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Somesh Prajapat
M.Sc. Scholar, Entomology
Section, College of Agriculture,
Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

Dr. VJ Tambe
Professor and Head,
Entomology Section, College of
Agriculture, Nagpur,
Maharashtra, India

Dr. RM Wadaskar
Assistant Professor, College of
Agriculture, Nagpur,
Maharashtra, India

Dr. VM Ilorkar
Principal Scientist, AICRP on
Agroforestry, College of
Agriculture, Nagpur,
Maharashtra, India

Dr. PD Raut
Assistant Professor, Soil
Science Section, College of
Agriculture, Nagpur,
Maharashtra, India.

Tejas V Solao
Entomology Section, College of
Agriculture, Nagpur,
Maharashtra, India

Nishant D Zatale
Department of Entomology,
Dr. PDKV, Akola,
Maharashtra, India

Corresponding Author:
Somesh Prajapat
M.Sc. Scholar, Entomology
Section, College of Agriculture,
Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

Seasonal incidence of major insect pests of bamboo like leaf roller, *Pyrausta coclesalis*

Somesh Prajapat, VJ Tambe, RM Wadaskar, VM Ilorkar, PD Raut, Tejas V Solao and Nishant D Zatale

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Abstract

A field study was conducted to study the seasonal incidence of bamboo leaf roller, *Pyrausta coclesalis* on bamboo, *Bambusa vulgaris* and its correlation with prevailing weather parameters during 2025-26 at AICRP on Agroforestry, College of Agriculture, Nagpur. Leaf damage was recorded on three randomly selected clumps at weekly intervals from 29th to the 40th Standard Meteorological Week (SMW), corresponding to the third week of July to the first week of October, 2025. Leaf roller incidence, expressed as percent leaf damage, was first recorded at 13.1 percent during the 29th SMW corresponding to the third week of July, 2025 and increased progressively throughout the monsoon period, and reached a peak of 23.4 percent during 36th SMW (first week of September), after which infestation declined gradually. Correlation analysis with weather parameters revealed that morning relative humidity had a significant positive influence on leaf damage ($r = 0.758$), whereas maximum temperature ($r = -0.636$) and evaporation ($r = -0.679$) exhibited significant negative correlations. Wind speed showed a negative but non-significant association ($r = -0.595$), whereas rainfall, rainy days, minimum temperature, evening relative humidity and bright sunshine hours were non-significantly correlated with leaf roller incidence. The results indicate that high humidity coupled with moderate temperature and low evaporation favour the buildup of bamboo leaf roller populations, with peak activity coinciding with the monsoon leaf-flush period. These findings are broadly consistent with earlier reports from central India and other regions, providing a basis for forecasting infestation periods and timing management interventions against bamboo leaf roller, *Pyrausta coclesalis*.

Keywords: Bamboo, *Bambusa vulgaris*, bamboo leaf roller, *Pyrausta coclesalis*, Seasonal incidence, leaf damage, weather parameters, correlation, standard meteorological week

Introduction

Bamboo is one of the most versatile and rapidly renewable plant resources in the world. Although it belongs to the grass family Poaceae, its woody culms, height and long service life enable it to perform many ecological and economic functions commonly associated with timber trees. More than 1,400 bamboo species occur across tropical, subtropical and temperate regions, where they support construction, furniture, paper and pulp industries, handicrafts, food production and rural livelihoods (Soderstrom and Calderon, 1979; Banik, 2015; Shende *et al.*, 2021) [7, 3, 11]. Bamboo also contributes to soil and water conservation, carbon sequestration, biodiversity protection and the rehabilitation of degraded land. These attributes have increased its importance in afforestation and agroforestry programmes. Across Asia, bamboo's presence is ubiquitous. It flourishes in nations including Japan, China, India, Bangladesh, Pakistan, Sri Lanka, Cambodia, Vietnam, Laos, Myanmar, Korea, and Indonesia (Verma and Sajeev, 2012; Annon., 2016) [13, 1]. India is a major centre of bamboo diversity and production. Bamboo is especially important to rural and tribal communities because it provides household material, employment and marketable products within a relatively short production cycle. Although the north-eastern states are traditionally associated with bamboo resources, large bamboo-bearing areas also occur in central India, including Madhya Pradesh and Maharashtra (Naithani, 1993; Verma and Sajeev, 2012) [7, 13]. In Maharashtra, bamboo cultivation is being promoted through plantations, agroforestry systems and institutional programmes intended to improve farm income and supply raw material to bamboo-based industries. The productivity and sustainability of these expanding plantations, however, depend upon effective protection from biotic stresses.

