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FIRST REPORT OF CHILI THRIPS, *SCIRTOTHRIPS OLIGOCHAETUS* (KARNY) (THYSANOPTERA: THRIPIDAE) INFESTING POMEGRANATE (*PUNICA GRANATUM* L.) IN GUJARAT, INDIA

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ABSTRACT

A severe infestation of chilli thrips, *Scirtothrips oligochaetus* (Karny), was recorded in pomegranate (*Punica granatum* L.) orchards at the Horticulture Farm, AAU, Anand, where the pest has emerged as a major threat due to its sap-sucking and lacerating feeding behaviour. Both nymphs and adults feed on tender floral parts flowers, buds and young fruits causing discoloration, flower drop, scarring, malformation and reduced market quality. Owing to its polyphagous nature and wide host range, *S. oligochaetus* poses a risk of spreading to other economically important crops, underscoring the need for continuous surveillance. The present study investigated the population dynamics of *S. oligochaetus* during 2024-2025 and correlated its seasonal abundance with prevailing weather parameters. Two major population peaks were observed in February and September. Morning relative humidity showed a significant positive correlation with thrips abundance, while maximum temperature exhibited a weak positive relationship. Minimum temperature, evening relative humidity and rainfall were negatively correlated with the pest population. The findings highlight February and September as critical periods for *S. oligochaetus* proliferation, emphasizing the importance of timely monitoring and strategic pest management to minimize crop damage and yield loss.

Keywords: Pomegranate, Chili thrips, *Scirtothrips oligochaetus* (Karny)

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1. INTRODUCTION

Pomegranate (*Punica granatum* L.) is a member of the Punicaceae family. Pomegranate gets its name from the Latin words pomum (apple) and granatum (seeded). It is a popular table fruit in tropical and subtropical climates. The fruit is indigenous to Iran and is widely grown in Mediterranean nations such as Spain, Morocco, Egypt and Afghanistan. It is also grown to some extent in Burma, China, Japan, the United States and India. India leads the globe in pomegranate farming. In India, it is regarded as "vital cash crop", It is primarily cultivated in the arid and semi-arid regions of states like Gujarat, Maharashtra, Karnataka, Uttar Pradesh, Andhra Pradesh and Tamil Nadu (Balikai *et al*., 2011). According to reports, a total of 91 insect species, 6 mite species, and 1 snail species have been identified as pests affecting pomegranate cultivation in India (Balikai *et al*., 2011; Gurjar *et al.,* 2023). Among this diverse pest complex, the damage caused by sucking insect-pests, such as thrips, mealybugs, aphids and whiteflies, is the most prominent and economically significant in India. These insect-pests cause considerable damage to pomegranate crop, affecting both fruit yield and quality.

Globally, approximately 6402 species are documented within the insect order Thysanoptera (Tyagi *et al*., 2024). These insects are divided into two suborders, nine families and six subfamilies (Mound *et al*., 1980). The largest suborder, Tubulifera includes 3809 known species, while the second-largest, Terebrantia has 2593 species (Tyagi *et al*., 2024). Members of this order have only one functional mandibular stylet, the second being greatly reduced, thus forming asymmetrical suctorial mouthparts compacted within a short cone-shaped rostrum (Reynaud, 2010). Thrips inhabit a variety of feeding environments, ranging from fungus-feeding to plant-feeding species. They are notorious for their pestilential behaviour, causing significant damage to agricultural and horticultural crops (Devkant *et al*., 2019).

Scirtothrips oligochaetus (Karny), synonymously known as *Anaphothrips oligochaetus* Karny (Karny *et al*., 1926), is a phytophagous thrips belonging to the order Thysanoptera and family Thripidae. Initially described by Karny in the early 20th century, it has been placed under both genera due to taxonomic revisions. This species is small, slender and wing-fringed. It is a pest of various crops, feeding on young leaves, buds and flowers, leading to leaf distortion, silvering and stunted growth. Due to its economic significance and taxonomic ambiguity, it is of interest in entomological and pest management studies (Karny, 1913).

