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SHORT COMMUNICATION

NEW REPORTS OF THRIPS (THYSANOPTERA: TEREBRANTIA: THIRIPIDAE) FROM INDIA

R.R. Rachana & R. Varatharajan

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NEW REPORTS OF THRIPS (THYSANOPTERA: TEREBRANTIA: THIRIPIDAE) FROM INDIA

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Abstract: The presence of three species of thrips, namely *Asprothrips bimaculatus* Michel & Ryckewaert, *Plesiothrips perplexus* (Beach), and *Pseudodendrothrips darci* (Girault), has been reported here for the first time from India, collected during a thrips survey carried out at Agartala in Tripura and Valparai in Tamil Nadu. Among them, *A. bimaculatus* and *P. darci* belong to the subfamily Dendrothripinae, and *P. perplexus* comes under Thripinae. Diagnosis and illustration for the above three terebrantians are given along with the images for the respective species.

Keywords: *Asprothrips bimaculatus*, *Plesiothrips perplexus*, *Pseudodendrothrips darci*, new reports, Thysanoptera.

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 (Rachana & Varatharajan 2017). 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 (Mound 2005), in addition to being a bio-indicator to pollutants like heavy metals and radio active nucleotides (Daniela et al. 2011). 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 *Asprothrips bimaculatus*, *Pseudodendrothrips darci* and *Plesiothrips perplexus* in India for the first time, of which the former two species belong to the subfamily Dendrothripinae, while *P. perplexus* comes under the subfamily Thripinae. The diagnostic features of each species have been described below along with their photographic images.

The genus *Asprothrips* was erected by Crawford in 1938, with *A. raii* as type species, and currently comprises

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eight described species worldwide (ThripsWiki - accessed on 25 May 2018). Nevertheless, as of now only two species are known from India (Rachana & Varatharajan 2017). The genus *Asprothrips* can be easily diagnosed by its reticulate body with a complex sculpture; head transverse with anterior margin recessed, 3-segmented maxillary palp; metathoracic endofurca lyre-shaped, extending to mesosternal furca; all tarsi usually 2-segmented; fore wing apex with 2 long apical setae; median pair of setae (S1 setae) on abdominal tergites II to VI shorter than distance between basal pores; males with or without pore plate on abdominal sternites (Tong et al. 2016).

The genus *Plesiothrips*, erected by Hood in 1915, comprises 17 described species worldwide (Thripswiki accessed on 25 May 2018), but existence of any individual of *Plesiothrips* has not been recorded previously in India. The genus is characterised by the presence of a pair of dorso-apical setae on the first antennal segment, which is unique among New World Thripinae. Moreover, the anterior ocellus is situated anterior to frontal margin of compound eyes; and females have a highly reduced ovipositor, without reaching the apex of abdomen. Males have unusually small antennal segment III and greatly enlarged segments IV–VI with numerous long setae; tergite IX bears a pair of drepanae and sternites III and IV bear a pair of circular pore plates (Mound et al. 2016).

Pseudodendrothrips Schmutz is a genus comprising leaf-feeding thrips of the subfamily Dendrothripinae under Thripidae. Its members are comparatively smaller than other thripids, and a majority of them are very pale in colour. The abdominal tergites bear transverse striae, with longitudinal ridge-like sculpture lines laterally; the metanotum has linear sculpture medially, with the median setae far behind the anterior margin. The antennae are eight to nine-segmented; segment VI entire or subdivided, the sensorium on VI and VII arising close to the base of these segments. The anterior marginal cilia of the forewing arise near the costal margin; the hind tarsi are exceptionally elongate with two stout spatulate setae ventro-laterally (Mound 1999).

