# Hawk-moths (Lepidoptera: Sphingidae) of Trinidad, West Indies: an illustrated and annotated list

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**ABSTRACT**

An illustrated and annotated catalogue is presented of 84 species of Sphingidae confirmed to occur in Trinidad. *Adhemarius daphne* (Boisduval)*, Aleuron chloroptera* (Perty), *Nyceryx stuarti* (Rothschild) and *Erinnyis impunctata* Rothschild & Jordan are new records for Trinidad. In addition, five prior species records have not been confirmed, and seven reported species are considered to be in error. Images of living adults of 33 species and the early stages of six species are included. Very little has been recorded regarding food plants and early stages in Trinidad, but known food plants from elsewhere in the Neotropics are tabulated, as are data of the months of capture and localities in suburban and forested localities in Trinidad.

**Key words:** catalogue, distribution, food plants, hornworms, phenology, Tobago

## INTRODUCTION

Of all the moth families in Trinidad, Sphingidae, popularly known as hawk-moths and hornworms have been most studied. They are large, colourful and conspicuous, easily recognised and frequently seen by naturalists and the public, most frequently when attracted to house lights. Globally, their taxonomy is well understood (at least compared to nearly all other moth families), and they have been used as model groups for biological and ecological studies in several areas of the tropics (Moss 1912, 1920; Janzen 1986, Kawahara *et al*. 2013; Schreiber 1978; Stradling *et al*. 1983; Tuttle 2007).

As discussed by Cock (2003), the moths of Trinidad have been documented by W.J. Kaye in a preliminary catalogue (Kaye 1901) and a catalogue (Kaye and Lamont 1927), to which there is a short supplement (Lamont and Callan 1950). Kaye (1904) was reprinted in the *Proceedings of the Agricultural Society of Trinidad and Tobago* of 1914 (Kaye 1914a), with occasional supplementary information mainly relating to common names, probably added by P.L. Guppy. There has been relatively little published on the Trinidad hawk-moths since then, apart from an intensive light trapping study on Sphingidae by Stradling *et al*. (1983), which provides an important resource for what follows. I have recently published a checklist of the moths of Tobago (Cock 2017b), which included 26 hawk-moth species. Treatments are available for Trinidad Castniidae (González and Cock 2004), Mimallonidae (St Laurent and Cock 2017) and Sematuridae (Cock 2016), but these are all relatively small families in Trinidad (Cock 2003). This illustrated catalogue of the Sphingidae of Trinidad is the first of the medium sized families to be treated, and it is hoped that other families will be tackled in the future.

### Nomenclature and classification.

Nomenclature follows Kitching and Cadiou (2000) and Kitching (2017), and where this has changed since Kitching and Cadiou (2000) an explanation is provided. Accordingly species names follow the original spelling and do not show gender agreement in the case of Latin and Greek adjectival species names. Some authors have recognised forms in two of the Trinidad species (*Erinnyis lassauxii* (Boisduval), *Erinnyis obscura* (Fabricius)). These are infraspecific, have no taxonomic standing, and are synonyms of the given species (see e.g. Kitching and Cadiou 2000). However, inasmuch as the names of forms can be conveniently used to refer to particular phenotypes of polytypic species, they are useful. Thus, it is easier to refer to '*Erinnyis obscura* f. *domingonis* (Butler)' and thereafter 'f. *domingonis*' than to repeatedly refer to 'a form of *Erinnyis obscura* with dark forewing markings'.

Kawahara *et al*. (2009) examined the phylogeny of the Sphingidae based on five nuclear genes, demonstrating that more work is needed to clarify the natural groups of Sphingidae, particularly below the subfamily level. Although their work indicates some problems relating to subfamilies as presently defined, this is not an issue when applied to the Trinidad fauna, and so the three subfamilies Smerinthinae, Sphinginae and Macroglossinae are used here without reservations. The tribes they recognised can be applied to the limited Trinidad fauna with little difficulty (Table 1). However, since then Kitching (2017) has built on their phylogeny and used subtribes to encompass the diversity Kawahara *et al*. (2009) showed, although this has not been formally published yet. Here I use Kitching's tribes and subtribes, and incorporate the species groups evident in Kawahara *et al.* (2009) as shown in Table 2.

### Identification.

When working with pinned specimens in good condition, all of the Trinidad species can be identified by careful examination and comparison with the images provided here. Diagnostic features are pointed out in the text which should help with similar species. Many naturalists are now taking photographs rather than specimens in support

**Table 1.** Provisional classification of the Trinidad Sphingidae, based on Kawahara *et al*. (2009). The group names within Dilophonotini are not used in Kawahara *et al*. (2009), but are based on their phylogenetic tree.

| Subfamily | Tribe | Group | Genera reported from Trinidad (and number of Trinidad species) |
|---|---|---|---|
| Smerinthinae | Ambulycini | | *Adhemarius* (3), *Protambulyx* (2) |
| Sphinginae | ? | *Cocytius* group | *Cocytius* (1), *Amphonyx* (2), *Neococytius* (1) |
| | Sphingini | Sphingini *sensu stricto* | *Manduca* (10) |
| | Acherontiini | | *Agrius* (1) |
| Macroglossinae | Dilophonotini | *Pachylia* group | *Pachylia* (2) |
| | | *Nyceryx* group | *Callionima* (4), *Nyceryx* (4), *Perigonia* (2), *Eupyrrhoglossum* (1), and *Aellopos* (5) |
| | | *Erinnyis* group | *Oryba** (2), *Pachylioides* (1), *Madoryx* (3), *Hemeroplanes* (1), *Erinnyis* (7), *Isognathus* (2), *Pseudosphinx* (1), *Phryxus* (1) |
| | | *Aleuron* group | *Aleuron* (2), *Unzela* (1) |
| | | *Enyo* and *Eumorpha* group* | *Enyo* (3) *Eumorpha* (9) |
| | | *Pachygonidia* group | *Pachygonidia* (1) |
| | Choerocampini | | *Hyles* (1), *Xylophanes* (12) |

* Weakly supported groups or placements in Kawahara *et al*. (2009).

**Table 2.** Classification of the Trinidad Sphingidae, after Kitching (2017), including the genera groups of Kawahara *et al.* (2009)

| Subfamily | Tribe | Subtribe | Genera reported from Trinidad (and number of Trinidad species) |
|---|---|---|---|
| Smerinthinae | Ambulycini | | *Adhemarius* (3), *Protambulyx* (2) |
| Sphinginae | Sphingini | Cocytiina | *Cocytius* (1), *Amphonyx* (2), *Neococytius* (1) |
| | | Sphingina | *Manduca* (10) |
| | | Acherontiina | *Agrius* (1) |
| Macroglossinae | Dilophonotini | Dilophonotina | *Pachylia* group: *Pachylia* (2)<br>*Nyceryx* group: *Aellopos* (5), *Callionima* (4), *Eupyrrhoglossum* (1), *Nyceryx* (4), *Perigonia* (2)<br>*Erinnyis* group: *Erinnyis* (7), *Hemeroplanes* (1), *Isognathus* (2), *Madoryx* (3), *Oryba** (2), *Pachylioides* (1), *Phryxus* (1), *Pseudosphinx* (1) |
| | | Philampelina | *Aleuron* group: *Aleuron* (2), *Unzela* (1)<br>*Enyo* and *Eumorpha* group*: *Enyo* (3) *Eumorpha* (9)<br>*Pachygonidia* group: *Pachygonidia* (1) |
| | Macroglossini | Choerocampina | *Hyles* (1), *Xylophanes* (12) |

* Weakly supported groups or placements in Kawahara *et al*. (2009).

of their observations. With experience, images of living moths can also be readily identified, and I have included such images as are available to me to facilitate this (Figs. 1-38). However, some of the better diagnostic features of the hindwings and abdomen may be obscured in images of living specimens in natural resting positions. This can be resolved by taking additional images to show these features (e.g. Fig. 5 *Protambulyx strigilis* (Linnaeus) female, Fig. 15 *Agrius cingulata* (Fabricius)), or more careful examination and comparison of the visible features. Further images of pinned adults, genitalia, diagnostic details, and literature references can be found on the *Sphingidae Taxonomic Inventory* website (Kitching 2017) and images of adults and early stages can be found in the websites of Janzen and Hallwachs (2017) and Oehlke (2017).

**Sources of records**

The basis of this checklist is the published work of Kaye and Lamont (1927), Lamont and Callan (1950), Schreiber (1978) and Stradling *et al*. (1983), together with my collecting while resident in Trinidad, 1978-1982 and on subsequent visits. I have supplemented these sources with records and images from numerous colleagues and contacts, and records from museums and collections as follows:

**MGCL** - McGuire Center for Lepidoptera and Biodiversity, which includes W.J. Kaye's collection (only selected records confirmed and included)

**MJWC** - the private research collection of M.J.W. Cock, UK (records from all specimens and unpublished notes compiled and collated)

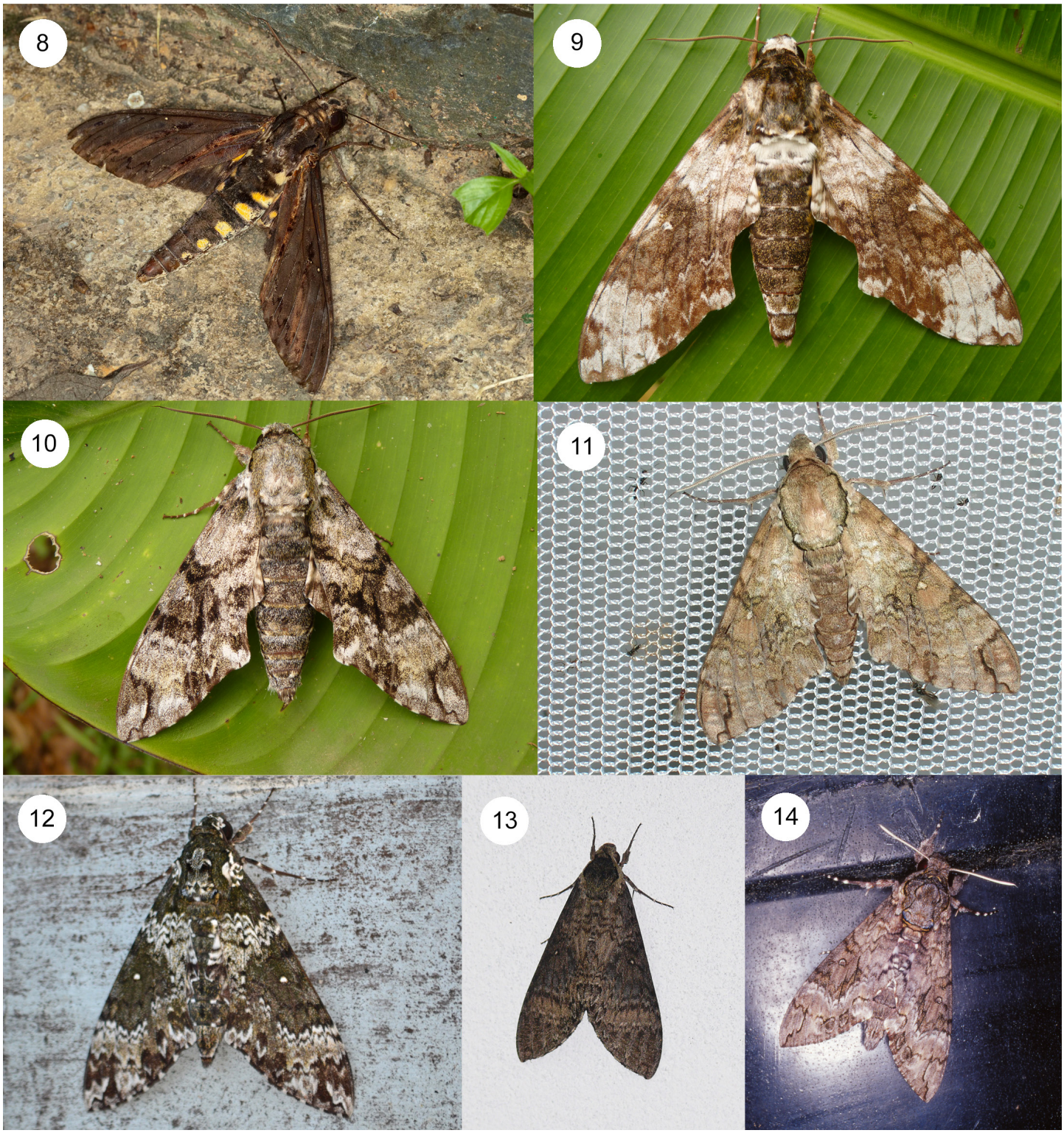
**NHMUK** - Natural History Museum, London, UK, which contains much historical material collected by F. Birch, S.M. Klages and others (only selected records confirmed and included)

**NMSE** - National Museum of Scotland, Edinburgh, UK, which includes the balance of the collections of Sir Norman Lamont and D.J. Stradling (records from Lamont's specimens compiled and collated, but only selected records from Stradling's material are included).


**Figs. 1-7.** Living adults of Trinidad Sphingidae (1). **1**, *Adhemarius gannascus* male, Morne Bleu, 28 December 2014 (K. Sookdeo photo). **2**, *Adhemarius daphne* male, Brasso Venado, 27 July 2014 (K. Sookdeo photo). **3**, *Adhemarius palmeri* male, Asa Wright Nature Centre, 1 March 2009 (J. Morrall photo). **4**, *Protambulyx strigilis* male, Morne Bleu, 2 January 2011 (K. Sookdeo photo). **5**, *Protambulyx strigilis* female, Penal, 5 September 2009 (K. Sookdeo photo). **6**, *Cocytius lucifer* male, Brigand Hill, 28 March 2003 (M.J.W. Cock photo). **7**. *Neococytius cluentius* female, Cat's Hill, 24 June 2009 (K. Sookdeo photo).

**OUNHM** - Oxford University Natural History Museum, which includes material collected by R.M. Farmborough and others (records from many, but perhaps not all, specimens compiled and collated).

**UWIZM** - University of the West Indies Zoological Museum, St. Augustine, Trinidad and Tobago, which includes part of the Sir Norman Lamont collection, F.D. Bennett's collection and part of D.J. Stradling's collection (records from all specimens compiled and collated).

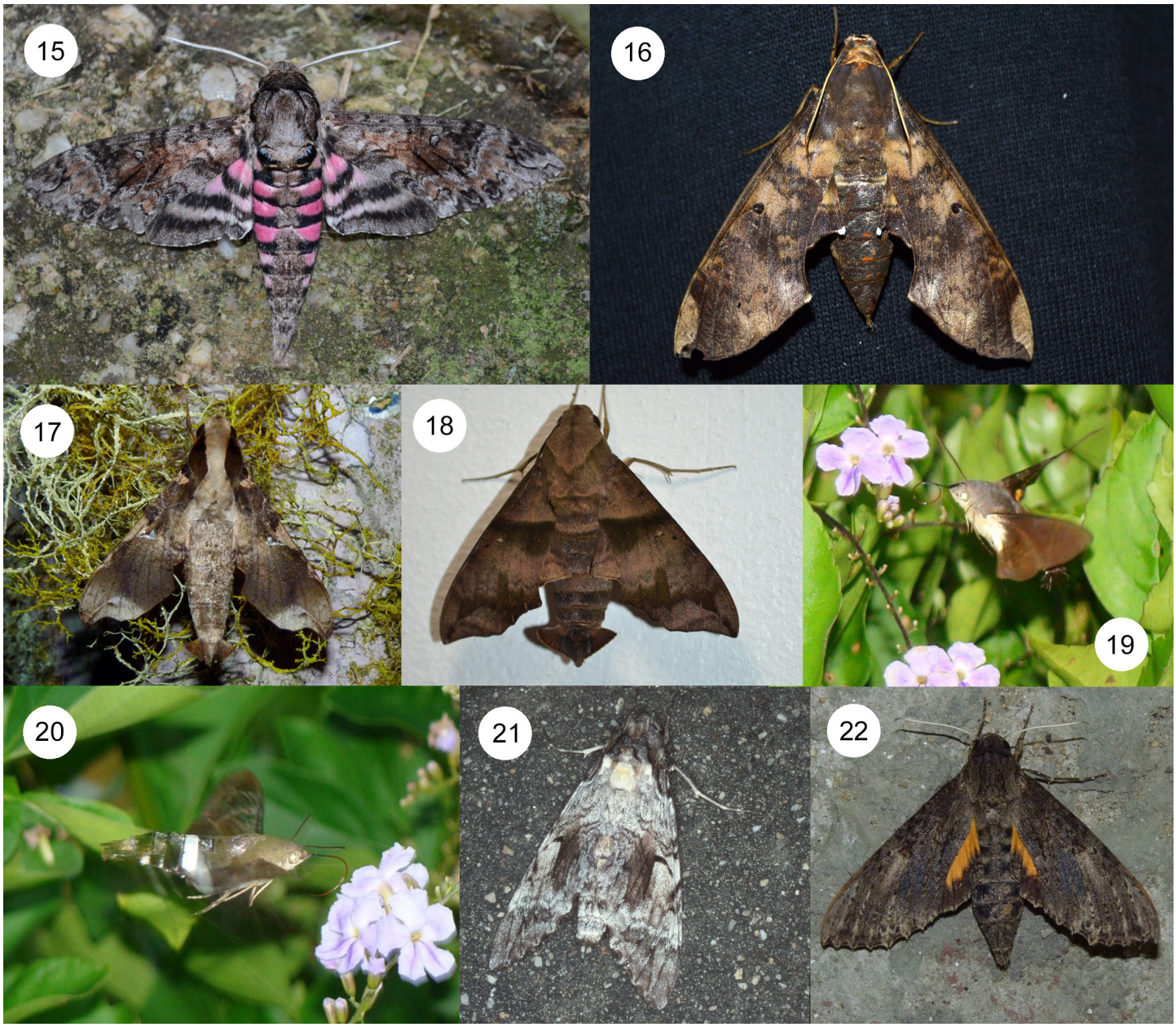



**Figs. 8-14.** Living adults of Trinidad Sphingidae (2). **8**, *Neococytius cluentius* male, Asa Wright Nature Centre, 23 March 2015 (S. Nanz photo). **9**, *Manduca albiplaga* male, Brasso Venado, 27 July 2014 (K. Sookdeo photo). **10,** *Manduca huascara*, Brasso Venado, 27 July 2014 (K. Sookdeo photo). **11,** *Manduca florestan*, Simla Nature Lodge, 16 June 2006 (M.S. Botham photo). **12**, *Manduca rustica rustica*, Morne Bleu, 29 December 2013 (K. Sookdeo photo). **13**, *Manduca diffissa tropicalis*, South Oropouche, August 2010 (T.P. Maharaj photo). **14**, *Agrius cingulata* male, Brigand Hill, 28 March 2003 (M.J.W. Cock photo).

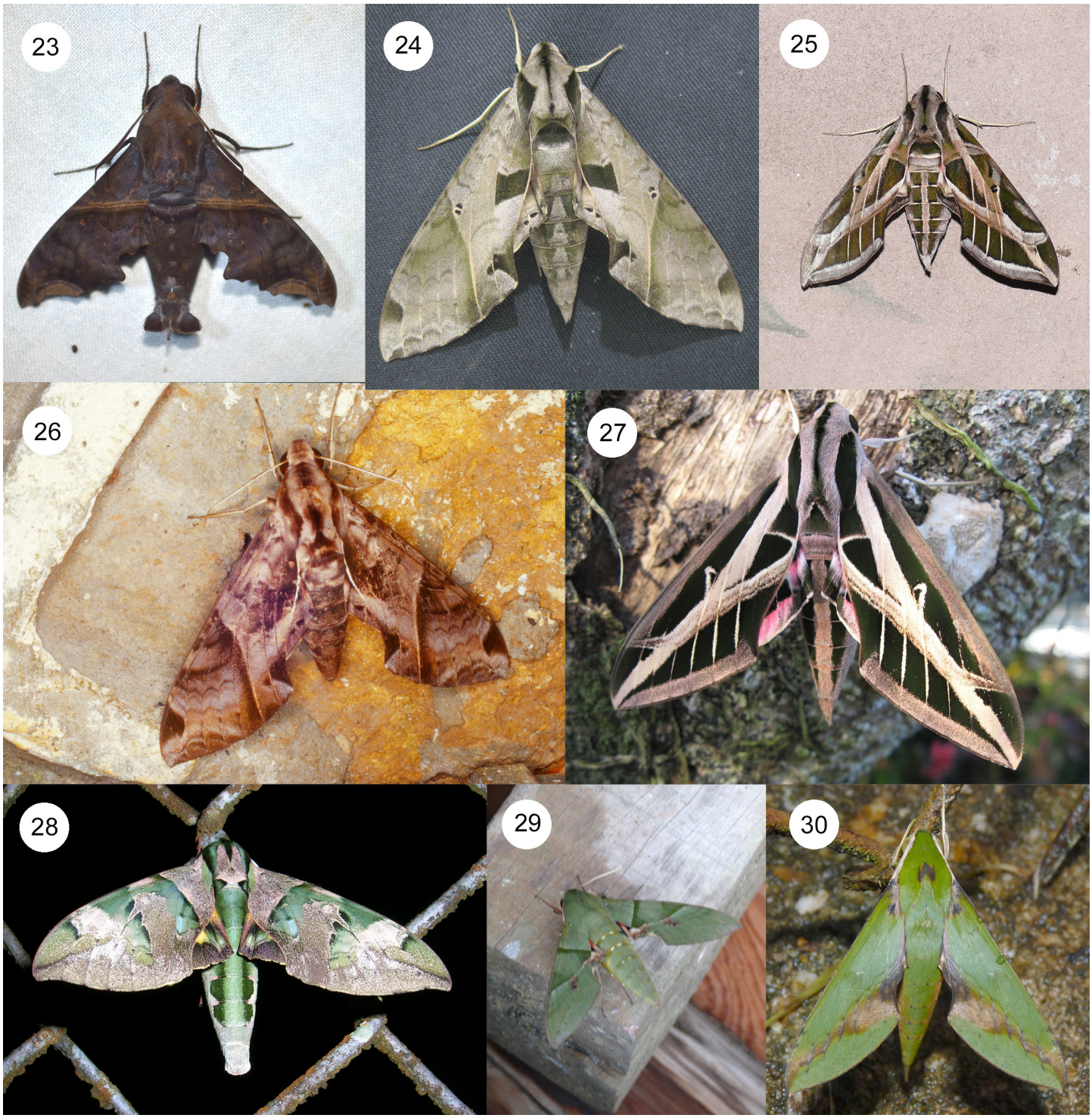
**Images of adults**

Images of pinned adults are provided life size under each species entry. Recognising that these may not be used in hard copy, a 5cm scale bar is included on each page. Male and female specimens are both shown where sexual dimorphism is significant, and at least one species for each genus is shown as both male and female (where material is available). Ventral (underside) views are shown where there are useful diagnostic features, or space would otherwise be wasted.

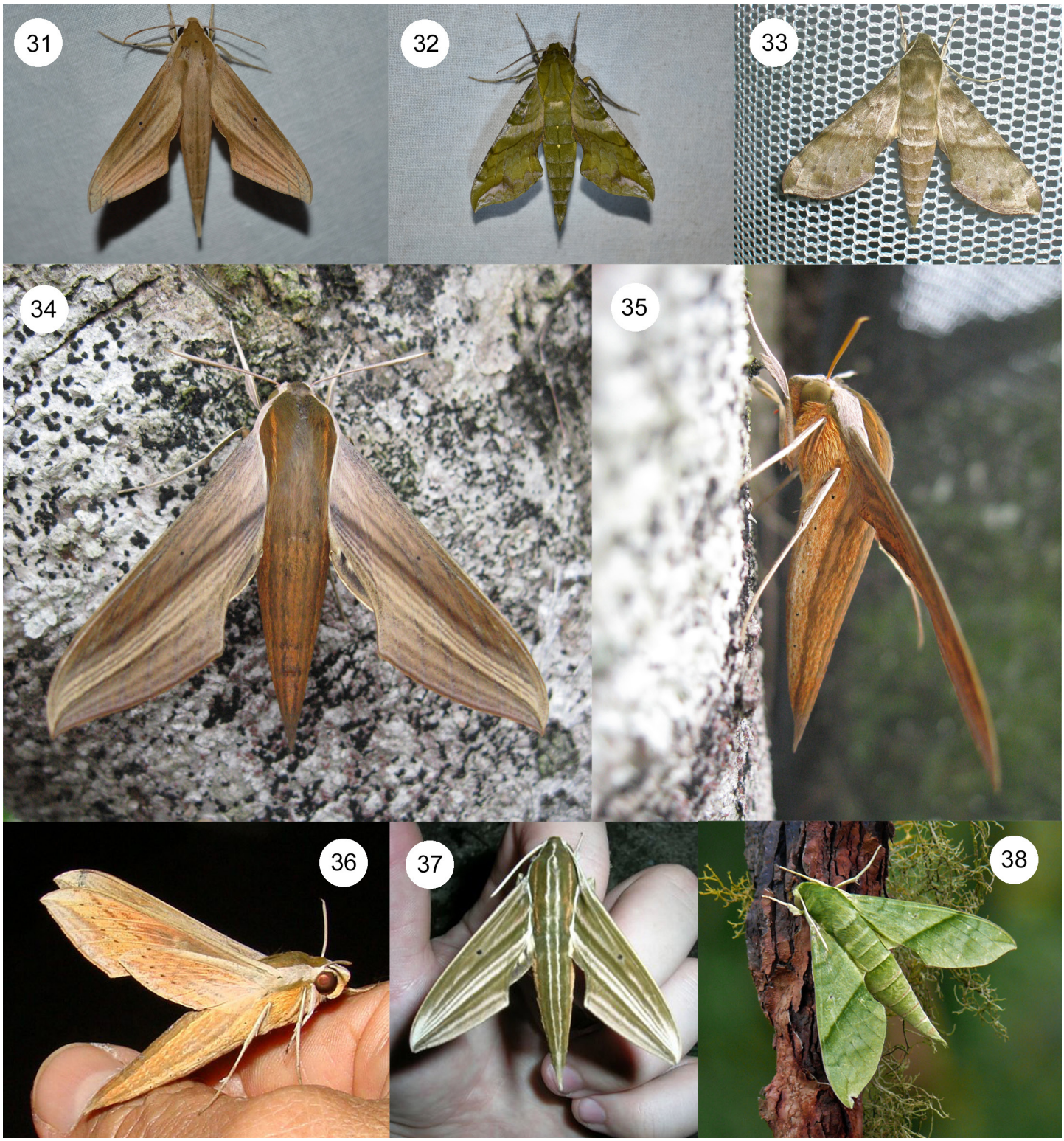
Figs. 1-38 of living adult moths show typical resting positions to facilitate the identification of images of living moths. These are deliberately not representative, but are simply images that I have accumulated from my own work and images generously shared by resident and visiting naturalists. For none of these images is a scale available, although these can be derived from the images provided of pinned specimens.



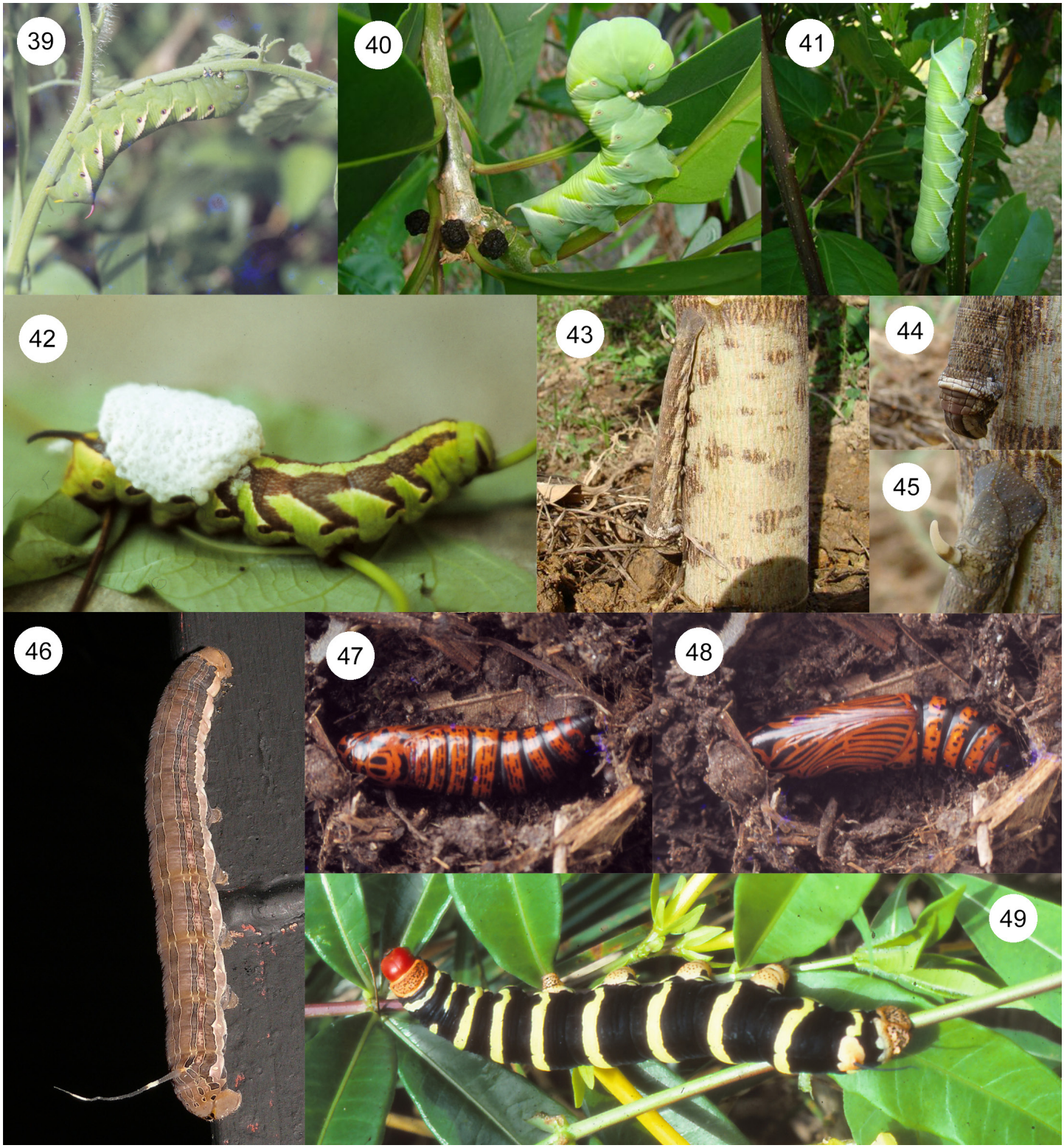

**Figs. 15-22.** Living adults of Trinidad Sphingidae (3). **15**, *Agrius cingulata* female, Morne Bleu, 21 September 2013 (K. Sookdeo photo). **16**, *Pachylia ficus*, Penal, 24 November 2013 (K. Sookdeo photo). **17,** *Callionima pan pan*, Morne Bleu, 28 December 2014, (K. Sookdeo photo). **18,** *Perigonia lusca lusca* male, Brasso Seco, 11 January 2014 (K. Sookdeo photo). **19**, *Aellopos ceculus*, Tobago, Englishman's Bay, 14 March 2013 (M. Kelly photo). **20**, *Aellopos clavipes clavipes*, Tobago, Englishman's Bay, 17 February 2009 (M. Kelly photo). **21**, *Pseudosphinx tetrio* male, Mt. St. Benedict's, 12 October 1993 (M.J.W. Cock photo). **22**, *Isognathus scyron*, Aripo Savanna, 28 September 2014 (K. Sookdeo photo).




**Figs. 23-30.** Living adults of Trinidad Sphingidae (4). **23**, *Enyo ocypete* male, Penal, 20 June 2014 (K. Sookdeo photo). **24,** *Eumorpha satellitia licaon*, Penal, 9 July 2010 (K. Sookdeo photo). **25,** *Eumorpha vitis vitis*, South Oropouche, 22 December 2009 (T.P. Maharaj photo). **26,** *Eumorpha anchemolus* female, Brigand Hill, 28 March 2003 (M.J.W. Cock photo). **27,** *Eumorpha fasciatus fasciatus* male, Penal 18 March, 2009 (K. Sookdeo photo). **28,** *Eumorpha capronnieri*, Morne Bleu, 14 June 2006 (M.S. Botham photo). **29,** *Eumorpha labruscae* male, South Oropouche, 8 July 2008 (T.P. Maharaj photo). **30**, *Xylophanes chiron nechus* male, Morne Bleu, 29 December 2013 (K. Sookdeo photo).




**Figs. 31-38.** Living adults of Trinidad Sphingidae (5). **31,** *Xylophanes loelia*, Penal, 4 February 2014 (K. Sookdeo photo). **32,** *Xylophanes pluto*, Penal, 20 June 2014 (K. Sookdeo photo). **33,** *Xylophanes pistacina*, Penal, 27 November 2008 (K. Sookdeo photo). **34-35,** *Xylophanes tersa tersa*, Penal, 27 November 2008 (K. Sookdeo photo). **36,** *Xylophanes tersa tersa*, Tobago, Englishman's Bay, 1 March 2009 (M. Kelly photo). **37**, *Xylophanes titana* male, Simla Nature Lodge, June 2006 (M.S. Botham photo). **38**, *Xylophanes tyndarus tyndarus* male, Morne Bleu, 30 May 2017 (T.P. Maharaj photo).




