

TAXONOMIC ACCOUNT OF JUMPING SPIDER-II: GENUS *Marpissa* C. L. KOCH (ARACHNIDA: ARANEAE: SALTICIDAE) FROM BANGLADESH

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Abstract

Present study includes the description of four species of the genus *Marpissa* C. L. Koch, 1846 collected from different areas of Bangladesh of which one species is described as new to science and other three species are new records for the area of present study. The recorded species are-*Marpissa dhakuriensis* Tikader, *M. ludhianensis* Tikader, *M. mandali* Tikader and *M. longinoda* n. sp. An illustrated description and distribution together with a key to the species are provided herewith.

Keywords: Taxonomy; Jumping spider; *Marpissa*; Arachnida; Araneae; Salticidae.

INTRODUCTION

Jumping spiders under the genus *Marpissa* C. L. Koch, 1846 are commonly found on the leaf and branches of shrubs in the garden and forests. Sometimes they are found to feed harmful pest insects in the crop-fields and gardens. They show some peculiar colourful morphological variations in body structure and appendages. These peculiarities depend on the characters of habitat, sunlight and food habit. As these spiders are predatory in habit, they are always found to move to and fro in the garden and forests for searching foods.

Taxonomically, the members of *Marpissa* are commonly found in the tropical and subtropical areas of the world. At present, the genus contains a total of 51 species in the world fauna and about 3000 species in the Asian countries (Tikader 1965, 1967, 1974, 1977, Tikader and Biswas 1981, Biswas 1984, Biswas and Biswas 1984 1992, 2004, 2008, Sadana and Kaur 1974, Wesolowska 1981, Roy *et al.* 2016, Proszynski 1992, Zabka 1985, Yaginuma 1986, Chen and Zhang 1991, Song *et al.* 1999, Koh 1989, Majumder 2004, 2005, Ikeda 1993, Keswani *et al.* 2012, Kim *et al.* 2017, Kim and Lee 2014, Logunov 1999, Monga *et al.* 1989, Butt and Beg 2000, Baba 2013a,b, Barrion and Litsinger 1995, Peng 2020). In Bangladesh, reports on these spiders are scanty (Chowdhury and Pal 1984, Begum and Biswas 1997, Biswas *et al.* 1993) and till date, only one species has been described (Biswas and Begum 1999).

Considering the taxonomic importance and predatory role of these spiders in crop pest management, the present study was undertaken to know their systematic position and global distribution. The present paper contains an illustrated description of four *Marpissa* species collected from different areas of the country together with their distribution and a taxonomic key to species.

MATERIAL AND METHODS

Collection and Preservation

Spider was collected following several methods, such as vial tapping, hand picking, jerking the branches of shrubs and trees, and sweeping grasses with a net. Majority of the collections were made by the shaking of tree branches on an inverted umbrella or a piece of white cloth placed underneath the trees. The collected specimens were placed inside a large glass jar or plastic jar containing a wade of cotton soaked with chloroform to anesthetize the specimens.

The specimens thus collected were then carried to the laboratory and transferred these to a petri dish filled with 70% alcohol for sorting. Single or more than one specimen was then transferred to separate glass vials filled with 70% alcohol temporarily for identification. After identification, the specimens were finally preserved (a single specimen in a single vial) in Audmans' preservatives (90 parts 70% alcohol+5 parts glycerine+5 parts glacial acetic acid) following Kaston (1972), Tikader (1987).

Identification and Deposition

The preserved specimens were identified following Kaston (1972), Tikader (1965, 1974, 1977, 1987), Tikader and Biswas (1981), Biswas and Biswas (1984, 1992, 2007), Davies and Zabka (1989), Barnes (1958), Yaginuma (1986), Peng (2020), Butt and Beg (2000), Song *et al.* (1999), Barrion and Litsinger (1995), Proszynski (1992), Fuhn and Gherasim (1995) and Zabka (1985, 1997). The identified specimens were finally preserved carefully in small glass vials (single specimen in single vial) within Audmans' preservatives and preserved in the Laboratory of the Zoology Department, Khulna Govt. womens' College and these will be deposited to the Museum of the Department of Zoology, University of Dhaka, Bangladesh in due course of time.