MATERIAL AND METHODS

Extensive random taxonomic surveys were conducted during 3–10 March 2016 and 17–20 April 2016, respectively at Agartala in Tripura and Valparai in Tamil Nadu. Specimens were collected at random by gentle tapping of plant parts on the board and laying yellow pan water traps at the canopy level of the plants at specific localities with dense and diverse crops. The collected

specimens were preserved in collection fluid (nine parts 10% alcohol + one part glacial acetic acid + one ml Triton X-100 in 1000ml of the mixture). Specimens were balsam mounted for permanent preservation (Ananthkrishnan & Sen 1980) and they were subsequently sorted out and identified with the help of standard keys (Mound 1999; Mound et al. 2016; Tong et al. 2016). The images of all the three species were photographed with the help of a binocular research microscope.

RESULTS

Asprothrips bimaculatus Michel & Ryckewaert

Material studied: ICAR/NBAIR/THYS/162-166, 4 females, 17.iv.2016, India, Tamil Nadu, Valparai, Yellow pan trap, coll. Rameshkumar Anandan. All specimens have been deposited in the National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, India.

Diagnosis: Female Macroptera (Image 1): Body bicoloured, head and thorax brown, abdomen white with two brown patches on tergite VI, antennal segments I–II brown, III–V white, VI brown distally, VII–VIII brown; fore and mid legs brown, hind legs white; forewings brown with basal area white. Ocellar setae pair I absent, pair II close to the margin of compound eyes, pair III within the ocellar triangle; four pairs of postocular setae. Antennal segment III pedicellate, VI with two long sense cones, almost reaching the apex of segment VIII. Pronotum reticulate with internal markings, except in discal area. Mesonotum with transverse lines, anterior campaniform sensilla present, median setae pair situated far from posterior margin. Metanotum reticulate medially, campaniform sensilla present. Hind tibiae with two stout apical setae. Tergite sculptured laterally, bearing spine-like microtrichia, tergites VII–VIII with posteromarginal



Image 1. *Asprothrips bimaculatus* Michel & Ryckewaert

comb bearing median row of small denticulations.

Asprothrips navsariensis and *A. indicus* have been reported from India (Rachana & Varatharajan 2017). Newly reported species can be distinguished from *A. navsariensis* and *A. indicus* by having bicoloured body, two brown patches on tergite VI of abdomen and brown forewings with basal white area.

Distribution: India (Tamil Nadu) (new record); Martinique (Michel & Ryckewaert 2014); Malaysia (ThripsWiki 2017); China (Tong et al. 2016).

***Plesiothrips perplexus* (Beach)**

Material studied: ICAR/NBAIR/THYS/110-112, 2 females, 06.iii.2016, India, Tripura, Agartala, Yellow pan trap, coll. Prashanth Mohanraj. All specimens have been deposited in the National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, India.

Diagnosis: Female Macroptera (Image 2): Head and thorax brown; abdomen light yellow, segments IX and X darker; antennae brown, 7-segmented; segment III light yellow, IV light brown, segments III and IV with forked sense cones, IV longer than III. Head produced anteriorly to form a triangular area; anterior ocellus on this triangular area, anterior to frontal margin of compound eyes; intercellular setae situated just above the inner side of posterior ocelli. Cheeks curved behind protuberant compound eyes. Pronotum as long as head, slightly wider than head; two pairs of long posteroangular setae, three pairs of posteromarginal setae. Forewing slender,



Image 2. *Plesiothrips perplexus* (Beach)

upper vein with 13 + 2 setae. Posterior margin of tergite VIII without marginal comb, tergite X with a complete median split. Sternites without discal setae.

Distribution: India (Tripura) (new record); Taiwan (Chen 1979); USA, California, Texas, Mexico, Australia (Mirab-balou et al. 2011).

***Pseudodendrothrips darci* (Girault)**

Material studied: ICAR/NBAIR/THYS/127-131, 4 females, 06.iii.2016, India, Tripura, Agartala, Yellow pan trap, coll. Prashanth Mohanraj. All specimens have been deposited in the National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, India.