**Figs. 39-49.** Early stages of Trinidad Sphingidae. **39,** *Manduca sexta paphus* mature caterpillar, Aranguez Gardens, on tomato (Solanaceae), undated (M.J.W. Cock photo). **40-41,** *Manduca sexta paphus* mature caterpillar (not reared), Tobago, Englishman's Bay, on ornamental *Brugmansia* sp. (Solanaceae), 19 January 2011 (M. Kelly photo). **42**, *Agrius cingulata* caterpillar, Arima Valley, Simla, on *Ipomoea* sp. (Convolvulaceae), parasitized by unidentified Microgasterinae (cocoons), January 1980 (M.J.W. Cock photo). **43-45**, *Erinnyis alope alope* caterpillar (not reared), Tobago, Englishman's Bay, on papaya, 16 January 2011 (M. Kelly photo). **46**, *Isognathus scyron* mature caterpillar, South Oropouche, August 2010 (T.P. Maharaj photo). **47-48**, *Isognathus scyron* pupa reared from *Allamanda cathartica* (Apocynaceae), Curepe, undated (M.J.W. Cock photo). **49**, *Pseudosphinx tetrio* mature caterpillar, on *Allamanda cathartica*, Tobago, Argyll Bay, 28 February 1981 (C.D. Adams photo).

**Vagility**

Some species of hawk-moths are well known to disperse by flying great distances, often as regular migrants (Hodges 1971, Tuttle 2007), and in Costa Rica many species move long distances into drier forests during the rainy season (Janzen 1986). However, there is little information regarding this behaviour in Trinidad, and it may be that some species recorded from the island are not resident, e.g. *Hyles lineata* (Fabricius) (see below). Writing about the Caribbean species, Cary (1951) lists *Agrius cingulata*, *Manduca rustica* (Fabricius), *Cocytius antaeus* (Drury), *Protambulyx strigilis*, *Erinnyis ello* (Linnaeus), *E. alope* (Drury), *Pachylia ficus* (Linnaeus), *Pachylioides resumens* (Walker), *Eumorpha satellitia* (Linnaeus), *E. vitis* (Linnaeus), *E. fasciatus* (Sulzer) and *E. labruscae* (Linnaeus) as likely to disperse over wide stretches of water. In passing, Cock and Boos (2007) reported that Julius O. Boos had collected specimens of *Callionima falcifera* (Gehlen) and *Enyo lugubris* (Linnaeus) 'at light on an oilrig in the sea between Venezuela and the island of Trinidad'. I checked these specimens, now in UWIZM, while preparing the present account. They are labelled 'Trintes Platform B, East of Mayaro Beach' August 1978, i.e. to the east of Trinidad. Trintes B was deployed in the Galeota Marine Field, east of Mayaro, from June 1978 (MPM 1981), and is 8-9km offshore, northeast of Point Galeota (Petroleum Economist 2015), so Cock and Boos (2007) referring to the platform as between Trinidad and Venezuela is misleading. Further records from offshore rigs would add to our insight regarding the species involved, and frequency and scale of the movement of these moths.

**Immature stages**

There is very little recorded regarding the life histories of the Sphingidae in Trinidad, so an overview is provided of food plant records from other parts of the Americas (Appendix Table 1). Several of the sources listed include images of caterpillars and pupae, notably Moss (1912, 1920), Dyer and Gentry (2002), Dyer *et al*. (2017), Janzen & Hallwachs (2017), and Oehlke (2017). In the following species accounts, only literature and information specific to Trinidad and Tobago is included. The few images available of early stages of Trinidad hawk-moths are shown as Figs. 39-49. Hawk-moth caterpillars have a distinctive and characteristic horn or tail on the posterior end of the body (hence the common name hornworms). Although this tail may be greatly reduced in mature caterpillars of some species, its presence will normally serve to distinguish hawk-moth caterpillars from those of other families for the Trinidad fauna (but not necessarily elsewhere). Pupation is generally in a cell in the soil. Rearing methods are not treated here, as information can be found on-line (e.g. https://breedingbutterflies.com/general-information/, http://sphingidae-haxaire.com/index.php/study/livestock/). There is considerable scope for documenting the life histories of Trinidad and Tobago's hawk-moths (and indeed other Lepidoptera), e.g. Cock (2007, 2008).

**Collecting**

Most collecting of hawk-moths in Trinidad, at least in the last 50 years, has been by using lights, particularly mercury vapour lights (MVL) with a strong ultra-violet component, to attract nocturnal adults. Based on this collecting method, Stradling *et al*. (1983) recorded all Sphingidae for nearly 4000 light trap nights at Curepe and used these data to examine patterns of flight in relation to rainfall and the lunar cycle, and how species frequency and diversity has varied over time.

As an aside, it may be noted that CAB International (CABI) staff (including F.D. Bennett, R.E. Cruttwell, the author, etc.) have labelled material as from Curepe, when actually it is from St. Augustine (based on the outlines shown for Curepe and St. Augustine on Google maps). The reasons for this are twofold: (1) although the part of Gordon Street where the CABI premises are situated is in St. Augustine, the CABI office uses the Curepe post office, and hence the postal address is Curepe, and (2) in those days, data labels were hand written or hand printed using a small hand-printing press, and the attraction of writing or preparing hundreds of data labels with the short 'Curepe' rather than the long 'St. Augustine' is obvious.

This body of data from Curepe (= St. Augustine) is complemented by records from collecting at light in forested areas, most notably at the Morne Bleu Textel Installation and at Simla in the Arima Valley, but with observations from many parts of Trinidad (Cock 2003). However, these represent dozens of evenings collecting compared to the thousands of nights trapping in St. Augustine. The intensive collecting at Curepe (St. Augustine) has resulted in five species being only recorded from there: *Erinnyis impunctata* Rothschild & Jordan, *Pachylia syces syces* (Hübner), *Callionima inuus* (Rothschild & Jordan), *Aleuron chloroptera* (Perty), and *Hyles lineata* (Appendix Table 2). However, when other habitats are better collected, this exclusivity to Curepe is expected to disappear; indeed, two further species were removed from this list as this paper was being finalized.

In Appendix Table 2, I have attempted to classify species as being commonly (+++), occasionally (++), rarely (+), or effectively never (-) associated with (i.e., collected in) suburban habitats and forested areas. However, the aforementioned intensive collecting in Curepe is expected to have led to a corresponding overemphasis on suburban

habitats in this analysis.

The hummingbird hawk-moths, *Aellopos* spp., fly by day and feed at flowers, resembling small humming-birds, and have been occasionally caught using nets by butterfly collectors or photographed hovering at flowers. While I was resident in Trinidad, malaise traps were run at several locations, to collect flying insects into ethanol. I sorted some of these catches from Curepe and the Aripo Valley to record the Sphingidae, but found only small numbers of a few species by this collecting method.

There is a group of genera that are poorly documented from Trinidad, because they are not readily attracted to light: *Nyceryx* Boisduval (four species), *Perigonia* Herrich-Schaffer (two species), *Aellopos* Hübner (four species), *Oryba* Walker (two species), *Aleuron* Boisduval (two, possibly four species), *Unzela* Walker (one, possibly two species), and *Pachygonidia* Fletcher (one, possibly two species) (Haxaire 1992, 1996a, 1996b, 2005). As noted above, *Aellopos* spp. are primarily day-flying, though they continue to feed until dusk; the remaining species primarily fly at dusk and dawn and are hardly attracted to lights, apart from *Perigonia lusca* (Fabricius), which is regularly caught at light. All these species are most likely to be seen and collected when coming to flowers. The flowers that are most attractive include species of *Calliandra* and *Inga* (Fabaceae, Mimosoideae) (Haxaire 1992, 1996b). *Eupyrrhoglossum* Grote (one species) and *Enyo* Hübner (three species) are also attracted to flowers at dusk, but then come to light later in the night (Haxaire 1992, 1996c). Thus, for the species that only fly at dusk, there are very few records and specimens, and several species of this group have been recorded from Trinidad by Schreiber (1978) for which I have not seen specimens. It seems likely that before collecting at light came to predominate, collectors in the late 19th and early 20th centuries were aware of this behaviour and exploited it to collect specimens of these genera. Certainly, it would merit investigation in Trinidad today to better understand the hawk-moth fauna.

## SPECIES ACCOUNTS

In the checklist that follows, the currently accepted name of each species (and where appropriate subspecies) recorded from Trinidad is followed by a list of all names used for the species in the literature relating to Trinidad. There follows brief notes on (1) taxonomic issues (if any), (2) identification, (3) biology in Trinidad (if anything is known), and (4) status in Trinidad. For the last, an indication is given as to how rare or common the species is in Trinidad, based on the number of records known to the author: rare <5, uncommon 5-10, occasional 11-19, quite or rather common 21-49, and common >50. For rare species, the individual records are listed. I also give an indication of the habitats in which species have been found, but rarely differentiate more than suburban (as exemplified by Curepe / St. Augustine) and forested, although where there seems to be a pattern, the latter is characterised by altitude or the part of the island. Additional information on months and localities of captures is summarised in Appendix Tables 2 and 4.

Species entries for 84 species which I can confirm as occurring in Trinidad follow below. These are followed by sections on species recorded from Trinidad which I have not been able to confirm (5 species), and species recorded from Trinidad, which I consider to be errors (7 species).

### The Sphingidae of Trinidad

**Family: Sphingidae**
**Subfamily: Smerinthinae**
**Tribe: Ambulycini**

The five Trinidad species of two genera are easily recognised by the elongate forewings with an apical notch, and the coloured dorsal hindwings: orange in *Protambulyx* Rothschild and Jordan and pink in *Adhemarius* Oiticica Filho.

**1. *Adhemarius gannascus* (Stoll, 1790)** (Figs. 1, 50-51)

*Amplypterus gannascus* (Stoll): Kaye (1914b), Kaye and Lamont (1927), Cary (1951)

*Amplypterus gannascus gannascus* (Stoll): Schreiber (1978), Stradling *et al*. (1983)

*Adhemarius gannascus* (Stoll): Vaglia & Haxaire (2005)

**Identification**. Three species of *Adhemarius* are recognised from Trinidad. *Adhemarius palmeri* (Boisduval) is easily separated from the other two, for example, by the dark diagonal line beyond the basal band of the forewing; when seen in life, the lines of the two wings are aligned. *Adhemarius gannascus* and *A. daphne* (Boisduval) below are similar, but the dark mark on the forewing costa just before the apex is consistently narrow in *A. gannascus* and wider in *A. daphne*.

**Biology in Trinidad**. According to Haxaire and Rasplus (1987a), the food plants are *Ocotea* sp. (Lauraceae), based on the work of D.H. Janzen and colleagues (Janzen and Hallwachs 2017). Recently, Janzen and Hallwachs (2016) clarify that they have not reared *A. gannascus* itself, although it flies in their study area, and these earlier records are all referable to cryptic species that had been confused with *A. gannascus*. Thus, at this time, the food plants and biology of *A. gannascus* are unknown.

**Status in Trinidad**. A fairly common forest species. Most records are from the north, but Kaye and Lamont (1927) report it from Fyzabad (R.M. Farmborough).

**2. *Adhemarius daphne daphne* (Boisduval, [1875])** (Figs. 2, 52)

**Taxonomic issues.** This species is identified based on the treatment by Vaglia and Haxaire (2005). There may be a further cryptic species based on DNA barcoding (Janzen and Hallwachs 2017; I.J. Kitching pers. comm. 2017). *Adhemarius daphne* has not hitherto been separated from *A. gannascus* in publications relating to Trinidad, but the author has long been aware that two species are present with different genitalia, and in the past I have incorrectly referred to the present species as *A. dentoni* (Clark). Based on material in UWIZM, I find that some specimens were treated as *A. gannascus* by Stradling *et al*. (1983).

**Identification**. As discussed under *A. gannascus* above.

**Status in Trinidad**. An occasional forest species.

**3. *Adhemarius palmeri* (Boisduval, [1875])** (Figs. 3, 53)

*Amplypterus palmeri* (Boisduval): Kaye (1914b), Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. *Adhemarius palmeri* is easily separated from the other two species of *Adhemarius* spp., for example, by the dark diagonal line beyond the basal band of the forewing.

**Status in Trinidad**. An occasional species, found in suburban areas and forested areas, but not recorded from higher areas

**4. *Protambulyx eurycles* (Herrich-Schäffer, [1854])** (Fig. 54)

*Protambulyx eurycles* (Herrich-Schäffer): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. This distinctive species might only be confused with the much commoner *P. strigilis* below, but that species lacks the strong wavy parallel lines on both wings, the dark forewing margin and the strong dark marking on the basal part of the forewing dorsum.

**Status in Trinidad**. I only know of three records, two from lowland forest, and one from a suburban situation.


**Fig. 50.** *Adhemarius gannascus gannascus* (Stoll) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].


**Fig. 51.** *Adhemarius gannascus gannascus* (Stoll) female, Morne Bleu, Textel Installation, at light, 13 September 1978 (M.J.W. Cock) [MJWC].

Curepe, MVL: ♂ 10 September 1979 (M.J.W. Cock) [UWIZM CABI.7042]
Parrylands Oilfield, MVL: ♂ 25 July 1981 (M.J.W. Cock) [UWIZM CABI.7043]
Valencia Forest, MVL: ♂ 5 August 1981 (M.J.W. Cock) [MJWC] (Fig. 54)


**Fig. 52.** *Adhemarius daphne daphne* (Boisduval) male, Morne Bleu, Textel Installation, at light, 29 March 1979 (M.J.W. Cock) [MJWC].


**Fig. 53.** *Adhemarius palmeri* (Boisduval) male, Hollis Reservoir, at pump house lights, 2 November 1978 (M.J.W. Cock) [MJWC].


**Fig. 54.** *Protambulyx eurycles* (Herrich-Schäffer) male, Valencia Forest, MVL, 5 August 1981 (M.J.W. Cock) [MJWC].

**5. *Protambulyx strigilis* (Linnaeus, 1771)**
(Figs. 4-5, 55-56)

*Ambulyx strigilis* (Linnaeus): Kaye (1901), Kaye (1914a)

*Protambulyx strigilis* (Linnaeus): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Cary (1951)

*Protambulyx strigilis strigilis* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Taxonomic issues.** Janzen and Hallwachs (2017) indicate that there may be two cryptic species present under this name in Costa Rica, but this possibility has not been investigated elsewhere.

**Identification**. A distinctive species readily separated from its congener, *P. eurycles*, above.

**Status in Trinidad**. A common and widespread species, found in suburban and forest habitats.

**Subfamily: Sphinginae**
**Tribe: Sphingini**
**Subtribe: Cocytiina**

This group of four Trinidad species in two genera is basal to the two other recognised subtribes of Sphingini treated below. They are large species with yellow basally on the hindwing and yellow lateral spots on the anterior abdomen. Several species of *Manduca* Hübner have the latter character, but not the former. All Trinidad species feed on Annonaceae and are notable for their long proboscides.

**6. *Cocytius duponchel* (Poey, 1832)** (Figs. 57-58)

*Cocytius duponchel* (Poey): Schreiber (1978), Stradling *et al*. (1983)

**Taxonomic issues.** Eitschberger (2006) placed this species in the genus *Amphonyx*, but this has not been widely accepted (e.g. Kitching 2017).

**Identification**. See under *C. antaeus* below.

**Biology in Trinidad.** Reported Annonaceae food plants include *Annona muricata* (soursop, introduced), *A. reticulata* (custard apple, introduced) and *A. squamosa* (sugar apple, introduced), but there are no reports of this species as a pest in Trinidad.

**Status in Trinidad**. An occasional but widespread species in Trinidad, found in both suburban and forest habitats.


**Fig. 55.** *Protambulyx strigilis* (Linnaeus) male, Morne Bleu, Textel Installation, at light, 29 September 1978 (M.J.W. Cock) [MJWC].


**Fig. 56.** *Protambulyx strigilis* (Linnaeus) female, Morne Bleu, Textel Installation, at light, 29 September 1978 (M.J.W. Cock) [MJWC].

**7. *Cocytius lucifer* Rothschild and Jordan, 1903**
(Figs. 6, 59)

*Cocytius lucifer* Rothschild and Jordan: Lamont and Callan (1950), Schreiber (1978)

*Cocytius lucifer lucifer* Rothschild and Jordan: Stradling *et al*. (1983)

*Amphonyx lucifer* (Rothschild and Jordan): Eitschberger (2006)

**Taxonomic issues.** As for the last species, Eitschberger (2006) placed this species in the genus *Amphonyx*, but this has not been widely accepted (e.g. Kitching 2017). There are two cryptic DNA barcode species under this name in Costa Rica (Janzen and Hallwachs 2011), but this has not been investigated elsewhere.

**Identification**. See under *C. antaeus* below.

**Status in Trinidad**. An occasional species in forest habitats.

**8. *Cocytius antaeus* (Drury, 1773)** (Fig. 60)

*Cocytius antaeus medon* [*sic*] (Stoll): Kaye (1914b) [misspelling of *medor*, a synonym of *antaeus*]

*Cocytius antaeus medor* (Stoll): Kaye and Lamont (1927), Cary (1951) [*medor* is a synonym of *antaeus*]

*Cocytius antaeus antaeus* (Drury): Schreiber (1978)

*Cocytius antaeus* (Drury): Eitschberger 2006

**Identification**. This large species resembles the previous two, *C. duponchel* and *C. lucifer*. Pinned specimens are easy enough to distinguish: the hyaline discal area of the hindwing has the veins dark in all three species, but only in *C. antaeus* is there a parallel dark line in the distal part of each hyaline space. This character is hidden when living adults are photographed, and so only characters of the forewing can be used: the forewings of *C. antaeus* and *C. duponchel* are more mottled than the rather evenly coloured forewing of *C. lucifer*; and furthermore *C. antaeus* has a

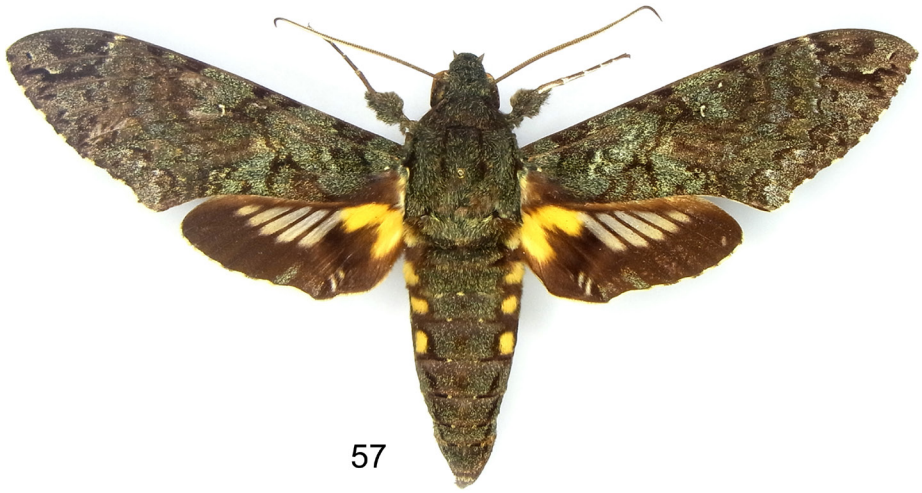



**Fig. 57.** *Cocytius duponchel* (Poey) male, Morne Bleu, Textel Installation, at light, 29 September 1978 (M.J.W. Cock) [MJWC].


**Fig. 58.** *Cocytius duponchel* (Poey) female, Valsayn Park, at light, 22 September 1978 (M.J.W. Cock) [MJWC].

single black streak in the discal area, *C. lucifer* has two, and *C. duponchel* has at most a weak streak.
**Biology in Trinidad.** As for *C. duponchel*, although the Annonaceae food plants include *A. muricata* (soursop, introduced), *A. reticulata* (custard apple, introduced) and *A. squamosa* (sugar apple, introduced), there are no reports of this species as a pest in Trinidad.
**Status in Trinidad**. An occasional species in suburban habitats, rarely found in forested areas.

**9. *Neococytius cluentius* (Cramer, 1775)**
(Figs. 7-8, 61-62)
*Cocytius cluentius* (Cramer): Kaye and Lamont (1927)
*Neococytius cluentius* (Cramer): Stradling *et al*. (1983)
**Identification**. The females of this species probably have the greatest wing spans of any Trinidad hawk-moth, up to 18cm. Adults are superficially similar to the last three species, but the forewing is much darker, and the lateral yellow spots on the abdomen extend further distally. Photographs of living adults with the yellow markings of the hindwing and abdomen potentially hidden may be confused with the smaller *Erinnyis alope* (and size is not always evident in an image). When at rest, the adult of *N. cluentius* holds its wings more tightly against the body (Fig. 7) like *Erinnyis* spp. but unlike *Cocytius* spp. (e.g. Fig 6). The weak pale marking of the forewing of *N. cluentius* are closer to the base of the wing, and *E. alope* has a dark stripe dorsally the length of the thorax, and a strong crest that can be seen in lateral view and sometimes in dorsal view.
**Biology in Trinidad.** The Annonaceae food plants reported include *A. muricata* (soursop, introduced), *A. reticulata* (custard apple, introduced), but there are no reports of this species as a pest in Trinidad.
**Status in Trinidad**. An uncommon species, primarily in forest habitats.

**Subfamily: Sphinginae**
**Tribe: Sphingini**
**Subtribe: Sphingina**
This tribe is represented by the genus *Manduca*, with ten species in Trinidad. Kawahara *et al*. (2013) conducted a multi-gene phylogenetic analysis of *Manduca*, and recognised (1) a basal group, the *lefeburii* complex, and three well supported groups referred to here as: (2) the *florestan* complex, (3) the *sexta* complex, and the (4) *occulta* complex.

**The *lefeburii* complex of *Manduca***
This is the basal group of the genus in the phylogeny of Kawahara *et al*. (2013).

**10. *Manduca lefeburii* (Guérin-Méneville, [1844])**
(Figs. 63)
*Protoparce lefeburei* [*sic*] (Guérin-Méneville): Kaye (1914b), Kaye and Lamont (1927)
*Protoparce lefeburei lefeburei* [*sic*] (Guérin-Méneville): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. A very distinctive species in Trinidad, although there are similar species in South America.

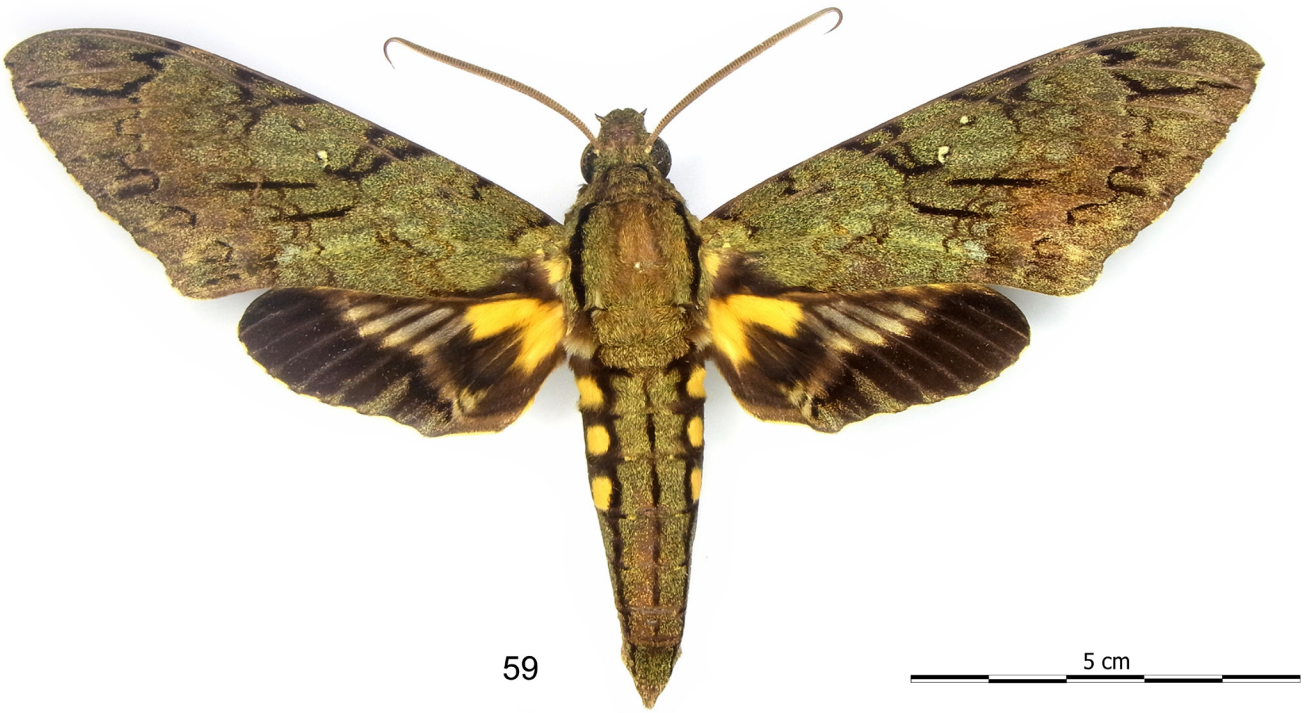



**Fig. 59.** *Cocytius lucifer* Rothschild and Jordan male, Brigand Hill, lighthouse security MVL lights, 24 March 2003 (M.J.W. Cock) [MJWC].

**Status in Trinidad**. An uncommon species, found in suburban and disturbed habitats, but not forested.

**11. *Manduca albiplaga* (Walker, 1856)** (Figs. 9, 64)
*Protoparce albifuga* [*sic*] (Walker): Kaye (1914b)
*Protoparce albiplaga* (Walker): Kaye and Lamont (1927)
*Manduca albiplaga* (Walker): Cary (1951)
*Manduca albiplaga albiplaga* (Walker): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. This is the largest *Manduca* species in Trinidad, and can be further recognised by the white discal and apical bands of the forewing.
**Status in Trinidad**. An occasional species, predominantly in forested areas, especially on the ridges of the Northern Range.

**The *florestan* complex of *Manduca***
The three species treated in this group do not have yellow markings laterally on the abdomen. *Manduca franciscae* (Clark) and *M. huascara* (Schaus) were not included in Kawahara *et al*.'s (2013) study, but are placed here based on their obvious similarity.


**Fig. 60.** *Cocytius antaeus* (Drury) female, St. Augustine, MVL, September 1978 (F.D. Bennett) [MJWC].


**Fig. 61.** *Neococytius cluentius* (Cramer) male, Parrylands Oilfield, MVL, 25 July 1981 (M.J.W. Cock) [MJWC].

**12. *Manduca franciscae* (Clark, 1916)** (Fig. 65)
*Manduca franciscae* (Clark): Stradling *et al*. (1983)
**Identification**. This rare species might easily be overlooked as a pale *M. florestan*, but it is slightly smaller, the colouring is significantly paler, and the hindwing of *M. florestan* (Stoll) is more uniformly brown. Separation of images of the two could be difficult without voucher material.
**Status in Trinidad**. I know of just two records, from Arima Valley and Palmiste.
Arima Valley, Simla, MVL: ♂ 3 May 1981 (M.J.W. Cock) [MJWC] (Fig. 65)
Palmiste: ♀ 11 June 1948 [N. Lamont] [UWIZM. 2013.13.2346]

**13. *Manduca huascara* (Schaus, 1941)** (Figs. 10, 66-67)
*Protoparce corallina*: Kaye (1914b) [probable misidentification]
*Manduca lichenea* (Burmeister): Cary (1951) [misidentification]
*Manduca fosteri* (Rothschild and Jordan): Stradling *et al.* (1983) [misidentification]
**Taxonomic issues.** This medium sized *Manduca* species has been misidentified in Trinidad collections in the past as *M. fosteri* (Rothschild and Jordan) and *M. lichenea* (Burmeister), which are not Trinidad species. Based on appearances, I suspect that this is also the species which Kaye (1914b) referred to as *M. corallina*, although curiously, he does not refer to this species in Kaye and


**Figs. 62.** *Neococytius cluentius* (Cramer) female, Parrylands Oilfield, MVL, 25 July 1981 (M.J.W. Cock) [MJWC].

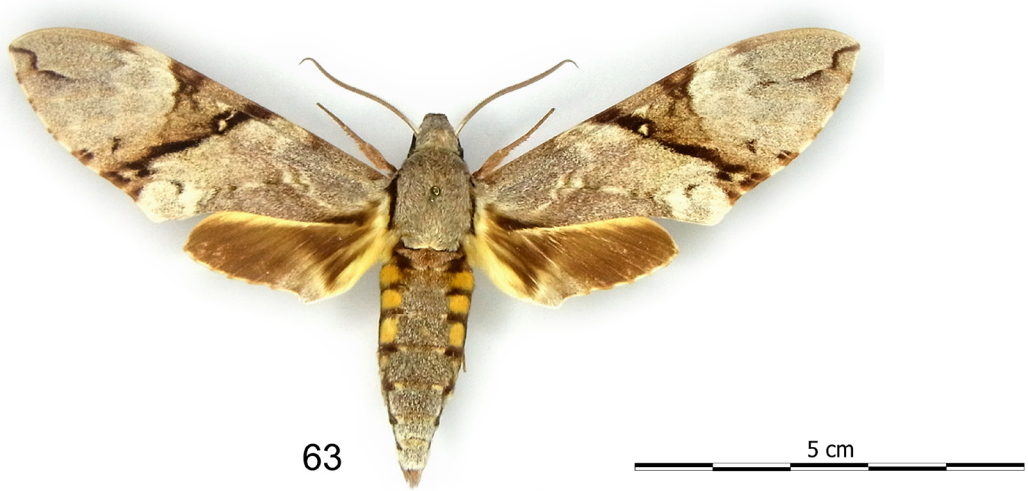



**Fig. 63.** *Manduca lefeburii* male, Manzanilla, at light, 3 June 1979 (M.J.W. Cock) [MJWC].


**Fig. 64.** *Manduca albiplaga* (Walker) male, Morne Bleu, Textel Installation, at light, 10 May 1981 (M.J.W. Cock) [MJWC]

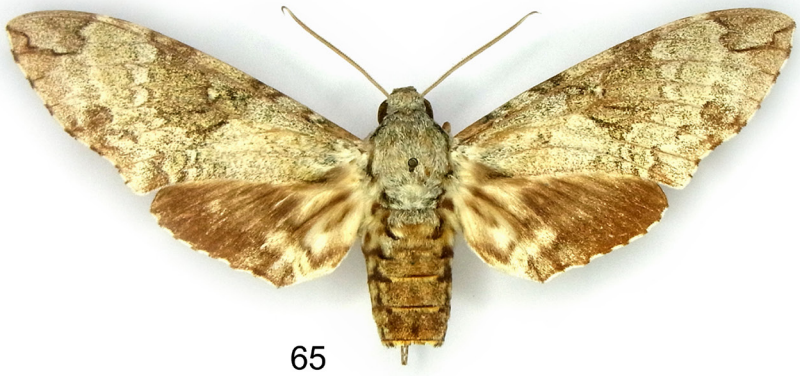



**Fig. 65.** *Manduca franciscae* (Clark) male (dissected), Arima Valley, Simla, MVL, 3 May 1981 (M.J.W. Cock) [MJWC].

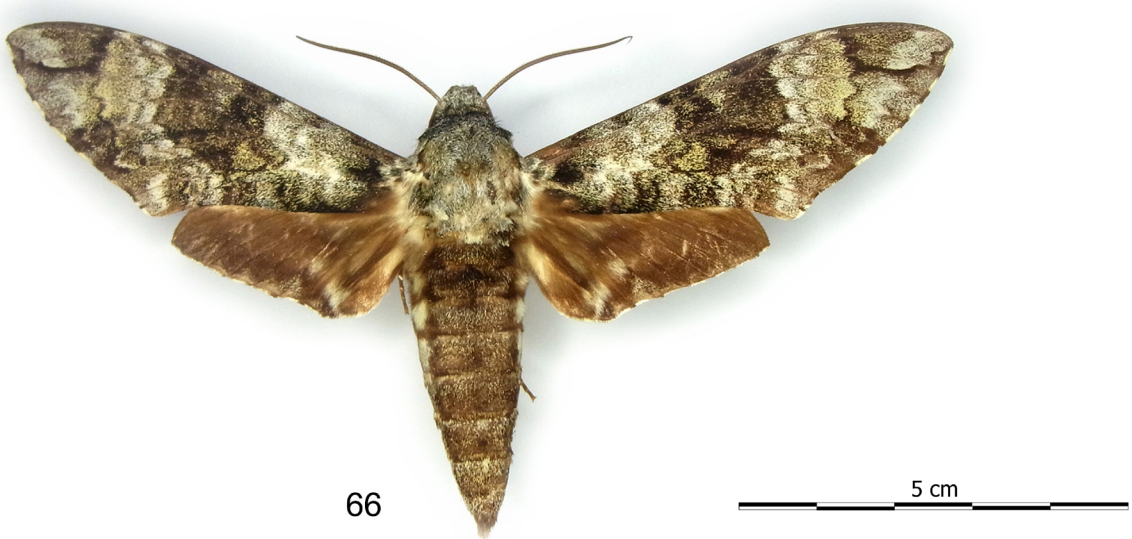



**Fig. 66.** *Manduca huascara* (Schaus) male, Arima Valley, Simla, MVL, 28 February 1981 (M.J.W. Cock) [MJWC].

Lamont (1927). It was confused with the common *M. florestan* (below) by Stradling *et al*. (1983).

**Identification**. This is a reasonably distinctive species within the Trinidad fauna: *M. florestan* is a more evenly coloured and greener species, with a diagnostic contrasting light brown patch at the end of the forewing cell (although care is needed as this patch can be weakly or very weakly expressed in some individuals). Images of living adult *M. huascara* might be confused with *Agrius cingulata* or *Pseudosphinx tetrio* (Linnaeus), but careful examination of the details of the forewing markings should separate them.

