

## A new record of *Frankliniella intonsa* Trybom, 1895 (Thysanoptera: Terebrantia: Thripidae) on tomato crop in West Bengal, India

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### Abstract

*Frankliniella intonsa* Trybom (Thysanoptera: Thripidae) is an economically important species owing to its polyphagous nature and potential role as a vector of tospoviruses. During fixed-plot surveys conducted from November 2023 to April 2024 at the C-Block Farm of Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal, India, specimens of thrips were collected from tomato (*Solanum lycopersicum* L.) flowers using the 'beat and jerk' technique. Collected specimens were preserved, slide-mounted, and identified following standard taxonomic protocols and available identification keys. Three female specimens were examined and confirmed as *F. intonsa* based on characteristic morphological features, including an 8-segmented antenna with forked sensoria on antennal segments III and IV, ocellar setae III arising within the ocellar triangle, presence of ctenidia on abdominal tergites V–VIII, and a complete postero-marginal comb of microtrichia on abdominal tergite VIII. The occurrence of *F. intonsa* on tomato represents the first confirmed host record of this species from tomato in West Bengal and expands its known host range in India. This finding also contributes to the distributional knowledge of the species in the Lower Gangetic Plains, where it has not previously been documented on this crop. Considering the economic importance of tomato and the known pest status of *F. intonsa* elsewhere, further studies are required to assess its population dynamics, pest potential, virus-vector status, and implications for integrated pest management in tomato-based agro-ecosystems in eastern India.

**Keywords:** *Frankliniella intonsa*, tomato, first host record, morphological identification, Lower Gangetic Plains

### Introduction

The suborder Terebrantia holds significant economic importance within the order Thysanoptera as it includes many agriculturally important pests and plant virus-vectors. It consists of eight families, primarily distinguished by antennal variations. Among these families, the Aeolothripidae are entirely predatory, while all major agricultural pests and virus vectors belong to the Thripidae family. In India, this suborder includes a total of 333 species (Rachana *et al.*, 2020<sup>[8]</sup>).

The thrips under the genus *Frankliniella* hold an importance because these are potential vectors of tospoviruses. Karny (1910)<sup>[4]</sup> established the genus *Frankliniella* as a footnote, and Hood (1914)<sup>[3]</sup> later selected *Thrips intonsa* Trybom as the type species. Based on the pattern of abdominal ctenidia and related setae, Sakimura and O'Neill (1979)<sup>[8]</sup> redefined the genus *Frankliniella* Karny. *Frankliniella intonsa* has not been reported from India until Rachana *et al.* (2020)<sup>[8]</sup> collected the females from wheat plant in Karnataka. This study is the first to report the occurrence of *F. intonsa*, among the several pests of tomato, in West Bengal.

### Materials and Methods

A fixed plot survey had been carried out from November, 2023 to April, 2024 at C-Block Farm (22.989°N, 88.456°E; Elevation: 13 metres) in Kalyani, Nadia, belonging to the lower Gangetic Alluvial Plains of West Bengal. The specimens of thrips were collected from the flowers of tomato using 'beat and jerk' technique over a white plastic tray. Thrips adhering to the plastic tray were picked up with a camel hair brush ('00' size) and were preserved in thrips collecting media (nine parts 10% alcohol + one-part glacial

acetic acid + one ml Triton X-100 in 1000 ml of the mixture). The specimens were mounted in Canada balsam for permanent preservation, following the protocol of Ananthkrishnan and Sen (1980)<sup>[11]</sup>. The specimens were randomly collected, then sorted and identified using suitable identification keys (Mound and Kibby, 1998<sup>[6]</sup>; Mound and Azidah, 2009<sup>[5]</sup>; Wang *et al.*, 2019<sup>[14]</sup>) and related websites (<https://www.thrips-id.com/en/><sup>[11]</sup>; [https://thrips.info/wiki/Classification\\_overview](https://thrips.info/wiki/Classification_overview)<sup>[12]</sup>)

### Results and Discussion

Three individuals of the mentioned species were found at the C-Block Farm of BCKV, Kalyani. The specimens were collected from the flowers of tomato plants. The species was confirmed as *F. intonsa* which is a first confirmed record for both in case of tomato plant and in West Bengal, India.

### Species account

**Sub-order:** Terebrantia Haliday, 1836

**Family:** Thripidae Stephens, 1829

**Sub-family:** Thripinae Stephens, 1829

**Genus:** *Frankliniella* Karny, 1910

***Frankliniella intonsa* Trybom, 1895**

### Distribution in India

Arunachal Pradesh, Assam, Bihar, Jammu & Kashmir, Karnataka, Manipur, Meghalaya, West Bengal (Pal *et al.*, 2023<sup>[7]</sup>; Tyagi *et al.*, 2024<sup>[13]</sup>).

