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RESEARCH NOTE

Outbreak of looper, *Perixera illepidaria* Guenée, in mango in South Gujarat, India

S. M. CHAVAN*

Agriculture Experimental Station, Navsari Agriculture University, Paria, Gujarat, India 396 145

***E-mail:** sachinento@gmail.com

ABSTRACT: An outbreak of a looper, *Perixera illepidaria* (Lepidoptera: Geometridae) was observed on mango trees in Gujarat state of India during January to March, 2025. The period of occurrence of looper was severe in February. The larval incidence of looper ranged from 2 to 39 larvae per inflorescence, with peak incidence (27.9 larvae per panicle) recorded during 7th Standard Meteorological Week (SMW) (third week of February). Loopers fed voraciously on flowers, secondary and tertiary branches of inflorescence leaving behind only the panicle axis (rachis). This voracious feeding can cause a dried appearance of the inflorescence, reduced fruit set, and up to 80–100% damage under severe infestations, resulting in substantial yield losses. The larvae exhibited considerable colour variation across the instars, ranging from black to dark brown, often with distinct banding patterns along the body. Moreover, no any natural parasitization either on larvae and pupae were observed. This is the first record of outbreak of *P. illepidaria* on mango crop from Gujarat. Given the economic losses caused by outbreaks, a comprehensive management strategy emphasizing research, monitoring, and preparedness is essential to prevent future losses.

Keywords: Outbreak, Looper, *Perixera illepidaria,* Mango, Gujarat

Mango (*Mangifera indica* L.) is a fruit of major economic and cultural importance and widely cultivated across tropical and subtropical regions of the world. In Gujarat, mango is cultivated over 177,000 ha with a production of 1.115 million ton, and the South Gujarat region contributes significantly, accounting for more than half of the state's mango production (Anon., 2023). Despite its prominence, mango cultivation is seriously hampered by a wide range of insect pests. The intensification of commercial mango production-through the introduction of innovative varieties, changes in crop management, practices, expansion of cultivation areas, and increased chemical inputs-has significantly reshaped the pest community composition. (Reddy *et al*., 2018). Additionally, climate change has led to the emergence of new pests, while the global trade in mangoes has facilitated the dispersal of pests to various regions (Jayanthi *et al*., 2014). Total 260 insect and mite pests have been reported from the Indian subcontinent, of which nearly 30 pests are serious and capable of causing major losses to mango growth and yield (Pena *et al*., 1998; Kapadia, 2003).

Flowering is a critical phase in mango production, during which only a small fraction of flowers develop into fruit. In recent years, mango inflorescences in India have been experiencing severe infestations by multiple species of polyphagous caterpillars belonging to different families. Lepidopteran pests, once considered minor, have now emerged as major threats during the flowering stage. These inflorescence-feeding larvae damage panicles by feeding on floral parts, leading to flower shedding, reduced fruit set, and consequent economic losses. Notably, these caterpillars are now causing greater damage to mango flowers than traditional pests such as hoppers (Jayanthi *et al.,* 2018). The impact of a diverse group of polyphagous caterpillars on panicles remained unrecognized for a long time. In Gujarat, an average avoidable yield loss of 47.33 per cent has been reported (Bana *et al.,* 2023).

There are total fifteen species of lepidopteran pest belonging to various families such as Pyralidae, Tortricidae, Gelechiidae, Noctuidae, Geometridae, Erebidae, Lymantriidae, Crambidae and Pyralidae were reported on mango inflorescence in South Gujarat (Kumari, 2025). Among them fourteen species *viz.*, *Chlumetia euthesticha* Turner Comb, *Platynota* sp., *Dudua aprobola* Meyrick, *Anarsia* sp., *Nanaguna* sp., *Penicillaria jocosatrix* G., *Perixera illepidaria* Guenee, *Euproctis* sp., *Lymantria* sp*., Conogathes punctiferalis* Guenee, *Citripestes eutraphera* (Meyrick), *Thalasodes* sp., *Helicoverpa armigera* Hubner and *Hyposidra* sp. were recorded as external feeder, whereas *Chlumetia*

transversa Walker was reported as sole internal feeder. However, *P. illepidaria* was earlier reported as minor pest, this paper is the first report of its outbreak on mango inflorescence in Gujarat.