**Status in Trinidad**. An occasional widespread species, more common in forested areas, but not from the higher parts of the Northern Range.

**14. *Manduca florestan* (Stoll, 1782)** (Figs. 11, 68)

*Diludia florestan* (Stoll): Kaye (1901, 1914a)

*Protoparce florestan* (Stoll): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927)

*Manduca floristan* [*sic*] (Stoll): Cary (1951)

*Manduca florestan florestan* (Stoll): Schreiber (1978), Stradling *et al*. (1983)

*Manduca florestan* (Stoll): D'Abrera ([1987]), Cock (2017b)

**Identification**. This species might be confused with the last two as discussed above.

**Status in Trinidad**. A common and widespread species in forested areas.

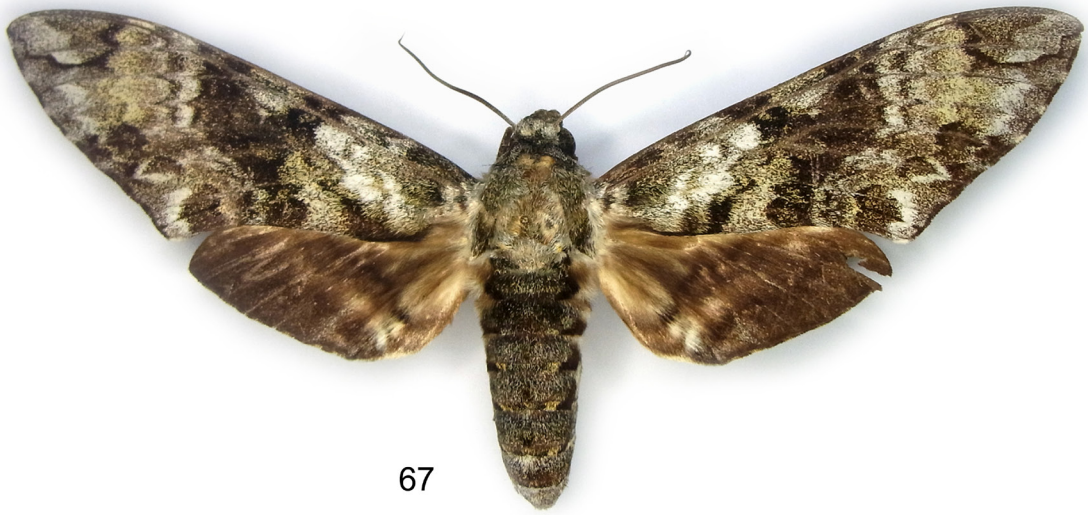



**Fig. 67.** *Manduca huascara* (Schaus) female, Brigand Hill, lighthouse security MVL lights, 25 March 2003 (M.J.W. Cock) [MJWC].

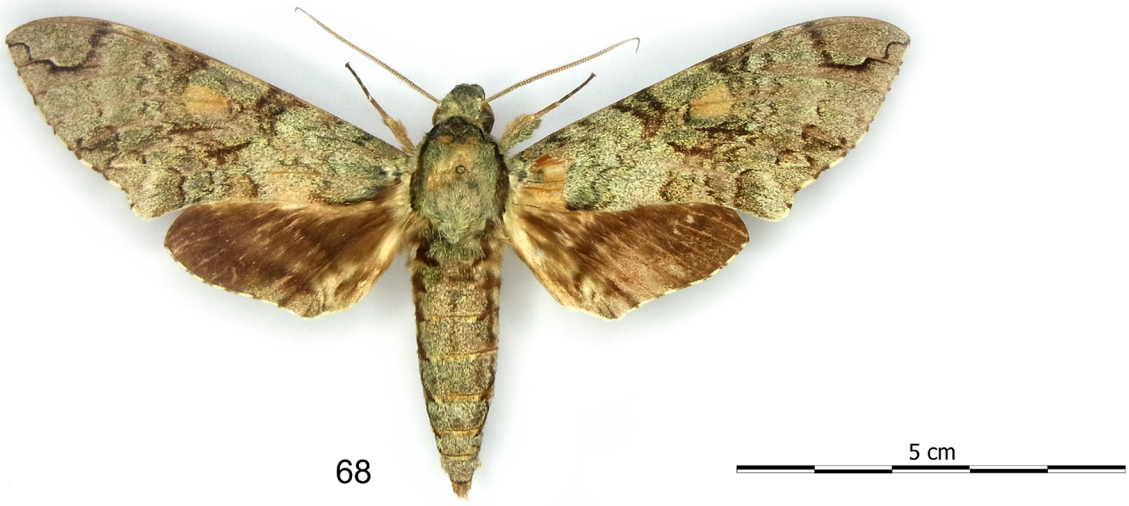



**Fig. 68.** *Manduca florestan* (Stoll) male, Morne Bleu, at light, 13 September 1978 (M.J.W. Cock) [MJWC].

**The *sexta* complex of *Manduca***

**15. *Manduca rustica rustica* (Fabricius, 1775)** (Figs. 12, 69)

*Macrospila* sp.: Guppy (1893)

*Protoparce rustica* (Fabricius): Kaye (1901, 1914a, 1914b)

*Protoparce rustica rustica* (Fabricius): Rothschild and Jordan (1903), Kaye and Lamont (1927)

*Manduca rustica rustica* (Fabricius): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. The fine grained mottling of the wings and strong white spot in the forewing cell should serve to recognise this species in Trinidad.

**Biology in Trinidad**. Guppy (1893) describes rearing a '*Macrospila* sp.' which he found on 'heliotrope', which may well have been the polyphagous *Manduca rustica*.

**Status in Trinidad**. A fairly common and widespread species in both suburban and forest habitats.

**16. *Manduca sexta* (Linnaeus, 1763) *paphus* (Cramer, 1779)** (Figs. 39-40, 70)

*Protoparce paphus* (Cramer): Kaye (1901), Guppy (1914), Kaye (1914a)

*Protoparce sexta* (Linnaeus): Guppy (1911a, 1911b)

*Protoparce sexta paphus* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927) , Cock (2017b)

*Protoparce* sp.: Topper (1943)

*Manduca sexta paphus* (Cramer): Cary (1951), Schreiber (1978), Stradling *et al*. (1983)

*Manduca sexta jamaicensis* (Butler): Schreiber (1978), Stradling *et al*. (1983) [misidentification or error]

*Manduca sexta* (Linnaeus): CABI (2002c)

**Taxonomic issues.** There appears to be at least two cryptic taxa under this name in Costa Rica (Janzen and Hallwachs 2017), but only a single species in South America based on the barcodes in BOLD (http://boldsystems.org/index.


**Fig. 69.** *Manduca rustica rustica* (Fabricius) male, Morne Bleu, Textel Installation, at light, 29 September 1978 (M.J.W. Cock) [MJWC].

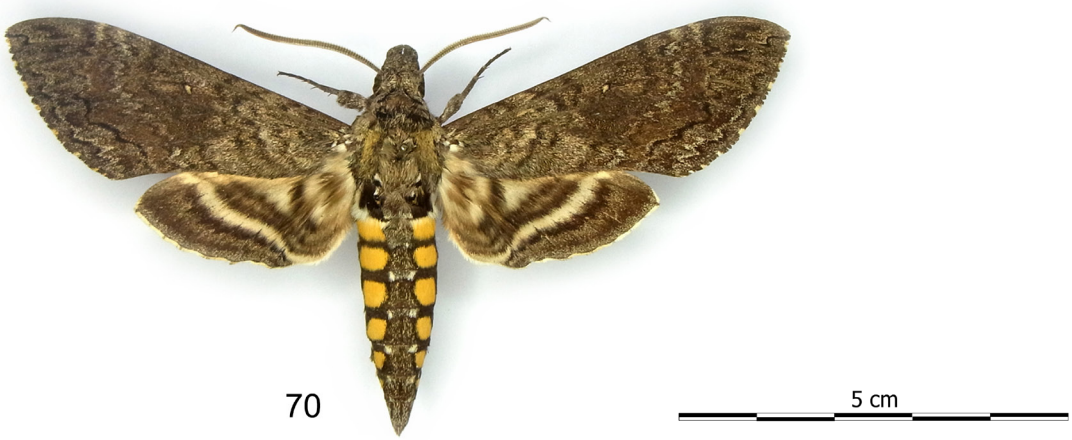



**Fig. 70.** *Manduca sexta paphus* (Cramer) male, Curepe, MVL, 25 July 1978 (M.J.W. Cock) [MJWC].

php, 24 October 2017). Schreiber (1978) records both *M. sexta jamaicensis* and *M. sexta paphus* from Trinidad; the former is restricted the Caribbean islands, including the Lesser Antilles, but I have seen no evidence that it also occurs in Trinidad.

**Identification**. This medium sized hawk-moth has the forewings rather uniformly grey, and although there are other similar species in South America, this is the only one of this appearance known from Trinidad. Photographs of living adults might be confused with *Agrius cingulata* as discussed above, or the darker *M. diffissa* (Butler) below.

**Biology in Trinidad.** In Trinidad, Guppy (1911b) notes caterpillars on tobacco, tomato and peppers, and Kaye and Lamont (1927) refer to this species as the tobacco hawk-moth.

**Status in Trinidad**. A fairly common species in suburban habitats, but hardly recorded from forests.

**The *occulta* complex of *Manduca***

This group is based on *M. occulta* (Rothschild and Jordan), a species closely related to *M. diffisa* Butler, which does not occur in Trinidad. Kawahara *et al*. (2013) did not include *M. ochus* (Klug) in their study, and its placement is uncertain.

**17. *Manduca diffissa* (Butler, 1871) *tropicalis* (Rothschild and Jordan, 1903)** (Figs. 13, 71)

*Protoparce diffusa* [*sic*] *tropicalis* (Rothschild and Jordan): Kaye (1914b) [misspelling]

*Protoparce diffissa tropicalis* (Rothschild and Jordan): Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)

*Manduca occulta occulta* Rothschild and Jordan: Schreiber (1978) [misidentification or error]

**Taxonomic issues.** Schreiber (1978) lists *Manduca occulta occulta* Rothschild and Jordan from Trinidad, but this is the Central American equivalent of *Manduca diffissa,* and not a South American species**.**

**Identification**. This species is darker than the superficially similar *M. sexta* above. In living specimens the slightly paler postdiscal lines align across the two wings.

**Status in Trinidad**. A fairly common, widespread species found in both suburban and forested habitats.

**18. *Manduca hannibal hannibal* (Cramer, 1779)** (Fig. 72)

*Protoparce hannibal* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927)

*Manduca hannibal* (Cramer): Cary (1951)

*Manduca hannibal hannibal* (Cramer): Schreiber (1978), Stradling *et al*. (1983)

**Taxonomic issues.** There seems to be at least two cryptic species in Costa Rica (Janzen and Hallwachs 2017) but this has not been evaluated elsewhere.

**Identification**. A distinctive species; note the orange dorsal markings on the abdomen, and the relatively uniform brown dorsal forewing, with a broad blackish post-discal band and narrow submarginal white

**Biology in Trinidad.** Kaye and Lamont (1927) give '*Frombeta* (Solanaceae)' as a food plant, but this is an error for *Trombeta*, incorrectly transcribed from Moss (1912).

**Status in Trinidad**. An uncommon species found in suburban and forested situations.

**19. *Manduca ochus* (Klug, 1836)** (Fig. 73)

*Protoparce ochus* (Klug): Kaye (1901), Rothschild and Jordan (1903), Kaye (1914a, 1914b), Kaye and Lamont (1927)

*Manduca ochus* (Klug): Cary (1951), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. A very distinctive species; the combination of rich brown and blackish costal markings on the forewing cannot be mistaken.

**Status in Trinidad**. A rare species, from both suburban and forest areas.

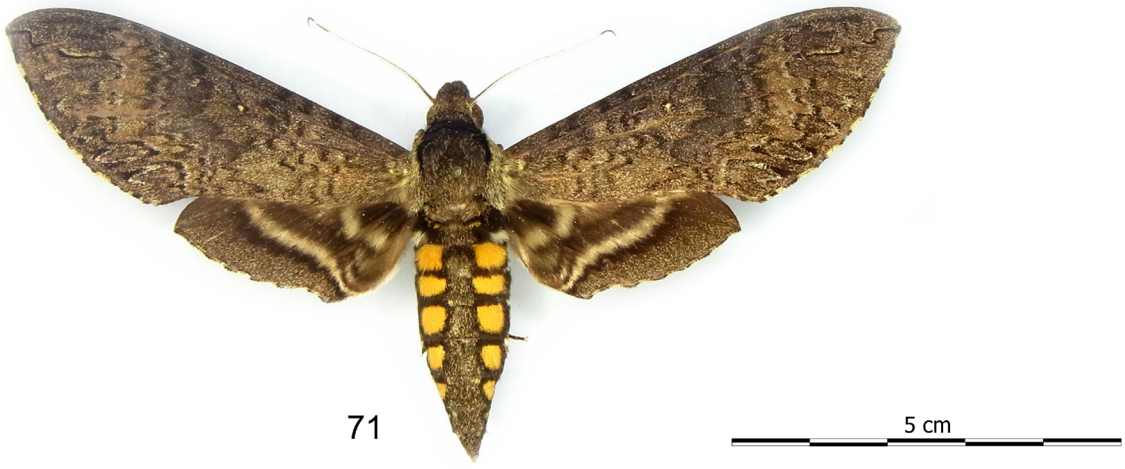



**Fig. 71.** *Manduca diffissa tropicalis* (Rothschild and Jordan) male, Morne Bleu, Textel Installation, at light, 10 May 1981 (M.J.W. Cock) [MJWC].

**Subfamily: Sphinginae**
**Tribe: Sphingini**
**Subtribe: Acherontiina**

This mostly Old World subtribe is represented by just one species in Trinidad: *Agrius cingulata*. It is unique in the Trinidad fauna in having pink markings on the abdomen.

**20. *Agrius cingulata* (Fabricius, 1775)**
(Figs. 14-15, 41, 74-75)
*Herse cingulata* (Fabricius): Kaye (1914b), Kaye and Lamont (1927), Pollard (1984)
*Agrius cingulata* (Fabricius): Cary (1951)
*Agrius cingatulus* [*sic*] (Fabricius): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. The pink markings on the dorsal hindwing and abdomen are distinctive. Slight sexual dimorphism, the male typically has more contrasting forewing markings. Images of resting adults do not show the pink markings normally, and they must be identified by comparison of the markings with similar species such as *Pseudosphinx tetrio* and *Erinnyis* spp.
**Biology in Trinidad**. The Convolvulaceae food plants include sweet potato (*Ipomoea batatas*), on which the caterpillar are an occasional, minor pest in Trinidad (Pollard 1984).
**Status in Trinidad**. An occasional species found in both disturbed and forest habitats.

**Subfamily: Macroglossinae**
**Tribe: Dilophonotini**
**Subtribe Dilophonotina**

For ease of comparison, the sequence in Kawahara *et al* (2009) is followed here, using group names for convenience based on the obvious clades on their phylogeny. Thus, I refer to the *Pachylia* group (two species of *Pachylia* Walker), the *Nyceryx* group (16 species of five genera), the *Erinnyis* group (17 species of seven genera), and the *Aleuron* group (three species of two genera).

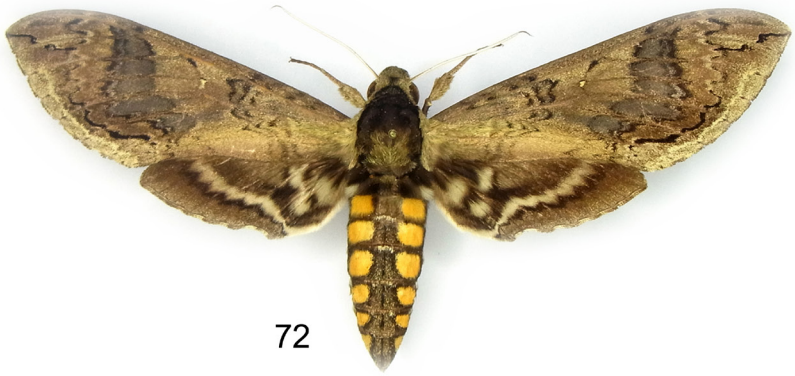



**Fig. 72.** *Manduca hannibal hannibal* (Cramer) female, Curepe, MVL, 28 November 1978 (M.J.W. Cock) [MJWC].

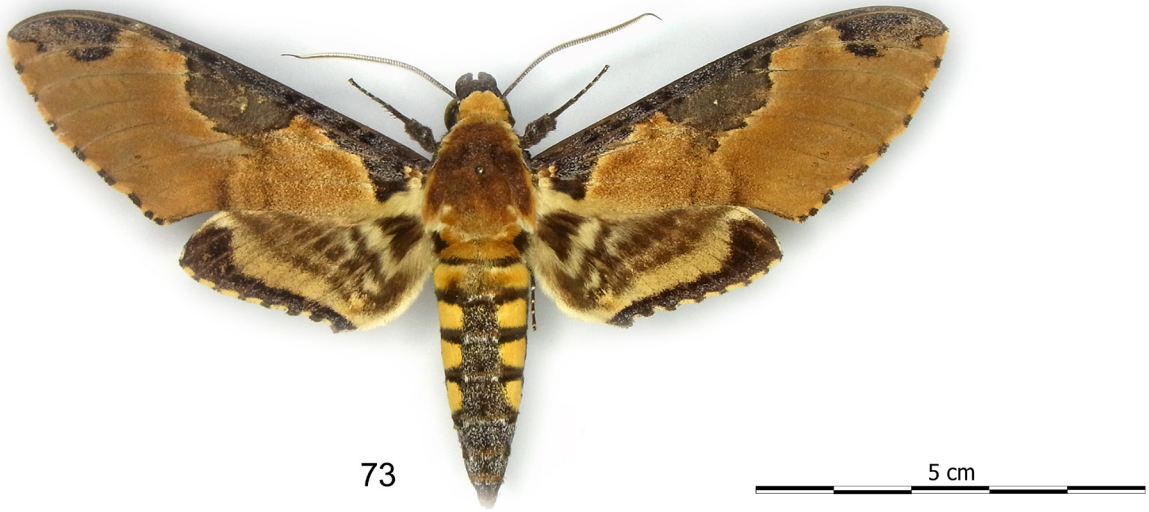



**Fig. 73.** *Manduca ochus* (Klug) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].

***Pachylia* group**

Two species of *Pachylia* are reported from Trinidad. Both feed on *Ficus* (Moraceae).

**21. *Pachylia ficus* (Linnaeus, 1758)** (Figs. 16, 76-77)

*Pachylia ficus* (Linnaeus): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. This species can be recognised by the mottled brown dorsal forewings with a distinct pale brown apical patch. The rare *P. syces* is darker and has a pale brown patch on the forewing costa as well.

**Status in Trinidad**. Kaye and Lamont (1927) considered *P. ficus* one of the commonest of the Sphingidae, but observations since the 1970s show that it is only an occasional species, mostly recorded from suburban areas.

**22. *Pachylia syces syces* (Hübner, [1819])** (Fig. 78)

*Pachylia syces syces* (Hübner): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Biology**. Adults have been collected at flowers of Mimosoideae (*Inga* sp., *Callliandra* sp., etc.) at dusk in French Guiana (Haxaire and Rasplus 1987a). It may be that this is primarily a dusk or crepuscular flier, rarely attracted to light.

**Identification**. The dorsal forewings are fairly uniformly dark brown with pale brown patches on the costa and apex.

**Status in Trinidad**. A rare species in Trinidad that I have not personally encountered. Stradling *et al*. (1983) note just three records, and I have seen images of two further females from Tobago (Cock 2017b).

Curepe, light trap: ♀ 25 November 1970 (F.D. Bennett) [UWIZM CABI.1984] (Fig. 78); ♂ 20 September 1973 [F.D. Bennett] [NMSE, ex D.J. Stradling collection]

***Nyceryx* group**

This group comprises the following genera from Trinidad: *Callionima* Lucas (four species), *Nyceryx* (four species), *Perigonia* (two species), *Eupyrrhoglossum* (one species), and *Aellopos* (five species). *Callionima* spp. can be readily recognised by the silver distorted Y-shape on the dorsal forewing; *Madoryx* spp. and *Hemeroplanes triptolemus*


**Fig. 74.** *Agrius cingulata* (Fabricius) male, Caura Valley, Nr. Caura, MVL, 24 September 1978 (M.J.W. Cock) [MJWC].


**Figs. 75.** *Agrius cingulata* (Fabricius) female, Brigand Hill, lighthouse security MVL lights, 28 March 2003 (M.J.W. Cock) [MJWC].


**Fig. 76.** *Pachylia ficus* (Linnaeus) male, St. Augustine, MVL, 29 August 1978 (F.D. Bennett) [MJWC].


**Fig. 77.** *Pachylia ficus* (Linnaeus) female, Brigand Hill, lighthouse security MVL lights, 28 March 2003 (M.J.W. Cock) [MJWC].


**Fig. 78.** *Pachylia syces syces* (Hübner) female, Curepe, light trap, 25 November 1970 (F.D. Bennett) [UWIZM CABI.1984].

(Cramer) also have one or two silver spots, but not in a Y-shape. The inclusion of *Callionima* is weakly supported, but the remaining genera appear to be a monophyletic group.

**23. *Callionima pan pan* (Cramer, 1779)** (Figs. 17, 79-80)
*Callionima pan* (Cramer): Stradling *et al*. (1983)
**Identification**. The slightly truncate forewing apical margin should help separate *C. pan* from the other *Callionima* spp. found in Trinidad.
**Status in Trinidad**. An uncommon species in Trinidad with records from a suburban area (Curepe, four records including three noted by Stradling *et al*. (1983)) and a forested area (Morne Bleu four records).

**24. *Callionima calliomenae* (Schaufuss, 1870)** (Figs. 81-82)
*Hemeroplanes calliomenae* (Schaufuss): Kaye (1914b), Kaye and Lamont (1927),
*Callionima calliomenae* (Schaufuss): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. The variable olive-grey-brown forewing dorsal colouring and denticulate margin, and the yellow rather than orange dorsal hindwing when visible, will distinguish this common species from others of the genus.
**Status in Trinidad**. A common species in suburban areas, but not recorded from forested areas.

**25. *Callionima inuus* (Rothschild and Jordan, 1903)** (Figs. 83-84)
*Callionima inuus* Rothschild and Jordan: Stradling *et al*. (1983)
**Identification**. This species is superficially similar to *C. falcifera* (below), but can be recognised by the more elongate, and less falcate forewing and the more contrasting dorsal forewing subapical reticulate pale orange patch, which has a curved outer margin.
**Status in Trinidad**. An occasional species, recorded only from a suburban area (Curepe).

**26. *Callionima falcifera* (Gehlen, 1943)** (Figs. 85-86)
*Callionima parce parce* (Fabricius): Schreiber (1978), Stradling *et al*. (1983) [misidentification]
*Callionima falcifera* (Gehlen): Stradling *et al*. (1983), Cock and Boos (2007)
**Taxonomic issues.** A population from Mexico was recognised as a separate subspecies in Kitching and Cadiou 2000), but this has now been sunk, so no subspecies name is needed (Kitching 2017). This species was identified by dissection and comparison with the illustrations in Soares (1993). Trinidad specimens are quite variable in colour, some being orange-brown in general colour (Fig. 85) and others darker (Fig. 86). I have dissected an example of both and found no significant differences.
**Identification**. The sharply falcate forewing, variable


**Figs. 79-80.** *Callionima pan pan* (Cramer) male, Curepe, MVL, 13 February 1980 (M.J.W. Cock) [MJWC]. **79**, dorsal. **80**, ventral.


**Figs. 81-82.** *Callionima calliomenae* (Schaufuss). **81**, male, Curepe, MVL, 11 September 1979 (M.J.W. Cock) [MJWC]. **82**, female, Curepe, MVL, 2 September 1978 (M.J.W. Cock) [MJWC].

orange-brown dorsal forewing and pale subapical reticulated patch with a straight outer margin should serve to distinguish this species.

**Status in Trinidad**. A common species in suburban areas, but only occasionally caught in lowland forested areas.

**27. *Nyceryx coffaeae* (Walker, 1856)** (Figs. 87-88)

*Nyceryx coffeae* [*sic*] (Walker): Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. This small hawk-moth is readily distinguished from the larger *N. maxwelli* (Rothschild) and the other two *Nyceryx* spp., which have denticulate wing margins, but might be confused with *Perigonia lusca*. *Nyceryx coffaeae* has two yellow patches on the dorsal hindwing (diagnostic for this species in Trinidad), where *P. lusca* has only one.

**Status in Trinidad**. An uncommon species, all records are from a suburban area (Curepe).

**28. *Nyceryx maxwelli* (Rothschild, 1896)** (Figs. 89-90)

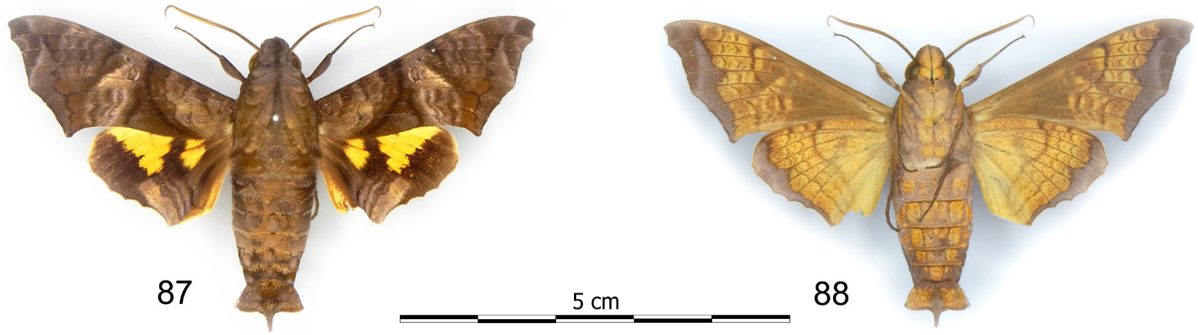
**Taxonomic issues.** This species has not previously been reported from Trinidad. My identification was confirmed by I.J. Kitching (pers. comm. 2004) from dorsal and ventral images, and from Haxaire & Cadiou (1999).

**Identification**. The relatively large size, forewing shape and markings, and extensive yellow basal-discal area of the dorsal hindwing will help to identify this species.

**Status in Trinidad**. *Nyceryx maxwelli* is only known


**Figs. 83-84.** *Callionima inuus* (Rothschild and Jordan) male, Curepe, light trap, 7 October 1969 (F.D. Bennett) [MJWC]. **83**, dorsal. **84**, ventral.


**Figs. 85-86.** *Callionima falcifera falcifera* (Gehlen) male. **85**, Curepe, MVL, 25 May 1979 (M.J.W. Cock) [MJWC]. **86**, Curepe, MVL, 12 September 1979 (M.J.W. Cock) [MJWC].




**Figs. 87-88.** *Nyceryx coffaeae* (Walker) male, Curepe, MVL, 14 January 1980 (M.J.W. Cock) [MJWC]. **87**, dorsal. **88**, ventral.

from Trinidad from one record, collected near Chatham, southwest Trinidad, by Mary Alkins-Koo.

Chatham: ♂ 7 January 1985 (M. Alkins) [UWIZM. 2014.9.1289] (Figs. 89-90)

**29. *Nyceryx riscus* (Schaus, 1890)** (Figs. 91, 93-94)

*Nyceryx riscus* (Schaus): Schreiber (1978), Stradling *et al*. (1983)

**Taxonomic issues**. Haxaire (2013) reports that there is a significant 3% barcode difference between the Central American and South American populations of *N. riscus*. The South American population may require a new name as *N. riscus* was described from Mexico.

**Identification.** The reddish brown dorsal forewing with a dark marginal band and the denticulate margin of both wings will separate this species and *N. stuarti* (Rothschild) (below) from other Trinidad hawk-moths. The dark marginal area is angled towards the tornus in *N. stuarti* (Fig. 91), but almost straight in *N. riscus* (Fig. 92).

**Status in Trinidad**. This species was first reported from Trinidad by Schreiber (1978) and Stradling *et al*. (1983). It is uncommon, but occurs in both suburban and forested areas. There are no records from the south of Trinidad, from where a very similar species, *N. stuarti* is reported below.

**30. *Nyceryx stuarti* (Rothschild, 1894)** (Figs. 91, 95-97)

**Taxonomic issues.** This species has not previously been reported from Trinidad. The two specimens reported below were confused with *N. riscus* (above) until I identified them from Haxaire (1996b, 2005) when preparing this catalogue. I have subsequently checked all material in MJWC, NMSE and UWIZM as *N. riscus* without finding additional specimens of *N. stuarti*.

**Identification.** See under *N. riscus* above.

**Status in Trinidad**. To date, this species in Trinidad is only known from a pair taken at light in Parrylands, February 1980, by the late Julius O. Boos. It seems likely that *N. stuarti* is associated with lowland forest, perhaps restricted to the south or southwest of Trinidad.

**31. *Perigonia pallida* Rothschild and Jordan, 1903** (Figs. 98-99)

*Perigonia pallida* Rothschild and Jordan: Kaye and Lamont (1927)

*Perigonia pallida pallida* Rothschild and Jordan: Schreiber (1978), Stradling *et al*. (1983)

**Identification**. This hawk-moth is unlikely to be confused with any other Trinidad species, being recognisable by its small size and the large yellow discal area of the dorsal hindwing.


**Figs. 89-90.** *Nyceryx maxwelli* (Rothschild) male, Chatham, 7 January 1985 (M. Alkins) [UWIZM]. **89**, dorsal. **90**, ventral.


**Figs. 91-92**. Diagnostic characters for *Nyceryx stuarti* (91) and *N. riscus* (92). (Not to scale)

**Status in Trinidad**. An uncommon species, only recorded from suburban areas (Port of Spain, Curepe).

**32. *Perigonia lusca lusca* (Fabricius, 1777)**
(Figs. 18, 100-103)

*Perigonia lusca* (Fabricius): Kaye (1914b), Kaye and Lamont (1927)

*Perigonia interrupta* (Walker): Schreiber (1978), Stradling *et al*. (1983) [synonym]

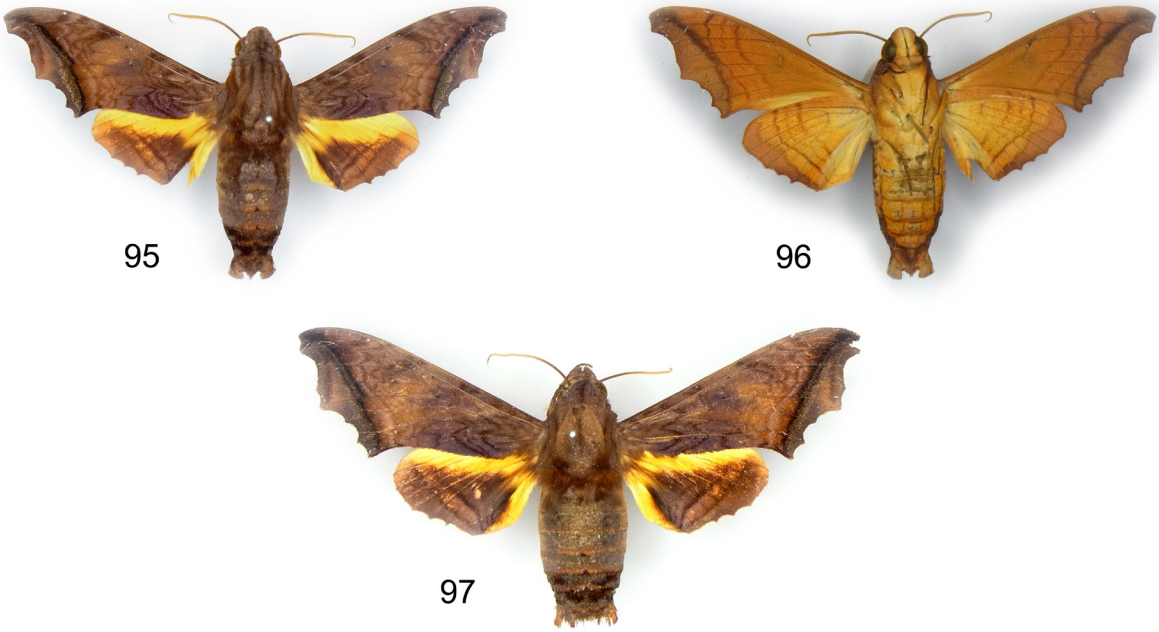
*Perigonia lusca restituta* (Walker): Stradling *et al*. (1983) [synonym]

*Perigonia lusca tenebrosa* (C. Felder and R. Felder): Stradling *et al*. (1983) [synonym]

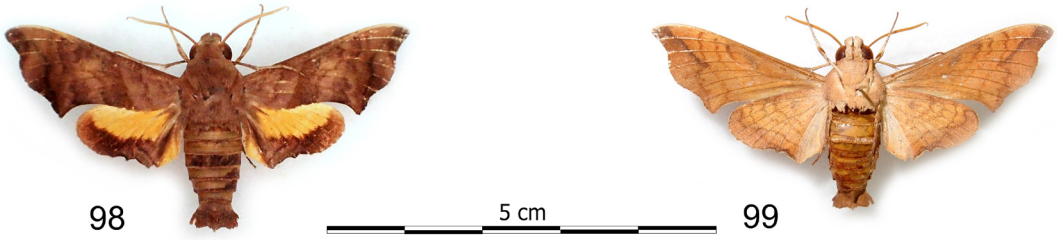
*Perigonia lusca lusca* (Fabricius): Cock (2017b)

**Taxonomic issues.** This is a variable species with several named forms, which have sometimes been treated as subspecies in the Trinidad literature. Here they are treated as a single subspecies which is variable in the extent of yellow dorsal hindwing markings. This interpretation is supported by DNA barcoding (I.J. Kitching pers. comm. 2017).


