

## **Redescription of *Tetragnatha cochinensis* (Araneae: Tetragnathidae) after a century in India**

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### **Abstract**

*Tetragnatha cochinensis* was first described by Gravely from India in 1921. *T. cochinensis* is distinguished from other tetragnathids by the unique arrangement of cheliceral teeth. The structure of chelicerae were briefly described and illustrated, but the genitalic descriptions of both sexes were inadequate. This paper provides detailed description of *T. cochinensis* with photographs on the basis of newly collected specimens from Kerala, India.

**Keywords:** Araneae, Long-jawed spiders, redescription, *Tetragnatha*, India.

### **Introduction**

Tetragnathidae or long-jawed spiders include 50 genera with 982 species (World Spider Catalog, 2021). The family is a cosmopolitan spider clade most of which typically build horizontal orb webs with open hubs. They are found in all continents except Antarctica (Alvarez-Padilla *et al.*, 2020). They have highest diversity in humid tropical and subtropical areas of the world. They build orb webs near rivers, streams and hiding in nearby vegetation (Dimitrov & Hormiga, 2011). Among tetragnathids, *Tetragnatha* Latreille, 1804 is the largest genus currently comprises 323 species and subspecies (World Spider Catalog, 2021). Indian tetragnathids constitute 55 species belong to 12 genera and among these genus *Tetragnatha* constitutes 25 species (Caleb & Sankaran, 2021). Members of this genus are elongate, moisture loving, nocturnal and most abundant

during rainy season. They may be distinguished by the structure of chelicerae (Gravely, 1921). They are characterized by the loss of median apophysis, the conductor wrapping and coiling with the embolus, presence of dorsal femoral trichobothria, globular tegulam, enlarged sperm duct and spermatheca opens directly into a membranous chamber (Alvarez-Padilla, 2007). In tetragnathids, many species are poorly described at the taxonomic level, species redescrptions and local revisions are frequent, but the complete revisions of the genus are unavailable (Castanheira *et al.*, 2019).

## Material and Methods

Specimens were collected by visual searching and hand picking from the surface of leaves and stems near water bodies. The collected specimens were stored in 70% ethyl alcohol. Specimens were examined under Leica M205C stereomicroscope. Digital images were taken by means of Leica DMC4500 digital camera attached to Leica M205 C stereomicroscope, with the software package Leica Application Suite (LAS), version 4.3.0. LAS montage facility. All measurements were taken in mm. Measurement data for palps and legs are as follows: total length (femur, patella, tibia, metatarsus [except palp], and tarsus). Specimens were deposited in the reference collection at the Centre for Animal Taxonomy and Ecology (CATE), Department of Zoology, Christ College (Autonomous), Irinjalakuda, Kerala, India.

Abbreviations used in the text and figures are as follows (Castanheira *et al.*, 2019): a = male dorsal apophysis used to lock females fang during copulation, AX1 = auxiliary guide tooth of the lower row, AXu = auxiliary guide tooth of the upper row above Gu, BC = basal cusp on the female's cheliceral fang, C = conductor, E = embolus, Gl = guide tooth of the lower (or ventral) row, Gu = guide tooth of the upper (or dorsal) row, L = translucent lobe at the mesal side of paracymbium, L2-n =teeth on the lower row numbered from the distal end after G1, P = paracymbium, rsu = remaining proximal teeth on the upper row after T in males, t = a tooth or prominence found in males of some species, T = elongated tooth in the upper row of some males, U2-n = teeth on the upper row numbered from the distal end after Gu.

## Taxonomy

Family **Tetragnathidae** Menge, 1866

Genus *Tetragnatha* Latreille, 1804

*Tetragnatha cochinensis* Gravely, 1921

**Diagnosis:** A long and slender species. Carapace is elongated and much narrowed anteriorly. Abdomen long and cylindrical with evident black spots on the dorsum of the female. Two rows of eyes are somewhat strongly recurved. Anterior laterals are small and are near to the posterior laterals. Male chelicerae are longer than in female. Female fang is much more geniculate and swollen at the middle (Gravely, 1921). Male palp characterized by elongated cymbium and short paracymbium. Genital fold is long and located on the anterior of the abdomen.

**Material examined.** 3♂♂, 4♀♀ Athirappilly, Kerala, India (10.2851°N, 76.5698°E). Anju K. Baby & A.V. Sudhikumar, 11.08.2021.