Agriculture Experimental Station (AES), Navsari Agriculture University (NAU), Paria, Dist. Valsad (Gujarat) was located at 20^{0}26'58.427"N Lat and 72^{0}57'5.723"E Long. in South Gujarat (Fig. 1). While surveying pests and diseases of mangoes under All India Co-ordinated Research Project on Fruits (AICRP-F) in Gujarat during January to March, 2025, sporadic outbreak of semilooper was recorded at AES, NAU, Paria and also from a few farmers' field.

To identify insect species, live insect samples along with inflorescence were collected in polypropylene bag and immediately brought to the Laboratory. Observe the different instars of insect using a stereo microscope equipped with the Scope Tek DCM130E microscope-camera and capture images. Subsequently insect specimens were molecularly identified as *P. illepidaria* (Lepidoptera: Geometridae) with the assistance of SLS, Research Laboratory, Surat.

Further, field observations were continued to record the period of incidence, nature of damage and also the natural parasitization. We observe the larval population per inflorescence on randomly selected five plants from infested field of mango (*var* Alphonso). The period of occurrence of looper in mango was severe in February. Ten panicles covering all the direction from each tree were selected. The average mean number of insect larvae per

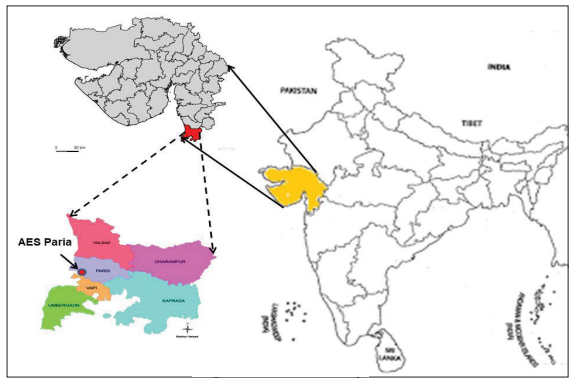

Fig. 1. Location of the study

panicle during 3 SMW (third week of January) was 0.9 larvae per panicle (Table 1). Larval population increases gradually and reached peak 27.9 larvae/ panicle during 7 SMW (third week of February). Thereafter larval population declining and reached 2.7 during 10 SMW (second week of March) (Table 1). Range of larval population was observed to the tune of 2 to 39 per inflorescence. *Larva* causes significant damage to mango inflorescences by feeding on flowers (Fig. 2 A, D), secondary and tertiary branches of inflorescence leaving behind only the panicle axis or rachis (Fig. 3-H). This voracious feeding can lead to a dried appearance of the inflorescence, lower fruit set, and up to 80–100% damage in severe infestations, resulting in major yield losses. The larvae chew on floral parts, which resulted in reduced fruit production. Nature of damage was also confirmed by rearing the larvae in laboratory (Fig. 2 C-7 & Fig. 3-G & H). Larvae observed to be a voracious feeder completely by devouring all the floral parts of panicle (Fig. 2 B & Fig. 3-H).

