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# Discovery of a new species and a new record of long-jawed spiders (Araneae: Tetragnathidae) from rice fields of Bangladesh

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## Abstract

Taxonomic account of two species of rice-plant inhabiting long-jawed spiders under genus *Tetragnatha* Latreille is described. Of these, *T. jibontiae* n. sp. is identified as new to science and *T. fletcheri* Gravely 1921 is recorded for the first time from the rice fields of Bangladesh. Brief generic diagnosis, illustrated description, distribution and key to the species are also provided.

**Keywords:** Taxonomy, long-jawed spider, *Tetragnatha*, Araneae, Tetragnathidae, Bangladesh

## Introduction

Long-jawed spiders (Family Tetragnathidae) are one of the major predatory components in the rice-agroecosystems. Population of these spiders in the rice-fields of Bangladesh is always greater than other groups (Chowdhury and Pal 1984, Kamal *et al.* 1992, Biswas *et al.* 1993, Okuma *et al.* 1993). Their role as potential biological agent of insect pests received attention very earlier to the entomologists. All the species of the genus *Tetragnatha* Latreille are orb-weavers and make typical circular webs within rice-plants. These webs serve as trapping organ of catching insects. They consume the prey insects as food waiting horizontally below the webs. By the webs, they feed more than a number of pest insects what they actually expect. A single mature long-jawed spider can consume more than 30 small pest insects as food from the webs per day (Kamal *et al.* 1992). Thus, they help in the biological control of insect pests in the rice-ecosystems.

Genus *Tetragnatha* is one of the largest among other 47 spider genera of the family Tetragnathidae. It composed of 349 species in the world fauna (World Spider Catalog 2025). The genus was first erected by Latreille in 1804 with the type-species *T. extensa* Linnaeus, 1758 and is distributed all over the world occurring from tundra zone in the Holarctic to Chille. In Bangladesh, the record of this genus is very poor and till date, the number is only 15 (Chowdhury and Pal 1984, Biswas and Raychaudhuri 1996, Biswas 2019, Okuma *et al.* 1993). However, a good number of contributions is available in other countries of the world (Chickering 1957, Tikader 1966, Yaginuma 1986, Okuma 1987, '88, Barrion and Litsinger 1995, Gillespie 1991, '92, '94, 2002, 2003a, 'b, Basu and Raychaudhuri 2016, Zhu *et al.* 2003, Yin 1976, Zhu and Shi 1983, Tanikawa 1996, 2007, Marusik 2010, Kim and Lee 2013, Seely 1928 etc.). The present paper contains taxonomic description of two species of which *T. jibontiae* n. sp. is identified as new and *T. fletcheri* Gravely 1921 is a new record from the area of present study. Generic diagnosis, distribution and key to the species are also provided.

## Materials and methods

**Collection and preservation:** Specimens of this study were collected from different rice-fields of Jhenaidah district, in different times by hand and hand-sweeping net from the webs and plant leaves. After collection, these were transferred to a large petridish filled with 70% ethyl alcohol for sorting. After sorting, the specimens were put in separate glass vials filled with 70% alcohol for identification (Tikader 1987, Lincoln and Sheals 1985).

**Identification and deposition:** The preserved specimens were identified following different booka and Journals of home and abroad; these are– Yaginuma (1986), Tikader (1987), Barrion and Litsinger (1981, '84, '95), Zhu *et al.* (2003), Tanikawa (2009), Biswas (2009), Biswas and Raychaudhuri Basu and Raychaudhuri (2016), Kim and

Lee (2013) and Dippenaar – Schoeman *et al.* (2023).

After identification, the specimens were preserves permanently in separate glass vials filled with Audmans' Preservatives (90 parts 70% alcohol + 5 parts glycerine + 5 parts glacial acetic acid) and deposited to the Laboratory of the Department of Zoology, Khulna Government Women's College, Khulna, Bangladesh.

**Illustration and photographs:** Illustrations of whole body and different body-parts were made by Camera Lucida fitted with Stereozoom Binocular Microscope. Measurtements of different body-parts were taken in millimeters (mm). Photographs were taken by DSLR Camera fitted with macrozoom lens (from the field and laboratory).

## Results and discussion

### Systematics

Family: Tetragnathidae Menge 1866
Subfamily: Tetragnathinae Menge 1866
Genus: *Tetragnatha* Latreille 1804
Type-species: *T. extensa* Linnaeus 1758
1804. *Tetragnatha* Latreille, *Nauv. Dict. d'Hist. Nat.,* 24: 135.

