The Hawkmoths of Nigeria

By John Boorman, M.A., F.R.E.S.

With photographs by the author

INTRODUCTION

FEW residents of, or visitors to, the West Coast of Africa can have failed to be impressed with the enormous numbers and diversity of the moths. Nigeria is no exception to the general rule, and the total number of species probably well exceeds 10,000. Conspicuous among these are the hawkmoths, mainly on account of their large size and the attraction exerted upon them by bright lights. Readers familiar with the English fauna will find among the Nigerian species four old friends : the Convolvulus Hawk (*Herse convolvuli*), the Death's Head Hawk (*Acherontia atropos*), the Oleander Hawk (*Deilephila nerii*), and the Silver Striped Hawk (*Hippotion celerio*). But whereas the British fauna comprises only about eighteen species, Nigeria can boast about ninety !

The richness of the fauna is in sharp contrast to the paucity of the literature, however, since there is no readily accessible and simple guide to enable the amateur collector to identify his captures. The present work is an attempt to remedy the gap in the case of one particular group, and as such aims to provide both the casual and the more serious collector with a means of identifying his captures, and to present the available information about them. Apart from the four species already referred to, none of the Nigerian species have English names, and scientific names have been used throughout. Technical terms have been avoided as far as possible, but any which have been used are explained in full.

For the amateur entomologist who wishes to collect one group of moths, the present one is an admirable choice. They are large, easy to collect, and to identify. There are relatively few species, and there are probably many more to be added to the Nigerian list. Also, even the most casual collector can make a worthwhile contribution to our knowledge of the group, since in most cases hardly anything is known of their biology and distribution.

What characterises a hawkmoth, and how can one recognise them ? This is not an easy question to answer without going into complex entomological terms, but in general hawkmoths are large moths with wings

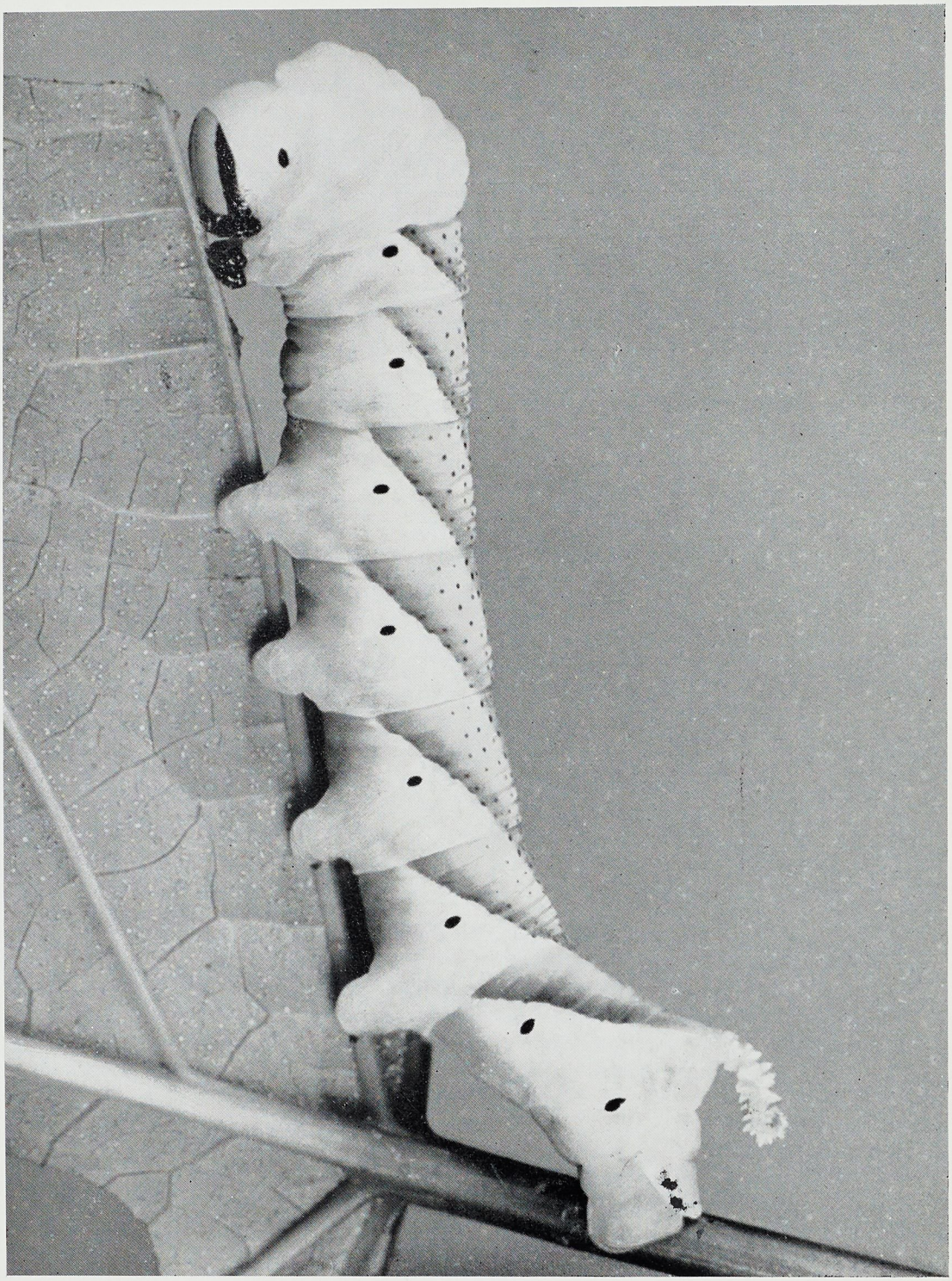
that are markedly longer than broad ; they have rather thickish but simple antennae (not threadlike), and the end of the abdomen is usually somewhat pointed, giving them a streamlined appearance. When at rest, they often fold the wings loosely against the body, giving an "isosceles triangle" shape, with the last segments of the abdomen curved upwards. Some species, like *Herse convolvuli*, rest with their wings folded closely along the sides of the body.

The life history follows the same general pattern of all other moths and butterflies : the eggs are laid on the leaves of the foodplants, and the larvae hatching from them undergo a number of moults until they are fully grown. Most of the hawkmoth larvae burrow into the soil to pupate, but some species spin a frail silken cocoon on the surface of the ground. In Nigeria, the perfect insects may emerge as little as four weeks after the eggs are laid, but the usual duration of the life cycle is three months to a year.

COLLECTING

Eggs of hawkmoths are laid on either the upperside or undersides of leaves, or on the stems, of the foodplant, and may sometimes be found by careful searching. They are usually large, about an eighth of an inch long, and roughly oval in shape. Female hawkmoths will often lay eggs if confined after capture in a cardboard box, but in these cases the larval foodplant may be in doubt. The only way out in these circumstances is to offer the young larvae, when they emerge, a variety of leaves from trees and shrubs in the hope that they will find one that is to their liking. It is best to take several small boxes and put half a dozen larvae in each, with one type of leaf. When a plant is found that they will eat, then the rest of the batch may be transferred to that plant.

Freshly emerged hawkmoth larvae have a spine or tail at the rear end ; this is characteristic and persists in all species throughout the larval life. It is well seen in the photograph of the *Acherontia atropos* larva. Large larvae eat an enormous volume of leaves, and often reveal their presence on a plant by stripped branches and large quantities of droppings on the ground below. Larvae are best kept in roomy, well ventilated cages or boxes (empty jam jars are not to be recommended in the tropics on account of condensation on the glass) and given fresh food each day. When fully grown they should be kept in a cage with about four inches of earth in the bottom, and with a few dead leaves scattered on the surface. When the larvae disappear (having burrowed below the surface to pupate), try to resist the temptation to turn the earth out to see if there is a pupa there. Water the earth occasionally, and a perfect insect should eventually



Acherontia atropos

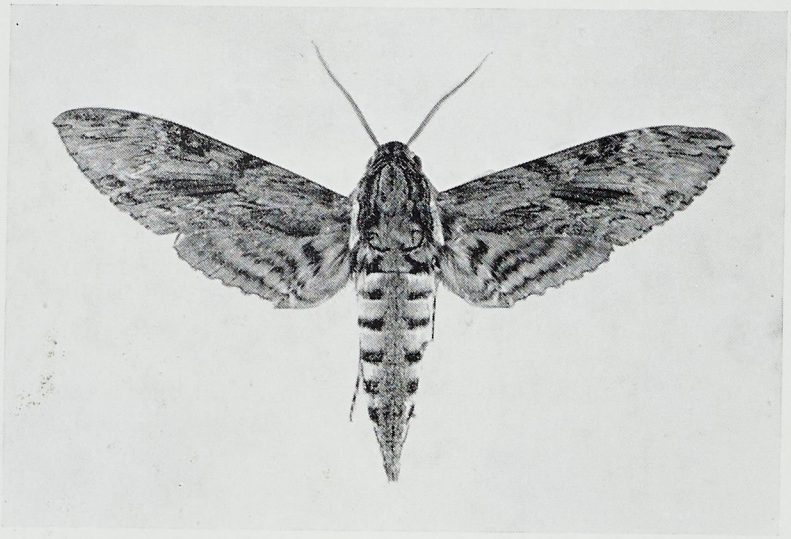
emerge. Moth pupae are delicate and disturbing them often results in crippled insects.

