

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(3): 794-797
www.biochemjournal.com
Received: 08-12-2025
Accepted: 12-01-2026

Govindan K
Regional Research Station,
Tamil Nadu Agricultural
University, Paiyur,
Tamil Nadu, India

Sasikumar K
Assistant Professor,
(Agril.Entomology), Regional
Research Station, Tamil Nadu
Agricultural University,
Paiyur, Tamil Nadu, India

K Geetha
Regional Research Station,
Tamil Nadu Agricultural
University, Paiyur,
Tamil Nadu, India

Senthilkumar M
Horticultural Research
Station, Yercaud, Tamil Nadu,
India

Mangammal P
Horticultural College and
Research Institute, Paiyur,
Krishnagiri, Tamil Nadu, India

Sivakumar B
Forest College and Research
Institute, Mettupalayam,
Tamil Nadu, India

S Thangewari
Department of Plant
Pathology, TNAU,
Coimbatore, Tamil Nadu,
India

Corresponding Author:
Sasikumar K
Assistant Professor,
(Agril.Entomology), Regional
Research Station, Tamil Nadu
Agricultural University,
Paiyur, Tamil Nadu, India

Diversity and nature of damage of mango thrips, hopper complex Krishngiri district of Tamil Nadu

Govindan K, Sasikumar K, K Geetha, Senthilkumar M, Mangammal P, Sivakumar B and S Thangewari

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i3Sj.7981>

Abstract

Among the insect pests causing damage to mango the incidence of thrips and hoppers at flowering stage causes considerable yield loss. The farmers mainly rely on combination of chemical insecticides for its management which apart from causing unwarranted issues reduces the chance of export of choice varieties and value products. An experiment was conducted out during 2022-2023 and 2023-2024 to assess the population of hoppers, thrips and natural enemies in mango ecosystem. During roving survey (2022-2023) observation on the population of thrips hoppers and natural enemies were recorded. The thrips population recorded and it was ranged from 3.80 to 30.20 thrips/panicle was recorded. Highest thrips population 30.20 thrips/panicle was recorded in Jagathop village, Kaveripattanam block. The lowest thrips population 3.80 thrips/panicle was recorded in thtralli village, Kaveripattanam block. Hoppers ranged from (4.80 to 7.40/panicle). Highest hoppers population 7.40 hoppers/panicle were recorded in Thtaralli village, Kaveripattanam block and Natural enemies like coccinellid (2.00 Nos to 5.00 Nos/tree) and spiders (1. 00Nos/tree to .00 Nos/tree). During roving survey (2023-2024) Highest thrips population 11.50 thrips/panicle was recorded in-Bannihalli village, Kaveripattanam block. The lowest thrips population 5.50 thrips/panicle was recorded in Jagathop village, Kaveripattanam block. Mango hoppers ranged from (2.50 to 8.50/shoot). Highest hoppers population 8.50 hoppers/shoot were recorded in Vallipatti village, Mathur block. The lowest hoppers population 2.50 hoppers/shoot was recorded in Signinampatti village, bargur block. Natural enemies like coccinellids population ranged from (1.05 Nos to 3.75 Nos/4 sides the tree). Highest population of coccinellids 3.75/4 sides the tree were recorded in Signinampatti village, bargur block. The lowest coccinellids (1.05 Nos) was recorded in Paiyur village, Kaveripattanam block in Krishnagiri District. Spiders population ranged from (0.64 Nos to 2.00 Nos/4 sides the tree). The highest population of 2.00 spiders/4 sides the tree were recorded in Vallipatti village, Mathur block of Krishnagiri District. The peak activity of hoppers recorded in 8th standard hoppers (6.40 Nos./panicle) and natural like coccinellid (2.00 Nos to 5.00 Nos/tree) and spiders (1. 00Nos/tree to .00 Nos/tree). During 2023-2024 Highest hoppers population 8.50 hoppers/shoot were recorded in Vallipatti village, Mathur block. Highest population of coccinellids 3.75/4 sides the tree were recorded in Signinampatti village, bargur block.