Cambridge 1884: 243; Simon 1894: 723; Thorell 1895: 1390; Pocock 1900: 214; Gravely 1921: 426; Tikader 1966: 8; Okuma 1968: 98; Yaginuma 1986: 130; Okuma et al 1993: 35; Koh 1989: 53; Chen & Zhang 1991: 124; Gillespie 1992: 1; Barrion & Litsinger 1995: 494; Biswas & Raychaudhuri 1996: 45; Mikhailov 1997: 108; Platnick 1997: 463; Tanikawa 2007: 104; Marusik 2010: 199; kim & Lee 2013: 54; Basu & Raychaudhuri 2016: 210; World Spider Catalog, Version 25.5, Nat. Hist. Mus. Bern., http: //www.wsc.nmbe.ch.

**Diagnosis:** The long-jawed spiders genus Tetragnatha Latreille are long to very long, narrow, sub-cylindrical, several times longer than wide. Cephalothorax long, basally or medially wide, flattened, thoracic groove conspicuous. Eyes in two rows, parallel, divergent or convergent; lateral eyes never contiguous. Chelicerae usually very long, especially in males and margins of furrow provided with numerous sharp, pointed teeth. Maxillae long, parallel and dilated at distal ends. Legs and pedipalp very long and slender, clothed with spines, hairs and trichobothria (Okuma *et al.* 1993).

Abdomen very long, usually dumbel-shaped, sometimes like a pointed tail beyond spinnerets. Spinnerets may be present at the end or nearer to the end of abdomen. Epigynal slit posterior to lung-slits in the procurved epigastric furrow.

**Biological note:** All long-jawed spiders are orb-weavers and can make typical circular or semi-circular webs in the crop-fields, drains or similar habitats nearer to water bodies. These are commonly found on grasses, leaves of rice-plants and other foliages stretching the legs forward. They make large horizontal webs during dusk below which they stay for the preys directing upward. They are nocturnal predators and take rest in the day both on the leaves or below the webs.

The webs of these spiders catch numerous small pest insects more than their expectations. An adult long-jawed spider can consume 30-32 small insect pests per day from their webs. Thus, they play an important role as a biological control, agent of insect pests in the crop-fileds and such other agroecosystems.

**Distribution:** All over the world with majority in Asia (Okuma *et al.* 1993, Zhu *et al.* 2003).

### Key to the species of genus *Tetragnatha* Latreille

1. Cephalothorax medially wide; fovea central, rounded; cervical furrows well-distinct; lateral eyes not close; cheliceral fang very long, margins with many teeth; abdomen dumbel-shaped, posterior end blunt; maxillae very long, wide anteriorly with dorsal hump; male palp as in Figure 2..... *T. jibontiae* n. sp.

_ Cephalothorax posteriorly wide; fovea elongate; cervical furrows faintly distinct; lateral eyes closed; cheliceral fang not so long, with few marginal teeth; abdomen long, posteriorly narrow and pointed; maxillae medium, a little wide anteriorly, without hump; male palp as in Figure 1. …… *T. fletcheri* Gravely

### Description of the species

**1. *Tetragnatha fletcheri* Gravely, 1921 (Fig. 1a – f; 3a-b)**

1921. *Tetragnatha fletcheri* Gravely, *Rec. Indian Mus.,*

Calcutta, 22: 440.

1966. *Tetragnatha fletcheri*: Tikader, *J. Assam Sci. Soc.,*9: 8.

1996. *Tetragnatha fletcheri*: Biswas & Raychaudhuri, *Ann Entomol.,*14 (1): 52.

2006. *Tetragnatha fletcheri*: Platnick, *World Spider Catalog,* Version 9.5: 992.

2009. *Tetragnatha fletcheri*: Biswas, *Ency. flora & fauna of Bangladesh, Arach*. 18 (1):

2025. *Tetragnatha fletcheri*: *World Spider Catalog,* Version 25.5, Nat. Hist. Mus. Bern., http: //www. wsc.nmbe.ch. (accessed 7th August, 2025).

**Material examined:** 2 females, South Shikerpur, dist. Jhenaidah, 18.V.1990, Coll. V. Biswas; 1 female, P.C. College rice-fields, dist. Bagerhat, 12.IX.1991, Coll. V. Biswass; 2females, Chalna, dist. Khulna, 25.VI. 1997; 1 female, Kumarkhali, Kustia, 15.V.1995, Coll. V. Biswas.

