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TAXONOMIC ACCOUNT OF SOME CRAB-SPIDERS OF SOUTHWEST REGION OF BANGLADESH

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ABSTRACT

A taxonomic study on some crab-spiders genus *Xysticus* Koch was carried out in the southwest region of Bangladesh. Two species of spiders were identified in this study of which one species *X. joyantiae* n. sp. is identified as new to science and the other one *X. minutus* Tikader is a new record for the area of present study. Generic diagnosis, distribution, illustrated description and key to the species are described.

Keywords: Taxonomy, crab-spider, *Xysticus,* Araneae, Misumeninae, Thomisidae

Introduction

Crab-spiders (Family Thomisidae) are one of the important predatory arachnids in the garden and forests. These are commonly found on the leaves and flowers of shrubs waiting for the preys. They are very slow and cannot make any web in their habitats. During preying, they hide themselves under the leaves or flowers and can show a remarkable degree of camouflage/ mimicry.

Crab-spiders are distributed worldwide and contains a total of 2155 species under 175 genera (World Spider Catalog 2023). Members of the genus *Xysticus* Koch are commonly found in the garden and forests of Bangladesh. The genus was first erected by Koch in 1835 with the type-species *Araneus cristatus* (Clerck 1757). The genus at present is composed of 360 species in the world fauna (Ono 1988, Levy 1985, Song and Zhu 1997, Kim and Lee 2012, Dippenaar-Schoeman *et al.* 2020, Gertsch 1934, Turnbull *et al.* 1965, Redner and Dondale 1966, Paik 1973 and 75) in which only 30 species in the Indian sub-continent (Tikader 1971 and 1980, Gajbe 2004, Majumder 2005, Keswani *et al.* 2012, Raychaudhuri and Saha 2014) and only three species recorded in Bangladesh (Okuma *et al.* 1993, Chowdhury and Nagari 1981, Chowdhury and Pal 1984, Biswas 2009 and 2019). The present paper contains description of two species of the genus *Xysticus* Koch of which one species *X. joyantiae* n. sp. is identified as new to science and another one *X. minutus* Tikaderis a new record for the area of present study. A key to the species together with the description and distribution are provided.

Materials and Methods

Collection and preservation: The study was initiated with the collection of specimens from the plant leaves of shrubs on an inverted umbrella placed underneath the trees. Collected specimens were then carried to the laboratory and sorted out within a Petri dish filled with 70% ethyl alcohol. After sorting, specimens were kept in 70% alcohol upto 2-3 hours for relaxation of body muscles and appendages (Chowdhury and Nagari 1980, Tikader 1987). The specimens were then preserved in 70% alcohol temporarilt and later in Audman's preservatives permanently (Lincoln and Sheals 1985) for identification and study.

Identification and study: Preserved specimens were identified following different fauna volumes and literatures of home and abroad, viz., Tikader (1980 and 1987), Barrion and Litsinger (1995), Yaginuma (1986), Davies (1986), Gertsch (1934), Turnbull *et al.* (1965), Ono (1988), Okuma *et al.* (1993), Chen and Zhang (1991), Song and Zhu (1997), Song *et al.* (1999), Biswas (2009), Kim and Lee (2012) Dippenaar-Schoeman *et al.* (2020).

Finally, identity of the species was confirmed from the Zoological Survey of India, Kolkata, India. All laboratory techniques for the study of specimens were followed by Levi (1965), Kaston (1972) and Tikader (1987).

Drawings and photographs: The illustrations of whole body, different body-parts and appendages were made with Camera Lucida fitted with a stereo zoom binocular microscope (SV8, Zeiss) and necessary photographs were taken by a Canon digital camera fitted with 90 mm macro zoom lens. All the measurements of different body-parts were taken in millimeters.

Type deposition: The types are at present in the collection of the Department of Zoology, Khulna Government Women's College, Khulna and will be deposited to the Museum of the Department of Zoology, University of Dhaka, Bangladesh, in due course of time.