Diagnosis: Female Macroptera (Image 3): Body white; interantennal projection brown; pronotum having paired longitudinal brown markings sublaterally with a transverse dark line interrupted at middle; pterothorax shaded laterally; antennal segment II darkest, remaining segments shaded, IV–VI white at base; forewing including clavus light brown but apex paler. Head with three pairs of ocellar setae, ocellar setae I anterolateral to first ocellus, ocellar setae III within ocellar triangle; antennae with nine segments, III and IV with a long and forked sense cone each. Pronotum with closely spaced transverse striae; four pairs of posteromarginal setae. First vein of forewing with three setae basally and three distally, second vein without setae; wing apex with a terminal seta. Abdominal tergite I sculptured medially, median setae wider apart than their length; tergites II–VIII with long median setae and close together; VIII with long marginal comb of microtrichia, VI–VII with few similar microtrichia medially; II–VII laterally with

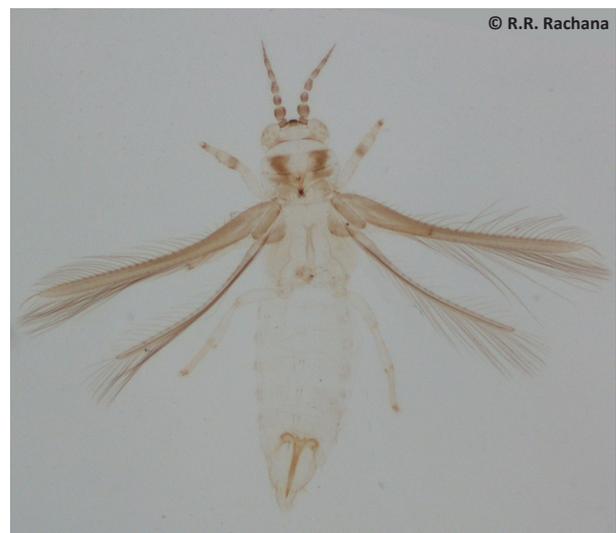


Image 3. *Pseudodendrothrips darci* (Girault)

numerous short linear ridges between transverse sculpture lines; sternites with transverse lines of sculpture, bearing three pairs of relatively long marginal setae.

The presence of a pair of longitudinal brown markings on the pronotum is characteristic of *Pseudodendrothrips bhattii* and *P. darci*, being absent in rest of the members of this genus (Mound 1999). These two species are difficult to distinguish, but unpublished observations of Masami Masumoto (Masami Masumoto, in litt., 05 April 2017) state that *P. bhattii* is devoid of a dark line on pronotum, differentiating it from *P. darci*.

Distribution: India (Tripura) (new record), Australia (Mound 1999).

DISCUSSION

The present report on the occurrence of three terebrantian species, namely *Asprothrips bimaculatus*, *Plesiothrips perplexus* and *Pseudodendrothrips darci* in India adds a new dimension to the faunistic wealth of the country. Since the eight known species of *Asprothrips* are all described from Asia, the present study shares the view that they appear to be Asian in origin. In this context, the present collection of *A. bimaculatus* from India corroborates the above view. Further, it is also evident from the tendency of widespread occurrence of *A. seminigricornis* in greenhouses of several countries (Mound 1999) and a conspicuous distribution pattern of *A. bimaculatus* between the Caribbean region and Asia (Tong et al. 2016) that the members of this genus can move far and wide from Asia. With respect to *Plesiothrips*, it is known that members of this genus are invariably confined to the New World, except for *P. perplexus* that has become widely spread across the tropics and sub-tropics on grassy weeds. There were, however, no reports pertaining to genus *Plesiothrips*, nor occurrence of *P. perplexus* in India. Hence our findings take the credit of recording the genus *Plesiothrips* in India for the first time. Although the present report is based on thrips collection at random from diverse

habitats and agro-ecosystems, chances of these species becoming active on crops are appreciably high by virtue of the fact that members of the genus *Asprothrips* have already been recorded from the leaves of turmeric and arrow root (Ananthkrishnan 1984). Similarly, the dendrothripine *P. darci* has been described as a pest of *Ficus* species in northern Australia (Mound 1999). Therefore, the present study not only highlights the new record of these thrips in India, but indicates the need for further study to monitor these herbivores so that they do not attain the status of a pest.

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