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The Skipper Butterflies (Hesperiidae) of Trinidad. Part 19. Hesperiinae, Moncini: the Remaining Genera with Pale Spots: *Cymaenes*, *Cobalopsis*, *Arita*, *Lerema*, *Morys* and *Tigasis*

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The Skipper Butterflies (Hesperiidae) of Trinidad. Part 19. Hesperiinae, Moncini: the Remaining Genera with Pale Spots: *Cymaenes*, *Cobalopsis*, *Arita*, *Lerema*, *Morys* and *Tigasis*

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ABSTRACT
Trinidad and Tobago skipper butterflies (Hesperiidae) of the tribe Moncini (genera *Cymaenes*, *Cobalopsis*, *Arita*, *Lerema*, *Morys* and *Tigasis*) are treated and the adults illustrated. Details are given of the taxonomy, history, identification and biology of the 14 Trinidad species in these genera, of which two species also occur in Tobago. Partial life histories of *Cymaenes tripunctus theogenis* (Capronnier), *Arita arita* (Schaus), *Lerema ancillaris ancillaris* (Butler), *Morys valerius valerius* (Möschler), *Morys geisa geisa* (Möschler) and a probable *Tigasis* sp. are described and illustrated, and notes are provided on the early stages of *Cobalopsis nero* (Herrich-Schäffer) and *Morys compta compta* (Butler).

Key words (not in title): Trinidad & Tobago, Tobago, life history, food plant, parasitism.

INTRODUCTION

This paper continues on from Cock (2011) dealing with the Trinidad species of the tribe Moncini of the Hesperiidae, Hesperiinae. In this section, I deal with what I have categorised as the spotted Moncini, the genera *Cymaenes*, *Cobalopsis*, *Arita*, *Lerema*, *Morys* and *Tigasis*, i.e. small brown species with variable pale spotting, which superficially are all rather similar, but on closer inspection show differences in the spots, UNH colouring and male brands which facilitate identification. All these genera were placed in Genera Group J of Evans' (1955) treatment of the subfamily Hesperiinae. As in the previous section, I have not focussed on the delineation of genera, but rather tried to provide adequate illustrations and diagnostic notes to facilitate species identification.

In this paper, all specimens illustrated are in the author's collection unless indicated otherwise. Similarly, any specimens referred to without attributing a collector or collection, were collected by the author and are in either the author's collection or the collection of CABI, Curepe, Trinidad. Other conventions and abbreviations follow earlier parts of this series (Cock 2011 and earlier papers). Plant names have been checked against Tropicos (2011) and The Plant List (2011). The museum abbreviations are given in the acknowledgements at the end of the paper.

Cymaenes Scudder 1872

This genus of 27 species (Mielke 2004) is found from USA throughout the Neotropical Region. Adults have no secondary sexual characters, and although they are superficially similar to several other genera, the genitalia indicate a distinct group (Evans 1955). Three species are found in Trinidad, one of which has not been identified and may be undescribed.

Food plants are mostly Poaceae, but Cyperaceae are also recorded (Beccaloni *et al.* 2008). Janzen and Hallwachs (2011) have reared several *Cymaenes* spp. from a variety of grasses, particularly *Paspalum* and *Setaria* spp.

J27/1 *Cymaenes tripunctus theogenis* (Capronnier 1874)

Figs. 1-5.

The nominate subspecies, *tripunctus* (Herrich-Schäffer 1865), was described from Cuba and occurs there and on Jamaica, the Cayman Islands, Hispaniola (Evans 1955), in southern Florida (Smith *et al.* 1994) and as an introduced species on New Providence Island, Bahamas (Cock 1998). The mainland subspecies, *theogenis* (Capronnier), was described from Botofogo (Rio de Janeiro, Brazil), and is found throughout the Neotropics, from Mexico to Paraguay (Evans 1955). It is characterised as slightly larger, paler and with the spots more developed (Evans 1955).

Kaye (1921, 1940) did not record this species from Trinidad, although since it occurs commonly, and there are specimens that he probably saw in the NHM, he may have misidentified it as another species. Evans' (1955) listing of seven males and 12 females from Trinidad is the first record from the island. However, Sheldon (1936) did record it from Tobago, where he found it not uncommon at Speyside.

Skinner and Williams (1923) in their work on the genitalia of the North American Hesperiidae illustrate the male genitalia of *C. tripunctus*, but since their specimen is from Suriname, it must be *C. tripunctus theogenis* that is illustrated rather than *C. tripunctus tripunctus*, the subspecies which occurs in Florida. The same drawing is used to illustrate this species in Lindsey *et al.* (1931), and appears to have been copied by Hayward (1950, plate

xi.5). Cock (1985) illustrates the male genitalia of a Trinidad specimen. Comparing the two figures, it can be seen that the lateral view of the Suriname male is confused due to the right half of the uncus and gnathos being drawn in below the left half, whereas in the figure of the Trinidad specimen only the left half is shown. Furthermore, the left valve in the Trinidad figure, stated to be in ventral view, is actually the internal view, and hence a mirror image of the right valve shown in the Suriname figure.

Mielke (1989) illustrates the male genitalia of *C. tripunctus tripunctus* from Jamaica. The valves of the two subspecies appear very similar but there are minor differences in the uncus and gnathos.

UPF generally with white spots in spaces 2, 3 and 6-8; usually an upper cell spot and at least a trace of a spot in space lB, stronger UNF; diffuse pale spot space 1 B UNF. The UNH has an indistinct discal band of spots. Sexes similar, but spots usually stronger in the female, which has more rounded wings.

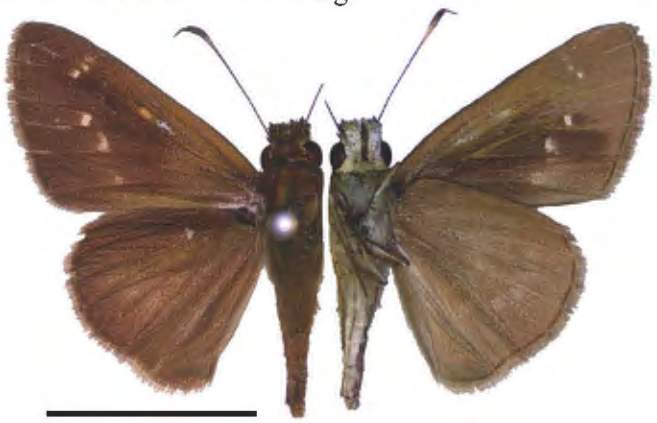

Fig. 1. Adult ♂ *Cymaenes tripunctus theogenis*, collected as caterpillar on *Megathyrsus maximus*, Mt. St. Benedict, 26.ii.1994, ref. 94/1.

Fig. 2. Adult ♀ *Cymaenes tripunctus theogenis*, Point Gourde, 12.vii.1997.

This species is widespread and quite common (34 records) in lowland areas of Trinidad, but not extending into the higher parts of the Northern Range, and with few records from southern Trinidad. Records from Crown Point, Rockley Bay and Scarborough suggest it is also widespread in Tobago. The months of capture indicate that it flies throughout the year in both Trinidad and Tobago.

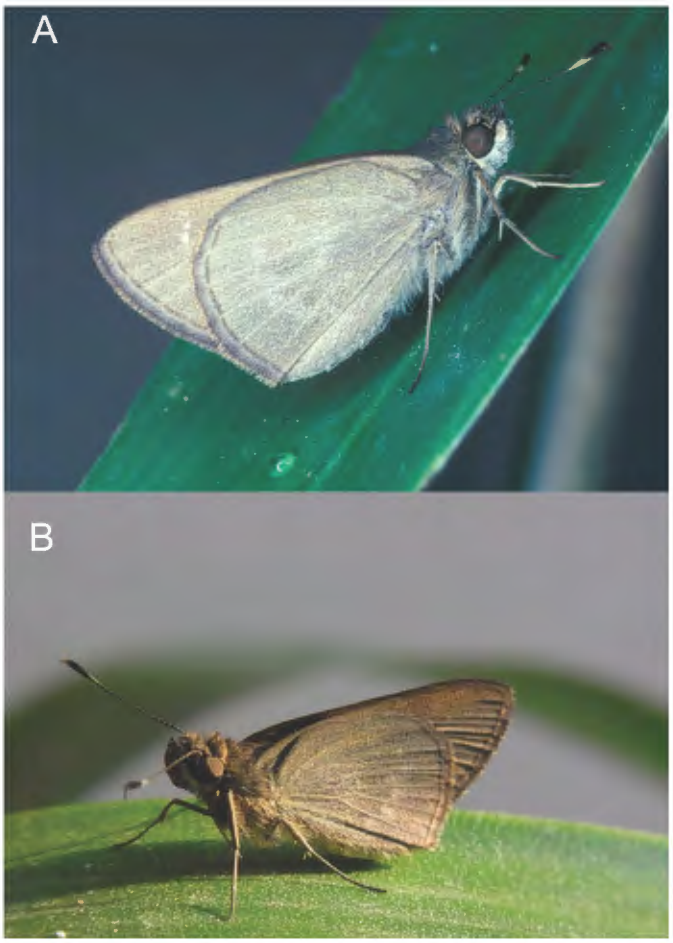

Fig. 3. Adult ♀ *Cymaenes tripunctus theogenis*.**A**, collected as caterpillar on *Megathyrsus maximus*, Mt. St. Benedict, 26.ii.1994; adult 23.iii.1994 (ref. 94/1); **B**, collected as final instar on *Setaria barbata*, Port of Spain, 18.xi.2011, adult 15.xi.2011 (ref. 11/72A). The apical spots are clearer in A, and the UNH discal band in B.