Adult moths may be captured with a net as they hover over flowers during the day or at dusk. Bright lights attract many species, mercury vapour discharge lamps being particularly good in this respect. The author took a large number of his species from a bridge near Lagos, where there were four mercury vapour lamps. The moths were attracted to the lights, and settled on the parapet of the bridge below. When at rest in these circumstances, the moths are best killed by stabbing them in the thorax with a hypodermic syringe containing strong oxalic acid. The injection of one drop of this chemical kills the moths instantly. Less satisfactory is a killing bottle, containing potassium cyanide or chloroform, as the moths flutter about before being overcome by the fumes and often damage themselves. Moths caught on the wing damage themselves very quickly by fluttering in the net, and these are best killed by pouring petrol or lighter fuel over them in the net. This kills instantly, and the petrol will evaporate in a few minutes without ill effect. Do not, however, use coloured petrols as these usually contain chemicals which might stain the wings.

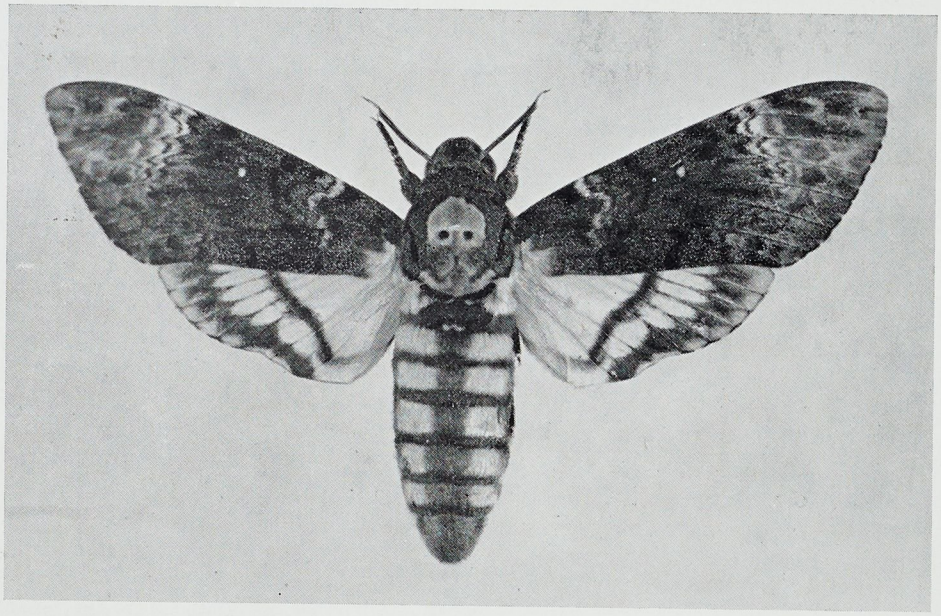
When the specimens have been caught and killed, they should be pinned through the thorax and set—that is, the wings spread out on a board with a groove down the middle in which the body of the insect rests. The wings are spread on either side and secured with strips of paper. In Nigeria, setting boards are best kept in a hot box or a heated cupboard for a couple of weeks before the insect is removed. Set insects should be kept in airtight boxes with a few drops of beechwood creosote to prevent mould from forming and to discourage attack by other small insects.

It is most important to keep accurate records of each insect, and each moth should bear on its pin a label giving the locality, date of capture, and name of the captor, together with any other relevant information. An immaculate insect without data is worthless, but even a very tattered, badly set insect with data may convey valuable information.

So little is known of the distribution of most of the Nigerian species, and of their biology, that any observations are of value. Collectors can add considerably to our knowledge by putting their own observations on record, so that they are available for the information of others working on the group. Lists of species and the dates of their capture could be sent to the Editor of *The Nigerian Field* for publication, and would be of real scientific value in this form.

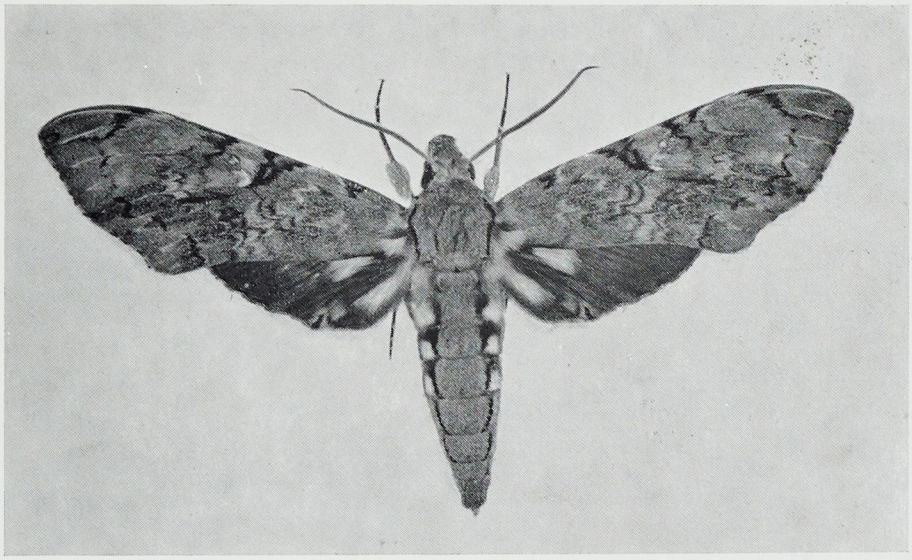


1. Herse convolvuli



2. Acherontia atropos

3. Coelonia fulvinotata



4. Xanthopan morgani

IDENTIFICATION

Most of the Nigerian species have fairly distinctive patterns on the wings, and can be readily identified by careful comparison with photographs. In a few cases, the specific differences are not immediately obvious, and then recourse must be made either to a key, or to preparations of the genitalia.

The male genitalia provide features for distinguishing very closely allied species, but the procedure for making preparations for study is elaborate and will not be detailed here. It will, however, be the specialist rather than the casual collector who will wish to use such characters. In the present work, apart from life size monochrome photographs of each species and a brief description of them, a "key" is presented. This is a sort of table composed of several sections, each of which comprises two alternatives. By examining the specimen to be identified, the collector should decide which of these alternatives most closely fits his insect. This leads to another section, and so on, until the specimen is named.

No key is infallible, and the author is acutely conscious of the shortcomings of the present one. It is recommended, therefore, that the key be used in conjunction with the illustrations, especially in couplets where one alternative names a species, and the other leads to a later couplet.

Readers interested in the classification of hawkmoths are referred to the relevant passages of the introduction to the group in Volume XIV of Seitz. Briefly, the characters upon which the classification is based include wing venation, the number and arrangement of the spines on segments of the legs and abdomen, the presence of patches of sense hairs on the legs and palps, and the presence of a pad between the claws of the leg. The African fauna falls into two main groups :—

Asemanophorae (without a patch of sense hairs on the inside of the base of the hind tibiae).

Semanophorae (with a patch of sense hairs—the "basal spot"—on the inside of the base of the hind tibia).

These groups are divided into subfamilies, which are further divided into tribes, genera, and finally species. The full scheme of classification for the Nigerian species is—

A. Asemanophorae.

Subfamily Acherontiinae

Tribe Acherontiicae

Genera *Herse*, *Acherontia*, *Coelonia*.

Tribe Sphingicae
Genera *Xanthopan*, *Pemba*.

Subfamily Ambulicinae
Genera *Rhadinopasa*, *Libyoclanis*, *Pseudoclanis*, *Platysphinx*, *Leucophlebia*, *Polyptychus*, *Lycosphingia*, *Typhosia*, *Acanthosphinx*, *Lophostethus*.

B. Semanophorae.

Subfamily Sesiinae
Genus *Cephonodes*.

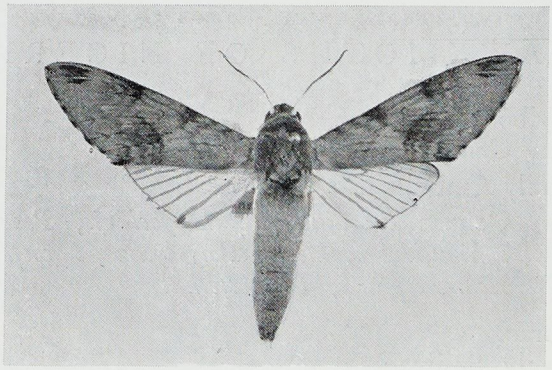
Subfamily Philampelinae
Tribe Nephelicae
Genera *Deilephila*, *Nephele*, *Temnora*, *Pseudenyo*, *Sphingonaepiopsis*, *Antinephele*, *Hypaedalia*, *Atemnora*, *Macroglossum*, *Leucostrophus*, *Euchloron*, *Basiothea*, *Hippotion*, *Theretra*, *Centroctena*.