Bamboo is attacked by a diverse complex of insects from the nursery stage to harvested and stored products. The pest complex includes defoliators, leaf rollers, sap feeders, shoot and culm borers, termites and post-harvest beetles. Approximately 170 insect species have been reported in association with bamboo in India and neighbouring countries, although information on their field abundance, seasonal activity and economic impact remains limited (Singh *et al.*, 1990) ^[10]. Among these groups, defoliators are particularly important because repeated loss of foliage directly reduces photosynthetic area, weakens clumps, retards culm and shoot development and may reduce the quality and quantity of usable bamboo. Pest outbreaks are often more conspicuous in nurseries and intensively managed plantations than in natural stands because of concentrated host plants and favourable microclimatic conditions (Tewari, 1992; Pal *et al.*, 1996) ^[12, 8].

The bamboo leaf roller, *Algedonia coclesalis* (Walker), reported in past literature under *Crypsiptya coclesalis* or *Pyrausta coclesalis*, is considered a major defoliator in central India. The lesser bamboo leaf roller, *Pyrausta bambucivora* Moore, is also of regional importance. Early-instar larvae initially scrape or feed on tender leaf tissues and subsequently roll or fold leaves, within which they continue feeding. Heavy infestation results in extensive leaf rolling and defoliation, reduced plant vigour and, in severe cases, drying or mortality of young culms. Leaf rollers have been recorded on several commercially important bamboo species, including *Bambusa vulgaris*, *B. nutans*, *B. tulda*, *Dendrocalamus asper*, *D. longispathus* and *D. strictus* (Pal *et al.*, 1996; Joshi *et al.*, 2005) ^[8, 5].

Joshi and Meshram (1989) ^[4] reported that bamboo defoliators belong to order Lepidoptera, Coleoptera and the most important Leaf roller belongs to Lepidoptera i.e. *Pyrausta bambucivora*. Wang *et al.* (1998) ^[14] authored "Insect Pests of Bamboo in Asia: An Illustrated Manual," published by INBAR, Beijing. This comprehensive manual provides extensive documentation of the diverse insect pests attacking bamboo species across Asia.

Materials and Methods

The present study was carried out on "Seasonal incidence of major insect pest of bamboo like leaf roller, *Pyrausta coclesalis*" at AICRP on Agroforestry, College of Agriculture, Nagpur, during 2025 to 2026.

The material required for the study of incidence include, a hand lens for immediate close-up field observation, permanent marker and labels a camera or mobile phone for photographing insects under field conditions, and a field notebook or logbook for recording collection data such as location, date and conditions, sample labels and record book of plantation of bamboo, polyethene bags, aluminum foil paper, ice packs and thermal insulated box for collection, preservation and transportation of samples.

The observations were recorded on bamboo spp. *Bambusa vulgaris* for incidence of major insect pest like leaf roller infestation. Total number of leaves and leaves damage by leaf roller was counted from 3 randomly selected clumps on *Bambusa vulgaris* species for computation of percent damage infestation.

Results and Discussion

The seasonal abundance of bamboo leaf roller was recorded

on bamboo species *Bambusa vulgaris* which was planted in year 2020. The data presented in Table 1 revealed that the population of bamboo leaf roller on *Bambusa vulgaris* was recorded from the 29th Standard Meteorological Week (SMW), corresponding to the third week of July, 2025, and continued till the 40th SMW, corresponding to the first week of October, 2025. Leaf damage due to the pest showed a progressive increase from 13.1 percent at the onset of observation, 29th SMW corresponding to the third week of July, 2025 and attained a peak of 23.4 percent during the 36th SMW, i.e., the first week of September, following which a decline in infestation was evident.

Correlation of bamboo leaf roller infestation with weather parameters

The data presented in Table 2 revealed that the correlation coefficients between bamboo leaf roller-induced leaf damage on *B. vulgaris* and various weather parameters recorded during 2025-2026, against a critical r-value of 0.632 at 5 percent level of significance, Morning relative humidity (RHM) exhibited a significant positive correlation with leaf damage ($r = 0.758$). Maximum temperature (Tmax) ($r = -0.636$) and evaporation (Evapo) ($r = -0.679$) each showed a significant negative correlation. Wind speed (WS) ($r = -0.595$), although negative, did not attain statistical significance, being marginally below the critical value. Rainfall (RF) ($r = -0.357$), rainy days (RD) ($r = 0.090$), minimum temperature (Tmin) ($r = -0.312$), evening relative humidity (RHE) ($r = 0.246$), and bright sunshine hours (BSH) ($r = -0.189$) were all non-significantly correlated with leaf damage.