Table 1: Larval population of *P. illepidaria* on mango inflorescence during 2025

SMW	Period of observation	Number of larvae/panicle/tree					Avg. no. of larvae/ panicle
		1	2	3	4	5	
3	January III	1.4	1.5	0.5	0.3	0.6	0.9
4	January IV	6.0	4.9	3.7	3.7	3.1	4.3
5	February I	12.5	10.6	8.8	8.9	8.4	9.8
6	February II	20.8	18.9	16.5	17.4	15.9	17.9
7	February III	29.0	30.3	26.1	27.6	26.4	27.9
8	February IV	19.0	20.3	16.2	17.4	14.6	17.5
9	Mar I	8.8	9.5	8.7	9.0	7.7	8.7
10	Mar II	3.4	3.1	2.7	2.3	2.1	2.7
	Min.	1.4	1.5	0.5	0.3	0.6	0.9
	Max.	29.0	30.3	26.1	27.6	26.4	27.9
	Avg. ± SD	12.6±9.6	12.4±10.0	10.4±8.7	10.8±9.3	9.9±8.7	11.2±9.2

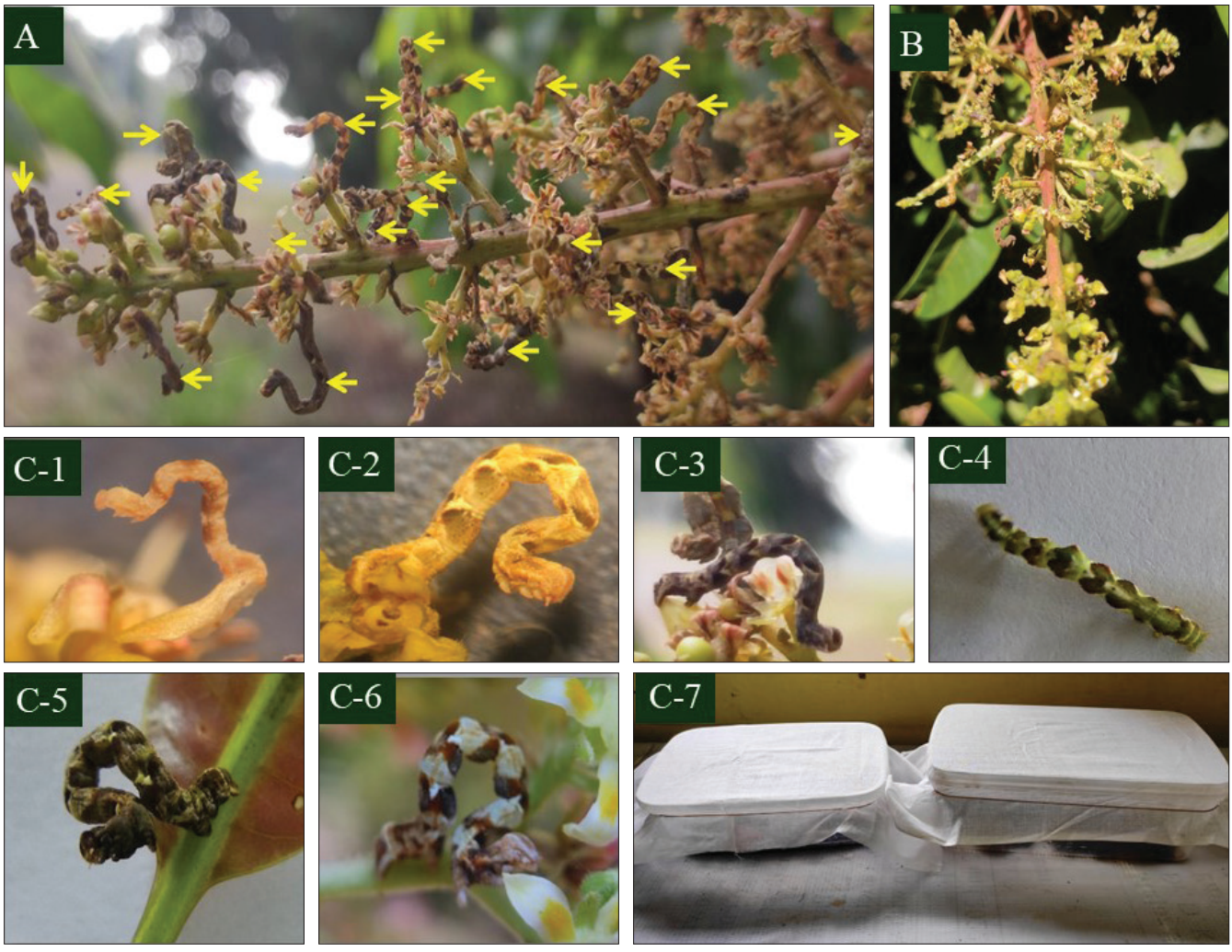

Fig. 2. A- Outbreak of mango looper *Perixera illepidaria* Guenee on mango inflorescence (yellow colored arrow indicate the presence of larva); **B**- Larvae completely devour all the floral parts of the inflorescence; **C-1** to **C-6** larvae exhibited considerable color variation across different instars; **C-7** rearing in laboratory

The larvae exhibited considerable colour variation across different instars, ranging from black to dark brown, often with distinct banding patterns along the body (Fig. 2 C-1 to C-6). These larvae produced silken threads, which they used for mobility and were frequently observed hanging from branches or moving between them. The larva moves in a distinctive looping manner (Fig. 2 C-1 to