Study of specimens

Dissection: To study in detail about the body characters and other necessary body-parts or appendages of spiders, dissection is necessary. Male palp and female genitalia or epigynum were dissected out being placed on a petridish filled with 70% alcohol under a Stereo Binocular Microscope. During dissection, the male palps were separated out from the body and boiled in 10% KOH solution for 3-5 minutes for relaxation of body muscles. Female epigynum was also dissected out in the same way and sinked in clove oil for 12-18 hours or overnight. Thus, it was cleansed and got ready for illustration and photography. After dissection, the male and female genitalia were placed in small microvials and put them into a large glass vial containing Audmans' preservatives along with the parent spiders for future study.

Illustration and Photography

Adult spiders and their body parts are illustrated under a Stereozoom Binocular Microscope fitted with a Camera lucida. Total body and leg measurements were taken under the same microscope with the same arrangements. Leg measurements were taken in the following sequence: femur, patella, tibia, metatarsus, tarsus and total length; all the measurements were taken in millimeters (mm). The photographs of the adult spider species were taken with a DSLR Camera fitted with 90-100 mm zoom lens and under Camera fitted microscope (SV8, Zeiss).

RESULTS AND DISCUSSION

Taxonomy

Family- SALTICIDAE Blackwall, 1841

Subfamily - Marpissinae Simon, 1901

Genus- *Marpissa* C. L. Koch, 1846

Type species- *M. muscosa* (Clerck, 1757)

Diagnosis

The spiders under *Marpissa* are medium to large size with broad but flat body. Cephalothorax usually rectangular, longer than wide. Ocular area little more than 1/3rd of cephalothorax and trapezium about 1.5 times broader than long, parallel sided, anteromedian eyes larger, and the eyes of the 2nd row smallest. Chelicerae longer than wide, with 1 tooth on inner margin and 2 on the outer. Sternum narrowed in front. Leg formula in male 1423 and in female 4123. Tibiae and metatarsi I and II of both sexes with 3 and 2 pairs of ventral spines, respectively.

Spiders under this genus are large with broad and flat bodies. They live under the loose bark of trees, on the fences of gardens and the outside of buildings. They hibernate in tight sac under bark, logs and similar protected places. Most of the hibernating individuals mature in the spring. Some for themselves spin a firm cocoon, but in groups form under the loose bark of the dead trees. The members of the genus *Marpissa* are good predators of small insects of the gardens and similar habitats. They can jump a long distance several times more than their body size and thus consume the preys.

Key to the species of *Marpissa*

1. Abdomen oval; cephalothorax with large, white, longitudinal band. 2
 Abdomen wide medially; cephalothorax without white band. 3
2. Abdomen broadly oval, posteriorly narrowing; cheliceral outer margin with one tooth; sternum elongate, posteriorly pointed; median spinneret long. *mondali*
 Abdomen parallel sided, posteriorly not narrowing; cheliceral outer margin with 2 teeth; sternum oval, posteriorly blunt; median spinneret short. *longinoda* n. sp.
3. Cephalothorax large, basally wide; abdomen nearly heart-shaped; space between anterior eyes without hairs; cheliceral outer margin with 2 widely placed teeth; maxillae long, not white anteriorly. *ludhianaensis*
 Cephalothorax not large, medially wide; abdomen medially wide not heart-shaped; space between anterior eyes with long hairs; cheliceral outer margin with 2 closely placed teeth; maxillae broad, anteriorly white *dhakuriensis*

Description of the species of *Marpissa*

1. *Marpissa dhakuriensis* Tikader, 1974

1974. *Marpissa dhakuriensis* Tikader. *Proc. Indian Acad. Sci.* **79** (5): 207.

Material examined

2 females, Sahrawardi park, Dhaka, 3.III. 1993, Coll. V. Biswas; 1 female, Mymensingh, 12. IX. 1992, Coll. V. Biswas; 2 female, Japhlong, Sylhet, 28. VII. 1993, Coll. V. Biswas; 2 females, Rangpur, 15. XI. 1992, Coll. V. Biswas.