**Figs. 93-94.** *Nyceryx riscus* (Schaus) male, Brigand Hill, lighthouse security MVL lights, 28 March 2003 (M.J.W. Cock) [MJWC]. **93**, dorsal. **94**, ventral.




**Figs. 95-97.** *Nyceryx stuarti* (Rothschild). **95**, male, Parrylands, at light, February 1980 (J.O. Boos) [MJWC]. **96**, as Fig. 95, ventral view. **97**, female, Parrylands, at light, February 1980 (J.O. Boos) [MJWC].




**Figs. 98-99.** *Perigonia pallida* Rothschild and Jordan male, Curepe, at light, 8 July 1977, D.J. Stradling [UWIZM.2014.9.1408] (photo UWIZM). **98**, dorsal. **99**, ventral.

**Identification**. This is a fairly distinctive, small species. It might be confused with *Nyceryx coffaeae* (above), under which species differences are highlighted. *Perigonia ilus* Boisduval is a confusingly similar species found on the adjacent mainland that could well occur in Trinidad. It can be most readily distinguished by the dorsum of the ventral hindwing being yellow rather than dull brown as in *P. lusca* (Fig. 103). In preparing this paper, I re-examined 29 specimens previously identified as *P. lusca*, and there were no *P. ilus* amongst them.

**Status in Trinidad**. A fairly common species found in suburban and forested areas.

**33. *Eupyrrhoglossum sagra* (Poey, 1832)** (Figs. 104-106)

*Eupyrrhoglossum sagra* (Poey): Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. This is one of two Trinidad species of hummingbird hawk-moths that have yellow markings on the dorsal hindwing and adjacent thorax, the other being *Aellopos ceculus* (Cramer), which follows. The yellow hindwing markings are narrower in *E. sagra*, the detail of the dorsal forewing markings differ, and the ventral forewing has some areas mottled with orange, whereas that of *A. ceculus* is uniformly dark apart from the white subterminal spot.

**Biology in Trinidad**. F.D. Bennett has collected *E. sagra* coming to flowers of *Lantana montevidensis* at 18.00 h (Curepe, January 1977), but this species is most often collected when attracted to light.

**Status in Trinidad**. An uncommon species, with records from suburban and lowland forest areas.

***Aellopos* Hübner, [1819]**

This is a genus of day-flying hummingbird hawk-moths, of which five species have been recorded from Trinidad, but only four are accepted here. The first, *A. ceculus,* has a yellow band on the dorsal hindwing and yellow laterally on the abdomen, while the three remaining confirmed


**Figs. 100-103.** *Perigonia lusca lusca* (Fabricius). **100**, male, Curepe, MVL, 31 December 1980 (M.J.W. Cock) [MJWC]. **101**, female, Curepe, MVL, 1 June 1979 (M.J.W. Cock) [MJWC]. **102**, female, Curepe, MVL, 4-10 June 1981 (M.J.W. Cock) [MJWC]. **103**, as Fig. 100, ventral view.


**Figs. 104-106.** *Eupyrrhoglossum sagra* (Poey). **104**, Left, male, Aripo Valley, Rapsey Estate, malaise trap, 14-21 August 1978 (R.M. Baranowski) [MJWC]. **105**, female, Curepe, MVL, 5 September 1978 (M.J.W. Cock) [MJWC]. **106**, as Fig. 105, ventral.

species are dark with a white band on the abdomen: *A. clavipes* (Rothschild and Jordan), *A. titan* (Cramer) and *A. fadus* (Cramer). Records of the fifth species, *A. tantalus* (Linnaeus) (Kaye 1901, Kaye and Lamont 1927), are here considered a misidentification of *A. clavipes*, as discussed below. However, *A. tantalus zonata* (Drury) occurs in the Caribbean as far south as Grenada, and so could turn up in Tobago or Trinidad. Hodges (1971), D'Abrera ([1987]) and Tuttle (2007) present diagnostic characters of the dorsal and ventral forewing surfaces to separate the four species. *Aellopos fadus* and *A. titan* both have on the ventral forewing, a double row of white spots from the inner margin to the cell; they also have an outer band of white spots from the tornus to about two-thirds along costa, single in *A. titan* and partially double in *A. fadus*; further, on the dorsal surface, *A. titan* has a strong dark spot at the end of the cell that is obscure or missing in *A. fadus*. In contrast, *A. tantalus* and *A. clavipes* lack the double row of white spots from the inner margin to the cell, and the outer band is reduced to three irregular spots in $M_3$-$Cu_1$ to $M_2$-$M_3$ (spaces 3-5), and on the dorsal surface both have a dark spot at the end of the cell. *Aellopos tantalus* and *A. clavipes* can be most readily separated by the presence in *A. clavipes* of two (sometimes one) narrow streaks on the underside in $Cu_1$-$Cu_2$ (space 2), although with complete specimens to hand, the swollen foretarsus of *A. clavipes* compared to the normal foretarsus of *A. tantalus* reliably distinguishes the two.

**34. *Aellopos ceculus* (Cramer, 1777)** (Figs. 19, 107-109)

*Eupyrrhoglossum ceculus* (Cramer): Kaye (1901, 1914a)

*Sesia ceculus* (Cramer): Kaye (1914b), Kaye and Lamont (1927), Cary (1951)

*Aellopos ceculus* (Cramer): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. With its yellow markings, *A. ceculus* can only be confused with *Eupyrrhoglossum sagra*, above, under which differences are discussed.

**Biology in Trinidad**. This is normally a day-flying species, although it comes rarely to light. F.D. Bennett has collected two specimens coming to flowers of *Lantana montevidensis* at 18.00 h (Curepe, January 1977).

**Status in Trinidad**. An occasional species found in both suburban and forest habitats.

**35. *Aellopos clavipes clavipes* (Rothschild and Jordan, 1903)** (Figs. 110-111)

*Aellopus* [*sic*] *sisyphus* (Burmeister): Kaye (1901), Kaye (1914a) [synonym of *A. tantalus*, misidentification]

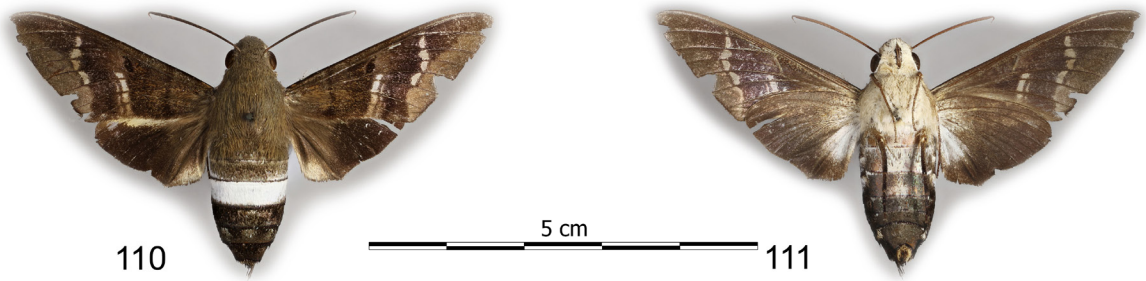
*Sesia tantalus* (Linnaeus): Kaye (1914b), Cary (1951) [misidentification]

*Sesia tantalus tantalus* (Linnaeus): Kaye and Lamont (1927) [misidentification]

*Aellopos tantalus* (Linnaeus): Schreiber (1978) [assumed misidentification]

*Aellopos clavipes clavipes* (Rothschild and Jordan): Schreiber (1978), Stradling *et al*. (1983), Kelly (2011), Cock (2017b)


**Figs. 107-109.** *Aellopos ceculus* (Cramer). **107**, male, Grande Ravine Reserve, (J. Boos) [MJWC]. **108**, female, Curepe, black light trap, 1-20 March 1982 (F.D. Bennett) [MJWC]. **109**, as Fig. 108, ventral view.




**Figs. 110-111.** *Aellopos clavipes clavipes* (Rothschild and Jordan) female, Fort George, 1000 ft.: January 1922 (F.W. Jackson) [MGCL] (photo R. St Laurent, MGCL). **110**, dorsal. **111**, ventral.

**Identification**. See under *Aellopos* above.
**Status in Trinidad**. A rare species, with just one specimen located from Trinidad, although another is known from the Gulf of Paria, 3½ miles offshore (I.J. Kitching pers. comm. 2017). The early records of *A. tantalus* are thought to be misidentifications of *A. clavipes*, as set out in the section on species not recognised from Trinidad. There are two recent photographic records from Tobago (Cock 2017b).
Fort George, 1000 ft. [305 m]: ♀ January 1922 (F.W. [Jackson]) [MGCL] (Figs. 110-111)

**36. *Aellopos titan titan* (Cramer, 1777)** (Figs. 112-113)
*Sesia titan* (Cramer): Kaye and Lamont (1927)
*Aellopos titan titan* (Cramer): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. See under *Aellopos* above.
**Status in Trinidad**. Known from just one record, a female captured by Sir Norman Lamont at Morne Diable, 1 July 1917 – not 1918 as stated by Kaye and Lamont (1927).
Morne] Diable: ♀ 1 July 1917 [N. Lamont] [NMSE] (Figs. 112-113)

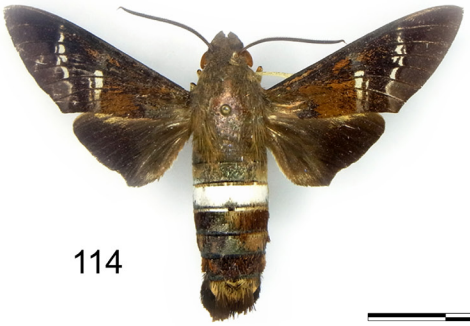
**37. *Aellopos fadus* (Cramer, 1775)** (Figs. 114-115)
*Sesia fadus* (Cramer): Kaye and Lamont (1927), Cary (1951)
*Aellopos fadus fadus* (Cramer): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. See under *Aellopos* above. A specimen in Lamont's collection in UWIZM had been misidentified as *A. titan*.
**Biology in Trinidad.** Usually seen and collected feeding at flowers.
**Status in Trinidad**. An uncommon species with records from both suburban (Curepe) and forest areas.
Curepe, light trap: ♀ 11 August 1975 (F.D. Bennett) [UWIZM CABI.2161]
Curepe, CIBC Station: ♀ 10 July 1989 (T. Cassie) [UWIZM CABI.2162]
Curepe, malaise trap: ♀ 27 June 1978 [MJWC]
Grande Ravine reserve, at flowers: ♂ September 1977 (J.O. Boos) [MJWC] (Figs. 114-115)
San Fernando: ♀ 20 April 1947 [N. Lamont] [UWIZM.2013.13.2301]
Trinidad: ♂ (Miller coll.) [MGCL]

***Erinnyis* group**

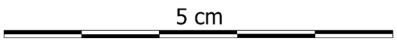
In Trinidad, the *Erinnyis* group of Kawahara *et al*. (2009) comprises *Oryba* (two species), *Pachylioides* Hodges (one species), *Madoryx* Boisduval (three species), *Hemeroplanes* Hübner (one species), *Erinnyis* Hübner (seven species), *Isognathus* C. Felder and R. Felder (two species) and *Pseudosphinx* Burmeister (one species). It is assumed that *Phryxus* Hübner (one species), which Kawahara *et al*. (2009) do not include, also belongs here



**Figs. 112-113.** *Aellopos titan titan* (Cramer) female, M[orne] Diable, 1 July 1917 [N. Lamont] [NMSE]. **112**, dorsal. **113**, ventral. (Photos A. Whiffin, NMSE).








**Figs. 114-115.** *Aellopos fadus* (Cramer) male, Gran Ravine reserve, at flowers, September 1977 (J.O. Boos) [MJWC]. **114**, dorsal. **115**, ventral.

given the similarity to *Erinnyis* and *Isognathus*. The inclusion of *Oryba* in the clade is not strongly supported, although the remaining genera seem to be a monophyletic clade, with *Erinnyis*, *Isognathus*, *Pseudosphinx* and *Phryxus* forming a tight group, and so the group is referred to by its most species-rich genus, *Erinnyis*.

*Erinnyis*, *Isognathus, Phryxus* and *Pseudosphinx* are noteworthy in that the adults rest with their forewings almost parallel with the body, rather than at an acute angle to each other as is the case with the other tribes found in Trinidad. This should help separate images of superficially similar species, apart from *Neococytius cluentius* which also holds its wings almost parallel with the body (Fig. 7).

**38. *Oryba kadeni* (Schaufuss, 1870)** (Fig. 116)

*Oryba kadeni* (Schaufuss): Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. This species might only be confused with *O. achemenides* (Cramer) below. The two are obviously different, as shown in the figures, but this is based on relative width, colour and contrast of the markings, rather than a single diagnostic character. Rothschild and Jordan (1903) highlighted that the distal marginal area of the dorsal forewing is much narrower than the space between this and the discal line beyond the cell in *O. achemenides*, but equally broad in *O. kadeni*. However, they are best separated by the conspicuous narrow green discal band bounded by brown lines or bands on the dorsal hindwing in *O. kadeni* that is missing in *O. achemenides*. There is quite strong sexual dimorphism in *O. kadeni*, along the lines shown for *O. achemenides* (Figs. 117-118), but I have not seen any male *O. kadeni* from Trinidad to illustrate this, although published images from elsewhere are available (Kitching 2017, Oehlke 2017).

**Status in Trinidad**. A rarely collected species, very occasionally attracted to light. Haxaire (1996a) indicates that adults fly extremely rapidly at dusk, which may reflect why it is seldom collected in Trinidad. The few records to date are from Curepe.

Curepe, MVL: ♀ 21 August 1978 (M.J.W. Cock) [MJWC]

St. Augustine: ? December 1979 (Stradling *et al*. 1983)

South of Valencia, 10.633N 61.195W, mist-netting: ♀ 5 September 2014 (M.G. Rutherford photo) [https://www.inaturalist.org/observations/11142177]

Trinidad: ? (F.W. Urich) (Kaye and Lamont 1927)

**39. *Oryba achemenides* (Cramer, 1779)** (Figs. 117-118)

*Oryba achemenides* (Cramer): Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. See under *O. kadeni* above; this is a generally darker species.

**Status in Trinidad**. An uncommon species in Trinidad and Tobago, with scattered records at light in suburban and forested areas.

**40. *Pachylioides resumens* (Walker, 1856)** (Figs. 119-120)

*Pachylia resumens* Walker: Kaye and Lamont (1927), Cary (1951)

*Pachylioides resumens* (Walker): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. This species is superficially similar to *Pachylia* spp., but lacks the pale costal marking at the apex of the dorsal forewing of the two Trinidad species.

**Status in Trinidad**. An occasional species, recorded from both suburban and forested areas.


**Figs. 116.** *Oryba kadeni* (Schaufuss) female, Curepe, MVL, 21 August 1978 (M.J.W. Cock) [MJWC].

**41. *Madoryx oiclus oiclus* (Cramer, 1779)**
(Figs. 121-122)

*Madoryx oiclus* (Cramer): Kaye (1914b), Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983), D'Abrera ([1987]), Cock (2017b)

**Identification**. The two silvery discal spots of the dorsal forewing separate *Madoryx* spp. from other genera in Trinidad. The spot closest to the costa is an elongate angled dash in *M. oiclus* whereas that of *M. plutonius* (Hübner) is reduced to a dot and that of *M. bubastus* (Cramer) is round.

**Status in Trinidad**. A common species, primarily in suburban situations.


**Fig. 117.** *Oryba achemenides* (Cramer) male, Brigand Hill, lighthouse security MVL lights, 17 January 2004 (M.J.W. Cock) [MJWC].


**Figs. 118.** *Oryba achemenides* (Cramer) female, Curepe, MVL, 31 October 1979 (M.J.W. Cock) [MJWC].


**Fig. 119.** *Pachylioides resumens* (Walker) male, Valsayn Park, at light, 22 September 1978 (M.J.W. Cock) [MJWC].

**42. *Madoryx plutonius plutonius* (Hübner, [1819])** (Fig. 123)

*Madoryx pluto pluto* (Cramer): Schreiber (1978), Stradling *et al*. (1983) [unavailable homonym]

**Identification**. See under *M. oiclus* above.

**Status in Trinidad**. A rare species, only recorded from forested areas of the Northern Range.

Cumaca Road, 4.6 miles, MVL: 2♂ 18 July 1981 (M.J.W. Cock) [MJWC; UWIZM CABI.2036]; ♂ 21 October 1982 (M.J.W. Cock) [UWIZM CABI.2037]

Lalaja Ridge, MVL: ♂ 3 September 1982 22.00-24.00h (M.J.W. Cock) [MJWC notes]

**43. *Madoryx bubastus bubastus* (Cramer, 1777)** (Figs. 124-125)

*Madoryx bubastus* (Cramer): Kaye (1914b)

*Madoryx bubastus bubastus* (Cramer): Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. See under *M. oiclus* above.

**Status in Trinidad**. An uncommon species, with records from both suburban and forested areas.

**44. *Hemeroplanes triptolemus* (Cramer, 1779)** (Figs. 126-127)

*Leucorhampha triptolemus* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Cary (1951)

*Hemeroplanes triptolemus* (Cramer): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. The elongate white discal spot and the narrow yellow bands on the abdomen should serve to recognise this species.

**Status in Trinidad**. A fairly common species, primarily recorded from suburban areas.

**45. *Phryxus caicus* (Cramer, 1777)** (Figs. 128-129)

*Phryxus caicus* (Cramer): Lamont and Callan (1950), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. The long white and black line across the

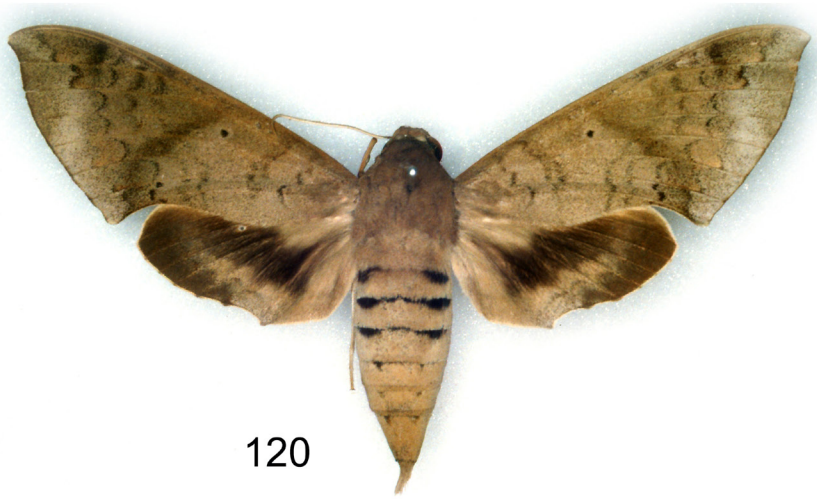



**Fig. 120.** *Pachylioides resumens* (Walker) female, Fyzabad, April 1917 - June 1918 (R.M. Farmborough) [OUNHM].


**Figs. 121-122.** *Madoryx oiclus oiclus* (Cramer). **121**, male, Valsayn Park, at light, 4 August 1978 (M.J.W. Cock) [MJWC]. **122**, female, Curepe, BLT, 21-28 February 1982 (F.D. Bennett) [MJWC].

dorsal forewing, orange-brown dorsal hindwing with dark marginal lines along the veins, and black and grey banded abdomen make this a distinctive species.

**Status in Trinidad**. An uncommon species, recorded from suburban and disturbed areas, but not from primarily forested areas.

***Erinnyis* Hübner, [1819]**

Seven species of *Erinnyis* are recognised from Trinidad. They can be divided into two groups based on the abdominal markings: *Erinnyis alope*, *E. lassauxii* (Boisduval), *E. impunctata* and *E. ello* have the abdomen banded with black and light grey, whereas *E. oenotrus* (Cramer), *E. crameri* (Schaus) and *E. obscura* (Fabricius) have the abdomen uniformly brown. In the first group, *E. alope* has the basal and discal dorsal hindwing yellow, *E. impunctata* and *E. ello* have it dull orange (brighter in female *E. ello*) and *E. lassauxii* has just the basal area orange, almost completed obscured in the typical form (although there is another form of *E. lassauxii* that

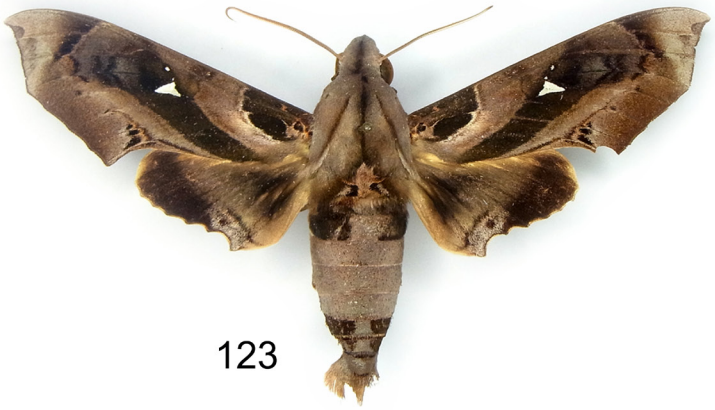



**Fig. 123.** *Madoryx plutonius plutonius* (Hübner) male, Cumaca Road, 4.6 miles, MVL, 18 July 1981 (M.J.W. Cock) [MJWC].


**Figs. 124-125.** *Madoryx bubastus bubastus* (Cramer). **124**, male, Parrylands Oilfield, at light, 22 February 1980 (J.O. Boos) [MJWC]. **125**, female, Curepe, MVL, 8-14 December 1981 (M.J.W. Cock) [MJWC].


**Figs. 126-127.** *Hemeroplanes triptolemus* (Cramer). **126**, male, Curepe, MVL, 9 October 1978 (M.J.W. Cock) [MJWC]. **127**, female, Curepe, MVL, 26 June 1979 (M.J.W. Cock) [MJWC].

closely resembles *E. impunctata* but has not been found in Trinidad); *E. impunctata* and *E. ello* can be separated by the dark brown dorsal forewing of *E. impunctata* (similar to male *E. crameri*), the uniformly pale grey forewing of the female of *E. ello* and the irregular dark streak from base to apex on the grey forewing of male *E. ello*. In the second group, *E. obscura* is much smaller than the others, the forewing reminiscent of male *E. ello*, and the hindwing dull orange, only narrowly darker at the margin; the female of *E. oenotrus* is grey with two darker patches on the costa, the one just before mid-costa extending irregularly to just above tornus; male *E. oenotrus* and both sexes of *E. crameri* resemble each other, but the hindwing margin of *E. oenotrus* is even with a diffuse internal border, whereas that of *E. crameri* is uneven, extending basally along the veins and with a sharp internal border. *Erinnyis* spp. might also be confused with *Isognathus* spp., of which two are known from Trinidad: the common *I. scyron* (Cramer) has similar colouring to *E. alope*, but the wings are broader, and the grey bands on the abdomen are narrower and not interrupted dorsally; the rare *I. caricae* (Linnaeus) has the hindwing yellow, with a minimal dark margin and dark veins extending at least halfway to the base of the wing. Given that several of these diagnostic characters relate to the dorsal hindwing, identification of images of living moths with this feature covered will be more difficult and rely on a careful comparison of the forewing characters. Hence, identification will be facilitated if images are also taken to show the hindwing.

**46. *Erinnyis alope alope* (Drury, 1773)**

(Figs. 42-44, 130-131)

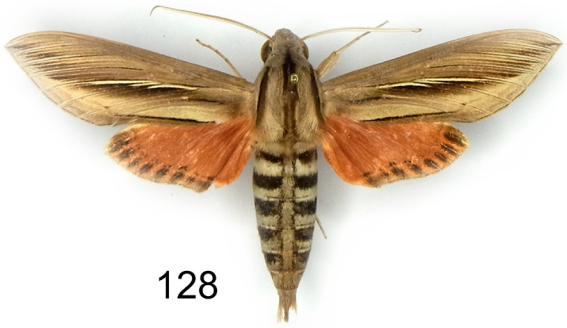
*Erinnyis alope* (Drury): Kaye and Lamont (1927), Cary (1951), CABI (2002b)

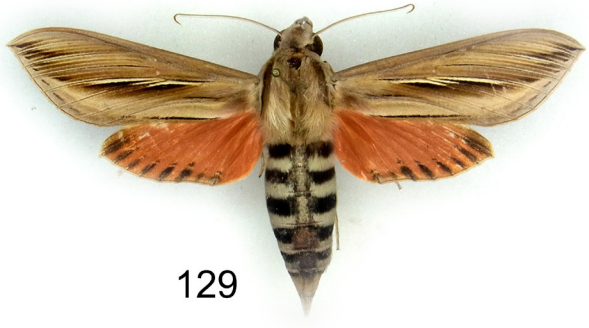
*Erinnyis alope alope* (Drury): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Biology in Trinidad**. Although food plants include papaya, *Carica papaya*, this species has not been reported as a pest in Trinidad.

**Identification**. See under *Erinnyis* above.

**Status in Trinidad**. A common species in both suburban and forested areas.




**Figs. 128-129.** *Phryxus caicus* (Cramer). **128**, male, Curepe, MVL, 22 November 1978 (M.J.W. Cock) [MJWC]. **129**, female, Maraval, 18 June 1977 (J.O. Boos) [MJWC].


**Fig. 130.** *Erinnyis alope alope* (Drury) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].

**47. *Erinnyis lassauxii* (Boisduval, 1859)** (Figs. 132-134)

*Erinnyis lassauxi* [*sic*] (Boisduval): Kaye (1914b), Kaye and Lamont (1927)

*Erinnyis lassauxi* [*sic*] (Boisduval) ssp.: Cary (1951)

*Erinnyis lassauxii* (Boisduval): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. See under *Erinnyis* above. Three forms of *E. lassauxii* have been recognised (Rothschild and Jordan 1903, D'Abrera [1988]): f. *lassauxii* (dorsal hindwing dark with the orange colour much reduced; Fig. 134), f. *omphaleae* (Boisduval) (dorsal hindwing with extensive orange area and a broad dark margin; Fig. 132) and f. *merianae* Grote (similar to f. *omphaleae*, but the orange more extensive and the dark margin correspondingly narrower). These names have no taxonomic standing, being infra-specific, but they are a useful tool to refer to the forms of a polytypic species . I have seen no specimens of the last-named form from Trinidad. Were f. *merianae* to occur, specimens might be confused with *E. impunctata* below (which Rothschild and Jordan (1903) and D'Abrera [1988] treat as a fourth form of *E. lassauxii*), but *E. impunctata* lacks the dark spots on the ventral surface of the abdomen (Fig. 136), which are found in all forms of *E. lassauxii* (Fig. 133). In the material that I have seen from Trinidad, males of *E. lassauxii* are usually f. *omphalae* (Fig. 132) and females are usually f. *lassauxii* (Fig. 134).

**Status in Trinidad**. A fairly common species in both suburban and forested areas.

**48. *Erinnyis impunctata* Rothschild and Jordan, 1903** (Fig. 135-136)

*Erinnyis oenotrus* (Cramer): Stradling *et al*. (1983) [partial misidentification, see below]

**Taxonomic issues.** This species not previously been recorded from Trinidad. When compiling records for this catalogue, two specimens in F.D. Bennett's series of *E. oenotrus* in UWIZM were found. They would have been combined with that species in the Stradling *et al*. (1983) dataset.

**Identification**. See under *Erinnyis* above. This species


**Fig. 131.** *Erinnyis alope alope* (Drury) female, Morne Bleu, Textel Installation, at light, 10 August 1978 (M.J.W. Cock) [MJWC].


**Figs. 132.** *Erinnyis lassauxii* (Boisduval) f. *omphaleae* (Boisduval) male, Morne Bleu, Textel Installation, at light, 29 September 1978 (M.J.W. Cock) [MJWC].

differs from *E. oenotrus* and *E. crameri* in having grey bands on the abdomen, like those of *E. ello*, *E. lassauxii* and some other species of *Erinnyis*. It is closest in appearance to *E. lassauxii* f. *merianae* as noted under that species, but this form has not been reported from Trinidad.

**Status in Trinidad**. Just two records from Curepe. This seems to be a rare species, but would have been overlooked.

Curepe, MVL: ♂ 1 January 1969 (F.D. Bennett) [UWIZM CABI.1935]; ♂ 12 February 1971 (F.D. Bennett) [UWIZM CABI.1933]

**49. *Erinnyis ello ello* (Linnaeus, 1758)** (Figs. 137-138)

*Dilophonota ello* (Linnaeus): Kaye (1901), Guppy (1911a, 1911b), Kaye (1914a)

*Erinnyis ello* (Linnaeus): Rothschild and Jordan (1903), Kaye (1914b), Urich (1915), Kaye and Lamont (1927), Cary (1951), Winder (1976), Des Vignes (1986), CABI (2002a), MFPLMA (2010)

*Erinnyis ello ello* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Taxonomic issues**. Barcoding of the material reared by Janzen and Hallwachs (2017) suggests that caterpillars of what appears to be *E. ello* reared from *Manilkara chicle* (Sapotaceae) in Costa Rica are a separate species, with matching barcodes from Mexico to the Amazon (Belém) (I.J. Kitching pers. comm. 2017). *Manilkara chicle* does not occur in Trinidad, but *M. bidentata* (known locally as balata) is occasional in Trinidad forests and more common in coastal areas (Hill and Sandwith 1947). It would be worth looking for caterpillars of *E. ello* on this tree in Trinidad, and experimental studies could clarify the status and biology of the two barcode groups.

**Biology in Trinidad**. In Trinidad, Guppy (1911b) notes caterpillars on rubber and cassava. Urich (1915) notes it as a pest of cassava, usually kept in check by natural enemies: *Telenomus* sp. (Scelionidae) attacking eggs, and at least one species of Microgasterinae parasitic on the caterpillars. Kaye and Lamont (1927) refer to this species as the cassava hawk-moth. In recent decades there have been periodic outbreaks reported on cassava (Des Vignes


**Fig. 133.** *Erinnyis lassauxii* (Boisduval) f. *omphaleae* (Boisduval) male, as Fig. 132, ventral.


**Fig. 134.** *Erinnyis lassauxii* (Boisduval) f. *lassauxi* (Boisduval) female, Brigand Hill, lighthouse security MVL lights, 17 January 2004 (M.J.W. Cock) [MJWC].

1986, MFPLMA 2010). While living in Trinidad, 1978-1982, I also observed occasional outbreaks on planted patches of introduced rubber trees, *Hevea brasiliensis* (Euphorbiaceae) at Fishing Pond, Arima Valley (between Simla and Asa Wright), and Southern Main Road (not far from Pitch Lake). These scattered patches of planted rubber trees are not obvious when the trees are mature, as in Arima Valley and on Southern Main Road, and the outbreaks were first noticed because the mature caterpillars had descended to the ground and were walking on the road. It was the popping noise made by inadvertently driving over them that drew the outbreak to my attention – in those days, as was the case with most cars, we did not have air-conditioning!

**Identification**. See under *Erinnyis* above.

**Status in Trinidad**. One of the commonest species everywhere, occasionally abundant.


**Figs. 135-136.** *Erinnyis impunctata* Rothschild and Jordan male, Curepe, MVL, 12 February 1971 (F.D. Bennett) [UWIZM CABI.1933]. **135**, dorsal. **136**, ventral.

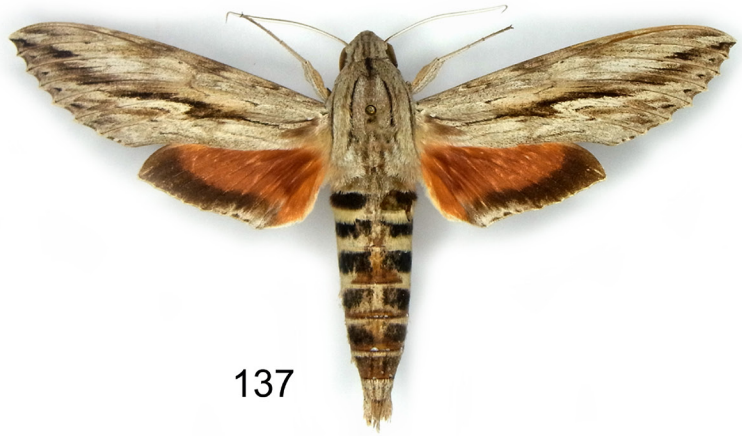



**Fig. 137.** *Erinnyis ello ello* (Linnaeus) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].


**Fig. 138.** *Erinnyis ello ello* (Linnaeus) female, Curepe, caterpillar on cassava, emerged 28 July 1978 (M.J.W. Cock) [MJWC].

**50. *Erinnyis oenotrus* (Cramer, 1780)** (Figs. 139-140)
*Erinnyis oenotrus* (Cramer): Kaye (1914b), Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)
**Identification**. See under *Erinnyis* above.
**Status in Trinidad**. A fairly common species, recorded from both suburban and forested areas

**51. *Erinnyis crameri* (Schaus, 1898)** (Figs. 141-142)
*Erinnyis crameri* (Schaus): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)
**Identification**. See under *Erinnyis* above.
**Status in Trinidad**. A common species in both suburban and forested situations.

