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Infestation of gallery worm, *Elasmopalpus jasminophagus* in *Jasminum nitidum*

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Abstract

A field experiment was conducted to assess the pest infestation in flowers of clonal selection (Acc. Jn-1) of the underutilized jasmine, *Jasminum nitidum* selected at TNAU. Jasmine (*Jasminum* spp.) belonging to the family Oleaceae is one of the commercially significant flower crops of India. India is the largest producer of jasmine, of which 80 per cent is being contributed by Tamil Nadu. Activity of gallery worm was recorded for five months from February, 2017 to June, 2017 with the highest infestation of 14.94 per cent during May, 2017 and the minimum infestation upto 6.07 per cent during February, 2017. Compared to *J. sambac*, gallery worm infestation was recorded to be minimum in *J. nitidum*.

Keywords: *Jasminum nitidum*, gallery worm, *Elasmopalpus jasminophagus*, infestation, Jasmine

1. Introduction

Commercial floriculture in India comprises of both the modern and the traditional groups of flowers. Among the traditional flowers, jasmine occupies a significant place. Besides being a popular fragrant loose flower and highly preferred garden plant, jasmine is also used for production of jasmine concrete, which is used in cosmetic and perfumery industries. Jasmine oil has a wide range of medicinal applications and is used in perfumery, soaps, flavouring and cosmetic industry reported by Lawless [5].

Among the large number of species existing, only three species (*J. sambac*, *J. grandiflorum*, *J. auriculatum*) have attained importance in commercial cultivation Rimando [6]; Green and Miller [4]. However, these three species do not produce flowers during the off-season from December to March. Preliminary research taken up at TNAU has indicated that besides the above species, few more species namely, *J. calophyllum*, *J. nitidum*, *J. rigidum*, *J. flexile* and *J. multiflorum* (Syn: *J. pubescens*) possess economic importance since they produce flowers which are suitable for use as loose flower and the plants of these species are suitable for use as fragrant flowering garden plants. The above species have the added merit of flowering throughout the year Ganga *et al*, [3] unlike the three popular commercial species namely, *J. sambac*, *J. grandiflorum*, *J. auriculatum* besides being relatively free from major pests and diseases.

J. nitidum flowers throughout the year and hence flowers of these species would be available during the lean-season or off-season of the commercial species. *Jasminum nitidum* is synonymous with *J. laurifolium*. It is a fragrant flowering shrub that can also be grown as a twining vine. The white flowers are multi-petalled and fragrant. They appear in clusters on the ends of new growth during any time the plant is actively growing. Leaves are dark green and glossy, making the plant attractive even when not in bloom. Individual flowers are two inches across. The buds are bold and bright pink and open flowers are pure white and star shaped due to the lanceolate corolla lobes. The flowers possess mild fragrance and the plants are relatively free from major pests and diseases.

Gallery worm, *Elasmopalpus jasminophagus* is a devastating pest in *J. sambac* cultivation. Caterpillars make tunnels of silk on the flower buds and their excreta are seen on the flower buds, which affects the flower quality considerably. The present study was undertaken to assess the degree of damage caused by gallery worm in *J. nitidum*.

2. Materials and Methods

The present study was carried in the Botanical Garden at the Department of Floriculture and Landscaping, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore. Well grown *J. nitidum* bushes maintained under normal agronomic

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practices were observed regularly for gallery worm infestation. From each bush, five twigs containing flower buds were selected at random. From these selected twigs, the total number of flower buds and the number of flower buds showing infestation due to gallery worm were recorded and gallery worm damage per cent was calculated.

$$\text{Gallery worm infestation (\%)} = \frac{\text{Number of infested buds}}{\text{Total number of buds}} \times 100$$

3. Results and Discussion

Though *J. nitidum* plants were infested by fewer pests compared to commercially cultivated jasmine species, it is important to document the pests and develop suitable plant protection measures to avoid loss in flower yield and quality. Trehan [7] has published the description of jasmine gallery worm on wild jasmine. David [2] reported that *E. jasminophagous* attacked the buds, usually living outside the buds in tunnels of silk and excreta. Amutha [1] reported that *E. jasminophagous* has a greater preference to *J. auriculatum*. The various stages of *E. jasminophagous* were documented in this study (Plate 1). The egg period was two days. The eggs were creamy and laid on the leaf surface in groups. The neonate larva was tiny, creamish green and lasted for 1 to 2

days. The second instar larva was greenish in colour and lasted for 1 to 2 days. The third instar larva had lateral brown streaks along the body and it also lasted for 1 to 2 days. The fourth instar matured larva was reddish brown in colour and lasted for 2-3 days. The larva exhibited fast wriggling movement when disturbed. The pupa was obrect, brown and spindle with a blunt anterior and a pointed posterior end and emerges into adult in 7 to 8 days. The adult moths were small and grey. The males were smaller than the females. The adult males lived for 6 to 7 days and the females for 7 to 8 days. Early stage larvae were found feeding inside the pollen grains. Later instars caused damage to floral parts *i.e.*, anthers, stamens, pollen grains and also scraped the inner petals and formed holes on flower buds. Grown up larvae were found inside the corolla. Gallery worm infestation resulted in drying of infested buds. Gallery worm pupated outside the flower buds and on leaves. (Table 1.) Gallery worm infestation rates were recorded to be 6.07, 11.03, 8.63 and 14.94 per cent during the months of February, March, April and May, 2017 respectively with the highest infestation during the month of May, 2017 (14.94 %) and the minimum infestation was observed during February, 2017 (6.07 %). Infested flower buds were fastened together with silk and frass materials.

Table 1: Incidence of gallery worm, *E. jasminophagous* and percent flower damage in *Jasminum nitidum*

Months	Incidence of gallery worm and flower damage percent											
	March, 2017	April, 2017	May, 2017	June, 2017	July, 2017	August, 2017	September, 2017	October, 2017	November, 2017	December, 2017	January, 2018	February, 2018
Incidence of <i>E. jasminophagous</i>	✓	✓	✓	x	x	x	x	x	x	x	x	✓
Flower damage (per cent)	11.03	8.63	14.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.07

P: Infestation

X: No Infestation

Symptoms of damage

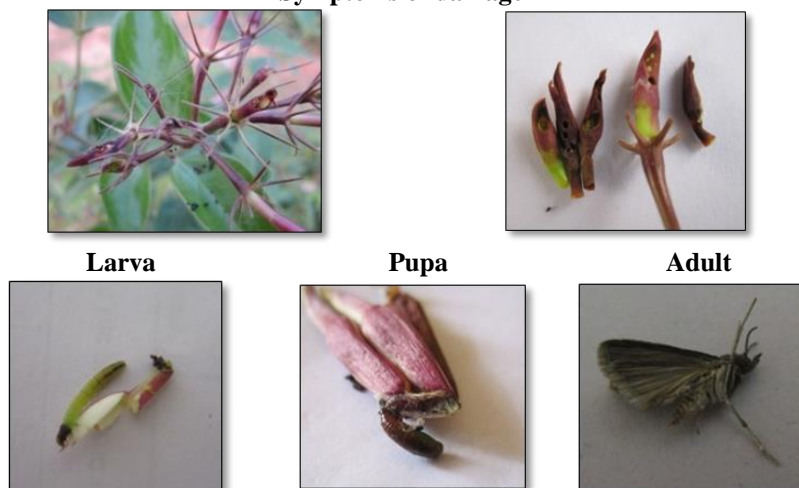


Plate 1: Symptoms of damage and stages of development of *Elasmopalpus jasminophagus* in *Jasminum nitidum*

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