Distribution

BANGLADESH: Dhaka, Mymensingh, Rangpur, Sylhet (Biswas 1999); INDIA (Proszynski 1990).

2. *Marpissa longinoda* n. sp. (Fig. 1, a-f; Fig. 2)

Material examined

Holotype: 1 female, Bagerhat, 18. IV. 1992, Coll. V. Biswas. Paratype: 1 female, Khulna, 12. V. 1993, Coll. V. Biswas. Allotype: 1 male, Jhenaidah, 10. VII. 1993, Coll. V. Biswas.

Description of the female (Holotype)

Cephalothorax and abdomen brown black; legs brown. Total body length 7.00 mm. Carapace 3.70 mm long, 3.00 mm wide; abdomen 3.30 mm long and 2.50 mm wide.

Cephalothorax of the female

Rectangular, medially broad, longer than wide, clothed with spines, hairs and pubescence; cephalic region slightly raised. Eyes pearly-white excepting the milky-white anteromedians; anterior row of eyes recurved and each ringed with black band; 2nd row of eyes minute; posterior row of eyes blackish, straight; ocular trapezium wider than long; dorsum with white markings. Chelicerae brown black, basally broad, inner and outer margins with 1 and 2 teeth, respectively (fig. 1b). Maxillae and labium brown, broad, anteriorly scopulate (fig. 1c). Sternum brown, oval, antero-posteriorly narrowing, hairy (fig. 1d). Legs strong and stout; tibiae and metatarsi I with 2 pairs of ventral spines; leg formula 4123; and the measurements (mm) of different parts of a leg as in Table 1.

Table 1. Measurements (mm) of leg segments of *Marpissa longinoda* n. sp.

Leg	Femur	Patella & Tibia	Metatarsus	Tarsus	Total
I	1.30 / 1.30	1.90 / 1.90	1.00 / 1.00	0.80 / 0.80	5.00 / 5.00
II	1.20 / 1.20	1.70 / 1.70	0.90 / 0.90	0.80 / 0.80	4.60 / 4.60
III	1.00 / 1.00	1.70 / 1.70	1.90 / 1.90	1.70 / 1.70	4.30 / 4.30
IV	1.40 / 1.40	1.90 / 1.90	1.00 / 1.00	0.90 / 0.90	5.20 / 5.20

Abdomen of the female

Cylindrical, posteriorly narrowing; dorsum decorated with dense pubescence, ventrally pale brown, with a black longitudinal marking, hairy; posterolateral spinnerets elongate, median pointed; epigyne as in fig. 1e.

Description of the male (Allotype)

Slightly smaller than the female. Total body length 6.20 mm. Carapace 3.00 mm long, 2.80 mm wide; abdomen 3.20 mm long and 2.50 mm wide.

Cephalothorax of the male

Longer than wide, brown black, more broad medially, clothed with hairs and pubescence. Eyes pearly-white, anteromedians broad, each ringed with black band; anterior row of eyes recurved; 2nd row of eyes minute and 3rd row slightly broader than the second row of eyes; ocular trapezium slightly wider, dorsum with a long white band. Chelicerae brown, broad, inner and outer margins with 1 and 2 teeth, respectively. Maxillae and labium brown, broad, scopulate anteriorly. Sternum brown, oval, hairy. Legs strong and stout, leg formula 4123. Male palp brown, broad, covered with hairs and spines (fig. 1f).

Abdomen of the male

Nearly oval, dorsum decorated with a white longitudinal band, covered with dense hairs and pubescence. Ventrally pale brown, with longitudinal blackish markings. Posterolateral spinnerets long, median small and pointed.

Type-locality

Bagerhat, Khulna and Jhenaidah.

Etymology

The species is named due to the elongate nature of pedicel.