**52. *Erinnyis obscura obscura* (Fabricius, 1775)** (Figs. 143-144)
*Erinnyis obscura obscura* (Fabricius): Cary (1951), Schreiber (1978), Stradling *et al*. (1983)
*Erinnyis domingonis* (Butler): Stradling *et al*. (1983) [synonym]
**Taxonomic issues**. For many years, *E. domingonis* was considered a valid species, resembling *E. obscura* but darker, although doubts had been expressed about its validity (Kitching and Cadiou 2000, Haxaire and Herbin 2000). Tuttle (2007) showed that both species could be reared from the same female and accordingly made *E. domingonis* a junior subjective synonym of *E. obscura*. The name *domingonis* may be useful to refer to the dark form, i.e. *E. obscura* f. *domingonis*. Stradling *et al*. (1983) record two males as *E. domingonis* from 3,767 trap nights in the St. Augustine area, 1969-1977. These specimens are now in NMSE and one is shown here as Fig. 144.
**Identification**. See under *Erinnyis* above.
**Status in Trinidad**. A common species in suburban areas, with rather few records from forested areas.

**53. *Isognathus scyron* (Cramer, 1780)** (Figs. 22, 45-46, 145-146)
Unnamed caterpillar: Guppy (1893)
*Anceryx scyron* (Cramer): Kaye (1901), Kaye (1914a)
*Isognathus scyron* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Cary (1951), Schreiber (1978), Stradling *et al*. (1983), D'Abrera ([1987])
**Identification**. See under *Erinnyis* above. There is slight sexual dimorphism: the male has two dark dashes on the discal cell of the dorsal forewing; these are absent in the female, which is darker than the male but has a more


**Figs. 139-140.** *Erinnyis oenotrus* (Cramer). **139**, male, Morne Bleu, Textel Installation, at light, 3 July 1978 (M.J.W. Cock) [MJWC]. **140**, female, Curepe, MVL, 15 January 1980 (M.J.W. Cock) [MJWC].


**Figs. 141-142.** *Erinnyis crameri* (Schaus). **141**, male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC]. **142**, female, Valsayn Park, at light, 30 June 1978 (M.J.W. Cock) [MJWC].

conspicuous light brown area beyond the end of the cell of the dorsal forewing, and the grey bands on the abdomen are more obvious.

**Biology in Trinidad**. The caterpillars are a common sight on the introduced ornamental *Allamanda cathartica* (Apocynaceae), often noticed by naturalists and the public.

**Status in Trinidad**. Very common in suburban areas, but also regularly found in forested areas, indicating that other food plants must also be used.

**54. *Isognathus caricae* (Linnaeus, 1758)** (Fig. 147)

*Isognathus caricae* (Linnaeus): Lamont and Callan (1950), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. See under *Erinnyis* above. The yellow dorsal hindwing with dark veins is unique in Trinidad.

**Status in Trinidad**. A rare species, with records from Palmiste (Lamont and Callan 1950), and Curepe (Stradling *et al*. 1983).

Curepe, light trap: ♀ 26 September 1969 (F.D. Bennett) [UWIZM CABI.1877]; ♂ 23 July 1977 (D.J. Stradling) [NMSE]

Palmiste: ♀ 22 April 1934 [N. Lamont] [NMSE]; ♀ 25 April 1934 [N. Lamont] [NMSE] (Fig. 148)

**55. *Pseudosphinx tetrio* (Linnaeus, 1771)** (Figs. 21, 47, 148-149)

*Macrospila tetrio* (Linnaeus): Caracciolo (1890)

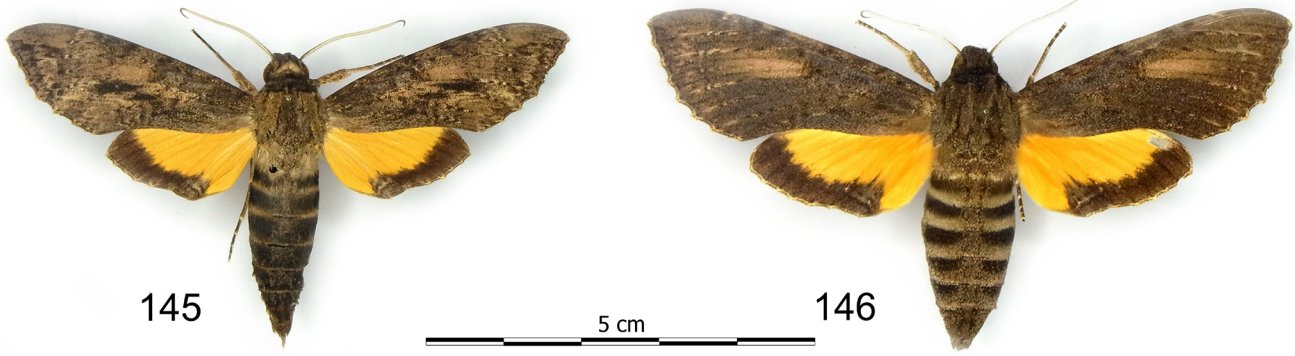
*Pseudosphinx tetrio* (Linnaeus): Kaye (1901), Rothschild and Jordan (1903), Kaye (1914a, 1914b), Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983), Cock (2003, 2008), Cooper and Cooper (2009), Cock (2017b)

**Identification**. The mottled grey dorsal forewings, dark dorsal hindwings and grey banded abdomen should distinguish this species in Trinidad. There is modest sexual dimorphism: the dorsal forewing markings of males are more contrasting, with an extensive dark area adjacent to the tornus, whereas the larger females are more uniformly pale grey.

**Biology in Trinidad**. Kaye and Lamont (1927) refer to this species as the frangipani hawk-moth and note that it is a 'constant pest on frangipani (*Plumeria*); the large voracious larvae completely stripping a tree of its leaves in a few days'. Cock (2008) illustrates the early stages in Trinidad and discusses this species in Trinidad and Tobago. The caterpillars in Trinidad have been observed almost exclusively on the naturalised frangipani, *Plumeria rubra* (Apocynaceae), but may also use the garden ornamental *Allamanda cathartica* (Apocynaceae) occasionally.

**Status in Trinidad**. A fairly common species that could turn up anywhere. Caterpillars are more conspicuous than adults, and more frequently observed by members of the public.


**Figs. 143-144.** *Erinnyis obscura obscura* (Fabricius). **143**, male, Curepe, MVL, 15 January 1981 (M.J.W. Cock) [MJWC]. **144**, male f. *domingonis*, St. Augustine, at light, February 1977 (D.J. Stradling) [NMSE] (photo A. Whiffin, NMSE).




**Figs. 145-146.** *Isognathus scyron* (Cramer). **145**, male, Curepe, MVL, September 1978 (M.J.W. Cock) [MJWC]. **146**, female, St. Augustine, from caterpillars on *Allamanda cathartica*, emerged 12 July 1978 (M.J.W. Cock) [MJWC].

***Aleuron* group**

In the Trinidad fauna, *Aleuron* (two species) and *Unzela* (one species) form a small, isolated group that is rarely collected.

**56. *Aleuron carinata* (Walker, 1856)** (Figs. 150-151)

*Aleuron carinata* (Walker): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. A small, rather plain species, generally brown, but with distinctive banding on the anterior part of the abdomen.

**Status in Trinidad**. A rare species in Trinidad collections with only three records. Haxaire (1992) states that the genus can be caught coming to flowers at dusk (18.45-19.00h in French Guiana) and very rarely come to light, so different collecting methods should show this species to be more common in Trinidad than light trap records indicate.

Arima Valley, Asa-Wright Nature Centre: ? 6 October 2017 (tlaloc27, poor photo) [https://www.inaturalist.org/observations/8552081]

Curepe, light trap: ♂ January 1977 (F.D. Bennett) [NHMUK]; ♂ 23 January -10 February 1982 (F.D. Bennett) [MJWC]

**57. *Aleuron chloroptera* (Perty, [1833])** (Fig. 152)

**Identification**. Th greenish colour of this distinctive small hawk-moth rapidly fades to olive-brown (as in Fig. 152); it has a broad dark margin to the dorsal hindwing, and the forewing is distinctly hooked at mid-termen.

**Status in Trinidad**. There is just one record of this species from Trinidad. Although this specimen was taken at light, *A. chloroptera* is more likely to be found feeding


**Fig. 147.** *Isognathus caricae* (Linnaeus) female, Palmiste, 25 April 1934 [N. Lamont] [NMSE] (photo A. Whiffin, NMSE).

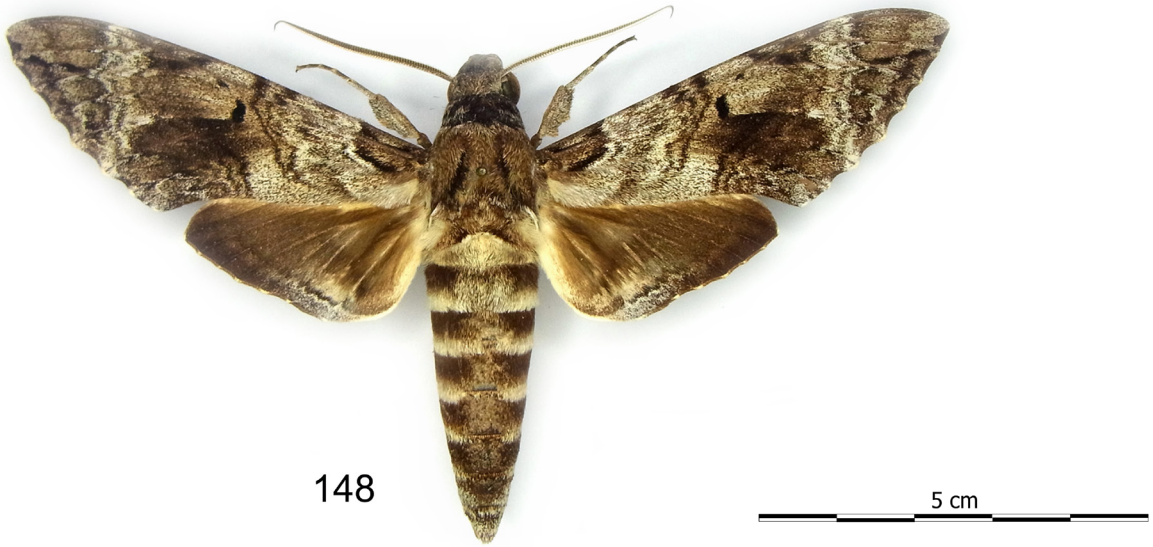



**Fig. 148.** *Pseudosphinx tetrio* (Linnaeus) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].

at flowers at dusk or as caterpillars.

Curepe, black light trap: ♂ 6 September 1976 (F.D. Bennett) [UWIZM CABI.2094]

**58. *Unzela japix japix* (Cramer, 1776)** (Figs. 153-155)

*Enyo japix japix* (Cramer): Rothschild and Jordan (1903), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. The white ventral body, narrow white band on the abdomen and wing markings will all help to recognise this small hawk-moth.

**Status in Trinidad**. This species has been rarely collected in Trinidad. There is an old, undated specimen in NHMUK,


**Figs. 149.** *Pseudosphinx tetrio* (Linnaeus) female, Port of Spain, 12 July 1978 (W. de Voogd) [MJWC].


**Figs. 150-151.** *Aleuron carinata* (Walker) male, Curepe, black light trap, 23 January -10 February 1982 (F.D. Bennett) [MJWC]. **150**, dorsal. **151**, ventral.


**Fig. 152.** *Aleuron chloroptera* (Perty) male, Curepe, black light trap, 6 September 1976 (F.D. Bennett) [UWIZM].

and recently one was photographed attracted to light in the Arima Valley.

Arima Valley, Asa Wright Nature Centre: ?♂ 22 March 2015 (S. Nanz photo , http://www.stevenanz.com/Main_Directory/Trips/2015_Trinidad_Tobago/Trinidad_Tobago_Leps/source/img_3286.htm) (Figs. 153-155).

Trinidad: ♂ [NHM]

**Subfamily: Macroglossinae**

**Tribe: Dilophonotini**

**Subtribe Philampelina**

Based on the phyllogentic tree in Kawahara *et al*. (2009, Figure 3), this subtribe comprises two groups: the *Enyo* and *Eumorpha* group (three species of *Enyo* and nine of *Eumorpha* Hübner), and the *Pachygonidia* group (one species of *Pachygonidia*).

***Enyo* – *Eumorpha* group**

The three Trinidad species of *Enyo* form a weakly supported group with *Eumorpha*.

**59. *Enyo lugubris lugubris* (Linnaeus, 1771)**
(Figs. 156-158)

*Enyo lugubris* (Linnaeus): Kaye (1901), Kaye (1914a), Cock and Boos (2007)

*Epistor lugubris lugubris* (Linnaeus): Rothschild and Jordan (1903), Kaye and Lamont (1927)

*Epistor lugubris* (Linnaeus): Kaye (1914b), Cary (1951)

*Enyo lugubris lugubris* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. A sexually dimorphic species. The male might only be mistaken for *E. ocypete* (Linnaeus) (below), but that species has a very conspicuous yellow-white patch on the dorsal hindwing dorsum that is absent in *E. lugubris*. However, this feature is not visible in images of the living moths, and the discal spot at the end of the cell should be examined – dark in *E. lugubris*, faint or pale in *E. ocypete*. The female of *E. lugubris* is less colourful than that of *E. ocypete*, and the dorsal forewing discal line extends to the dorsum as a weakly distinguished line, whereas in *E. ocypete* it extends to the dorsum as the sharply contrasting inner border of a broad dark band.


**Figs. 153-155.** *Enyo japix japix* (Cramer), Arima Valley, Asa Wright Nature Centre, 22 March 2015 (photos S. Nanz). **153**, dorsal view. **154**, lateral view. **155**, ventral view. (Not to scale)


**Figs. 156-158.** *Enyo lugubris lugubris* (Linnaeus). **156**, male, Curepe, MVL, 23 May 1979 (M.J.W. Cock) [MJWC]. **157**, as Fig. 156, ventral view. **158**, female, Curepe, MVL, 20 September 1978 (M.J.W. Cock) [MJWC].

**Status in Trinidad**. A common species almost exclusively found in suburban areas.

**60. *Enyo ocypete* (Linnaeus, 1758)** (Figs. 23, 159-160)

*Enyo ocypete* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. A strongly sexually dimorphic species. Diagnostic features to distinguish *E. ocypete* from *E. lugubris* are discussed under that species.

**Status in Trinidad**. Not as common as *E. lugubris* in Trinidad, but *E. ocypete* is also a common species. It is found in both suburban and lowland forested areas.

**61. *Enyo gorgon* (Cramer, 1777)** (Figs. 161-162)

*Enyo gorgon* (Cramer): Kaye (1901), Kaye (1914a)

*Epistor gorgon* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927)

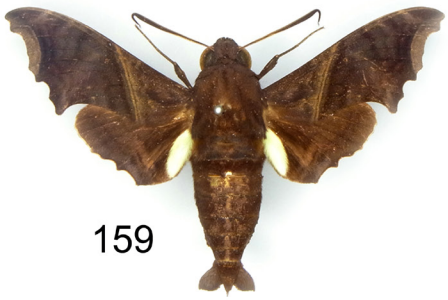
*Epistor gorgon gorgon* (Cramer): Schreiber (1978), Stradling *et al*. (1983)

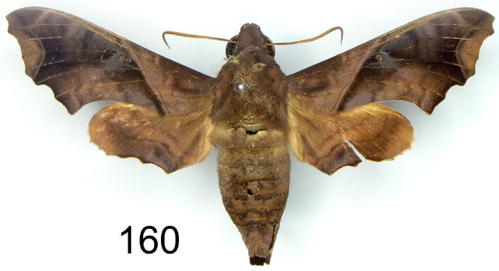
**Identification**. A strongly sexually dimorphic species. The male is distinctive due to the arrangement of three shades of brown on the dorsal forewing, and the bulging costa. The female superficially resembles those of other members of the genus, but the contrasting shades of brown and the distinct discal eye spot of the dorsal forewing make it easily recognisable.

**Status in Trinidad**. An uncommon species in Trinidad, with all records from suburban areas.

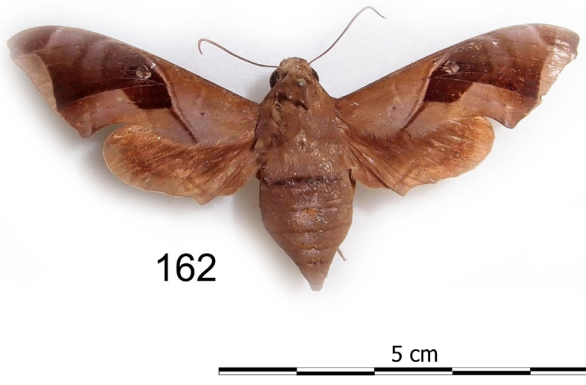
***Eumorpha* Hübner, [1807]**

This genus has nine Trinidad species. It was previously been placed in a separate tribe Philampelini, but is clearly nested within Dilophonotini in Kawahara *et al*.'s (2009) phylogeny. Ponce *et al*. (2015) discuss the phylogeny of the genus and the development of a dorsal posterior eye spot on the caterpillars, grouping species into six provisional groups (referred to as clades I–VI). Their phylogeny indicates that *E. phorbas* (Cramer), *E. capronnieri* (Boisduval) and *E. labruscae* form the basal clade I of the genus, although the inclusion of the last-named is not strongly supported. The remaining Trinidad species form two groups based on adult markings, *E. vitis* and *E. fasciatus* in one and the remaining species, *E. obliquus* (Rothschild and Jordan), *E. megaeacus* (Hübner), *E. satellitia* and *E. anchemolus* (Cramer) in the other. However, the phylogeny of Ponce *et al*. (2015) indicates that although the last two species are very close, the others are spread across separate clades that do not match adult markings; thus, *E. fasciatus* and *E. megaeacus* are in clade IV whereas *E. vitis* is in clade VII with *E. anchemolus*, while *E. obliquus* is in clade II and *E. satellitia* in clade VI.




**Figs. 159-160.** *Enyo ocypete* (Linnaeus). **159**, male, Curepe, MVL, 19 January 1980 (M.J.W. Cock) [MJWC]. **160**, female, Curepe, MVL, 15 September 1979 (M.J.W. Cock) [MJWC].


**Figs. 161-162.** *Enyo gorgon* (Cramer). **161**, male, Valsayn Park, at light, 3 August 1979 (M.J.W. Cock) [MJWC]. **162**, female, Curepe, light trap, 20 July 1970 (F.D. Bennett) [UWIZM CABI.4777] (photo UWIZM).

**62. *Eumorpha anchemolus* (Cramer, 1779)**
(Figs. 26, 163-164)

*Pholus anchemolus* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927)

*Eumorpha anchemolus* (Cramer): Cary (1951)

*Eumorpha anchemola* [*sic*] (Cramer): Schreiber (1978), Stradling *et al*. (1983), D'Abrera ([1987])

*Eumorpha triangulum* (Rothschild and Jordan): Cock (2003) [misidentification]

**Identification**. The first four species of *Eumorpha* treated here are all rather similar: *E. anchemolus*, *E. satellitia*, *E. obliquus* and *E. megaeacus*. *Eumorpha anchemolus* and *E. obliquus* are distinctly larger than *E. satellitia* and *E. megaeacus* (which is not helpful when working from an image with no scale). Characters of the dorsal forewing can be used as follows to separate the four species. There is a darker area running from the base of the forewing along the dorsum to about the mid-point where it either ends in a sharply demarcated, pointed wedge (*E. satellitia*, *E. obliquus*, *E. megaeacus*), or a diffuse area spreading further into the forewing disc (*E. anchemolus*). In *E. satellitia*, the basal side of this wedge is also sharply demarcated and pointed, in *E. obliquus*, a dark subdiscal line runs from the upper inner corner of the wedge to the


**Fig. 163.** *Eumorpha anchemolus* (Cramer) male, Morne Bleu, Textel Installation, at light, 20 August 1978 (M.J.W. Cock) [MJWC].


**Figs. 164.** *Eumorpha anchemolus* (Cramer) female, Brigand Hill, lighthouse security MVL lights, 25 March 2003 (M.J.W. Cock) [MJWC].

costa, and in *E. megaeacus* the basal side of the wedge is barely differentiated from the wedge and forms part of a continuous dark band from the base of the forewing to the end of the wedge, the band being sharply demarcated by a pale stripe above it from the base of the wing.

Males of *E. anchemolus* from Trinidad generally have a reddish tone (Fig. 163), whereas the three females examined lack this (Fig. 164). Cock (2003) misidentified two females from Brigand Hill as *E. triangulum. Eumorpha anchemolus* and *E. triangulum* can be separated by the shape of the subapical costal patch on the forewing upperside: in *E. anchemolus* this is cut off by Rs4 (vein 6), making it quadrate as in *E. satellitia* and the other species, whereas in *E. triangulum* the inner, basal corner is elongated downwards across about half the wing width (Kitching 2017).

**Status in Trinidad**. An occasional species in Trinidad, rarely found in suburban areas and normally found in forested areas, most commonly at Morne Bleu.

**63. *Eumorpha satellitia* (Linnaeus, 1771) *licaon* (Cramer, 1775)** (Figs. 24, 165)

*Pholus satellitia licaon* (Cramer): Kaye (1914b), Kaye and Lamont (1927)

*Pholus satellitia lichaon* [*sic*] (Cramer): Cary (1951)

*Eumorpha satellitia satellitia* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983) [Jamaican subspecies]

*Eumorpha satellitia licaon* (Cramer): Cock (2017b)

**Identification**. See under *E. anchemolus* (above).

**Status in Trinidad**. A rather common and widespread species in Trinidad, more frequent in forested areas than suburban areas

**64. *Eumorpha obliquus* (Rothschild and Jordan, 1903)** (Figs. 166-167)

*Pholus obliquus* Rothschild and Jordan: Kaye and Lamont (1927)

*Eumorpha obliquus* (Rothschild and Jordan): Cary (1951), Cock (2017b)

*Eumorpha obliquus obliquus* (Rothschild and Jordan): Schreiber (1978), Stradling *et al*. (1983)

**Taxonomic issues.** Kitching & Cadiou (2000) treated *E. obliquus* as having three subspecies, but Eitschberger (2011) raised *E. orientis* (Daniel) and *E. guadelupensis* (Chalumeau & Delplanque) to species level, leaving *E. obliquus* with no subspecies.

**Identification**. See under *E. anchemolus* (above).

**Status in Trinidad**. An uncommon species in Trinidad, recorded from Morne Bleu and Curepe, but rare in suburban areas.

**65. *Eumorpha megaeacus* (Hübner, [1819])** (Fig. 168)

*Eumorpha eacus* (Cramer): Stradling *et al*. (1983) [unavailable homonym]

**Identification**. See under *E. anchemolus* (above).

**Status in Trinidad**. A rare species in Trinidad with just two records. The food plants are particular species of *Ludwigia* spp. (Onagraceae) (Appendix Table 1). Janzen & Hallwachs (2017) found it almost entirely on *L. leptocarpa* and *L. octovalvis*, rather than other *Ludwigia* spp. in Costa Rica. These two species are particularly associated with freshwater swamps and riparian habitats (CABI 2015, University of Florida 2017), which are under-collected habitats in Trinidad, and may explain why there are not more records of *E. megaeacus*.

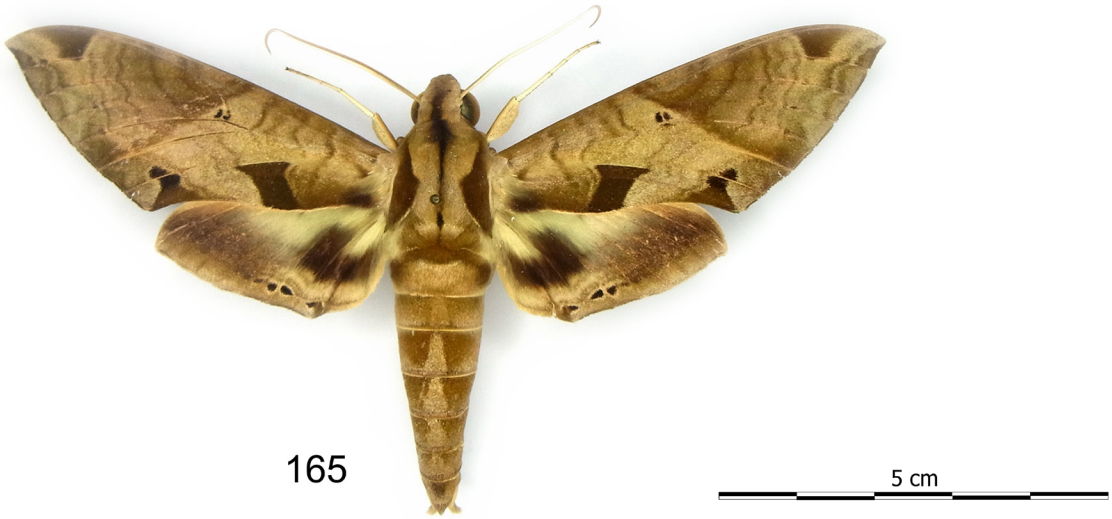


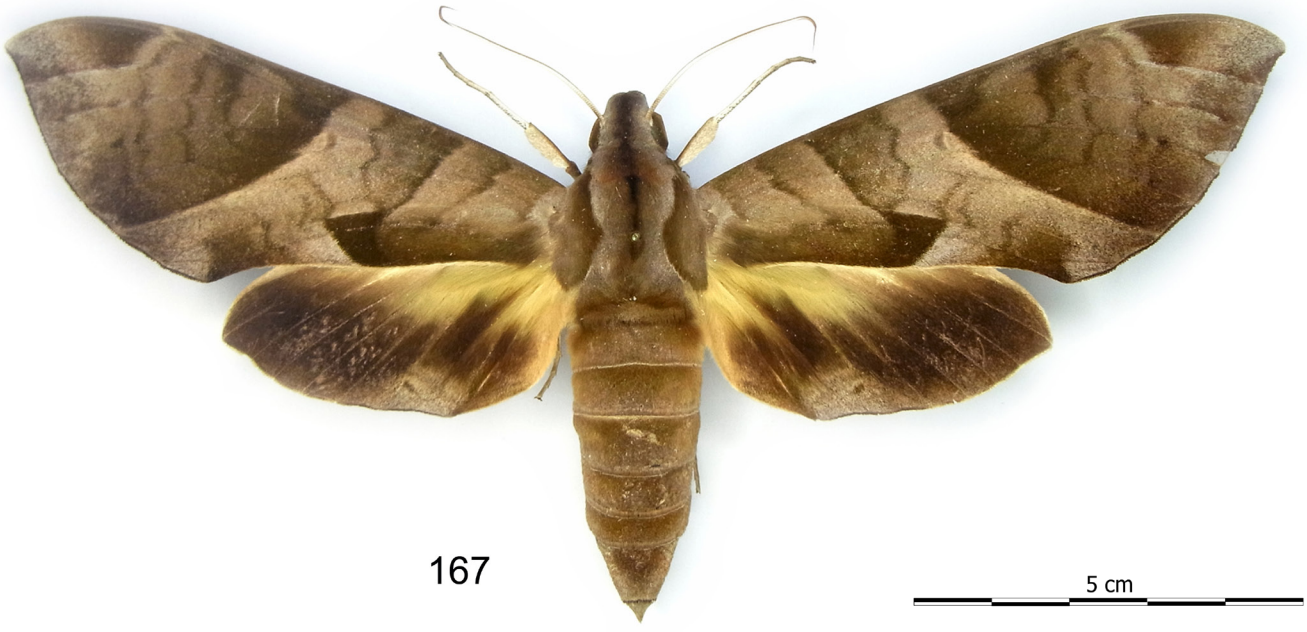

**Fig. 165.** *Eumorpha satellitia licaon* (Cramer) male, Morne Bleu, Textel Installation, at light, 26 July 1978 (M.J.W. Cock) [MJWC].

Cushe Village, Cunapo Southern Main Road, approximately mid-way between Biche and Rio Claro: ?♀ 14 September 2017 (K. Mahabir photo)
Hollis Reservoir, at pump house lights: ♂ 2200-2300 h 5 September 1978 (M.J.W. Cock) [MJWC]

**66. *Eumorpha vitis vitis* (Linnaeus, 1758)** (Figs. 25, 169)
*Pholus vitis vitis* (Linnaeus): Kaye and Lamont (1927)
*Eumorpha vitis vitis* (Linnaeus): Cary (1951), Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. The broad white stripe from the base (or near) to the apex of the dorsal forewing separates *E. vitis*, *E. fasciatus* and *Hyles lineata* (below) from other Trinidad hawk-moths. Both *Eumorpha* spp. have an additional transverse stripe from mid-dorsum to costa, just before apex. The margin of the dorsal hindwing is broadly pink in *E. fasciatus* and narrowly pale brown in *E. vitis* making these species easy to separate. However, when this character is not visible in images of living moths, they can be separated by the double discal spot in *E. vitis*,


**Fig. 166.** *Eumorpha obliquus* (Rothschild and Jordan) male, Morne Bleu, Textel Installation, at light, 27 August 1978 (M.J.W. Cock) [MJWC].




**Figs. 167.** *Eumorpha obliquus* (Rothschild and Jordan) female, Morne Bleu, Textel Installation, at light, 13 September 1978 (M.J.W. Cock) [MJWC].

which is single in *E. fasciatus*, and by the narrow, pale line from just before mid-dorsum to the main white stripe at right angles to the dorsum in *E. fasciatus* and the less well marked, broader, double line in the same area, but nearer the wing base and at an angle to the dorsum in *E. vitis*.

**Status in Trinidad**. A common species, particularly in suburban and disturbed areas.

**67. *Eumorpha fasciatus fasciatus* (Sulzer, 1776)**
(Figs. 27, 170)

*Pholus fasciatus* (Sulzer) (*vitis*): Kaye (1914b),
*Pholus fasciatus* (Sulzer): Kaye and Lamont (1927)
*Eumorpha fasciata fasciata* [*sic*] (Sulzer): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. See under *E. vitis* above.

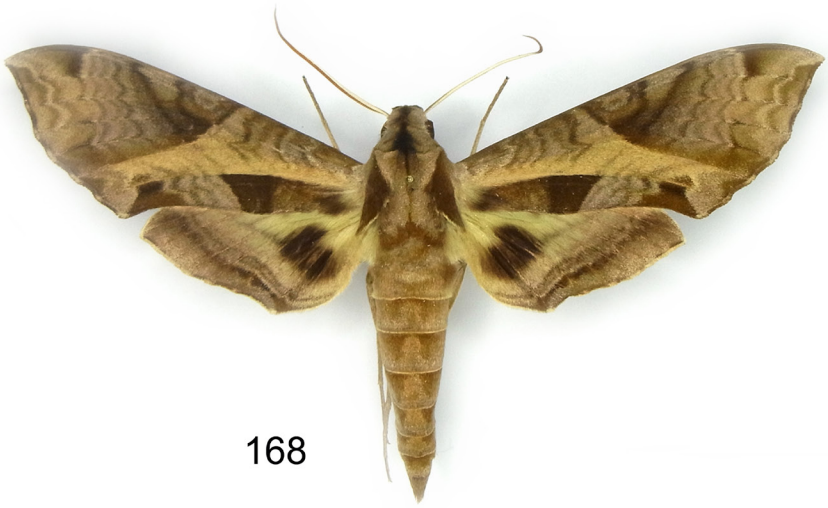



**Fig. 168.** *Eumorpha megaeacus* (Hübner) male, Hollis Reservoir, at pump house lights, 22.00-23.00h 5 September 1978 (M.J.W. Cock) [MJWC].


**Fig. 169.** *Eumorpha vitis vitis* (Linnaeus, 1758) male, St. Augustine, MVL trap, 10 August 1978 (F.D. Bennett) [MJWC].

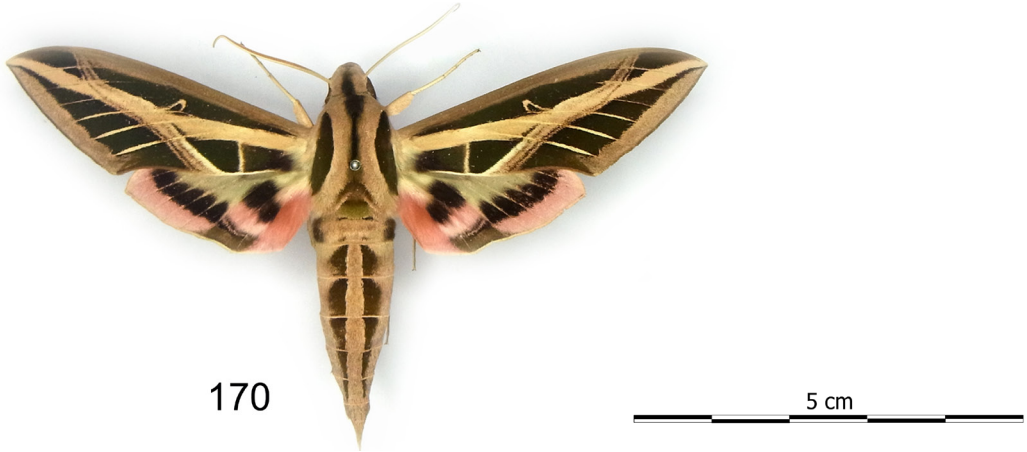



**Fig. 170.** *Eumorpha fasciatus fasciatus* (Sulzer) male, Curepe, MVL, 28 December 1979 (M.J.W. Cock) [MJWC].

**Status in Trinidad**. An occasional species, recorded from suburban and disturbed areas, but not forests.

**68. *Eumorpha phorbas* (Cramer, 1775)** (Fig. 171)
*Pholus phorbas* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927)
*Eumorpha phorbas* (Cramer): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. The mottled dark green dorsal forewing should serve to recognise this species. *Eumorpha capronnieri* is similar in markings, but most of the forewing is pale brown. *Eumorpha labruscae* is uniformly green, but lighter in colour and with straight discal lines across the wing, and a small brown patch centrally; when the hindwings are visible, the unusual blue markings are very distinctive.
**Status in Trinidad**. A fairly common species in all forested areas, but rare in suburban areas.

