AgriScope
Monthly e-Magazine on Agriculture and Interdisciplinary Sciences
Visit at us: www.agriscope.in
Email at us: agri4scope@gmail.com
ISSN: 3139-6488

Black Thrips (*Thrips parvispinus*): A Growing Challenge to Chilli and Vegetable Production

Geeta Songer[1]*, Akanand[1], and Hem Prakash Verma[2]
[1]Department of Entomology, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India
[2]Guest Teacher, Agricultural Extension, IGKV, Raipur, Chhattisgarh.
*Corresponding author Email: geetasonger1@gmail.com

Article ID: 21003

Introduction

Chilli (*Capsicum annuum* L.) is one of the major spice and vegetable crops of India, with substantial economic, nutritional and export importance. India is among the world's leading producers of chilli and fruits are rich in vitamin A, C and E, carotenoids and other antioxidant compounds, while the crop provides an important source of income for small and commercial farmers. However, chilli production is constrained by a complex of insect pests and diseases, among which thrips are particularly important because of their ability to cause direct feeding damage to tender foliage, flowers and developing fruits. In recent years, the invasive black chilli thrips, *Thrips parvispinus* Karny (Thysanoptera: Thripidae), has emerged as an important threat to chilli production in India.

T. parvispinus is regarded as a Southeast Asian species and has subsequently spread to several regions outside its presumed native range (Mound & Collins, 2000) and is a highly polyphagous species capable of infesting a wide range of agricultural, horticultural and ornamental plants. It has been reported as an important pest of pepper and other crops, particularly under warm tropical and subtropical conditions. The species was first recorded in India in 2015 from papaya in Karnataka (Tyagi *et al*., 2015). Following its establishment expanded rapidly to several regions of the country and was subsequently reported from a growing number of cultivated and non-cultivated hosts. Its ability to exploit diverse host plants, reproduce rapidly and persist across cropping systems has facilitated its establishment and spread, increasing the risk of infestation in newly planted crops.

The emergence of *T. parvispinus* is particularly significant because chilli is highly susceptible to thrips injury, and the pest can exploit tender leaves, growing points, flower buds and flowers. Both adults and immature stages feed by damaging plant tissues, resulting in characteristic silvering, bronzing, leaf distortion, curling, necrosis and drying of growing points. Feeding in flowers can interfere with flowering and fruit set, ultimately reducing yield and fruit quality. Moreover, its concealed feeding behaviour within flowers and young foliage can make early

detection and effective control difficult. These characteristics, combined with a short generation time, high reproductive potential and broad host range, favour rapid population build-up under suitable environmental conditions.

Severe infestations of *T. parvispinus* in southern India have highlighted its potential as a major constraint to chilli production. The species has become predominant in several chilli-growing areas and has been associated with severe crop damage and substantial yield losses (Sridhar *et al*., 2021). Its rapid spread, expanding host range and dominance over other thrips species emphasize its adaptability and potential for movement among cultivated crops, weeds and alternate hosts.

The increasing importance of *T. parvispinus* highlights the need for systematic surveillance, early identification and region-specific integrated pest management. Understanding its distribution, biology, damage potential and management options is essential for minimizing crop losses and limiting further spread in India.

Distribution and Current Status in India

T. parvispinus has progressively expanded its geographical distribution in India. It has been reported from Andhra Pradesh, Chhattisgarh, Haryana, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, Telangana, Uttar Pradesh and West Bengal, among other regions (Tyagi *et al.*, 2015; Rachana *et al.*, 2022).

The rapid expansion of this invasive thrips is of particular concern because of its ability to establish populations on diverse host plants and persist across cropping systems. Its occurrence in different geographical regions also increases the likelihood of movement between cultivated crops and alternate hosts.

Host Range

Beyond chilli, *T. parvispinus* has a broad host range encompassing agricultural, horticultural and ornamental crops. Reported hosts include capsicum, black gram, red gram, cotton, beans, mango, coriander, watermelon, bitter gourd, ivy gourd and jasmine, among others. The availability of alternate hosts facilitates its persistence between cropping seasons and movement among crops, thereby promoting population build-up and geographical spread. Consequently, *T. parvispinus* has become increasingly dominant over other thrips species in some chilli-growing areas, particularly in southern India (Sridhar *et al*., 2021). The broad host range of this pest also has important implications for its management because weed hosts, neighbouring

AgriScope
Monthly e-Magazine on Agriculture and Interdisciplinary Sciences
Visit at us: www.agriscope.in
Email at us: agri4scope@gmail.com
ISSN: 3139-6488

crops and ornamental plants may serve as reservoirs for population maintenance and subsequent infestation of chilli.