Keywords: Diversity, ecosystem, thrips, hoppers, natural enemies, survey

Introduction

Mangifera indica L. (Mango), “the king of fruits”, is an evergreen tropical fruit tree comprising about 69 species belonging to the family Anacardiaceae and originated in the Indo-Burma region and has become naturalized and adapted throughout the tropics and subtropics. One of the major fruit crops of India, is known as the king of fruits for its sweetness, excellent flavuor, delicious taste and high nutritive value and being rich in vitamins A and C (Anitha and Sharmila, 2023) ^[1]. Its origin is believed to be south Asia where it has been cultivated for the last four thousand years (Anitha and Sharmila, 2023) ^[1]. Major mango producing countries are India, China, Thailand, Mexico, Pakistan, the Philippines, Indonesia, Brazil, Nigeria and Egypt. India ranks first and accounts for about 50% of the world’s mango production with 2.5 million hectares producing annually 18.0 million tons (Sandeep *et al.*, 2025) ^[2].

In India total area under mango cultivation is 20.21 lakh hectares, production 99.65 lakh tonnes, average productivity 6.28 tonnes/ha and percentage share on production is(40.10%) (Sandeep *et al.*, 2025) ^[2].

In Tamil Nadu account for over 70% of the total area under Mango (52%), In Tamil Nadu area under mango is 3.22 lakh hectares, production 99.65 and average productivity 30.97 tonnes/ha (Sandeep *et al.*, 2025) ^[2]. The major mango growing states in Indian are Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal. Other States where mangoes are grown include Madhya Pradesh, Kerala, Haryana, Punjab etc. The Productivity of mango found to be declining over the years. The National average productivity is found to be as low as 10 tonnes per ha (Sandeep *et al.*, 2025) ^[2]. In Tamil Nadu, Krishnagiri district 40,000 hectares come under the mango cultivation. 50% of the mango has been cultivated under rainfed condition. Apart from regular bearing the farmers of this region are practicing off season mango cultivation. Among the different constraints in mango cultivation the incidence of insect pests is one of the major concern for the farmers (Devaramanae *et al.*, 2023) ^[3]. The average yield is ten tons per ha one of the most important problem is shedding of flowers due to thrips and thrips infestation and yield loss up to thrips 61% and thrips 100% (Chaudhari *et al.*, 2017) ^[4].

The mango crop is attacked by about 492 species of insects, 17 species of mites and 26 species of nematodes in the world level. Mango is usually infested by several pests during its growth from feed on inflorescences, buds and foliage seedling until fruit maturity (Chaudhari *et al.*, 2017) ^[4]. Of 260 species of pest insects attacking this crop, 196 species insects pests recorded in India (Gundappa *et al.*, 2015) ^[5]. During the reproductive phase of the crop, pests like thrips and thrips pose a threat to mango production (Gundappa *et al.*, 2016) ^[6]. Key challenges for mango production in India are insect pests and diseases. The major insect pests of mango include thrips, thripsmealy bugs, midge, leaf webber, scale insects, stem borer and fruit fly (Reddy *et al.*, 2018) ^[7]. Mango thrips and thrips have been ranked among the most destructive pests worldwide. Mango thrips are a significant and serious and ubiquitous insect problem in the Indian Mango ecosystem throughout the year (Devaramanae *et al.*, 2023) ^[3]. Mango thrips species, especially *Idioscopus clypealis* (Lethierry), *Idioscopus nitidulus* (Walker) and *Amritodus atkinsoni* (Lethierry), remain active and cause damage at all stages of mango mango and harvesting results in losses of up to 100 per cent (Gundappa *et al.*, 2016) ^[6].

Mango thrips have incomplete metamorphosis and pass three life stages such as egg, nymph and adult. Both the nymphs and adults of the thrips puncture and suck the sap from tender shoots, inflorescences, and leaves of mango crop, which cause non-setting of flowers and dropping of immature fruits, thereby reducing the yield (Munj *et al.*, 2020) ^[8]. Thrips also excrete a secretion, called honey dew. In moist weather, it encourages the development of fungi like *Meliola mangiferae* (Earle), resulting in growth of sooty mould fungus on dorsal surface of leaves, branches and fruits. This black coating interferes with the normal photosynthetic activity of the plant, ultimately resulting in non-setting of flowers and dropping of immature fruits (Aashish *et al.*, 2019) ^[8]. The Mango thrips crop losses by sucking the sap on the petals, anthers, pollen, and floral nectaries and ovipositing in the panicles, which leads to discoloration and reduced vigor of the panicles (Pawar *et al.*, 2025) ^[10]. The occurrence and seasonal prevalence data generated from the present study can be used to manage the

population of thrips and thrips on mango and this study have far-reaching implications in pest management strategy and the data so generated would help in the forecast of thrips and thrips.

