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A new species of *Chirothripoides* (Thysanoptera: Tubulifera) from India and Malaysia

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Chirothripoides brahmaputrai **sp.n.** is described based on a holotype female from Assam State, India, and a paratype female from Peninsular Malaysia. A key to the six species of *Chirothripoides* is provided, and partial sequence data of mitochondrial cytochrome c oxidase (mtCOI) from the holotype of the new species is generated and submitted to Barcode of Life Database.

Key words: Thysanoptera, thrips, new species, India, Malaysia

Introduction

The order Thysanoptera is classified into two suborders: Terebrantia and Tubulifera. The suborder Tubulifera, with the single family Phlaeothripidae, includes about 3650 species (ThripsWiki 2016), of which 430 species are recorded from India (Tyagi & Kumar 2016). The pantropical genus *Chirothripoides* Bagnall (1915) includes five species, all of which are presumably mycophagous on dead branches: *C. typicus* from Trinidad (type species); *C. dendropogonus* Watts from USA; *C. faurei* Bournier from Angola; *C. hexadon* Okajima and *C. malayensis* Okajima from Malaysia. A new species is described here from two specimens; one collected on shrubs near Brahmaputra River, Assam State, India and the other from Malaysia. The latter specimen was listed by Okajima (1981) under *C. malayensis* with a note "*material excluded from paratype series*". A key to the six species of *Chirothripoides* is also provided, and molecular data of mitochondrial cytochrome c oxidase (mtCOI) from the holotype of the new species was generated as additional data for future studies.

Material and methods

Specimen collection, non-destructive method for DNA isolation and amplification of partial fragment of mtCOI gene were performed as earlier protocols (Buckman *et al.* 2013; Tyagi *et al.* 2015). Voucher specimens were retrieved and slide mounted in Canada balsam for morphological examination. PCR products were purified from the Agarose gel using Qaigen Gel Purification Kit as per manufacturer's instructions. Sequencing of purified PCR product was carried out in both directions using 48-capillary Genetic Analyzer (Applied BioSystems ABI 3730) using BigDye® Terminator Cycle Sequencing Kit (v3.1). The generated forward and reverse COI fragments of the holotype of this new species were analysed with SeqScape software version 2.7 (Applied Biosystems) and consensus sequence was obtained after checking deletion, insertion and stop codons. The generated sequence of the holotype was submitted to BOLD (Barcode of Life Database) under the project titled "DNA Barcoding Thrips of India".

Chirothripoides Bagnall

This genus can be characterised as follows (Okajima 1981; Bhatti 1998a, b). Head longer than broad, distinctly produced in front of eyes; maxillary stylets short; mouthcone short and rounded; postocular setae minute; eyes large. Antennae 8-segmented, III and IV each with 2 stout sense cones. Pronotum without long setae, weakly sclerotised, anterior margin irregular. Basantral plates absent or reduced. Ferna with two widely spaced sclerites, distance between them about three-fourths of their width. Postferna well developed as a transverse sclerite. Prospinasternum without spina. Pterothorax elongate. Mesoacrotergite complete and narrowed at middle. Mesopraesternum absent. Meso- and metasternum with long seta on either side, as long as or longer than width of sternum. Fore coxae elongate; fore tibiae with or without

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tooth; mid tibiae with one, hind tibiae with 2 spur-like setae. Fore tarsi 1-segmented, mid and hind tarsi either 1- or 2-segmented. Fore wings long and slender, parallel sided, with few duplicated cilia. Abdominal tergites without wing-retaining setae; sternite VIII posterior margin with long teeth, lateral and median pairs stouter than others; tube shorter than head; anal setae shorter than tube.

This genus is close to *Adamantothrips* and *Lonchothrips* but can be distinguished from these as follows: *Adamantothrips* shares all the characters of *Chirothripoides* except that the tube is swollen. *Lonchothrips* has the mesoacrotergite divided into two broadly separated sclerites (Bhatti 1998a), antennal segment II is forwardly extended, and the posterior margin of sternite VIII lacks projections.