Where doubt arises as to the correctness of an identification, especially in the case of a rare species, the specimen should be determined by careful comparison with known specimens in a museum collection. This is particularly true in the case of some of the members of the genus *Temnora*, most of which are dull brown moths with only slight differences in wing pattern to distinguish them.

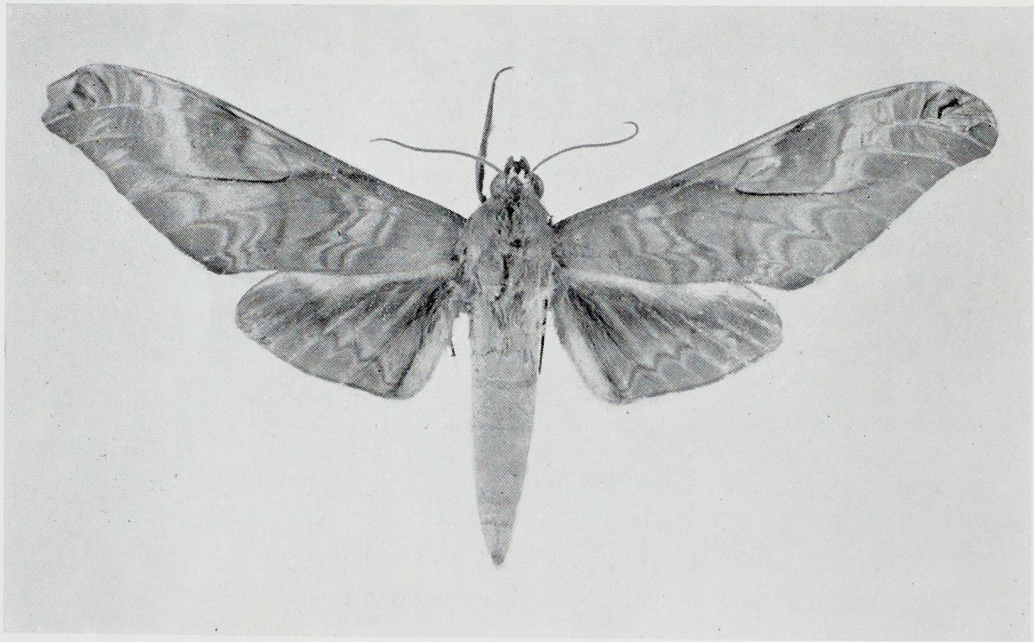
In the next section, the scientific names of each species are followed by an abbreviation. This represents the name of the author of the original description of that species, and is used in order that no ambiguity may arise when one species has been described more than once, and given more than one name.

The following is a list of these abbreviations :—

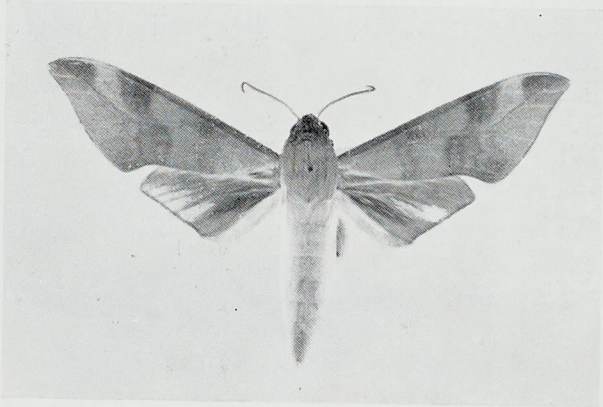
Angas.	Angas
Auriv.	Aurivillius
Beauvois.	Beauvois
Bsdv.	Boisduval
Btlr.	Butler
Clark.	Clark
Cr.	Cramer
Dalm.	Dalmeyer
Drc.	Druce
Dwtz.	Dewitz
F.	Fabricus
Fldr.	Fielder



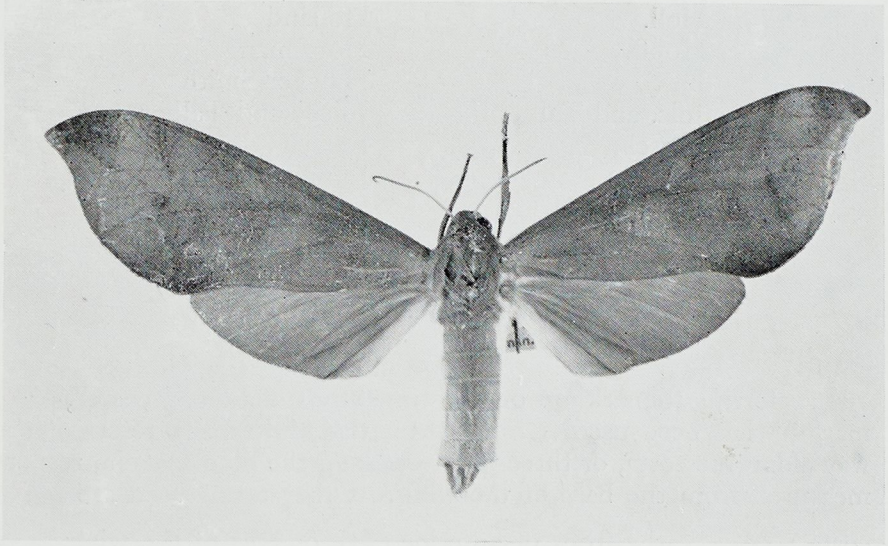
5. Pemba jordani



6. Rhadinopasa hornimanni



7. Libyoclanis bicolor



8. Libyoclanis major

10. Pseudoclanis postica

Hbn.	Hubner
Holl.	Holland
Hopff.	Hopffman
H.-S.	Hawker-Smith
Joic. and Talb.	Joicey and Talbot
Karsch.	Karsch
L.	Linnaeus
Mab.	Mabile
R. and J.	Rothschild and Jordan
Rothsch.	Rothschild
Schultze.	Schultze
Wkr.	Walker

In referring to markings on the wings, the notation "$\frac{1}{2}$ costa", or "$\frac{3}{4}$ hind margin" has been used. This means that the feature referred to is half way along the costa, or three quarters along the hind margin, respectively, measured from the base of the wing. Other terms used are :

costa :	the front or anterior edge or area of the wing.
longitudinal :	parallel to the longer axis.
median :	in the middle or mid line.
stigma :	a marking in the fore wing, at the outer end of the cell.
transverse :	at right angles to the longer axis.

It will be noticed that some of the terms used for areas of the wings are not those normally used. Thus, in the hind wings, the anal angle and anal margin are here termed "hind angle" and "hind margin". This has been used so that as few technical terms as possible should be introduced, and the same terms have been used for the fore wings as for the hind wings.

NOTES ON THE SPECIES

The descriptions given below are not intended to be exhaustive, but merely to enable the reader to translate the monochrome photographs into colour. The sources of the records given are denoted by these abbreviations: BM, British Museum collection; H, E. Haig collection; I, University College Ibadan collection; JB, author's collection; M, Dr. B. McNulty's collection; W, Williams (1954). The University College, Ibadan, collection has been formed from specimens collected by a number of persons, but is largely composed of a collection made by Dr. D. R. Rosevear. The author wishes to express his thanks to officials of the institutions and to the collectors mentioned, for permission to study their collections and to quote their records. Observations on the frequency of a species are

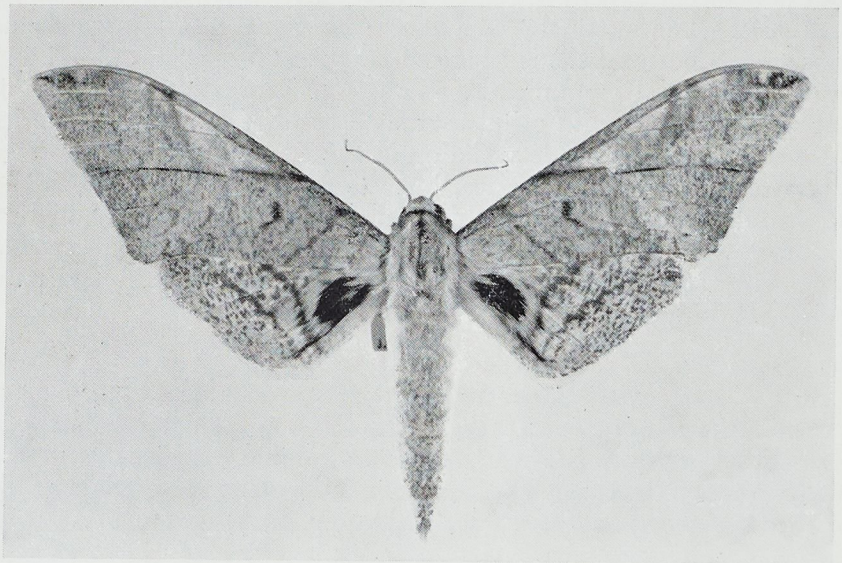
based on the author's personal experience only, and have no strictly numerical basis. The seasonal distribution (the months during which the perfect insect has been taken) is prefaced by the abbreviation "SD", and the months are denoted by numerals. Thus, "5" represents the month of May. It should be borne in mind that such records are for all Nigeria; there is, of course, considerable variation in the time of onset of the rains and dry season in different latitudes, but the records are not sufficiently numerous to allow of analysis on this basis. Sizes are given in inches, measured from wing tip to wing tip of specimens set with the hind margin of the fore wing at right angles to the axis of the body. FW indicates fore wings, HW hind wings, and ABD, abdomen.