The present findings indicated that bamboo leaf roller infestation on *B. vulgaris* was initiated with the onset of the monsoon season in July, increased progressively, and reached its peak in first week of September 2025 and declined afterwards. During this period greeny texture with sufficient foliage on bamboo with maximum relative humidity. This pattern was in general agreement with Joshi *et al.* (2005) ^[5], who reported that larval populations of leaf rollers generally appeared with the onset of rains at the end of June, coinciding with the leaf-flush season in bamboo when sufficient foliage was available for larval feeding, and that population build-up reached a peak during August and September under monsoon conditions. The peak infestation recorded in the present study during the 36th SMW (early September) closely corresponded with this reported peak period.

Similarly, Pal *et al.* (1996) ^[8] reported that outbreaks of *Crypsiptya coclesalis* on bamboo were observed during July, August, and September, which is consistent with the period of active infestation and peak buildup recorded in the present study. The findings also agreed with those of Kumar *et al.* (2021) ^[6], who reported that infestation of *Algedonia coclesalis* on bamboo species in Ranchi, Jharkhand, initiated in July and persisted till October — a period that closely matches the July-to-early-October observation window of the present study.

However, the present findings were only partially in agreement with those of Ashad-Uz-Jaman Kazi *et al.* (2021) ^[2], who monitored the pest on a monthly basis throughout the year at a silviculture nursery and was reported that 20 percent and 22 percent infestation of leaf roller during August and November 2021 and it was declined upto 2 percent during March to June. It was declined upto 2

percent. While both studies concurred, that larval activity increased sharply from July onward and remained minimal during the early months of the year. The present study neither conducted on silviculture nor extended observations beyond the first week of October and therefore could not confirm whether infestation continued to rise toward a later

peak, as reported by Kazi *et al.* (2021)^[2] for December. This discrepancy may be attributable to differences in geographic location, prevailing climatic conditions, or possibly to species-specific or site-specific or stage/age of plant variation in pest phenology, and does not necessarily indicate a contradiction between the two studies.



Plate 1: Bamboo leaf roller, *Pyrausta coclesalis*



Plate 2: Infested leaves of bamboo, *Bambusa vulgaris*

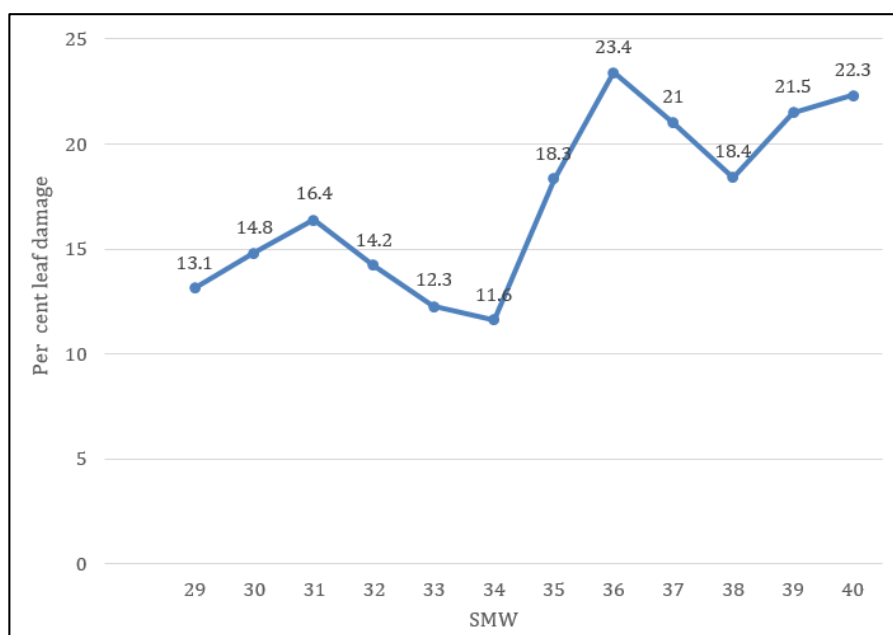


Fig 1: Seasonal abundance of Bamboo leaf roller

Table 1: Seasonal incidence of Bamboo leaf roller, *Pyrausta coclesalis* during 2025-26

