

Seasonal occurrence of teak skeletonizer *Eutectona machaeralis* (Walker) (Lepidoptera, Crambidae) on *Tectona grandis* L. (Lamiaceae) in Saharanpur, Uttar Pradesh, India

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ABSTRACT: A field survey of teak trees grown along roadsides and in farmer's fields conducted in Saharanpur, Uttar Pradesh, during 2023-2024, revealed a considerable infestation of teak skeletonizer, *Eutectona machaeralis* (Walker). The incidence of *E. machaeralis* was recorded in the fifth week of May, i.e., 42 standard meteorological week (SMW). The population of *E. machaeralis* started to increase gradually from the first week (27th SMW) of July in both the years and reached its peak level in the fifth and first weeks (31st and 32nd SMW) of July and August, which started to decline from the second week (33rd SMW) of August and reached its lowest level in the fourth week (48th SMW) of November. The population was nil in the month of December during 2023 and 2024. The higher population was recorded during the year 2023 as compared to 2024. © 2026 Association for Advancement of Entomology

KEY WORDS: Incidence, peak level, May - December, larval population, damage per leaf

INTRODUCTION

Teak, (*Tectona grandis* Linn) commonly known as Sagun and Sagwan is an economically important plant of the family Lamiaceae. It is a large deciduous tree that demands proper light and is very sensitive to drought, coppices, frost, and pollards (Troup, 1921a). Teak is one of India's most valuable commercial timber trees. The high oil content and toxic substances make it highly durable. It is commonly used in ship, bridge, and wharf construction, as well as carpentry and military applications. Besides these utilities, teak is very susceptible to damage by insects in teak plantations and nurseries (Dhobe *et al.*, 2014). Teak naturally

grows in India below 24° N latitude in Kerala, Andhra Pradesh, Karnataka, Orissa, Madhya Pradesh, Maharashtra, Gujrat, Rajasthan, Uttar Pradesh, and Manipur (Troup, 1921b). Teak is one of the most durable timbers in the world; it is practically impervious to fungus and white ant attack and resistant to decay (Palanisamy *et al.*, 2009). In India, teak trees are infested with approximately 187 different insect species (Hutacharim and Tubtim, 1995). The worst leaf-feeders are the teak skeletonizer *Eutectona machaeralis* Walker (Pyralidae) and the teak defoliator *Hyblaea puer*a Cramer (Hyblaeidae), both of which are abundant and cause significant damage to the teak trees (Tripathy, 2022). The teak

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skeletonizer is named for its ability to transform the entire leaf into a skeleton, preserving the veins. Teak skeletonizer is a significant pest on teak plantations, nurseries, and forests, feeding on leaf green matter, leaving veins intact, and feeding on leaves of all qualities until natural leaves fall (Roychoudhury and Mishra, 2021). The present study aims to describe the seasonal occurrence of teak skeletonizer in Saharanpur U.P., India. No such study is carried out in this region before.

MATERIALS AND METHODS

The present study was conducted from May to December 2023–2024 in district Saharanpur, Uttar Pradesh, India. Saharanpur is a city in the state of Uttar Pradesh in northern India which is located at 29°58'1.4844"N; 77° 33' 3.6612" E. Field surveys were conducted on teak plants (approximately 5 years old) planted along the road sides on Janta Road as well as in farm lands. The leaves of the teak plants were severely infested with larvae of the teak skeletonizer, *Eutectona machaeralis* causing skeletonization. To record the seasonal incidence ten infected teak plants were selected and weekly observations were made on the larval population. Data on the seasonal population trends of larvae, percentage of infestation, mode of feeding, and damage per leaf were observed for two years by qualitative and visual scoring. The mean values and standard errors of the collected data were calculated and compiled using Microsoft Excel. Photographs of the egg (Fig. 1), larvae (Fig. 2), pupae (Fig. 3), adults (Figs. 4, 5), and damage (Fig. 6) on the host plants were taken with the help of a digital camera. The daily meteorological data, like temperatures (°C), rainfall, and relative humidity (RH), were taken from HRI and the Training Centre, Saharanpur.

