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TAXONOMIC ACCOUNT OF ORB-WEAVING SPIDER GENUS *CYRTARACHNE* THORELL, 1868 (ARANEAE: ARANEIDAE: CYRTARACHNINAE) FROM BANGLADESH

Vivekanand Biswas[1*] and D. Raychaudhuri[2]

[1]Department of Zoology, Khulna Government women's' College, Khulna-9000, Bangladesh, [2]Department of Zoology, University of Calcutta, 35, Ballygunge Circular Road, Kolkata-700 019, India

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ABSTRACT

Taxonomic study on some orb-weaving spiders of the genus *Cyrtarachne* Thorell was carried out in Khulna, the southwest part of Bangladesh. Two species were recorded during the study of which *C. ovata* sp. n. was identified as new to science and *C. sundari* Tikader was recorded earlier from this country. Illustrated description and distribution together with key to the species of Bangladesh are presented herewith.

Keywords: Araneae, Araneidae, Bangladesh, *Cyrtarachne*, Cyrtarachninae, Taxonomy.

INTRODUCTION

Orb-weaving spiders (Family: Araneidae) are one of the attractive and common predatory arachnids in the crop-fields and gardens of Bangladesh. These are known to all by their peculiar orb-weaving mechanism and different typical geometrical webs on which they stay and catch the crop pest insects (Biswas and Raychaudhuri 2019). Members of the genus *Cyrtarachne* Thorell are small to medium in size (ranges from 8 mm to 12 mm) with attractive colour and peculiar body shapes. They usually spin the webs in the dusk (during sundown) and stay therein long time to catch the preys.

The genus was first erected by Thorell in 1868 with the type-species *C. gr*ubei (Keyserling 1864) and at present, it is composed of 55 species worldwide (World Spider Catalog 2024, Mikhailov 1997). In Bangladesh, only three species of this genus was recorded earlier (Okuma *et al.*1993, Chowdhury and Nagari

*Corresponding author: *vivekarach@gmail.com*

1981, Biswas 2019, Begum and Biswas 1997, Biswas and Raychaudhuri 2019). But a good number of records are found in different Asian countries like - India (Tikader 1960, 1963, 1982; Jose 2011, Ahmed *et al*. 2015, Sen *et al.* 2015, Jwala *et al.* (2022), China (Yin *et al.* 1997, Yin and Zhao 1994, Song *et al.* 1999), Japan (Yaginuma 1986, Tanikawa 2007, 2013), Korea (Namkung 2003, Namkung and Kim 1985, Kim and Lee 2012), Singapore (Koh 1989), The Philippines (Barrion and Litsinger 1995) etc. The present paper describes two araneid species –*C, sundari* Tikader and *C. ovata* sp. n. of which one is identified as new to science. *C. sundari* is a new record for the area of present study and only some of its diagnostic characters are used. A key to all the species recorded in Bangladesh are presented herewith.

MATERIALS AND METHODS

Collection and Preservation: Specimens of this study were collected from different areas of Bangladesh. Collections were made by jerking the branches of shrubs on an inverted umbrella placed underneath the plant. The collected specimens were then transferred to a Petri dish filled with 70% ethyl alcohol for sorting. After sorting, the specimens were placed in separate glass vials for future identification. After identification, the specimens are preserved permanently in Audmans' preservatives following Lincoln and Sheals (1985) and Tikader (1987).

Identification and Study: The specimens were identified by study of various taxonomic characters *viz.*, – body shape, colour, eye pattern, structure of legs, cheliceral dentition, pedipalp, epigyne etc. The pedipalp and female epigynum were dissected out from the body and boiled in 10% KOH for 2-3 minutes following Levi (1965) and Tikader (1987). The identifying characters were studied following different important books and pulications of different authors of home and abroad like – Davies (1988), Tikader (1982, 1987), Yaginuma (1986), Chen and Zhang (1991), Yin *et al.* (1997), Song *et al*. (1999), Dondale *et al*. (2003), Tanikawa (2007), Biswas (2009) and Kim and Lee (2012).

After identification, the species were later confirmed from the Arachnida section, Zoological Survey of India, Kolkata.

