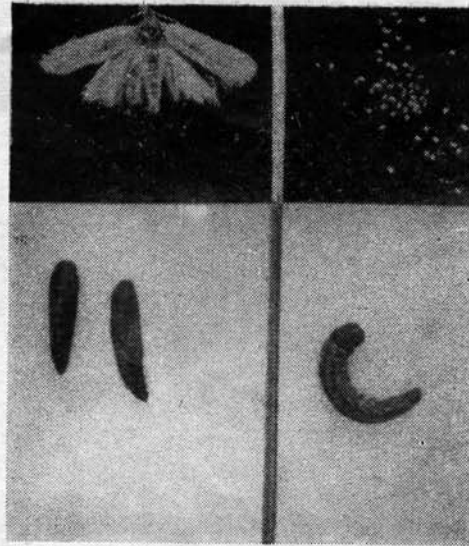


Life history of *Nephantis*



LEAF - EATING CATERPILLAR A PROBLEM IN COCONUT CULTIVATION

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Liberation of parasites on infested palms

THE coconut palm, *Cocos nucifera*, by virtue of its luxuriant growth of green foliage attracts a number of pests particularly caterpillars, bugs, mites, etc. and offers a favourable feeding site for them. Among the caterpillar pests which damage the palm the coconut caterpillar, *Nephantis serinopa* is a serious problem and it is one among the four major pests of the crop. The pest in its larval stage inhabits the lower surface of the leaflets inside galleries made of silken threads, bitten parts of leaf and excreta and food on the green parenchymatous tissues of the leaf. This reduces the functional tissues as a result of which the photosynthetic activity of the palm is reduced, adversely affecting the production of nuts. The leaves are also rendered unsuitable for thatching, fencing and such other uses to which they are generally put.

Coconut is the principal host plant of this pest. But it is also found to attack palmyra, talipot, wild date or toddy palm and some ornamental palms.

The pest is recorded from India, Burma and Ceylon. In India infestation is observed mostly in the coastal and backwater areas and in certain pockets in the interior.

Severity of Infestation

On the west coast of India the pest is present throughout the year but the severity of infestation is more during the hot months of March to May. If the south-west monsoon is delayed pest infestation continues in a serious form in June also. With the onset of rains there is a high mortality of the pest due to fungal and bacterial diseases resulting in a decline in the population. During this period the insect parasites, predators and the mites *Pyemotes ventricosus* multiply in large numbers contributing to the natural control of the pest. But after the rains, in November-December the pest population increases and

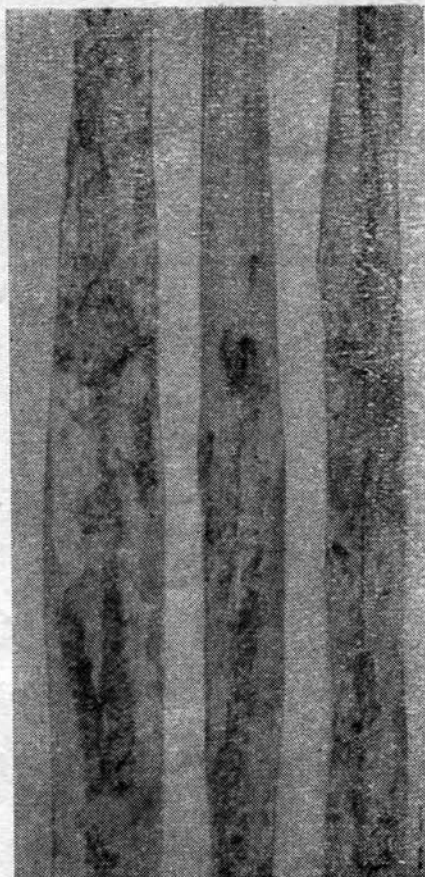
by April-May it attains the peak period.

