

## ✕ Three noxious Hornworms in Suriname.

by ✓

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Of the many hawk moth species which are present in Suriname only very limited and scattered data have ever been published dealing with their life histories. In this article the author presents data concerning the morphology and biology of three common species, viz.: *Protoparce sexta paphus* (Cr.), *Erinnyis alope* (Drury) and *Pseudosphinx tetrio* (L.).

### → I. Protoparce sexta paphus (Cramer) ✕

The hornworm of this hawk moth is found on tomato, peppers and tobacco throughout the year, its relative abundance varying from place to place. The larger caterpillars feed ravenously and even a few hornworms can completely defoliate and sometimes destroy medium sized plants.

The Chalcid fly *Telenomus connectens* Ashm.<sup>2)</sup> proved to be an important egg parasite.

#### DESCRIPTION OF THE STAGES.

**Egg** : oval spherically shaped; longest diameter 1.5—1.6 mm. Colour shining light greenish.

**Larvae** : There are 5 larval instars. The head widths for the successive instars amount to : 0.8—0.9; 1.2—1.3; 1.8—2.1; 3.0—3.2, and 5.2—6.2 mm.

**Larva I.** Length of young larva 0.5 cm, of full-grown larva 1 cm. General colour light green; head yellow-green. Posterior margin of each of the abdominal segments 1 up to and including 7 of a lighter yellow. Dorso-laterally, at both sides of the body a longitudinal white-yellowish stripe may vaguely be noticed. The body segments show more or less distinctly fine whitish dots. Abdominal legs of the 6th segment about twice as large as those of the segments 3, 4 and 5. The legs of the 10th segment large and fleshy. Dorsally on segment 8 a black horn with a length of about 0.3 cm is present. This horn, tapering to the end, is spinulated.

**Larva II.** Length of young larva about 1.1 cm, of full-grown larva 1.5 cm. General colour light green. Head and body segments provided with minute white warts, which are rather regularly arranged in transverse rows on the segments, giving the skin a granulated appearance. Dorso-laterally at both sides of the body a longitudinal whitish line may be noticed. On the lateral part of each of the abdominal segments 1 up to and including 7 an oblique white stripe is present, extending rather high up on the back of the larva. Spiracles visible as small dark dots; the larger ones, long ovally shaped, are situated on the prothorax and abdominal segments 6, 7 and 8. The horn, with a length of about 3.5—4 mm, is dark brown-black coloured and spinulated.

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

<sup>2)</sup> Determination by C. F. W. MUESEBECK, U.S.D.A.

*Larva III.* Length of young larva 1.5 cm, of full-grown larva 2.3 cm. General colour green. Body provided with very small white warts; those on the thoracic segments are more strongly developed. The anterior side of each of the seven white oblique lateral stripes may be bordered in the middle by a short dark line. The seventh stripe also extends on the upper part of segment 8, where it ends near the horn-base. The horn with dark small spine-like projections has a length varying from 4—4.5 mm; primary colour yellowish-brown. Spiracles black; on the abdominal segments 1 to 6 of uniform size; the 6th, 7th and 8th gradually increasing in size. Abdominal spiracles of full-grown larva sometimes bordered with violet.

*Larva IV.* Length of young larva 2 cm, width 0.3 cm; of full-grown larva 3.5 cm and 0.6 cm. Head, thorax and abdomen covered with minute white warts. Length of horn varying from 5—6 mm.

*Larva V.* Length of young larva about 4 cm, width 0.6 cm; of full-grown larva 7—9 cm and 1—1.5 cm, respectively. Main body colour dull somewhat waxy green. Larva has a fleshy appearance. The minute white warts are totally absent. The anterior border of each of the seven dorso-lateral white oblique stripes provided with a lighter green or sometimes a dark line. Spiracles ovals shaped; the black central slit-like spiracle part is bordered with a yellowish rim, while the periphery is formed by a fine black line. The spiracle itself may be bordered with purple. Horn: length 4—7 mm, purple-red, curved downwards, moderately spinulated. Before pupation the main body colour changes into a dirty green, often with some purple.