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Fig. 1: General view of pomegranate field

2. MATERIALS AND METHODS

A survey was carried out during 2024-25 at the Horticulture Farm, College of Horticulture, AAU, Anand, focusing on thrips infestation in pomegranate fields.

Observations were made from 5 randomly selected plants under unprotected conditions. From each plant, five tender twigs, each measuring 10 cm in length, were chosen randomly and gently tapped onto a black paperboard. The number of adult thrips was then counted using a hand lens. Additionally, the number of thrips present on five flower buds, flowers and leaves per plant was visually counted and recorded.

Simultaneously, weather parameters such as maximum temperature, minimum temperature, relative humidity and wind speed were collected from the Meteorological Department of AAU, Anand.

A minimum of 20-25 thrips were collected and preserved in 70 per cent ethyl alcohol for identification. The samples were then sent to the Zoological Survey of India, Kolkata, West Bengal, where the specimens were identified as *S. oligochaetus* (Karny) (Thysanoptera: Thripidae).

2.1 STATISTICAL ANALYSIS

The population of seasonal pests observed during the study period (dependent variable) was correlated with weather variables (independent variables), including maximum temperature, minimum temperature, morning relative humidity, evening relative humidity and total rainfall, which were obtained from AAU, Anand.

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3 RESULT AND DISCUSSION

3.1 Taxonomic tree (Mound and Palmer, 1981)

Kingdom	Animalia
Phylum	Arthropod
Class	Insecta
Order	Thysanoptera
Family	Thripidae
Genus	*Scirtothrips*
Species	*oligochaetus*

3.2 Morphological characters of *S. oligochaetus*

Scirtothrips dorsalis and *S. oligochaetus* are two morphologically similar species of thrips, often causing challenges in accurate identification and population assessment, particularly in field conditions (Rageshwari *et al*., 2021). These difficulties are primarily due to their overlapping morphological traits, which require careful microscopic examination for reliable differentiation. Both species possess yellow bodies and display similar antennal coloration patterns. Antennal segments I and II are pale, while segments V to VIII are distinctly shaded. Their forewings are pale and ocellar setae III are located between the posterior ocelli, a trait common to both species. In males, the ninth abdominal tergite is devoid of drepanae, a feature observed in both species (Mound and Stiller, 2011).The most consistent and diagnostically useful morphological difference between the two species lies in the number of setae present on the second vein of the forewing. *S. dorsalis* typically has 2-3 setae in this region, whereas *S. oligochaetus* consistently exhibits only two setae on the second vein and a total of 10 setae on the forewing (Rao *et al.,* 2024). This subtle but definitive characteristic plays a critical role in taxonomic identification and has been utilized in diagnostic keys. Moreover, the two species differ in abdominal coloration, which offers an additional criterion for identification. *S. dorsalis* displays distinct dark shading across the intermediate abdominal terga, a feature absent in *S. oligochaetus*, which has a uniformly pale abdomen (Raizada, 1976). Based on such morphological evidence, *S. oligochaetus* is recognized as a valid and distinct species.

