

# Report of six new thrips species on vegetable and pulse crops in central India

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Thrips are the most cryptic and stealthy insect pests due to their minute size, slender body, polymorphism, and concealed habits. Thrips have greater economic importance in wide variety of crops, including vegetables and pulses, as they cause direct damage to crops and also indirectly by transmitting Orthotospoviruses. A thorough field survey was conducted in three distinct agro-climatic zones of Chhattisgarh during which thrips were monitored, collected, curated, and identified. We report the occurrence of six new thrips species, *Heliothrips ceylonicus* (Schmutz, 1913), *Frankliniella intonsa* (Trybom, 1895), *Ceratothripoides claratris* (Shumsher, 1946), *Microcephalothrips abdominalis* (D. L. Crawford, 1910), *Megalurothrips typicus* (Bagnall, 1915), and *Craspedothrips minor* (Bagnall, 1921) on major vegetable and pulse crops for the first time in Chhattisgarh state of central India. *H. ceylonicus* was the most widespread species in all three zones, infesting okra, brinjal, chilli, tomato, cucumber, blackgram, greengram, and cowpea, with the highest population recorded on chilli and blackgram. *F. intonsa*, an invasive and polyphagous species, showed notable presence in okra and brinjal, especially in Balod and Raipur districts of Chhattisgarh plains. *C. claratris* was found in solanaceous and pulse crops, suggesting its host range expansion. *M. abdominalis* and *M. typicus*, were found in moderate populations on cowpea and okra, while *C. minor* was newly recorded on cowpea. These findings highlight the expanding host range and distribution of thrips species in central India, particularly in Chhattisgarh, emphasising the need for continuous monitoring, accurate identification, and integrated management strategies to mitigate the growing threat caused by thrips to vegetable and pulse crop productivity.

**Keywords:** Agro-climatic zones, identification, invasive thrips, morphological, thrips diversity.

CHHATTISGARH is one of the major producers of vegetables and pulses, with 0.49 and 0.62 million hectares under cultivation, yielding 6.89 and 0.47 million metric tons, with a productivity of 3.81 and 0.75 metric tons, respectively<sup>1,2</sup>. However, the productivity of both vegetables and pulses is increasingly threatened by a range of insect pests, among which thrips (Order: Thysanoptera) have emerged as key pests damaging the crops. Their ecological diversity and extensive host associations are particularly pronounced in tropical and subtropical regions<sup>3</sup>. Thrips have significant economic importance worldwide, as they infest a wide range of crops, including vegetables, fruits, pulses, and ornamentals, in both open-field and protected cultivation systems. Earlier, only one major thrips species i.e., *Scirtothrips dorsalis* (Hood, 1919) was known to infest chilli, causing economic loss. But in 2021, an outbreak of invasive thrips species, *Thrips parvispinus* (Karny, 1912), forced farmers to plough the chilli fields. Thrips infestation causes a yield loss of 24% in tomato crops<sup>4</sup>, while 68–70% in French beans are grown for export<sup>5</sup>. Furthermore, some thrips species, such as the western flower thrips, *Frankliniella occidentalis* (Pergande), act as vectors of serious plant viruses, including *Tomato spotted wilt virus* (TSWV), attributing to 20% to 80% yield reductions<sup>6–8</sup>. The threat from thrips is exacerbated due to the quick expansion of the host range, adaptation to extreme climates, and resistance to insecticides. This underlines the urgent need for monitoring the geographical expansion of thrips species into new areas, particularly in the context of invasive and quarantine species. Conventional approaches rely heavily on morphological traits and dichotomous keys, though these may not always be sufficient for accurate differentiation<sup>9,10</sup>. Despite their economic significance, the species composition, diversity, and host associations of thrips in many agro-ecosystems in Chhattisgarh remain inadequately explored. Therefore, the present study aims to document the diversity and distribution of thrips species, including invasive species associated with major vegetable and pulse crops, with a focus on accurate morphological identification to support better pest management and biosecurity efforts.