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Two new reports of thrips (Thysanoptera: Thripidae) from India

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Abstract
Opimothrips tubulatus Nonaka and Okajima and *Trichromothrips antidesmae* Li, Li and Zhang have been recorded for the first time from India. *O. tubulatus* was collected on the leaves of an unidentified weed of, whereas *T. antidesmae* was collected on the leaves of *Citrus limon* (L.) Burm. during a thrips survey carried out at Chitradurga in Karnataka. Among them, *O. tubulatus* belongs to the subfamily Panchaetothripinae, and *T. antidesmae* comes under Thripinae. Diagnosis and illustration for the above two terebrantians are given along with the images for the respective species.

Keywords: Panchaetothripinae, Terebrantia, Thripinae

Introduction
The suborder Terebrantia includes eight families, of which thrips belonging to the families Aeolothripidae, Melanthripidae, Merothripidae, Stenurothripidae and Thripidae have been collected and recorded from India. Among them, Thripidae is the biggest family, represented by a large number of economically important species. A recent appraisal of this family in India reflects the presence of 307 species in 105 genera [6]. While analysing the diverse species in terms of their practical attributes, it is apparently evident that the functional dynamics of thrips have gained momentum in recent years; their involvement in diverse aspects like pollination, gall induction, predation, and vector potential besides agricultural pests, have been realized [3], in addition to being a bioindicator to pollutants like heavy metals and radioactive nucleotides [2]. Owing to their wide range of feeding habits and habitat diversity, it becomes imperative to undertake a periodical survey of these minute insects from varied habitats and micro-niches. Attempts made in such routine surveys resulted in the collection of three species which are newly recorded for India. This paper reports the occurrence of *Opimothrips tubulatus* and *Trichromothrips antidesmae* in India for the first time, of which the former species belong to the subfamily Pancahetothripinae, while *T. antidesmae* comes under the subfamily Thripinae. The diagnostic features of each species have been described below along with their photographic images.

The genus *Opimothrips* was erected by Nonaka and Okajima, with *O. tubulatus* as type species, and is a monotypic genus [4]. But existence of this genus has not been recorded previously in India. This genus can be easily diagnosed by its 8-segmented antennae, III and IV with thin, Y-shaped sense cones with the arms curving around the segment. Head polygonally reticulate, cheeks constricted at base; maxillary palps bi-segmented. Pronotum uniformly reticulate, two pairs of campaniform sensilla, one pair of long setae. Mesoscutum entire; metascutum with reticulate triangle. Tarsi 1-segmented. Fore wing with prominent veins, costal setae shorter than fringe cilia; posteromarginal setae wavy. Abdominal tergite I reticulate, median pair of setae minute; II strongly constricted, wart-like tubercles laterally; III–VII with thick antecostal line; X asymmetrical, divided longitudinally [7].

The genus *Trichromothrips*, erected by Priesner, comprises 38 described species worldwide. Nevertheless, as of now only 13 species are known from India [6]. The genus is characterised by the slender body, unicoloured or bicoloured. Head prolonged anteriorly and often constricted behind compound eyes; without ocellar setae I, setae III relatively long; postocular setae five pairs, uniserial. Antennae 8 segmented, I with a pair of dorsal apical setae, III and IV with a forked sense cone. Pronotum smooth medially; 2 posteroangular setae pairs generally developed. Mesonotum with median setae pair placed near posterior margin or ahead of

submedian setae pair. Metanotum usually smooth or feebly sculptured medially; median setae pair situated at or near anterior margin. Mesosternum without sternopleural suture; endofurca with spinula. Metasternal endofurca generally without spinula. Forewing first vein with median gap in setae row and 2 distal setae; clavus generally with 4 (rarely 3 or 5) veinal and one discal setae. Abdominal tergites without ctenidia or posteromarginal craspeda; II - VII with three setae along lateral margin in straight line; VIII without posteromarginal comb; X without median split. Abdominal sternites without posteromarginal craspeda, with or without accessory setae; II with 2 or 3 posteromarginal setae pairs; III - VII with 3 pairs; laterotergites without accessory setae [5].

Materials and Methods

Random taxonomic surveys were conducted from 13–21 March 2017 at Chitradurga, Karnataka for collection of thrips. Specimens were collected by the standard beating method and were preserved in thrips collecting media (nine parts 10% alcohol + 1 part glacial acetic acid + 1 ml Triton X-100 in 1000 ml of the mixture). Specimens were mounted in Canada balsam for permanent preservation [1]. The specimens were collected at random, subsequently sorted out and identified using appropriate keys.