1. *Herse convolvuli*, L.
   4″; FW grey, with darker and lighter brown streaks. HW grey, with darker bands. ABD with large pink and black lateral spots, separated by thin white bands. A very common species distributed throughout Nigeria. The larvae feed on plants belonging to the *Convolvulaceae* e.g. *Ipomea sp.* SD 4, 5, 6, 7, 9, 10, 11.

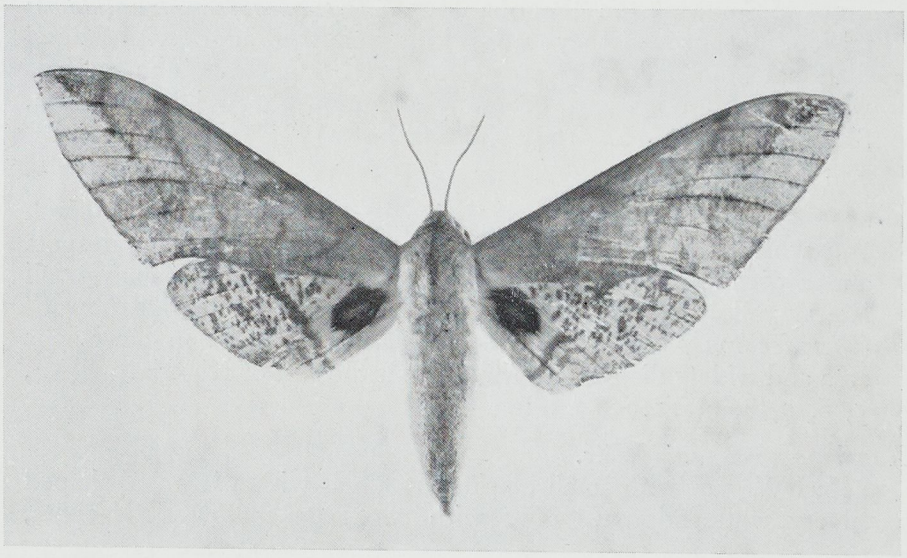
2. *Acherontia atropos*, L.
   $4\frac{1}{2}$—$4\frac{3}{4}$″; FW blackish green with brown markings. HW yellow, with black bands. ABD yellow, with wide transverse black bands. An unmistakeable species on account of the pale skull-like marking on the thorax. This is one of the few moths that make a noise; when handled it makes a shrill squeaking sound, said to be produced by air being forced out of the short proboscis. The larvae are quite common on the "Pagoda flower" (*Clerodendron paniculatum*); when fully grown they are bright yellow orange with lateral diagonal blue and white stripes on each segment. The moth is widely distributed and generally common throughout Nigeria. SD 5, 6, 7, 8, 9, 12. (See photo of larva.)

3. *Coelonia fulvinotata*, Btlr.
   $4\frac{1}{4}$—$4\frac{1}{2}$″; FW rather variable, being grey or brownish with black and white markings. HW brown, with two yellow basal spots and a distinct lighter submarginal band. ABD dark with small lateral yellow spots. The larvae feed on the "Pagoda flower" (*Clerodendron paniculatum*). A very common moth in the Lagos area and widely distributed throughout the rest of Nigeria. SD 4, 5, 6, 7, 8, 9, 11.

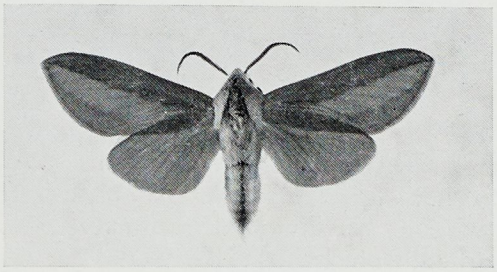
4. *Xanthopan morgani*, Wkr.
   $4\frac{1}{2}$″; FW grey with small black marks, and with a large, C-shaped silvery white stigma. HW with two large yellow basal spots,



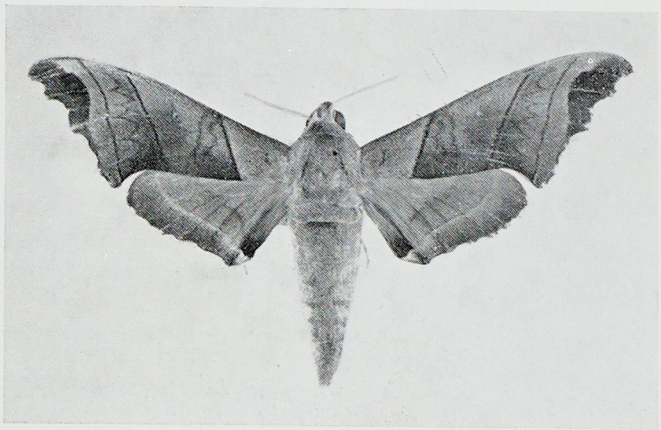
11. Platysphinx constrigilis



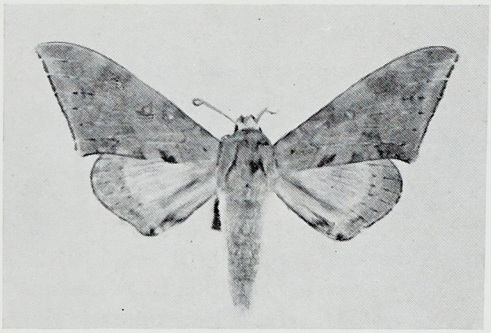
12. Platysphinx phyllis



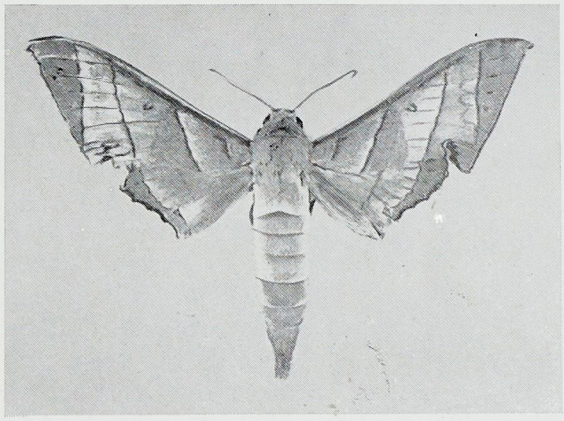
14. Leucophlebia afra



15. Polyptychus digitatus

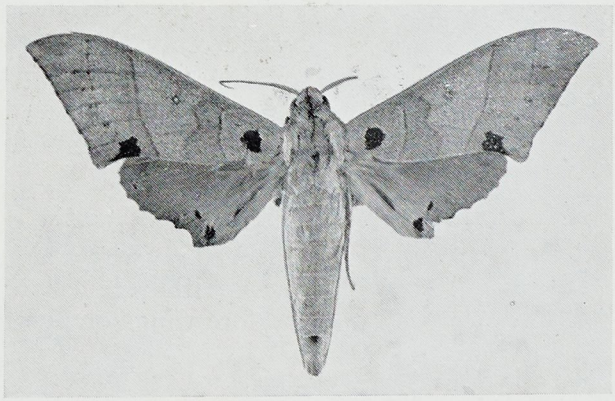


16. Polyptychus virescens



18. Polyptychus orthographus

19. Polyptychus poliades



20. Polyptychus carteri

otherwise uniformly dark brown. ABD with lateral yellow spots. Recorded from Asaba (BM), Ilesha (BM), Kano (BM), Lagos (JB), and Sobo Plain (M). SD 4, 6, 8, 10, 11.

5. *Pemba jordani*, Joic. and Talb.

$2\frac{1}{4}''$; FW pale grey with darker brown markings. HW pure white, with the veins brown (no other Nigerian species has pure white HW). ABD pale grey, without markings. Presumably very rare; only two specimens recorded, from Lagos (JB). SD 6, 7.

6. *Rhodinopasa hornimanni*, Drc.

5″; FW greenish orange, marked with silvery pink. HW orange yellow, dark red at the base. ABD brownish orange, unmarked. Recorded from Akri Ngida (BM), Ikom (I), Mamfe (I), Port Harcourt (M, JB). This species is possibly found more to the east of the Niger than to the west. SD 1, 4, 6, 7.

