



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(2): 2774-2776

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Received: 03-01-2018

Accepted: 04-02-2018

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First record of *Rhomphaea labiata* (Zhu & Song, 1991) from India (Araneae: Theridiidae)

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Abstract

Studies on Theridiid spider fauna of Indian region especially Kerala is very less. Hence large number of our spiders in Western Ghats of Kerala remains undiscovered and unrecorded. The theridiidae is diverse family in India with 58 known species belonging to 19 genera. Only a few genera such as *Argyrodes*, *Chryso*, *Nesticodes*, *Parasteotoda* and *Theridula* are recorded from Kerala so far. *Rhomphaea* is one of the species rich genera of the family Theridiidae with 34 known species worldwide. First record of *Rhomphaea labiata* (Zhu & Song, 1991) is reported from India. It shows close similarity with *Argyrodes flavescens* O. P. Cambridge, 1880 but can be distinguished by its boomerang-shaped abdomen, elongated ocular projection and oval shaped spermathecae with a posterolateral arch touching spermathecae. Descriptions and illustrations based on a female collected from Peechi-Vazhani wild life sanctuary, Kerala are given.

Keywords: theridiidae, taxonomy, western ghats

1. Introduction

The family Theridiidae is one of the largest family of spiders with 2472 species in 124 genera worldwide (WSC, 2018) ^[11]. Even though India exhibits rich assemblage of spiders, studies about Theridiids of Indian region is highly neglected probably due to their small size and lack of literature (Siliwal, 2009) ^[9]. Only 58 Indian species belonging to 19 genera are recorded (Sebastian & Peter, 2009) ^[7] from India so far. Studies on Theridiid spiders of India were initiated by Westwood (1835). An extensive study of Theridiids of India were conducted by Tikader during 1963-1977. The genera of the family Theridiidae can be distinguished into six groups based on their habit and habitat (Murphy & Murphy, 1993) ^[5].

Genus *Rhomphaea* was removed from the synonymy of *Argyrodes* Simon, 1864 by Agnarsson, 2004 based on elongate tibia, boomerang-shaped abdomen and rhomboid egg sac. *Rhomphaea* includes spear shaped theridiids specialized in hunting the prey by attacking them on their web. The genus was established by Koch (1872) and includes 34 species so far (WSC, 2018) ^[11]. Except *Rhomphaea projiciens* O. Pickard-Cambridge, 1896 no other species is reported from India. In this paper we report the first record of *Rhomphaea labiata* (Zhu & Song, 1991) ^[15] from India. The present species is collected from Peechi-Vazhani Wildlife Sanctuary, situated at 20 km east of Thrissur, Kerala (Map 1). The Peechi-Vazhani Wildlife Sanctuary is situated in the catchment area of Peechi and Vazhani dams and has rich faunal and floral diversity.

2. Materials and Methods

Specimens were collected by hand during August 2016 from Peechi-Vazhani wildlife sanctuary. The material was preserved in 75% alcohol. Live images of the specimens is taken with a Digital Camera, fitted with macro lens. Microphotographs were taken by Digital Camera attached to a Labomed CZM6 Stereozoom Microscope using Canon EOS Utility Software. The measurement and illustration of the specimen was done using drawing tube in the laboratory. Legs and pedipalp measurements were taken from their dorsal side of the body and are given in the order: Femur, Patella, Tibia, Metatarsus (except palp), Tarsus and Total. The eye measurements were taken with calibrated ocular micrometer. Female epigyne was cleared in situ with clove oil. The description was done by immersing the spider in a petri dish containing 70% alcohol. All measurements are in millimeters. Maps were prepared the using online tool available at www.mapcustomizer.com.

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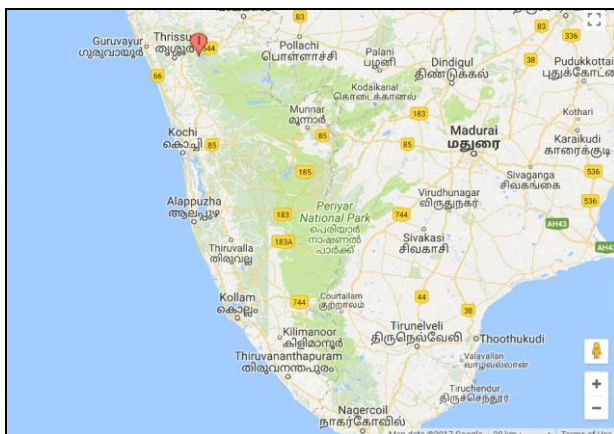
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Abbreviations: AL-Abdomen length; AW-Abdomen width; CL-Cephalothorax length; CW-Cephalothorax width; TL-Total length; AME- anterior median eyes; ALE- anterior lateral eyes, PME- posterior median eyes, PLE- posterior lateral eyes; Fig-Figure.