Materials and Methods

Roving surveys were carried out in different mango growing villages Krishnagiri District of Tamil Nadu for assessing the diversity and nature of damage of mango thrips and thrips complex and natural enemies were recorded in four directions viz., north, south, east and west direction on randomly selected twigs or panicle lower canopy of the tree by visual count method without disturbing the relevant plant part. In vegetative stage, three sweeps were done on the selected tree trunk with polythene cover to collect surviving thrips population on trunk. Thrips populations were recorded by tapping the inflorescence on a simple white paper. The incidence of thrips, thrips complex and natural enemies in mango was made by observing the five randomly selected mango trees and survey was made in two blocks viz., Kaveripattanam and Bargur of Krishnagiri District. Two years during 2022-2023 and 2023-2024. The natural enemies viz., Coccinellids, spiders were counted at four side of trees. Roving survey was conducted at fortnight interval on thrips populations in mango.

Experimental Results and discussion

Roving survey of thrips, thrips complex and natural enemies in mango

The roving survey was conducted during August 2022 to March 2023 in Krishnagiri District. Highest thrips population 30.20 thrips/panicle was recorded in Jagathop village, Kaveripattanam block. The lowest thrips population 3.80 thrips/panicle was recorded in thtralli village, Kaveripattanam block. The same results were reported by Bana *et al.*, (2018) ^[11] who state that Peak thrips of thrips in second fortnight of March. The thrips ranged from 4.80 to 7.40 thrips/panicle (Table 1). Highest thrips population 7.40 thrips/panicle were recorded in thtralli village, Kaveripattanam block and Natural enemies like coccinellid (2.00 Nos to 5.00 Nos/tree) and spiders (1.00Nos/tree to .00 Nos/tree). The same results were reported by Babu *et al.* (2002) ^[12] mango thrips population high in flowering period of march month. Roving survey during August 2023 to March 2024 in Krishnagiri District. The thrips population ranged from (2.50 to 8.50/panicle). Highest thrips population 11.50 thrips/panicle was recorded in-Bannihalli village, Kaveripattanam block. The lowest thrips population 5.50 thrips/panicle was recorded in Jagathop village, Kaveripattanam block The findings of present investigations are more or less in close agreement of findings of Bana *et al.*, (2018) ^[11]

The highest thrips population 8.50 thrips/shoot were recorded in Vallipatti village, Mathur block. Results of our current investigation are in line with Kadavkar *et al.*, (2021) ^[13] in which they revealed that incidence of the mango thrips was noticed and the peak incidence of mango thrips was found to be in during the February (12.31 thrips/panicle) was noticed and also same results reported by Bana *et al.*, (2018) ^[11] who state that Peak thrips of mango tree in second fortnight of March. The lowest thrips population 2.50 thrips/shoot was recorded in Signinampatti village, bargur block. The thrips population declined from second week of March which disappeared

during second week of May (Chaudhari *et al.*, 2017) ^[14]. Natural enemies like coccinellids population ranged from (1.05 No to 3.75 Nos/4 sides the tree). The findings of present investigations are more or less in close agreement of findings of Zala and Bharpoda (2022) ^[15] who reported that coccinellids and spiders population more active during flowering stage. Highest population of coccinellids 3.75/4 sides the tree were recorded in Signinampatti village, bargur block. The lowest coccinellids (1.05 Nos) was recorded in

Paiyur village, Kaveripattanam block in Krishnagiri District. The natural enemies like Spiders population ranged from (0.64 Nos to 2.00 Nos/4 sides the tree). The highest population of 2.00 spiders/4 sides the tree were recorded in Vallipatti village, Mathur block of Krishnagiri District (Table 2) the similar study, incidence of natural enemies spiders and coccinellids peak activity January month during the flowering period (Patel *et al.*, 2018) ^[15].