7. *Libyoclanis bicolor*, Rothsch.

$2\frac{3}{4}''$; FW pale buff brown with rather faint, darker markings. HW reddish pink, fading to pale brownish towards the margin. ABD pale creamy brown, without markings. Recorded from Ibadan (BM), and Lagos (JB). SD 6, 7, 9.

8. *Libyoclanis major*, R. and J.

$4\frac{1}{4}''$; FW warm reddish brown, with darker markings giving the effect of a dead, dry leaf. HW dark reddish pink, brownish towards the costa. ABD brownish, unmarked. One specimen taken by Dr. Roche at Oshodi, and a short series bred by Dr. McNulty from Port Harcourt. This species is probably identical with that figured in Seitz as *Phylloxiphia formosa*, Schultze. SD 2, 6, 7, 12.

9. *Libyoclanis vicina*, R. and J.

Not illustrated; very similar to *L. bicolor*, but the fore wings are more of an orange brown colour, while the hind wings are more orange than pink. One specimen from "Cross River" (BM), and one from Lagos (JB). SD 8.

10. *Pseudoclanis postica*, Wkr.

$3\frac{1}{2}''$; FW pale yellowish brown with darker, indistinct markings. HW yellow, with a large black basal spot and a black submarginal line. ABD pale yellow brown, unmarked. The female is larger, the fore wings orange brown, and the hind wings orange instead

of yellow. Recorded from Afikpo (H), Ibadan (BM), Ilesha (BM), Ilobi (JB), Lagos (JB), Ogoja (H), Okundi (H), and Port Harcourt (M). Probably widely distributed and generally fairly common. The Nigerian form of this species is form *occidentalis*, R. and J. SD 2, 4, 6, 7, 8, 9, 10, 11.

11. *Platysphinx constrigilis*, Wkr.

The genus *Platysphinx* contains three Nigerian species, which resemble each other closely.

$3\frac{3}{4}''$; FW yellow, peppered with small grey spots and faint darker markings. There is a distinct black line in the middle of the FW parallel to the hind margin. HW yellow, with a black basal spot and numerous bright red spots and lines. ABD yellow, unmarked. Recorded from Adiabo (BM), Calabar (BM), Cross River (BM), Ikom (I, H), Ilesha (BM), Lagos (JB), Port Harcourt (M), and Sobo Plain (M). SD 1, 3, 5, 6, 7, 9, 10, 11, 12. Williams records the closely related *P. piabilis* from Ibadan (Williams, 1954). This species is characteristically a South African one, and the record may be an error for one of the two succeeding species, which are superficially very similar.

12. *Platysphinx phyllis*, R. and J.

Very similar to *P. constrigilis*, but lacks the distinct horizontal black line on the FW. It is best distinguished by the form of the male genitalia. Recorded from Abakaliki (H), Enugu (H), Ibadan (H), Lokoja (BM), Ogoja (H), and Uwet (I). SD 2, 4, 6, 7, 11, 12.

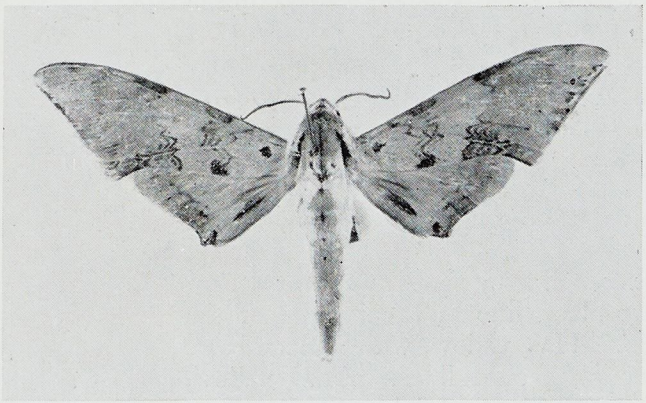
13. *Platysphinx stigmatica*, Mab.

Not illustrated. Superficially very similar to the preceding species, and best distinguished from it by examination of the genitalia. Recorded from Port Harcourt (M). SD 5, 7, 8.

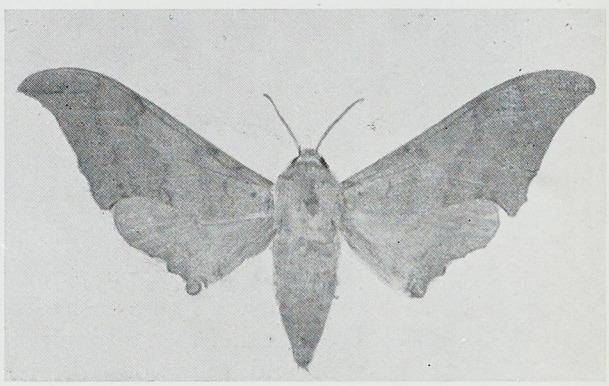
14. *Leucophlebia afra*, Karsch.

The form occurring in Nigeria is form *edentata*, R. and J.

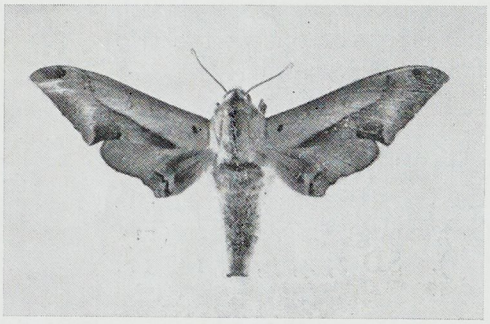
2″; FW pink, with a broad longitudinal yellow streak from the base of the wing to the apex. HW yellow orange, without markings. ABD blackish grey, with narrow yellow bands between the segments. Recorded from Abakaliki (H), Amara (BM), Afikpo (BM), Baro (BM), Bauchi (BM), Enugu (H), Ilorin (BM), Lagos (BM), and Lokoja (BM). This appears to be a Savannah species, apart from the one Lagos record. SD 6, 7, 9.