**General description:** Body long, nearly dumbel-shaped; cepalothorax brownish-green; abdomen brownish-white in colour. Total length (female) 12.10 mm. Carapace 3.10 mm long, 2.00 mm wide; abdomen 9.00 mm long and 3.10 mm wide. Total length (male) 10.10 mm long. Carapace 4.00 mm long, 2.00 mm wide; abdomen 6.10 mm long and 2.80 mm wide.

**Cephalothorax:** Longer than wide, slightly depressed, narrowed anteriorly, clothed with fine pubescence (Fig. 1a); cephalic region a little raised, cervical furrows distinct; postero-medially with a pith, radial furrows distinct. Eyes pearly-white, each encircled with black patch, anterior row recurved, posterior row nearly straight, laterals smallest and close each other, ocular quad longer than wide, slightly narrower in front than behind (Fig. 1b). Chelicerae longer than carapace, with numerous sharp teeth, strong in female, straight in male, first dorsal tooth situated at the fang base; distance between the second and third twice than that between first and second, followed by a diminishing series of small teeth; first two ventral teeth similar to the first two dorsals, situated at the base of fang, first being directed forward ; the third tooth small, followed by a diminishing series of teeth ; fang dorsally spinous near base , this in males very small (Fig. 1c-d) ; second cheliceral tooth in male conspicuously large. Maxillae pale brown, long (Fig. 1e). Labium darker, helmet shaped (Fig.1e), both anteriorly scopulate. Sternum yellow-brown, elongate, posteriorly narrowed, clothed with finr hairs (Fig. 1f). Legs very long and slender, yellow-brown, clothed with hairs and spines; leg formula 1243 and the measurements (in mm) of different segments are shown in Table 1.

**Abdomen:** Long, cylindrical, dorsum decorated with hairs; mid-dorsally with a longitudinal deep brown line and laterally with white longitudinal

**Table 1. Measurement (mm) of leg segments of female *T. fletcheri* Gravely**

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|---|---|---|---|---|---|---|
| I | 15.00/15.00 | 0.80/0.80 | 4.00/4.00 | 4.20/4.20 | 2.70/2.70 | 26.70/26.70 |
| II | 12.00/12.00 | 0.50/0.50 | 3.80/3.80 | 4.00/4.00 | 2.00/2.00 | 22.30/22.30 |
| III | 3.05/3.05 | 0.40/0.40 | 2.00/2.00 | 2.05/2.05 | 7.30/7.30 | 14.80/14.80 |
| IV | 6.05/6.05 | 0.45/0.45 | 3.40/3.40 | 3.00/3.00 | 7.40/7.40 | 20.30/20.30 |

lines. Epigyne as in Fig. 1h.