Identification Characteristics of *T. parvispinus*

Adults are small and slender, generally measuring about 1.0-1.5 mm in length. The adult body is predominantly dark brown to black, whereas immature stages are comparatively lighter. Adults possess two narrow wings fringed with long hairs along their margins. Females are generally larger than males. Both adults and immature stages occur on young leaves, flower buds and flowers. Infested plant parts commonly exhibit a silvery or bronzed appearance accompanied by characteristic black fecal spots (Tyagi *et al*., 2015).

Biology and Life Cycle

The female lays eggs within plant tissues, particularly tender leaves, flower buds and flowers. Under favourable conditions, *T. parvispinus* develops rapidly and can complete its life cycle within approximately two weeks. Studies on chilli have reported development from egg to adult in about 13-14 days under favourable conditions (Rachana *et al*., 2022). The larval stages are primarily associated with actively growing plant tissues, whereas prepupal and pupal stages are generally less active. Adults frequently occur in flowers and on tender foliage. The short generation time, rapid development and high reproductive potential enable populations to increase rapidly when temperature, host availability and other environmental conditions are favourable.

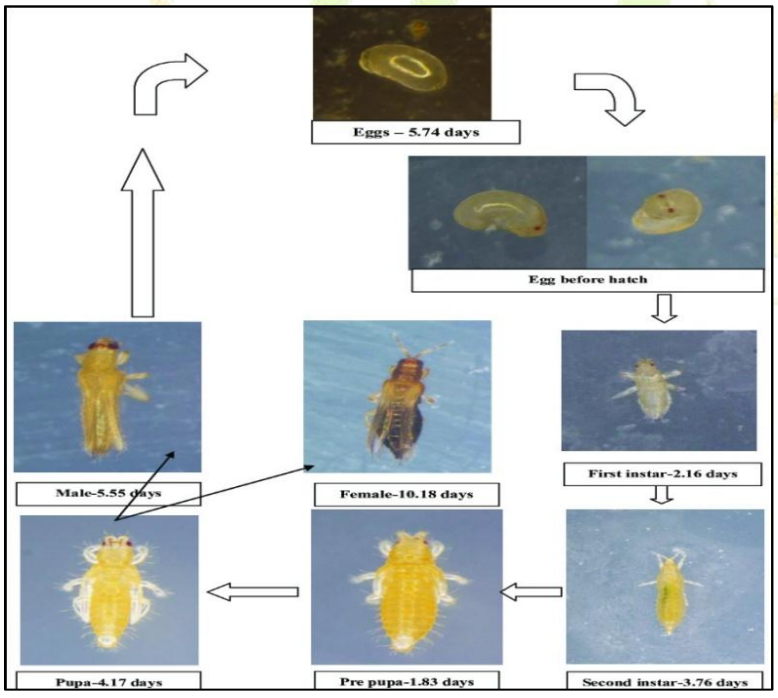


Figure 1. Life cycle of *Thrips parvispinus* (Karny) (Priyanka *et al.*, 2024)

AgriScope
Monthly e-Magazine on Agriculture and Interdisciplinary Sciences
Visit at us: www.agriscope.in
Email at us: agri4scope@gmail.com
ISSN: 3139-6488

Damage Symptoms

Both immature and adult stages of *T. parvispinus* cause damage through feeding on plant tissues. The pest preferentially attacks young leaves, growing points, flower buds, flowers and developing fruits.

- Silvery or bronzed patches on tender leaves.
- Upward curling of leaves, often producing a cup-like appearance.
- Leaf distortion, shrivelling and drying of growing tips.
- Suppression of plant growth.
- Flower damage and premature flower shedding.
- Reduced fruit setting.
- Rough, brown or cork-like lesions on developing fruits.
- Stunting and weakening of severely infested plants.

During severe outbreaks, substantial yield losses may occur. Severe outbreaks have been associated with yield losses of up to 80-100% in some affected fields (Sridhar *et al*., 2021).