The early stages of ssp. *tripunctus* have been documented by Dethier (1939, 1942a) on grasses and sugar cane in Cuba, and by Cock (1998) on several grasses on New Providence Island, Bahamas. Comstock (1944) gives Guinea grass, i.e. *Megathyrsus maximus*, as a food plant and this record and those of Dethier (1939) have been repeated by most authors on the Caribbean and USA Hesperiidae. Minno *et al.* (2005) describe the shelters, show a colour photograph of the caterpillar and add grass food plant records from *Digitaria ciliaris*, *Paspalum setaceum*, *Tripsacum dactyloides*, and *Brachiaria mutica* (=*Urochloa mutica*). Bamboo has been reported as a food plant in Cuba (Bruner *et al.* 1975, as listed by Beccaloni *et al.* 2008).

Dethier's (1942b) study on the structure of the wax glands of Hesperiinae included caterpillars of *C. tripunctus*. He refers to these glands occurring on the subventral area of A7-A8, so presumably that is the case for this species, although observations from other Hesperiinae have shown different arrangements (Cock 2001, 2003, 2005, 2006, 2009, 2010).

Subspecies *theogenis* has been reported from various grasses, including sugar cane (*Saccharum officinarum*) and other grasses in Argentina (Pastrana 2004). In Trinidad, I have reared this species on *Paspalum virgatum* (Macoya Gardens, 39C), three times on *Megathyrsus maximus* (Point Gourde ref. 94/4, Mt. St. Benedict refs. 94/1 and 03/200) and twice on *Setaria barbata* (Mt. St. Benedict ref. 94/59A, Port of Spain ref. 11/72) (Cock 1998; Beccaloni *et al.* 2008).

A penultimate instar caterpillar collected on *M. maximus* (ref. 94/1) had formed a shelter from a large leaf, with the distal 19 cm pendulous from where the caterpillar had eaten to the midrib from both sides; the distal part of the leaf was rolled; shelter sealed at the basal end with a flap; more feeding distal to the shelter and at apex of leaf. A final instar caterpillar collected on *Setaria barbata* (ref. 94/59A) was in a shelter which at the time I considered to be identical to that of *Lerema ancillaris* (Butler) on ?*M. maximus*, collected the day before (ref. 95/58) and described below under *L. ancillaris*.

The last two instar caterpillars are similar; the final instar grows to about 25 mm. They are quite variable in the detail and extent of the head markings (Fig. 4). Individual 03/200 is described here. Head widest near base, slightly indent at vertex; a strong black line from vertex laterally to mouthparts; posterior to black line is translucent green; the face ground colour off white; a strong black line down epicranial suture, diffuse externally; frons translucent green with narrow vertical line down middle; on each epicranium, a diffuse dark arc from upper epicranium converging towards epicranial suture, and running lateral to adfrontal sutures, diverging level with the base of the frons and running to the stemmata. T1 concolorous with body. Body translucent green; a clear, darker dorsal line, bordered by a broad yellow-green subdorsal line; two whitish dorsolateral lines, the upper one T2-A9, and the lower T3-A7; a pale ventrolateral line below spiracles A1-A9; spiracles pale, inconspicuous; all legs concolorous; anal plate semicircular. The final instar lasted 20 days for the only caterpillar reared from the penultimate instar (ref. 94/4).

Individual 94/1 had the frons brown, bordered with black, and the diffuse arc in epicranium was a diffuse vertical line. Individual 94/4 (Fig. 4C) had the vertex and dorsal part of the epicranial suture reddish brown; frontal and adfrontal sutures dark; the diffuse line on each epicranium, roughly vertical, as the last; T1 with a very narrow, dark, dorsal plate. Individual 11/72A (Fig. 4D) was similar to the last, but with dark brown dorsal markings instead of reddish brown.

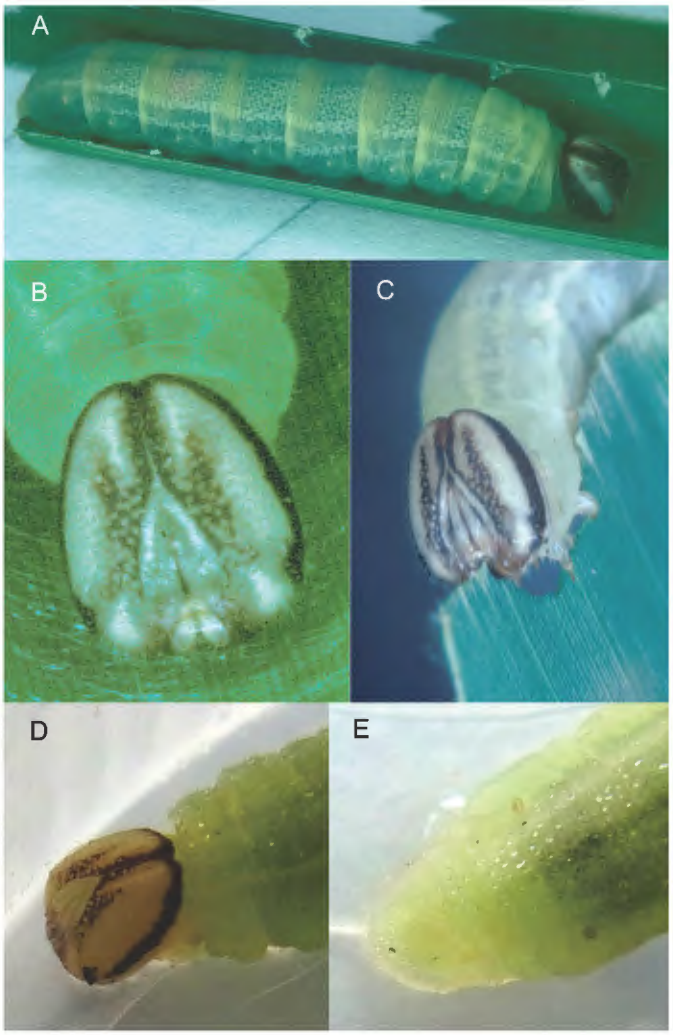

Fig. 4. Final instar caterpillar of *Cymaenes tripunctus theogenis*. **A**, dorsolateral view, collected as caterpillar on large coarse grass, Rio Claro-Guayaguayare Road, 11.x.1993, pupated 15.x, photo 11.x (ref. 93/9); **B**, detail of head, collected as final instar caterpillar on ?*Megathyrsus maximus*, Mt. St. Benedict, 21.iii.2003, pupated 26.iii, photo 21.iii (ref. 03/200); **C**, detail of head, collected as penultimate instar caterpillar on *M. maximus*, Point Gourde, 26.ii.1994, moulted 27.ii, pupated 17.iii, photo 8.iii (ref. 94/4); **D**, detail of head, collected as final instar on *Setaria barbata*, Port of Spain, 18.xi.2011, pupated 29.x, photo 24.x (ref. 11/72A); **E**, detail of anal plate, as D.

At the prepupal stage, individual 94/59A had subventral wax glands on the posterior part of A6, on A7, and the anterior part of A8; while individual 11/72A had subventral glands from the edge of the posterior margin of A6 to the anterior half of A8, whereas individual 94/4

was noted to have a single solid mass subventrally on A7-A8. More observations on the wax glands would be desirable to clarify whether they are variable in position and extent, change over time, or differ between sexes (or caterpillar 94/4 was incorrectly recorded).

Pupation is in a simple leaf roll held by several strands of silk; the cremaster is attached to a crossbar of silk, and there is a simple thoracic girdle. In spite of the well developed wax glands observed in prepupae, there was no white waxy powder on the pupa or lining the shelter in the case of individual 03/200 (Fig. 5). The pupa measured 20-22 mm; green; 2 mm frontal spike; whitish subdorsal and dorsolateral lines on abdomen (ref. 03/200). Pupation lasted 11-17 days.