**69. *Eumorpha capronnieri* (Boisduval, [1875])** (Figs. 28, 172)
*Pholus capronnieri* (Boisduval): Kaye and Lamont (1927)
*Eumorpha capronnieri* (Boisduval): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)
**Identification**. The brown and green dorsal forewings are very distinctive.
**Status in Trinidad**. An occasional species in forested areas.

**70. *Eumorpha labruscae* (Linnaeus, 1758)** (Figs. 29, 173)
*Pholus labruscae* (Linnaeus): Kaye (1914b), Kaye and Lamont (1927), Cruttwell (1974)
*Eumorpha labruscae labruscae* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983)
**Taxonomic issues.** Kitching & Cadiou (2000) included a subspecies from Galapagos, but this is sunk by Kitching (2017).
**Identification**. The red, yellow and blue markings of the


**Fig. 171.** *Eumorpha phorbas* (Cramer) male, Morne Bleu, Textel Installation, at light, 10 August 1979 (M.J.W. Cock) [MJWC].


**Fig. 172.** *Eumorpha capronnieri* (Boisduval) male, Rio Claro-Guayaguayare Road, milestone 6.5, MVL, 30 September 1978 (M.J.W. Cock) [MJWC].

dorsal hindwings are very unusual, but the rather uniform green dorsal forewing with straight discal lines is also distinctive.

**Status in Trinidad**. A common species in Stradling *et al*.'s (1983) study, but it seems to have been much less common in subsequent years. Most records are from suburban areas.

***Pachygonidia* group**

This genus, with one record of one confirmed Trinidad species forms a separate group, most closely related to several Old World genera (Kawahara *et al.* 2009, Fig. 3).

**71. *Pachygonidia caliginosa* (Boisduval, 1870)** (Fig. 174)
*Pachygonia* [*sic*] *caliginosa* (Boisduval): Schreiber (1978), Stradling *et al*. (1983)

There is a specimen in Lamont's collection in UWIZM with no data, erroneously labelled *Eupyrrhoglossum sagra* (Poey). It is probably a Trinidad specimen, taken by Lamont prior to 1915, most likely at Palmiste (I have observed that material of this vintage from Palmiste listed by Kaye and Lamont (1927) is unlabelled in UWIZM).

**Identification**. This medium sized, brown species, with two discal lines on the dorsal hindwing can only be confused with *P. subhamata* (Walker), which has the apex of the forewings truncate rather than falcate. *Pachygonidia subhamata* is recorded from Trinidad by Schreiber (1978) but I have not seen any specimens.

**Status in Trinidad**. Just one poorly documented record from early last century. This is another genus that flies at dusk (and probably also dawn) and is best captured at flowers (Haxaire 1996b).

[Palmiste]: ♀ undated [N. Lamont] [UWIZM.2013.13.2300

**Subfamily: Macroglossinae**
**Tribe Macroglossini**
**Subtribe: Choerocampini**

Two genera of Macroglossini are found in Trinidad: the Old World genus *Hyles* with a single representative, and the New World genus *Xylophanes* with 12 species. The latter are quite easy to recognise by virtue of the resting position with the wings held horizontal at an angle of about 60° and the long, relatively thin body.


**Fig. 173.** *Eumorpha labruscae* (Linnaeus) female, Valsayn Park, at light, 29 September 1978 (M.J.W. Cock) [MJWC].


**Fig. 174.** *Pachygonidia caliginosa* (Boisduval), female, [Trinidad], [N. Lamont] [UWIZM.2013.13.2300] (photo UWIZM).

**72. *Hyles lineata* (Fabricius, 1775)** (Fig. 175)
*Celerio lineata* (Fabricius): Cary (1951)
*Hyles lineata lineata* (Fabricius): Stradling *et al*. (1983)
**Taxonomic issues.** *Hyles lineata* is a New World species (introduced in Hawai'i) that could be confused with the very similar Old World species, *H. livornica* Esper, which has been reported from French Guiana (Haxaire 1993). The identification of the single known specimen from Trinidad (below) was confirmed using the diagnostic characters set out in Haxaire (1993) and Eitschberger and Steiniger (1976).
**Identification**. The broad white stripe from base to apex of the forewing is superficially similar to *Eumorpha vitis* and *E. fasciatus*, but both those species have a transverse stripe from mid-termen to costa just before apex. Any future Trinidad specimens should be checked against *H. livornica*.
**Status in Trinidad**. Only known from a single specimen taken by light trap at Curepe. Given that this is a vagile species, it may be that it is not normally resident in Trinidad.
Curepe, light trap: ♂ 25 July 1970 (F.D. Bennett) [UWIZM CABI.4988]

**73. *Xylophanes anubus* (Cramer, 1777)** (Fig. 176)
*Xylophanes anubus* (Cramer): Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)
**Identification**. The larger size and relatively uniform beige coloured dorsal forewings should distinguish this species from other *Xylophanes* spp.
**Status in Trinidad**. This species is quite common in forested areas, particularly in the Northern Range, but rare in suburban and disturbed areas.

**74. *Xylophanes ceratomioides* (Grote and Robinson, 1867)** (Fig. 177)
*Xylophanes ceratomioides* (Grote and Robinson): Schreiber (1978), Stradling *et al*. (1983)
**Identification**. A very distinctive species in the Trinidad fauna; the arrangement of the brown and pinkish areas of the dorsal forewing are like no other species, although


**Fig. 175.** *Hyles lineata* (Fabricius) male, Curepe, light trap, 25 July 1970 (F.D. Bennett) [UWIZM CABI.4988] (photo UWIZM).


**Fig. 176.** *Xylophanes anubus* (Cramer) male, Morne Bleu, Textel Installation, at light, early November 1978 (M.J.W. Cock) [MJWC].

there are other superficially similar *Xylophanes* spp. on the mainland (D'Abrera 1987).

**Status in Trinidad**. A fairly common species in forested areas, but rare in suburban and disturbed areas.

**75. *Xylophanes chiron* (Drury, 1773) *nechus* (Cramer, 1777)** (Figs. 30, 178-179)

*Xylophanes chiron nechus* (Cramer): Kaye and Lamont (1927), Cary (1951), Schreiber (1978), Stradling *et al*. (1983)

**Identification**. A very distinctive species in the Trinidad fauna.

**Status in Trinidad**. This is a common, sometimes very common, species in forested areas, and is also occasionally found in suburban and disturbed areas.

**76. *Xylophanes loelia* (Druce, 1878)** (Figs. 31, 180-181)

*Xylophanes loelia* (Druce): Schreiber (1978), Stradling *et al*. (1983), Vaglia *et al*. (2008)

**Identification**. This is the least common of three medium sized species with slightly contrasting brown dorsal forewings, the other two being *X. neoptolemus* (Cramer) and *X. tersa* (Linnaeus). The latter has yellow markings on the dorsal hindwing whereas the other two are pinkish red, but this character is not evident in images of the living adults. Quite subtle differences can be seen comparing the dorsal forewings, but the body colouring and markings are also helpful. In *X. tersa*, the base of the dorsal forewing is pale, sharply contrasting with the adjacent thorax (Figs. 34-36), whereas there is little colour difference between the wing base and adjacent thorax for *X. loelia* and *X. neoptolemus*. In addition, *X. tersa* has golden dorso-lateral longitudunial bands on the abdomen (Figs 34, 190), not present on the other two species. The dorsal thorax and body of *X. loelia* is paler than in *X. neoptolemus*, and *X. loelia* has a faint thin brown dorsal line on the abdomen but not the thorax, whereas *X. neoptolemus* has three parallel brown dorsal lines on the abdomen and one on the thorax.

**Status in Trinidad**. This is an occasional species in suburban and disturbed areas. It may have been overlooked as the common *X. neoptolemus* by Stradling *et al*. (1983).


**Fig. 177.** *Xylophanes ceratomioides* (Grote and Robinson) male, Toco, at light, 3 June 1978 (M.J.W. Cock) [MJWC].


**Figs. 178-179.** *Xylophanes chiron nechus* (Cramer). **178**, male, Cumaca Road, 4.6 miles, MVL, 18 July 1981 (M.J.W. Cock) [MJWC]. **179**, female, Morne Bleu, Textel Installation, at light, 26 June 1978 (M.J.W. Cock) [MJWC].

**77. *Xylophanes neoptolemus* (Cramer, 1780)** (Figs.182-183)

*Choerocampa neoptolemus* (Cramer): Kaye (1901), Kaye (1914a)

*Xylophanes neoptolemus* (Cramer): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Kitching and Cadiou (2000), Vaglia *et al*. (2008)

*Xylophanes neoptolemus trinitatis* Closs: Closs (1917), Schreiber (1978), Stradling *et al*. (1983)

*Xylophanes neoptolemus trinitatas* [*sic*] Closs: Cary (1951)

**Identification**. See under *X. loelia* (above).

**Status in Trinidad**. A common and widespread species.

**78. *Xylophanes pistacina* (Boisduval, [1875])** (Figs. 33, 184-185)

*Xylophanes pistacina pistacina* (Boisduval): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. The mixture of pastel green-grey colours and a simple discal line on the dorsal forewings make this species distinct.

**Status in Trinidad**. An occasional species in suburban and forested areas.

**79. *Xylophanes pluto* (Fabricius, 1777)** (Figs. 32, 186-187)

*Xylophanes pluto* (Fabricius): Kaye (1914b), Kaye and Lamont (1927), Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. The dorsal green forewing, infused with white and multiple discal lines should separate this species from others even if the vivid orange hindwing is not visible.

**Status in Trinidad**. A fairly common species in both suburban and forested areas.

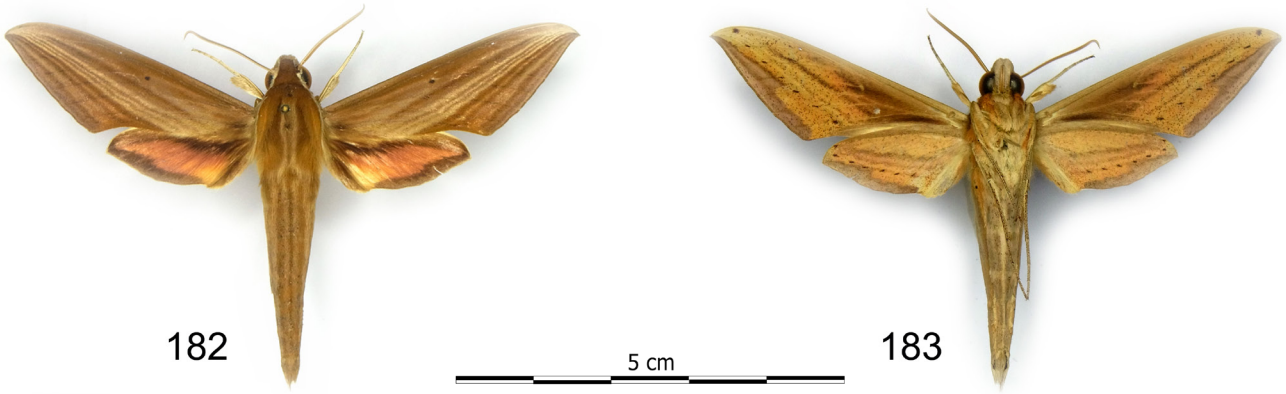
**80. *Xylophanes porcus* (Hübner [1823]) *continentalis* Rothschild and Jordan, 1903** (Figs. 188-189)

*Xylophanes porcus continentalis* Rothschild and Jordan: Schreiber (1978), Stradling *et al*. (1983)

**Identification**. This plain brown species is unlikely to be confused with any other at present, but there are cryptic species under this name in mainland South America (I.J. Kitching pers. comm. 2017).

**Status in Trinidad**. An occasional species in forested areas.


**Figs. 180-181.** *Xylophanes loelia* (Druce) male, Curepe, MVL, 17 September 1979 (M.J.W. Cock) [MJWC]. **180**, dorsal. **181**, ventral.




**Figs. 182-183.** *Xylophanes neoptolemus* (Cramer) male, Morne Bleu, Textel Installation, at light, 10 July 1978 (M.J.W. Cock) [MJWC]. **182**, dorsal. **183**, ventral.

**81. *Xylophanes tersa tersa* (Linnaeus, 1771)** (Figs. 34-36, 190-191)

*Choerocampa tersa* (Linnaeus): Kaye (1901, 1914a)

*Xylophanes torsa* [*sic*] (Linnaeus): Kaye (1914b)

*Xylophanes tersa* (Linnaeus): Rothschild and Jordan (1903), Kaye and Lamont (1927)

*Xylophanes tersa tersa* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983), Cock (2017b)

**Identification**. See under *X. loelia* (above).

**Status in Trinidad**. The commonest hawk-moth in Trinidad, occurring in all habitats sampled.

**82. *Xylophanes thyelia thyelia* (Linnaeus, 1758)** (Figs. 192-195)

*Xylophanes thyelia* (Linnaeus): Kaye (1914b), Kaye and Lamont (1927), Cary (1951)

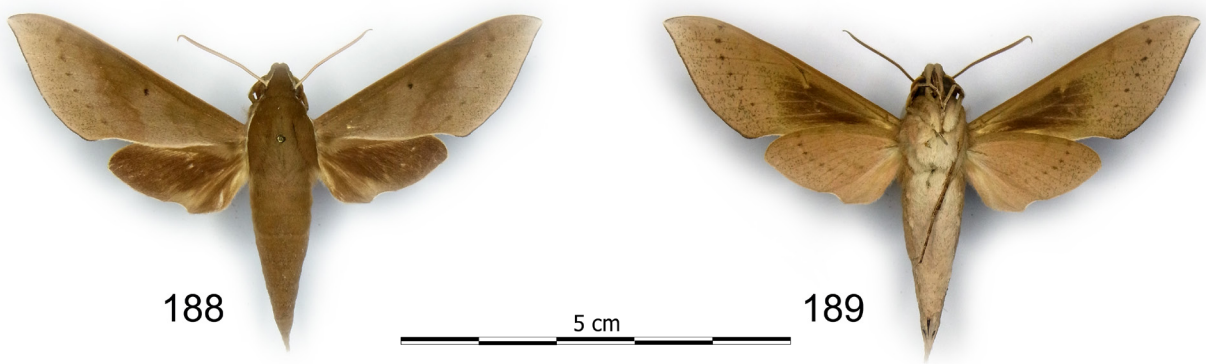
*Xylophanes thyelia thyelia* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983)

**Identification**. A very distinctive species in the Trinidad fauna, due to its small size, pale line from base to apex of the dorsal forewing, and rich colouring ventrally.

**Status in Trinidad**. An uncommon species, primarily found in forested areas, but occasionally in suburban areas.


**Figs. 184-185.** *Xylophanes pistacina* (Boisduval, [1875]). **184**, male, Curepe, MVL, 14 June 1979 (M.J.W. Cock) [MJWC]. **185**, female, Arima Valley, Simla, MVL, 3 May 1981 (M.J.W. Cock) [MJWC].


**Figs. 186-187.** *Xylophanes pluto* (Fabricius) male, St. Augustine, MV Trap, 10 August 1978 (F.D. Bennett) [MJWC]. **186**, dorsal. **187**, ventral.



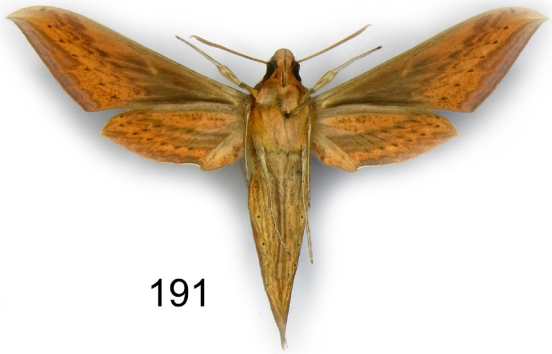

**Figs. 188-189.** *Xylophanes porcus continentalis* Rothschild and Jordan male, Morne Bleu, Textel Installation, at light, until 23.30h 29 September 1978 (M.J.W. Cock) [MJWC]. **188**, dorsal. **189**, ventral.

**83. *Xylophanes titana* (Druce, 1878)** (Figs. 37, 196-197)
*Xylophanes titana* (Druce): Stradling *et al*. (1983), Cock (2007)

**Biology in Trinidad.** Cock (2007) illustrates the adult and early stages from a caterpillar collected on *Endlichera umbellata* (Rubiaceae) on Morne Catherine.

**Identification**. Images of living adults of this species might be confused with *X. tersa*, but *X. titana* is larger, the dorsal forewing is darker and more contrasting and the abdomen and thorax have two pale dorsal lines

**Status in Trinidad**. An occasional species in forested areas.

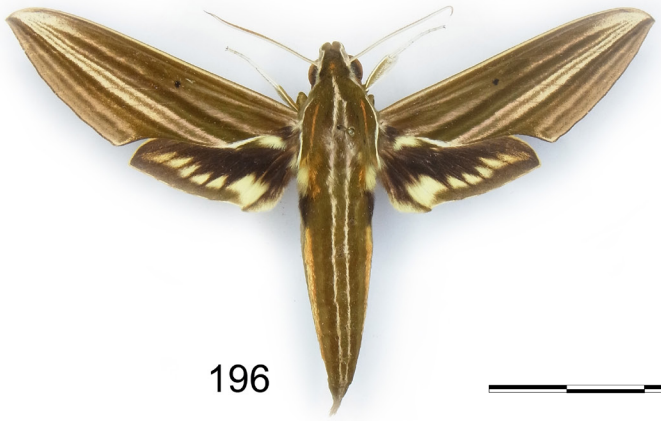



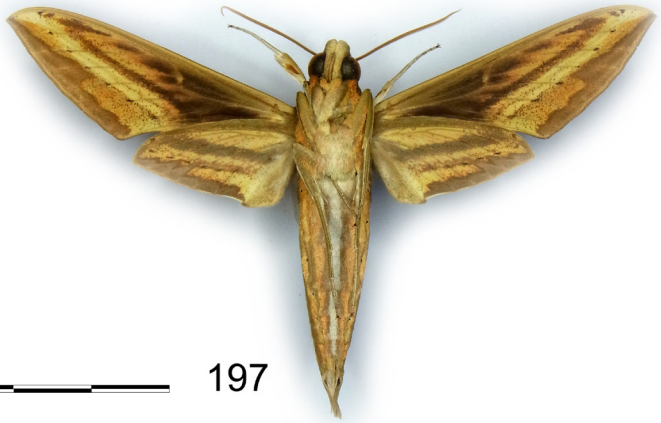

**Figs. 190-191.** *Xylophanes tersa tersa* (Linnaeus) male, Curepe, MVL, 5 August 1978 (M.J.W. Cock) [MJWC]. **190**, dorsal. **191**, ventral.

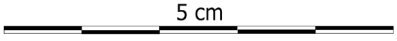




**Figs. 192-195.** *Xylophanes thyelia thyelia* (Linnaeus) males. **192**, Morne Bleu, Textel Installation, at light, 22.00-02.00h 29 March 1979 (M.J.W. Cock) [MJWC]. **193**, as Fig. 192, ventral view. **194**, Cumaca Road, 4.6 miles, MVL, 21 October 1982 (M.J.W. Cock) [MJWC]. **195**, as Fig. 194, ventral view.




**Figs. 196-197.** *Xylophanes titana* (Druce) male, Morne Bleu, Textel Installation, at light, until 23.30h 29 September 1978 (M.J.W. Cock) [MJWC]. **196**, dorsal. **197**, ventral.

**84. *Xylophanes tyndarus tyndarus* (Boisduval, [1875])** (Figs. 38, 198-199)

*Choerocampa tyndarus* (Boisduval): Kaye (1901, 1914a)

*Xylophanes tyndarus* (Boisduval): Rothschild and Jordan (1903), Kaye (1914b), Kaye and Lamont (1927), Cary (1951), Cock (2017b)

*Xylophanes tyndarus tyndarus* (Boisduval): Schreiber (1978), Stradling *et al*. (1983)

**Taxonomic issues.** Haxaire (2013) described a new subspecies for Central America, whereas the nominotypical subspecies is restricted to South America, including Trinidad.

**Identification**. This plain green species, slightly darker beyond the discal line, should not be confused with any other Trinidad species.

**Status in Trinidad**. An occasional species in forested areas, rare in suburban areas.

**Species not confirmed from Trinidad:**

The following species have been recorded as occurring in Trinidad by Schreiber (1978) and Stradling *et al*. (1983), but I have been unable to confirm them from specimens, photographs or recent records, and there are no specimens known to I.J. Kitching (pers. comm. 2017) in the NHMUK or elsewhere. Schreiber (1978) based his distribution table on a review of 17 museums and private collections in Europe and USA containing nearly 75,000 labelled Neotropical specimens. At the time, Schreiber (1978) lists 22,815 Neotropical records from the NHMUK, but the NHMUK Sphingidae holdings have been doubled by the addition of the J.-M. Cadiou collection. Of the collections checked by Schreiber, I have only checked the NHMUK (partly in person, but completely by consultation with I.J. Kitching), and the implication is that voucher specimens for some of Schreiber's records are held in one or more of the museums or collections that I have not seen. Having said that, there is also the possibility of errors – in labelling, in curation, in identification, in the interpretation of labels ('Trinidad' occurs in several Neotropical collecting localities in diverse countries), and even transcription errors. Although Stradling *et al*. (1983) also list these species, this is purely on the basis of the distribution reported by Schreiber (1978) and not on new observations. Nevertheless, the first four of these species are dusk and dawn flower feeders unlikely to be captured at light (see introduction), and the fifth could be overlooked for the common *X. tersa*, so in principle there is no reason to say that their presence in Trinidad will not be confirmed in the future.

***Aleuron iphis* (Walker, 1856)**

*Aleuron iphis* (Walker): Schreiber (1978), Stradling *et al*. (1983)

This rare dusk flower-feeder occurs in French Guiana (Haxaire and Rasplus 1987b) and so might be a Trinidad species.

***Aleuron neglectum* Rothschild and Jordan, 1903**

*Aleuron neglectum neglectum* Rothschild and Jordan: Schreiber (1978), Stradling *et al*. (1983)

Same comments as for the preceding *A. iphis*.

***Pachygonidia subhamata* (Walker, 1856)**

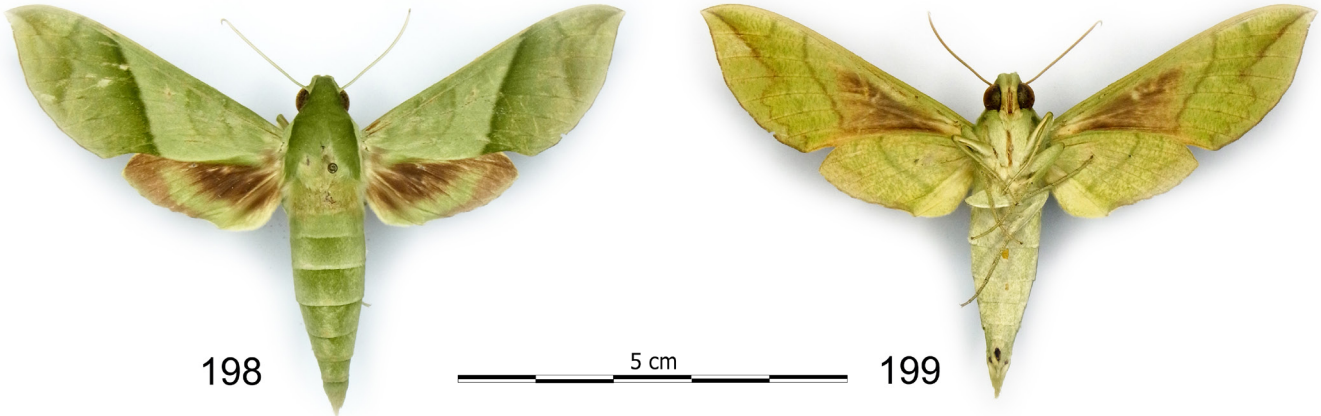
*Pachygonia [sic] subhamata* (Walker): Schreiber (1978), Stradling *et al*. (1983)

Given that this is a dusk flower-feeder, and has been recorded from coastal Venezuela (I.J. Kitching pers. comm. 2017), it may yet be found to occur in Trinidad.

***Unzela pronoe pronoe* Druce, 1894**

*Enyo pronoe pronoe* (Druce): Schreiber (1978), Stradling *et al*. (1983)

This dusk flower-feeder occurs in French Guiana (Haxaire and Rasplus 1987b), so could be a Trinidad species.




**Figs. 198-199.** *Xylophanes tyndarus tyndarus* (Boisduval) male, Morne Bleu, Textel Installation, at light, 10 May 1981 (M.J.W. Cock) [MJWC]. **198**, dorsal. **199**, ventral.

***Xylophanes turbata* (Edwards, 1887)**

*Xylophanes turbata* (Edwards): Schreiber (1978), Stradling *et al*. (1983)

Schreiber (1978) includes this species from Trinidad in his distribution table, but not in his distribution map. It has been recorded from coastal Venezuela (I.J. Kitching pers. comm. 2017) and so it is possible that it could occur in Trinidad. It resembles *X. tersa*, but the dorsal hindwing is pale brown (D'Abrera [1987]), so it is unlikely to have been overlooked in Stradling *et al*.'s (1983) comprehensive light trapping at Curepe. It just might be worth watching out for this species in the dry northwest peninsular or Bocas Islands.

**Species recorded from Trinidad, but considered to be errors**

See comments under 'Species not confirmed from Trinidad:' above. However, in contrast to the species treated in that section, there are arguments for thinking that the following species are unlikely to occur in Trinidad as set out below.

***Adhemarius ypsilon* (Rothschild and Jordan, 1903)**

*Amplyterus ypsilon* Rothschild and Jordan: Schreiber (1978), Stradling *et al*. (1983)

Although recorded from Mexico to Peru, this species is not known from northern Venezuela (I.J. Kitching, pers. comm. 2017) and is unlikely to occur in Trinidad.

***Manduca occulta* (Rothschild and Jordan, 1903)**

*Manduca occulta occulta* (Rothschild and Jordan)*:* Schreiber (1978), Stradling *et al*. (1983)

Schreiber (1978) lists *Manduca occulta occulta* from Trinidad, but this is the Central American equivalent of *Manduca diffissa,* and not a South American species**.**

***Manduca sexta jamaicensis* (Butler, 1875)**

*Manduca sexta jamaicensis* (Butler): Schreiber (1978), Stradling *et al*. (1983)

Schreiber (1978) records both *M. sexta jamaicensis* and *M. sexta paphus* from Trinidad; the former is restricted the Caribbean islands, including the Lesser Antilles, and I have seen no specimens to indicate that it also occurs in Trinidad.

***Isognathus rimosa* (Grote, 1865)**

*Isognathus rimosa* (Grote): Cary (1951)

Cary (1951) lists this species as perhaps occurring in Trinidad ('Trinidad (?)'), but I know of no records.

***Aellopos tantalus tantalus* (Linnaeus, 1758)**

*Aellopus* [*sic*] *sisyphus* (Burmeister): Kaye (1901) [synonym of *A. tantalus*]

*Sesia tantalus* (Linnaeus): Kaye (1914b), Cary (1951)

*Sesia tantalus tantalus* (Linnaeus): Kaye and Lamont (1927)

*Aellopos tantalus* (Linnaeus): Schreiber (1978), Stradling *et al*. (1983)

Kaye (1901) included this species in his provisional list of the Trinidad moths as its synonym as *Aellopus sisyphus* (Burmeister), referring to a specimen in 'Coll. Schaus'. The bulk of William Schaus's collection is now held in the USNM although some is in NHMUK and other major collections (Heinrich and Chapin 1942). This specimen has not been found in USNM (J.W. Brown pers. comm. 2017) or NHMUK (I.J. Kitching pers. comm. 2017). Kaye and Lamont (1927) list this species from Trinidad based on a record from Fort George (1,000 ft.) [305 m] January 1922 (F.W. Jackson). The specimen was located in MGCL and found to be *A. clavipes*. Early last century, *A. clavipes* was considered to be a subspecies of *A. tantalus*, following the treatment of Rothschild and Jordan (1903), which probably explains the use of the name *A. tantalus* from Trinidad. Schreiber (1978) included records from Kaye and Lamont (1927) so it is reasonable to suggest that his inclusion of this species from Trinidad is based on that source. I conclude that these early records refer to *A. clavipes* and not *A. tantalus*.

***Eumorpha cissi* (Schaufuss, 1870)**

*Eumorpha cissi* (Schaufuss): Stradling *et al*. (1983)

Stradling *et al*. (1983) list one specimen of this species from Trinidad, but I have failed to locate a specimen in UWIZM or NMSE. It is not impossible that they were misled by the slight sexual dimorphism shown by *E. anchemolus*, and mistook the darker, less red female for a separate species (as the present author also did initially). *Eumorpha cissi* is an Andean species extending into western Venezuela, and found above 1500m (5,000ft) (D'Abrera [1987]), and unlikely to occur in Trinidad, and so this record is not accepted.

***Xylophanes crotonis* (Walker, 1856)**

*Xylophanes crotonis* (Walker): Schreiber (1978), Stradling *et al*. (1983)

Schreiber (1978) includes this species from Trinidad in his distribution table, but not in his distribution map. It appears to be an Andean species (I.J. Kitching pers. comm. 2017) and unlikely to occur in Trinidad.

**DISCUSSION**

I have recorded 84 species of Sphingidae from Trinidad, plus 12 unconfirmed records, of which five are considered possible and seven are considered likely to be errors. This compares with 54 recorded by Kaye

and Lamont (1927), 81 recorded by Schreiber (1978), and 77 recorded by Stradling *et al*. (1983) out of a total possible list of 94 including published records that they had not substantiated. Comparing my list of 84 species with Stradling *et al*.'s (1983, Appendix 1) 75 confirmed records, they treat *Erinnyis domingonis* as a separate species whereas here it is treated as a synonym of *E. obscura*, I reject their record of *E. cissi*, and they do not include *Adhemarius daphne,* the four species of *Aellopos*, *Aleuron chloroptera*, *Erinnyis impunctata*, *Pachygonidia caliginosa*, *Nyceryx stuarti* and *Unzela japix*. Of these, *Adhemarius daphne, Aleuron chloroptera*, *N. stuarti* and *Erinnyis impunctata* are here recorded from Trinidad for the first time.

Of the 84 species accepted, six (7%) are based on single records (*Aellopos clavipes, A. titan*, *Aleuron chloroptera*, *Hyles lineata*, *Nyceryx maxwelli*, *Pachygonidia caliginosa*), a slightly higher rate than for Lycaenidae in the recent analysis by Cock & Robbins (2016), where six out of 131 Lycaenidae (5%) are known only from single specimens. This percentage of records based on single specimens suggests that further collecting will reveal more new records for Trinidad.

Comparing the records from suburban habitats and forest habitats (Appendix Tables 2 and 3), it can be seen that despite the totally disproportionate investment in collecting in suburban habitats (Curepe / St. Augustine), there are many species that were collected as frequently or more frequently in forest habitats (Appendix Table 2). I have categorised 23 species as relatively frequent in suburban habitats and 23 as relatively frequent in forest habitats. Six species are frequently collected in both: *Erinnyis alope*, *E. ello*, *E. crameri*, *Eumorpha satellitia*, *Xylophanes neoptolemus* and *X. tersa*. There has been an even larger bias towards collecting in the northern half of Trinidad than in the south, and not surprisingly, although all bar one of the 84 Trinidad species have been recorded from the north, only 51 have been recorded from the south (Appendix Table 2). Further collecting and observations in the south is likely to show that most or all species also occur there.

Cock (2017b) listed 26 Sphingidae from Tobago (Appendix Table 2), representing 31 % of the 84 species recorded here from Trinidad. This is significantly higher than 20% for all butterflies (Cock 2017a), reflecting the greater mobility of adult hawk-moths compared to other families of Lepidoptera. All species recorded from Tobago are known from Trinidad and can be identified using the images provided here.

The table of captures in forested areas (Appendix Table 4) indicates that hawk-moths are collected in significant numbers in every month, but the amount of collecting effort in each month is uneven, so more detailed analysis is not justified. Of the collecting sites shown in Appendix Table 3, the area lumped together under 'Morne Bleu' is on the ridge tops of the northern range at the head of the Arima Valley at about 600–700 m (2,000–2,300 ft.), whereas the remainder are all at significantly lower elevations. There is no hint that any species are only found at the higher elevation sites, although a significant number of less common species have yet to be recorded from the high elevation sites. On balance, there is little evidence of species being restricted by elevation rather than by habitat.

This illustrated checklist of Trinidad hawk-moths should enable adults of all known species to be identified, and it is my hope that this will stimulate interest in this charismatic group in Trinidad and Tobago. Using this checklist, identifications can now be reliably made, and further studies on distribution and frequency, adult feeding habits, food plants and life history studies, etc., can all be readily taken up.

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**REFERENCES**

**CABI (CAB International)** 2002a. *Erinnyis ello* (Linnaeus). *Distribution Maps of Plant Pests*, 628: 1-3.

**CABI (CAB International)** 2002b. *Erinnyis alope* (Drury). *Distribution Maps of Plant Pests*, 637: 1-3.

**CABI (CAB International)** 2002c. *Manduca sexta* (Linnaeus). *Distribution Maps of Plant Pests* 638: 1-4.

**CABI (CAB International)** 2015. Datasheet. *Ludwigia octovalvis* (primrose willow). Invasive Species Compendium. [Online] Available at http://www.cabi.org/isc/datasheet/31671 (Accessed 22 June, 2017).