Table 1: Roving survey of thrips and hoppers complex in mango of Krishnagiri District (2022-2023)

S. No	Date of survey	Village	Block	GPS	Verities	Crop stage	Thrips/panicle	Hoppers/shoots	Coccinellids/tree	Spider/tree
1.	17.08.2022	Kandikanpatti	Kaveripattanam	12.3347N 78.392E	Bangalora	Flowering	13.40	6.20	3.00	2.50
2.	17.08.2022	Sonarhalli	Mathur	12.221N 78.3260E	Bangalora	Flowering	23.60	5.80	3.00	3.00
3	02.01.2023	N.Thattakal	Kaveripattanam	12.369N 78.296E	Neelum	Flowering	17.60	4.80	2.00	2.00
4	10.01.2023	Jagathop	Kaveripattanam	12.366N 78.194E	Bangalora	Flowering	30.20	6.80	2.00	2.00
5	12.01.2023	Velampatti	Kaveripattanam	12.396N 78.296E	Bangalora	Flowering	13.20	5.80	4.00	3.00
6	12.01.2023	Barur	Kaveripattanam	12.326N 78.317E	Bangalora	Flowering	15.40	6.80	3.00	2.00
7	18.01.2023	Thtaralli	Kaveripattanam	12.346N 78.243E	Bangalora	Flowering	5.40	5.80	2.00	1.00
8	18.01.2023	Thtaralli	Kaveripattanam	12.359N 78.376E	Bangalora	Flowering	3.80	6.20	4.00	3.00
9	18.01.2023	Thtaralli	Kaveripattanam	12.324N 78.253E	Bangalora	Flowering	10.60	7.40	5.00	4.00
10	18.01.2023	Thtaralli	Kaveripattanam	12.360N 78.236E	Bangalora	Flowering	8.80	4.60	3.00	2.00
11	24.01.2023	Barur	Kaveripattanam	12.328N 78.303E	Bangalora	Flowering	15.00	5.40	3.00	2.00
12	06.03.2023	Thtaralli	Kaveripattanam	12.351N 78.236E	Bangalora	Flowering	25.55	4.45	2.50	2.00
13	20.03.2023	Panamartahu patti	Uthankarai	12.227N 78.454E	Senthura	Flowering	13.10	3.45	1.50	1.25

Table 2: Roving survey of thrips and hoppers complex in mango of Krishnagiri District (2023-2024)

S. No	Date of survey	Village	Block	GPS	Verities	Crop stage	Thrips/panicle	Hoppers/shoots	Coccinellids/tree	Spider/tree
1	03.10.2023	Paiyur	Kaveripattanam	12.375N;78.214E	Bangalora	-	-	4.50	1.50	1.10
2	17.10.2023	Jagatop	Kaveripattanam	12.367N;78.193E	Bangalora	-	-	6.55	1.10	0.95
3	07.11.2023	Pothapuram	Kaveripattanam	12.398N;78.197E	Bangalora	-	-	3.50	2.10	1.95
4	10.11.2023	Kuchannoor	Kaveripattanam	12.326N;78.358E	Bangalora	Flowering	8.50	6.50	1.50	1.00
5	14.11.2023	Jagatop	Kaveripattanam	12.398N;78.197E	Neelum	Flowering	5.50	5.50	2.60	1.65
6	30.11.2023	Signinampatti	Bargur	12.459N ;78.424E	Bangalora	Flowering	-	2.50	3.72	2.05
7	30.11.2023	Vaikundam	Bargur	12.429N;78.311E	Bangalora	Flowering	6.00	4.50	2.20	1.15
8	01.12.2023	Bannihalli	Kaveripattanam	12.372N;78.170E	Senthoor	Flowering	11.50	7.50	2.00	1.15
9	27.12.2023	Pothapuram	Kaveripattanam	12.399N;78.198E	Neelum	Flowering	6.55	4.00	2.25	1.95
10	11.01.2024	N.Thattakal	Kaveripattanam	12.369N ;78.296E	Bangalora	Flowering	9.50	6.20	1.10	0.50
11	21.01.2024	Samiyanahalli	Bargur	12.286N ;78.350E	Bangalora	Flowering	6.25	4.50	1.55	1.00
12	04.02.2024	Vallipatti	Mathur	12.357N;78.466E	Bangalora	Flowering	8.25	8.50	2.55	2.00
13	30.02.2024	Surampatti	Kaveripattanam	12.427N;78.267E	Bangalora	Flowering	9.50	7.50	2.50	1.80
14	08.03.2024	Kuchannoor	Kaveripattanam	12.326N;78.358E	Neelum	Flowering	7.50	4.50	2.50	1.50
15	20.03.2024	Paiyur	Kaveripattanam	12.378N;78.215E	Bangalora	Flowering	9.50	6.20	1.05	0.60

