

## Biology of the Poinciana Looper, *Pericyma cruegeri* (Butler) on Guam

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### Abstract

The poinciana looper, *Pericyma cruegeri* was introduced on Guam in 1971. Since then it has become a serious pest of royal poinciana (*Delonix regia*) and yellow poinciana (*Peltophorum pterocarpum*) trees. Its distribution, host plants, type of damage, life cycle and natural enemies on Guam are presented.

The poinciana looper, *Pericyma cruegeri* (Butler) is one of the recently introduced pests to Guam which defoliates selected trees. It could have been accidentally introduced either in the egg or pupal stages on royal poinciana, *Delonix regia* (Bojer) Rafinesque, cuttings and seedlings or by gravid females entering on military or civilian airplanes. Like other introduced pests, *P. cruegeri* has found the favorable tropical climate, availability of abundant host material and the absence of its natural enemies on Guam congenial for its multiplication and has become very destructive to the host trees.

*P. cruegeri* has been recorded in Australia, Borneo and the Philippines (Roxas, 1927), Papua and New Guinea, Thailand, and Tonkin (Szent Ivany, 1963), Kauai Island of Hawaii (Davis, pers. comm.) and in Rota (Hale, pers. comm.). The first outbreak of this pest on Guam (Fig. 1) was noted in July 1971 at Ipan and Inarajan. Subsequently, defoliation of royal poinciana and yellow poinciana trees, *Peltophorum pterocarpum* (DC) Backer, was noted at Barrigada, Mangilao, Dededo and Yigo in November.

During 1972, the first defoliation of royal poinciana was noted at Ipan in June. Later, defoliation occurred at Agana Heights in August and at Mangilao, Barrigada and Tamuning in October.

In February 1973, the poinciana loopers were observed at the Naval Station and Merizo, in April and May at Ipan, Talofofo and Piti, and in July thru October at Agana, Barrigada, Mangilao, Piti, Agat, Tamuning, Maina, Sinajana, Chalan Pago, Ordot, and Agana Heights. In early 1974, the loopers were found all over the island defoliating poinciana trees.

On Guam, *P. cruegeri* has been noted to feed only on *Delonix regia*, *Desmanthus virgatus* (L.) Willd. and *Peltophorum pterocarpum* (DC) Backer. However, Szent Ivany (1960) reported the larvae of *P. cruegeri* feeding on young leaves of *Cassia fistula* L. and *Leucanea leucocephala* (Lam.) Dewit [= *L. glauca* (L.) Benth.] in

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Fig. 1. Map of Guam.

addition to *D. regia* and *P. pterocarpum* [= *P. ferrugineum* Benth.]

Infestations of the poinciana looper caused complete defoliation of the host trees. The larvae (Fig. 2) were found feeding on the leaflets and left bare rachises (Fig. 3). The mature larvae pupated in concretions covered with a greyish white web and leaflets on the rachises. If the host trees were defoliated before the larvae reached the stage when they were ready to pupate, they crawled down or dropped off the bare trees and crawled around the surrounding areas looking for food. In the process, they crawled upon nearby plants and entered nearby houses and other buildings.

In most cases, complete defoliation occurred whenever there was an infestation. Many times reinfestation occurred when the trees produced new foliage after initial defoliation.

Continuous defoliation of tree has caused (a) smaller leaves in the regrowth, (b) dying of small branches, (c) secondary infestations by bark borers and fungus diseases, (d) general reduction of vigor of the trees and (e) skipping of flowering seasons.

In 1971, a survey was undertaken to note the occurrence of natural enemies of *P. cruegeri* on Guam. A tachinid, *Exorista civiloides* (Bar.) was found parasitizing the pupae. However, the parasitization by this organism did not exceed one percent. A preying mantis, *Hierodula patellifera* (Serville) has been noted in large numbers feeding on the larvae of *P. cruegeri* on most of the royal poinciana trees and a pre-

datory pentatomid bug, *Eocanthrona furcellata* (Wolff) was occasionally noted feeding on the larvae of *P. cruegeri*. In addition, domestic chickens were found pecking on the larvae that crawled down the trees when the trees were completely defoliated.

A general life cycle of *P. cruegeri* in the Philippines was reported by Roxas (1927). In this paper, a detailed description of the various stages in the life cycle has been included and the whole study was carried out at the Plant Industry Division, Guam Department of Agriculture. Larvae and pupae were field-collected and kept

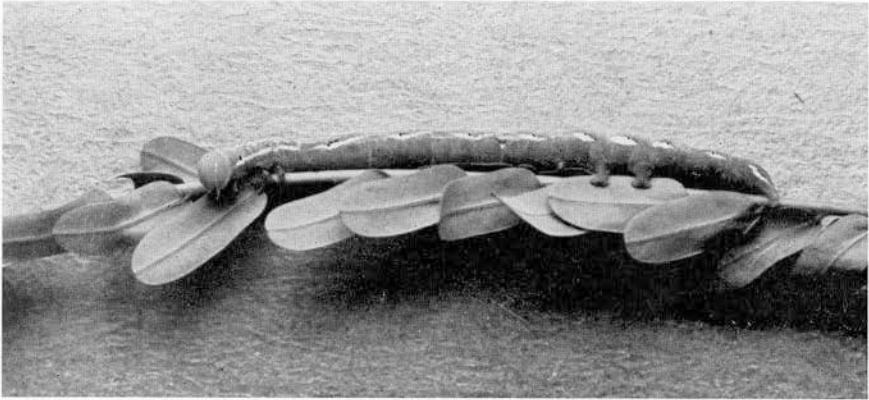


Fig. 2. Fifth instar larva of poinciana looper feeding on the leaflet of royal poinciana.