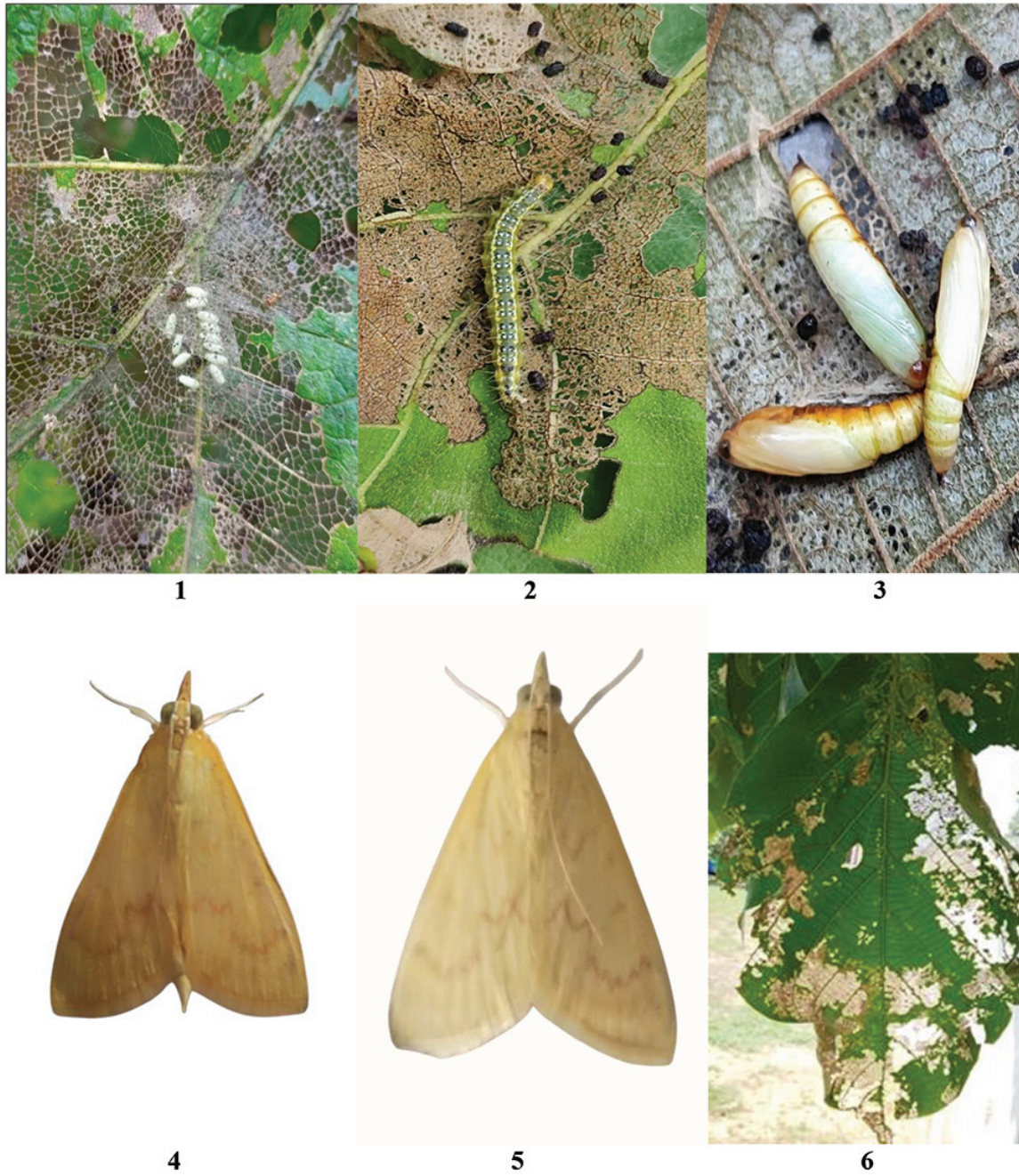
RESULTS AND DISCUSSION

The seasonal occurrence of the teak skeletonizer, *E. machaeralis*, in *T. grandis*, noted from the last week of May until the last week of December in both 2023 and 2024. Initial larval population was observed at 1.3±0.67 and 1.0±0.40 larvae per twig with 2.5 and 1.9 per cent damage/leaf/plant in both

