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FIRST REPORT OF OCCURRENCE OF INVASIVE PEST *Thrips parvispinus* (KARNY) (THYSANOPTERA: THIRIPIDAE) IN CHILLI FROM GHAZIPUR DISTRICT OF UTTAR PRADESH, INDIA

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ABSTRACT

The South East Asian thrips, *Thrips parvispinus* (Karny) was first reported in India on Papaya in 2015 later it spread to many host plants such as cowpea, *Dahlia rosea*, cotton etc. The severe infestation on chilli was reported from southern states. The current investigation focused on assessing the prevalence of thrips infestation on chilli in the Eastern gangetic plain of India in Ghazipur district of Uttar Pradesh. The study revealed the presence of *Thrips parvispinus* (Karny) specifically in Chilli fields during the survey conducted in 2024–25. *T. parvispinus* infestation was observed on both flowers and fruits of the chilli plants. The impact of this infestation was evident as infested flowers were observed to drop prematurely, and lesions were observed on the rinds of the fruits. This discovery of *T. parvispinus* (Karny) infesting chilli marks the first documented occurrence of this novel invasive thrips species affecting chilli cultivation in Ghazipur district of Uttar Pradesh, India. This finding highlights the need for further research and management strategies to address the threat posed by this invasive pest to chilli crops.

Keywords : *Thrips parvispinus*, chilli, invasive thrips, *Capsicum annum* L, vegetables.

Introduction

Chilli (*Capsicum annum* L.) is one of the commercial vegetable crop grown in India for vegetable, condiments, sauces, pickles and spice purpose. India is the world leader in production, consumption and export of chilli. In India, Andhra Pradesh, followed by Telangana, Madhya Pradesh, Karnataka and West Bengal are top chilli growing states. The invasive pest known to cause huge loss to local crops due to absence of natural enemies and competitors. So far there are 23 invasive insect pests introduced in India. In India *Thrips parvispinus* was first reported in 2015 on papaya from Karnataka (*Carica papaya*) (Tyagi *et al.*, 2015). The *T. parvispinus* is a cosmopolitan and polyphagous pest reported to be present in Indonesia, Australia, Thailand, North America, Europe, Malaysia and Africa (Waterhouse, 1993; Zhang, *et al.*, 2011; Lim, 1989). The severe infestation of *T. parvispinus* caused 23 percent loss to pepper in Indonesia (Johari and Natalia, 2018) and economic loss to papaya in Hawaii (Sugano

et al., 2013). The first reported authors of the pest in India expressed concern over as papaya is commercial crop and the reported thrips may attain serious pest status. Subsequently, the reports of infestation on *Dahlia rosea* (Rachana *et al.*, 2018), *Brugmansia* sp., (Roselin *et al.*, 2021), cotton (Amutha and Rachana, 2022) and on cow pea (*Vigna unguiculata*) (Nagdev *et al.*, 2022) was followed. Later the severe infestation on chilli (*Capsicum annum*) was reported from Karnataka (Basavaraj *et al.*, 2022), Telangana and Andhra Pradesh (Hulagappa *et al.*, 2022; Veeranna *et al.*, 2022), Gujarat (Patel *et al.*, 2022). Similarly, the farmers of Ghazipur district of Uttar Pradesh reported severe curling of leaf and heavy flower drop in chilli in the month of August to September-2025. Therefore, a quick roving survey was conducted to know the pest responsible for the chilli crop loss and to calculate the extent of crop loss. This survey mainly aims at documenting the pests responsible for crop loss. *Thysanoptera* is an order of insects that has two suborders: Terebrantia and Tubulifera. Due to the