**Distribution:** Bangladesh (Jhenaidah, Bagerhat, Khulna, Kustia), India (Gravely 1921, Tikader 1966).

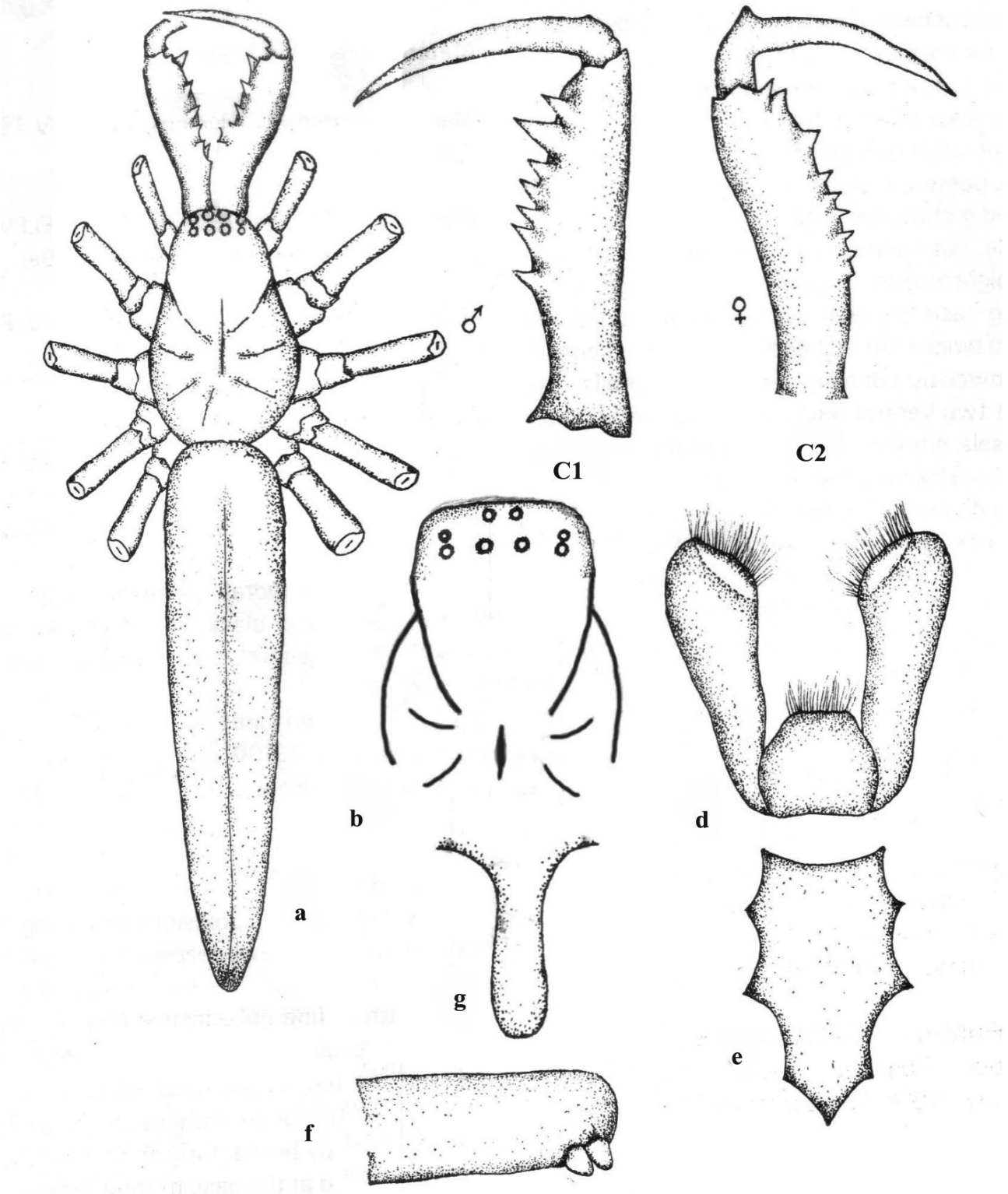

**Figure 1. *Tetragnatha fletcheri* Gravely a. Whole body (dorsal view); b. Cephalothorax; $c_1$-$c_2$. Chelicerae; d. Maxillae & labium; e. Sternum; f. Part of abdomen showing spinnerets; g. Epigynum.**

**2. *Tetragnatha jibontiae* n. sp. (Fig. 2a-f; 3c-d)**

**Material examined:** 1 male (Holotype), South Shikerpur, Dist Jhenaidah (from webs of rice-plant), date 27.IX.2024, Coll. V. Biswas; 2 males (Paratypes), date 18.IV.2025, Coll. V. Biswas (from same habitat).

**General description:** Body long, nearly dumbel-shaped, yellowish-brown in colour with cephalothorax more darker (holotype); fovea deep brown. Total body length (male)11.50 mm. Carapace 3.50 mm long, 2.90 mm wide; abdomen 8.00 mm long and 2.10 mm wide.

**Cephalothorax:** Broad, elongate, flat, wider medially, with a deep black median fovea and two lateral distinct cervical furrows; few laterally radiating striae present around the fovea (Fig. 1a). Eyes black, each encircled by black bands; anterior row of eyes slightly recurved while the posterior row nearly straight; lateral eyes separated; ocular quad tetrangular (Fig. 1b). Chelicerae very long, dark-brown with long, curved fang and numerous marginal teeth; fang basally broad, with a pointed hump (Fig. 1c). Maxillae very long, medially constricted, anteriorly enlarged and scopulate (fig. 1d). Labium small, vase-shaped, anteriorly scopulate (Fig. 1d). Sternum broad, anteriorly wide, posteriorly pointed (Fig. 1e). Legs