**Description. Male** (Fig. 1). Total body length 4.40. Carapace length 1.24 and width 0.58. Carapace yellow, elongated, much narrower anteriorly and with two darker thin parallel lines from the cephalic furrow, passing through the fovea, reaching the posterior region (Figs. 1A-C). Anterior lateral eyes are smaller and are near to posterior laterals. Sternum

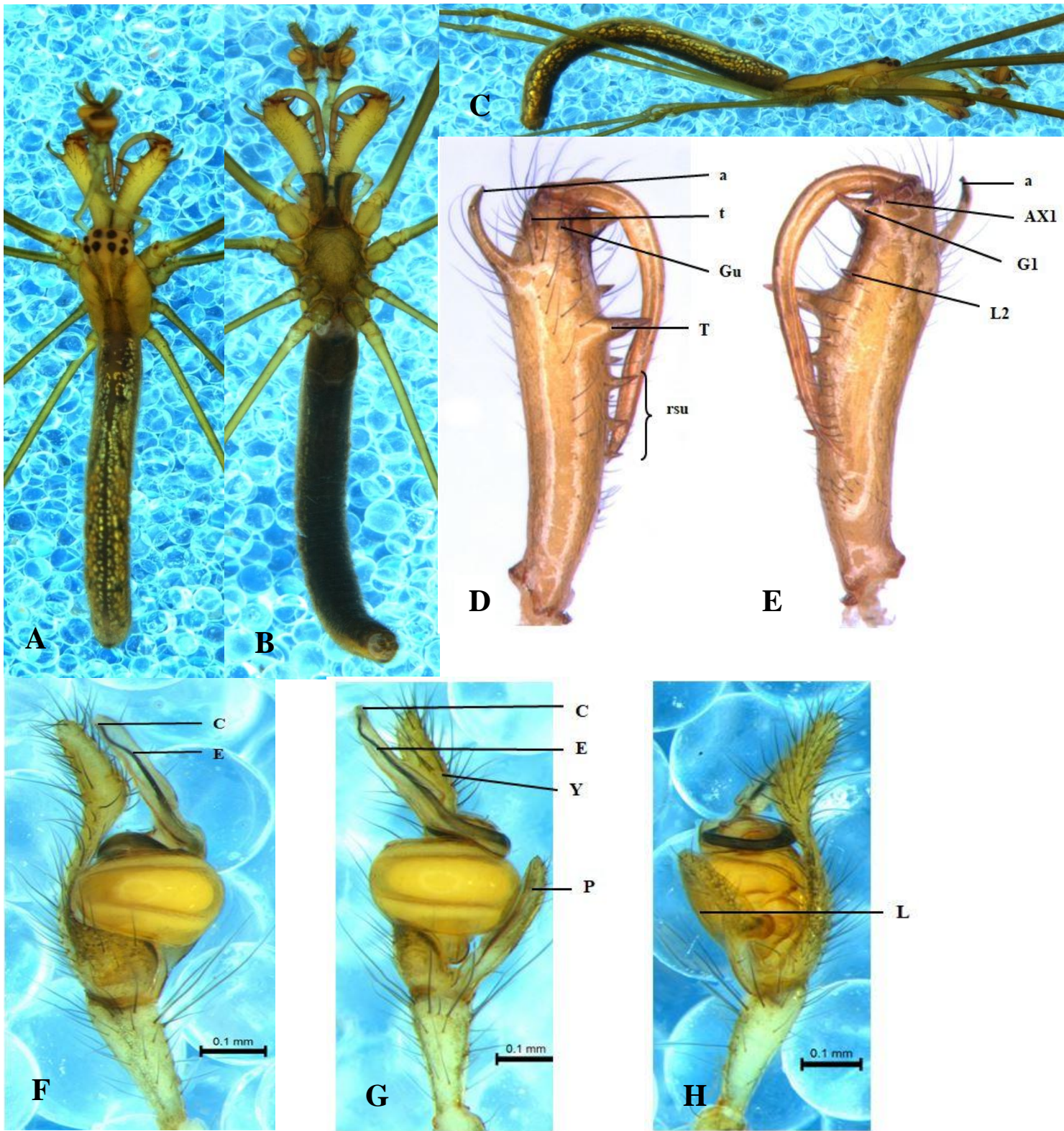


Fig. 1. *Tetragnatha cochinensis* Gravely, 1921 ♂. A. dorsal habitus. B. ventral habitus. C. lateral habitus. D-E. left chelicera. D. dorsal view. E. ventral view. F-H. left palp. F. dorsal view. G. mesal view. H. ventral view.

