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First record of *Parotis marginata* (Hampson) [Lepidoptera: Pyralidae] on Tagar, *Tabernaemontana divaricata* (Apocynaceae) at Anand, Gujarat, India

MV Dabhi and NA Bhatt**Abstract**

An investigation based on monitoring of the ornamental crop for the occurrence of invasive alien insect pest was carried out followed by roving survey in the year 2018 at S. M. Polytechnic in Agriculture, BACA, Anand Agricultural University, Anand (Gujarat). A first-time incidence of *Parotis marginata* (Hampson) [Lepidoptera: Pyralidae] was noticed on Tagar, *Tabernaemontana divaricata* (Apocynaceae). The incidence of larva/leaf observed during the survey which showed more than 90 per cent damage and failure to the further growth. The mini tagar as well as regular tagar shrubs were affected by this pest which showed cent per cent leaf damage with one larva in each folded leaf per plant. The heavy infestation to almost all the affected leaves which showed dried and scorching burning effect that leads to accidental fire and death of the plant, if not treated with chemicals.

Keywords: *Parotis marginata* (Hampson), Tagar**1. Introduction**

Moths and butterflies are strongly associated with vegetation structure and composition, which makes them a suitable indicator for various ecological studies ^[1]. They showed highly sensitivity to the environmental change ^[2] and proved to be powerful indicator of forest disturbance ^[3]. Some of the lepidopteron insects are regular and potential pest of trees and shrubs in forest-based ecosystem. Due to rapid urbanization and deforestation, an invasive alien species likely to established outside of its natural past or present distribution, whose introduction and/or spread threaten biological diversity. Tagar, *Tabernaemontana divaricata* of family Apocynaceae plants are grown as hedges to mark the garden boundaries in the village, urban and city areas. These shrubs are extensively and regularly raised in the garden to increase aesthetic values. Our mandatory work is to monitor and survey of different horticultural/ornamental crops raised near colleges gardens at campus of Anand Agricultural University, Anand. Among these, tagar plant was found to be severely attacked by greenish blue colored caterpillars initially sheltered inside the rolled leaves and the shrubs were completely dried up in the later stage. These caterpillars were collected and brought in to the laboratory for the further study.

2. Materials and Methods

The present investigation was conducted to monitor the activity of different insect pests of horticultural/ornamental plants during *kharif* 2018 at S. M. C. Polytechnic in Agriculture, BACA and near by vicinity area of Anand Agricultural University, Anand, Gujarat. During the roving survey, new lepidopteran pest of sub family Pyralid was found infesting leaves of tagar plant. The larval samples were collected from a shrub plant grown area in the garden and road boundaries which brought to the laboratory for further rearing purpose. The critical study and observation were taken which showed that it was first time infesting tagar plant so that it sent for detailed identification. For this purpose the larva were reared in the laboratory condition. The larvae were put in the aluminum bowl which covered with muslin cloth. The larvae were provided new food after every 3 to 4 days interval. The larva made leaf folds in which the pupa was observed. The adults were collected, pinned and dried them following standard procedures. There were total 20 pinned, properly spread and dried specimens sent to Network Project on Insect Biosystematics, Division of Entomology, ICAR- IARI, New Delhi -110012

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for identification.

3. Results and Discussion

The larvae collected from the tagar plant were reared in the laboratory up to adult stage. The adults were identified as *Parotis marginata* Hampson under the family Crambidae and order lepidoptera.

3.1 Taxonomic tree

Domain	:	Eukaryota
Kingdom	:	Metazoa
Phylum	:	Arthropoda
Subphylum	:	Uniramia
Class	:	Insecta
Order	:	Lepidoptera
Family	:	Pyralidae
Genus	:	Parotis
Species	:	<i>Parotis marginata</i>

3.2 Other scientific names

Cenocnemis marginata Hampson

Glyphodes marginata

Margaronia marginata Hampson

(<https://www.cabi.org/isc/datasheet/44713>)

The moth, *Parotis marginata* (Hampson) [Lepidoptera: Pyralidae] found to be first time causing severe damage to a shrub, Tagar, *Tabernaemontana divaricata* (Apocynaceae) commonly called pinwheel flower and crape jasmine, is an evergreen shrub native to India and now cultivated throughout South East Asia and the warmer regions of continental Asia. The color of the larva was bluish green (Fig. 1, Plate I a, b). The pupa is medium to small and light to dark brown in color (Fig.1, Plate II a,b,d). Larva pupate in a light brown earthen biomass cocoon (Fig.1, Plate II c) in the laboratory rearing culture. The adult having a greenish parrot like color (Fig.1, Plate III a,b,c,d). The female moth has black hair like structure at the tip of its abdomen (Fig.1, Plate III b). The tagar plants grown as hedges and solitary were examined at the university campus, Anand Agricultural University, Anand (Gujarat) which showed noticeable leaf infestation (Fig.1, Plate IV c).