**Table 2. Measurement (mm) of leg segments of male *T. jibontiae* n. sp**

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|---|---|---|---|---|---|---|
| I | 14.00/14.00 | 0.70/0.70 | 4.00/4.00 | 4.00/4.00 | 2.70/2.70 | 25.40/25.40 |
| II | 11.50/11.50 | 0.50/0.50 | 3.70/3.70 | 3.80/3.80 | 2.50/2.50 | 22.00/22.00 |
| III | 3.00/3.00 | 0.40/0.40 | 2.00/2.00 | 2.00/2.00 | 2.80/2.80 | 11.20/11.20 |
| IV | 5.20/5.20 | 0.40/0.40 | 3.50/3.50 | 3.40/3.40 | 2.20/2.20 | 14.70/14.70 |

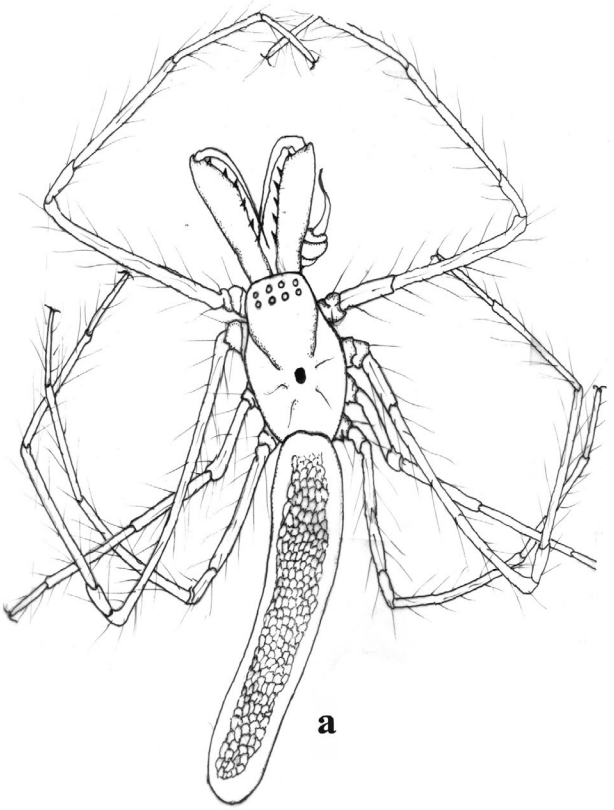


**Figure 2(a). *Tetragnatha jibontiae* n. sp. a. Male whole body (dorsal view).**

very long and slender, clothed with sharp hairs and spines; leg formula 1243 and the measurements (in mm) of different segments are shown in Table 2.