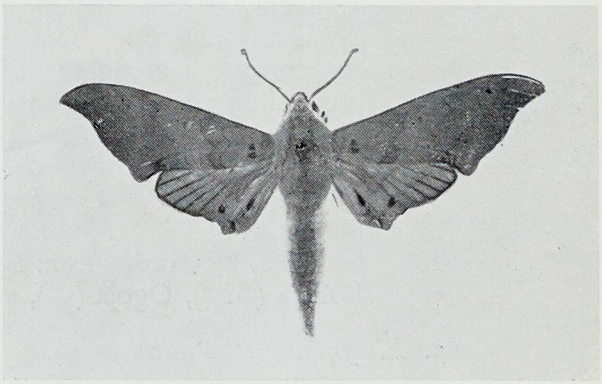
21. Polyptychus murinus



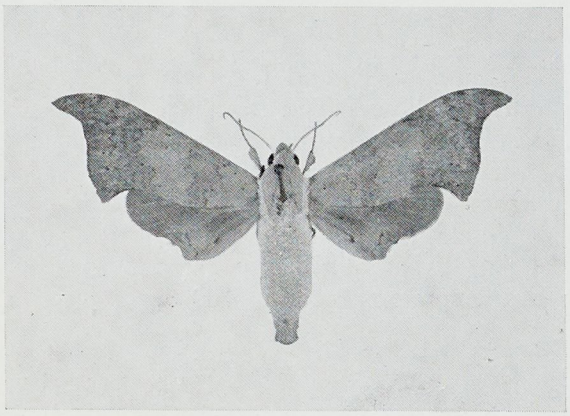
22. Polyptychus cymatodes



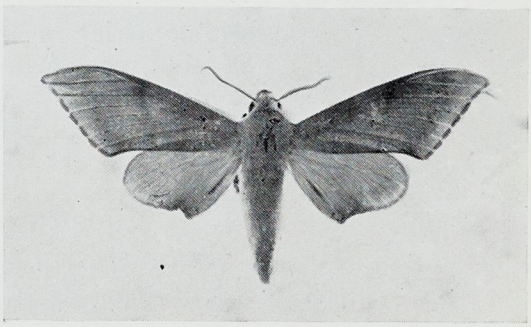
23. Polyptychus rhadamistus



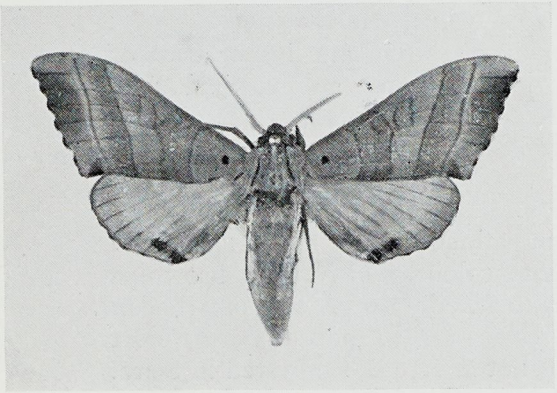
24. Polyptychus andosus



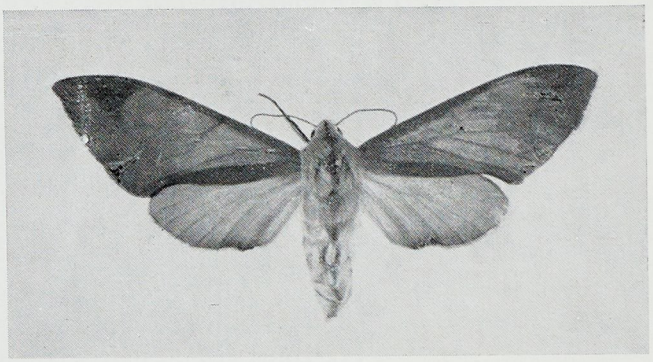
25. Polyptychus anochus



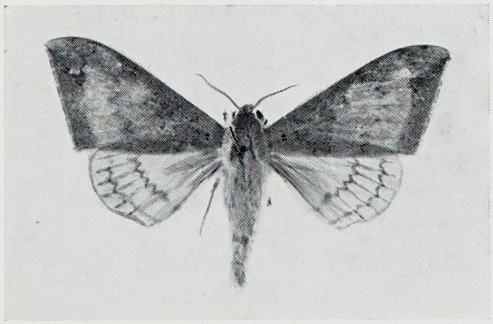
26. Polyptychus consimilis



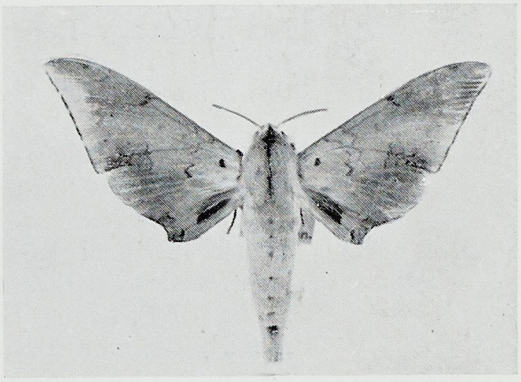
27. Polyptychus roseus



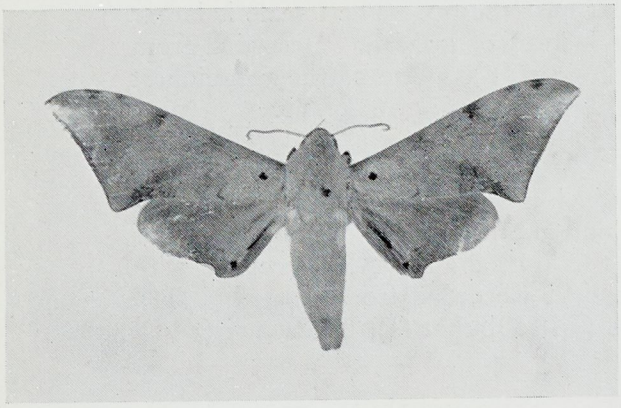
28. Polyptychus foliaceus



29. Polyptychus contrarius



30. Polyptychus retusus



31. Polyptychus spurelli

32. Polyptychus nigriplaga

15. *Polyptychus digitatus*, Karsch.

$3\frac{1}{4}''$; FW dark greyish, with darker markings and lighter areas of silvery grey. HW greyish, with a lighter submarginal line. ABD dark grey, unmarked. Recorded from Ibadan (BM), and Lagos (JB). Not a common species. SD 9.

16. *Polyptychus virescens*, Btlr.

$2\frac{1}{4}''$; FW green, with rather indistinct darker markings. Old specimens fade to a dirty yellow colour. HW pale brownish yellow. ABD brownish green, unmarked. Recorded from Ibadan (BM), Ikom (H), Ilesha (BM), Lagos (JB), Obubra (I), and Port Harcourt (M). Fairly common; not as rare as suggested in Seitz. Unlikely to be mistaken for any other species when fresh. SD 3, 5, 6, 7, 8, 9, 11.

17. *Polyptychus trisecta*, Auriv.

Not illustrated. Resembles very closely a large female of *P. orthographus*. There appears to be only one specimen from Nigeria; this is in the BM collection and is labelled simply "Nigeria".

18. *Polyptychus orthographus*, R. and J.

$2\frac{3}{4}''$; FW yellow brown, distinctly divided into six triangular areas by darker transverse lines. HW pale brownish yellow with a darker marginal band. ABD pale yellow brown, unmarked. The female is darker and larger. Recorded from Calabar (BM), Ilesha (BM), Lagos (JB), Port Harcourt (M), and Sobo Plain (M). A fairly common species. SD 1, 2, 4, 6, 7, 8, 9, 10, 12.

19. *Polyptychus poliades*, R. and J.

$2\frac{3}{4}''$; FW pale grey brown with four, fine transverse darker lines. HW pale grey brown, with a faint darker marginal band. ABD greyish, with single black spot near the tip. The female is larger and of a dark brown colour instead of greyish. Recorded from Ibadan (BM, H, W), and Lagos (JB). One of the commonest species in the Lagos area. SD 1, 4, 5, 6, 7, 8, 9, 11.

20. *Polyptychus carteri*, Btlr.

$2\frac{3}{4}''$; very similar to *P. poliades* but with a large chocolate brown spot at the base of the FW, and another at the hind angle. HW with two chocolate spots at the hind angle. ABD greyish, with a single black spot near the tip. Recorded from Abakaliki (H), Ibadan (BM, H, W), Lagos (JB), Obubra (I), Olokemeji (BM),

Port Harcourt (M), Sapele (BM), and Sobo Plain (M). One of the commonest species. SD 2, 3, 4, 5, 6, 7, 8, 9, 11, 12.

21. *Polyptychus murinus*, Rothsch.

$3\frac{1}{4}''$; FW greyish brown, distinctly marked with two darker transverse bands. Stigma pale brown; a large dark brown basal spot and another large dark spot at $\frac{1}{2}$ hind margin. This species is very like *P. nigriplaga* and *P. retusus*, but may be distinguished from both of these by the reddish tint of the underside of the FW. HW greyish brown, darker at the margin, and with a longitudinal streak along the hind margin. ABD greyish, unmarked; thorax with a dark median line. Recorded from Lagos (JB), and Port Harcourt (M). SD 3, 6, 9.

22. *Polyptychus cymatodes*, R. and J.

3''; FW grey, with distinct darker transverse markings and the distal half of the wing rather darker; a pronounced hook at the tip and a minute brown basal spot. HW greyish buff, indistinctly darker at the margin. Recorded only from Lagos (JB), one specimen only, at light.

23. *Polyptychus rhadamistus*, F.

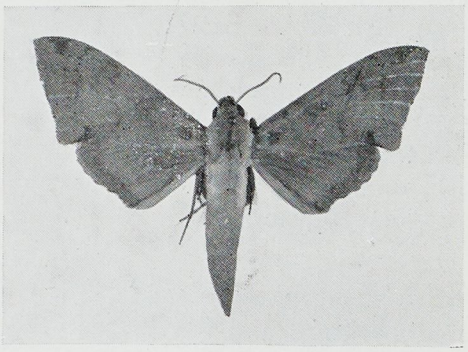
$2\frac{1}{4}''$; FW greyish white, with a blackish patch at the apex and a prominent oblique black line from $\frac{1}{3}$ hind margin to $\frac{3}{4}$ costa. HW dark brown, with a blackish streak at the hind angle. ABD dark grey, unmarked. Recorded from Agberi (BM), Ibadan (W), Ikom (I), Lagos (JB), Onitsha (BM), and Sobo Plain (M). A very common species. SD 4, 5, 6, 7, 8, 9, 11.

24. *Polyptychus andosus*, Wkr.

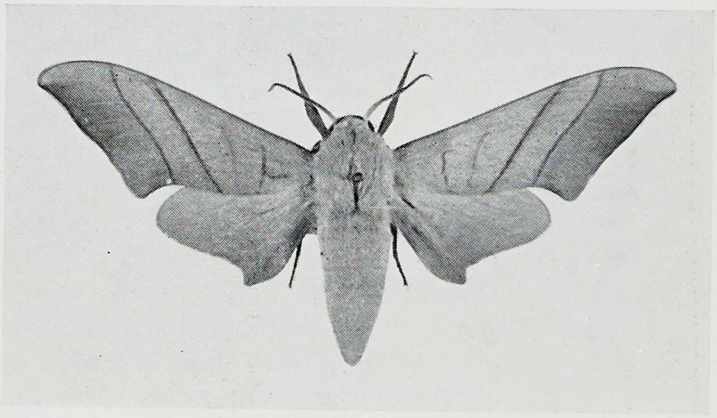
$2\frac{1}{4}''$; FW dark grey with a darker transverse median band and two black basal dots. HW bright orange brown, with an indistinct blackish marking at the hind angle. ABD grey, unmarked. Recorded from Iju (JB), Port Harcourt (M), and Sobo Plain (M). SD 3, 5, 6, 7, 12.