Conclusion

Present study suggests that at the flowering stage of mango crops, thrips and hoppers can cause heavy damage and resulting in considerable yield loss. The occurrence and seasonal prevalence data generated from the present study can be used to manage the population of hoppers and thrips on mango and this study have far-reaching implications in pest management strategy and the data so generated would help in the forecast of hoppers and thrips.

References

- Anitha R, Sharmila S. Nutritional and medicinal values of *Mangifera indica* L. fruit. Trends Hortic. 2023;6(2):1-12. doi:10.24294/th.v6i2.2949.
- Sandeep G, Kushwaha RR, Supriya, Kumar M, Mahima P, Neerugatti. A study on growth and decomposition analysis of area, production and yield of mango in Uttar Pradesh, India. Environ Ecol. 2025;43(1A):296-302. doi:10.60151/envec/FRLF9317.
- Devaramane R, Niranjana S, Ramesh KP, Subash C. ICT-based surveillance of hoppers and thrips in mango orchards of Maharashtra, India. Pest Manag Hortic Ecosyst. 2023;29(2):196-201.
- Chaudhari AU, Sridharan S, Soorianathasundaram K, Singh SD. Dynamics of mango hopper population under ultra-high density planting. Int J Curr Microbiol Appl Sci. 2017;6(11):2206-2211.
- Gundappa R, Rajkumar B, Srivastava K, Singh S. Rearing of mango stem borer, *Batocera rufomaculata* De Geer (Coleoptera: Cerambycidae). Pest Manag Hortic Ecosyst. 2015;21:219-220.
- Gundappa AT, Shukla PK. Appraisal of thrips population dynamics in mango using weather-based indices. Vegetos. 2016;29:1-3.
- Reddy PVR, Gundappa B, Chakravarthy AK. Pests of mango. In: Omkar, editor. Pests and their management. Singapore: Springer Nature Pvt Ltd; 2018. p. 415-440.
- Munj AY, Reddy PV, Gundappa B, Bana JK, Irulandi S. Management of mango hopper using entomopathogens. J Entomol Zool Stud. 2020;8(5):1598-1600.
- Aashish KA, Alok A, Guru PPG. Evaluation of insecticides against mango hoppers *Amritodus atkinsoni*

- and *Idioscopus clypealis*. Indian J Entomol. 2019;81(2):340-350. doi:10.5958/0974-8172.2019.00052.X.
10. Pawar ST, Sajad M, Namala V, Pushpavalli, Mudasir G. Biological suppression of major insect pests in mango ecosystems. Int J Adv Biochem Res. 2025;9(12):1040-1046. doi:10.33545/26174693.2025.v9.i12m.6709.
 11. Bana JK, Kumar S, Sharma H. Diversity and nature of damage of mango insect-pests in south Gujarat ecosystem. J Entomol Zool Stud. 2018;6(2):274-278.
 12. Babu LB, Maheshwari TM, Rao NV. Seasonal incidence and biology of the mango hoppers. Entomon. 2002;27:35-42.
 13. Kadavkar SS, Patil SA, Hole UB, Mohite PB, Thamidela MD. Seasonal incidence of mango hopper *Amritodus atkinsoni* Leth. Pharma Innov J. 2021;10(3):596-598.
 14. Patel KB, Patel KM, Shinde CU, Desai KD. Non-chemical management of mango hopper *Amritodus atkinsoni*. Int J Entomol Res. 2025;10(3):164-167.