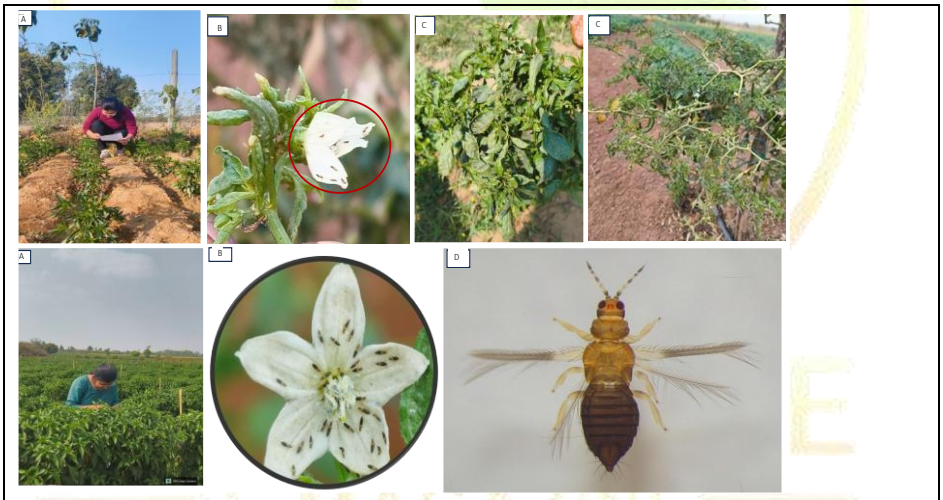


Figure 2. Field occurrence and damage symptoms of *Thrips parvispinus*: (A) field survey, (B) infestation in flowers, (C) plant damage and characteristic symptoms, and (D) adult thrips.

Integrated Pest Management of *T. parvispinus* in chilli and vegetable Crops

The concealed feeding behaviour, broad host range, rapid multiplication, short life cycle and increasing risk of insecticide resistance make *T. parvispinus* difficult to manage through insecticides alone. Therefore, sustainable management requires an integrated, monitoring-based approach combining cultural, mechanical, physical, biological and need-based chemical tactics.

11. Cultural Management

- Use healthy, pest-free planting material and resistant/early-maturing varieties where available.
- Practise deep summer ploughing, regular inter cultivation and soil raking to destroy soil-inhabiting pupae.
- Maintain field sanitation by removing weeds, crop residues, volunteer plants and alternate hosts.
- Apply neem cake @ 500 kg ha^{-1} + vermicompost @ 1.5-2.0 t ha^{-1} and maintain balanced plant nutrition.
- Avoid excessive nitrogen fertilization and maintain recommended spacing (60 × 30 or 45 × 45 cm).
- Use silver mulch (25-30 µm) to reduce thrips pupation.
- Grow 2-3 border rows of maize, sorghum or bajra; chilli + maize/sorghum + cowpea (10:3:1) can support natural enemies.
- Practise crop rotation with non-host/cereal crops and monitor neighbouring crops and alternate hosts.

2. Mechanical and Physical Management

- Remove and destroy severely infested shoots, leaves, buds, flowers and plants.
- Install blue sticky traps @ 20-25 ha^{-1} for monitoring and 65–75 ha^{-1} for mass trapping.
- Use glue-coated blue tarpaulin sheets where locally practiced.
- Prefer sprinkler irrigation to disturb thrips populations.
- In protected cultivation, use insect-proof nets and maintain strict sanitation.

3. Biological Management

- Conserve natural enemies such as *Orius* spp., *Chrysoperla* spp. and *Amblyseius* spp. by minimizing indiscriminate insecticide use.
- Incorporate entomopathogenic fungi such as *Beauveria bassiana, Metarhizium anisopliae* and *Lecanicillium lecanii*.
- Use *Pseudomonas fluorescens* and *Bacillus albus* as microbial biocontrol agents.
- Apply entomopathogenic nematodes such as *Steinernema carpocapsae* and *Heterorhabditis indica* where appropriate.

4. Botanical and Organic Management

- Apply 5% NSKE/neem seed extract, 0.5% neem oil, 0.5% pongamia oil or 5% *Vitex negundo* extract.
- Use azadirachtin 3000 ppm @ 2 ml L^{-1}.
- Apply 2% fish oil rosin soap, alone or with NSKE.
- Use *Kappaphycus alvarezii* extract @ 2 ml L^{-1} to enhance plant tolerance**.**

5. Monitoring and Decision-Based Management

- Regularly inspect tender leaves, growing points, buds and flowers for early infestation.
- Combine direct plant inspection, blue sticky traps and surveillance of alternate hosts.
- Record population trends over time and initiate control based on locally validated action thresholds.
- Integrate cultural, mechanical, biological and botanical measures with need-based insecticides to reduce resistance risk and conserve natural enemies

5. Chemical management and insecticide resistance management

Chemical control should be used judiciously when *T. parvispinus* populations reach economically important levels or locally recommended thresholds.

