

## Three noxious Hornworms in Suriname,

by

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### III. *Pseudosphinx tetrio* (L.)<sup>1)</sup>

Everywhere in the coastal region of Suriname the beautiful ornamental trees *Plumeria alba* L. and *P. rubra* L. become sooner or later attacked by the hornworms of the hawk moth *Pseudosphinx tetrio* L. During the entire year partly or totally defoliated trees showing their skeleton of grey naked branches can be observed in the gardens, while at the same time other frangipani trees elsewhere are in full leaf. Generally a tree is not killed by one attack even if entirely defoliated, but it will take several months before it recovers. However, if successive attacks by the caterpillars of new generations cause extensive defoliation shortly after new leaves have been formed, the tree often dies.

MERIAN (1726) mentions this hornworm as a pest of cassave and gives the full-grown caterpillar and pupa on plate V in print. However, the hawk moth pictured on this plate bears no connexion with the caterpillar and pupa of *P. tetrio*, as it is the moth of *Protoparce rustica* Fabr. (see STULDREHER-NIENHUIS, 1945). SEPP (1852) publishes the plates of MERIAN's work in colour and calls the moth *Sphinx rustica*.

In the following pages a brief description of the developmental stages and the life history of the noxious hornworm will be given.

#### MORPHOLOGY.

The egg is nearly spherical with longest and shortest diameters of 2.3 and 2.1 mm, respectively. Egg-shell grey-whitish. There are 5 larval instars of which the following head widths in millimetres can be noted: 1.2—1.3 (I), 1.7—1.9 (II), 2.8—3.2 (III), 4.5—5.4 (IV) and 6.0—7.9 (V).

**Larva I.** The newly hatched predominantly yellow-coloured caterpillar has a length of about 0.9 cm and attains a length of 1.2 cm when full-grown. Head and pronotum are pale orange coloured, while the other yellow body segments have a darkgrey band along the anterior and posterior borders. The anterior margin of the pronotum is also seamed by a dark band. Dorsally, the 8th abdominal segment bears a 5 mm long black thread-like projection whereas segment 9 is ornamented with a pair of 0.5 mm long black spines.

**Larva II.** The newly moulted larva with a length of 1 cm reaches a length of 2.4 cm when full-grown. The main body colour is velvety black<sup>2)</sup>. Head light brown-orange; the following parts are pink: pronotum, abdominal segment 9 dorsally the region around the base of the projection on segment 8, which itself is black (and 8 mm long), the legs of segment 10 and to a lesser extent the other abdominal legs. Moreover the anterior margin of the pronotum is bordered

<sup>1)</sup> Identification by W. D. FIELD, U.S.D.A.

<sup>2)</sup> To facilitate the colour description for this instar and the succeeding ones, the black in stead of the yellow colour has been chosen as the primary body colour.

with black while the pronotum and the abdominal legs of segment 10 have fine black dots. Dorsally and dorso-laterally the meso- and metathorax have a yellow coloured crossband, which is sometimes interrupted. Abdominal segments 1—7 have a broad yellow transverse band. Laterally, segment 8 has some small yellow lines or blots which are also often present on the thorax and the other segments.

*Larva III.* The young larva has a length of about 2.5 cm increasing up to 4.5 cm when fully grown. Head reddish brown. Pronotum, abdominal legs, dorsal part of segment 9 (which has a pair of short projections) pink, dotted with black. There is also a pink zone around the base of the black thread-like projection on segment 8, which varies in length from about 1—1.5 cm. Body velvety black, ornamented with a yellow transverse band on each of the abdominal segments 1—7. Laterally meso- and metathorax and the 8th abdominal segment have a small yellow transverse line which is sometimes interrupted on the mesothorax and on the 8th segment.

*Larva IV.* Length of young larva 4.5 cm, of full-grown larva 7 cm. Black abdominal projection, thread-like to the end, varies in length from 1.2—2.4 cm. See further larva III.