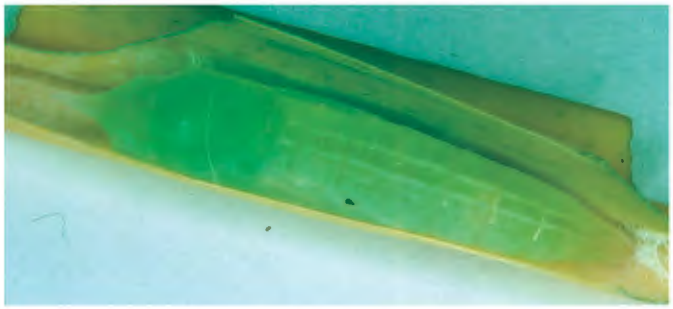

Fig. 5. Pupa of *Cymaenes tripunctus theogenis,* collected as caterpillar on large coarse grass, Rio Claro-Guayaguayare Road, 11.x.1993, pupated 15.x, photo 16.x (ref. 93/9).

As noted previously (Cock 1998), given that the caterpillars of both subspecies of *C. tripunctus* are variable, they cannot be separated in the early stages.

One of two caterpillars collected together in Port of Spain on *Setaria barbata,* 18.xi.2011 (ref. 11/72B) was parasitized (the other caterpillar was successfully reared and I am assuming they were both *C. tripunctus*). Three days after collection, a braconid larva emerged from a penultimate instar caterpillar, and spun a fluffy white cocoon in the host shelter; the adult wasp emerged 11 days later. The cocoon and adult were similar to those of *Fornicia* spp., but it has not been identified.

J27 *Cymaenes finca* Cock 1985

Figs. 6-7.

This species was described from Trinidad (Cock 1985), and as yet it has not been recorded from elsewhere. Although not stated in the original description, the specific name is a noun in apposition, and is a pun on the type locality, Spanish Farm (*finca* being the Spanish for farm). The type series is split between the collections of the NHM, USNM and the author.

Cock (1985) illustrates the male genitalia and compares them with those of *C. tripunctus theogenis*. The male has a weak spot in space 1B, and spots in spaces 2, 3 and 6, whereas the female has spots in 1B, 2, 3 and 6-8. UNF at most a hint of a spot in space 1B; similarly a hint of a discal band UNH. This species is similar to *C. tripunctus*, but larger and with different genitalia (Cock 1985).

Fig. 6. ♂ *Cymaenes finca*, Las Lomas, Spanish Farm, 17.xii.1980, M.J.W. Cock (holotype in NHM).

Fig. 7. ♀ *Cymaenes finca*, Las Lomas, Spanish Farm, 2.viii.1980, M.J.W. Cock (paratype in NHM).

The type series of eight males and one female was taken at Spanish Farm, Las Lomas, between March 1980 and August 1981, three of the males being captured at dusk on two separate occasions. Since then, I have caught a further two males at Arena Forest Reserve, 2.x.1982. I am not aware of any other captures. This seems to be a localised species associated with lowland forest. I was collecting at Spanish Farm at dusk, hoping to catch *Pachythone erebia* Bates (Riodinidae). This is the species known from Trinidad as its synonym, *P. barcanti* Tite, which was described from this locality from specimens caught at dusk by Malcolm Barcant (Tite 1968; Barcant 1970). Since collectors rarely search for small brown-black butterflies at dusk, it is difficult to know how sig-

nificant these early evening captures of *C. finca* are, or how widespread either species might be if other areas of lowland forest were checked at this time of day.

The early stages and food plants are unknown, but this is likely to be another grass-feeding species.

J27 *Cymaenes* sp. nr. *campestris* Mielke 1980

Figs. 8-9.

This record is based on a single male specimen collected by Sir Norman Lamont at Morne Diablo, 10.xi.1929 (Figs. 8-9), which Kaye (1940, no. 381E) recorded incorrectly from Trinidad as *Lerodea fusca* (Grote and Robinson), although the species actually intended was *L. eufala eufala* Edwards (Cock 2004). I examined Lamont's specimen in the NMS, and concluded that it is a species of *Cymaenes* close to or the same as *C. campestris* Mielke described from Paraná, Santa Catarina and Rio Grande do Sul, Brazil (Cock 2004). However, examination of a male paratype of *C. campestris* in the NHM, suggests that this Trinidad specimen is not conspecific. The large gap between southern Brazil and Trinidad also suggests the Trinidad specimen is unlikely to be conspecific, so it probably represents an undescribed species.

There is no new information on this species, and the life history and food plants are unknown. I am reluctant to describe this as a new species based on a single specimen, so I encourage collectors in Trinidad to keep an eye out for more.

Fig. 8. ♂ *Cymaenes* sp. nr. *campestris*, Morne Diablo, 10.xi.1929, N. Lamont (specimen in NMS). Note the dark shading on the costa UNH is an artefact due to the positioning of the camera flash; the UNH is more or less uniformly coloured.

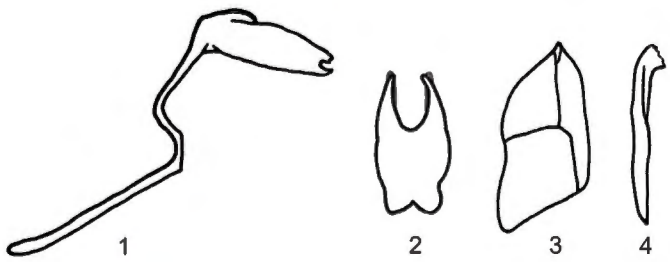

Fig. 9. Genitalia of ♂ *Cymaenes* sp. nr. *campestris*, Morne Diablo, 10.xi.1929, N. Lamont (specimen in NMS). **1**, lateral view without claspers and penis; **2**, uncus and gnathos dorsal view; **3**, left valve, internal view; **4**, left valve ventral view.

***Cobalopsis* Godman 1900 in Godman 1899-1901**

Godman (1900) established this genus with *edda* (Mabille) as its type species. However, *edda* is now considered a synonym of *C. autumna* (Plötz), a species which is not known to occur in Trinidad. Although Kaye (1904) included *C. edda* in his first list of butterflies "a single specimen only in June 1898 (W.J. Kaye)", he did not include it in subsequent lists, so he probably concluded that this was a misidentification.

There are no secondary sexual characteristics in this genus (Evans 1955). The reported food plants are Poaceae (Beccaloni *et al.* 2008).

J37/4 *Cobalopsis nero* (Herrich-Schäffer 1869) in Herrich-Schäffer 1867-71

Figs. 10-11.

Herrich-Schäffer (1867-71) briefly described this species based on a female specimen without locality, but the description is not diagnostic and no subsequent authors seem to have referred to the type. O.H.H. Mielke (pers. comm. 2011) sent me a picture of a type from Berlin which appears to be a male without abdomen, the markings of which are close to that shown here (Fig. 10), but the white hyaline spots F are slightly larger. However, both UNH of the type seem to have lost most of their scales and the spots in spaces 2-4 UNH that Herrich-Schäffer refers to (and can be seen in Figs. 10-11) are not visible. Evans (1955) defined his use of *nero* by including several synonyms, including *dyscritus* (Mabille) (♂ type from Colombia), for which Godman (1900, plate 98.33) and Hayward (1950, plate viii.1) illustrated the male genitalia. *Cobalopsis nero* occurs from Mexico to Paraguay, but based on the numbers in the NHM has been collected most often in northern South America, including Trinidad (Evans 1955).

Kaye (1940, no. 397A) introduced this species to the Trinidad catalogue as *Cobalopsis lucifer* (Hübner), giving *dyscritus* as a synonym and listing a specimen from Maupertuis, 16.ii.1922 (Sir N. Lamont). Evans (1955) and Mielke (2004) place *lucifer* in the genus *Decinea*. However, given that *dyscritus* is now treated as a synonym of *Cobalopsis nero*, and that there is a Lamont specimen of *C. nero* with this data in the NMS, I have made the reasonable assumption that Kaye's record of *lucifer* is a

misidentification for the species now known as *C. nero* (Cock 1982).

UPF with spots in spaces 1B (sometimes in male, stronger in female), 2, 3, 6-8 and upper cell; UNF diffuse spot in space 1B; UNH paler brown with a weak purple flush and variably pale spots in spaces 2-5.

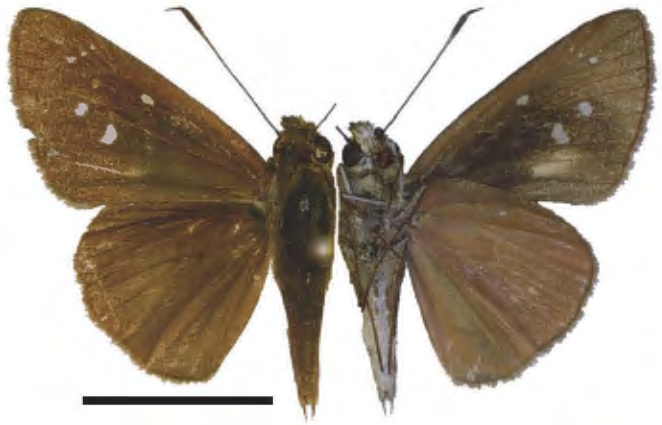

Fig. 10. ♂ *Cobalopsis nero*, Las Lomas, Spanish Farm, 17.xii.1980.