The incidence of larval feeding observed from fourth week of July to fourth week of October in the year 2018. The infestation started from the apical whorl of leaves and the tiny larva was found to feed on the tender leaves by scraping the epidermal surface which later on imparting irregular web like appearance on the apical leaves. Young larvae (Fig.1, Plate I c) were found to construct their shelters by folding the leaf edges longitudinally with their saliva starting from the top of the leaves (Fig.1, Plate I b). Mature larvae were found to tie the lateral margin of the entire leaf together with the silk material (Fig.1, Plate I b). After consuming the entire epidermal tissue, larvae change the old leaf folds and start feeding on new leaf. Larvae were found singly in the folded leaves and sometimes they made their shelter by spinning two leaves together. It was noticed that the last instar larvae constructed their shelter by spinning leaves together in a congregated manner and pupated in this shelter (Fig.1, Plate II b). The similar type of observation was recorded which mentioned that saptarni, *Alstonia scholaris* (normally found in mixed deciduous forests and has only recently been grown in nurseries and plantations for the sake of its wood) is attacked by *P. marginata*, which rolls and partly skeletonized

the leaves, retarding the growth of the tree so much as to make it unsuitable for transplanting into forests [4].

The similar types of observation are also recorded by different scientists on various other host trees which showed conformity with this research study. The larval infestation of Alstonia leaf folder, *P. marginata* was recorded for the first time in the devil tree plantation in the Birsa Agricultural University, Ranchi [5]. The Leaf folder insect was noticed from the 3rd week of June to 1st week of December. Maximum leaf infestation was observed in the month of August. Brief descriptions of the damage caused by the three major groups of forest insect pests in Bangladesh viz., nursery pests; plantation pests; and wood and timber pests among the leaf rollers such as *P. marginata* were also noted in Chittagong, Bangladesh [6].

After opening the several leaf folds it was noticed that only one larva along with its fecal matter was found in each fold (Fig.1, Plate I c), which indicated larvae may be solitary feeder (Fig.1, Plate I a). During heavy infestation, almost all the affected leaves were dried and found hanging from the shoots exhibiting scorching burning effect due to accidental fire (Fig.1, Plate IV, c). Maximum damage by the larvae was noticed in the month of August when all the dried leaves dropped down due to heavy rain which making even the younger trees leafless. At the initial stage, leaf roll damage done by larvae of *P. marginata* (Fig.1, Plate IV b) was observed in new leaf. Later on incidence of larvae/leaf covered whole plant which lead to more than 90 per cent damage (Fig.1, Plate IV a, c & d) and failure to the further growth. The mini tagar as well as regular tagar shrubs were affected by this pest which showed cent per cent leaf damage with one larva in each folded leaf.

The lepidopteran fauna of Central and Southern Bhutan suggested that the 182 species belonging to families Crambidae and Pyralidae of which *P. marginata* noticed in a district like Mendrelgang, Damphu, Dagana, Gelephu [7]. The *P. marginata* reported among the most commonly occurring species of insect pest infesting forest tree in the Konkan region of Maharashtra (India) [8] while, the same insect was also observed first time on sapota from the T.C.B College of Agriculture Bilaspur, Chhattisgarh (India) [9]. The high altitude and favorable conditions of northern Maharashtra has an abundant and diverse flora and fauna. The region has a wide variety of insects which also showed occurrence and report of this pest, *P. marginata* (Order: Lepidoptera) from Nasik, Jalgoan and Nandurbar as uncommon species [10]. Diversity of moths Lepidoptera in the Guptaeswar proposed reserve forest area of Eastern Ghat hill, Koraput district, Odisha, India revealed that total 30 species of moths under 27 genera and 7 families of which *P. marginata* of Crambidae was first time reported [11]. The moth belongs to Superfamily: Pyraloidea, Family: Crambidae and Sub family: Spilomelinae species: *P. marginata* was reported from vagamon hills (Western Ghats), Idukki district, Kerala, India [12]. The moth *P. marginata* of Lepidoptera, reported for the first time from the mangroves of Diu Island [13]. Inventory of moths of subfamily Pyraustinae (Crambidae) from state of Sikkim revealed that distribution of *P. marginata* was observed in Sikkim, Cachar, Ganjam, Calcutta, Travancore, Ceylon, Nicobars and Solomons [14]. A preliminary study on the occurrence of crambid moths revealed that the location of *P. marginata* was noticed at Yercaud and Coimbatore of Tamil Nadu [15].