Results and Discussion

Systematics
Family: Thomisidae Sundevall 1833
Subfamily: Misumeninae Simon 1895
Genus: *Xysticus* Koch 1835
Type-species: *Araneus cristatus* Clerck 1757

1835. *Xysticus* Koch
1895. *Xysticus* Simon
1940. *Xysticus* Comstock
1948. *Xysticus* Kaston
1951. *Xysticus* Locket & Millidge
1954. *Xysticus* Roewer
1960. *Xysticus* Tikader
1978. *Xysticus* Dondale and Redner
1980. *Xysticus* Tikader
1986. *Xysticus* Yaginuma
1988. *Xysticus* Ono.
1991. *Xysticus* Chen and Zhang
1995. *Xysticus* Barrion and Litsinger
1997. *Xysticus* Song and Zhu
1997. *Xysticus* Platnick
1997. *Xysticus* Mikhailov
1999. *Xysticus* Song
2002. *Xysticus* Buchar and Ruzicka
2004. *Xysticus* Gajbe
2005. *Xysticus* Majumder
2006. *Xysticus* Platnick
2009. *Xysticus* Biswas
2023. *Xysticus* World Spider Catalog

Body medium sized, dark in color. cephalothorax rather square fronted, clothed with simple isolated hairs and spines, usually pointed but some are blunt. Posterior eyes nearly equidistantly placed; medians smaller than laterals; anteromedian usually a little further from each other than from the anterolaterals. Laterl eyes situated in low subconfluent tubercles. Legs comparatively short, stout and spiny; tibiae and metatarsi I and II usually with more than 3 pairs of inferior spines, tarsal claws with 5 or 6 isolated teeth. Male palpal organ of some species with strongly chitinized apophysis. Abdomen much wider behind than in front, usually bearing a dentated band on its dorsal surface.

The crab-spiders are usually medium in size. Females are deeply colored than the males. They live under stones, leaves or loose barks or low herbage etc., a few live on small plants and bushes.

Type-species: *Araneus cristatus* Clerck

Distribution: Africa, America, Asia and Europe.

Key to the species of *Xysticus*

Anterior margin of cephalothorax straight; eyes white, none with any basal band; each cheliceral margin with 1 tooth; maxillae and labium nearly shoe-shaped; sternum bluntly pointed posteriorly

……. *X. minutus*

Anterior margin of cephalothorax not straight ; eyes dissimilar, lateral eyes with broad, black basal bands ; outer margin of chelicerae with 2 and inner margin with 1 tooth ; maxillae and labium pot- like ; sternum sharply pointed posteriorly

…….. *X. joyantiae* n. sp.

Description of the species

***Xysticus joyantiae* n. sp. (**Figure 1a-1f)

One female, Chitalmari, district Bagerhat, date 05. VII. 1995, Coll. V. Biswas ;2 females, Rampal, District Bagerhat, date 18. IX. 1998, Coll. V. Biswas; 1 female Dasani, District Bagerhat, date) 5.X. 1998, Coll. V. Biswas; 1 female Bagmara, Dist., Bagerhat, date 21. XII. 1998, Coll. V. Biswas.

Body medium in size and light brown in color. Cephalothorax and abdomen pale brown; legs yellowish green. Total body length (female) 2.40 mm. Carapace 1.00 mm long, 0.90 mm wide; abdomen 1.40 mm long and 1.50 mm wide.

Slightly longer than wide, broad posteriorly and narrowing anteriorly; anterior margin wavy and posterior margin rounded; carapace laterally with brown longitudinal bands (Figure 1a). Chelicerae longer than wide, anteriorly narrowed; each of inner and outer margins with 1 and 2 teeth respectively, clothed with spines (Figure 1b). Maxillae and labium pale brown, nearly similar in shape and size, both scopulate anteriorly (Figure 1c). Sternum longer than wide, nearly heart-shaped, anteriorly wide and posteriorly narrowed and pointed (Figure 1d). Legs long and slender, clothed with spines and hairs; leg formula 2134 and the measurements (in mm) of leg segments are shown in Table-1.

Abdomen: Broad, rounded, medially wide, clothed with sharp spines; dorsum decorated irregularly. Epigyne typical with two curvely pointed terminal outgrowths (Figure 1e).

Holotype:1 female in spirit.
Paratype: 1 female in spirit.
Allotype: Nil (male not found in the habitat; it will describe when available).
Etymology: The species is named after one of the prominent teachers of the type-locality Mrs. JoyantiRani Sana.