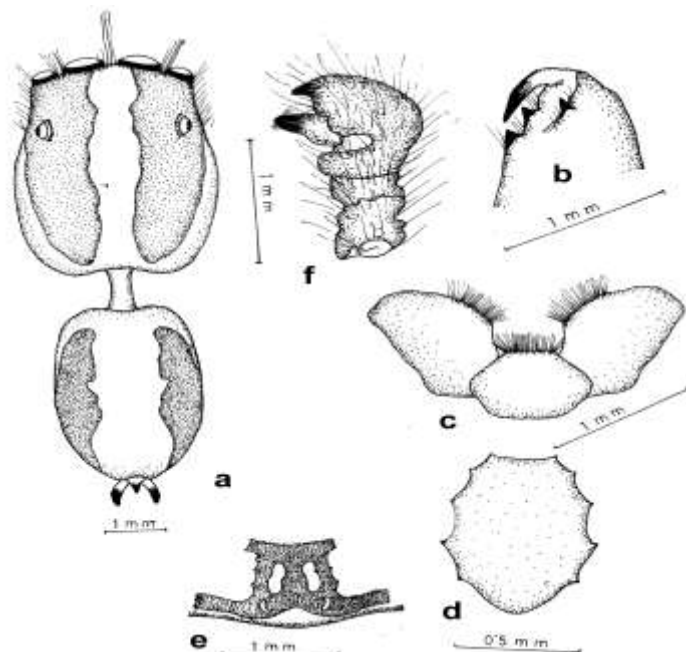


Fig. 1. *Marpissa longinoda* n. sp. a. Whole body (dorsal view); b. Chelicerae; c. Maxillae and Labium; d. Sternum; e. Epigynum; f. Male palp.



Fig. 2. Pictorial view of *Marpissa longinoda* n. sp. (dorsal view).

Remarks

The species *M. longinoda* n. sp. neither related to the Indian congeners (Tikader 1965, 1974, 1977, Tikader and Biswas 1981, Biswas 1984, Biswas and Biswas 1984, 1992, Butt and Beg 2000, Proszynski 1992, Biswas 1995, Biswas and Begum 1999, Majumder 2004, 2005, Biswas and Biswas 2004, 2007, Biswas and Roy 2008, Sadana and Kaur 1974, Monga *et al.* 1989) nor to the species known from elsewhere (Yaginuma 1986, Chen and Zhang 1991, Song *et al.* 1999, Peng 2020, Zabka 1985, 1997, Barrion and Litsinger 1995, Barrion *et al.* 1984, Fuhn and Gherasim 1995, Barnes 1958, Bohdanowicz and Proszynski 1987, Harm 1981, Baba 2013 a and b, Kim *et al.* 2017, Ikeda 1993, Logunov 1999, Wesolowska 1981, Logunov and Wesolowska 1992).

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

3. *Marpissa ludhianaensis* Tikader, 1974

1974. *Marpissa ludhianaensis* Tikader, *Proc. Indian Acad. Sci.* 79(5): 205.

Material examined

2 females, 1 male, Bagerhat, 12. V. 1992, Coll. V. Biswas; 1 female, Jhenaidah, 12. IX. 1992, Coll. V. Biswas; 1 female, Khulna, 19. IX. 1993, Coll. V. Biswas; 2 females, BAU campus, Mymensingh, 12. XI. 1993, Coll. V. Biswas.

Distribution

BANGLADESH: Bagerhat, Jhenaidah, Khulna, Mymensingh; INDIA (Proszynski 1990).

4. *Marpissa mondali* Tikader, 1974

1974. *Marpissa mondali* Tikader, *Proc. Indian Acad. Sci.* **79** (5): 213.

Material examined

2 female, Barisal, 2. III. 1992, Coll. V. Biswas; 2 female, ADI, Faridpur, 12. IX. 1992, Coll. V. Biswas; 1 female, S. Park, Dhaka, 4. III. 1993, Coll. V. Biswas; 2 female, BARI, Jeshore, 2. X. 1993, Coll. Biswas.

Distribution

BANGLADESH: Barisal, Dhaka, Faridpur, Jashore; INDIA (Tikader 1974, Proszynski 1990).

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