existence of plant viral vectors and agriculturally significant pests, the suborder Terebrantia is the most commercially significant suborder within Thysanoptera (Rachana *et al.*, 2020). Thrips are minute insects belong to the order Thysanoptera. Their prepupal stage, which occurs between the larval and pupal stages, fringed wings and a protruding bladder-like structure at the tarsal end are their characteristics. This order of insects has a remarkably diverse range of eating preferences; they can be herbivorous, fungivorous, pollinivorous or predatory (Mound, 2005a). The discovery of an invasive pest on a key agricultural host plant is deeply troubling for quarantine authorities. A recent finding concerning its presence on a vital crop in Tamil Nadu, combined with previous incidents of infestation on economically important plants in Karnataka, hints at a potential expansion of its territory across state boundaries. This spread raises serious concerns about the pest's impact on agriculture and necessitates swift action to contain its proliferation. Hence, it's imperative to implement preventive measures to halt the spread of the invasive thrips to other parts of India. One such notorious pest species originating from Southeast Asia is *Thrips parvispinus*, posing a substantial threat to a diverse array of agricultural and horticultural crops. *T. parvispinus*, categorized as a thrips of quarantine significance within the "*Thrips orientalis* group" (Mound, 2005b), has been identified as a major pest affecting a wide range of unrelated plant families across regions spanning from Thailand to Australia (Mound and Collins, 2000).

Reports have emerged concerning the presence of the species on greenhouse Gardenia plants in Greece, papaya crops cultivated in Hawaii, as well as food crops from various countries, encompassing green beans, potatoes, eggplant, and chili (Murai *et al.*, 2009). Initially documented by Tyagi *et al.* (2015) on papaya from Bangalore, India, the species' presence was subsequently observed on Dahlia rosea blooms in Puttur, Karnataka, as reported by Rachana *et al.* (2018). Patel *et al.* (2022) later confirmed the species' presence on chili flowers in Umreth, Gujarat. The discovery of an invasive insect infesting a vital agricultural host plant sparks grave concern and alarm among quarantine officials. With previous reports of this species affecting economically significant host plants in Karnataka and the latest finding on an agriculturally crucial host in Tamil Nadu, there's a growing apprehension about its gradual spread across states. Therefore, it's imperative to implement preventive

measures to contain the spread of the invasive thrips to other regions of India. Continuous monitoring of *T. parvispinus* in various parts of the country is essential, considering its potential to pose a significant threat within our borders. Given its polyphagous nature, completely eradicating the risk of this thrips species migrating to economically valuable crops presents a formidable challenge. This paper aims to highlight *T. parvispinus* as an emerging threat infesting new host crops in Gujarat. This meticulous approach ensured comprehensive data gathering for further analysis and understanding of thrips distribution and infestation patterns across the surveyed districts of Gujarat.

Material and Methods

Some chilli growing farmers of Ghazipur district complained about the heavy infestation and damage by sucking insect pests in their fields during August-October, 2025. Therefore in order to identify the insect pest species, its severity of infestation, level of damage and to recommend suitable management practices, The investigation into the inventory of thrips infestation on chilli crop in Ghazipur district of Uttarpradesh, India, for this a rapid roving survey was conducted in eight locations i.e., Jasdeopur, Kathar, Ranipur, Machhati and Patalganga of Bhawarkol block and Mahrupur, Chandany and Kabirpur of Mohamdabad block.

(Fig.3). For this purpose, twenty plants were randomly selected for sampling from each location. In a plant, top, middle and bottom leaf was collected and observed under microscope for counting. Number of thrips per flower was observed and calculated on the spot.

Sample collection and analysis

The samples of thrips were collected from the farmer's field Ghazipur district (25.6135° N, 83.5070° E) of Uttar Pradesh. The Thrips specimens were collected from the flowers and fruits of chilli plants by gently tapping them onto white paper sheets and were collected using camel hairbrush. These collected thrips were then carefully preserved in 70% high-grade ethyl alcohol into 2 ml centrifuge tubes to facilitate their subsequent identification. Later, the samples were brought to plant clinic division of plant protection of Krishi Vigyan Kendra, P.G. college Ghazipur, for further analysis. Detailed records were maintained during the collection process, noting down pertinent information such as the host plant species, collection location, and date of collection.

Table 1 : *Thrips parvispinus* reported from different areas of Ghazipur district.