Fig. 11. ♀ *Cobalopsis nero*, Parrylands, 3.iii.1980.

There are two emerged pupae and a final instar head capsule in the NHM dry early stages collection as *Cobalopsis nero*. However, the pupae are too large to be *C. nero* and Moss actually labelled them as *Prenes nero*, i.e. *Panoquina nero* (Fabricius), a Caribbean species, and they do resemble those of *Panoquina* spp. (Cock 2001).

The 41 Trinidad records that I am aware of show this species to be widespread in lower areas of northern and central Trinidad, but with only one record from the south (Parrylands, 3.iii.1980). Only 14 records include the exact month of capture, and these show that most captures are between December and April, i.e. during the dry season.

Hayward (1969) gives *Saccharum officinarum* as a food plant in Argentina. Pastrana (2004), quoting Hayward (1969), gives this as sugar cane and other grasses. Janzen and Hallwachs (2011) have reared this species frequently from *Megathyrsus maximus*, *Paspalum virgatum*, *Setaria palmifolia* (=*S. paniculifera*) and *S. poiretiana*, and occasionally from several other grasses.

My unpublished food plant record of bamboo for *C. nero* in Beccaloni *et al.* (2008) is an error that I made when reference numbers on two specimens from Curepe were transposed (Cock 2009). Hence the record for *C. nero* (ref. 81/41) is actually from an unidentified broad-leaved grass. Fortunately, my notes and the associated larval and pupal remains with the two specimens leave no room for doubt as to the correct association.

My record is based on a single collection made at Curepe, 28.xii.1981, in secondary forest. The shelter was a leaf roll at the base of a leaf. The head was slightly indent at vertex; dark with pale adfrontals and a pale inverted U in dorsal half of epicranium, the lateral arm extending diffusely to stemmata, which are in a pale patch. T1 concolorous with body. Body slightly opaque, with a clear dorsal line bordered with pale area; yellow tint to posterior of each segment; faint pale lateral line along trachea; pale ventrolateral ridge; spiracle A8 dark, other spiracles pale. The pupa measured 27 mm; elongate; pale green; frontal spike stout, 3 mm; proboscis extends almost to base of cremaster. A female emerged after nine days.

J37/6 *Cobalopsis miaba* (Schaus 1902)

Figs. 12-13.

For many years this species has been known as *Cobalopsis potaro* (Williams and Bell 1931), (Evans 1955; Cock 1982). However, Mielke (1980) studied the type of *Megistias miaba* Schaus (1902) and established that

Fig. 12. ♂ *Cobalopsis miaba*, Mt. Tabor summit, 1850 ft. (564 m), 5.viii.1979.

it is a senior synonym of *Cobalopsis potaro*. *Papias elegans* Hayward, described from Ecuador, is also a synonym (Evans 1955; Mielke 2004). *Cobalopsis miaba* is found from Costa Rica to Paraguay, but more than half the specimens in the NHM are from Trinidad and Guyana (Evans 1955).

Fig. 13. ♀ *Cobalopsis miaba*, El Tucuche, 2600 ft. (790 m), 11.viii.1979.

The male genitalia are illustrated by Williams and Bell (1931, Fig. 29, as *Euroto potaro*) and Hayward (1940, Fig. 17, as *Papias elegans*).

In the male, the UPF spots in spaces 2 (often indistinct in male), 3 and 6-8 (7-8 may be indistinct or absent in males) are small; no spots in spaces 1B or cell; diffuse white area in space 1B UNF. The UNH is dark brown with a reddish purple sheen; small pale spots in spaces 1C-7. Female similar but F spots stronger and wings more rounded.

Based on the 64 records that I have of this species from Trinidad, it seems to be a common species in the Northern and Central Ranges, with only occasional records from lowland areas, e.g. Point Gourde (17.i.1988) and Las Lomas, Spanish Farm (17.xii.1980), and no records from the south of the island. Most records are from the higher parts of the Northern Range that have been collected, i.e. from Morne Catherine to Morne Bleu. Records extend in the Northern Range to the summit ridge of El Tucuche (9.i.1980) and in the Central Range to the summit ridge of Mt. Tamana (common, 13.vii.1997). On three occasions I have taken pairs *in copulo*, an unusually high proportion of captures (almost 10%). The months of capture of 47 specimens are throughout the year, except May-June, with peaks in January and July-August.

Steinhauser (1975) reports a single female specimen provisionally identified as *C. miaba* (=*C. potaro*) reared from "long grass" by Miguel and Francisco Serrano in El Salvador. I have found no other information on the life history and food plants.

Arita Evans 1955

This is a genus of four species (Mielke 2004), of which one, the type species *arita* (Schaus), is found in Trinidad. The genus has no secondary sexual characteristics.

J38/1 *Arita arita* (Schaus 1902)

Figs. 14-18.

Schaus (1902) described this species from Trinidad as *Cobalus arita*, and Evans (1955) placed it in his new genus *Arita*. Evans (1955) reported specimens from Colombia to south Brazil, and it is also present in Panama (Lindsey 1925) and perhaps further north in Central America, e.g. Costa Rica (Janzen and Hallwachs 2011) and Mexico (based on *Thoon wellingi* Freeman, a possible synonym – see below).

Kaye (1914) described *musa* on the basis of specimens from "Emperor Valley, Jan. 29, 1913 (K. St. A. Rogers); in coll. Kaye from St. Ann's Valley (G. E. Tryhane)". Implicitly this is two specimens, and I have traced two specimens recognised as types which match. The K. St. A. Rogers specimen is in HEC; it is a female and a good match to the illustration in Kaye (1914, pl. 30.6). The other is in MGCL from the W.J. Kaye collection; it is a male *A. arita* which has been dissected and identified by S.R. Steinhauser (A.D. Warren, pers. comm. 2011). No further information is added in Kaye (1921). Evans (1955) may have seen either of these types, but refers to a female type from Trinidad in the NHM. There is a holotype label adjacent to a female from Caparo in the NHM, but this cannot be a type. Evans (1955) made

Fig. 14. ♂ *Arita arita*, Mt. Tamana, c. 250 m, 12.xi.1995.

Fig. 15. ♀ *Arita arita*, San Miguel Valley, old cacao estate, 17.x.1979.

musa a synonym of *A. arita*. Kaye (1940, no. 396B) also noted *A. arita* as a Trinidad species commenting, "I have not seen this species".

Lindsey (1925, plate 30.5) illustrates the male genitalia (as *Cobalus arita*) – either from Panama or Guyana. Bell (1942) described *Tigasis akuris* Bell from Venezuela and illustrated the male genitalia, which Mielke and Casagrande (2002) found to be a synonym of *A. arita*.

Freeman (1969) described *Thoon wellingi* from Mexico and illustrated the female and male genitalia (Freeman 1969, Fig. 17). This species is now treated as a synonym of *A. arita* (Mielke 2004). However, although Freeman's illustration of the male genitalia does suggest an *Arita* sp., it is not a close match to those of *A. arita* illustrated by Lindsey (1925) and Bell (1942), so this synonymy may need to be reconsidered.

The male has UPF spots in spaces 1B (a trace or absent), 2, 3, (rarely in 4 and 5), 6 and 7, upper cell and usually lower cell; the spot in space 2 is narrow and oblique – a useful character to recognise this species, in common with *Tigasis garima* (Schaus) below. UNH reddish brown with a purple sheen; spots in spaces 1C-7, cell and a blurred spot in space 1B adjacent to that in space 1C. The female is similar but the F spots are more pronounced, especially that in space 2, and the wings are more rounded.

Fig. 16. Female *Arita arita* caught by spider, Palo Seco Oilfield, 7.xi.1995.

I have records of no less than 74 specimens of *A. arita* from Trinidad, 47 males and 27 females. It is found in forested areas throughout the island from lowlands to about 2,000 ft. (610 m). Captures are in forest, along roadsides and tracks, and sometimes at eupatorium flowers at forest edges. Bacon *et al.* (1974) recorded it as *Cococilopsis* [sic] *musa* (=*Cobalopsis musa*) from Nariva Swamp, which Cock (1981) corrected to *A. arita*.

Janzen and Hallwachs (2011) have reared this species repeatedly from *Olyra latifolia* and another unidentified grass. Beccaloni *et al.* (2008) quote Cock (pers. comm. 1997) that the food plant of *A. arita* in Trinidad is *O. latifolia*.