Illustration and Photograph: All the drawings of the species were illustrated by a Camera Lucida fitted with Stereo zoom Binocular Microscope. Legs and palpal

measurements were taken under the same in the following sequences: femur. Patella, tibia, metatarsus, tarsus and total length. All the measurements are taken in millimeters (mm).

The photographs were taken in the laboratory by a Camera fitted Microscope (model SV8, Zeiss).

Type deposition: All the identified types are now in the laboratory of the Department of Zoology, Khulna Government Womens' College, Khulna, and will be deposited to the Museum of the Department of Zoology, University of Dhaka, in due course of time.

RESULTS AND DISCUSSION

Taxonomic account

Family : ARANEIDAE Clerck, 1757
Subfamily : Cyrtarachninae O.P. Cambridge,1871
Tribe : Cyrtarachnini O.P. Cambridge, 1871
Genus : ***Cyrtarachne*** Thorell, 1868
Type-species : *C. grubei* (Keyserling, 1864)
1868. *Cyrtarachne* Thorall, *Eng. Resa. Arachn*., : 10.
1878. *Dema* : Karsch, *Z. ges. Naturw.,* **51** : 801.
1895. *Cyrtarachne* : Simon, *Hist. Nat. Araign*., **1** (4) : 880.
1900. *Cyrtarachne* : Pocock, *Fauna of Brit. India,, Arachn*. : 228
1960. *Cyrtarachne*: Yaginuma, *Spiders of Japan in colour*, : 61.
1960. *Cyrtarachne* : Tikader, *J. Bombay nat. Hist. Soc*., **57** (3): 547.
1982. *Cyrtarachne* : Tikader, *Fauna of India, Araneidae*. **2** (1) : 138
1988. *Cyrtarachne* : Davies, *Mem. Qld. Mus*., **25** (2) : 38.
1995. *Cyrtarachne* : Barrion and Litsinger, *Riceld. Spid. South & S. Asia* : 581.
1997. *Cyrtarachne* :Platnick, *Advances in spider Taxonomy* : 498.
1997. *Cyrtarachne* : Yin *et al., Fauna Sinica, Araneidae* : 267.
1999. *Cyrtarachne*: Song *et al.,The Spiders of China* :
2005. *Cyrtarachne*: Majumder, *Mem. Zool. Surv. India***, 20** (3) : 9.
2009. *Cyrtarachne*; Biswas (Ahmed ed.), *Flora & fauna of Bangladesh*, **18**(1):149
2024. Cyrtarachne :*World Spider Catalog,* Version 24.5, Nat. Hist .Mus. Bern, Online – http://www.wsc.nmbe.ch (accessed 21th Nov. 2024)

Distribution: ASIA, AUSTRALIA, AFRICA.

Key to the species of genus *Cyrtarachne* Thorell in Bangladesh

1. Abdomen triaguar, with distinct humps and sagilla; inner and outer margins of chelicerae with 2 and 1 teeth; sternum roughly triangular .... *C. sundari**

_ Abdomen never as above; cheliceral teeth when present, never with such combination; sternum never as above 2

2. Abdomen rhomboid; cheliceral margins with teeth; cephalothorax wider than long; sternum heart-shaped 3

_ Abdomen elongately ovoid; cheliceral margins without any teeth; cephalothorax longer than wide; sternum cylindrical .... *C. ovata* n.sp.

3. Abdominal dorsum medially strongly reticulate, marginally and poste decorated, without any sigilla; cervical furrows distinct ; chelicerae parallel sided with 4 teeth on outer margin, anteromedian and lateral eyes marginal and on protuberences. ..... *C. biswajiti**

_ Abdominal dorsmum weakly reticulate centrally, medially with a branch with a pair of distinct sigilla; cervical furrows weakly impressed; chelicerae not parallel-sided, with 3 teeth on outer margin; eyes never marginal and protuberance ..... *C. kaikobadi**

* - marked species are described earlier and used here only to complete the couplet of the key. Species *C. sundari* is a new record for the present study.