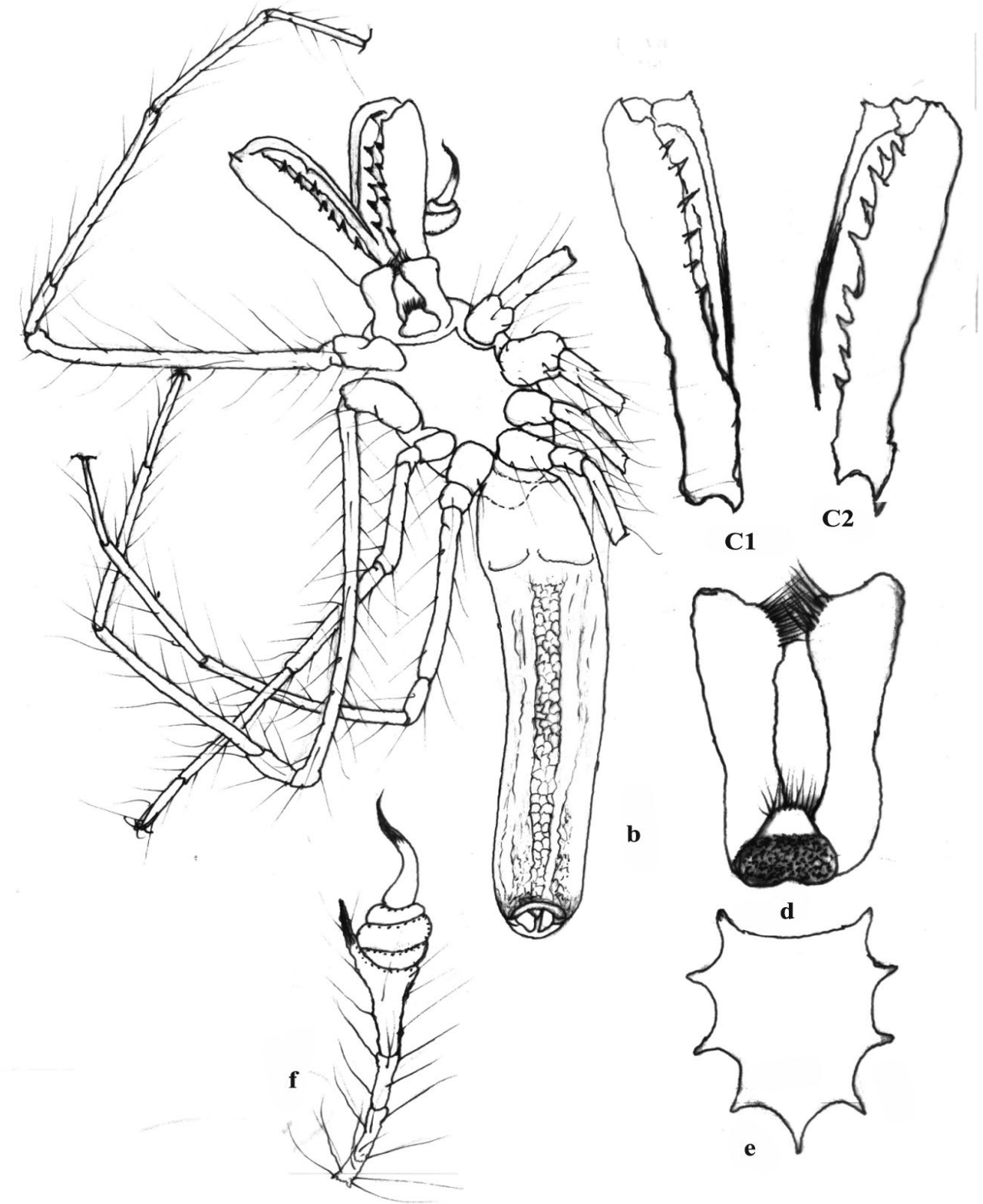

**Figure 2(b-f).** ***Tetragnatha jibontiae*** **n. sp. b. Male whole body (ventral view); $c_1$-$c_2$. Chelicerae; d. Maxillae & labium; e. Sternum; f. Male palp.**

**Abdomen:** Long, dumbel-shaped, yellowish-brown, little wide anteriorly; dorsum decorated with scale-like appearance, posteriorly blunt; spinnerets short and broad, situated nearer to the end; ventrally pale-yellow. Male palp as in Fig. 1g.