Key to species of *Chirothripoides*

(based on original descriptions*)

1. Mid and hind tarsi 1-segmented 2
-. Mid and hind tarsi 2-segmented 4
2. Posterior margin of abdominal sternite VIII with 5 pairs of teeth; median pair of teeth "much more than half length of lateral pair" (Okajima 1981)..... *dendropogonus**
-. Posterior margin of abdominal sternite VIII with 3–4 pairs of teeth; median pair of teeth subequal to, or longer than, lateral pair 3
3. Posterior margin of abdominal sternite VIII with 3 pairs of teeth ..... *hexadon**
-. Posterior margin of abdominal sternite VIII with 4 pairs of teeth ..... *brahmaputrai* **sp.n.**
4. Posterior margin of abdominal sternite VIII with 5 pairs of teeth ..... *typicus**
-. Posterior margin of abdominal sternite VIII with 4 pairs of teeth 5
5. Median pair of teeth more than 1.4 times as long as lateral teeth ..... *faurei**
-. Median pair of teeth shorter than lateral teeth..... *malayensis**

Chirothripoides brahmaputrai sp.n.

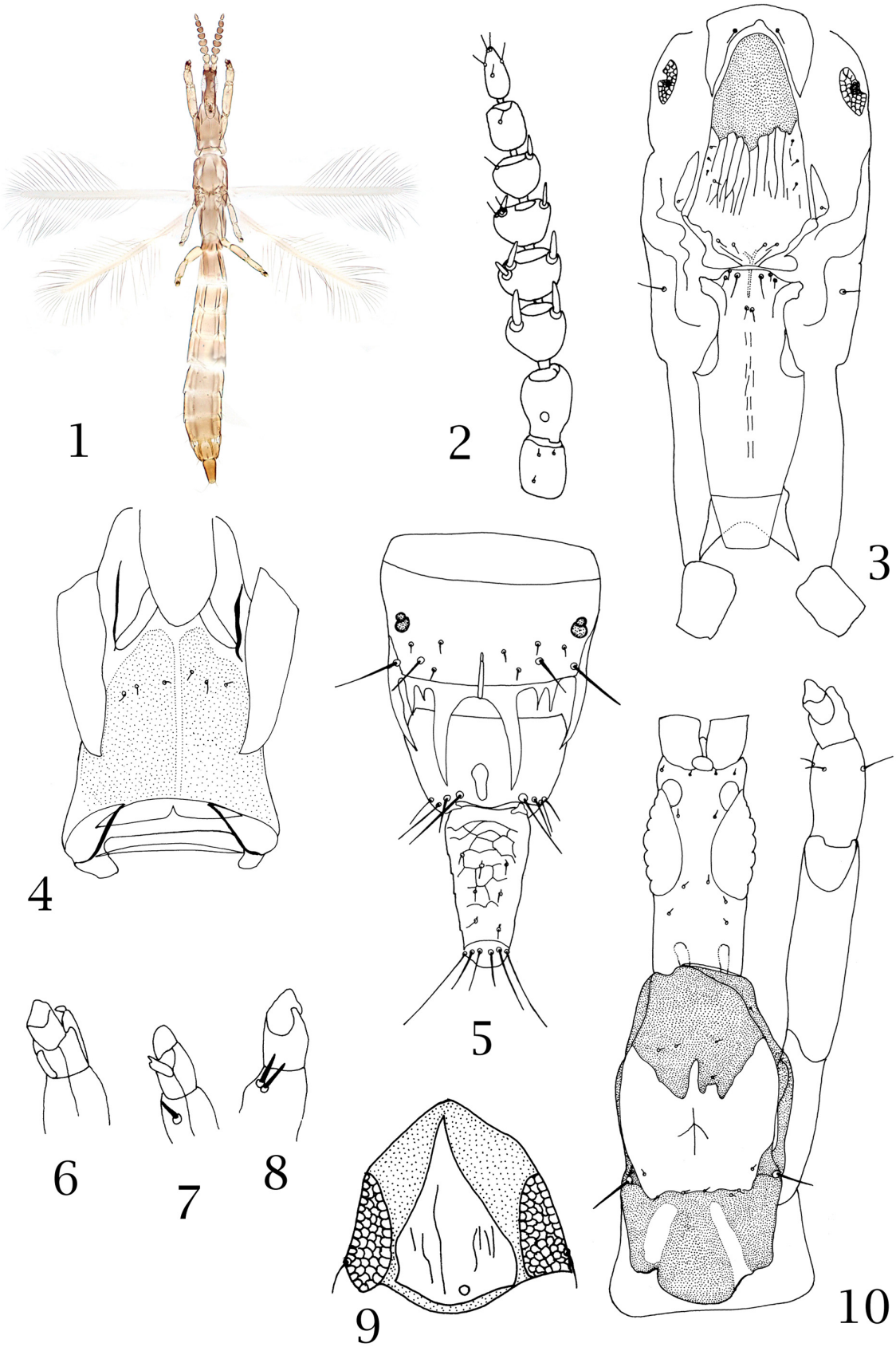
(Figs 1–14)