Description of the new species

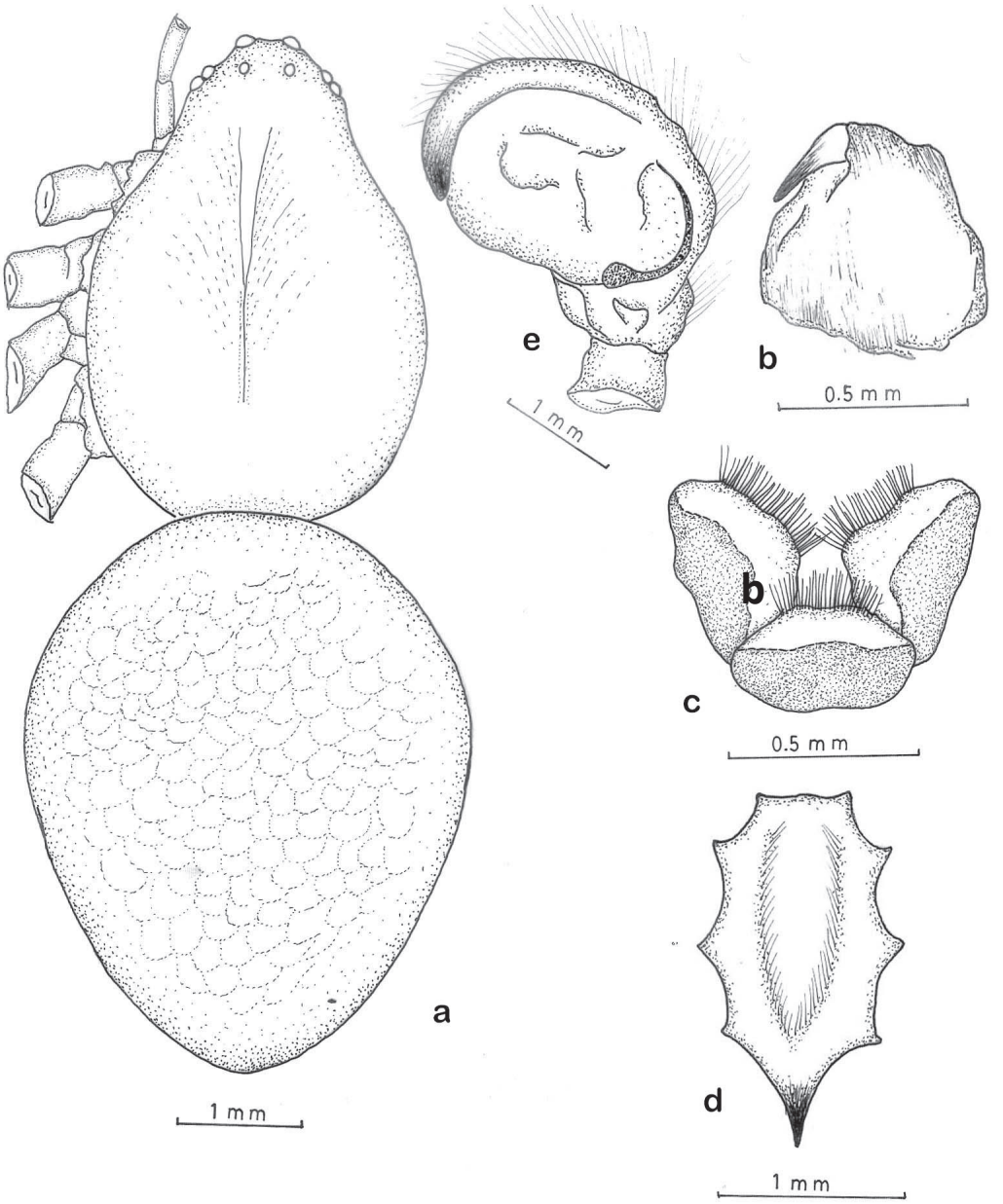
1. *Cyrtarachne ovata* sp. n.

(Figs. 1a – 1e; Plate- Ia)

Material examined: Holotype: 1 male, Savar, district Dhaka, 18. IV. 1995, Coll. V. Biswas (preserved in Audmans' preservatives).

