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Short Communication

Effect of weather parameters on the incidence of *Parotis marginata* (Hampson) (Crambidae: Lepidoptera); an emerging threat to crape jasmine, *Tabernaemontana divaricata* (L.)

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Tabernaemontana divaricata (Apocynaceae), commonly known as pinwheel flower, crape jasmine, East India rosebay and Nero's crown. Besides these, it's another name is *milkflower* as the stem exudes milky latex at the time of injury.It is an evergreen shrub native to India and now cultivated throughout South East Asia and the warmer regions of continental Asia. It can be raised as a house/ glasshouse plant because of its attractive flowers and foliage. The plants are also raised as hedges to mark the garden boundaries in the village, urban and city areas. The shrubs flower throughout the year, offering generous amounts of white fragrant blossoms. The waxy blossoms are white five-petal pinwheels that are borne in small clusters on the stem tips. Flowers are commonly used on the occasion of *pooja* in all over India. The plant also contains a variety of alkaloids which has medicinal properties. Although, previously it was reported that the leaves of this plant are eaten by the caterpillars of the oleander hawk-moth (*Daphnis nerii*) but, recently it was found that the *Parotis marginata* (Hampson) (Crambidae: Lepidoptera) causes havoc damage of the plant. Matured caterpillars were pale green with several raised black lumps on each segment, and a yellowish brown head. They lived in a shelter created from curled or joined leaves held with silk and feed from inside by scraping. The adults were yellowish green in colour, with a crenulated brown line around the edges of each wing. The moths had a wing span of about 32 to 36 mm.

Weather plays an important role for determining the geographical distribution and periodic abundance of the insect pests. Among the weather factors; temperature, rainfall, relative humidity plays the crucial role in insect life (Seni and Naik, 2018). Although, some literature are available related with the infestation of *P. marginata* on different host plants (Ahmed *et al*., 1974; Ghirtlahre *et al*., 2015; Chattopadhyay, 2017;Dhabi and Bhatt, 2019). But, no literature is available related with the role of weather factors on the population build up of the *P. marginata* on crape jasmine. For this, an attempt was made to know the role of abiotic factors on the population build up of *P. marginata* on crape jasmine.

The experiment was conducted in the Regional Research and Technology Transfer Station (OUAT), Chiplima, Sambalpur, Odisha, India from 2017 to 2018. The Station is situated at 20°21' N latitude and 80°55'E longitude in Dhankauda block of Sambalpur district at an altitude of 178.8 m above MSL. The climate of the area is warm sub humid.The experiment was conducted on five crape jasmine shrubs of five to six years old. The plants were grown naturally and noplant protection measures were taken during the crop growth period. Observations on the incidence of *P. marginata* in terms of folded leaves per 30 leaves randomly selected per plant were recorded at weekly interval. Then percentage of folded damage leaves were worked out by using the formula:

FDL% = Number of infested leaves/ Total number of leaves observed × 100.

The data on weather parameters during the experiment were taken from the meteorological observatory located in the RRTTS, Chiplima. The influence of weather factors on the incidence of *P. marginata* on crape jasmine was analyzed by correlation analysis and then regression analysis was done by using SPSS 16 statistical software.

The data on the seasonal incidence of leaf folder damaged leaves were worked out for the year 2017 and 2018. From the Fig.1 it was found that the infestation of *P.marginata* initiated from July month (28th SMW) and peak infestation occurred in October-November month (42nd to 47th SMW). Ahmed *et al*. (1974) reported that *P. marginata* attacked *Alstonia scholaris* in nursery and responsible for rolls and skeletonized the leaves, ultimately retarding the growth of the plant. They further observed that in the field, larvae were present from March to October in the Chittagong

Table 1: Correlation between folder damage leaves in crape jasmine and abiotic factors

Weather parameters	Correlation coefficient (r)
Max. temp. (^{0}C)	-0.043
Min. temp. (^{0}C)	-0.382
Morning Relative Humidity (%)	-0.226
Evening Relative Humidity (%)	-0.213
Rainfall (mm)	-0.505*

*-Significant ($p<0.05$)

Table 2: Regression analysis of *P. marginata* incidence with different abiotic factors