The species *X. joyantiae* n. sp. shows similarities in general appearance with *X. minutus* Tikader (Tikader 1971) and *X. hedini* Schenkel (Kim and Lee 2012) but it stands distinct with the following diagnostic characters –

a). Anterior margin of cephalothorax wavy.
b). Lateral eyes largest and ringed with black basal bands.
c). Abdomen globular with slight dorsal decoration.
d). Much different chelicerae, maxillae, labium and sternum and
e). Much different epigynum.

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

Distribution: Bangladesh: Chitalmari and Rampal, district Bagerhat**.**

***Xysticus minutus* Tikader**
(Figs. 2a-2f)

1960. *Xysticus minutus* Tikader
1980. *Xysticus minutus* Tikader
2004. *Xysticus minutus* Gajbe
2005. *Xysticus minutus* Majumder
2006. *Xysticus minutus* Platnick
2009. *Xysticus minutus* Biswas
2019. *Xysticus minutus* World Spider Catalog
2023. *Xysticus minutus* World Spider Catalog

Two females, Harinkhana, district Bagerhat, 07. VII. 1997. Coll. V. Biswas; 1 female and 1 male, Rampal, district Bagerhat, 12. IX. 1998, Coll. V. Biswas; 1 female Chitalmari, district Bagerhat, 08. IX. 1997, Coll. V. Biswas.

Cephalothorax and abdomen light brown, legs greenish. Total body length (female) 2.30 mm. Carapace 1.00 mm long, 1.00 wide; abdomen 1.30 mm long and 1.40 mm wide. Total body length(male) 2.10 mm. Carapace 0.90

Table1. Measurements (mm) of leg segments of *X. joyantiae* n. sp

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.5/1.5	0.8/0.8	1.0/1.0	1.0/1.0	0.8/0.80	5.1/5.1
II	1.5/1.5	0.6/0.6	1.4/1.4	1.3/1.3	0.8/0.80	5.6/5.6
III	1.1/1.1	0.5/0.5	1.0/1.0	1.0/1.0	0.7/0.7	4.3/4.3
IV	1.5/1.5	0.5/0.5	0.9/0.9	0.9/0.9	0.7/0.7	4.0/4.0