Sr. No.	Date of Observation	SMW	Percent leaf damage (%)	Rainfall (mm)	No of Rainy Days	Temperature °C		Relative Humidity (%)		BSH (hrs)	Wind Speed (km/hr)	Evaporation (mm)
						Max.	Min.	Mor.	Eve.			
1	18-07-2025	29	13.1	216.8	2	35.7	24.4	71.9	58.7	3.4	5.0	3.5
2	25-07-2025	30	14.8	82.8	3	36.1	24.5	75.0	65.1	1.3	5.0	3.3
3	01-08-2025	31	16.4	85.4	4	33.1	23.3	81.6	69.6	1.3	4.0	2.8
4	08-08-2025	32	14.2	7.8	0	32.7	21.2	77.9	68.9	2.9	6.8	4.8
5	15-08-2025	33	12.3	9	1	33.7	22.9	82.6	69.6	2.2	5.3	5.7
6	22-08-2025	34	11.6	136.2	4	35.3	24.5	77.1	69.9	3.4	4.6	3.4
7	29-08-2025	35	18.3	34	3	33.5	23.8	74.0	54.0	7.2	5.2	3.1
8	05-09-2025	36	23.4	40.8	2	33.7	23.5	87.8	77.6	2.5	3.8	2.5
9	12-09-2025	37	21	22.8	1	30.3	23.1	89.9	74.7	0.7	3.1	1.9
10	19-09-2025	38	18.4	114.8	6	32.5	23.1	83.0	63.1	2.9	1.3	2.5
11	29-09-2025	39	21.5	79.6	3	32.5	22.1	87.3	62.6	2.9	2.7	2.7
12	03-10-2025	40	22.3	39.2	3	31.9	22.5	93.0	69.9	0.3	3.6	3.2

SMW = Standard Meteorological Week, BSH = Bright Sunshine Hours, Min. = Minimum, Max. = Maximum, Mor. = Morning, Eve. = Evening

Table 2: Correlation of bamboo leaf roller *Pyrausta coclesalis* with weather parameters

Weather parameter	Correlation coefficient (r)	Nature of correlation	Significance (critical r = 0.632, P≤0.05)
Morning relative humidity (RHM)	0.758*	Positive	Significant
Maximum temperature (Tmax)	-0.636*	Negative	Significant
Evaporation (Evapo.)	-0.679*	Negative	Significant
Wind speed (WS)	-0.595	Negative	Non-significant
Rainfall (RF)	-0.357	Negative	Non-significant
Rainy days (RD)	0.090	Positive	Non-significant
Minimum temperature (Tmin)	-0.312	Negative	Non-significant
Evening relative humidity (RHE)	0.246	Positive	Non-significant
Bright sunshine hours (BSH)	-0.189	Negative	Non-significant

Critical r-value = 0.632 at the 5 percent level of significance; n = 10

References

- Anon. Bamboo leaf roller. Plant Bio-Security and Product Integrity. 2016. p. 1469.
- Ashad-Uz-Jaman Kazi, Junayed M, Rahman MZ, Nasreen S, Uddin SMK. Present status and incidence of insect pests of green bamboos in Bangladesh. International Journal of Business, Social and Scientific Research. 2021;9(3):54-59.
- Banik RL. Bamboo silviculture. In: Liese W, Kohl M, editors. Bamboo-The Plant and Its Uses, Tropical Forestry Series. Hamburg: Springer; 2015. p. 113-174.
- Joshi KC, Meshram PB. Pests of bamboos and their control. In: Proceedings of Seminar on Bamboo Silviculture. Jabalpur; 1989. p. 99-107.
- Joshi KC, Roychoudhury N, Kulkarni N, Sambath S. Studies on the bamboo leaf roller, *Crypsiptya coclesalis* (Walker), a major pest of bamboo in Central India. Jabalpur, India: Tropical Forest Research Institute; 2005.
- Kumar A, Chandra G, Singh KP. Relative infestation intensity of bamboo leaf roller *Algedonia coclesalis*. Indian Forester. 2021;147(5):496-499.
- Naithani HB. Contribution to the taxonomic studies of Indian bamboos. Ph.D. Thesis. Vol. I. Srinagar, Garhwal: H.N.B. Garhwal University; 1993.
- Pal R, Roychoudhury N, Joshi KC. *Crypsiptya coclesalis* Walker, a devastating pest of bamboos. My Forest. 1996;32(9):221-223.
- Soderstrom TR, Calderon CE. A commentary on bamboos (Poaceae: Bambusoideae). Biotropica. 1979;11(3):161-172.
- Singh P. Current status of bamboo pests in India. In: Rao IVR, Gnanaharan R, Sastry CB, editors. Bamboos-Current Research. Peechi: KFRI; 1990. p. 190-194.
- Shende NV, Dangore UT, Bagde NT, Rathod VJ. Economic analysis of bamboo cultivation in Nagpur district. Journal of Pharmacognosy and Phytochemistry. 2021;10(2S):91-97.
- Tewari DN. A monograph on bamboo. Dehradun: International Book Distributors; 1992. 498 p.
- Verma RV, Sajeev TV. Insect pest of bamboo in India. INVIS Bulletin. 2012. p. 227-246.
- Wang H, Verma RV, Xu TS. Insect pests of bamboo in Asia: an illustrated manual. Beijing: INBAR; 1998.