My single rearing record was from a final instar caterpillar collected 6.v.1995 on *O. latifolia* on Lalaja Ridge (ref. 95/17). It was found in a 35 mm shelter cut from one edge of the leaf lamina and folded upwards, with feeding basal to the shelter. The caterpillar (Fig. 17) measured 26 mm; head slightly indent at vertex; light brown, adfrontal sutures dark, extending diffusely onto epicranium; stemmata black. Body pale, dull, translucent green with the dorsal line darker; T1 and all legs concolorous with body; spiracles pale, inconspicuous; gonads yellowish. Wax glands developed before pupation, but I did not record details.

The pupa (Fig. 18) measured 17 mm; smoothly rounded; flattened anteriorly due to bulbous eyes; abdomen fairly elongate; proboscis extends 3½ segments beyond wing cases; head, thorax and appendages brown;

Fig. 17. Anterolateral view of head of instar 5 caterpillar of *Arita arita,* collected 6.v.1995 on *Olyra latifolia*, Lalaja Ridge, photo 6.v.1995, 26 mm, ref. 95/17.

Fig. 18. Dorsolateral view of pupa of *Arita arita,* collected as caterpillar 6.v.1995 on *Olyra latifolia*, Lalaja Ridge, pupated 16-19.v., adult 7.vi., photo 21.v., 17 mm, ref. 95/17.

abdomen pale green-brown with trace of dorsal line; spiracle T1 dark matt brown. White waxy powder on eyes and posterior half of abdomen; shelter lined with light covering of white waxy powder, with heavier deposits at each end.

Lerema Scudder 1872

Lerema accius (J.E. Smith) from the USA is the type species of this genus of eight species, which is found throughout the Neotropical Region. There are many records of *L. accius* as a grass-feeder (Beccaloni *et al.* 2008), as well as one from *Wisteria* (Fabaceae) (Hayward 1947) which needs confirmation before it can be accepted. Males of this genus have a compact, broad, tripartite stigma from base of vein 3 to vein 1 UPF.

J39/3 *Lerema ancillaris ancillaris* (Butler 1877)

Figs. 19-26.

Butler (1877) described *L. ancillaris* based on a male from "Amazons", Brazil. The nominate subspecies is found from there north to Panama, while subsp. *liris* Evans 1955 is found in Central America. Subspecies *liris* has slightly different genitalia (Evans 1955) and some authors have treated it as a valid species, but not Mielke (2004) in the checklist of Neotropical Lepidoptera.

The male genitalia of ssp. *ancillaris* have been illustrated from Guyana by Lindsey (1925, plate 30.9 as *L. mooreana* Dyar, a synonym) and Hayward (1950, plate ix.5); Scott (1986, Fig. 71.449) illustrates the valve.

Kaye (1921, 1940) did not record this species from Trinidad, but given that it is a common species, and Lamont collected specimens (Palmiste: ♀ 18.iv.1926 [N. Lamont] [NMS]; ♀ 13.iii.1932 [N. Lamont] [NMS]), Kaye may have misidentified material (cf. *Cymaenes tripunctus theogenis* above). In contrast, Sheldon (1938) probably recorded it twice from Tobago as *Lerodea phocylides* (Plötz) from Roxborough (F. d'A[abadie]), and *Lerema parumpunctata* (Herrich-Schäffer) from Scarborough, one specimen (W. G. S[heldon]), both of which are synonyms of the rather similar *Lerema accius* found from Central America to Venezuela, but not known from Trinidad. Barcant (1970) listed the second of these as *L. parum punctata* from Tobago (Cock 1982).

Males usually have spots in spaces 2 (sometimes absent), 3 and 6-8 (Fig. 19), although some have no spots apart from mere traces of the spots in spaces 6-8 UPF and UNF (Fig. 20); UNF no spot in space 1B; UNH indistinct spots in spaces 1C-3. The female is more heavily spotted, with UPF spots in spaces 1B, 2, 3, 6-8 (Figs. 21-22); some may have both upper and lower spots in space 1B as well as an upper cell spot (Fig. 22); UNH variable spots in spaces 1C-7 (Fig. 22), often indistinct (Fig. 21).

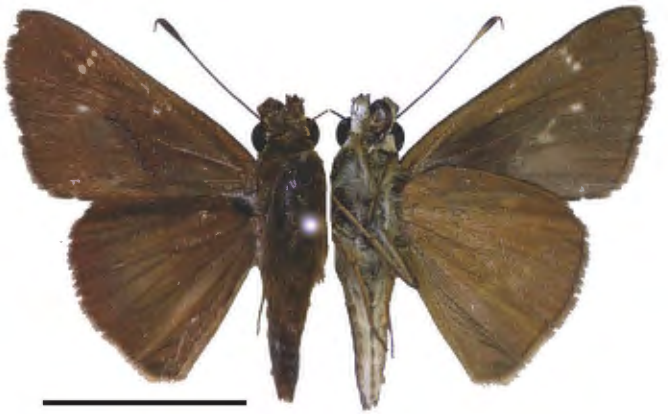

Fig. 19. ♂ *Lerema ancillaris ancillaris*, Point Gourde, 12.vii.1997.

Fig. 20. ♂ *Lerema ancillaris ancillaris* with reduced spotting F, Point Gourde, 12.vii.1997.

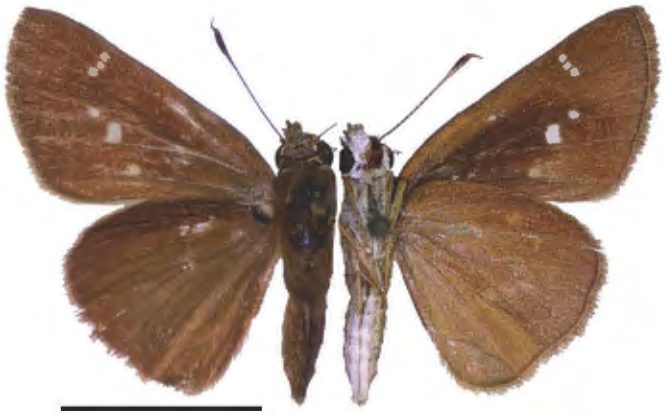

Fig. 21. ♀ *Lerema ancillaris ancillaris*, Caroni Swamp, ¼ mile east of Cacandee Sluice, 20.ii.1982.

I have records of 27 specimens captured in Trinidad: 17♂♂ and 10♀♀. These show that *L. a. ancillaris* is widespread in lowland, disturbed situations throughout the island, and it extends into forested areas along roadsides, but doesn't occur in forests. There are several captures from swampy areas, including Caroni Swamp (Cacandee Sluice), Nariva Swamp (Manzanilla-Mayaro

Fig. 22. ♀ *Lerema ancillaris ancillaris*, collected as pupa on *Setaria poiretiana*, Curepe, 25.x.1981, ref. 7B.

Road (Cock 1981) and Sand Hill), and Oropouche South Lagoon, but it is not clear whether these represent disturbed areas adjacent to swamps or a genuine association with swamps. The months of capture do not show a clear pattern; although most specimens have been caught in the dry season (February-April) or July, the former is linked with collecting at the edge of swamps, when these areas are more accessible, and the latter reflects a single occasion when this species was common at Point Gourde in 1997.

Both subspecies feed as caterpillars on a variety of grasses. Moss (1949) reared subspecies *ancillaris* from "ribbon" or "fan" grasses at Belem (Para) Brazil, which

Fig. 23. Adult female of *Lerema ancillaris ancillaris*, collected as caterpillar on ?*Megathyrsus maximus*, Port of Spain, 4.x.1994, photo 19.x.1994, ref. 94/58.

may (or may not) refer to *Phalaris arundinacea*, as listed by Beccaloni *et al.* (2008) on the basis of Moss' record. Dyar (1914) described the synonym *L. mooreana* Dyar from Guyana, reared from larvae on sugar cane by H.W.B. Moore. Hayward (1950) gives *Saccharum giganteum* (=*Erianthus saccharoides*), *S. alopecuroides* (=*E. alopecuroides*), *S. poiretianum* (=*Panicum poiretianum*) and other grasses as food plants, as well as *Wisteria speciosa* (Fabaceae) – an unlikely record that needs confirmation. Subsequent authors have repeated some of these records (e.g. Hall 1939; Hayward 1947; Pastrana 2004; Beccaloni *et al.* 2008). Cock (pers. comm. 1997 in Beccaloni *et al.* 2008) listed ?*Megathyrsus maximus* (=?*Panicum maximum*) and *Setaria poiretiana* as food plants in Trinidad. In the NHM there are specimens reared by H.E. Box from sugar cane in Trinidad (ix.1952) and Guyana (iii.1924, species XIII) and *Paspalum* (viii.1923, ref. 65).