### Host Plants in India

*Cassia* sp. (Fabaceae) (Rachana *et al.*, 2024)<sup>[8]</sup>.

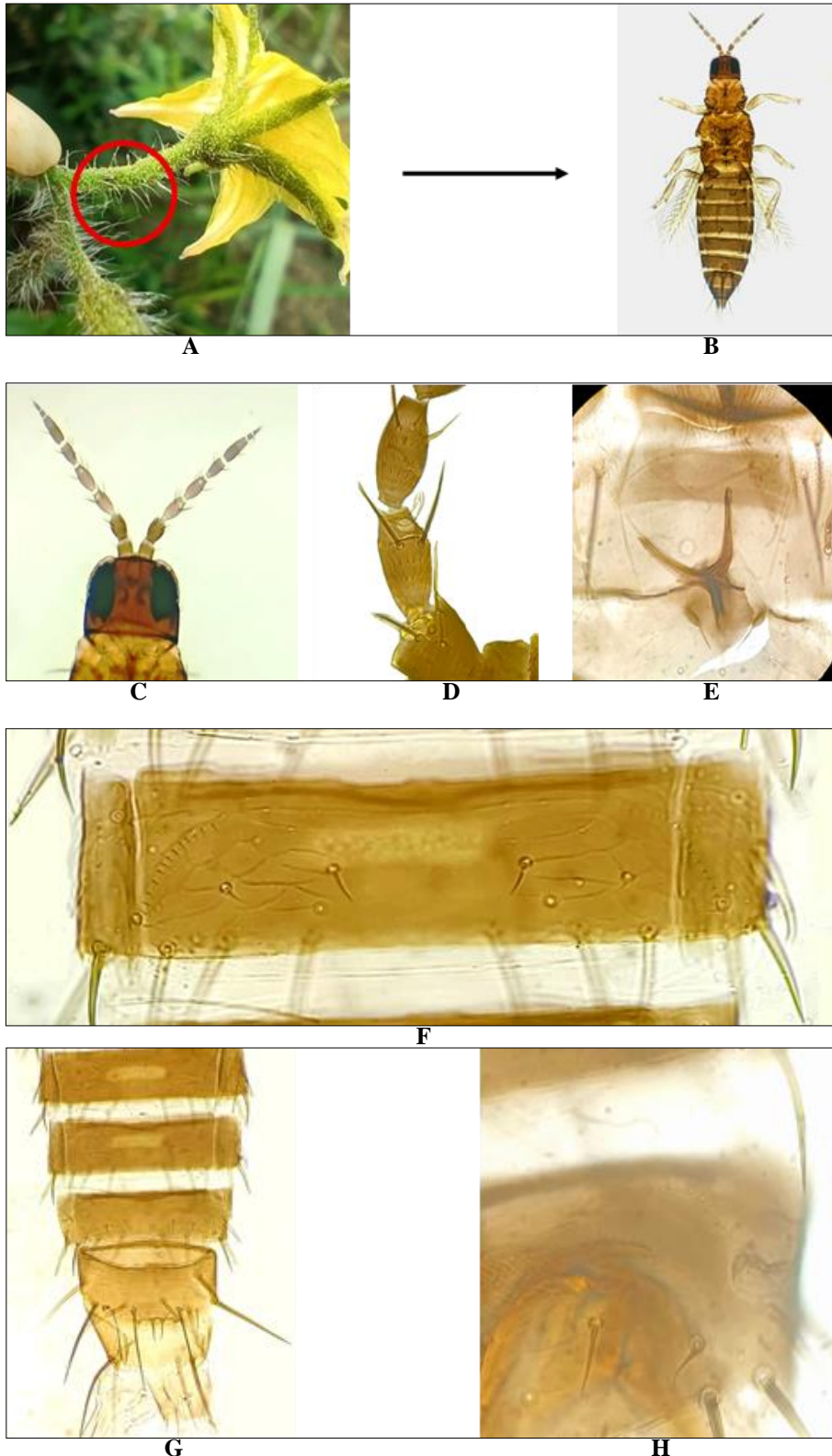
**Materials Examined**

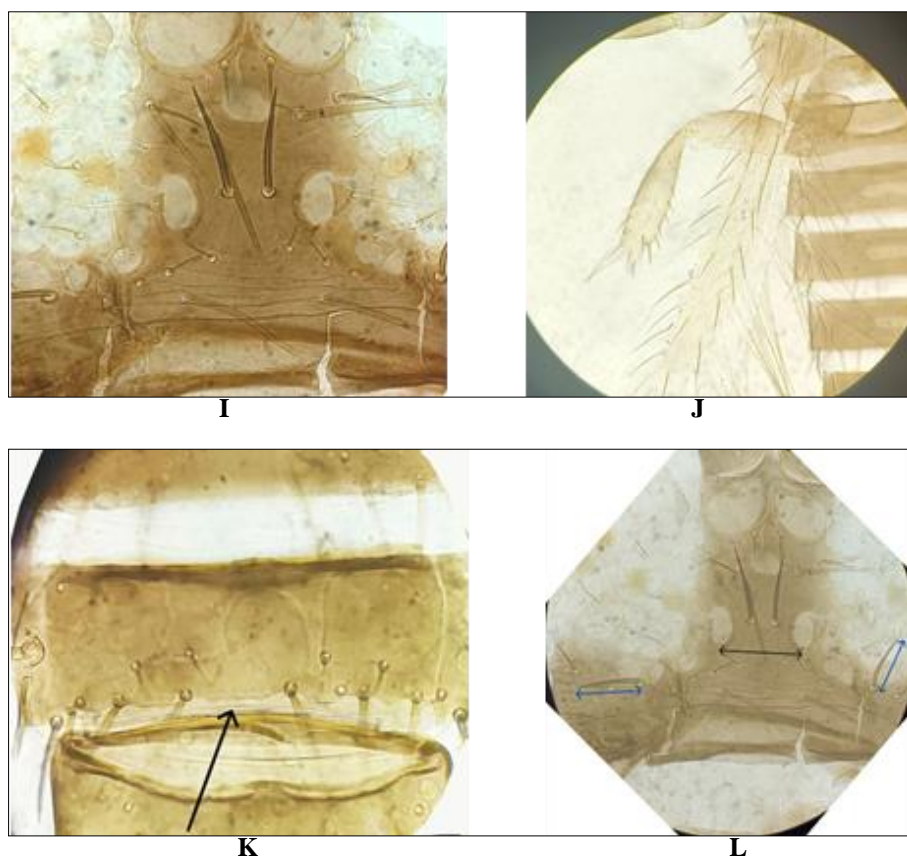
West Bengal, Nadia, Kalyani, C-Block, 22.989°N & 88.456°E, 13 m, 27.iii.2024, coll. Aivi Mallick, 3 ♀, Tomato plant.

**Diagnosis**

Adult females, having body length around 2-3 mm, were dark brown in colour. Terminal abdominal segment is not tubular (Figure 1B) which brings the specimen under the suborder Terebrantia. Antenna 8-segmented, terminal segment is not very much elongated (Figure 1C) and segments III and IV bear forked sensoria (Figure 1D). Metathoracic furca is not lyre-shaped,

nor are bearing any spinula (Figure 1E) and the median tergal setae on abdominal segments V-VII usually further apart than their length (Figure 1F). Pronotum is broadly rectangular and its breadth is more than its length (Figure 1C). Terminal abdominal tergite does not have spine-like setae (Figure 1G). Abdominal tergites V-VIII possess ctenidia (Figure 1H). Ocelli present and ocellar setae I present; ocellar setae III arise within the ocellar triangle (Figure 1I). Forewings bear two complete rows of setae (Figure 1J). Abdominal tergite VIII with complete postero-marginal comb of slender microtrichia (Figure 1K). Postocular setae pair IV shorter than the distance between hind ocelli (Figure 1L).