Female macroptera. With the generic characters indicated above. Body light brown; abdominal segments IX–X yellow with orange shading; legs yellow; fore wings unshaded. Head about 2.5 times longer than broad, preocular projection about 0.6 times longer than broad, postocular setae minute, pointed (Figs 10, 11). Antennal segments III–VIII cup-shaped, segment II with campaniform sensilla in basal half; III and IV each with 2 stout sense cones, VIII long and slender (Figs 2, 13). Pronotal epimeral setae shorter than eyes. Basantral plate membranous but with two faint median longitudinal lines and 3 pairs of setae (Fig. 4). Metanotum with elongate narrow band of linear reticulations. Fore wing with 5 duplicated cilia, basal wing setae absent. All tarsi 1-segmented (Figs 6–8). Pelta triangular with few longitudinal lines of sculpture, with a pair of campaniform sensilla in paratype but only single one in holotype. Abdomen slender; tergites III–VIII each with a pair of lateral depressions; tergites with well-developed inwardly directed pair of setae at posterolateral angles; sternite VIII with 4 pairs of projections or teeth at posterior margin, median pair a little longer than lateral pair (Figs 5, 14); tube reticulate ventrally, smooth dorsally.

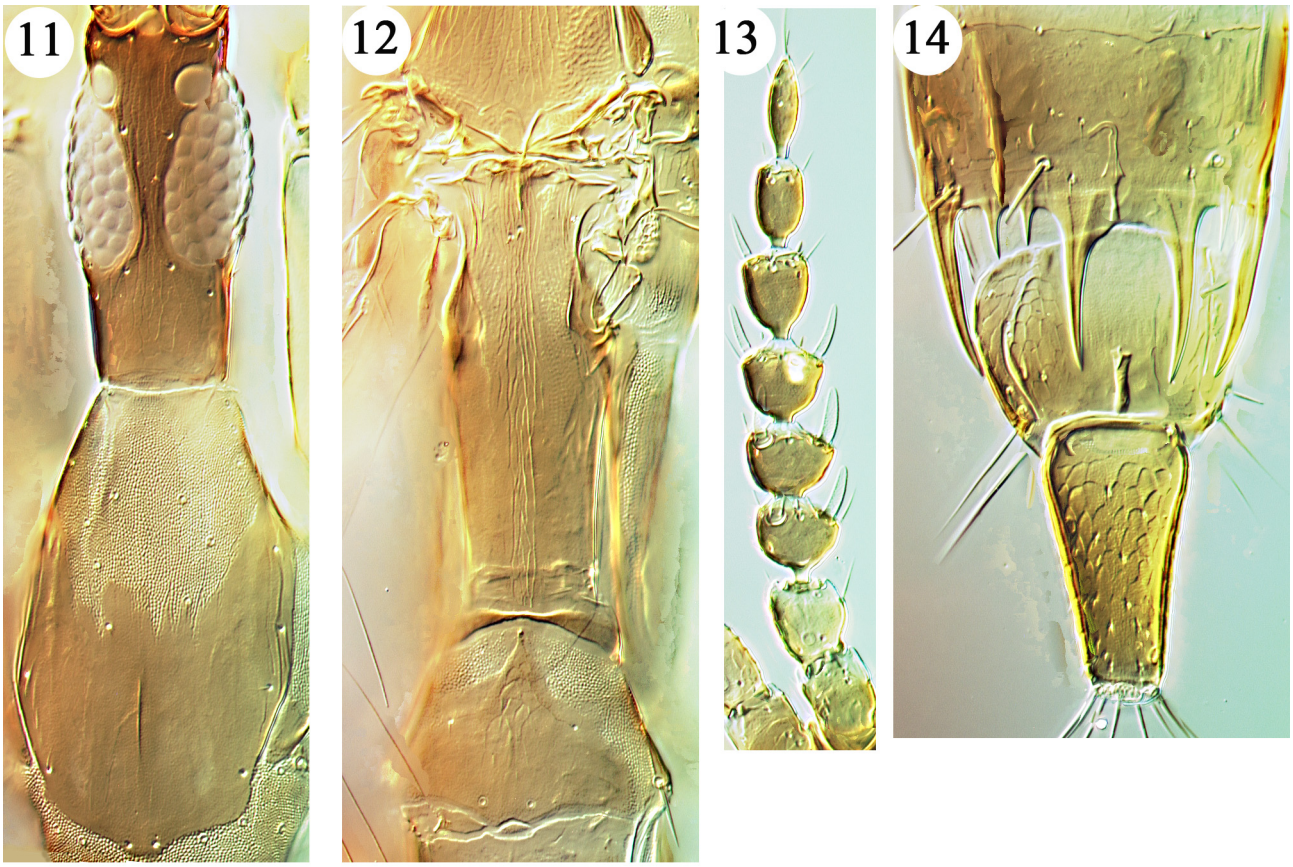
Measurements (holotype in microns). Total body length 1450. Head length 123, width across eyes 60, across cheeks 50; eye length 56; pronotal epimeral seta 25; fore wing length 620; fore femur length 124; pelta length 63; lateral projections of sternite VIII length 49–51, median teeth length 58; tube length about 77, basal width 41, apical width 26. Antennal segments I–VIII length (width) as follows: 22 (20); 30 (23); 27 (29); 22 (29); 20 (25); 19 (20); 22 (18); 24 (12).