years. The population increased gradually from the first week (27th SMW) of July and was observed to be 3.4±0.51 larvae/twig/plant with 4.10 per cent leaf damage/plant in 2023 and 2.4±0.41 larvae/twig causing 3.9 per cent damage/leaf/plant in 2024. The population of *E. machaeralis* reached up to 11.9±0.73 larvae/twig/plant with 12.30 per cent leaf damage per plant during the year 2023 and 10.9±0.56 larvae/twig/plant with 10.21 per cent leaf damage per plant during the year 2024 in the 4th week (30th SMW) of July. The population reached 12.9±0.52 larvae/twig/plant with 14.45 per cent leaf damage/plant in the 5th week (30th SMW) of July during 2023 and 10.9±0.51 larvae/twig/plant with 12.35 per cent leaf damage/plant during the 5th week (30th SMW) of July during 2024. The highest population was 13.2±0.62 larvae/twig/plant with 15.47 per cent leaf damage/plant in the 1st week (32nd SMW) of August during the year 2023 and 12.2±0.52 larvae/twig/plant with 14.91 per cent leaf damage/plant in the 1st week (32nd SMW) of August during the year 2024. In the 2nd week (33rd SMW) of August, the larval population was recorded at 11.5±0.53 larvae/twig/plant with 15.985 per cent leaf damage/plant during the year 2023, whereas it was observed to be 10.5±0.51 larvae/twig/plant with 13.78 per cent leaf damage/plant in 2024. The population started to decline from the 3rd week (34th SMW) of August in both years and reached 7.9±0.51 larvae/twig/plant with 10.10 per cent leaf damage/plant in the 1st week (36th SMW) of September during the year 2023 and 5.9±0.55 larvae/twig/plant with 9.35 per cent leaf damage/plant in the 1st week (36th SMW) of September in 2024. The population increased slightly in the 2nd and 3rd weeks (37th and 38th SMW) of September. The larval count was observed at 9.3±0.62 and 9.7±0.52 larvae/twig/plant with 11.10 and 11.12 per cent leaf damage/plant, respectively, during the years 2023 and 2024. Again, from the 4th week (39th SMW) of September, the population started to decrease continuously till the 4th week (48th SMW) of November during 2023 and 2024. The lowest larval population was observed at 2.1±0.42 larvae/twig/plant with 3.76% leaf damage/plant in the 4th week (48th SMW) of November, 2023, and 1.8±0.47 larvae/twig/plant with 2.98 per cent leaf damage/plant in the 4th week (48th SMW) of