Fig. 3. Branches and rachises of royal poinciana tree defoliated by poinciana loopers. Many pupal concretions are also seen on the rachises.

in glass jars until the emergence of the adult moths (Fig. 4). After emergence, they were kept in rearing cages and fed with diluted honey solution. The cages were covered with a wet muslin cloth to increase the humidity, thus inducing egg laying of the moths in the laboratory. Tender twigs of royal poinciana were kept inside the cages with the bases dipped in water to induce laying of eggs.

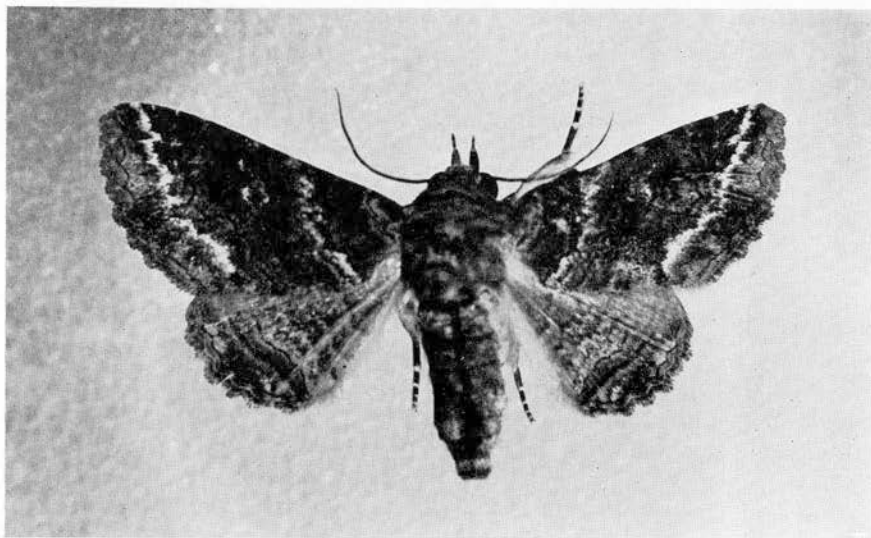


Fig. 4. Adult poinciana looper.

The moths are dark grey in color and are about 3.5 to 4.0 cm in width with the wings extended. There is some degree of variation in color of the individuals even within the same sex. Adult males could be differentiated from the females by the following external morphological differences:

Male: Antenna dilated at the lower  $\frac{2}{3}$ ; in other words, the basal  $\frac{2}{3}$  of the antenna is thicker than the distal  $\frac{1}{3}$ . The femur and tibia of forelegs are thickly covered with long curly hair.

Female: Antenna fairly uniform in thickness and not dilated at the base. The femur and tibia of forelegs are covered with short hair.

Egg laying took place during the night and eggs were laid singly on the leaflets. Rarely, two or three eggs were laid close to each other on a single leaflet. Eggs were semispherical, yellowish-green to bluish-green with longitudinal lines on the outside. The diameter of the egg was 0.7 mm. The incubation period averaged 2.5 days with a range of 2 to 3 days.

The larva that emerged from the egg was yellow and 3.1 mm in length. Because of the atrophied nature of the first two pairs of the abdominal legs, the larva moved by looping. However, it readily started feeding by scraping the flame tree leaflets. The duration of first instar was 5 to 6 days, with an average of 5.1 days. The width of the first instar head capsule was 0.6 mm. (The exuvia after each molt-

ing was used for measuring the width of head capsule). The second instar larva was 12 to 14 mm in length; head capsule width was 0.9 mm. The second instar larva was dark greenish with black dots on the body. The head was yellowish-orange. Duration of the 2nd instar was 3 to 4 days with an average of 3.7 days. The 3rd instar larva was light green with grey and white longitudinal lines on the body. The head was orange with a dorso-median yellow patch. It was 17 to 19 mm in length, averaging 18.5 mm. The width of the head was 1.3 mm. Duration of the 3rd instar was 5 to 6 days with an average of 5.1 days.

The 4th instar larva was light green with five white dorsal and two black lateral longitudinal lines. Head was yellowish-green with 'V' shaped white line on the dorsal side. The 4th instar larva measured 36 to 37 mm in length. The width of the head capsule was 1.9 mm. Duration of the 4th instar was 4 to 5 days, with an average of 4.4 days.

The 5th instar larva was about 5.0 cm in length with a greenish head. The body was green with five white dorsal and two yellow lateral longitudinal lines. On the dorsal side of each spiracle, there was a black patch and below a snow white patch. The color of larvae also varies. Some had a yellowish-green head, but all the five white dorsal longitudinal lines were merged to form a white band on the dorsal side. Laterally, there was a wide prominent black band covering the spiracles.

The general color of larvae varies depending upon the degree of prominence of the white and black longitudinal bands. Duration of the 5th instar varied from 9 to 11 days, averaging 9.9 days.

The prepupal stage lasted for 2 days. During this stage, the larva constructed a globular cocoon by binding the leaflets and rachises with the silken threads around it.

The pupa was chocolate colored, covered with a white waxy coating. At the posterior end of the pupa, there were eight small hooks (four large and four small). These were hooked to the silken threads inside the cocoon. The length of pupa varied from 14 to 20 mm depending upon the nutrition during the larval stage. The pupal period varied from 9 to 12 days with an average of 10.2 days.

On the average, the poinciana looper completed its life cycle in 40 days. In the absence of any drastic fluctuations of physical or biological factors that affect the population of this pest on Guam, it continued to defoliate the host trees all through the year.

To reduce this imbalance and to suppress the population, efforts have been undertaken by the Guam Department of Agriculture to introduce and establish some parasites of this pest on Guam.

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