Material studied. Holotype female macroptera, **INDIA**: Assam: Bishwanath District, on leaves of shrubs near Brahmaputra river, 13.v.2016 (Reg. No. 7447/H17), coll. Devkant, in the National Zoological Collections (NZC), Zoological Survey of India, Kolkata, India. Paratype female, **MALAYSIA** (Malaya), 3500 ft, Genting Tea Estate, on leaves of shrub, 6.x.1973, coll. L.A. Mound, in The Natural History Museum, London.

Comments. The paratype of this new species was listed under *malayensis* by Okajima (1981) but excluded from the type series of that species. In the key to species by Okajima (1981), *brahmaputrai* runs to couplet 4. However, it is distinguished from the two species at that point, *faurei* and *malayensis*, because they both have the mid and hind tarsi 2-segmented. Specimens of *faurei* in The Natural History Museum, London, include a paratype from Angola and five females from Nigeria. Among these specimens, the largest has the median teeth on sternite VIII 1.4 times as long as the lateral pair, but the smallest female has the median teeth 1.7 times as long. In contrast, *malayensis* has the median teeth a little shorter than the lateral pairs. The length of the teeth on sternite VIII of *brahmaputrai* is also different between the



FIGURES 1–10. *Chirothripoides brahmaputrai* **sp. n.**, holotype female: (1) Female; (2) Antenna; (3) Meso- and metanota; (4) Prosternum; (5) Sternites VIII–X; (6) Fore tarsus; (7) Mid tarsus; (8) Hind tarsus; (9) Abdominal tergite I; (10) Head & pronotum with fore leg.



FIGURES 11–14. *Chirothripoides brahmaputrai* **sp.n.**, paratype female (11) Head & pronotum; (12) Meso- and metanota; (13) Antenna; (14) Sternites VIII–X.

two specimens presented here (Figs 5, 14). In the holotype the median teeth is distinctively shorter than the lateral pair, whereas the paratype exhibits these pairs subequal in length. It is not possible to generalise from these measurements, because most species of *Chirothripoides* are known from very few specimens with no information about variation.

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