**Caracciolo, H.** 1890. [A note]. *Bulletin des Séances de la Société entomologique de France*, 1889(18): clxxviii.

**Cary, M.M.** 1951. Distribution of Sphingidae (Lepidoptera: Heterocera) in the Antillean-Caribbean Region. *Transactions of the American Entomological Society*, 77(2): 63-129.

**Closs, A.G.** 1917. *Xylophanes neoptolemus* Stoll, subspec. *neoptolemus trinitatis* subspec. nov. *Internationale Entomologische Zeitschrift*, 11: 96.

**Cock, M.J.W.** 2003. On the number of species of moths (Lepidoptera) in Trinidad and Tobago. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*, 2003: 49-58.

**Cock, M.J.W.** 2007. *Xylophanes titana* (Lepidoptera: Sphingidae) in Trinidad. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*, 2007: 82-84.

**Cock, M.J.W.** 2008. *Pseudosphinx tetrio* (L.) (Lepidoptera: Sphingidae) in Trinidad and Tobago. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*, 2008: 49-52.

**Cock, M.J.W.** 2016. The corkscrew moths (Lepidoptera, Geometroidea, Sematuridae) of Trinidad and Tobago. *Tropical Lepidoptera Research*, 26(2): 101-105.

**Cock, M.J.W.** 2017a. The butterflies (Papilionoidea) of Tobago, West Indies, West Indies: An updated and annotated checklist. *Insecta Mundi*, 0539: 1-38.

**Cock, M.J.W.** 2017b. A preliminary catalogue of the moths (Lepidoptera except Papilionoidea) of Tobago, West Indies. *Insecta Mundi*, 0585: 1-58.

**Cock, M.J.W.** and **Boos, J.O.** 2007. Observations on Sphingidae (Lepidoptera) from Talara, north coastal Peru. *Revista Peruana de Entomología*, 45 (2006): 75-78.

**Cock, M.J.W.** and **Robbins, R.K.** 2016. Annotated checklist and biogeographic composition of the Lycaenidae (Lepidoptera) of Trinidad, West Indies. *Insecta Mundi*, 0506: 1-33.

**Cooper, J. and Cooper, M.** 2009. A historical note on *Pseudosphinx tetrio* (L.) (Lepidoptera: Sphingidae) in Trinidad, West Indies. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*, 2009: 43-44.

**D'Abrera, B.** [1987]. Sphingidae Mundi. Hawk Moths of the World. Faringdon, UK: E.W. Classey Ltd. 226 p.

**Des Vignes, W.** 1986. Cassava hornworm on cassava. *FAO Plant Protection Bulletin*, 34(4): 218.

**Dyer, L.A.** and **Gentry, G.L.** 2002. Caterpillars and parasitoids of a tropical lowland wet forest. [Online] Available at http://www.caterpillars.org (Accessed: 14 April, 2017).

**Dyer, L.A., Miller, J.S., Rab Green, S.B., Gentry, G.L., Greeney, H.F.** and **Walla, T.W.** 2017. Caterpillars and parasitoids of the Eastern Andes in Ecuador. [Online] Available at http://www.caterpillars.org. (Accessed: 14 April, 2017).

**Eitschberger, U.** 2006. Revision der Gattungen *Amphimoea* Rothschild & Jordan, 1903, *Cocytius* auct. (nec Hübner, [1819]) und *Neococytius* Hodges, 1917 mit der Neugliederung der Gattung *Cocytius* auct. (Lepidoptera, Sphingidae). *Neue Entomologische Nachrichten*, 59: 171-288, 438-465.

**Eitschberger, U.** 2011. Vorarbeit zur Revision der *Eumorpha obliquus* (Rothschild & Jordan, 1903)-Artengruppe mit der Beschreibung einer neuen Art aus Bolivia (Lepidoptera, Sphingidae). *Neue Entomologische Nachrichten*, 66: 131-191.

**Eitschberger, U.** and **Steiniger, H.** 1976. Die Artverschiedenheit von *Hyles lineata lineata* (Fabricius, 1775) und *Hyles livornica livornica* (Esper, 1779) (Lep. Sphingidae). *Atalanta, Würzburg*, 7: 71-73.

**González, J.M.** and **Cock, M.J.W.** 2004. A synopsis of the Castniidae (Lepidoptera) of Trinidad and Tobago. *Zootaxa*, 762: 1-19.

**Guppy, P.L.** 1893. Notes on some lepidopterous insects (collected principally on San Fernando Hill). *Journal of the Trinidad Field Naturalists' Club*, 1(8): 198-200.

**Guppy, P.L.** 1911a. Report of the assistant entomologist 1910-1911. *Circular, Board of Agriculture, Trinidad*, 2: 9-11.

**Guppy, P.L.** 1911b. Insect notes for the year 1910-1911. *Circular, Board of Agriculture, Trinidad*, 3: 3-14.

**Guppy, P.L.** 1914. Birds and their value to the agriculturist. *Bulletin of the Department of Agriculture, Trinidad and Tobago*, 13(80): 148-156.

**Haxaire, J.** 1992. Les *Aleuron* Boisduval (1870) en Guyane française (Lepidoptera Sphingidae). *Bulletin de la Société Sciences Naturelles*, 73: 13-16.

**Haxaire, J.** 1993. Systematique et repartition des especes du groupe d'*Hyles lineata* (Fabricius) (Lepidoptera Sphingidae). *Lambillionea*, 93: 156-165.

**Haxaire, J.** 1996a. Les premiers états d'*Oryba kadeni* Schaufuss: écologie et description. *Lambillionea*, 96: 73-79.

**Haxaire, J.** 1996b. Les genres *Pachygonidia* Fletcher, *Nyceryx* Boisduval et *Perigonia* Herrich-Schäffer

en Guyane française. (Lepidoptera Sphingidae). *Lambillionea*, 96: 342-350.

**Haxaire, J.** 1996c. Note sur *Eupyrrhoglossum venustum* Rothschild & Jordan (Lepidoptera Sphingidae). *Lambillionea*, 96: 694-698.

**Haxaire, J.** 2005. Description d'un nouveau Sphingidae bolivien *Nyceryx janzeni* sp. n. (Lepidoptera Sphingidae). *Lambillionea*, 105: 583-588.

**Haxaire, J.** 2013. Description de cinq nouveaux Sphingidae néotropicaux et asiatiques (Lepidoptera, Sphingidae) et notes sur *Nyceryx riscus* (Schaus, 1890). *The European Entomologist*, 5(2): 25-43.

**Haxaire, J. and Cadiou, J.M.** 1999. Description of a new species in the genus *Nyceryx*, and notes on allied species (Lepidoptera, Sphingidae). *Lambillionea*, 99: 344-350.

**Haxaire, J.** and **Herbin, D.** 2000. Les Lépidoptères Sphingidae de Bolivie ecologie et systématique. 2ème partie: les sous-familles des Smerinthinae et Macroglossinae pro parte (1). *Revue de l'Association Roussillonnaise d'Entomologie*, 9(1): 4-19.

**Haxaire, J.** and **Rasplus, J.-Y.** 1987a. Contribution à la connaissance des Sphingidae de Guyane Française. lre Partie [Lep.]. *Bulletin de la Société entomologique de France*, 91(9-10) (1986): 275-285.

**Haxaire, J.** and **Rasplus, J.-Y.** 1987b. Contribution à la connaissance des Sphingidae de Guyane Française. 2e Partie [Lep.]. *Bulletin de la Société entomologique de France*, 92(1-2): 45-55.

**Heinrich, C. and Chapin, E.A.** 1942. William Schaus. *Proceedings of the Entomological Society of Washington,* 44(9): 189-195, plate 17.

**Hill, A.W.** and **Sandwith, N.Y.** 1947. Sapotaceae. Flora of Trinidad and Tobago, 2(3): 123-137.

**Hodges, R.W.** 1971. Fascicle 21. Sphingoidea Hawkmoths. *In:* The Moths of America North of Mexico. London: E.W. Classey. 158 p., 14 pl., xii.

**Janzen, D.H.** 1986. Biogeography of an unexceptional place: what determines the saturniid and sphingid moth fauna of Santa Rosa National Park, Costa Rica, and what does it mean to conservation biology? *Brenesia*, 25/26: 51-87.

**Janzen, D.H.** and **Hallwachs, W.** 2016. DNA barcoding the Lepidoptera inventory of a large complex tropical conserved wildland, Area de Conservacion Guanacaste, northwestern Costa Rica. *Genome*, 59: 641-660.

**Janzen, D. H.** and **Hallwachs, W.** 2017. Dynamic database for an inventory of the macrocaterpillar fauna, and its food plants and parasitoids, of Area de Conservacion Guanacaste (ACG), northwestern Costa Rica. [Online] Available at http://janzen.sas.upenn.edu (Accessed: 14 April, 2017).

**Kawahara, A.Y., Mignault, A.A., Regier, J.C., Kitching, I.J.** and **Mitter, C.** 2009. Phylogeny and biogeography of hawkmoths (Lepidoptera: Sphingidae): evidence from five nuclear genes. *PLoS ONE*, 4(5), e5719: 11 p.

**Kawahara, A.Y., Breinholt, J.W., Ponce, F.M., Haxaire, J., Xiao, L., Lamarre, G.P.A., Rubinoff, D.** and **Kitching, I.J.** 2013. Evolution of *Manduca sexta* hornworms and relatives: Biogeographical analysis reveals an ancestral diversification in Central America. *Molecular Phylogenetics and Evolution*, 68: 381-386.

**Kaye, W.J.** 1901. A preliminary catalogue of the Lepidoptera Heterocera of Trinidad. *Transactions of the Entomological Society of London*, 1901: 115-158, 2 plates. [Reprinted in *Proceedings of the Agricultural Society of Trinidad and Tobago* 1914].

**Kaye, W.J.** 1914a. Moths of Trinidad. *Proceedings of the Agricultural Society of Trinidad and Tobago,* 1914: 58-69, 115-1235, 191-200, 231-242. [Reprint of Kaye (1901) without plates and with additional annotations, mainly common names, probably by P.L. Guppy]

**Kaye, W.J.** 1914b. [Exhibit, October 23rd, 1913]. *Proceedings and Transactions of the South London Entomological and Natural History Society*, 1913-1914: 129.

**Kaye, W.J.** and **Lamont, N.** 1927. A catalogue of the Trinidad Lepidoptera Heterocera (moths). *Memoirs of the Department of Agriculture, Trinidad and Tobago*, 3: 1-144.

**Kelly, M.** 2011. First record of the hawkmoth *Aellopos clavipes* (Sphingidae) in Tobago, West Indies. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*, 2011: 72.

**Kitching, I.J.** 2017. Sphingidae Taxonomic Inventory. Available at http://sphingidae.myspecies.info/ (Accessed: 14 April, 2017).

**Kitching, I.J.** and **Cadiou, J.-M.** 2000. Hawkmoths of the World. An Annotated and Illustrated Revisionary Checklist (Lepidoptera: Sphingidae). Ithaca, USA and London, UK: Cornell University Press. viii + 227 p.

**Lamont, N.** and **Callan, E.McC.** 1950. Moths new to Trinidad, B.W.I. *Zoologica*, 35: 197-207.

**MFPLMA (Ministry of Food Production, Land and Marine Affairs, Trinidad and Tobago)** 2010. Cassava hornworm *Erinnyis ello.* Fact Sheet #1. Research Division, Ministry of Food Production, Land and Marine Affairs, Trinidad and Tobago, 2 p.

**MPM (Ministry of Petroleum and Mines, Trinidad and Tobago)** 1981. Annual Report for 1978. Government of Trinidad and Tobago, vi + 26 p.

**Moss, A.M.** 1912. On the Sphingidae of Peru. *Transactions of the Zoological Society of London*, 20: 73-135.

**Moss, A.M.** 1920. Sphingidae of Para, Brazil. *Novitates Zoologicae*, 27: 333-424, plates i-xi.

**Oehlke, B.** 2017. Sphingidae of the Americas. [Online] Available at http://www.silkmoths.bizland.com/Sphinx/danjansphinx.htm (Accessed: 14 April, 2017).

**Petroleum Economist** 2015. Energy Map of Trinidad and Tobago. 2015 Edition. [Online] Available at http://ngc.co.tt/wp-content/uploads/pdf/publications/energy-map-of-tnt-2015-ed.pdf (Accessed: 14 April, 2017).

**Pollard, G.** 1984. Insect pests of sweet potato in the Caribbean with particular reference to the borer (*Megastes grandalis* Guen.). p. 147-152. *In:* **Dolly, D.** ed., Root Crops in the Caribbean. Proceedings of the Caribbean Regional Workshop on Tropical Root Crops. St. Augustine, Trinidad and Tobago: Faculty of Agriculture, University of the West Indies. 269 p.

**Ponce, F., Breinholt, J.W., Hossie, T., Barber, J.R., Janzen, D.H., Hallwachs, W.** and **Kawahara, A.Y.** 2015. A molecular phylogeny of *Eumorpha* (Lepidoptera: Sphingidae) and the evolution of anti-predator larval eyespots. *Systematic Entomology*, 40(2): 401-408.

**Rothschild, W.** and **Jordan, K.** 1903. A revision of the lepidopterous family Sphingidae. *Novitates Zoologicae*, 9(supplement): i-cxxxv, 1-972, 67 pl.

**Schreiber, H.** 1978. Dispersal centres of Sphingidae (Lepidoptera). Biogeographica, Volume 10. The Hague: Dr W. Junk Publishers. 195 p.

**Soares, A.** 1993. Nota sôbre o gênero *Callionima* Lucas, 1856 (Lepidoptera, Sphingidae, Macroglossinae, Dilophonotini). *Revista Brasileira de Entomologia*, 37: 35-39.

**St Laurent, R.A.** and **Cock, M.J.W.** 2017. Annotated list of Mimallonidae (Lepidoptera, Mimallonoidea) from Trinidad and Tobago. *Zootaxa*, 4268: 53-70.

**Stradling, D.J., Legg, C.J.** and **Bennett, F.D.** 1983. Observations on the Sphingidae (Lepidoptera) of Trinidad. *Bulletin of Entomological Research*, 73: 201-232.

**Topper, B.F.** 1943. Tomato cultivation on the College Farm. *Tropical Agriculture*, 19(9) (1942): 180-182.

**Tuttle, J.P.** 2007. The Hawk Moths of North America. Washington DC: The Wedge Entomological Research Foundation. xviii + 253 p.

**University of Florida** 2017. *Ludwigia leptocarpa*. Available at https://plants.ifas.ufl.edu/plant-directory/ludwigia-leptocarpa/ (Accessed 22 July, 2017).

**Urich, F.W.** 1915. Cassava insects. *Bulletin of the Department of Agriculture, Trinidad and Tobago*, 14(2): 38-40.

**Vaglia, T.** and **Haxaire, J.** 2005. Revision des *Adhemarius* du complex *gannascus* (Stoll, 1790). *Lambillionea*, 105(supplement 3): 3-[45].

**Vaglia, T., Haxaire, J., Kitching, I.J., Meusnier, I.** and **Rougerie, R.** 2008. Morphology and DNA barcoding reveal three cryptic species within the *Xylophanes neoptolemus* and *loelia* species-groups (Lepidoptera: Sphingidae). *Zootaxa,* 1923: 18-36.

**Winder, J.A.** 1976. Ecology and control of *Erinnyis ello* and *E. alope*, important insect pests in the New World. *PANS*, 22(4): 449-466.

**Appendix Table 1.** Overview of the main food plants of Sphingidae found in Trinidad based on records from elsewhere.

| | Species | Food plants | Sources |
|---|---|---|---|
| **1** | *Adhemarius gannascus* | Apparently unknown | |
| **2** | *Adhemarius daphne* | Lauraceae (*Ocotea*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **3** | *Adhemarius palmeri* | Apparently unknown | |
| **4** | *Protambulyx eurycles* | Probably Anacardiaceae and Simaroubaceae | Oehlke (2017) |
| **5** | *Protambulyx strigilis* | Anacardiaceae (*Anacardium*, *Astronium*, *Spondias*, *Schinus*, *Tapirira*, *Simarouba*) | Dyer and Gentry (2002), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **6** | *Cocytius duponchel* | Annonaceae (*Annona*, *Rollinia, Guatteria*, *Xylopia*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **7** | *Cocytius lucifer* | Annonaceae (*Annona*, *Desmopsis*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **8** | *Cocytius antaeus* | Annonaceae (*Annona*, *Rollinia*) | Moss (1912, 1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **9** | *Neococytius cluentius* | Annonaceae (*Annona*), Piperaceae (*Piper*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017) |
| **10** | *Manduca lefeburii* | Salicaceae (*Casearia*, *Zuelania*) | Haxaire and Rasplus (1987a), Janzen and Hallwachs 2017), Oehlke (2017) |
| **11** | *Manduca albiplaga* | Annonaceae (*Annona*, *Rollinia*) and Lamiaceae (*Aegiphila*); perhaps also Cordiaceae | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **12** | *Manduca franciscae* | Apparently unknown | |
| **13** | *Manduca huascara* | Apparently unknown | |
| **14** | *Manduca florestan* | Polyphagous on at least 11 families, particularly Bignoniaceae and Lamiaceae, but also Boraginaceae, Cordiaceae, Rubiaceae, Verbenaceae, etc. | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **15** | *Manduca rustica* | Polyphagous, including Bignoniaceae, Convolvulaceae, Cordiaceae, Lamiaceae, Malvaceae, and Verbenaceae | Moss (1912), Janzen and Hallwachs (2017), Oehlke (2017) |
| **16** | *Manduca sexta* | Mainly Solanaceae (*Capsicum*, *Datura*, *Nicotiana*, *Solanum*); also Lamiaceae (*Aegiphila*), Martyniaceae (*Martynia*, *Proboscidia*) and Petiveriaceae (*Rivina*) | Moss (1912,1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs 2017), Oehlke (2017) |
| **17** | *Manduca diffissa* | Solanaceae (*Nicotiana*, *Solanum*) | Moss (1912,1920) |
| **18** | *Manduca hannibal* | Solanaceae (*Cestrum*, *Datura*, *Solanum*), Lamiaceae (*Aegiphila, Clerodendrum*) | Moss (1912,1920), Dyer *et al*. (2017), Janzen and Hallwachs 2017), Oehlke (2017) |
| **19** | *Manduca ochus* | Solanaceae (*Cestrum*) | Janzen and Hallwachs 2017) |
| **20** | *Agrius cingulata* | Convolvulaceae (*Convolvulus*, *Ipomoea*, *Merremia*) | Moss (1912, 1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **21** | *Pachylia ficus* | Moraceae (*Brosimum*, *Castilla*, *Ficus*, *Maclura)* | Moss (1912, 1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **22** | *Pachylia syces* | Moraceae (*Ficus*, *Artocarpus*), Urticaceae (*Cecropia*) | Moss (1912, 1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **23** | *Callionima pan* | Apparently unknown | |
| **24** | *Callionima calliomenae* | Apparently unknown | |
| **25** | *Callionema inuus* | Apocynaceae (*Ambelania*) | Moss (1920) |
| **26** | *Callionima falcifera* | Apocynaceae (*Stemmadenia*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **27** | *Nyceryx coffaeae* | Rubiaceae (*Calycophyllum*, *Uncaria*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **28** | *Nyceryx maxwelli* | Apparently unknown | |
| **29** | *Nyceryx riscus* | Bignoniaceae (*Xylophragma*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **30** | *Nyceryx stuarti* | Rubiaceae (*Uncaria*) | Janzen and Hallwachs (2017) |

**Appendix Table 1 Continued.** Overview of the main food plants of Sphingidae found in Trinidad based on records from elsewhere.

| | Species | Food plants | Sources |
|---|---|---|---|
| **31** | *Perigonia pallida* | Apparently unknown | |
| **32** | *Perigonia lusca* | Rubiaceae (*Calycophyllum*, *Coffea*, *Guettarda*, *Ourouparia*, *Uncaria*), Aquifoliaceae (*Ilex*) | Moss (1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **33** | *Eupyrrhoglossum sagra* | Rubiaceae (*Chomelia*, *Guettarda*, *Sabicea*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **34** | *Aellopos ceculus* | Rubiaceae (*Ourouparia*, *Sabicea*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017) |
| **35** | *Aellopos clavipes* | Rubiaccae (*Randia*) | Moss (1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **36** | *Aellopos titan* | Rubiaceae (*Alibertia*, *Genipa*, *Guettarda*, *Randia*) | Moss (1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **37** | *Aellopos fadus* | Rubiaceae (*Alibertia*, *Augusta*, *Genipa*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **38** | *Oryba kadeni* | Rubiaceae (*Cosmibuena*, *Isertia*, *Palicourea*, *Remijia*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **39** | *Oryba achemenides* | Rubiaceae (*Ourouparia*, *Uncaria*) | Moss (1920), Janzen and Hallwachs (2017) |
| **40** | *Pachylioides resumens* | Apocynaceae (*Echites*, *Forsteronia*, *Zschokkea*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **41** | *Madoryx oiclus* | Bignoniaceae (*Tecoma*), Verbenaceae (*Rehdera*) | Haxaire and Rasplus (1987a), Janzen and Hallwachs (2017), Oehlke (2017) |
| **42** | *Madoryx plutonius* | Aquifoliaceae (*Ilex*), Melastomataceae (*Conostegia*, *Miconia*), Vochysiaceae (*Erisma*, *Vochysia*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **43** | *Madoryx bubastus* | Rubiaceae (*Calycophyllum*, *Guettarda*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **44** | *Hemeroplanes triptolemus* | Apocynaceae (*Amblyanthera*, *Echites*, *Fischeria*, *Mesechites*, *Zschokkea*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **45** | *Phryxus caicus* | Apocynaceae (*Mesechites*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **46** | *Erinnyis alope* | Euphorbiacae (*Hevea*, *Manihot*), Caricaceae (*Carica*) | Moss (1912, 1920), Haxaire and Rasplus (1987a), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **47** | *Erinnyis lassauxii* | Apocynaceae (*Gonolobus*, *Morrenia*) | Moss (1912, 1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **48** | *Erinnyis impunctata* | Apparently unknown | |
| **49** | *Erinnyis ello* | Euphorbiaceae (*Euphorbia, Manihot*, *Poinsettia, Sebastiania*), Caricaceae (*Carica*); also Apocynaceae, Sapotaceae (*Bumelia*, *Chrysophyllum*, *Manilkara*) | Moss (1912, 1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **50** | *Erinnyis oenotrus* | Apocynaceae (*Forsteronia*, *Echites*, *Zschokkea*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **51** | *Erinnyis crameri* | Apocynaceae (*Rauvolfia*, *Stemmadenia*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **52** | *Erinnyis obscura* | Apocynaceae (*Blepharodon*, *Cynanchum*, *Gonolobus*, *Sarcostemma*) | Moss (1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **53** | *Isognathus scyron* | Apocynaceae (*Allamanda*). See text | Oehlke (2017) |
| **54** | *Isognathus caricae* | Apocynaceae (*Allamanda*, *Himatanthus*) | Oehlke (2017) |
| **55** | *Pseudosphinx tetrio* | Apocynaceae (*Plumeria*) | Moss (1912), Janzen and Hallwachs (2017), Oehlke (2017) |
| **56** | *Aleuron carinata* | Dilleniaceae (*Curatella*, *Doliocarpus*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **57** | *Aleuron chloroptera* | Dilleniaceae (*Curatella*, *Davilla*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **58** | *Unzela japix* | Dilleniaceae (*Curatella*, *Davilla*, *Doliocarpus*, *Pinzonia*, *Tetracera*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **59** | *Enyo lugubris* | Vitaceae (*Cissus*), Dilleniaceae (*Doliocarpus*) | Moss (1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |

**Appendix Table 1 Continued.** Overview of the main food plants of Sphingidae found in Trinidad based on records from elsewhere.

| | Species | Food plants | Sources |
|---|---|---|---|
| **60** | *Enyo ocypete* | Dilleniaceae (*Curatella*, *Davilla*, *Doliocarpus*, *Tetracera*), Onagraceae (*Ludwigia*), Vitaceae (*Cissus*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **61** | *Enyo gorgon* | Vitaceae (*Cissus*, *Vitis*) | Moss (1920) , Janzen and Hallwachs (2017), Oehlke (2017) |
| **62** | *Eumorpha anchemolus* | Dilleniaceae (*Davilla*, *Doliocarpus*), Vitaceae (*Ampelopsis*, *Cissus*) | Moss (1912, 1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **63** | *Eumorpha satellitia* | Vitaceae (*Ampelopsis*, *Cissus*) | Moss (1912, 1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **64** | *Eumorpha obliquus* | Marcgraviaceae (*Schwartzia*), Vitaceae (*Cissus*) | Moss (1920), Janzen and Hallwachs (2017) |
| **65** | *Eumorpha megaeacus* | Onagraceae (*Ludwigia*) | Moss (1920), Janzen and Hallwachs (2017), Oehlke (2017) |
| **66** | *Eumorpha vitis* | Vitaceae (*Cissus*, *Vitis*) | Moss (1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **67** | *Eumorpha fasciatus* | Onagraceae (*Ludwigia*) | Moss (1912, 1920), Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **68** | *Eumorpha phorbas* | Marcgraviaceae (*Schwartzia*) | Janzen and Hallwachs (2017) |
| **69** | *Eumorpha capronnieri* | Apparently unknown | |
| **70** | *Eumorpha labruscae* | Vitaceae (*Ampelopsis*, *Cissus*) | Moss (1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **71** | *Pachygonidia caliginosa* | Apparently unknown; other species of *Pachygonidia* feed on Dilleniaceae, Rubiaceae, Vitaceae | Janzen and Hallwachs (2017) |
| **72** | *Hyles lineata* | Polyphagous including Melastomataceae, Nyctaginaceae, Onagraceae, Portulacaceae | Tuttle (2007), Janzen and Hallwachs (2017), Oehlke (2017) |
| **73** | *Xylophanes anubus* | Rubiaceae (*Palicourea*, *Psychotria*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **74** | *Xylophanes ceratomioides* | Rubiaceae (*Hamelia*, *Margaritopsis*, *Psychotria*) | Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **75** | *Xylophanes chiron* | Many Rubiaceae (*Coussarea*, *Faramea*, *Margaritopsis*, *Morinda*, *Palicourea*, *Psychotria*, *Rudgea*, *Spermacoce*), Melastomataceae (*Miconia*), Vochysiaceae (*Vochysia*) | Moss (1920), Dyer and Gentry (2002), Dyer *et al*. (2017), Janzen and Hallwachs (2017), Oehlke (2017) |
| **76** | *Xylophanes loelia* | Rubiaceae (*Spermacoce*); also Onagraceae (*Ludwigia*) | Moss (1920), Janzen and Hallwachs (2017) |
| **77** | *Xylophanes neoptolemus* | Apparently unknown | |
| **78** | *Xylophanes pistacina* | Rubiaceae (*Psychotria*) | Oehlke (2017) |
| **79** | *Xylophanes pluto* | Erythroxylaceae (*Erythroxylon*), Rubiaceae (*Augusta*, *Hamelia*, *Manettia*, *Margaritopsis*, *Morinda*) | Moss (1912), Haxaire and Rasplus (1987b), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **80** | *Xylophanes porcus* | Rubiaceae (*Hamelia*, *Margaritopsis*, *Palicourea*, *Psychotria*) | Moss (1920), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **81** | *Xylophanes tersa* | Rubiaceae (*Diodia*, *Hamelia*, *Margaritopsis*, *Pentas*, *Richardia*, *Spermacoce*) | Moss (1912, 1920), Tuttle (2007), Dyer and Gentry (2002), Janzen and Hallwachs (2017), Oehlke (2017) |
| **82** | *Xylophanes thyelia* | Apparently unknown | |
| **83** | *Xylophanes titana* | Rubiaceae (*Manettia*) | Janzen and Hallwachs (2017), Oehlke (2017) |
| **84** | *Xylophanes tyndarus* | Rubiaceae (*Faramea*) | Janzen and Hallwachs (2017), Oehlke (2017) |

**Appendix Table 2**. Overview of the frequency of capture, distribution and habitat of Sphingidae in Trinidad and Tobago. **Curepe 1969-1976** is the total number of each species recorded by Stradling *et al.* (1983) with the three light traps in Curepe (St. Augustine) over 3767 trap nights. **Curepe 1978-1982** is based on my irregular light trap records over these years in my garden in Curepe (St. Augustine). **Other records** encompasses all records not from Curepe (note that records from Curepe / St. Augustine that are not included in the first two datasets are not included in these numbers). **Suburban species** and **Forest species** gives a subjective indication of the relative frequency in these habitats based on 1-3 + signs, or – for almost or completely absent. **Recorded from South Trinidad:** the south of Trinidad is treated as south of the Central Range; there are no records from the strip south of Tabaquite and north of San Fernando. **Recorded from Tobago** is taken from Cock (2017b).

| | Species | Curepe 1969-1976 | Curepe 1978-1981 | Other records | Suburban species | Forest species | Recorded from South Trinidad | Recorded from Tobago |
|---|---|---|---|---|---|---|---|---|
| 1 | *Adhemarius gannascus* | 3 | 1 | 49 | + | +++ | | |
| 2 | *Adhemarius daphne* | 0 | 1 | 5 | - | +++ | X | |
| 3 | *Adhemarius palmeri* | 14 | 0 | 5 | ++ | ++ | X | |
| 4 | *Protambulyx eurycles* | 0 | 1 | 2 | - | ++ | X | |
| 5 | *Protambulyx strigilis* | 133 | 11 | 29 | ++ | ++ | X | X |
| 6 | *Cocytius duponchel* | 44 | 3 | 6 | ++ | + | X | |
| 7 | *Cocytius lucifer* | 3 | 0 | 9 | + | +++ | X | |
| 8 | *Cocytius antaeus* | 62 | 0 | 3 | ++ | + | X | |
| 9 | *Neococytius cluentius* | 3 | 1 | 4 | + | + | X | |
| 10 | *Manduca lefeburii* | 7 | 2 | 4 | ++ | - | | |
| 11 | *Manduca albiplaga* | 9 | 1 | 29 | + | +++ | | |
| 12 | *Manduca franciscae* | 0 | 0 | 2 | - | + | | |
| 13 | *Manduca huascara* | ? | 1 | 18 | + | +++ | | |
| 14 | *Manduca florestan* | 369[2] | 1 | 44 | + | +++ | X | X |
| 15 | *Manduca rustica* | 51 | 1 | 11 | ++ | ++ | X | X |
| 16 | *Manduca sexta* | 468 | 11 | 12 | +++ | - | X | X |
| 17 | *Manduca diffissa* | 543 | 11 | 23 | ++ | ++ | X | |
| 18 | *Manduca hannibal* | 13 | 1 | 7 | + | + | X | |
| 19 | *Manduca ochus* | 2 | 0 | 6 | + | ++ | X | |
| 20 | *Agrius cingulata* | 79 | 1 | 28 | | | X | |
| 21 | *Pachylia ficus* | 17 | 0 | 17 | ++ | ++ | X | X |
| 22 | *Pachylia syces* | 0 | 0 | 0 | + | - | | X |
| 23 | *Callionima pan* | 0 | 1 | 4 | - | + | | |
| 24 | *Callionima calliomenae* | 59 | 9 | 1 | +++ | - | | |
| 25 | *Callionema inuus* | 12 | 0 | 0 | +++ | - | | |
| 26 | *Callionima falcifera* | 572 | 27 | 16 | +++ | ++ | X | |
| 27 | *Nyceryx coffaeae* | 7 | 2 | 0 | +++ | - | | |
| 28 | *Nyceryx maxwelli* | 0 | 0 | 1 | | | X | |
| 29 | *Nyceryx riscus* | 11 | 3 | 2 | ++ | + | | |
| 30 | *Nyceryx stuarti* | 0 | 0 | 2 | | ++ | X | |
| 31 | *Perigonia pallida* | 11 | 1 | 0 | +++ | | | |
| 32 | *Perigonia lusca* | 58 | 15 | 7 | +++ | + | X | X |
| 33 | *Eupyrrhoglossum sagra* | 8 | 2 | 7 | ++ | ++ | X | X |
| 34 | *Aellopos ceculus* | 0 | 0 | 7 | ++ | ++ | X | X |
| 35 | *Aellopos clavipes* | 0 | 0 | 1 | | | | X |
| 36 | *Aellopos titan* | 0 | 0 | 1 | | + | X | |
| 37 | *Aellopos fadus* | 0 | 0 | 6 | + | + | | |
| 38 | *Oryba kadeni* | 1 | 1 | 1 | ++ | + | | |
| 39 | *Oryba achemenides* | 2 | 1 | 3 | ++ | ++ | | X |
| 40 | *Pachylioides resumens* | 12 | 0 | 4 | ++ | + | X | X |
| 41 | *Madoryx oiclus* | 105 | 7 | 3 | +++ | + | X | X |
| 42 | *Madoryx plutonius* | 0 | 0 | 5 | | ++ | | |

**Appendix Table 2 Continued**. Overview of the frequency of capture, distribution and habitat of Sphingidae in Trinidad and Tobago.