**Fig 1 (A-L):** Morphological characters of *Frankliniella intonsa*. A: *F. intonsa* in naked eyes B: *F. intonsa* under compound microscope; C: Head and antennae, D: Forked sensoria on antennal segment III; E: Metathoracic furca; F: Median tergal setae on abdominal segment; G: Terminal abdominal tergite; H: Ctenidia; I: Ocellar setae I present; J: Forewings; K: Postero-marginal comb on tergite VIII; L: Postocular setae IV

## Conclusion

The present study marks the first documentation of *Frankliniella intonsa* Trybom, 1895 on tomato crops in the Lower Gangetic Plains of West Bengal, India. Morphological diagnosis confirmed the identity of *F. intonsa* based on characteristic features, including an 8-segmented antenna with forked sensoria on segments III and IV, a broadly rectangular pronotum, and the presence of a complete postero-marginal comb of slender microtrichia on abdominal tergite VIII. This finding reveals extension of the known host range and geographic distribution of *F. intonsa*, underscoring its potential role as an emerging pest of economic significance in tomato cultivation.

Given its status as a vector of tospoviruses, the occurrence of *F. intonsa* on tomato warrants further research to assess its ecological and economic impact on agricultural systems in the region. Further research is required to evaluate its population dynamics, impact on crop yield and the development of sustainable pest management strategies in tomato cultivation.

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