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DESCRIPTION OF A NEW SPECIES OF ORB-WEAVING SPIDER OF THE GENUS *CYRTARACHNE* THORELL, 1868 FROM BANGLADESH (ARANEAE : ARANEIDAE : CYRTARACHNINAE)

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Abstract

Taxonomic description of a new species of orb-weaving spider of genus *Cyrtarachne* Thorell is provided herewith. In this study, species *Cyrtarachne kaikobadi* n. sp. was identified as new to science. The paper presents an illustrated description of the new species together with brief generic diagnosis and distribution.

Key words: Taxonomy, Orb-weaving spider, *Cyrtarachne,* Araneae, Araneidae, Cyrtarachninae, Bangladesh.

Introduction

Spiders of the genus *Cyrtarachne* Thorell are common orb-weaving spiders in the garden and forests of Bangladesh. They belong to the family Araneidae and make typical webs within plant leaves on which they stay for the preys. Their preys are composed of many small pest insects those are injurious to economic plants. Members of the genus *Cyrtarachne* are colourful, small to medium in size and are typical in shape. They are very slow in nature and some times stay whole day on the webs in the same position for the preys. They are one of the common biological control agents of insect pests in the gardens and forests.

The genus *Cyrtarachne* was first erected by Thorell in 1868 with the type-species *C. grubei* (Keyserling, 1864). At present, it is composed of 55 species in the world fauna and 12 species in the Indian Sub-continent but only 3 species are described in Bangladesh (World Spider Catalog, 2024; Tikader, 1960, 1962; Caleb and Sankaran, 2024; Biswas and Raychaudhuri, 2019; Chowdhury and Nagari, 1981; Okuma *et al.*, 1993). A good number of species are also described in other different countries of the world (Yin and Zhao, 1994; Barrion and Litsinger, 1995; Yin *et al.*, 1997; Song *et al.*, 1999; Tanikawa, 2007, 2013; Kim and Lee, 2012). The present paper contains illustrated description of a new species *C. kaikobadi* n. sp. with its generic diagnosis and distribution.

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Materials and Methods

Collection and Preservation: The specimens were collected from different gardens of southwestern coastal areas of districts Bagerhat and Khulna of Bangladesh during April to May. Collections were made by jarking the branches of trees and shrubs on an inverted umbrella placed underneath the plants. The specimens after collection were placed to a large glass jar containing wade of cotton with chloroform for anesthesizing the specimens. These were then transferred to a petridish filled with 70% ethyl alcohol for sorting. After sorting, the specimens were then placed to separate glass vials with 70% alcohol for future identification and study.

The collected specimens were primarily put in 70% alcohol and after identification, these were preserved permanently in Audmans' Preservatives (90 parts ethyl alcohol + 5 parts glycerine + 5 parts glacial acetic acid) following Lincoln and Sheals (1985) and Tikader (1987).

Identification and study: The specimens were identified by the study of various important taxonomic characters viz. - body shape, size, colour, eye pattern, decoration, structure of legs, chelicerae, pediplps, epigynum etc. The female epigynum was dissected out by the help of fine blade and the put it in clove oil for 10 to 12 hours (over night) following Levi (1965) and Tikader (1987). All other characters were studied following the description and keys made by different authors like - Davies (1988), Tikader (1982, 1987), Yaginuma (1986), Chen and Zhang (1991), Barrion and Litsinger (1995), Yin *et al.* (1997), Tanikawa (2007), Biswas (2009) and Kim and Lee (2012).

After identification, the species was later confirmed from the Arachnida section, Zoological Survey of India, Kolkata. The specimens are now preserved with the collection of the Department of Zoology, Khulna Government Womens' College, Khulna and later it will be deposited permanently to the Museum of the Department of Zoology, University of Dhaka, Bangladesh, in due course of time.

Illustration and photograph: Whole body and different body-parts of spiders were illustrated by a Camera Lucida fitted with Stereozoom Binocular Microscope. Leg and palpal measurements were taken under the same condition in the following sequences : femur, patella, tibia, metatarsus, tarsus and total length and all these measurements are taken in millimeters (mm).