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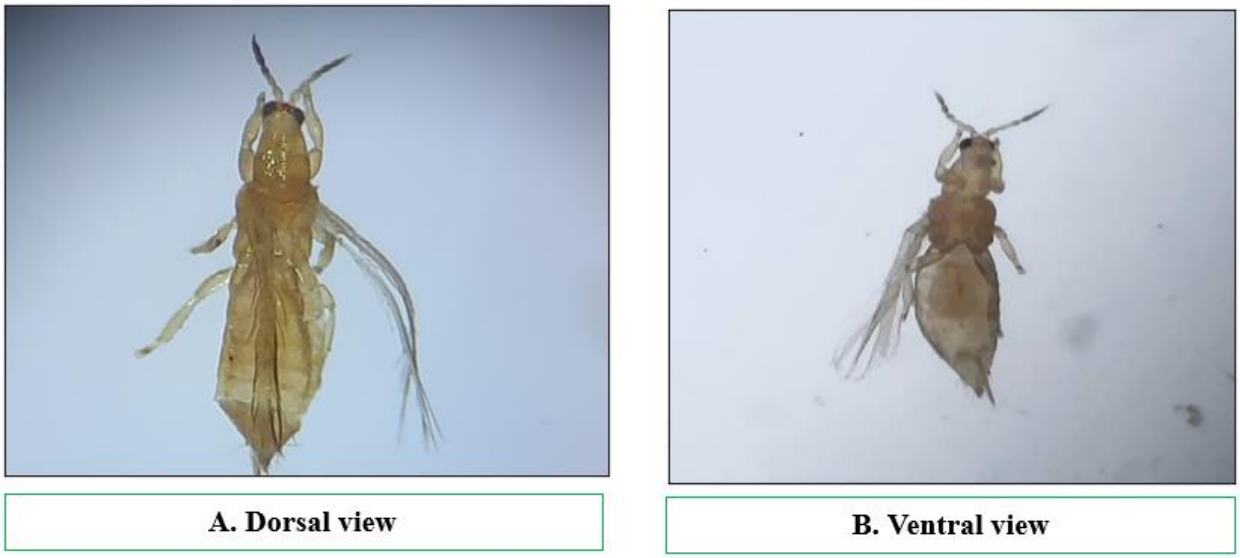

Fig. 2: Dorsal and ventral view of chilli thrips (*S. oligochaetus*) under stereo zoom microscope

3.3 Distribution

Chili thrips (*S. oligochaetus*) is slowly spreading across states, as shown by earlier reports of this species on important crop plants in Andhra Pradesh, Delhi, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh (Pal *et al*., 2024).

The lectotype of this species originates from Coimbatore, India and it is widely distributed throughout the country. Beyond India, specimens have also been recorded from various international locations, indicating a broad geographic range. These include Tanzania (Arusha), Ethiopia (Melka Werer), Nigeria (Ibadan) and Barbados in the West Indies, as reported by Mound and Palmer (1981), as well as the Cape Verde Islands, according to Zur Strassen (1993). More recent records documented by Pal *et al*. (2024) further extend the known distribution to Bangladesh, Cabo Verde, Ethiopia, Nigeria, Malaysia, Tanzania, the United Arab Emirates, the West Indies and Yemen. Additionally, the species has been found in Thailand (Thongjua and Thongjua, 2015), Pakistan (Iftikhar *et al*., 2016) and Boquete (Panam) (Lafuente *et al*., 2012)

3.4 Host range

The host range of this species includes a wide variety of crops such as tea, coffee, citrus, cassava, castor, chillie (*Capsicum*), bananas, mango, grapevine, groundnut, strawberry (Mound and Palmer, 1981), mangosteen (Thongjua and Thongjua, 2015), citrus (Singh *et al.,* 2020), rose (Lafuente *et*

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al., 2012), cotton (Rao *et al*., 2024) and several spices including coriander, cumin, fennel, fenugreek, dill, ajwain, nigella and anise (Kant *et al.,* 2022).

3.5 Nature of damage

Both nymphs and adults feed on the undersurface of leaves. Their rasping–sucking feeding causes leaf-tip burn, curling and drying, often leading to flower drop. Continuous scraping on flower buds and fruits results in scab formation and surface blemishes, thereby reducing the market value. Severe infestations can also stunt plant growth and adversely affect overall yield.