Fig 1: *Rhomphaea labiata* (Zhu & Song, 1991) [15] in life



Map 1: Peechi-Vazhani Wildlife sanctuary

3. Results

3.1 Taxonomy

Rhomphaea labiata (Zhu & Song, 1991) [15]

3.2 Material examined: Two females, Peechi-Vazhani Wildlife Sanctuary, Kerala, India. Repository: DMCK-TH2016-007, DMCK-TH2016-008, 29 August, 2016 Arachnological Collections, Zoology Museum, Deva Matha College, Kuravilangadu, Kerala, India.



Fig 2: *Rhomphaea labiata* (Zhu & Song, 1991) [15]: 1. Dorsal View, 2. Ventral View

3.3 Description

3.3.1 Measurements of Female (Holotype): CL-2.38, CW-1.31, AL-4.61, AW-3.00, TL- 9.22, Palp and leg: Palp (0.52, 0.31, 0.66, 1.03; 2.52); I (0.42, 0.12, 0.56, 1.11, 1.24; 3.45); II (0.38, 0.07, 0.47, 0.64, 1.01; 2.57); III (0.20, 0.10, 0.26, 0.36, 0.47; 1.39); IV 0.36, 0.12, 0.38, 0.72, 0.80; 2.38).

3.3.2 Cephalothorax (Fig. 2.1): Longer than wide and light yellowish in color. Cephalic region slightly elevated and anterior end narrower than rest.

3.3.3 Eyes (Fig. 2.1): Heterogeneous, eight in two rows. Ocular quadrangle wider than long. PME larger and prominent. Lateral eyes contiguous, eye rings present. Eye diameter: AME: 0.21, ALE: 0.13, PME: 0.24, PLE: 0.02.

3.3.4 Sternum (Fig. 2.2): Heart shaped, tapering to coxa IV. Legs long, slender clothed with fine hairs. Light yellowish in color up to coxae, femur onwards light blackish in color.

3.3.5 Abdomen (Fig. 2.1, 2.2): Longer than wide, pale yellowish, boomerang-shaped and extends beyond the spinnerets. Dorsal and lateral sides decorated with silvery patches on the posterior half; posterior end provided with darker patch. Ventrums light yellowish with a mid ventral brown patch.

3.3.6 Spinnerets well developed; posterior and anterior side with black markings.

3.3.7 Epigyne (Fig.3) Small, light brown in color. Spermthecae longer than wide, oval in shape. Forming an arch shaped appearance, sclerotized ends of copulatory ducts touches the spermatheca.



Fig 3: Epigyne- dorsal view

4. Discussion

Rhomphaea labiata (Zhu & Song, 1991) [15] shows close similarity with *Argyrodes flavescens* O. P. Cambridge, 1880. *R.labiata* can be distinguished from *A.flavescens* by its boomerang-shaped abdomen. Ocular projection of *R.labiata* is elongated when compared to *A.flavescens*. Major difference between both spiders comes in female genitalia. In *R.labiata* oval shaped spermathecae with a sclerotized postero-lateral arch touches the spermathecae, while in *A.flavescens* the sclerotized structure does not touch the spermathecae and lies far from spermathecae. Both spiders show difference in size and shape of fertilization duct also. Fertilization duct of *R.labiata* is longer and prominent when compared to *A.flavescens*.

Genus *Rhomphaea* was first established by L. Koch, 1872. *Rhomphaea* shows close similarity with genus *Argyrodes*.

Exline and Levi (1962) merged *Rhomphaea* with the genus *Argyrodes*, but Yoshida (2001)^[13] removed it from synonymy of *Argyrodes*. Only one species of *Rhomphaea* was reported from India so far, *Rhomphaea projiciens* O. Pickard-Cambridge, 1896 from Andhra Pradesh (Srinivasulu, *et al.* 2013)^[10]. The present record extends the distribution of the species further south in the Indian region.

5. Distribution: China, Korea, Laos, Japan and India (New Record).

6. Ecology (Fig. 1): *Rhomphaea labiata* (Zhu & Song, 1991)^[15] was collected from a cob web (with a leaf retreat at the middle of the web). The habitat of the spider was very near to the location of Peechi-Vazhani Dam which indicates its preference for humid and wet surroundings.

7. Conclusion

As only one species from this genus *Rhomphaea* has been reported from India so far, the present record proves to be significant. The climatic conditions of Western Ghats in Kerala support a rich growth of Theridiid spiders, but due to the lack of the studies much of our theridiid diversity remains unrecorded. So the discovery of the habitat of this spider and its description may help the future studies on Theridiid spiders of Kerala.

The *Rhomphaea* species are highly varied in their habits. Some species are kleptoparasitic (Sancak, 2017)^[14] while others hunt their own prey using fourth legs to throw sticky threads at their prey. They have the habit of keeping their legs close to their body while resting. This makes them look like a piece of leaf fragment suspended in air in the web. The abdomen in these species are highly varied in their structure, can be either boomerang shaped or triangular shaped. The palps in males are unusually long and eyes are present on a conical projection (Koh & Ming, 2013)^[3].

8. Acknowledgment

Financial assistance received from Kerala State Biodiversity Board, Kerala (PF-02/J/2017/KSBB) is gratefully acknowledged. Authors also thank Kerala Forest Department for permitting the study in the forest areas of Kerala.

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