The Photographs of the identified specimens were taken in natural condition (in the field by DSLR Camera) and in the laboratory by Camera fitted microscope (model SV8, Zeiss).

Results and Discussion

Systematics

Family: ARANEIDAE Clerck, 1757; Subfamily: Araneinae O.P. Cambridge, 1871
Tribe: Araneini O.P. Cambridge, 1871; Genus: *Cyrtarachne* Thorell, 1868

Type species: *C. grubei* (Keyserling, 1864) 1868. *Cyrtarachne* Thorell, *Eng. Resa. Arachn.* : 10. *Dema* : Karsch, 1878 : 801; *Cyrtarachne*: Simon, 1895 : 880; Pocock, 1900 : 228; Yaginuma , 1960 : 61 ; Tikader, 1960 : 547; Barrion and Litsinger, 1995: 581; Platnick, 1997 : 498; Yin *et al*. : 267; Majumder, 2005 : 9; Biswas, 2009: 149; World Spider Catalog, 2024 , Version 24.5, Nat. Hist. Mus. Bern, http ://wsc.nmbe.ch

Diagnosis: Spiders of the genus *Cyrtarachne* Thorell are small to medium in size with body rounded to nearly rounded. Cephalothorax dorsally strongly convex and wider than long. Eyes small; lateral eyes large and contiguous. Chelicerae small, thick ; inner and outer margins with small teeth. Maxillae and labium leathery and scopulate. Legs long and slender ; tibiae I with strong spines.

Abdomen triangular or rhomboid or elongately oval, with or without humps ; leathery and with or without sigilla. Epigyne variable.

Biological note: These spiders build specialized geometrical webs within plant leaves in the garden and forests. They stay there long time for the preys and consume small pest insects from the webs. For this reason, they are considered as one of the important biological control agents of insect pests of economic plants.

Distribution: Asia, Australia, Africa.

Description of new species

***Cyrtarachne kaikobadi* n. sp.** (**Figs.1a - 1e; Plate 1**)

Material examined: Holotype : 1 female, Harinkhana , Bagerhat, 07. IV. 1997 & 18. V. 1997 , Coll. V. Biswas; Paratype: 1 female, ADI, Daulatpur , Khulna, 12. VII. 1998, Coll. V. Biswas; Allotype: Nil.

Designation of the types

Holotype: This is a single female specimen preserved permanently in Audmans' preservatives. It was collected from the web of a shrub of village Harinkhana, district Bagerhat on 7th April, 1997 and the whole illustrated description of the species is made on the basis of its taxonomic characters.

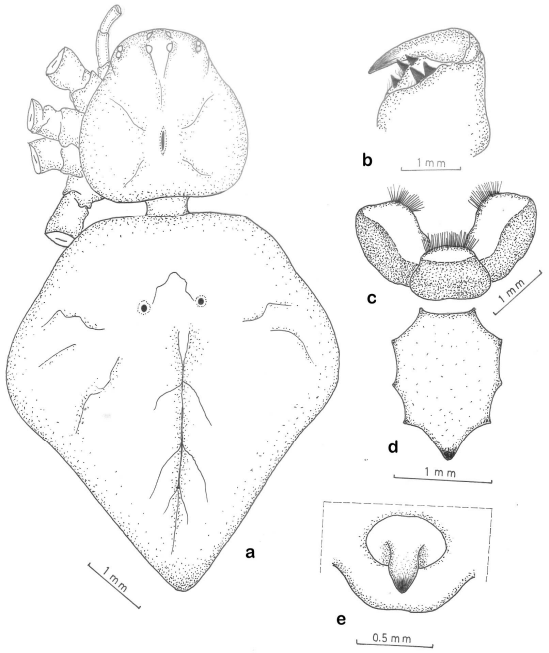

Fig. 1(a-e). *Cyrtarachne kaikobadi* n. sp. a. Whole body (dorsal view); b. Chelicerae; c. Maxillae & Labium; d. Sternum; e. Epigynum

Plate 1. *Cyrtarachne kaikobadi* n. sp. (dorsal view)

Paratypes: This is also a single female specimen collected from Agricultural Diploma Institute (ADI), Daulatpur, district Khulna. It is also preserved in Audmans' preservative on 12th July 1998.