| | Species | Curepe 1969-1976 | Curepe 1978-1981 | Other records | Suburban species | Forest species | Recorded from South Trinidad | Recorded from Tobago |
|---|---|---|---|---|---|---|---|---|
| 43 | *Madoryx bubastus* | 3 | 1 | 3 | ++ | ++ | | |
| 44 | *Hemeroplanes triptolemus* | 31 | 3 | 7 | +++ | + | X | X |
| 45 | *Phryxus caicus* | 14 | 1 | 3 | ++ | | X | |
| 46 | *Erinnyis alope* | 344 | 3 | 26 | +++ | +++ | X | X |
| 47 | *Erinnyis lassauxii* | 44 | 0 | 12 | ++ | ++ | X | X |
| 48 | *Erinnyis impunctata* | 2[3] | 0 | 0 | + | | | |
| 49 | *Erinnyis ello* | 1023 | 26 | 111 | +++ | +++ | X | X |
| 50 | *Erinnyis oenotrus* | 19[3] | 1 | 6 | ++ | + | | |
| 51 | *Erinnyis crameri* | 107 | 3 | 14 | +++ | +++ | | |
| 52 | *Erinnyis obscura* | 201[4] | 3 | 5 | +++ | | | |
| 53 | *Isognathus scyron* | 1740 | 118 | 37 | +++ | + | X | |
| 54 | *Isognathus caricae* | 0 | 0 | 4 | + | | X | |
| 55 | *Pseudosphinx tetrio* | 18 | 5 | 18 | ++ | ++ | X | X |
| 56 | *Aleuron carinata* | 1 | 0 | 0 | + | | | |
| 57 | *Aleuron chloroptera* | 0 | 0 | 0 | + | | | |
| 58 | *Unzela japix* | 0 | 0 | 1 | | + | | |
| 59 | *Enyo lugubris* | 183 | 43 | 16 | +++ | | X | |
| 60 | *Enyo ocypete* | 84 | 8 | 9 | +++ | + | X | X |
| 61 | *Enyo gorgon* | 5 | 1 | 4 | ++ | | | |
| 62 | *Eumorpha anchemolus* | 6 | 0 | 18 | + | +++ | X | |
| 63 | *Eumorpha satellitia* | 27 | 8 | 25 | +++ | +++ | X | X |
| 64 | *Eumorpha obliquus* | 4 | 0 | 7 | | +++ | | X |
| 65 | *Eumorpha megaeacus* | 0 | 0 | 2 | | + | | |
| 66 | *Eumorpha vitis* | 160 | 5 | 26 | +++ | + | X | X |
| 67 | *Eumorpha fasciatus* | 12 | 8 | 5 | +++ | + | X | |
| 68 | *Eumorpha phorbas* | 5 | 0 | 27 | + | +++ | X | |
| 69 | *Eumorpha capronnieri* | 1 | 0 | 9 | | +++ | X | X |
| 70 | *Eumorpha labruscae* | 57 | 2 | 10 | +++ | | X | |
| 71 | *Pachygonidia caliginosa* | 0 | 0 | ?1 | | | | |
| 72 | *Hyles lineata* | 1 | 0 | 0 | + | | | |
| 73 | *Xylophanes anubus* | 1 | 0 | 27 | | +++ | X | |
| 74 | *Xylophanes ceratomioides* | 5 | 0 | 26 | + | +++ | X | |
| 75 | *Xylophanes chiron* | 29 | 3 | 84 | ++ | +++ | X | |
| 76 | *Xylophanes loelia* | 0 | 2 | 4 | + | | | |
| 77 | *Xylophanes neoptolemus* | 205 | 2 | 68 | +++ | +++ | X | |
| 78 | *Xylophanes pistacina* | 1 | 1 | 3 | + | + | X | |
| 79 | *Xylophanes pluto* | 356 | 21 | 23 | +++ | + | X | X |
| 80 | *Xylophanes porcus* | 2 | 0 | 25 | | +++ | | |
| 81 | *Xylophanes tersa* | 1472 | 259 | 43 | +++ | +++ | X | X |
| 82 | *Xylophanes thyelia* | 3 | 1 | 8 | + | +++ | X | |
| 83 | *Xylophanes titana* | 1 | 0 | 19 | | +++ | | |
| 84 | *Xylophanes tyndarus* | 3 | 0 | 10 | + | +++ | X | X |
| | Total | 8848 | 645 | 1131 | | | | |
| | Number of species | 65 | 50 | 77 | 23[1] | 23[1] | 51 | 26 |

[1]This is the number of species allocated +++; six species are rated +++ in both habitats.
[2]*Manduca huascara* and *M. florestan* were mixed together as *M. florestan.*
[3]Two specimens of *Erinnyis impunctata* were included under *E. oenotrus.*
[4]Including two specimens identified by Stradling *et al*. (1983) as *E. domingonis.*

**Appendix Table 3.** The main collecting sites for Trinidad Sphingidae from non-suburban sites. Morne Bleu includes the Morne Bleu Textel Installation, as well as sites along the Arima-Blanchisseuse Road from the base of the road to Morne Bleu Textel Installation to the end of Las Lappas Trace, and Lalaja Ridge. Palmiste was Sir Norman Lamont's Estate near San Fernando; although it is a housing development now, when Lamont collected from around 1913 to the 1940s the species he collected indicates it must have been mixed estate with some garden and some forest fragments. Arima Valley includes observations from the Asa Wright Nature Centre, Simla and Sir Norman Lamont's St. Patrck's Estate adjacent to Simla. Cumaca represents one specific sight on the Cumaca Road where I ran a mercury vapour light on two occasions. 'Other' includes material from diverse parts of Trinidad including Inniss Field, Balandra, Sangre Grande, Hollis Reservoir, Rio Claro – Guayaguare Road, Maturita, and Penal, for each of which at least ten records are included, as well as 20 sites with fewer records.

| | Species | Morne Bleu | Palmiste | Arima Valley | St. Benedicts | Parrylands | Brigand Hill | Aripo Valley | Cumaca | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Adhemarius gannascus* | 40 | | 10 | | | | | 2 | 8 |
| 2 | *Adhemarius daphne* | 4 | | 3 | | 1 | | | | 1 |
| 3 | *Adhemarius palmeri* | 1 | | 5 | | 1 | | | 1 | 4 |
| 4 | *Protambulyx eurycles* | | | | | 1 | | | | 1 |
| 5 | *Protambulyx strigilis* | 25 | 5 | 1 | | | | | | 3 |
| 6 | *Cocytius duponchel* | 3 | 1 | 2 | | 3 | | | | 3 |
| 7 | *Cocytius lucifer* | 7 | 1 | | | | | | | 0 |
| 8 | *Cocytius antaeus* | 1 | 2 | | | | | | | 1 |
| 9 | *Neococytius cluentius* | | | 1 | 1 | 2 | | | | 1 |
| 10 | *Manduca lefeburii* | 1 | | | | | | | | 1 |
| 11 | *Manduca albiplaga* | 22 | | 4 | 6 | | | | | 1 |
| 12 | *Manduca franciscae* | | 1 | 1 | | | | | | |
| 13 | *Manduca huascara* | 4 | | 9 | | | 8 | | | 1 |
| 14 | *Manduca florestan* | 22 | 2 | 12 | 1 | 2 | 2 | | | 10 |
| 15 | *Manduca rustica* | 6 | 3 | 3 | | | 1 | | | |
| 16 | *Manduca sexta* | | 6 | | | | | | | 1 |
| 17 | *Manduca diffissa* | 10 | 5 | 2 | 1 | 1 | | | | 2 |
| 18 | *Manduca hannibal* | 2 | | 3 | | | | | | |
| 19 | *Manduca ochus* | 1 | 2 | | 1 | | | | | |
| 20 | *Agrius cingulata* | 15 | 7 | | | | 2 | | | 1 |
| 21 | *Pachylia ficus* | | 7 | 2 | | | 2 | | | 2 |
| 22 | *Pachylia syces* | | | | | | | | | |
| 23 | *Callionima pan* | 4 | | | | | | | | |
| 24 | *Callionima calliomenae* | | | | 1 | | | | | |
| 25 | *Callionema inuus* | | | | | | | | | |
| 26 | *Callionima falcifera* | | 1 | 2 | 1 | 1 | 1 | | | 4 |
| 27 | *Nyceryx coffaeae* | | | | | | | | | |
| 28 | *Nyceryx maxwelli* | | | | | | | | | 1 |
| 29 | *Nyceryx riscus* | | | 1 | | | 1 | | | |
| 30 | *Nyceryx stuarti* | | | | | 2 | | | | |
| 31 | *Perigonia pallida* | | | | | | | | | |
| 32 | *Perigonia lusca* | 1 | 1 | | 2 | | 1 | | | 1 |
| 33 | *Eupyrrhoglossum sagra* | | | 1 | | 1 | | 1 | | 1 |
| 34 | *Aellopos ceculus* | 1 | 1 | | | | | | | 3 |
| 35 | *Aellopos clavipes* | | | | | | | | | 2 |
| 36 | *Aellopos titan* | | | | | | | | | 1 |
| 37 | *Aellopos fadus* | | | | | | | | | 1 |
| 38 | *Oryba kadeni* | | | | | | | | | 1 |
| 39 | *Oryba achemenides* | 1 | | | | | 1 | | | 1 |
| 40 | *Pachylioides resumens* | | | 1 | | 1 | | | | |

**Appendix Table 3.** Continued. The main collecting sites for Trinidad Sphingidae from non-suburban sites.

| | Species | Morne Bleu | Palmiste | Arima Valley | St. Benedicts | Parrylands | Brigand Hill | Aripo Valley | Cumaca | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | *Madoryx oiclus* | | | | | | 1 | | | |
| 42 | *Madoryx plutonius* | 1 | | | | | | | 3 | |
| 43 | *Madoryx bubastus* | | | | | 1 | | | | 1 |
| 44 | *Hemeroplanes triptolemus* | | 2 | | | 1 | | | | 1 |
| 45 | *Phryxus caicus* | | 1 | | | | | | | 1 |
| 46 | *Erinnyis alope* | 13 | 3 | | 1 | | | 1 | | 1 |
| 47 | *Erinnyis lassauxii* | 5 | 1 | 2 | | 1 | 2 | | | |
| 48 | *Erinnyis impunctata* | | | | | | | | | |
| 49 | *Erinnyis ello* | 31 | 6 | 10 | 6 | | | 1 | | 3 |
| 50 | *Erinnyis oenotrus* | 1 | 2 | 3 | | | | | | 1 |
| 51 | *Erinnyis crameri* | 6 | 4 | 1 | | | | | | |
| 52 | *Erinnyis obscura* | | | | 1 | | | | | 1 |
| 53 | *Isognathus scyron* | 2 | 11 | | | | | | | 2 |
| 54 | *Isognathus caricae* | | 4 | | | | | | | |
| 55 | *Pseudosphinx tetrio* | 6 | 2 | | | | | | | 2 |
| 56 | *Aleuron carinata* | | | 1 | | | | | | |
| 57 | *Aleuron chloroptera* | | | | | | | | | |
| 58 | *Unzela japix* | | | 1 | | | | | | |
| 59 | *Enyo lugubris* | | 7 | | 1 | | | | | |
| 60 | *Enyo ocypete* | | | | 2 | 3 | | | | 3 |
| 61 | *Enyo gorgon* | | | | | | | | | |
| 62 | *Eumorpha anchemolus* | 10 | | | 3 | | 3 | | | 2 |
| 63 | *Eumorpha satellitia* | 8 | 7 | 1 | 2 | | 1 | | 1 | 7 |
| 64 | *Eumorpha obliquus* | 7 | | | | | | | | |
| 65 | *Eumorpha megaeacus* | | | | | | | | | 1 |
| 66 | *Eumorpha vitis* | | 11 | | 1 | | | | | 1 |
| 67 | *Eumorpha fasciatus* | | 4 | | | | | | | 1 |
| 68 | *Eumorpha phorbas* | 14 | | 3 | | | | | 5 | 6 |
| 69 | *Eumorpha capronnieri* | 4 | | | | | | | 2 | 3 |
| 70 | *Eumorpha labruscae* | | 3 | 1 | | | | | | 2 |
| 71 | *Pachygonidia caliginosa* | | | | | | | | | |
| 72 | *Hyles lineata* | | | | | | | | | |
| 73 | *Xylophanes anubus* | 15 | | | | | | | 4 | 7 |
| 74 | *Xylophanes ceratomioides* | 8 | | 8 | | 2 | 1 | | | 7 |
| 75 | *Xylophanes chiron* | 64 | 3 | 1 | | 2 | | | 2 | 1 |
| 76 | *Xylophanes loelia* | | | | | | | | | 3 |
| 77 | *Xylophanes neoptolemus* | 2 | 3 | 13 | 2 | 7 | 1 | 17 | | 13 |
| 78 | *Xylophanes pistacina* | | | 2 | | | | | | 1 |
| 79 | *Xylophanes pluto* | 9 | 5 | 2 | 1 | | | | | 3 |
| 80 | *Xylophanes porcus* | 12 | | 2 | | | | | 2 | 1 |
| 81 | *Xylophanes tersa* | 10 | 9 | | | | 1 | 8 | | 5 |
| 82 | *Xylophanes thyelia* | 4 | | | | | | | 2 | 2 |
| 83 | *Xylophanes titana* | 15 | | 1 | | | | | | |
| 84 | *Xylophanes tyndarus* | 5 | 1 | | 1 | | | | | 1 |
| | Number of records | 423 | 134 | 115 | 35 | 33 | 29 | 28 | 24 | 140 |
| | Number of species | 43 | 35 | 34 | 19 | 18 | 16 | 5 | 10 | 56 |

**Appendix Table 4**. The months of capture for Trinidad Sphingidae from non-suburban sites.

| | Species | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Adhemarius gannascus* | 1 | 3 | 11 | | 3 | 1 | 4 | 7 | 22 | 2 | 4 | 2 | **60** |
| 2 | *Adhemarius daphne* | 1 | | 3 | | | | 3 | | 1 | 1 | | | **9** |
| 3 | *Adhemarius palmeri* | 1 | | 3 | 1 | 1 | | 1 | 1 | | 3 | 1 | | **12** |
| 4 | *Protambulyx eurycles* | | | | | | | 1 | 1 | | | | | **2** |
| 5 | *Protambulyx strigilis* | 3 | | 2 | | | | 3 | 2 | 15 | 1 | 4 | 4 | **34** |
| 6 | *Cocytius duponchel* | | | | | | | 4 | 2 | 2 | 3 | 1 | | **12** |
| 7 | *Cocytius lucifer* | 1 | | 1 | | | | | | 5 | | | 1 | **8** |
| 8 | *Cocytius antaeus* | 1 | | | | | | | | 2 | 1 | | | **4** |
| 9 | *Neococytius cluentius* | | | 1 | | 1 | 1 | 2 | | | | | | **5** |
| 10 | *Manduca lefeburii* | | | | | | 2 | | | | | | | **2** |
| 11 | *Manduca albiplaga* | | | 1 | | 11 | 3 | 3 | 5 | 10 | | | | **33** |
| 12 | *Manduca franciscae* | | | | | 1 | 1 | | | | | | | **2** |
| 13 | *Manduca huascara* | 3 | 3 | 10 | | 1 | | 1 | 3 | 1 | | | | **22** |
| 14 | *Manduca florestan* | | 1 | | 5 | 22 | 8 | 3 | | 10 | 2 | | | **51** |
| 15 | *Manduca rustica* | 1 | | 3 | | 1 | | | | 4 | 1 | 2 | 1 | **13** |
| 16 | *Manduca sexta* | | | | 2 | 2 | | | 1 | | | | 2 | **7** |
| 17 | *Manduca diffissa* | 2 | | 4 | | 3 | 1 | 3 | 2 | 3 | | 1 | 2 | **21** |
| 18 | *Manduca hannibal* | 1 | | | | 1 | | | 1 | | | 2 | | **5** |
| 19 | *Manduca ochus* | 1 | | | | 1 | | 1 | | | | 1 | | **4** |
| 20 | *Agrius cingulata* | 2 | 1 | 10 | 1 | 1 | | 2 | 2 | 4 | | 1 | 1 | **25** |
| 21 | *Pachylia ficus* | 1 | 1 | 4 | | 1 | | | 1 | 1 | | 2 | 2 | **13** |
| 22 | *Pachylia syces* | | | | | | | | | | | | | |
| 23 | *Callionima pan* | | | | 1 | | | 1 | | 1 | | | 1 | **4** |
| 24 | *Callionima calliomenae* | | | | | 1 | | | | | | | | **1** |
| 25 | *Callionema inuus* | | | | | | | | | | | | | |
| 26 | *Callionima falcifera* | | | 1 | | 1 | | | | 5 | | 3 | | **10** |
| 27 | *Nyceryx coffaeae* | | | | | | | | | | | | | |
| 28 | *Nyceryx maxwelli* | 1 | | | | | | | | | | | | **1** |
| 29 | *Nyceryx riscus* | | | 1 | 1 | | | | | | | | | **2** |
| 30 | *Nyceryx stuarti* | | 2 | | | | | | | | | | | **2** |
| 31 | *Perigonia pallida* | | | | | | | | | | | | | |
| 32 | *Perigonia lusca* | 1 | | 1 | | 2 | | | | 1 | | | 1 | **6** |
| 33 | *Eupyrrhoglossum sagra* | | | | | | | 1 | 2 | | 1 | | | **4** |
| 34 | *Aellopos ceculus* | 1 | | 1 | | | | | | 2 | | 1 | | **5** |
| 35 | *Aellopos clavipes* | | 2 | | | | | | | | | | | **2** |
| 36 | *Aellopos titan* | | | | | | | 1 | | | | | | **1** |
| 37 | *Aellopos fadus* | | | | | | | | | 1 | | | | **1** |
| 38 | *Oryba kadeni* | | | | | | | | | 1 | | | | **1** |
| 39 | *Oryba achemenides* | 1 | | | | 1 | | | | | | | 1 | **3** |
| 40 | *Pachylioides resumens* | 1 | | | | | | 1 | | | | | | **2** |
| 41 | *Madoryx oiclus* | 1 | | | | | | | | | | | | **1** |
| 42 | *Madoryx plutonius* | | | | | | | 2 | | 1 | 1 | | | **4** |
| 43 | *Madoryx bubastus* | | 1 | | | | | | | | | | 1 | **2** |

**Appendix Table 4 Continued** . The months of capture for Trinidad Sphingidae from non-suburban sites.

| | Species | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44 | *Hemeroplanes triptolemus* | | | | | | | 1 | | 1 | 1 | 1 | | **4** |
| 45 | *Phryxus caicus* | | | | | | 1 | | | | | 1 | | **2** |
| 46 | *Erinnyis alope* | | | | | 1 | | 1 | 3 | 9 | 3 | 2 | | **19** |
| 47 | *Erinnyis lassauxii* | 2 | | 2 | | | 1 | 1 | | 4 | 1 | | | **11** |
| 48 | *Erinnyis impunctata* | | | | | | | | | | | | | |
| 49 | *Erinnyis ello* | 2 | 1 | 32 | 1 | 7 | 2 | 3 | 2 | 4 | 1 | 2 | | **57** |
| 50 | *Erinnyis oenotrus* | | 1 | 3 | 1 | | | 1 | | | | 1 | | **7** |
| 51 | *Erinnyis crameri* | | 1 | 3 | | | | 3 | | | 2 | 1 | 1 | **11** |
| 52 | *Erinnyis obscura* | | | | | | | 1 | 1 | | | | | **2** |
| 53 | *Isognathus scyron* | 1 | 3 | 1 | 1 | | | 1 | 2 | 3 | 1 | 1 | 1 | **15** |
| 54 | *Isognathus caricae* | | | | 4 | | | | | | | | | **4** |
| 55 | *Pseudosphinx tetrio* | 2 | | 4 | | | | 1 | | | | 1 | 2 | **10** |
| 56 | *Aleuron carinata* | | | | | | | | | | 1 | | | **1** |
| 57 | *Aleuron chloroptera* | | | | | | | | | | | | | |
| 58 | *Unzela japix* | | | 1 | | | | | | | | | | **1** |
| 59 | *Enyo lugubris* | 1 | 1 | | | 1 | | | | 1 | 1 | 1 | 2 | **8** |
| 60 | *Enyo ocypete* | | | | | 2 | 1 | | 2 | 3 | | | | **8** |
| 61 | *Enyo gorgon* | | | | | | | | | | | | | |
| 62 | *Eumorpha anchemolus* | 1 | | 3 | 1 | 4 | | | 4 | 4 | 1 | | | **18** |
| 63 | *Eumorpha satellitia* | | | 1 | | 9 | 6 | 6 | 1 | 2 | | 1 | 1 | **27** |
| 64 | *Eumorpha obliquus* | | | | | | | | 4 | 3 | | | | **7** |
| 65 | *Eumorpha megaeacus* | | | | | | | | | 1 | | | | **1** |
| 66 | *Eumorpha vitis* | 1 | | 2 | | 2 | | | | 1 | 2 | | 5 | **13** |
| 67 | *Eumorpha fasciatus* | | 2 | | | | | | 1 | | 1 | | 1 | **5** |
| 68 | *Eumorpha phorbas* | | | 2 | | | 1 | 7 | 5 | 6 | 2 | 3 | 2 | **28** |
| 69 | *Eumorpha capronnieri* | 1 | | | 3 | | 1 | 2 | 1 | 1 | | | | **9** |
| 70 | *Eumorpha labruscae* | | | | | | | 1 | 1 | 2 | 1 | 1 | | **6** |
| 71 | *Pachygonidia caliginosa* | | | | | | | | | | | | | |
| 72 | *Hyles lineata* | | | | | | | | | | | | | |
| 73 | *Xylophanes anubus* | 1 | | | | 1 | | 2 | 3 | 11 | 5 | 3 | | **26** |
| 74 | *Xylophanes ceratomioides* | 1 | | 2 | | | 2 | 4 | 6 | 8 | | 2 | 1 | **26** |
| 75 | *Xylophanes chiron* | 2 | | | | | 2 | 4 | 3 | 50 | 5 | 4 | 3 | **73** |
| 76 | *Xylophanes loelia* | | | 1 | 1 | | 1 | | | | | | | **3** |
| 77 | *Xylophanes neoptolemus* | 1 | 2 | 5 | | 2 | 1 | 3 | 24 | 1 | 6 | 9 | 4 | **58** |
| 78 | *Xylophanes pistacina* | | | | | 2 | | | | | | | | **2** |
| 79 | *Xylophanes pluto* | 1 | 5 | | | 1 | 2 | | | 10 | | 1 | | **20** |
| 80 | *Xylophanes porcus* | | | | 1 | 1 | | | 3 | 6 | 6 | | | **17** |
| 81 | *Xylophanes tersa* | | 2 | 9 | | | | 3 | 9 | 4 | | 3 | 3 | **33** |
| 82 | *Xylophanes thyelia* | 1 | | 1 | | | | | 1 | 1 | 2 | 2 | | **8** |
| 83 | *Xylophanes titana* | | | | | 1 | 1 | | 2 | 8 | 2 | 2 | | **16** |
| 84 | *Xylophanes tyndarus* | | | | | 5 | 2 | | | | | | 1 | **8** |
| | Number of records | 42 | 32 | 129 | 24 | 94 | 41 | 82 | 108 | 235 | 60 | 65 | 46 | **960** |
| | Number of species | 33 | 17 | 32 | 14 | 32 | 21 | 36 | 33 | 44 | 29 | 33 | 24 | **75** |

**Annex Table 5.** Index of species by numerical sequence, by genus and by species

| | Numeric sequence | | Alphabetical sequence by genus | | Alphabetical sequence by species |
|---|---|---|---|---|---|
| 1 | *Adhemarius gannascus* | 2 | *Adhemarius daphne* | 39 | *achemenides, Oryba* |
| 2 | *Adhemarius daphne* | 1 | *Adhemarius gannascus* | 11 | *albiplaga, Manduca* |
| 3 | *Adhemarius palmeri* | 3 | *Adhemarius palmeri* | 46 | *alope, Erinnyis* |
| 4 | *Protambulyx eurycles* | 34 | *Aellopos ceculus* | 62 | *anchemolus, Eumorpha* |
| 5 | *Protambulyx strigilis* | 35 | *Aellopos clavipes* | 8 | *antaeus, Cocytius* |
| 6 | *Cocytius duponchel* | 37 | *Aellopos fadus* | 73 | *anubus, Xylophanes* |
| 7 | *Cocytius lucifer* | 36 | *Aellopos titan* | 43 | *bubastus, Madoryx* |
| 8 | *Cocytius antaeus* | 20 | *Agrius cingulata* | 45 | *caicus, Phryxus* |
| 9 | *Neococytius cluentius* | 56 | *Aleuron carinata* | 71 | *caliginosa, Pachygonidia* |
| 10 | *Manduca lefeburii* | 57 | *Aleuron chloroptera* | 24 | *calliomenae, Callionema* |
| 11 | *Manduca albiplaga* | 6 | *Cocytius duponchel* | 69 | *capronnieri. Eumorpha* |
| 12 | *Manduca franciscae* | 7 | *Cocytius lucifer* | 54 | *caricae, Isognathus* |
| 13 | *Manduca huascara* | 25 | *Callionema inuus* | 56 | *carinata, Aleuron* |
| 14 | *Manduca florestan* | 24 | *Callionima calliomenae* | 34 | *ceculus, Aellopos* |
| 15 | *Manduca rustica* | 26 | *Callionima falcifera* | 74 | *ceratomioides, Xylophanes* |
| 16 | *Manduca sexta* | 23 | *Callionima pan* | 75 | *chiron, Xylophanes* |
| 17 | *Manduca diffissa* | 8 | *Cocytius antaeus* | 57 | *chloroptera, Aleuron* |
| 18 | *Manduca hannibal* | 61 | *Enyo gorgon* | 20 | *cingulata, Agrius* |
| 19 | *Manduca ochus* | 59 | *Enyo lugubris* | 35 | *clavipes , Aellopos* |
| 20 | *Agrius cingulata* | 60 | *Enyo ocypete* | 9 | *cluentius, Neococytius* |
| 21 | *Pachylia ficus* | 46 | *Erinnyis alope* | 27 | *coffaeae, Nyceryx* |
| 22 | *Pachylia syces* | 51 | *Erinnyis crameri* | 51 | *crameri, Erinnyis* |
| 23 | *Callionima pan* | 49 | *Erinnyis ello* | 2 | *daphne, Adhemarius* |
| 24 | *Callionima calliomenae* | 48 | *Erinnyis impunctata* | 17 | *diffissa, Manduca* |
| 25 | *Callionema inuus* | 47 | *Erinnyis lassauxii* | 6 | *duponchel, Cocytius* |
| 26 | *Callionima falcifera* | 52 | *Erinnyis obscura* | 49 | *ello, Erinnyis* |
| 27 | *Nyceryx coffaeae* | 50 | *Erinnyis oenotrus* | 4 | *eurycles, Protambulyx* |
| 28 | *Nyceryx maxwelli* | 62 | *Eumorpha anchemolus* | 37 | *fadus, Aellopos* |
| 29 | *Nyceryx riscus* | 70 | *Eumorpha capronnieri* | 26 | *falcifera, Callionema* |
| 30 | *Nyceryx stuarti* | 67 | *Eumorpha fasciatus* | 67 | *fasciatus, Eumorpha* |
| 31 | *Perigonia pallida* | 70 | *Eumorpha labruscae* | 21 | *ficus, Pachylia* |
| 32 | *Perigonia lusca* | 65 | *Eumorpha megaeacus* | 14 | *florestan, Manduca* |
| 33 | *Eupyrrhoglossum sagra* | 66 | *Eumorpha obliquus* | 12 | *franciscae, Manduca* |
| 34 | *Aellopos ceculus* | 68 | *Eumorpha phorbas* | 1 | *gannascus, Adhemarius* |
| 35 | *Aellopos clavipes* | 63 | *Eumorpha satellitia* | 61 | *gorgon, Enyo* |
| 36 | *Aellopos titan* | 66 | *Eumorpha vitis* | 18 | *hannibal, Manduca* |
| 37 | *Aellopos fadus* | 33 | *Eupyrrhoglossum sagra* | 13 | *huascara, Manduca* |
| 38 | *Oryba kadeni* | 44 | *Hemeroplanes triptolemus* | 48 | *impunctata, Erinnyis* |
| 39 | *Oryba achemenides* | 72 | *Hyles lineata* | 25 | *inuus, Callionema* |
| 40 | *Pachylioides resumens* | 54 | *Isognathus caricae* | 58 | *japix, Unzela* |
| 41 | *Madoryx oiclus* | 53 | *Isognathus scyron* | 38 | *kadeni, Oryba* |
| 42 | *Madoryx plutonius* | 43 | *Madoryx bubastus* | 70 | *labruscae, Eumorpha* |
| 43 | *Madoryx bubastus* | 41 | *Madoryx oiclus* | 47 | *lassauxii, Erinnyis* |
| 44 | *Hemeroplanes triptolemus* | 42 | *Madoryx plutonius* | 10 | *lefeburii, Manduca* |
| 45 | *Phryxus caicus* | 11 | *Manduca albiplaga* | 72 | *lineata, Hyles* |
| 46 | *Erinnyis alope* | 17 | *Manduca diffissa* | 76 | *loelia, Xylophanes* |
| 47 | *Erinnyis lassauxii* | 14 | *Manduca florestan* | 7 | *lucifer, Cocytius* |
| 48 | *Erinnyis impunctata* | 12 | *Manduca franciscae* | 59 | *lugubris. Enyo* |
| 49 | *Erinnyis ello* | 18 | *Manduca hannibal* | 32 | *lusca, Perigonia* |
| 50 | *Erinnyis oenotrus* | 13 | *Manduca huascara* | 28 | *maxwelli, Nyceryx* |
| 51 | *Erinnyis crameri* | 10 | *Manduca lefeburii* | 65 | *megaeacus, Eumorpha* |
| 52 | *Erinnyis obscura* | 19 | *Manduca ochus* | 77 | *neoptolemus, Xylophanes* |
| 53 | *Isognathus scyron* | 15 | *Manduca rustica* | 64 | *obliquus, Eumorpha* |
| 54 | *Isognathus caricae* | 16 | *Manduca sexta* | 52 | *obscura, Erinnyis* |
| 55 | *Pseudosphinx tetrio* | 9 | *Neococytius cluentius* | 19 | *ochus, Manduca* |
| 56 | *Aleuron carinata* | 27 | *Nyceryx coffaeae* | 60 | *ocypete. Enyo* |
| 57 | *Aleuron chloroptera* | 28 | *Nyceryx maxwelli* | 50 | *oenotrus, Erinnyis* |
| 58 | *Unzela japix* | 29 | *Nyceryx riscus* | 41 | *oiclus, Madoryx* |
| 59 | *Enyo lugubris* | 30 | *Nyceryx stuarti* | 31 | *pallida, Perigonia* |
| 60 | *Enyo ocypete* | 39 | *Oryba achemenides* | 3 | *palmeri, Adhemarius* |
| 61 | *Enyo gorgon* | 38 | *Oryba kadeni* | 23 | *pan, Callionima* |
| 62 | *Eumorpha anchemolus* | 71 | *Pachygonidia caliginosa* | 68 | *phorbas, Eumorpha* |
| 63 | *Eumorpha satellitia* | 21 | *Pachylia ficus* | 78 | *pistacina, Xylophanes* |
| 64 | *Eumorpha obliquus* | 22 | *Pachylia syces* | 79 | *pluto, Xylophanes* |
| 65 | *Eumorpha megaeacus* | 40 | *Pachylioides resumens* | 42 | *plutonius, Madoryx* |
| 66 | *Eumorpha vitis* | 32 | *Perigonia lusca* | 80 | *porcus, Xylophanes* |
| 67 | *Eumorpha fasciatus* | 31 | *Perigonia pallida* | 40 | *resumens, Pachylioides* |
| 68 | *Eumorpha phorbas* | 45 | *Phryxus caicus* | 29 | *riscus, Nyceryx* |
| 69 | *Eumorpha capronnieri* | 4 | *Protambulyx eurycles* | 15 | *rustica, Manduca* |
| 70 | *Eumorpha labruscae* | 5 | *Protambulyx strigilis* | 33 | *sagra, Eupyrrhoglossum* |
| 71 | *Pachygonidia caliginosa* | 55 | *Pseudosphinx tetrio* | 63 | *satellitia, Eumorpha* |
| 72 | *Hyles lineata* | 58 | *Unzela japix* | 53 | *scyron, Isognathus* |
| 73 | *Xylophanes anubus* | 73 | *Xylophanes anubus* | 16 | *sexta, Manduca* |
| 74 | *Xylophanes ceratomioides* | 74 | *Xylophanes ceratomioides* | 5 | *strigilis, Protambulyx* |
| 75 | *Xylophanes chiron* | 75 | *Xylophanes chiron* | 30 | *stuarti, Nyceryx* |
| 76 | *Xylophanes loelia* | 76 | *Xylophanes loelia* | 22 | *syces, Pachylia* |
| 77 | *Xylophanes neoptolemus* | 77 | *Xylophanes neoptolemus* | 81 | *tersa, Xylophanes* |
| 78 | *Xylophanes pistacina* | 78 | *Xylophanes pistacina* | 55 | *tetrio, Pseudosphinx* |
| 79 | *Xylophanes pluto* | 79 | *Xylophanes pluto* | 82 | *thyelia, Xylophanes* |
| 80 | *Xylophanes porcus* | 80 | *Xylophanes porcus* | 36 | *titan, Aellopos* |
| 81 | *Xylophanes tersa* | 81 | *Xylophanes tersa* | 83 | *titana, Xylophanes* |
| 82 | *Xylophanes thyelia* | 82 | *Xylophanes thyelia* | 44 | *triptolemus, Hemeroplanes* |
| 83 | *Xylophanes titana* | 83 | *Xylophanes titana* | 84 | *tyndarus, Xylophanes* |
| 84 | *Xylophanes tyndarus* | 84 | *Xylophanes tyndarus* | 66 | *vitis, Eumorpha* |