Results and Discussion

Opimothrips tubulatus Nonaka and Okajima (Fig. 1)

Diagnosis

Female macroptera: Body yellowish brown, fore legs yellow, tarsi yellow, tibiae brown, yellow in apical half and basally, femora brown in basal half, rest yellow; antennal segments I–III golden yellow, IV–V yellow with shaded brown distally, VI–VIII dark brown; forewing uniformly shaded with apex pale, clavus brown; first vein with 11 setae, not uniformly arranged; second vein with 6 setae. Antennae 8 segmented; sutures complete and distinct between all segments; III–IV with thin, Y-shaped sense cones, the arms unusually thin and curving around the segment, narrow apex on IV shorter, wider, more abruptly constricted than III; outer sense cone on VI extending to midpoint of VIII. Head wider than long; ocellar hump weakly developed, ocelli visible; major setae rudimentary; eyes not bulged, covering lateral side almost completely; genae much reduced, without protruding transparent fringe. Pronotum reticulate, raised sculpture on lateral margins; median area with transverse reticulations. Mesonotum anterior margin shallowly notched, not reaching beyond anterior one third; 2 pairs of small setae, the inner pair anterior to the outer pair. Metanotal median triangle weakly indicated; polygonally reticulate, extending beyond posterior margin, median setae anterior to campaniform sensilla. Forewing base humped, costal setae shorter than fringe; first vein with 7 basal setae, 2 at middle and 2 distally, thin and pointed; second vein with 6 setae, curved except last three; clavus with 4 veinal setae but no discal seta; posteromarginal cilia wavy. Fore tibia with a spine at apex; hind tibia with a row of 11 conspicuous spines on inner side and two stout ones at apex; hind tarsi with a spine at median on inner side and two short, stout ones at apex. Abdominal tergite I reticulations extending beyond margin; median area of II with weak reticulations, laterally with wart-like tubercles; thick sublateral antecostal line on III–VII, laterally forming a posterior directed notch; VIII with complete posteromarginal comb of minute teeth; IX with campaniform sensilla; X asymmetric, median split complete, terminal setae almost half as long as the segment. Sternites II–VII with 2 pairs of marginal setae on broad craspedum; antecostal lines on III–VII with median concave invagination. Ovipositor long, well developed, exceeding abdominal apex.

Material studied: 3 Females, India, Karnataka, Chitradurga, Hiriyur, 04.xii.2017, Coll. Rachana, R.R. All the specimens have been deposited at ICAR – National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, Karnataka, India.

Host plant: Unidentified weed (Asteraceae)

Distribution: Karnataka

Trichromothrips antidesmae Li, Li and Zhang (Fig. 2)

Diagnosis

Female macroptera: Body and legs yellow, head and pronotum with dark areas laterally; antennal segments I–II brown, III–V yellow with brown apex, VI–VII brown, VIII pale brown; forewing brown with pale apex, clavus brown. Head not constricted behind compound eyes; ocellar setae III situated at tangent of hind ocelli posterior margin; 5 postocular setae pairs, I the longest, III minute. Antennal segments II–VI with microtrichia, VIII slightly a little longer than VII. Pronotum with 2 posteroangular setae pairs and 2 posteromarginal setae pairs. Mesonotum smooth anteriorly with median transverse striations; median setae pair near posterior margin. Metanotum smooth medially but with longitudinal striations laterally; campaniform sensilla absent; median setae pair close to anterior margin. Mesosternum with sternopleural sutures. Forewing first vein with 6 basal and 2 distal setae, second vein with 14 setae; clavus with 4 marginal setae and 1 discal seta. Abdominal tergites with lateral transverse striations, II–VII with S3 - S5 setae in a straight line along lateral margin; IX without campaniform sensilla. Abdominal sternites without discal setae, II with 2 posteromarginal setae pairs, III–VII each with 3 posteromarginal setae pairs, marginal setae placed on posterior margin.

Material studied: 3 Females, INDIA, Karnataka, Chitradurga, Hiriyur, 22.xi.2017, Coll. Rachana, R.R. All the specimens have been deposited at ICAR – National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, Karnataka, India.

Host plants: *Citrus limon* (Rutaceae)

Distribution: Karnataka

Remarks: Two microtrichial rows on the dorsal surface of antennal segment II is not usual among *Trichromothrips* species.

Fig 1: *Opimothrips tubulatus* Nonaka and Okajima

Fig 2 : *Trichromothrips antidesmae* Li, Li and Zhang

Conclusion

The reports of *O. tubulatus* from Thailand and China are from grass, and hence concluded the species as being associated with grasses [7]. However, the present specimens have been collected from an unidentified weed.

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