General: Body small, brown, robust, nearly rhomboid. Cephalothorax and legs brown ; abdomen yellow-brown with white dorsal reticulate markings. Total body length 10 mm. carapace 4 mm long, 4.10 mm wide ; abdomen 6 mm long and 5.10 mm wide.

Cephalothorax: longer than wide, medially wide, anteriorly narrowing with 2 lateral and 1 median tubercles ; medially with a distinct transverse furrow ; cervical furrows weakly distinct (Fig. 1a). Eyes pearly white, similar; anterior row recurved and posterior row faintly so ; lateral eyes close and situated on tubercles ; median eyes marginal and placed lateral to the median tubercle ; ocular quad squarish. Chelicerae brown, small, strong, each of inner and outer margins with 2 and 3 teeth (Fig. 1b). Maxillae brown-black, longer than wide, anteromedially broad and scopulate (Fig. 1c). Labium brown-black, wider than long, anteriorly scopulate (Fig. 1c). Sternum dark brown, nearly heart-shaped, posteriorly bluntly pointed, anterior margin concave (Fig. 1d). Legs long and slender, clothed with spines and hairs; leg formula 2143 and the measurements (in mm) of leg segments are shown in Table 1.

Table 1. Measurements (mm) of leg segments of *C. kaikobadi* n. sp.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.10/2.10	1.00/1.00	2.00/2.00	2.10/2.10	0.60/0.60	7.80/7.80
II	2.80/2.80	1.00/1.00	2.00/2.00	1.80/1.80	0.60/0.60	8.20/8.20
III	1.80/1.80	0.60/0.60	1.20/1.20	1.00/1.00	0.50/0.50	5.10/5.10
IV	2.50/2.50	1.00/1.00	2.00/2.00	1.00/1.00	0.50/0.50	7.10/7.10

Abdomen : Rhomboid, medially wide, posteriorly narrowed and bluntly pointed ; dorsum anteromedially with 2 sigilla and decorated with white reticulate markings ; epigyne tongue-like (Fig. 1e).

Male unknown, it will be described when available in the collection.

Etymology: The species is named after Professor Muhammad Kaikobad of Govt. P.C. College, Bagerhat to whom I am greatly indebted in this research.

Distribution : Bangladesh : Gardens of village Harinkhana, district Bagerhat and Agricultural Diploma Institute (ADI) garden, Daulatpur, district Khulna (type-localities).

Remarks: The species is nearly related to *C. biswajiti* Biswas & Raychaudhuri, 2019 in having the rhomboid structure of both the species. But none of its congeneric species (Tikder, 1982 ; Yaginuma, 1986 ; Koh, 1989 ; Shinkai & Takano, 1988 ; Namkung & Kim, 1985 ; Barrion & Litsinger, 1995 ; Yin *et al.* 1997 ; Kim & Lee, 2012) are known have abdomen posteriorly nearly tail-like. The present species also possesses the following diagonostic characters -

1. Structure of female genitalia (or epigynum) is quite different and it is tongue-like (Fig. 1e).
2. Cheliceral inner and outer margins with 3 and 2 teeth respectively (Fig. 1b).
3. Maxillae and labium broad, scopulate and without any spine (Fig. 1c).
4. Structure of sternum elongate (Fig. 1d).

The species, is therefore, decribed as new to science.

Discussion

The new species *Cyrtarachne kaikobadi* n. sp. is a small, rhomboid, brownish coloured orb-weaving spider. Members of this spiders are available on the webs made by their own within gardens plants. It has some specialized diagnostic characters of like - chelicerae, maxillae, labium and also female genitalia on the basis of which it is established as a new species. So, from this study, it may be assumed that there are more numbers of endemic fauna (species) present in different areas of the country.

Taxonomic study on the orb-weaving spider genus *Cyrtarachne* Thorell of Bangladesh is scarce, except Okuma *et al.* (1993), Biswas (2009) and Biswas and Raychaudhuri (2019). Therefore, a detailed taxonomic study on this genus may discover several new species in future.

As the new species *C. kaikobadi* n. sp. is an inhabitant of the gardens and forests, so, it may expect that it must have a predatory role in controlling pest insects of those ecosystems.

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