25. *Polyptychus anochus*, R. and J.

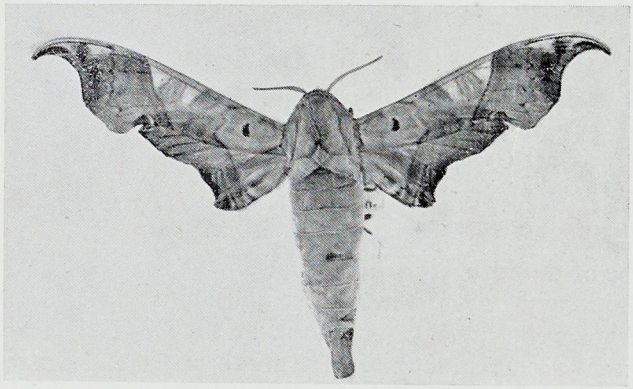
Easily distinguished by the shape of the fore wings, combined with the colour. $2\frac{1}{4}''$; FW pale buff with rather indistinct darker transverse lines and bands; with a very pronounced hook at the apex. HW reddish brown, with a rather indefinite dark mark at the hind angle. ABD pale greyish brown, unmarked. Recorded only from Lagos (JB), two specimens which appear to be the first Nigerian records. SD 6, 11.



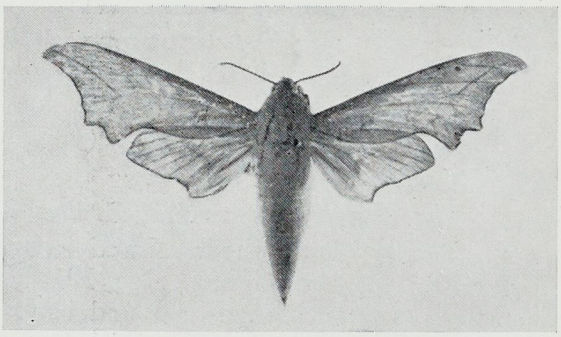
33. Polyptychus pauperculus



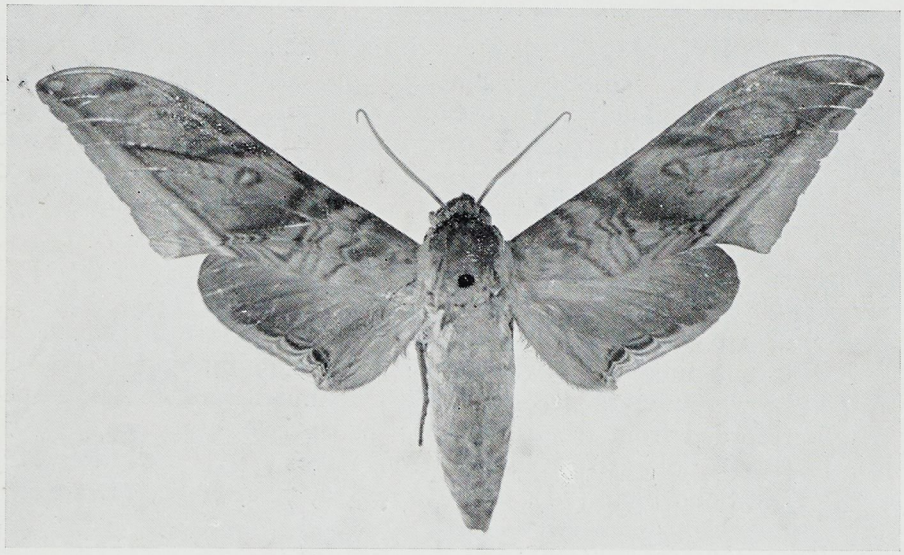
35. Polyptychus molitor



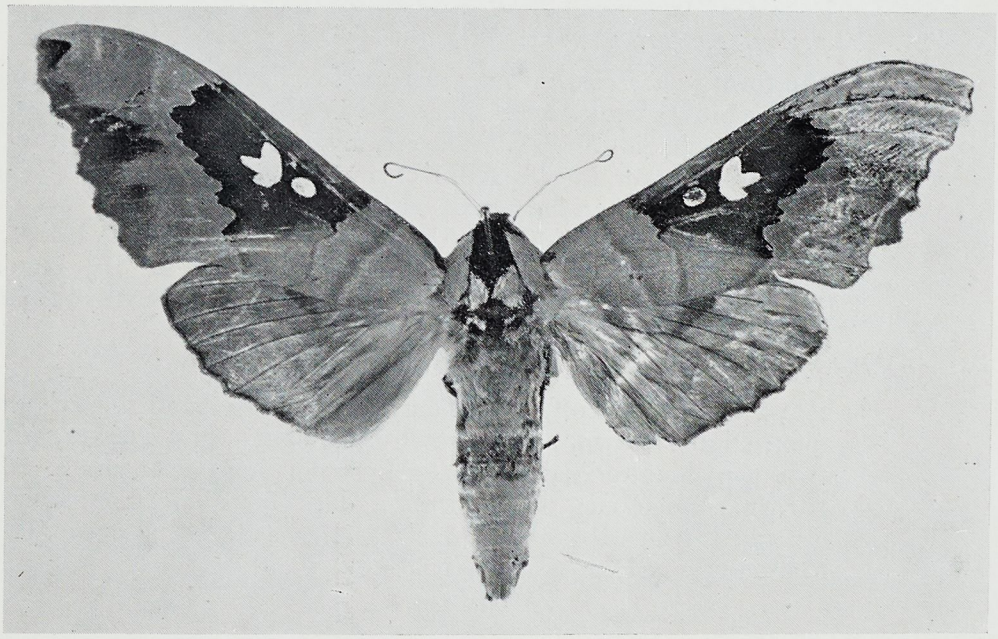
36. Lycosphingia hamata



37. Typhosia illustris



38. Acanthosphinx gussfeldti



39. Lophostethus demolini

26. *Polyptychus consimilis*, R. and J.

$2\frac{1}{2}''$; FW pale reddish grey with a more or less distinct transverse line from $\frac{1}{2}$ costa to $\frac{1}{2}$ hind margin. HW pale pinkish brown, with a small dark dot at the hind angle and a dark streak along hind margin. ABD pale greyish, unmarked. A species very similar to *P. andosus*, but distinguished by lacking the two black basal dots. This may be a Savannah species; recorded from Enugu (H), and Jebba (BM). SD 3, 4, 5.

27. *Polyptychus roseus*, Drc.

$2\frac{1}{2}''$; FW brown with distinct darker transverse markings. HW bright pinkish red with a black streak at the hind angle. ABD brown, unmarked. A widely distributed and common species, recorded from Abakaliki (H), Ibadan (BM), Enugu (H), Ilesha (BM), Ilobi (JB), Kaduna (BM), Lagos (JB), Port Harcourt (M), and Sobo Plain (M). SD 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

28. *Polyptychus foliaceus*, R. and J.

$2\frac{3}{4}''$; FW reddish brown, with an indistinct darker line from the hind angle to $\frac{1}{2}$ costa, and an indistinct almost triangular spot on the costa near the apex. HW pinkish, lighter at the hind margin. ABD reddish brown, unmarked. Recorded only from Kaduna (BM).

29. *Polyptychus contrarius*, Wkr.

The form *submarginalis*, Wkr., occurs in Nigeria. $1\frac{3}{4}''$; FW pale creamy brown with darker transverse lines and a variable amount of darker shading. HW pale creamy brown with two distinct transverse darker lines. ABD creamy brown, unmarked. The female is darker than the male. A fairly widely distributed species, having been recorded from Abakaliki (H), Enugu (H), Ibadan (BM, H), Idanre (JB), Ikom (I), Kaduna (M), Lagos (JB), Ogoja (H), and Port Harcourt (M). SD 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

30. *Polyptychus retusus*, R. and J.

$2\frac{1}{2}''$; FW greyish buff, with a darker transverse band towards the apex; stigma brown, and a brown basal spot. HW darker, with a brown longitudinal streak along the hind margin. ABD greyish, unmarked; thorax with a dark brown median streak. Recorded from Ibadan (BM, W), Ilesha (BM), Lagos (JB), Mamfe (I). SD 4, 6, 8, 9, 10.

31. *Polyptychus spurelli*, R. and J.

3″; FW grey, with indistinct darker markings; with a large chocolate spot at the base and a pale brown stigma. HW greyish brown, with a dark spot at the hind angle and a dark streak along the hind margin. ABD greyish, unmarked. Recorded from Calabar (BM, I), and Ikom (BM). SD 9.

32. *Polyptychus nigriplaga*, R. and J.

$2\frac{3}{4}$″; FW greyish brown, with somewhat indefinite darker bands; with a large brown basal spot and a pale brown stigma. HW grey brown, with a darker longitudinal streak along the hind margin. ABD greyish brown, unmarked. Recorded from Abakaliki (H), Ibadan (H), Lagos (JB), and Port Harcourt (M). Not a very common species. SD 6, 7, 8, 11, 12.