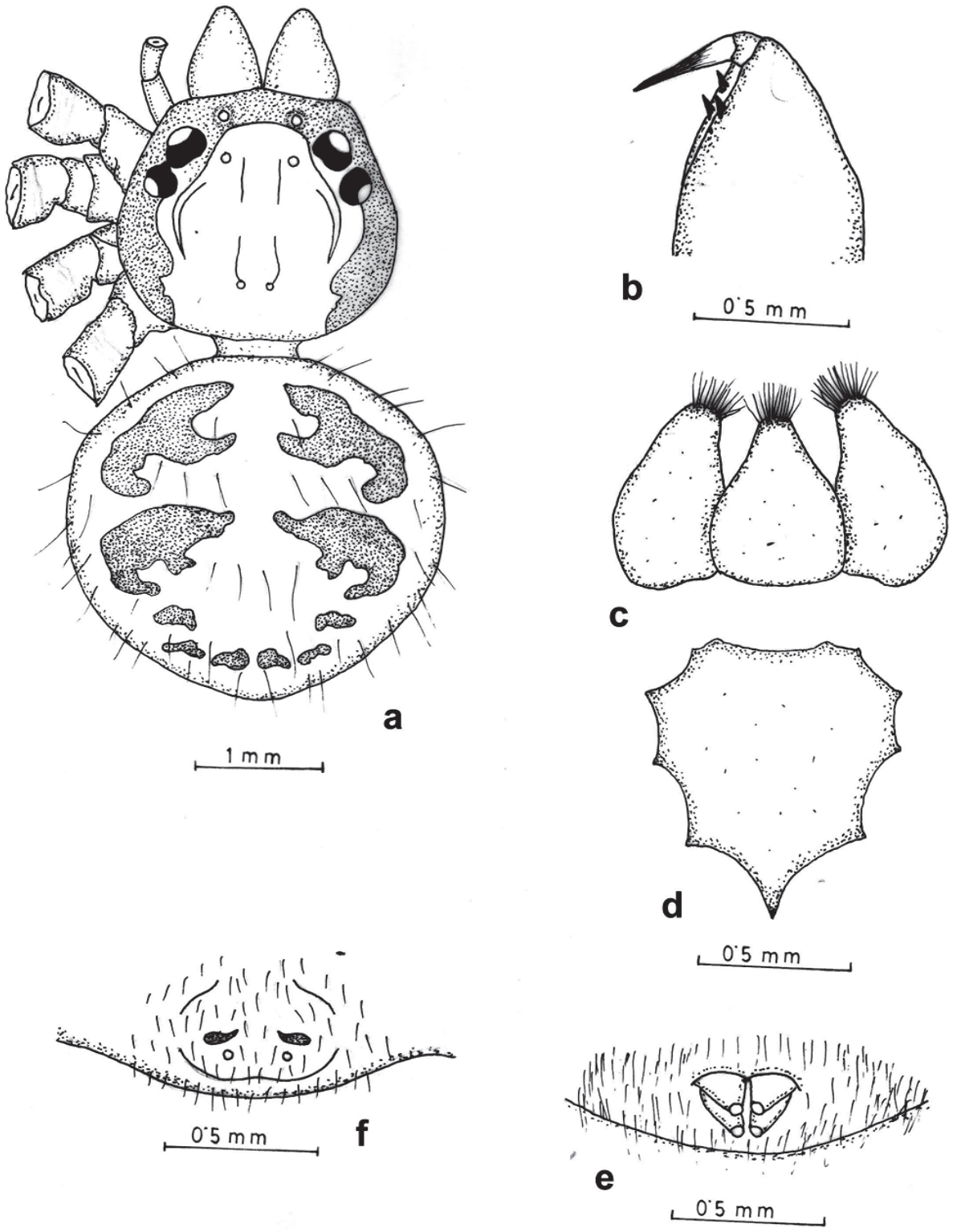


Figure 1. *Xysticus joyantiae* n. sp. a. Whole body (dorsal view), b. Chelicerae, c. Maxillae and Labium, d. Sternum, e. Spinnerets, f. Epigynum.