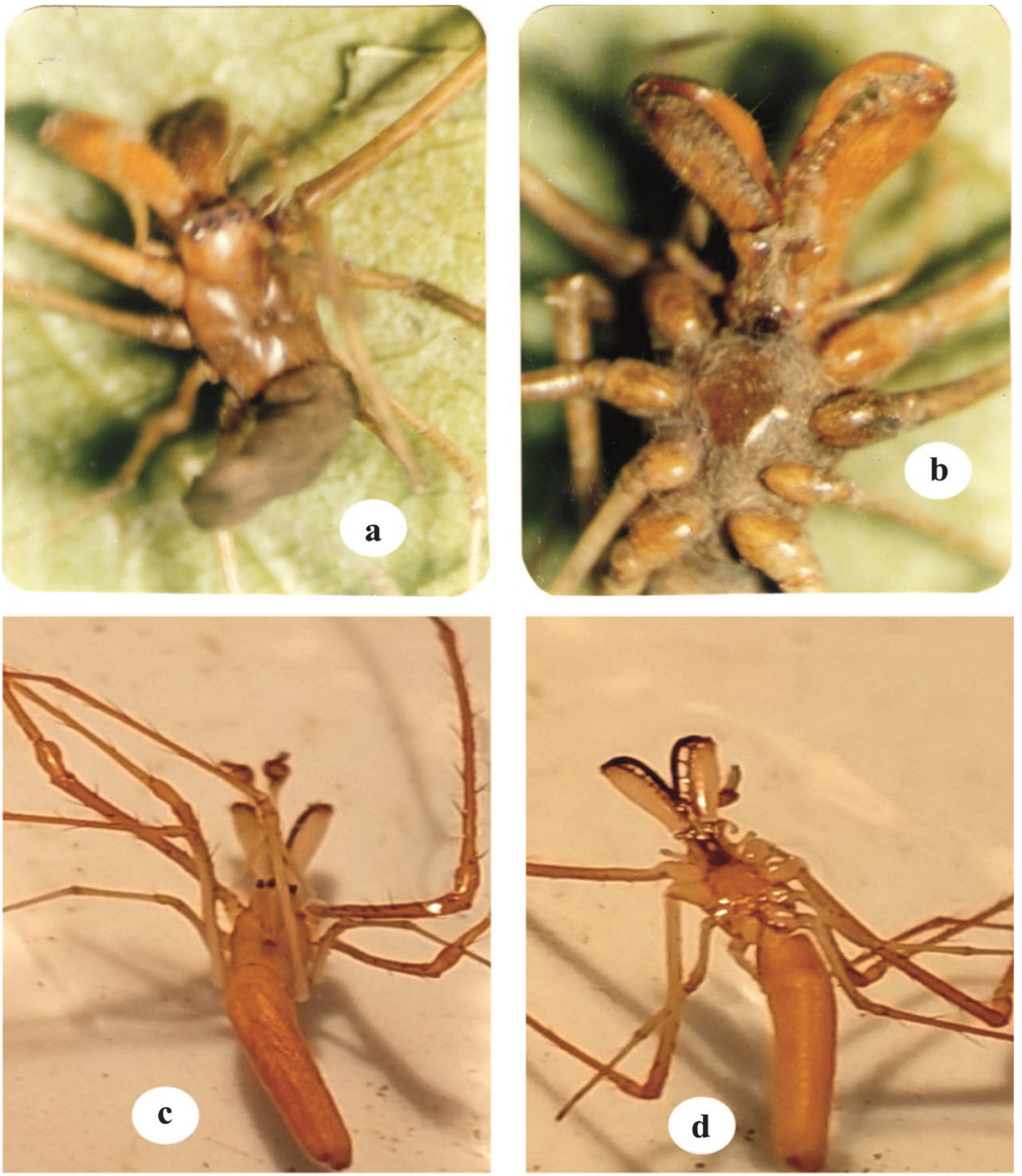

**Figure 3**. ***Tetragnatha fletcheri*** **Gravely, 1921 a. Whole body (dorsal view); b. Ventral view showing chelicerae, Maxillae, Labium & Sternum; c-d.** ***Tetragnatha jibontiae*** **n. sp. c. Whole body (dorsal view); d. Whole body (ventral view) showing appendages.**

**Male (Holotype):** One male in spirit.

**Paratype:** 2 males in spirit.

**Female (Allotype):** Unknown and will be described separately after collection (when will be available).

**Type locality:** Rice-fields of Village South Shikerpur, District Jhenaidah, Bangladesh.

**Etymology:** The species is named in honour of Mrs. Jibonti Ghosh, Teacher of Sociology, Coronation Girl's High School, Khulna, Bangladesh.

**Remarks:** The species *T. jibontiae* n. sp. does not show any similarity to its neighbor congeners and elsewhere of the world. However, it shows some special characters for which it stands distinct as a species new to science. These characters are -

1. The structure of cephalothorax and abdomen much different with others.
2. Structure of chelicerae, its fang and marginal teeth are distinctly variable (Fig. $1d_1$ &$d_2$).
3. Maxillae and labium much different in structure and colour.
4. Structure of male palpus is typical and much different with others.

Considering the above distinct characters, the present species may therefore be described as new to science.

## Conclusion

The rice-plant inhabiting tetragnathids or long-jawed orb-weavers are very poorly known in the taxonomic history of the study of spider fauna of Bangladesh Till date, in Bangladesh, 15 species are recorded and described including the present new species *T. jibontiae* n. sp. From the earlier descriptions, it is observed that none of the previously described species are similar in characters (viz. chelicerae, pedipalp, maxillae, labium etc.) with the present species. Therefore, it is undoubtedly proved that the present one is identified as new to science. Another one is a new record for the area of present study and as it is described earlier, so, only the remarkable characters and distribution of the newly recorded species is included.

It was also observed that both the species are orb-weavers and predatory in habit. Both of them can spin typical geometric webs within rice-plants by which they catch and consume small insect pests from the webs. Therefore, it is proved that these spiders play a significant role in the biological control of insect pests in rice-agroecosystems. A detailed study on the orb-weaving mechanism and food and feeding habit of these spiders may open a new field of biological pest management system.

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