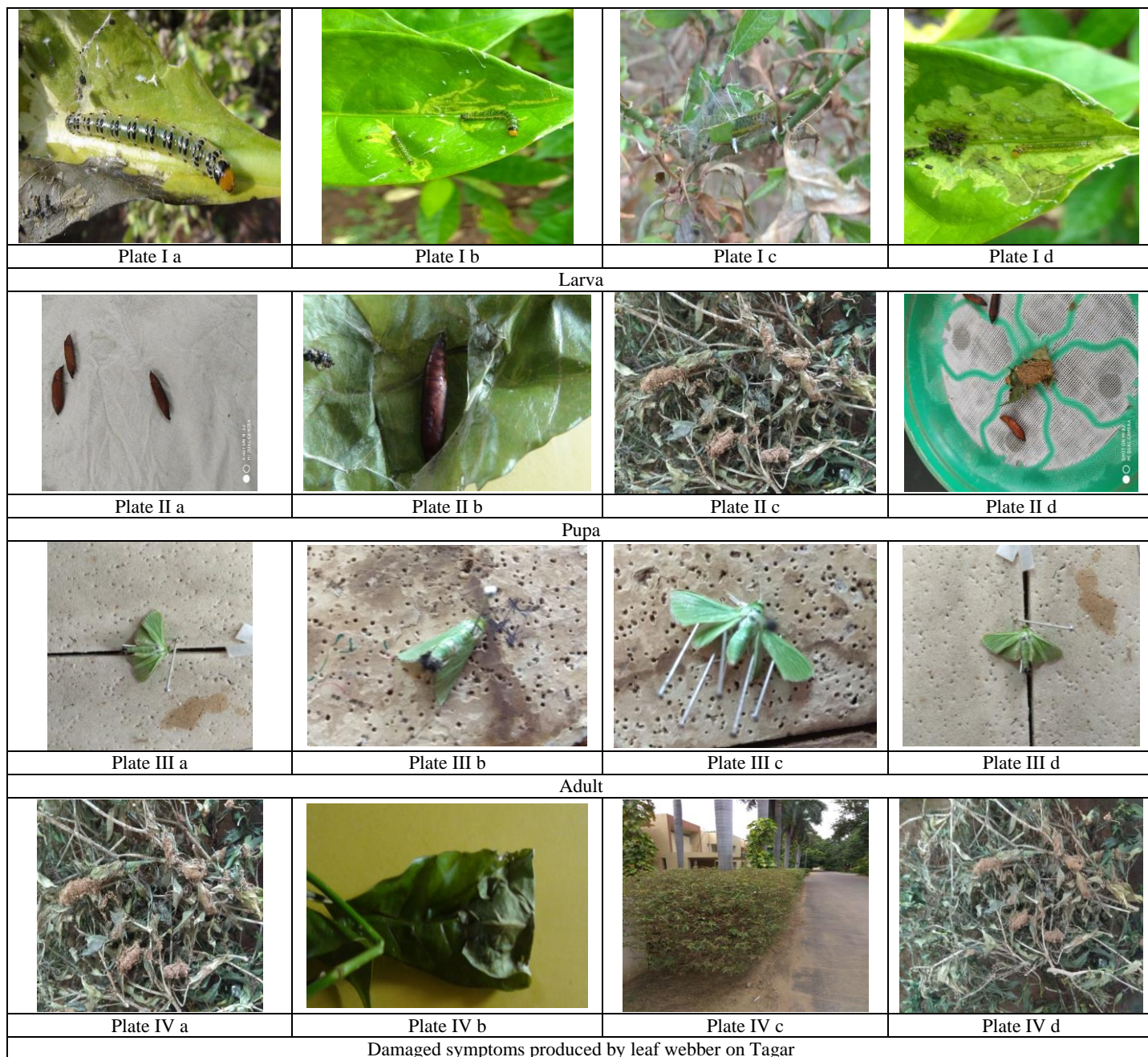


Fig 1: Different life stages and nature of damage by *Parotis marginata* (Hampson) on Tagar

4. Conclusion

The moth, *Parotis marginata* (Hampson) found to be first time causing severe damage to a shrub, Tagar, *Tabernaemontana divaricata* (Apocynaceae) in the Anand region of Gujarat state, India. The young larvae were made shelters by folding the leaf edges longitudinally with their saliva starting from the top of the shrub leaves which leads to damage to garden plants. The heavy infestation to almost all the affected leaves showed dried and scorching burning effect that lead to accidental fire in the garden area. The plants were dried and died due to attack of this pest which also reduced beauty and quality of the garden drastically. The heavy damage also required the cultural as well as plant protection management strategy to manage the pest.

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