Life cycle. Moths lay eggs on the lower side of the leaflets which are already infested. Each female lays from 60 to 250 eggs. Eggs hatch in about 5 days. The caterpillars cover themselves with silken galleries and feed voraciously. There are seven larval instars including the pre-pupal stage. After feeding for five to eight weeks they pupate. The pupal stage lasts about 2 weeks and the moths commence egg laying 24 hours after emergence. On the west coast of India the duration of life-cycle from egg to adult lasts about two months.

Control

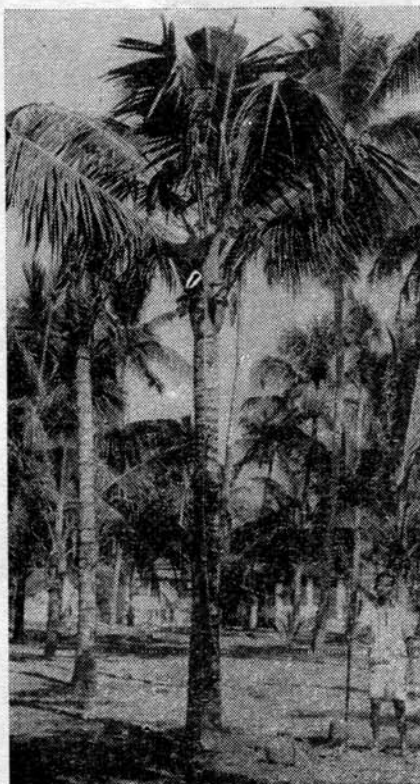
In cases of stray infestation the infested leaflets can be clipped off and burnt so as to prevent further spread of the pest.

Of the various insecticides tried DDT at 0.2 per cent concentration effected satisfactory control of the pest in the west coast of India. For immediate knock down effect BHC 0.2 per cent was an equally efficient insecticide. But because of its less retentive toxicity as compared to DDT the latter is preferred for large scale pest control operations. Sporadic and epidemic outbreaks of this pest could be brought under control by spraying DDT × BHC combination (50:50) at 0.2 per cent strength. In cases of very severe infestations it is advisable to cut off and burn very badly damaged leaves before insecticide is sprayed. Since the pest is lodged in galleries on the lower surface of the leaflets it is necessary that the spray is directed towards the lower surface of leaves, so that the larval galleries may get drenched with insecticide suspension. The organo-phosphorus insecticide like Malathion at 0.05 per cent was also found to be effectively controlling the pest under field conditions. When compared to the persistent DDT and other chlorinated hydro-



Nephantis-infested coconut leaflets showing larval galleries

Spraying of *Nephantis*-infested palms



carbons the less residual Malathion will produce little adverse effect on the beneficial natural parasitic fauna of the pest. The stomach poisons like lead arsenate which are not likely to produce any baneful effect on the parasites are being tried under conditions with a view to evolving an integrated pest control schedule in which chemical and biological control operations can be combined.

In nature this pest is subject to the attack of a number of natural enemies—parasites, predators and pathogens. By mass multiplication, liberation and colonization of some of the important parasites this pest can be kept under check. The important parasites attacking this pest at its larval stage are *Bracon brevicornis*, *Perisierola nephantidis*, *Elasmus nephantidis* and at the pupal stage *Trichospilus pupivora*. All these parasites are being bred and liberated by the zonal parasite breeding stations located in the important coconut growing tracts where *Nephantis serinopa* is a problem. Recently an exotic larval parasite *Spogossia (Stomatomyia) bezziana* was introduced for study from eastern Ceylon and attempts to colonize it in India are under way.

Parasitic Control

Thus, as listed above, there are a number of parasites attacking the pest at its various stages. Those larvae, which may escape attack from the larval parasites and pupate, are likely to be parasitised by the pupal parasites. This is what is known as the sequence theory of parasitic control which is considered to be very effective. There would have been an ideal sequence if the eggs had also been parasitized. But in the case of *Nephantis* no effective egg parasites seem to have been advantageously used so far.

A thorough knowledge of the biotic and physical factors responsible for the seasonal outbreak of the pest in certain pockets is essential to enable the plant protection workers to forecast such outbreaks.