C-6). Pupation typically occurs on flowers (Fig. 3-C) and also on the underside of leaves close to the inflorescence. Numerous pupae were seen scattered on the upper surfaces of leaves (Fig. 3D). Pupa was triangular, initially green (Fig. 3A), which later changed to brown prior to adult emergence (Fig. 3B). The adult's wings featured two lines of dark brown spots on the upper surface, with the first line located close to the outer edge of each wing (Fig. 3E). Their feeding behaviour involved migrating from one inflorescence to another via these threads, feeding actively on mango flowers and causing substantial damage.

Natural parasitization was also studied by rearing the larvae and pupae in laboratory for observing the emergence of natural enemies, if any (Fig. I). Result revealed that no any parasitization of larvae and pupae were observed. *Perixera illepdidaria* generally oviposits near webs of juvenile spiders as a significant defence against predators (Nafus and Schrecner 1991).

Outbreaks of *P. illepidaria* may be associated with changing climatic conditions. Damage caused by *P. illepidaria* to mango inflorescences directly affects mango production. However losses in terms of fruit yield needs to be studied. Earlier, outbreak of *P. illepidaria* was noticed on litchi trees during 2011 and 2012 in Muzabbarpur (Kumar *et al.,* 2014). Nafus (1997) has reported *P. illepidaria* as