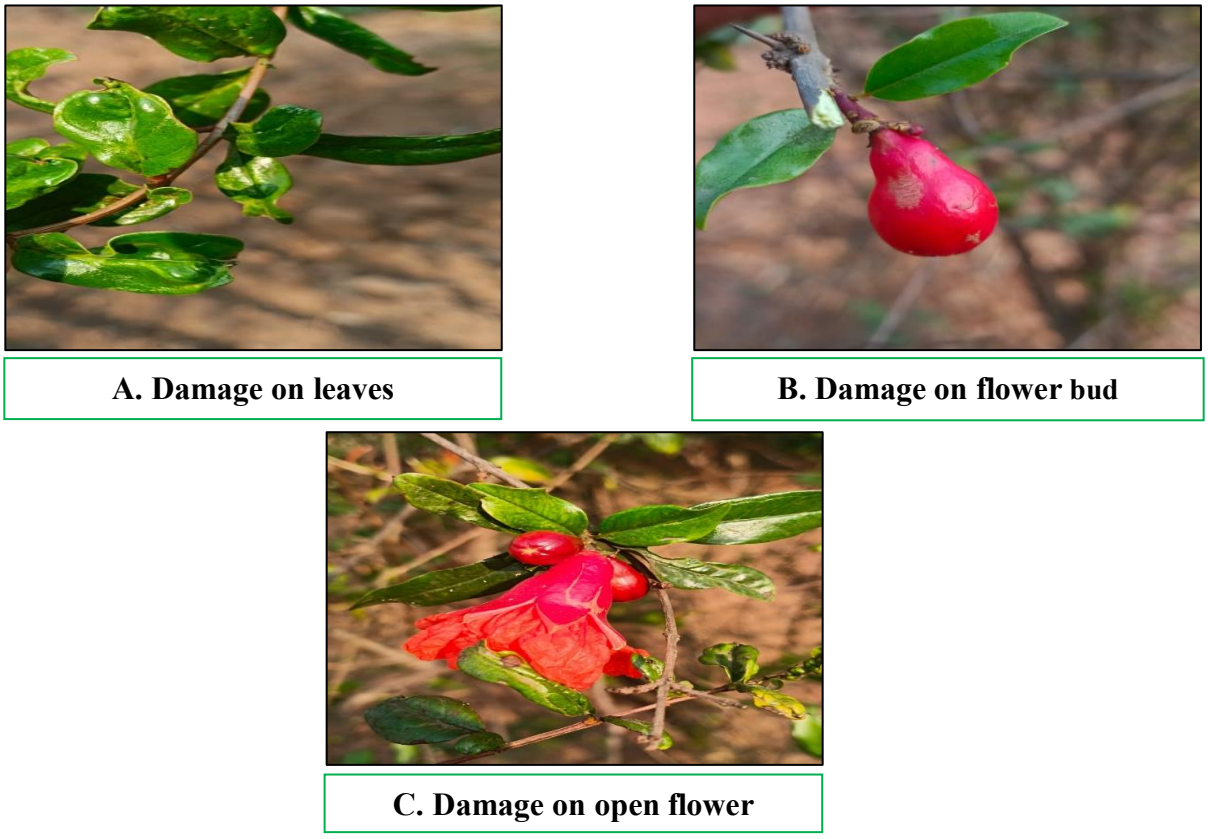

Fig. 3: Damage caused by chilli thrips (*S. oligochaetus*) on different parts of pomegranate

Monitoring of insect pest populations revealed that the mean population of thrips was highest during the months of February and September. Analysis indicated that maximum temperature had a positive correlation with thrips infestation (r = 0.081) (Table 2). This finding is supported by Elango and Sridharan (2017) who also observed a positive correlation between temperature and thrips population.

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Table 1: Monitoring of population dynamics of chilli thrips in pomegranate during 2024-2025

