



First description of male long-jawed orb-weaver spider (*Tylorida flava*)

The long-jawed orb-weavers of the family Tetragnathidae are a cosmopolitan spider clade, particularly diverse in humid tropical and subtropical areas of the world (Dimitrov & Hormiga 2011). The subfamily Leucauginae comprises six genera and the genus *Tylorida* Simon, 1894 includes eight species (Caleb & Sankaran 2022). Four of them are reported from India and a comprehensive revision of Indian species was published by Sankaran *et al.* (2017) with a description of *T. flava* as a new species but based only on a female specimen. Here, the male *T. flava* is described for the first time along with illustrations of the genitalia. Specimens were collected during visual encounters by hand, and were stored in 70% ethanol. The body characters were examined under a Leica M205C stereomicroscope and the digital images were taken by means of Leica DMC4500 digital camera attached to the microscope, with the software package Leica Application Suite (LAS), version 4.3.0 LAS montage facility. Measurements for palps and legs are as follows: total length [femur, patella, tibia, metatarsus (except palp), and tarsus]. Spine positions are as follows: prolateral, dorsal, retrolateral and ventral. Specimens are deposited in the reference collection at the Centre for Animal Taxonomy & Ecology (CATE), Department of Zoology, Christ College, Irinjalakuda, Kerala. **Abbreviations:** C, conductor; CDBP, cymbial dorso-basal process; dmtT, disto-median triangular process of tegulum; E, embolus; EB, embolic base; P, paracymbium; ST, subtegulum; T, tegulum; ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye.

Tylorida flava Sankaran, Malamel, Joseph & Sebastian, 2017 (Figs. 1, 2)

Tylorida flava Sankaran *et al.*, 2017: 296, figs. 1A, 3A–F, 4A–H.

Material examined ($n=7$). India: Kerala: a male (CATE115421) and a female (CATE115422; mating pair from foliage), collected at Makkiyad Hills (11°45'18"N, 75°54'25"E; alt. 820 m a.s.l.), Wayanad, Kerala, India by A.V. Sudhikumar & Anju K. Baby on 18 April 2022; two males (CATE115423, 115424) and three females (CATE115425, 115426, 115427; from foliage), collected from Chirappullu Hill (11°42'37"N, 75°54'12"E; alt. 1,517 m a.s.l.), Wayanad, Kerala, India by Anju K. Baby on 25 May 2022.

Diagnosis. Males of *T. flava* are most similar to the males of *T. marmorea* (Pocock, 1901), but can be separated by the following combination of characters: Cheliceral promargin with large rounded tubercle near the distal tooth and a rounded tiny tubercle set apart from the distal tooth on the retromargin (vs. cheliceral promargin lacks tubercle on the base, but with slightly bifid tubercle near the distal tooth of retromargin); cymbial dorso-basal process long, protruding and projected towards the dorsal side (vs. with short cymbial dorso-basal process and slightly folded retrolaterally); strong paracymbium with broad apex in contact with subtegulum (vs. paracymbium with apical warp touching the tegulum).

Description of the male. CATE115421. Measurements are in mm. Total length: 4.76. Carapace 1.86 long, 1.41 wide. Abdomen: 2.87 long, 1.27 wide. Ocular area length 0.36, width 0.34. Eye diameters: AME 0.14, ALE 0.12, PME 0.11, PLE 0.09. Clypeus height 0.06. Chelicerae 1.31 long, 0.53 wide. Palp and leg measurements: palp 2.81 [1.38, 0.15, 0.33, 0.95], leg I 26.84 [7.29, 0.94, 7.72, 9.77, 1.12], II 14.61 [4.32, 0.56, 3.88, 4.81, 1.04], III 5.90 [2.01, 0.35, 1.23, 1.67, 0.64], IV 13.73 [3.36, 0.45, 3.92, 4.95, 1.05]. Leg formula: 1243. Spination. Palp. 0000, 0000, 0000, 0000; legs: femur I 3-1-1-0, II 0-1-0-0, III 1-1-1-0, IV 1-3-1-0; patellae I 0-0-0-0, II - III 0-2-0-0, IV 0-1-0-0; tibia I 1-0-1-0, II 0-1-0-0, III 0-0-0-0, IV 1-0-0-0; metatarsus I - II 0-0-0-0, III 0-2-0-0, IV 0-0-0-0; tarsi I - IV 0-0-0-0. Carapace olive green, cephalic region much darker towards the fovea.