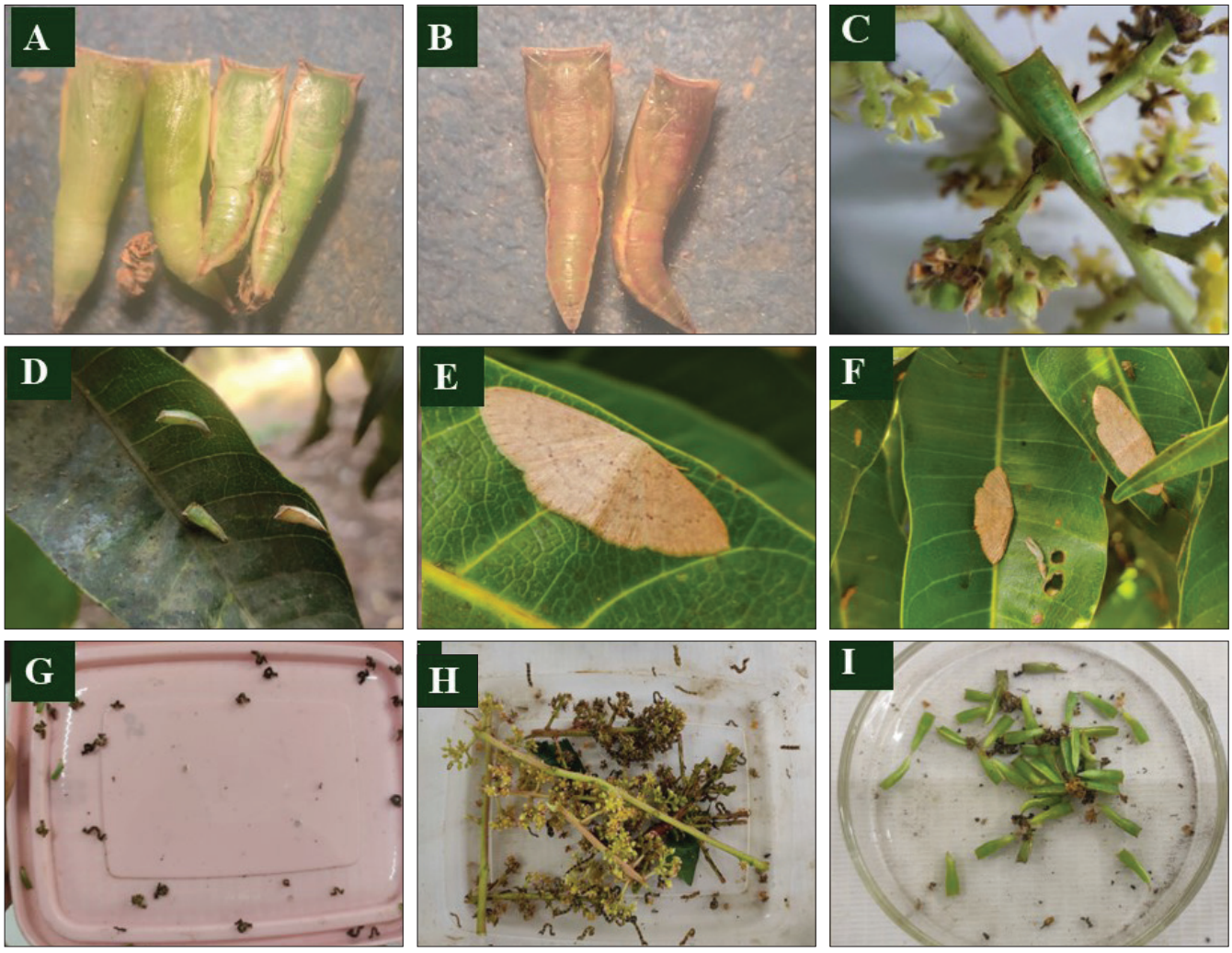

Fig. 3. A-Pupa initially green & triangular in shape; **B**- Mature brown pupa, **C**- Pupation occurs on inflorescence; **D**- Pupation on the leaf near to inflorescence; **E**-Adults; **F**-Outbreak of adults nearby infested area; **G-**Nature of damage was also confirmed by rearing the larvae in laboratory, **H**- Larvae observed as voracious feeder; **I**-Natural parasitization study

pest of mango in the Federal status of Micronesia and in Palau. Likewise, Soumya *et al*. (2021) from Karnataka reported its feeding on mango. Similarly, Nilamudeen *et al*. (2023) recorded serious infestation of *Perixera illepidaria* at Kollengode block of Palakkad district in Kerala. The looper caterpillars were found feeding voraciously on mango flowers. More than twenty larvae were collected from a single inflorescence on slight shaking. The damaged inflorescence presented a dried appearance and flowers became brittle. In addition to mango it also attacks litchi, longan, rambutan and castor (Abrol, 2015)

Considering the recent outbreak and the damage caused by *P. illepidaria* to mango trees, there is a need to keep vigil on the further spread and undertake studies on the eco-biology, behavior and spatial and temporal distribution of *P. illepidaria*.

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AUTHORS CONTRIBUTION

SMC- Designing, Planning, Implementation of the experiment, MS preparation and MS finalization.

CONFLICT OF INTEREST

The authors do not have any conflict of interest with respect to the content of the article.

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