Months	SMW*	Mean of thrips/ twig	Mean of thrips/ flower bud	Mean of thrips/ flower	Total
September-24	**35**	7.4	3.8	2	13.2
	36	9.2	2.5	1.2	12.9
	37	6.4	4.2	1.4	12
	38	7.6	3.2	2.4	13.2
October-24	**39**	6.6	3.5	1.2	11.3
	40	7.2	2.2	2	11.4
	41	5.6	1.8	1.4	8.8
	42	4.8	3.4	2.2	10.4
November-24	**43**	4.6	3.4	1.4	9.4
	44	5.2	2.8	2.2	10.2
	45	4.2	3.5	2.2	9.9
	48	4.8	2.2	3.5	10.5
December-24	**49**	4.4	1.6	1.4	7.4
	50	3.4	3.2	1	7.6
	51	4.8	2.6	1.8	9.2
	52	5.2	2.2	1.4	8.8
January-25	**1**	6.2	2.2	1.8	10.2
	2	6.6	3.4	2.6	12.6
	3	7.6	2.8	3	13.4
	4	7.8	2.4	2.2	12.4
February-25	**5**	7.4	3.4	2.4	13.2
	6	7	3.8	3.2	14
	7	5.8	3.2	2.6	11.6
	8	6.6	4.2	3.4	14.2

**Note: ***SWM: Standard Meteorological Weeks

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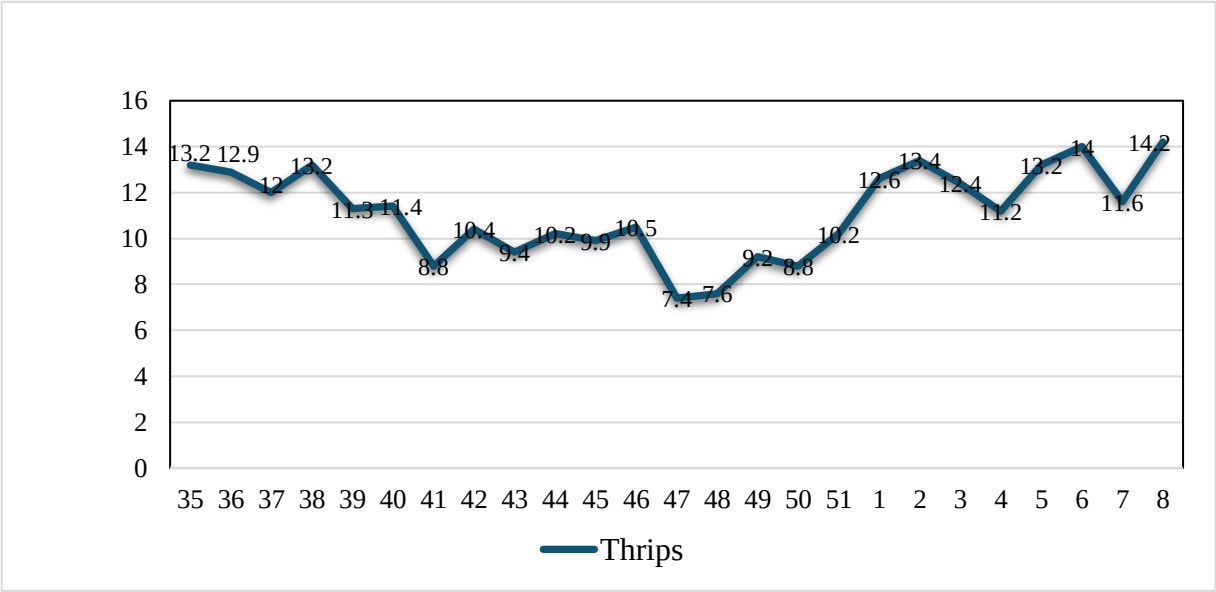
Table 2: Influence of weather parameters on the population dynamics of chilli thrips on pomegranate during 2024-2025

Variables	Correlation coefficient
Maximum temperature (T_{max}) (^oC)	0.081
Minimum temperature (T_{min}) (^oC)	-0.068
Morning RH (%)	0.509*
Evening RH (%)	-0.053
Rainfall (mm)	-0.379



*Correlation is significant at the 0.05 level

4. CONCLUSION

From the thorough analysis of the present findings, it can be concluded that the abundance of *S. oligochaetus* thrips was highest during the months of February and September. This suggests that these months might be critical for the population growth or activity of this species, potentially due to environmental factors, such as temperature, humidity or availability of food sources.

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