Paratype: 2 males, Terosree, district Manikganj, 07. VIII. 1997, Coll. V. Biswas (preserved in same preservative).

Allotype: Nil.



Figs. (1a-1e): ***Cyrtarachne ovata*** **sp. n**
a. Whole body (dorsal view); b. Chelicerae; c. Maxillae & labium; d. Sternum; e. Male palp.

General: Body small, yellowish brown in colour. Cephalothorax yellowish-brown ; legs brown ; abdomen pale yellow with silver-white markings. Total body length 8.80 mm. Carapace 2.90 mm long, 2.20 mm wide; abdomen 5.90 mm long and 5.00 mm wide.

Cephalothorax: Longer than wide, anteriorly narrowing and broad medially; cephalic region raised with 2 anteriorly radiating radii. Eyes pearly yellow; anteromedians slightly larger, rest similar; both rows of eyes recurved; lateral closed, placed marginally; lateral and anteromedian eyes situated on tubercles; ocular quad wider than long, narrowing posteriorly; anterior margin (between anteromedian eyes) slightly concave. Chelicerae dark brown, broad basally, margins without any teeth (Fig. 1b). Maxillae brown, longer than wide, anteriorly wide and scopulate (Fig. 1c). Labium brown, wider than long, bowl-shaped, anteriorly scopulate (Fig. 1c). Sternum brown, longer than wide, cylindroid, posteriorly pointed, medially with fine pubescence (Fig. 1d). Legs long and slender, clothed with spines and hairs; leg formula 4123 and the measurements (in mm) of leg segments are shown in Table -1. Male palp as in Fig. Ie.

Table 1. Measurements (mm) of leg segments of *Cyrtarachne ovata* n. sp.

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.00/2.00	0.90/0.90	2.00/2.00	1.50/1.50	0.60/0.60	7.00/7.00
II	2.10/2.10	0.60/0.60	2.00/2.00	1.00/1.00	0.60/0.60	6.30/6.30
III	1.70/1.70	0.50/0.50	1.20/1.20	0.90/0.90	0.40/0.40	4.70/4.70
IV	2.50/2.50	0.90/0.90	2.00/2.00	1.20/1.20	0.50/0.50	7.10/7.10

Abdomen: Brown, oval, anteromedially wide and posteriorly narrowed ; dorsum with silvery decoration. Female unknown and will describe when available in collection.

Distribution: BANGLDESH: Dhaka and Manikganj (type locality).

Etymology: The species is named due to the oval shape of the abdomen.

