

# STUDIES ON A LEAF FEEDING CATERPILLAR OF SWEET POTATO, *BRACHMIA CONVULVULI* WLSM. (Gelechiidae: Lepidoptera)

A. VISALAKSHI and J. JOHNSON

*Division of Entomology, Agricultural College  
and Research Institute, Vellayani.*

Sweet potato (*Ipomoea batatas*) is one of the important tuber crops cultivated in Kerala. Among the various insects which damage this crop in this state, the leaf folder *Brachmia convulvuli* Wlsm has lately been found to be of common occurrence. This insect was recorded from Canary Islands, South Africa, Comoro Islands, Mauritius, Indo-Malayan regions and Java (Franssen 1934, Fletcher 1932). Fletcher (1932) briefly described the full grown larva and pupa which were found on *Ipomoea turpethum*. No information is available on the biology of this pest and the present paper embodies observations made on the biology and habits of the insect, in Kerala. For making these observations, the insect was reared in the laboratory on tender shoots of sweet potato kept in glass cylinders (12" x 9") with their cut ends dipped in water.

## Life History

The female moth oviposits two days after emergence. Eggs are laid on the undersurface of leaf base in groups packed between the radiating veins. A female moth lays 100-120 eggs in the laboratory.

The egg (Fig. 1) is oblong in shape measuring 0.52 mm in length and 0.23 mm

in width. The surface of chorion is sculptured with longitudinally arranged pits and reticulate ridges. Egg is yellowish white in colour when laid and turns reddish as development progresses; the developing embryo is seen through the transparent chorion. Incubation period lasts 3 days.

The larva undergoes five instars. The first instar (Fig. 2) larva is cream coloured with black head and brownish prothoracic shield. It measures 1 mm in length and 0.15 mm in width. Head and body are sparsely covered with minute hairs. In 2-3 days it moults, giving rise to the second instar larva. Just before moulting, the first two abdominal segments of the first instar caterpillar develop brown colouration. The 2nd instar caterpillar measures 2.5 mm in length and 0.27 mm in width. Head is black and broader than prothoracic segment. Thoracic segments are brownish and ringed with two whitish bands intersegmentally between the three thoracic segments, the posterior band being broader than the anterior one; the thoracic legs also are brownish in colour. The first two abdominal segments of the caterpillar are brown and the third to seventh pale green. Each of the latter segments bear on each side a brownish band rising from the posterolateral corner of the segment,

traverses obliquely to the anterior margin and then meets dorsally. The second instar moults in 3 days. Third instar caterpillar measures 4.5 mm in length and 0.3 mm in width. The colouration of this caterpillar is similar to that of the 2nd instar larva with the exception of the presence in it, of an additional dorsal, transverse, brownish band on each of the abdominal segments posterior to the bands described for the 2nd instar larva. Third instar lasts 2 days. The fourth instar is 6-7 mm in length and 0.5 mm in breadth. In this instar the dorsal side of the 5th abdominal segment becomes completely dark. Black bands appear dorsally, on the segments 8-10. Duration of the fourth instar is 2 days. The fifth (final) instar larva (Fig. 3 & 4) measures 11.5-12.5 mm in length and 1 mm in breadth. The colouration is similar to that of 4th instar excepting that the bands and markings are more distinct and conspicuous. In 4 days the larva stops feeding and remains quiescent for one day at the end of which it pupates.

Pupation takes place inside folded leaf. The pupa (Fig. 5) measures 8 mm in length and 1.5 mm in width. It is cylindrical and yellowish brown in colour. It terminates posteriorly in a short cremasteral process bearing a small group of hairs. Pupal period lasts 7 days.

The adult (Fig. 6) is a slender moth measuring 4 mm in length and 11 mm across stretched forewings; forewings are greyish brown in colour and irrorated with white. A white spot is present on the costal margin | its length from the base. Below this and situated centrally on the forewing is a circular white patch with a

brownish centre. Hind wings are white with the fringes grey.