Plate 13

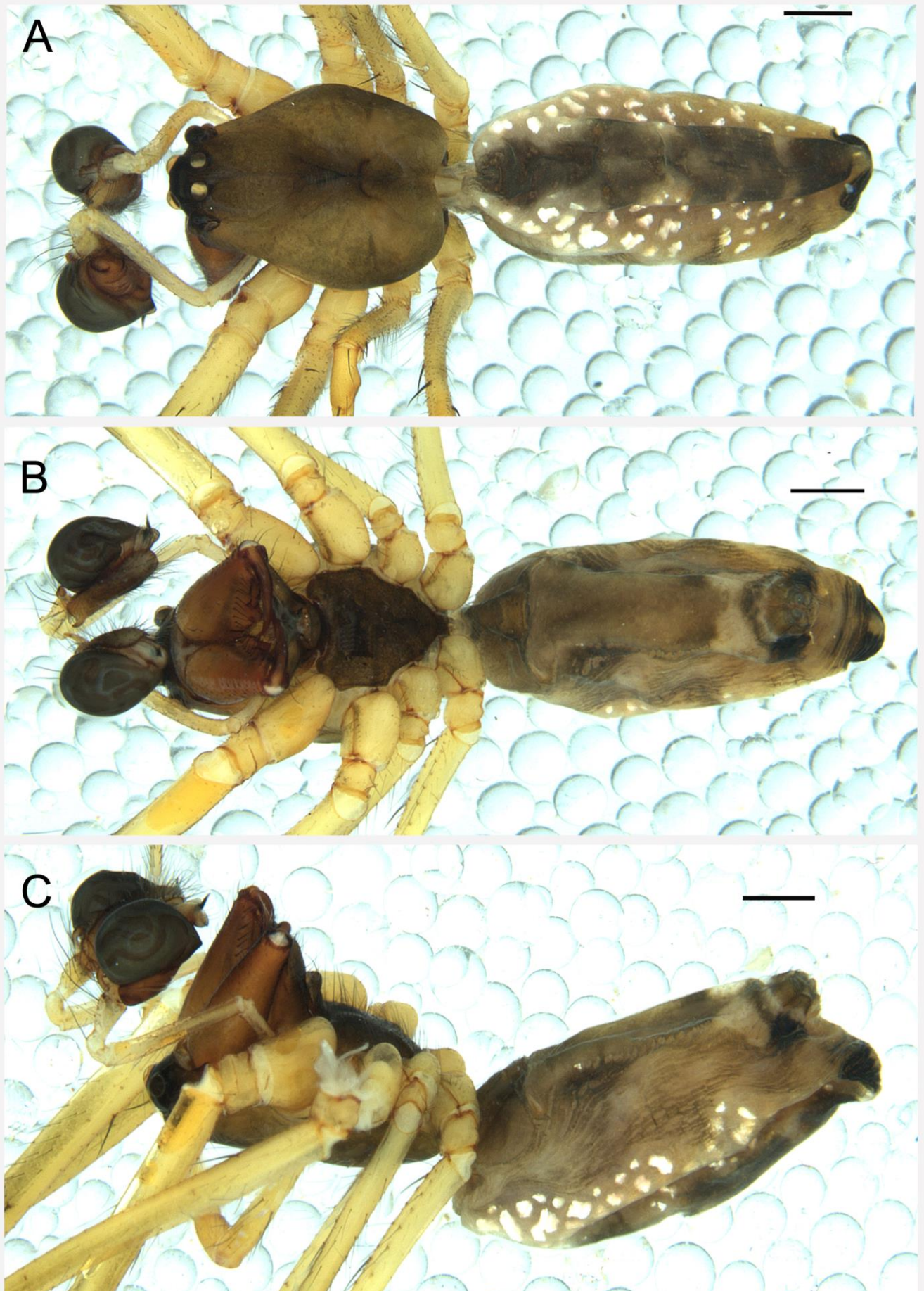


Figure 1. *Tylorida flava* male habitus: (A) dorsal, (B) ventral, and (C) lateral view; scale: 0.5 mm.