light yellow with darker contour, Labium elongated, Clypeus 0.09 and pale yellow in colour. Leg I length 14.22 (3.89, 0.41, 4.58, 4.30, 1.04), leg II 7.80 (2.51, 0.38, 2.10, 2.22, 0.59), leg III 3.57 (1.27, 0.22, 0.77, 1.10, 0.21), leg IV 8.23 (2.92, 0.27, 2.32, 2.16, 0.56). Leg formula 1423. Abdomen length 3.16 and width 0.38. Abdomen is slender, cylindrical and yellow coloured with guanine spots. Black spots present in the dorsum of the abdomen are not much clear, but with an obvious black spot on the postero-dorsal

region of the abdomen. Abdominal venter much darker than in female. Fang without any projections. Chelicerae 1.08 long, 0.30 wide and light yellow in colour. 'a' is very slender distally with truncate apex, directed upward and outward. 't' larger than Gu and directed upward. Gu small and a large gap between Gu and T. 'T' with larger base, elongated and pointed. AXu absent. 'rsu' with four teeth evenly spaced and arranged in descending series (Fig. 1D). AX1 and G1 are present in the fang base. AX1 small and both sharing same basis. G1 large and slightly projected upward. AX1 much closer to fang base than Gu. L2 is much smaller than G1 followed by four teeth (Fig. 1E). Palp total length 1.59 (0.64, 0.22, 0.22, 0.51). Palp with very elongated cymbium and strongly developed. Conductor almost transparent, tapering towards the apex and not twisted at the distal halves with embolus. Embolus thickened proximally and relatively narrows at the distal end. Embolus originating at the middle portion of the bulb, with a long curve at the initial portion. Paracymbium is short, thick and a knob present at the ectal side. L is wider (Figs. 1F-H).

**Female** (Fig. 2). Body length 6.45. Carapace, eyes and sternum same as male. Carapace 1.24 long and 0.75 wide (Figs. 2A-C). Labium elongated and dark brown in colour. Clypeus 0.08 and yellow in colour. Legs are slender and pale yellow in colour. Leg I length 16.68 (5.08, 0.49, 5.48, 4.78, 0.85), leg II 9.42 (2.97, 0.39, 2.85, 2.68, 0.53), leg III 4.44 (1.60, 0.26, 0.94, 1.18, 0.46), leg IV 10.23 (3.33, 0.37, 3.08, 2.88, 0.57). Leg formula 1423. Abdomen length 5.21 and width 0.46. Abdomen with guanine spots along with dark spots on the dorsal side. A noticeable black spot is present on the postero-dorsal region of the abdomen. Abdominal venter is dark without any markings. Chelicerae 0.96 long, 0.22 wide, yellow coloured and comparatively shorter than in males. Fang is closer to both rows of teeth and tapering to the tip. Cheliceral promargin bears eight teeth. AXu absent, Gu directed upward and not much closer to the fang. U2 slightly larger than Gu, pointed and well separated. U2 is opposite the fifth ventral. Size of the remaining teeth is decreasing (Fig. 2D). G1 near to the fang base and AX1 absent. L2 pointed upward and remaining nine teeth are decreasing in size. L2 and L3 are larger than G1 (Fig. 1E). Comparatively a large round prominence found in the lower side of the retromargin. BC dark, small and present at the middle of the fang. Genital fold long, laterally compressed, with thick and straight tip (Fig. 2F).

**Natural History.** *T. cochinensis* spiders build their orb webs near river, streams or water logging areas. They usually build large orb webs horizontally to different water bodies. They are nocturnal and sometimes hiding in nearby vegetation under leaves, when direct sunlight is quite difficult.

**Distribution.** India (endemic species).

## Discussion

Gravely (1921) described *T. cochinensis* on the basis of cheliceral morphology of male and female collected from Southern regions of India. But the description lacks genital structures and other morphological characters. The female is identical in cheliceral morphology to the newly collected female from Athirappilly, Kerala, India. The description and illustration of chelicerae perfectly matches to the photographs of the newly collected specimen with geniculate fang, small teeth, first teeth of each row close to the fang base, second teeth of both rows situated far behind and second dorsal is opposite the fifth or sixth ventral. Detailed examinations of male shows, chelicerae are