Kendall and McGuire (1975) record ssp. *liris* from a 'broad-bladed grass', *Bambusa vulgaris* and *Saccharum officinarum*, in Mexico. It has since been reared in moderate numbers from more than 25 different species of grass in Costa Rica (Janzen and Hallwachs 2011).

Hayward (1950) quotes a brief description of the caterpillar and pupa by Jørgensen (1935), which is compatible with mine below.

In addition to my rearing records (Beccaloni *et al.* 2008) of a pupa on *Setaria poiretiana* (Curepe, 25.x.1981, ref. 81/7B) and a caterpillar on ?*M. maximus* (Port of Spain, 4.x.1994, ref. 94/58), I have reared this species from a pupa on cauliflower (Aranguez Gardens, 20.vii.1980) and a caterpillar on maize (Macoya Gardens, 20.ix.1978). The pupa on cauliflower showed no signs of associated feeding, and this plant was only used as an unusual pupation site. In contrast, the pupa on *S. poiretiana* formed a shelter similar to that of the caterpillar on ?*M. maximus*, with associated feeding.

The following description is based on a final instar caterpillar found on ?*M. maximus* (ref. 94/58). A more recently collected caterpillar (ref. 11/02) was similar in the final instar (Fig. 25), but had a black head in earlier instars. The shelter (ref. 94/58) was formed in the terminal section of a leaf of about 30 cm; the edges were rolled downwards and held with silk, lamina edge to lamina edge; lightly lined with silk over the midrib; basal to the shelter, the lamina had been eaten to the midrib from both sides, and as a result the distal shelter was pendulous. The caterpillar resembled that of *C. tripunctus theogenis* (Fig. 4); 25 mm; head rounded, widest nearest ventral part, slightly indent at vertex; posterior margin narrowly dark; dark stripe from vertex laterally to mouthparts; similar stripe from vertex to frons, and weakly down frons to mouthparts; adfrontal sutures dark; epicrania white with a dark stripe down middle of front of each from below level of vertex to level with bottom of frons; area between these lines, including frons, with green tint. T1 with a very narrow, dark dorsal plate on posterior margin. Body dull pale yellow-green; dorsal line less yellow; white dorsolateral line; spiracles pale, inconspicuous; all legs concolorous with body. The prepupa developed wax glands subventrally on posterior margin of A6 and A7, and anterior margin of A8.

Fig. 24. Penultimate instar caterpillar of *Lerema ancillaris ancillaris*, collected as small caterpillar on *Megathyrsus maximus*, Mt. St. Benedict, 8.x.2011, moulted to penultimate instar 13.x, photo 17.x., moulted to final instar 22.x; 13 mm, ref. 11/02.

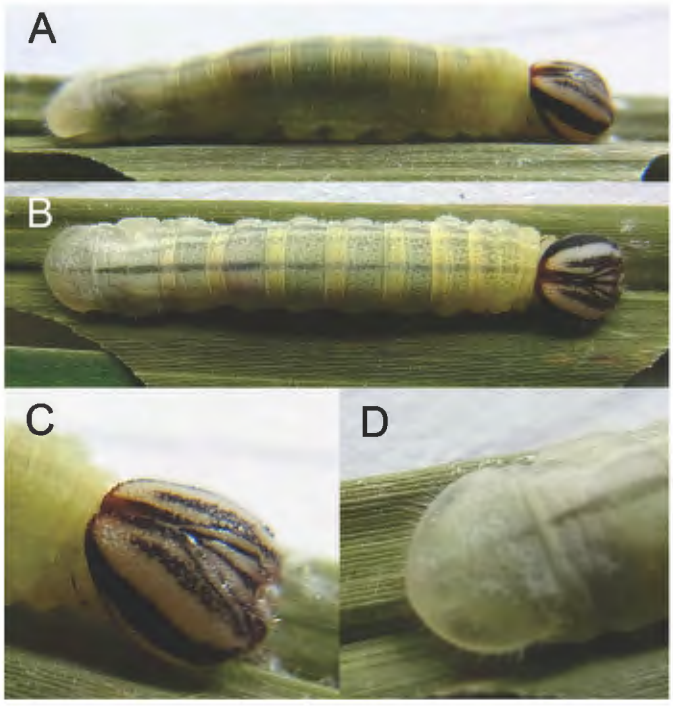

Fig. 25. Final instar caterpillar of *Lerema ancillaris ancillaris*, collected as small caterpillar on *Megathyrsus maximus*, Mt. St. Benedict, 8.x.2011, moulted to final instar 22.x, photo 24.x., pupated 7.xi; 17 mm, ref. 11/02. **A**, lateral view; **B**, dorsal view; **C**, anterolateral view of head; **D**, posterodorsolateral view of anal plate.

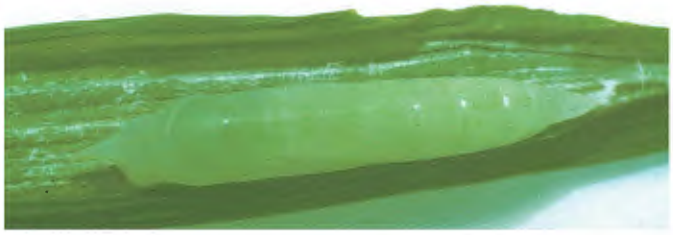

Fig. 26. Pupa of *Lerema ancillaris ancillaris*, collected on *Setaria poiretiana*, Curepe, 25.x.1981, ref. 81/7B.

The pupal chamber contained white waxy powder, but its deposition on the pupa and shelter walls was not recorded. The pupa (refs. 81/7B and 94/58) was elongate, with a well developed forward-directed frontal spike and the proboscis sheath reaching the cremaster; pale milky green; unmarked. It was held in the shelter with a simple silk girdle. Pupation lasted about 9 days.

J39/4 *Lerema lineosa* (Herrich-Schäffer 1865)
Fig. 27.

This species was described from Brazil by Herrich-Schäffer (1865) as part of the description of *Euphyes singularis* (Herrich-Schäffer) in his work on Cuban butterflies. No types have been located (O.H.H. Mielke, pers. comm. 2011), and my interpretation of the name is based on Evans' (1955) treatment. Evans lists just a few specimens from Colombia to Brazil. The only illustration of the male genitalia seems to be Evans' (1955) diagram (Mielke 2005). The only Trinidad records are those in Cock (1982).

The male has no F spots and may resemble some male *L. ancillaris* in this regard, but *L. ancillaris* always has at least a trace of these spots. The brand is shorter, thicker and darker than that of *L. ancillaris*. The female is similar to that of *L. ancillaris*, but lacks the apical spots UPF and UNF.

Fig. 27. ♂ *Lerema lineosa*, Caroni Swamp, ¼ mile east of Cacandee Sluice, 20.ii.1982.

I have only found this species near Cacandee Sluice at the edge of Caroni Swamp: 2♂ ¼ mile E of the Sluice, 20.ii.1982; and 1♂ ¾-1 mile SSW of the Sluice, 12.iv.1982 (Cock 1982). The two females of *L. lineosa* that I reported from the first locality in Cock (1982) were misidentified and are actually *L. ancillaris*. Both *Lerema* spp. were present on these occasions, either or both were feeding at flowers of *Stachytarpheta jamaicensis*, but at the time I did not distinguish between the two species. Pending further captures, it seems possible that this species may be associated with freshwater swamp in Trinidad.

Beccaloni *et al.* (2008) include no food plant records for this species, but there is a specimen in the NHM reared on sugar cane in Guyana by H.E. Box (ix.1923), but with no associated remains of the early stages.

***Morys* Godman 1900 in Godman 1899-1901**

This genus of eight species (Mielke 2004) was established with *valerius* (Möschler) as the type species. *Euroto* Godman (type species *compta* Butler) is a synonym (Evans 1955; Mielke 2004) which appears in the Trinidad literature. Members of this genus are similar to *Lerema* spp., but differ in the form of the secondary sexual characters: instead of having a compact broad stigma, there are brands of various types or an incomplete stigma (Evans 1955). The only recorded food plants are Poaceae (Beccaloni *et al.* 2008, quoting my records).

J40/1 *Morys valerius valerius* (sense Evans 1955, probably not Möschler 1879)

Figs. 28-32.