Plate 14

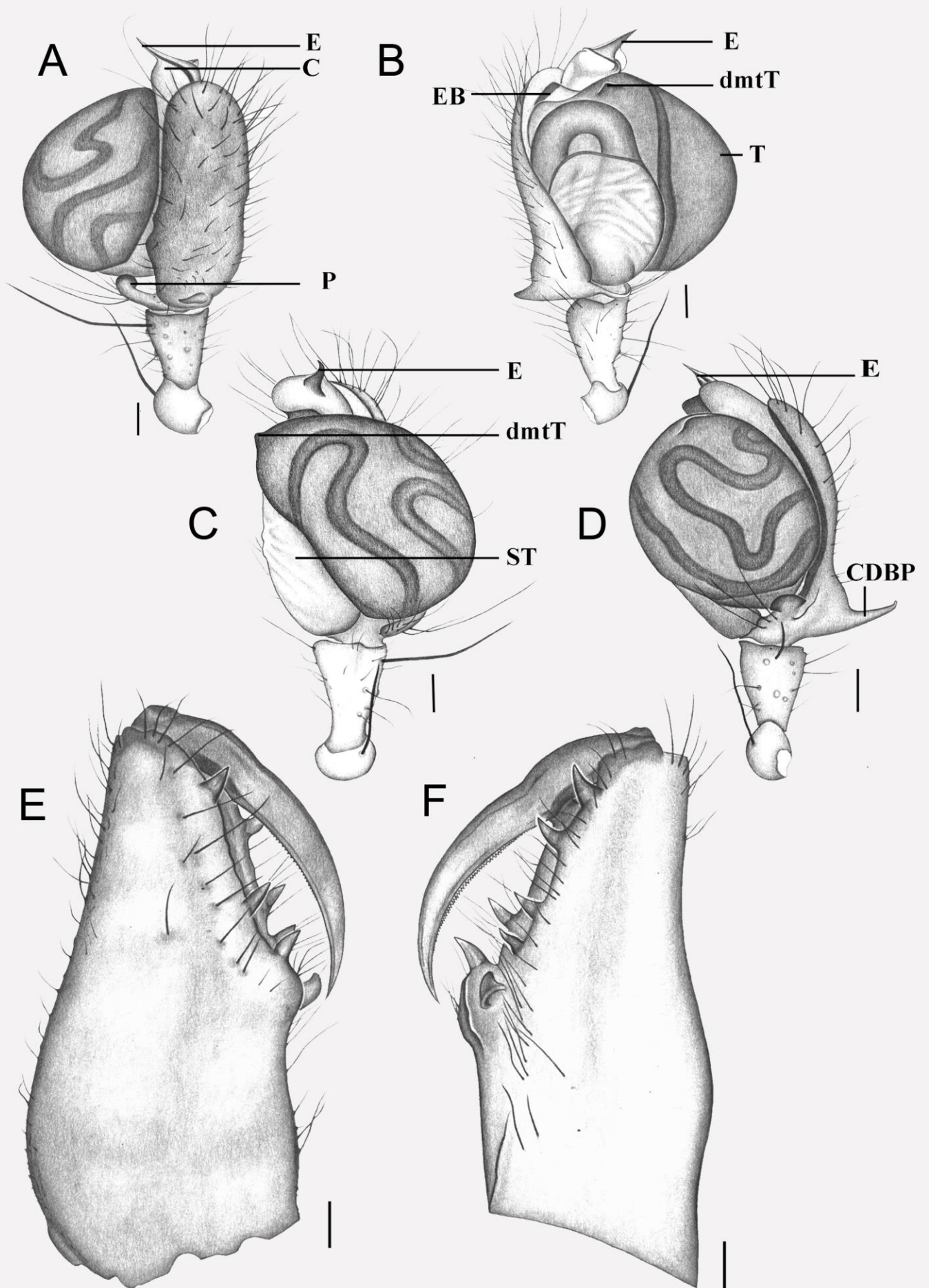


Figure 2. *Tylorida flava* male: (A) prolateral, (B) ventral, (C) retrolateral, and (D) dorsal views of left palp; (E) upper and (F) lower views of left chelicera; scale: 0.1 mm.

Two rows of eyes strongly recurved; ocular area dark, lateral eyes contiguous and located on the tubercles. Fovea distinct. Clypeus black. Sternum heart shaped, yellowish black with long black hairs and a conspicuous bifid posterior extension. Labium yellowish brown and rectangular; maxillae elongated with distinct scopulae. Chelicerae yellowish brown, small; promargin with three teeth with distal one located on the upper end of the large rounded tubercle sharing the same basis; retromargin with four teeth, a tiny tubercle set apart from distal tooth and opposite to the large rounded tubercle. Abdomen elongated, greyish; dorsum with median longitudinal black patches and a pair of black spots on the posterior side; laterally with silvery spots; venter with a pair of black spots located on the sides of lateral spinnerets. Legs yellowish without annulations. Prolaterally femur III with single row of trichobothria and femur IV with two rows of trichobothria. Spinnerets greyish. Palpal segments yellow. Tegulam dark brown and nearly globular. Disto-median triangular process small, prominent and facing towards the embolic base. Subtegulum light brown. Embolus short, blackish, protruding with apical twist and slightly slanted distally. Embolic base short, flat and lying-in close contact with conductor base. Conductor, thick, nearly transparent and enclosing the embolus distally. Cymbium with broad base, bent towards the ventral side; prolaterally with a small flat cone like process on the posterior end. Cymbial dorso-basal process long, thickened at the base, distal end protruding and slightly projected towards the dorsal side. Paracymbium long with broad apex and the distal end in contact with subtegulum.

Note: Left chelicera of subadult male was depicted by Sankaran *et al.* (2017), which is somewhat different from that of the adult cheliceral morphology. Adult male chelicera with conspicuous round shaped tubercle on the distal end of the promargin, which is not prominent in the drawings of subadult (figure 4c in Sankaran *et al.* 2017). A blunt tiny tubercle located on the distal end of the retromargin of adult, which is unnoticeable in the drawings of subadult. The original description lacks lower view of chelicera.

Natural history. Members of this species have mostly been collected from foliage. One male was found under tree leaves near a riparian habitat and the remainder were from the forest. Mating pairs were captured from foliage at high altitudes. During the day they shelter under leaves and show quick responses to danger. As do other tetragnathids, they usually build horizontal orb webs between tree trunks, shrubs and tree leaves.

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