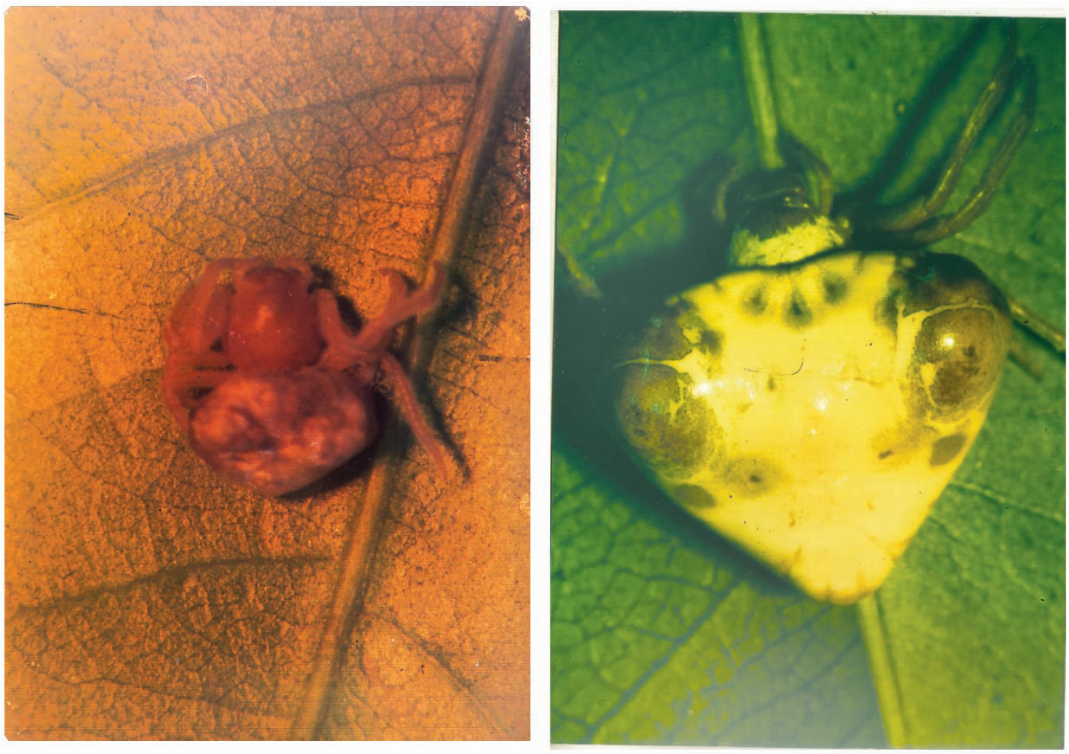


Plate I. Photographs of *C. ovata* n.sp. & *C. sundari* Tikader, a. *C. ovata* n.sp. (dorsal); b. *C. sundari* Tikader

Remarks: None of the congeneric species of *Cyrtarachne ovata* n. sp. (Tikader 1982; Shinkai and Takano 1984; Koh 1989; Yaginuma 1986; Barrion and Litsinger 1995; Yin *et al.* 1997; Song *et al.* 1999; Namkung and Kim 1985; Majumder 2005; Kim and Lee 2012; Tanikawa 2013) have the following diagnostic characters –

1. Anteriorly produced cephalothorax and posterior oval shaped abdomen,
2. Cheliceral margins without any teeth,
3. Sternum cylindrical,
4. Maxillae and labium are typical and
5. Typical bulb-like male palps.

The species, is thus, recognized as new to science.

2. *Cyrtarachne sundari* Tikader

(Figs. 2a-2e : Plate – Ib)

1963. *Cyrtarachnesundari*Tikader, *J. Bombay nat. Hist. Soc.,***60** (1) : 271.
1982. *Cyrtarachnesundari* :Tikader, *Fauna of India, Araneidae*, **2** (1) : 150.
2005. *Cyrtarachnesundari* : Majumder, *Mem. Zool. Surv. India*, **20** (3) : 9.
2006. *Cyrtarachnesundari* :Platnick, *World Spider Catalog,* Version 6.5 : 1142.
2009. *Cyrtarachnesundari* : Biswas, *Encycl. flora & fauna of Bangladesh,***18** (1) : 149
2019. *Cyrtarachnesundari* : Biswas, *Bangladesh J. Zool.,***47** (2) : 192.
2024. *Cyrtarachnesundari* :*World Spider Catalog,* Version 24.5, Nat. Hist. Mus. Bern., Online – http://www.wsc.nmbe.ch (accessed 14th Nov., 2024)

Material examined: 1 female, Japhlong, district Sylhet, 12. I. 1993, Coll. V. Biswas; 1 female, Mirpur botanical garden, Dhaka, 14. III. 1998, Coll. V. Biswas ; 2 females, district Bagerhat, 08. VII. 2000, Coll. V. Biswas ; 1 female , ADI, Daulatpur, Khulna, 15. II. 2002, Coll. V. Biswas.
Male was not found and should be described after collection.

General: Body triangular, robust, greenish-white in colour with two dorsal blackish-brown coloured humps. Cephalothorax and legs brown; abdomen yellow-brown. Total body length 10.00 mm. Carapace 3.50 mm long, 3.80 mm wide; abdomen 6.50 mm long and 6.50 mm wide.

Remarks: The detailed characters of different body-parts and appendages of this species (*C. sundari* Tikader) did not describe as it is described earlier by Biswas and Rachaudhuri (2019) from this country. Therefore, only the main general characters andacoloured photograph is shown.
Distribution: BANGLADESH: Sylhet, Dhaka, Bagerhat, Khulna; India (Tikader 1963, ’82; Majumder 2005).

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