Möschler (1879) described *Apaustus valerius* from Colombia, based on a single female specimen. Godman (1900) examined the type and recognised this species from Central America, illustrating the male UPS, venation and genitalia from Mexican specimens (plate 98.47-49). Evans (1955) described *valda* Evans as a new subspecies from Mexico and Honduras, while recognising the nominate subspecies from Colombia to Brazil, with most records from Trinidad. However, although Evans (1955) attributed Godman's (1900) figure of the male genitalia to the nominate subspecies, given the locality of Godman's specimen (Mexico), his figure must be of ssp. *valda*. The distal part of the clasper of Godman's figure is deeply and smoothly divided between two short arms, whereas that shown by Evans (1955) has the two arms much longer and coming together to almost meet distally. Trinidad material that I have examined matches the illustration of *valerius* by Evans in this regard. Hayward (1950) treats *M. valerius* from Argentina based on a single female specimen, so although he illustrates the male genitalia, this cannot be of an Argentine specimen, and the illustration is so similar to the illustration of ssp. *valda* by Godman (1900) that it is likely to be a copy. Although Mielke (2004) treats *valda* as a subspecies of *valerius*, it may well be that it is a distinct species, based on the genitalia differences.

Möschler's (1879) description of *valerius* differs in some details from the species Evans (1955) treated as *valerius* (no spot in space 1B UPF, yellow-white 'wisp' in space 1B UNF, spots in spaces 2-5 UNH, veins yellowish UNH). O.H.H. Mielke (pers. comm. 2011) sent me photographs of the female type of *valerius*, which is in the Berlin Museum. It matches the description, but does not seem to be the species treated as *valerius* by Evans (1955), although a study of the genitalia will be needed to confirm this and clarify what species the type represents. Until then, I use the name *valerius* in the same sense that Evans (1955) used it.

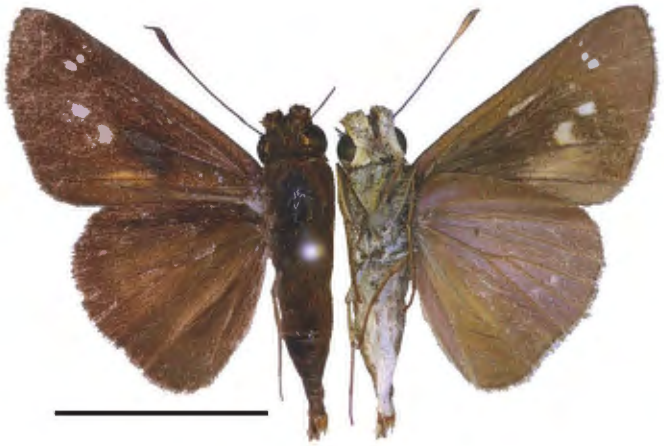

Fig. 28. ♂ *Morys valerius valerius*, Las Lomas, Spanish Farm, 17.xii.1980.

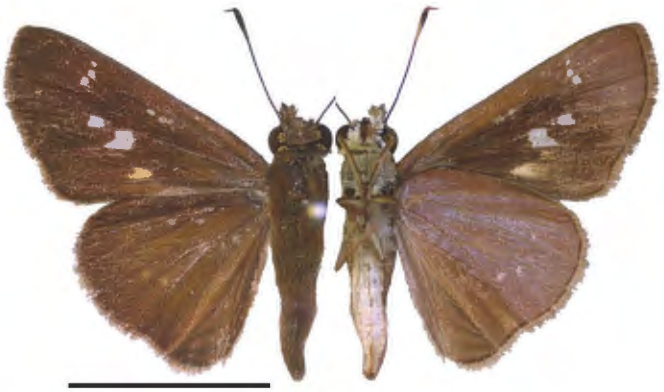

Fig. 29. ♀ *Morys valerius valerius*, Curepe, 26.ix.1979.

Godman (1900) noted that this species was labelled '*Pamphila cerdo* Boisd.' in the NHM; this name was not published by Boisduval, but was listed by Butler (1870) without any description and so is an unavailable *nomen nudum*. Kaye (1914) first recorded *M. valerius* from Trinidad as *Morys cerdo*, based on a specimen captured at St. Clair, Port of Spain, 31.xii.1912 by (K. St. A. Rogers). This record is repeated in Kaye (1921, no. 400).

The three UPF brands in the male are distinctive: against cell, from origin of vein 2 to origin of vein 3, wider nearer vein 2 and slightly triangular; two brands under vein 2 and parallel to it, aligned with basal part of the first brand (Fig. 28). UPF with diffuse yellow spot in space 1B, white hyaline spots in spaces 2, 3, 6, 7 and sometimes 8, and there may be an upper cell spot F, especially in the female; UNH is brown with a lilac sheen

apart from spaces 1A-1C, and pale spots variably present in spaces 1C-6. The female is similar to the male, but the wings are longer and more rounded.

Records of 28 specimens (18♂♂, 10 ♀♀) show this species to be moderately common in the foothills of the Northern Range of Trinidad from Morne Catherine to Arima Valley, with scattered records from lowland central and southern Trinidad. Most records are from below 1000 ft. (305 m), but captures extend to around 1500 ft. (460 m) (♀ Morne Catherine, 6.viii.1979). There is one record from Gasparee Island off the NW peninsula of Trinidad (♂ 5.ii.1922 [N. Lamont], NMS). Captures are throughout the year, but with slightly more in December-February, i.e. early dry season.

Beccaloni *et al.* (2008) include my unpublished records of *Olyra latifolia* and *Setaria barbata* (Poaceae) as food plants in Trinidad. In Costa Rica, Janzen and Hallwachs (2011) have reared subspecies *valda* commonly from *Acroceras zizanioides* and *O. latifolia*, and occasionally from a dozen other Poaceae.

Fig. 30. ♂ *Morys valerius valerius,* collected as caterpillar on *Olyra latifolia*, in forest to north of Mt. St. Benedict, 1.v.1995, photo 23.v.1995, ref. 95/2A.

I reared this species from two caterpillars collected 1.v.1995 on *O. latifolia*, in the forest above Mt. St. Benedict (ref. 95/2), and from a prepupa collected 6.x.1994 on *S. barbata* in Port of Spain (ref. 94/61). The following is mostly based on the first collection. The leaf shelter was made by rolling the leaf upwards, with feeding distal to the shelter; it is not clear that any cuts were used to make the shelter. The mature final instar caterpillar measured 20 mm. Head rounded triangular (i.e. widest just above the base); slightly indented at vertex; ground colour white; heavy dark stripe from vertex, where it is red-brown, to stemmata; frons grey-green; occipital suture red-brown at vertex, shading to grey-green at and along adfrontal sutures; red-brown line near and parallel to lower half of occipital suture. T1 concolorous. Body dull green with yellow speckles; dorsal line darker; pale dorsolateral, lateral and sub-spiracular lines; legs and prolegs concolorous; spiracle A8 light brown, inconspicuous; other spiracles pale, inconspicuous. The wax glands are formed laterally on the ventral surface of A7 extending into the anterior half of A8.

The prepupa on *S. barbata* (ref. 94/61) was found on the underside of a leaf with no shelter, except that silk held the leaf slightly concave. The prepupa measured 24 mm, and I noted the wax glands as subventrally on the posterior margins of A6 and A7 and anterior margin of A8. The pupae measured 19-22 mm; they were slender,

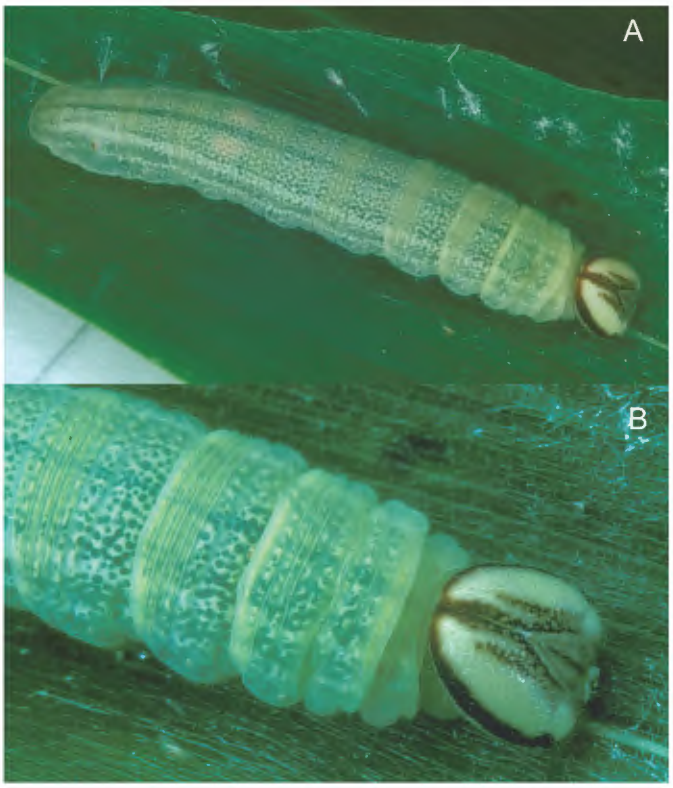

Fig. 31. Final instar caterpillar of *Morys valerius valerius,* collected on *Olyra latifolia*, in forest to north of Mt. St. Benedict, 1.v.1995, photo 1.v.1995, 20 mm, ref. 95/2A. **Above**, dorsolateral view; **Below**, detail of head and anterior segments.