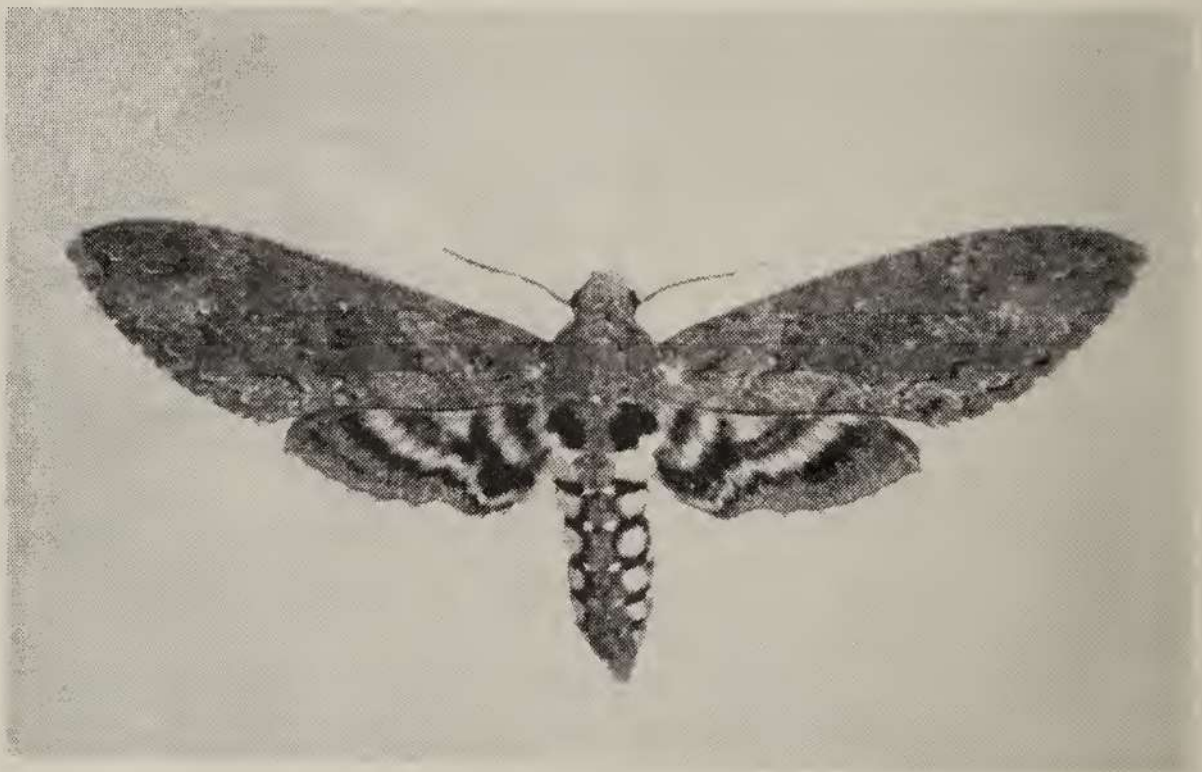


Fig. 1. *Protoparce sexta paphus* (Cr.), female moth,  $\frac{1}{5} \times$  natural size.

*Pupa.* Length 5—5.5 cm. Colour dark brown. The proboscis of the future moth is enclosed in a slender case that projects from the front and has a length of about one third to one half of the pupal total.

*Adult* (see fig. 1). Wing expanse 10—12 cm. Primary colour of front wings gray to brownish-gray, marked with irregular somewhat zigzagging dark brownish

or black lines and more grayish white parts distributed over the wing surface. A small whitish gray spot bordered by a small dark line is present near the middle of the front wing. The lateral margin of the front wing is ornamented with about nine small whitish spots. The hind wings are grayish white with a broad brownish-gray band along the margin. The inner side of this band is bordered by a slightly zigzagging dark line. Moreover there are two dark or black smaller bands, which cross the central wing part diagonally, and often partly coalesce. Near the pilose wingbase a short fourth dark band is situated.

The abdomen, tapering to the end, is marked dark-gray with a row of six orange-yellow spots on each side, which decrease in size from the 2nd to the 8th segment.

Antennae of the male moth are ciliated and broader than those of the female moth.

#### LIFE HISTORY.

The moths start flying at dusk. The eggs are deposited singly on either side but preferable on the underside of the leaves. The eggs hatch in about 5 days. The young hornworm gnaws a circular slit around the upper part of the egg, and emerges from the egg. After devouring the egg shell almost completely, the larva soon starts feeding on the leaf of the foodplant. The worms grow rapidly as experiments with larvae on pepper in breeding cages showed. The first four larval stages last each about 1.5 tot 2 days. After a moult the stripped derm is devoured with the exception of the head capsule and the abdominal horn.

The hornworm of the fifth stage after feeding ravenously and quickly increasing in size during 2 to 3 days, enters into the ground and makes an earthen cell, without showing any silk-spinning capacity. Here it changes into a brown pupa after 2 to 3 days. The pupal stage lasts for 14 to 19 days. Consequently, the total duration from the egg stage to the adult form varies from 29 tot 38 days. Hornworms, especially in their younger stages, are easily overlooked on account of the greenish body colour and their habit of elevating the front part of the body when disturbed, in which position they remain motionless for some time.

Often the defoliation of the foodplant gives the first indication of the presence of the (larger) hornworm.

*Telenomus connectens* Ashm., a black bodied Chalcid with a length of about 1.2 mm and yellowish brown legs and antennae, may parasitize the sphingid eggs to a very high percentage. This is the reason why tomato, pepper and tobacco plants are as a rule attacked by rather low numbers of hornworms.

✓ „Wandelende” stinkzwamfragmenten. Op 5 augustus 1955 was ik er getuige van, dat in een fijnspar-bos op Pijnenburg (Soester gedeelte) verscheidene stinkzwammen (*Phallus impudium*) waren opgeschoten. Op het sporenslijm waren tal van aasvliegen afgekomen, maar het aardigste was, dat sommige stelen uiteen waren gevallen in stukken, die zich over de bosbodem verplaatsten. De oorzaak? In de fragmenten van de stelen, die zoals men weet, hol zijn, wemelde het van oranje aaskevers (*Oeceoptoma thoracicum* L.), die door hun bewegingen er voor zorgden, dat de fragmenten zich al kantelend verplaatsten.

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