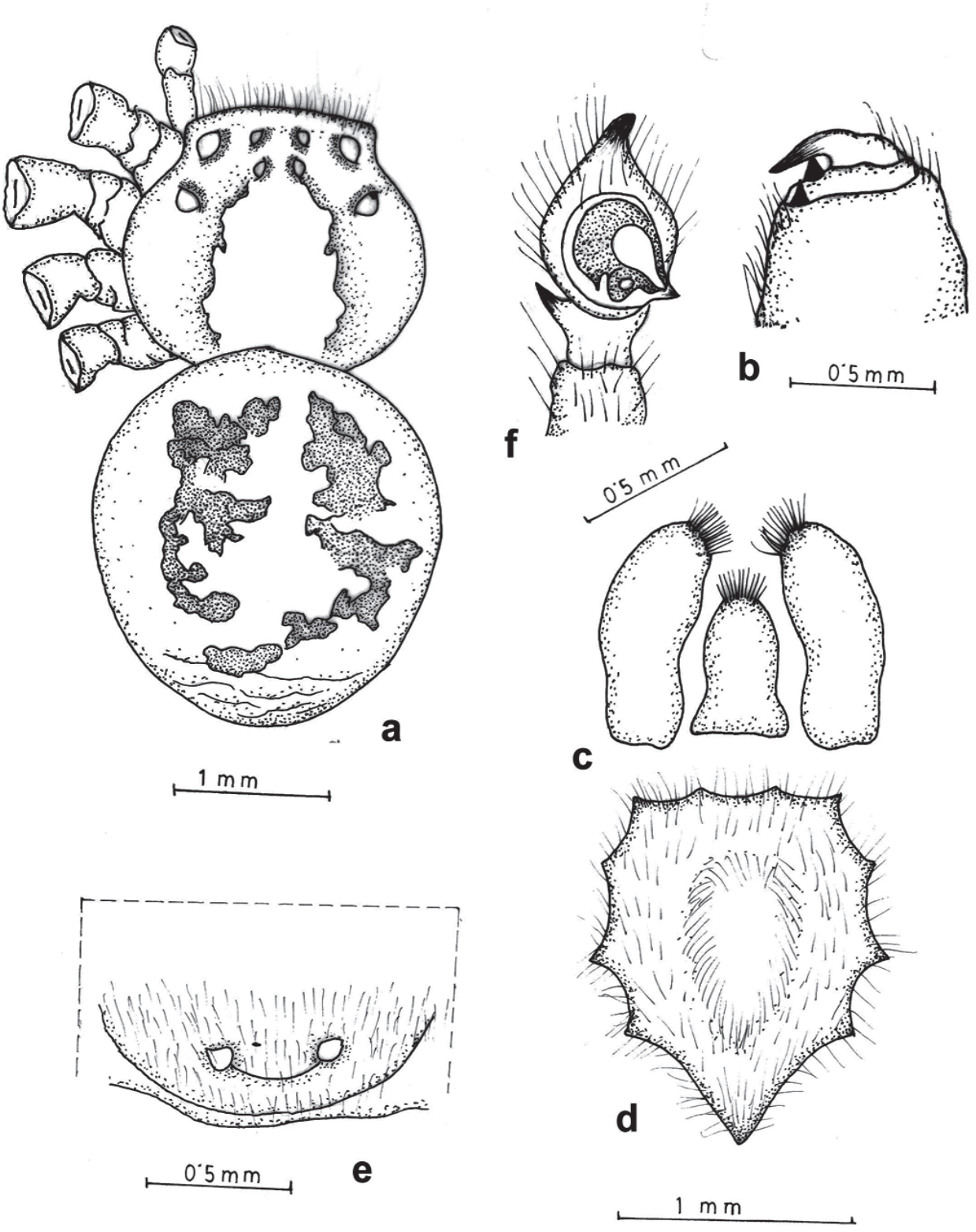


Figure 2. *Xysticus minutus* Tikader a. Whole body (dorsal view), b. Chelicerae, c. Maxillae and Labium, d. Sternum, e. Epigynum, f. Male palp.

Table 2. Measurements (mm) of leg segments of *Xysticus minutus* Tikader

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.5/1.5	0.8/0.8	1.0/1.0	1.0/1.0	0.8/0.8	5.1/5.1
II	1.5/1.5	0.5/0.5	1.3/1.3	1.2/1.2	0.8/0.8	5.3/5.3
III	1.0/1.0	0.5/0.5	1.0/1.0	1.0/1.0	0.5/0.5	4.0/4.0
IV	1.0/1.0	0.4/0.4	0.9/0.9	0.9/0.9	0.4/0.4	3.1/3.1

Male similar in shape and slightly smaller than the females; male palp with cymbium pointed; tibial apophysis spine-like (Figure 2f).

mm long, 0.80 mm wide, abdomen 1.20 mm long and 1.00 mm wide.

Broad, nearly longer than wide, wider basally, anteriorly broadly narrowed, anterior margin straight, clothed with spine-like hairs and pubescence; cephalic region slightly raised; both rows of eyes recurved; median eyes minute and smaller than the laterals; posterolateral eyes distantly placed and equal; ocular quad squarish, narrowing posteriorly. Chelicerae broad, thick, each of inner and outer margins with 1 tooth, fang short (Figure 2b). Maxillae longer than wide, scopulate anteriorly (Figure 2c). Labium cylindroid, basally broad and constricted, scopulate anteriorly (Figure 2c). Sternum heart-shaped, pointed posteriorly, clothed with spines (Figure 2d). Legs long, clothed with spines and spine-like hairs; leg formula 2134 and the measurements (in mm) of leg segments are shown in Table - 2.

Broad, globular, posteriorly rounded, clothed with hairs and pubescence; dorsum decorated irregularly (Figure 2a), epigyne as in Figure. 2e.

Bangladesh: Chitalmari and Rampal, district Bagerhat; India (Tikader, 1980).

Conclusion

From the taxonomic records in the study of these spiders of Bangladesh it was found that the described two species of genus *Xysticus* Koch are new records for the country and of these, *X. joyantiae* n. sp. is identified as new to science. Species *X. minutus* Tikader describes for the first time from Bangladesh. The behavior of these spiders are peculiar. They usually stay (spreading the front legs) on the coloured flowers and leaves of plants for the preys. They consume a good number of pest insects of garden crops and thus serve as one of the important biological control agents. On the other hand, during their movement from plant to plant, they also help in pollination of flowers.

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