S.N	Name of Place	Village name	Locations	Infestation level	
				Mean no. of thrips per three leaves	Mean no. of thrips per flower
1.	Bhawarkol	Jasdeopur	25.568553°N 83.835706° E	9.3	3.2
		Kathar	25.561178°N 83.7056° E	9.0	4.5
		Ranipur	25.586951°N 83.83979° E	9.1	3.8
		Machhati	25.594175°N 83.834281° E	9.4	5.1
		Patalganga	25.5734°N 83.8538° E	9.0	4.8
2.	Mohamdabad	Mahrupur	25.6337°N, 83.8035° E	8.2	3.2
		Chandany	25.6163°N, 83.8088° E	7.1	3.9
		Kabirpur	25.7887°N, 83.7744° E	7.5	4.1

**Fig. 1:** Location of Ghazipur district in India**Fig. 2:** Overview of Ghazipur district

Result and Discussion

The pest species was identified based on morphological characteristics observed in adult specimens (Fig. 3). These characteristics include a dark brown body, with the head and thorax appearing lighter than the abdomen. The antennae were found to be composed of seven segments, while the forewings exhibited a brown coloration with a sharply pale base. Additionally, the legs were noted to be yellow in color. The identification of the pest as *Thrips parvispinus* (Thysanoptera: Thripidae) was determined using a combination of reference keys provided by Tyagi *et al.* (2015), Sridhar *et al.* (2021), DPPQS, (2022), Hulagappa *et al.* (2022), Rachana *et al.* (2021) and Palanisamy *et al.* (2023). These references collectively provided the necessary criteria for accurately identifying and confirming the species of thrips observed in the study. Infestation thrips in chilli started during flowering stage (Fig. 3). inflict severe damage and are active during the flowering and bud development stages. Severe infestation results in flower dropping and no fruit formation. If fruit formed, they become distorted, uneven shape and also lesions seen on fruit rinds which reduce its market value. Despite the fact that *T. parvispinus* is already recognized, the species was first identified in India on papaya from Bangalore by Tyagi *et al.* (2015). Rachana *et al.* (2018) then reported the same on *Dahlia rosea* blooms in Puttur, Karnataka. The same was later found by Patel *et al.* (2022) on the chilli flower in Umreth, Gujarat. Ranjith *et al.* (2022) recorded larvae and adult of *T. parvispinus* were found feeding on guava flowers for the first time in India. Also, Kumar *et al.* (2023) reported it from brinjal and Ibrahim *et al.* (2023) reported it on Mango from Kerala. This discovery underscores the importance of conducting additional research and implementing effective management strategies to mitigate the risk posed by this invasive pest to chilli crops in the area. During the investigation period spanning 2024- 2025.

Roving survey to ascertain the incidence and to assess the extent of loss Roving survey on incidence of thrips revealed severe to heavy severe infestation in Ghazipur districts of Uttar Pradesh (Table 1). According to farmers observation the yield loss due to chilli thrips is expected around 40% in Rabi-2025. Thrips preferred to suck the sap from flowers and young leaves. Due to sucking of sap, flowers were observed to be brown, dried and drop off. In farmers' fields, the young plants had no flowers due to thrips infestation. Whereas the young leaves curled upward, bronze and silvery in appearance on lower portion. Overall, the infested plants observed to be curled, bronze in appearance scars on fruits. *Thrips parvispinus* (Karny) was discovered and positively

identified from both chilli flowers and fruits in the eastern region of the India, district Ghazipur of state Uttarpradesh. This finding marks the first reported instance of an infestation of the invasive thrips species, *Thrips parvispinus* (Karny), on chilli (*Capsicum annum*) in Ghazipur (U.P). The detection of this invasive thrips species on chilli plants is significant as it indicates a potential threat to the cultivation of this important vegetable crop in the region. This discovery emphasizes the significance of maintaining ongoing vigilance and monitoring efforts to track the spread of invasive pests and to mitigate their impact on agricultural production in Indo- Gangetic, Eastern plain zone of Uttar Pradesh.



Fig. 3 : Chilli crop and flower infested by black thrips (*Thrips parvispinus*)

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