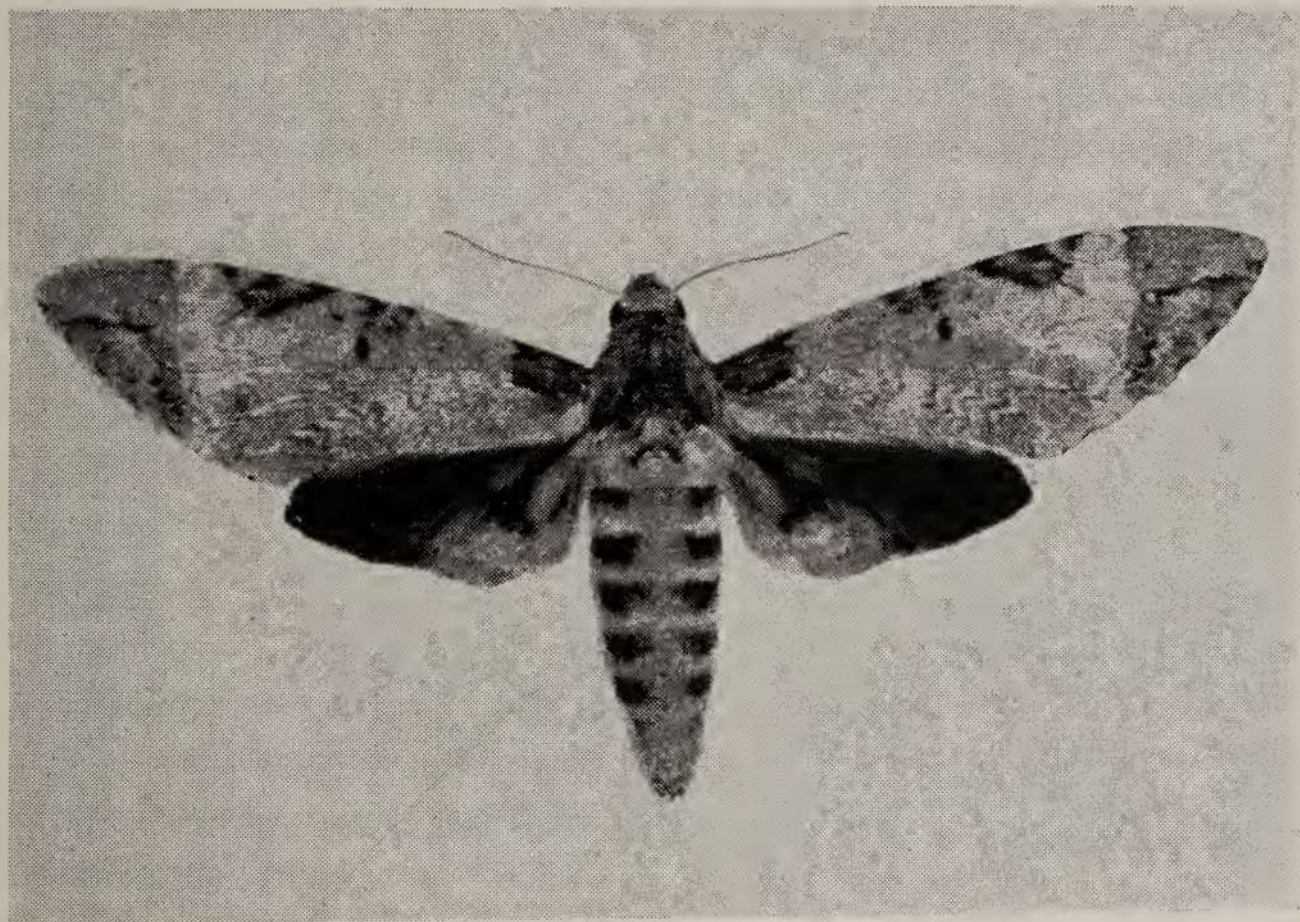


Fig. 3. *Pseudosphinx tetrio* L., female moth,  $\frac{5}{7} \times$  natural size.

*Larva V.* After moulting the hornworm has a length of about 6 cm and a width of 0.9 cm; the full-grown caterpillar may reach a length of 12.5 cm with a width of 2 cm. The black projection of segment 8 may vary in length from 0.5—2.8 cm.

Head red brown; main body colour velvety-black with a broad yellow band on each of the first seven abdominal segments and a smaller band laterally on the mesothorax, metathorax and the 8th abdominal segment. That of the mesothorax is often more whitish yellow. The pronotum, the abdominal legs, the zone

around the projection of segment 8 and the 9th segment dorsally are orange-pink coloured with black dots. Thoracical legs orange-pink.

**P u p a.** The shiny dark brown pupa varies in length from 6.5—8.5 cm and has a width of about 1.6—1.8 cm.

**A d u l t** (see fig. 3). The large robust hawk moth may measure from 12 to 15.5 cm across the expanded wings. The upper side of the forewing is light grey, with some scattered dark brown lines and zones. The upper side of the hind wing is dark brown with a creamy light brown colour partly along the anterior and inner margins and cream-grey near the lower inner angle.

Dorsally at both sides, the light grey abdomen is ornamented with a row of brown transverse short bands. The male with ciliated antennae is somewhat smaller than the female moth.

**LIFE HISTORY.** The hawk moth flies and lays eggs during the hours of darkness. The eggs are deposited in a mass of a single layer close together though not always touching and are cemented onto the lower surface of a *Plumeria* leaf. Up to 69 eggs in one egg mass have been counted. After eclosion the caterpillar feeds on the egg shell leaving only the somewhat flat shiny basal part that has been glued onto the leaf.

The duration of the larval stages I—V amounts to 2, 2—3, 2—3, 3—4 and 6 days respectively<sup>1</sup>). The newly-hatched caterpillars congregate in flocks and start feeding upon the lower surface of the leaf causing irregular holes between the veins. When disturbed they swing their bodies and threadlike abdominal projections and sometimes drop down, suspended by a silk thread.

The habit of a congregated life can also be noticed during stages II and III. Larvae IV and V, however, live independently and are extremely voracious. The leaves, together with coccids and their waxy scales which are often present on the lower leaf surface, are completely eaten away, including the stalks. The hornworms of stages IV and V can easily be observed when actively crawling or eating during daylight. If alarmed they make shaking movements with the lifted frontal part of the body; when strongly disturbed they swing their head and thorax vigorously. The striking colour pattern of the hornworm formed by its velvety black body with yellow bands and pink-orange coloured parts will undoubtedly act as a warning colouration to birds, since a bird predator has never been perceived.

When full-grown, the hornworm of the 5th instar crawls to the soil surface where it hides beneath fallen leaves and other plant debris, which are loosely spun together with strong silk threads. After a praepupal period of 3—4 days the hornworm changes into a pupa, from which the hawk moth appears 18—19 days later. MERIAN (1726) mentions a pupal duration of 4 weeks from her breeding experiments in December 1700. SEPP (1852) notes a duration of 29 days.

#### Literature

- MERIAN, M. S., 1726, De Generatione et Metamorphosibus Insectorum Surinamensium, Figure V.  
 SEPP, J. C. & Zn., 1852, Surinaamsche Vlinders — Papillons de Surinam, Derde deel, Plaat 101.  
 STULDREHER-NIENHUIS, J., 1945, Verborgen Paradijzen, 2e druk, p. 175.

<sup>1</sup>) Data about developmental duration of the stages originate from laboratory breeding experiments during January—February 1955.