Insect	Variable*	R^2	p-value
P. marginata	Max. temp.	0.002 (0.20%)	0.851
	Min. temp.	0.146 (14.60%)	0.079
	Rainfall	0.256 (25.60%)	0.016
	MRH%	0.051 (5.10%)	0.313
	ERH%	0.045 (4.50%)	0.342

*MRH: Morning Relative Humidity, ERH: Evening Relative Humidity

area of Bangladesh. Chattopadhyay (2017) noticed that *P. marginata* attacked *A. scholaris* plantation in Ranchi, Jharkhand from the 3rd week of June to 1st week of December and maximum leaf infestation occurred in the month of August. Ghirtlahre *et al*. (2015) observed that *P.marginata* infested sapota plant and feeding the leaves from December to January in Bilaspur, Chhattisgarh. Dhabi and Bhatt (2019) observed that the incidence of larval feeding started from fourth week of July in tagar and continued till fourth week of October in the year 2018 in Anand, Gujarat and maximum damage by the larvae was noticed in the month of August. But, here at Chiplima, Sambalpur, it is observed that maximum damage caused by the larvae was in October -November months in crape jasmine.

The correlation co-efficient between leaf folder infestation and pooled weather parameters of the year 2017 and 2018 were worked out (Table 1). The results showed that the maximum and minimum temperature, morning and evening relative humidity and rainfall had negative correlation with leaf folder incidence. However, none of the correlation coefficient was found significant except rainfall.

Regression analysis was worked out to investigate,among different abiotic factors which factor

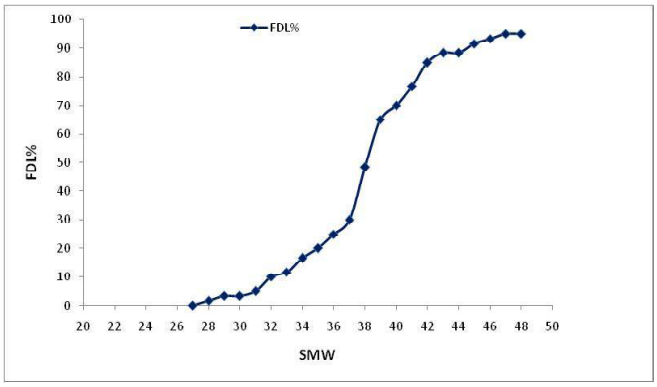

Fig 1: Seasonal incidence of leaf folder in crape jasmine along with standard meteorological week (Pooled of 2017 and 2018)

contributed the most to the variation of leaf folder incidence (Table 2). Step wise regression analysis showed that the rainfall significantly contributed 25.6% variation of leaf folder incidence.

The *P. marginata* also reported from the forest tree in the Konkan region of Maharashtra, Koraput and Ganjam in Odisha, Idukki region in Kerala, Yercaud and Coimbatore of Tamil Nadu, Sikkim, Calcutta, Travancore, Ceylon, Nicobars, Solomons and from the mangroves of Diu Island in India (Ghorpade and Patil, 1991;Kirti *et al*., 2016; Rathikannu and Chitra, 2017; Mathew *et al.,* 2018). Caterpillar caused the damage by joining leaves with silken threads and feeding from inside by scraping. Gradually, almost all the leaves are infested and later leaves were dried and found hanging from the shoots. The affected plants could not produce any flowers. So, it failed to fetch a market price as well as reduce the aesthetic value of the garden. It is also noticed that only one larva dwelled in each folded leafwhich indicated larvae may be solitary in nature.During experimental period, no pupa was observed in the infested plant but in laboratory rearing, it is observed that the caterpillars pupate in their shelter. It means pupation occurred away from the plant in field and may be in soil. Similar observation was recorded by Ahmed *et al*., (1974) who found that pupation of *P. marginata* occurred in soil.

The moth, *Parotis marginata* (Hampson) being reported for the first time, causing havoc damage to the crape jasmine, *Tabernaemontana divaricata* at the Chiplima, Sambalpur, Odisha. Suitable management practices should be followed as and when the first appearance of this pest is occurred on this crop. Emphasis should be given to find out natural enemies of the pest locally and conserve them.

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