures 11-13. Holotype female of *Althepus incognitus* Brignoli 1973. 11) Cephalothorax, dorsal view. 12) Opisthosoma, dorsal view. 13) Internal genitalia, dorsal view.

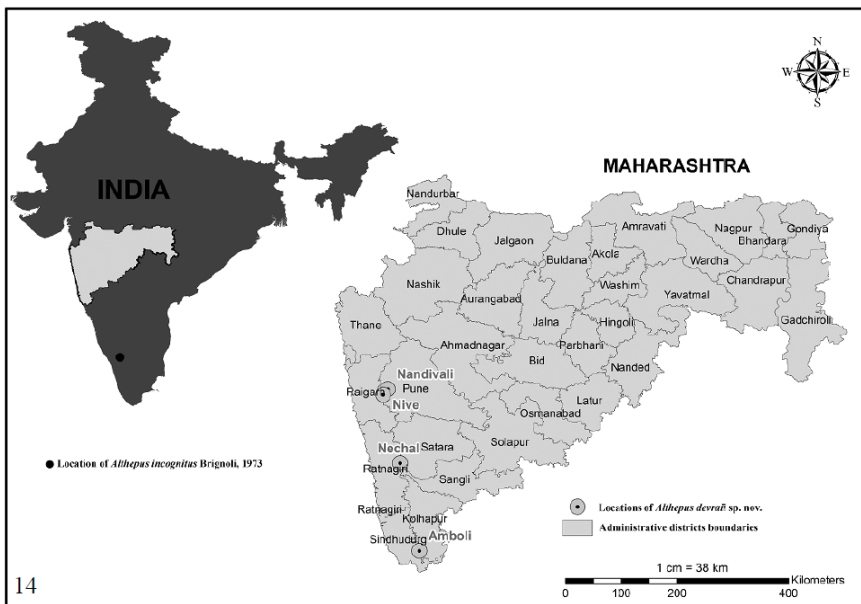


Figure 14. Distribution map of *Althepus devraii* sp. nov. and *Althepus incognitus* Brignoli, 1973.