#### Larval habits and damage caused

The first instar caterpillar is very active moving briskly on the leaf surface for sometime. Subsequently it weaves a thin web of silk forming a tunnel along the side of the veins on the ventral side of the leaves. Under this protection, it starts feeding by nibbling the surface tissues of the leaf within the tunnels. It moults remaining within this tunnel and the head shield is usually seen within it. The second instar caterpillar comes out of its shelter and feeds on the surface tissue. At the later stage of this instar the caterpillar comes upto the upper surface of the leaf and starts spinning silken threads across the leaf connecting its two margins. Gradually the two margins of the leaf are brought together and finally folding the leaf completely. Remaining within this fold, the caterpillar feeds on the green matter of the leaves depositing the faecal matter within the fold itself. When the green matter of one leaf is completely eaten up it moves out of the fold and makes another fold out of a fresh leaf.

The damage is caused by the caterpillar folding the leaf and feeding on the green matter. The leaves thus attacked eventually dry up. The attack is more severe during the summer months when a large number of leaves are seen destroyed by the caterpillars.

#### Acknowledgement

The authors are thankful to Dr. M. R. G. K. Nair, Professor of Entomology for his valuable guidance in carrying out the

work and in the preparation of the paper and to Dr. C. K. N- Nair. Principal & Additional Director of Agriculture (Research), Agricultural College & Research Institute, Vellayani, for providing the necessary facilities required for the work.

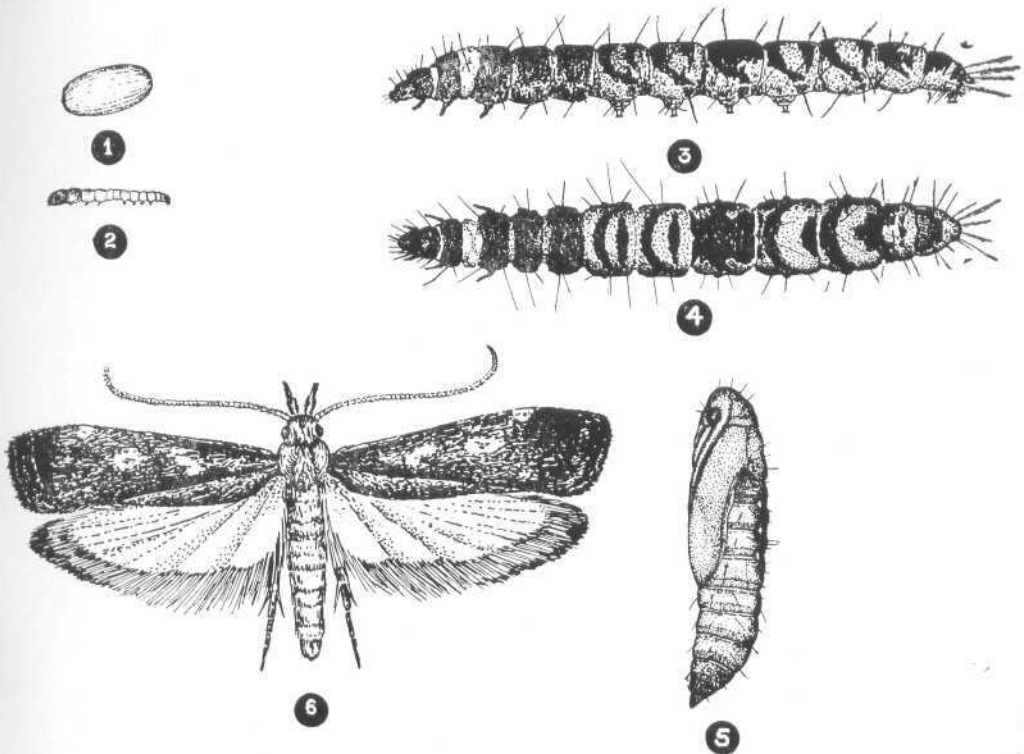
#### References

1. Fletcher, T. B. 1932; Life histories of Indian Microlepidoptera: 55-56.
2. Franssen, C J. H. 1934. Insect pests of sweet potato crop in Java, *Korte Meded. Inst. Plzikt.* No. 20, 21 pp. Buitenzorg.

(Accepted 10-8-1968)

---

Biology of *Brachmia convolvuli* Wlsm.



Figs. 1 to 6. Life stages of *Brachmia convolvuli* Wlsm.

- 1- Egg
- 2- First instar caterpillar
- 3- Full grown caterpillar (Lateral view)
- 4- Full grown caterpillar (Dorsal view)
- 5- Pupa
- 6- Adult