Table1. Seasonal occurrence of teak skeletonizer *E. machaeralis*

Months and week		2023						2024				
		SMW	Larvae/ plant	Leaf damage %	Mean temp. (°C)	Rain fall (mm)	R H (%)	Larvae per plant	Leaf damage %	Mean temp. (°C)	Rain fall (mm)	R H (%)
May	V	22	1.3±0.67	2.5	34.91	93.28	14.12	1.0±0.40	1.9	35.23	92.21	13.13
June	I	23	1.4±0.69	2.7	34.21	94.70	31.23	1.1±0.39	2.1	36.71	90.10	10.21
	II	24	1.6±0.69	3.30				1.3±0.49	2.9			
	III	25	1.7±0.48	3.45				1.3±0.49	3.1			
	IV	26	1.1±0.66	3.52				1.1±0.38	3.4			
July	I	27	3.4±0.51	4.10	30.15	415.45	55.56	2.4±0.41	3.9	30.29	305.62	58.32
	II	28	6.5 ±0.52	6.25				4.5 ±0.53	5.29			
	III	29	8.5±0.51	7.90				6.5±0.55	6.9			
	IV	30	11.9±0.73	12.30				10.9±0.56	10.21			
	V	31	12.9±0.52	14.45				10.9±0.51	12.35			
August	I	32	13.2±0.62	15.47	29.41	354.25	76.90	12.2±0.52	14.91	28.32	310.25	74.32
	II	33	11.5±0.53	15.98				10.5±0.51	13.78			
	III	34	9.5±0.62	11.80				7.5±0.42	10.76			
	IV	35	8.7±0.53	11.71				6.7±0.56	10.31			
September	I	36	7.9±0.51	10.10	28.50	208.39	63.25	5.9±0.55	9.35	29.41	208.39	72.28
	II	37	9.3±0.62	11.10				8.3±0.65	10.25			
	III	38	9.7±0.52	11.12				8.7±0.54	10.35			
	IV	39	8.5±0.48	9.65				7.5±0.51	7.55			
October	I	40	6.3±0.59	8.58	26.49	20.51	61.81	4.9±0.55	6.52	27.67	16.49	60.83
	II	41	5.7±0.62	7.36				4.3±0.45	5.39			
	III	42	5.8±0.49	6.29				4.5±0.49	6.10			
	IV	43	4.9±0.61	5.39				3.9±0.63	4.32			
	V	44	3.9±0.54	5.81				2.9±0.56	3.41			
November	I	45	2.8±0.67	4.81	22.96	4.25	47.84	2.1±0.57	3.98	23.98	14.56	51.61
	II	46	2.5±0.52	4.62				2.1±0.56	3.78			
	III	47	2.3±0.42	4.17				1.9±0.45	3.10			
	IV	48	2.1±0.42	3.76				1.8±0.47	2.98			
December	I	49	0.00	0.00	15.70	25.58	40.51	0.00	0.00	15.32	12.45	30.15
	II	50	0.00	0.00				0.00	0.00			
	III	51	0.00	0.00				0.00	0.00			
	IV	52	0.00	0.00				0.00	0.00			
	Mean			7.77±4.10								



Figs. *Eutectona machaeralis* Walk. - (1) Eggs, (2) Larva, (3) Pupa, (4) Male adult, (5) Female adult, (6) skeletonized leaf of *Tectona grandis*

November, 2024. The population of the pest nil in all the weeks of December 2023 and 2024 (Table 1).

Several authors have studied the seasonal incidence and population dynamics of *E. machaeralis* from various parts of India. As no prior data are available for Saharanpur, existing results from other states are used as a reference. Patil and Thontadarya (1983) noticed the larval activity of *E. machaeralis* throughout the year and also noticed the negligible population from January to March. Similarly, Khan *et al.* (1988) noted peak incidence of *E. machaeralis* during September in Madhya Pradesh. Longanathan *et al.* (2001) observed the activity of *E. machaeralis* throughout the year with two peaks. The above findings are more or less similar to the present findings. Chauhan *et al.* (2013) observed the activity of *E. machaeralis* in the fifth week of May in 2006 and 2007, which reached its peak in the fourth week of July in 2006 and the first week of August in 2007 and declined up to the first week of November. Kabade *et al.* (2015) reported the activity of the teak skeletonizer from April to December in Gujarat. Elsewhere, Wu *et al.* (1979) also reported the similar observations, which were almost similar to our findings. The weather parameters like, monsoon rainfall, cooler nights, and high relative humidity favors larval buildup, while dry and cool winter suppresses activity.

Mode of infestation and damage to the host plant: The infestation begins at the leaf margin; caterpillars gradually skeletonize the leaves to the midrib, and two caterpillars do not feed in the same feeding zone. Only the larval stages of *E. machaeralis* are responsible for the unique skeletonization of leaves. The larvae of *E. machaeralis* consume the green leaf tissue found between the veins, leading to the distinctive symptom of skeletonization (Fig. 6). Partially damaged leaves are not immediately shed, and even completely skeletonized leaves remain on the affected tree for an extended period, giving it a dry, scorched appearance.

Teak skeletonizer *E. machaeralis* is a serious pest of teak plants in Saharanpur, leading to major leaf damage to the teak plants. The highest leaf damage

per plant was observed from 12.30 to 15.98 per cent leaf damage/plant from the fourth week of July to the first week of August during the year 2023 and from 10.21 to 13.78 per cent leaf damage from the fourth week of July to the first week of August during the year 2024. The pest population showed a positive correlation with relative humidity and rainfall, and a negative correlation with maximum temperature.

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