Insecticide	Dose per hectare
Spinosad 45% SC	160 g ha^{-1}
Spirotetramat 15.31% OD	400 g ha^{-1}
Tolfenpyrad 15% EC	1 L ha^{-1}
Imidacloprid 17.80% SL	250 ml ha^{-1}
Thiamethoxam 25 WG	75 g ha^{-1}
Fluxametamide 10 EC	200 ml ha^{-1}
Cyantraniliprole 10.26% OD	290 ml ha^{-1}

To delay insecticide resistance:

- rotate insecticides belonging to different IRAC mode-of-action groups rather than repeatedly using the same chemistry;
- avoid unnecessary prophylactic and repeated broad-spectrum applications;
- apply insecticides only when monitoring indicates the need;
- ensure adequate coverage of young leaves, growing points, buds and flowers where thrips commonly occur;

- follow the recommended label dose and pre-harvest interval; and
- avoid insecticide mixtures unless officially recommended and compatible.

Pesticide selection, dose, product registration and pre-harvest interval should always follow the current CIB&RC-approved label and the latest recommendations of the concerned agricultural university or state agriculture department. Thus, chemical intervention should be considered as one component of an integrated programme rather than the primary or sole management strategy.

Conclusion

T. parvispinus has emerged as an important invasive pest of chilli and other agricultural, horticultural and ornamental crops in India due to its rapid development, broad host range, concealed feeding behaviour and high reproductive potential. Since its detection in India in 2015, it has become widespread, with severe outbreaks highlighting its potential to cause significant crop losses. Sustainable management requires a preventive, monitoring-based and integrated approach combining field sanitation, regular surveillance, physical and mechanical measures, conservation of natural enemies, botanical and microbial products, and judicious insecticide use with mode-of-action rotation. Early detection and timely intervention, along with improved surveillance, host-range documentation and development of region-specific economic thresholds and IPM strategies, are essential for effective long-term management**.**

References

1. Anusha S, Hari Kumar V, Kiran Kumar S, Neelaveni S, Suneetha B, Bala Krishna Ch, *et al*. Field evaluation of integrated pest management strategies against chilli black thrips *Thrips parvispinus* (Karny) in the Srikakulam district. *Uttar Pradesh J Zool.* 2024;45(17):54-59.
2. European and Mediterranean Plant Protection Organization (EPPO). *Thrips parvispinus* (THRIPV): Distribution details in India. EPPO Global Database. Updated 2026.
3. Priyanka, T., Hemadri, T., Kadanavar, B., Shrihari, H., Chavan, S.S. and Keerthi, M.C., 2024. Biology and morphometrics of Thrips parvispinus (Karny)(Thysanoptera: Thripidae) on chilli, Capsicum annuum L. *Pest Management in Horticultural Ecosystems*, *30*(1), pp.85-92.
4. Rachana, R. R., Roselin, P., Amutha, M., Sireesha, K. and Reddy, G. N., Invasive pest, *Thrips parvispinus* (Karny) (Thysanoptera: Thripidae)-a looming threat to Indian agriculture. *Curr Sci*, 2022,122(2), 211-21.
5. Ramesha NM, Asritha C, Satwika M, Kumar MA. Invasive thrips (*Thrips parvispinus*) and their management in chilies. *Chron Bioresour Manag.* 2024;8(2):62-66.

6. Sridhar V, Rachana RR, Prasannakumar NR, Venkataravanappa V, Sireesha K, Anitha Kumari D, *et al*. Dominance of invasive species, *Thrips parvispinus* (Karny) over the existing chilli thrips, *Scirtothrips dorsalis* Hood on chilli in the southern states of India with a note on its host range: a likely case of species displacement. *Pest Manag Hortic Ecosyst.* 2021;27(2):132-136.

7. Tyagi K, Kumar V, Singha D, Chakraborty R. Morphological and DNA barcoding evidence for invasive pest thrips, *Thrips parvispinus* (Thripidae: Thysanoptera), newly recorded from India. *J Insect Sci.* 2015;15(1):105.