33. *Polyptychus pauperculus*, Holl.

$2\frac{1}{4}$″; FW grey with darker, brown transverse markings; with a large reddish brown basal spot. HW greyish brown, with a slightly darker marginal band. ABD greyish, unmarked. A widely distributed species, recorded from Agberi (BM), Calabar (BM), Ilesha (BM), Lagos (JB), Lokoja (BM), Obudu (H), Onitsha (BM), Port Harcourt (M), Sapele (BM), Sobo Plain (M), and Warri (BM). This species can only be distinguished from the following species by the male genitalia. SD 3, 4, 5, 6, 7, 8, 12.

34. *Polyptychus hollandi*, R. and J.

Superficially almost identical to *P. pauperculus*, but possibly a little darker. Recorded from Oloibiri (JB), Sapele (BM), and Warri (BM). SD 4.

35. *Polyptychus molitor*, R. and J.

3″; FW pale buff with four fine transverse lines; an indistinct darker patch at the margin below the apex. HW yellowish buff, unmarked. ABD yellow buff, unmarked. Recorded from Boro (BM), Enugu (H), Ilorin (BM), and Ogoja (H). Possibly a Savannah species. SD 7, 11, 12.

36. *Lycosphingia hamata*, Dwtz.

3″; FW of very characteristic shape, with a very pronounced hook at the tip; yellow brown, with darker markings and a black spot near the base. HW yellow brown, with fine blackish submarginal and median lines. Rests with its wings held above the body, like

a butterfly. Three specimens only recorded from Nigeria; two from Lagos (JB) and one from Sobo Plain (M). SD 7, 8, 11.

37. *Typhosia illustris*, R. and J.

$2\frac{1}{2}''$; FW pale creamy brown with faint darker transverse lines and a thin oblique black line from the apex to the centre of the wing. HW pale at the margin, otherwise reddish brown. ABD pale creamy brown, unmarked. Recorded from Ikom (BM, I), Port Harcourt (M), and Sobo Plain (M). Possibly an Eastern species. SD 3, 4, 8, 10, 11, 12.

38. *Acanthosphinx gussfeldti*, Dwtz.

$4\frac{1}{4}''$; FW purple brown with a triangular green marking at the hind angle, extending along the margin to the apex. HW purple brown, with a green marginal line bordered on the inside by a fine black line. ABD purplish, unmarked. These moths have spines on the hind tibiae, and can inflict painful wounds if handled carelessly. Recorded from Port Harcourt (M), Calabar (BM), and Lagos (JB). SD 3, 4, 6, 7, 9, 11.

39. *Lophostethus demolini*, Angas.

The form *carteri*, Rothsch., occurs in Nigeria. $5\frac{1}{2}''$; FW pale brown, with a broad median chocolate band which is wider at the costa than at the hind margin. Stigma very large, white, and ⟶• shaped. HW pale creamy brown, with only indistinct markings. ABD pale brown, unmarked. This is the largest species found in our area. Recorded from Abakaliki (H), Ibadan (W), Ilobi (JB), Lagos (JB), Obudu (H), Port Harcourt (M), Sobo Plain (M), and Zaria (BM). SD 3, 4, 5, 6, 8, 9, 10.

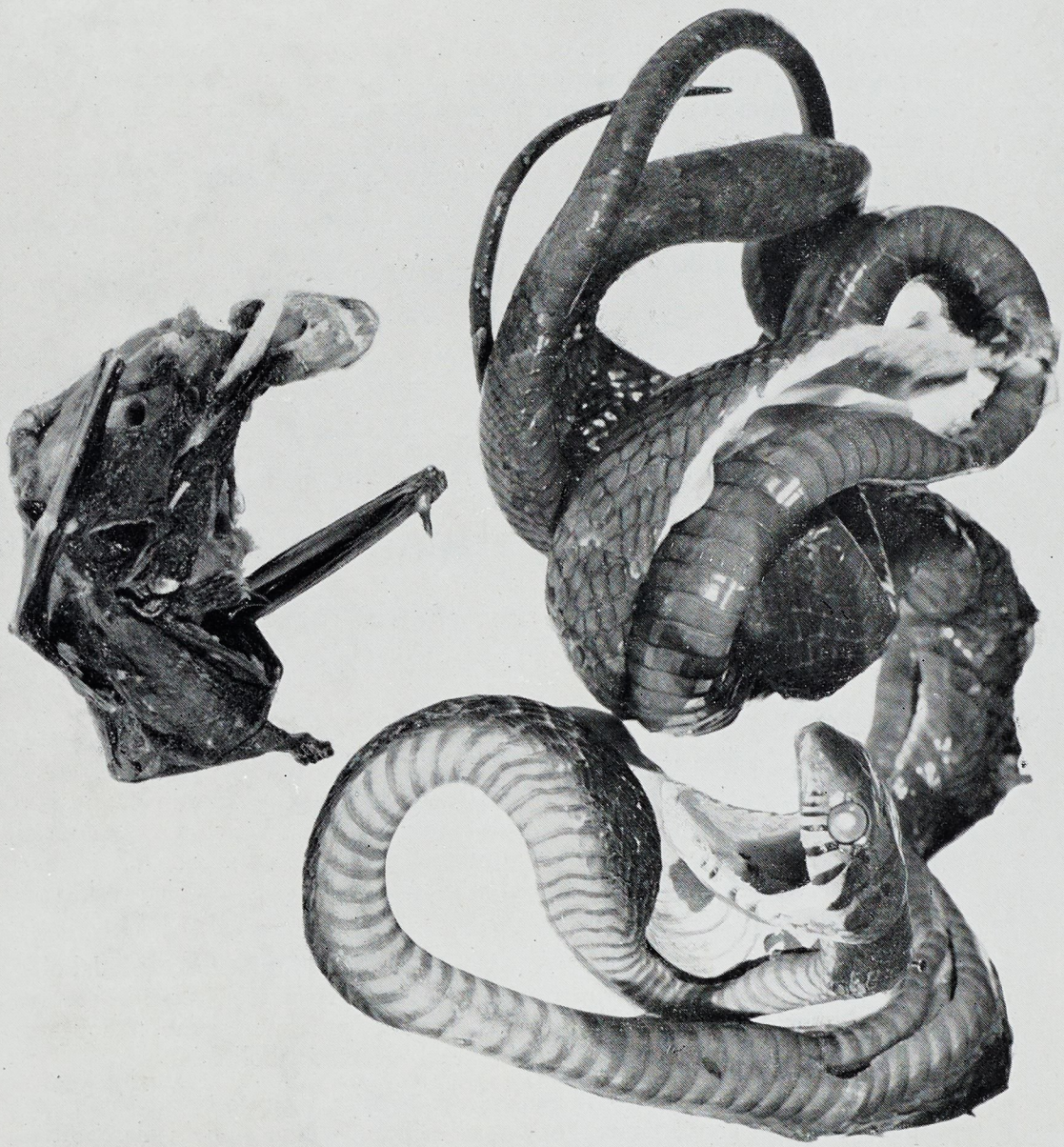
(*To be concluded.*)

A Bat-Eating Snake

By Stanley F. Woodward, C.M.Z.S.
University College Hospital, Ibadan

THE Powdered Snake or Blotchy Tree Snake, *Boiga pulverulenta* (Fischer), a nocturnal and arboreal back-fanged member of the family Colubridae, is common in the neighbourhood of Ibadan.

The food of this species includes lizards, mice, small bush rats and tree frogs, but Sternfeld (1909) states that it consists mostly of small birds.



I recently received through the Medical Officer of The Nigerian Regiment, Ibadan, an adult specimen of this species. On examination, a large bulge in the stomach proved to be the remains of a partially digested bat. The wings and wing hooks were still recognisable, as shown in the photograph.

In thirty years experience of snakes I have not come across such a case of a snake eating a bat, and considering the hooks on the Bat's wings it must be a difficult venture for a snake to capture and swallow such an animal.

It would be interesting to know whether any other readers have heard of a similar case.

Ref. Sternfeld (1909) Die Fauna der deutschen Koloniens, Berlin.

Photo by Medical Illustration Unit, U.C.H., Ibadan.

Nigeria's Useful Plants

By Bep Oliver, Dr. es. Sc., ing. Chim.

With illustrations by the author and from the Federal Information Service of Nigeria

Part III. Plants Yielding Essential Oils

The flowers, leaves, stems, seeds, roots and bark of certain plants are highly scented. This fragrance is due to volatile oils which may be found in cuticular pockets, glands or capillaries. In the exudation of certain trees the oils are found associated with gums or resins as oleo-resins or oleo-gum-resins.

Various suggestions have been made as to the utility of the essential oils for the plants. Their function may be to attract insects to secure pollination, or to protect hosts against parasites: but by most they are thought to be by-products of the general plant metabolism.

Isolates. Essential oils are generally a mixture of up to twenty or thirty pure odorous constituents known as isolates. The same isolate often