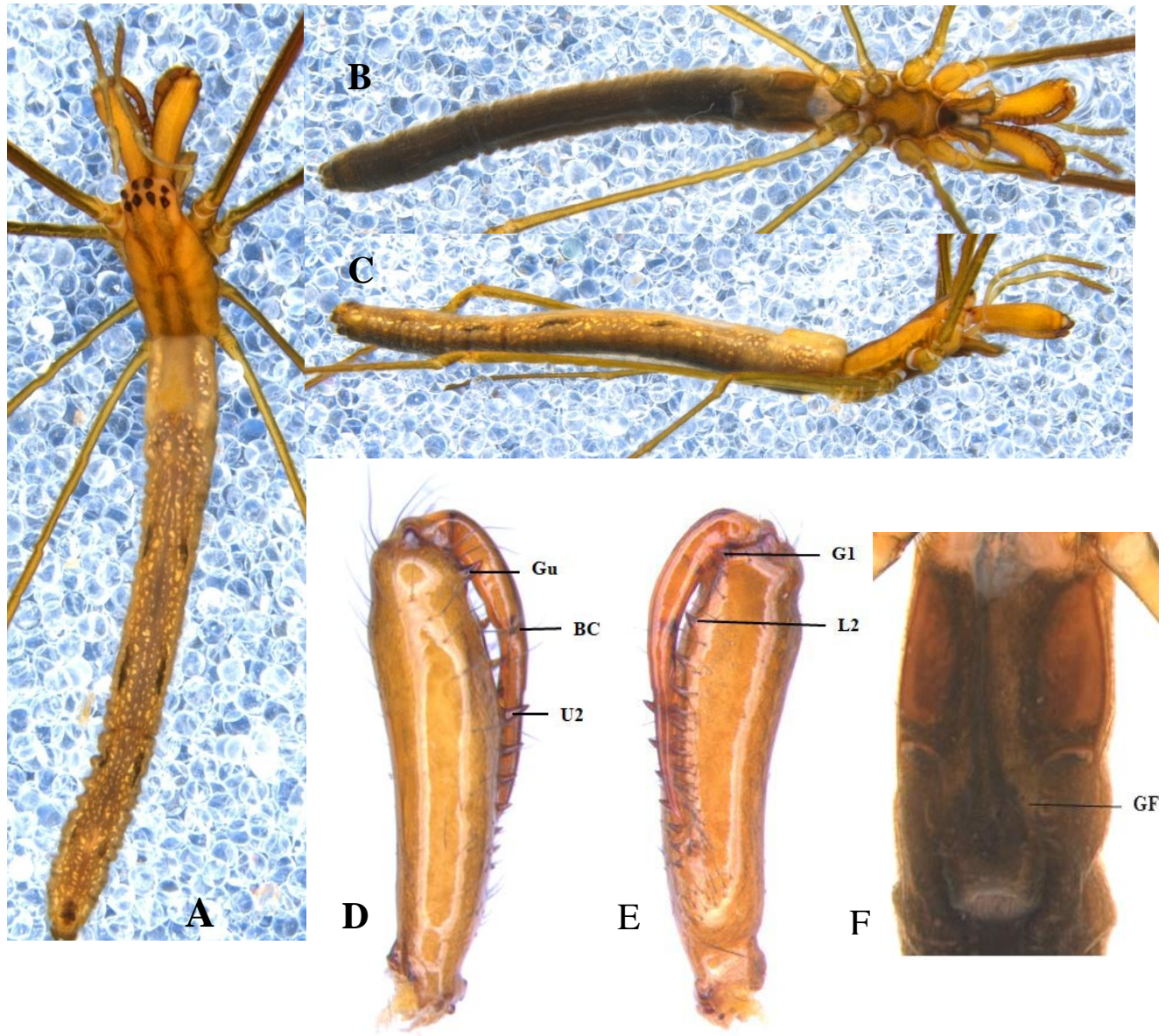


Fig. 2. *Tetragnatha cochinensis* Gravely, 1921 ♀. A. dorsal habitus. B. ventral habitus. C. lateral habitus. D-E. left chelicera. D. dorsal view. E. ventral view. F. epigynal fold, ventral view.

longer than in female and cheliceral apophysis is slender with truncate apex. First dorsal tooth is slightly larger than first ventral, which is minute. The position of second tooth of each row is somewhat different in the original illustrations. The second ventral tooth is anterior to the second dorsal tooth, but much closer to first ventral tooth. The second tooth of both rows is large and remaining teeth are decreasing in size.

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