Fig. 32. Dorsolateral view of pupa of *Morys valerius valerius,* collected as prepupa on *Setaria barbata*, Port of Spain, 8.x.1994, 22 mm, ref. 94/61.

plain green, with a 2 mm frontal spike. Pupation lasted 9-12 days.

Another shelter collected at Mt. St. Benedict on *O. latifolia* on the same occasion (ref. 03/201) contained a final instar head capsule and five rather flimsy parasitic Hymenoptera cocoons, from which five small adult wasps emerged 2-3 days later. They have not been identified. However, the identity of the host is uncertain given the similarity of the caterpillars of *Morys*, *Cymaenes* and *Lerema* spp.

J40/2 *Morys compta compta* (Butler 1877)
Figs. 33-34.

This species was described from the Amazons (Butler 1877) from three localities, including both male and female specimens. Evans (1955) refers to a male type in the NHM, and Mielke and Casagrande (2002) formally designated a male from the type series as the lectotype. Evans (1955) treated *M. compta* as comprising two subspecies: the nominate ssp. from Venezuela and the Guyanas south to Paraguay, and ssp. *micythus* (Godman 1900) described from Mexico and found south to Ecuador.

The male genitalia are illustrated by Evans (1955), but the illustrations by Godman (1900, plate 99. 31) and Hayward (1950, plate viii.12) are of *M. geisa* (Möschler), the latter probably copied from the former.

Morys compta was recorded from Trinidad by Kaye (1914) citing specimens from St. Ann's Valley taken by himself and G.E. Tryhane. The same records are given in Kaye (1921, no. 407). There is a specimen in MGCL from Kaye's collection which he identified as *Euroto compta*, "Trinidad, '98, W.J. Kaye", which may well be the first of these. It is actually a potentially undescribed species of *Morys* identified by the late S.R. Steinhauser (A.D. Warren, pers. comm. 2011). I will try and treat this species in a future paper.

Kaye (1914, plate 30.8) described and illustrated *Euroto simplissima* Kaye from a male captured in Emperor Valley, Port of Spain, 3.ii.1913 by K. St. A. Rogers, and repeats this information in Kaye (1921, no. 409). Evans (1955) mis-spelt this name *simplicissima* and synonymised it with *M. compta*, based on Kaye's (1914) illustration. The type is in HEC and I have examined photographs of it. It is correctly synonymised under *M. compta*; the type has a brand under vein 2 and traces of a discal band UNH, both typical of *M. compta*, but not mentioned or illustrated by Kaye (1914) in the type description.

Both male and female have F spots in spaces 2, 3 and 6-8, although those in spaces 7 and 8 may be absent; a weak diffuse area in space 1B UNF; UNH brown with a reddish chestnut tint and paler spots variably in spaces

Fig. 33. ♂ *Morys compta compta*, Waller's Field, 17.ii.1982.

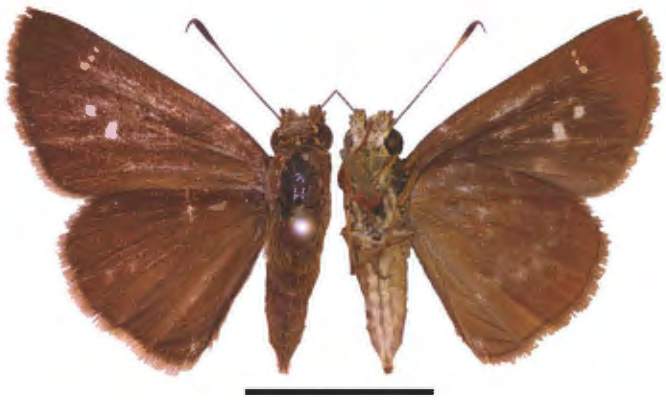

Fig. 34. ♀ *Morys compta compta*, Parrylands, 21.viii.1980.

1C-7. The male brand consists of three sections: the largest along the base of space 2, wider above the base of vein 2; a streak in space 1B below vein 2 and an inconspicuous short streak below this. The female is larger with more rounded wings.

Trinidad records include 36 ♂♂ and 10 ♀♀, mostly from the Northern Range, from Point Gourde to Quare Road, but with several records from central and southern Trinidad. Although most captures are at lower altitudes, they extend to 2300 ft. (700 m, ♀, Morne Bleu Textel, 16.i.1988). Captures are from forested areas, secondary forest and suburban areas. Roadside flowers, e.g. *Bidens pilosa*, are used as nectar sources. Adults can be found at any time of year, but captures are most common early in the dry season (January-February) and least common at the beginning of the rainy season (May).

I have reared this species from a caterpillar collected on a grass, *Paspalum virgatum* (Beccaloni *et al.* 2008). The caterpillar was collected at St. Augustine, 17.iii.1982 (ref. 82/52), but very little detail was recorded. The caterpillar was in a shelter made from the rolled, basal part of the leaf, and when the pupa was formed on the lid of the rearing container, it was surrounded by white waxy powder. The following notes are based on the remains

preserved with the pinned adult. Pupa 21 mm; translucent; cylindrical, elongate at ends; frontal spike short with black apex; proboscis sheath reaches base of cremaster; cremaster broad, pointed. Final instar caterpillar head approximately 2.2 x 3.1 mm wide x high; pale brown ground colour; dark brown stripe from apex laterally to stemmata; diffuse brown line from apex to apex; diffuse brown line down epicranial suture, continuing adjacent to adfrontals on epicranium to base of adfrontals; diffuse line running parallel to epicranial suture to base of adfrontals; narrow brown line down centre of clypeus; covered with white waxy powder; scattered pale erect setae. T1 with a narrow pale brown dorsal plate; body with scattered pale inconspicuous setae. Penultimate instar head 1.7 x 2.0 mm wide x high; rugose; scattered inconspicuous pale erect setae; pale brown with brown and dark brown markings; posterior collar narrowly dark brown with a wider brown border, and anterior to this an area of pale brown; dark brown stripe from vertex over apex laterally to stemmata; brown stripe down epicranial suture, extending on epicranium along the margin with the adfrontals to the base of the adfrontals; diffuse, brown stripe parallel to epicranial suture to base of adfrontals; clypeal sutures narrowly brown; brown stripe down middle of clypeus. N-2 instar caterpillar head 1.2 x 1.4 mm wide x high; dark brown-black; rugose, shiny; inconspicuous short, pale, erect setae.

J40/3 *Morys geisa geisa* (Möschler 1879)
Figs. 35-39.

Möschler (1879) described this species from Colombia based on two males. O.H.H. Mielke (pers. comm. 2011) sent me photographs of a male specimen in the Berlin Museum labelled lectotype; apart from some loss of colour, and the spot in space two being more convex basally and concave distally, it seems a good match to the male shown in Fig. 35. Godman (1900) states that he examined "the type" and found it to be the same as *M. compta*. However, Evans (1955) treats *M. geisa* and *M. compta* as separate species, as followed here.

Based on Evans' treatment, the male venation and male genitalia illustrated by Godman (1900, plate 99.31) as *M. compta* are *M. geisa*. Similarly, the male genitalia illustrated by Hayward (1950, viii.12) as *M. compta* (probably copied from Godman 1900) and of *M. geisa* (viii.14), are both *M. geisa*.

Schaus (1902) described *Euroto etelka* Schaus from a Trinidad male. His description includes a cell spot and two rows of pale spots UNH, but examination of the type indicates that one apparent row is damaged to the specimen, and it otherwise closely matches the specimen shown here (Fig. 35). It is a synonym of *Morys geisa* (Evans 1955; Mielke 2004). Kaye (1940, no. 409a) adds *Euroto etelka* to his Trinidad catalogue as a separate species, commenting that it was "described from a Trinidad specimen".

Fig. 35. ♂ *Morys geisa geisa*, San Miguel Valley, old cacao estate, 17.x.1979.

Fig. 36. ♀ *Morys geisa geisa*, collected as caterpillar on *Orthoclada laxa*, Arena Forest, 6.v.1995, ref. 95/15.

Kaye (1914, plate 30.14) described the same species as *Phanis sylvia* Kaye from "Trinidad, St. Ann's Valley (G.E. Tryhane)", and illustrates a male specimen. By implication, only one specimen was involved, although a series is possible. Kaye (1921, no. 404) adds no further information. Evans (1955) mis-spelt Kaye's species as *silvia* when he synonymised it with *M. geisa* (Mielke 2004). Evans (1955) states that the type is in the NHM, but although there are males in the NHM from St. Ann's Valley and Trinidad (without locality) in the NHM, and a type label is placed against the latter, there is no indication that either is the type (e.g. a label in Kaye's writing). The type has not been located in MGCL which includes Kaye's collection (A.D. Warren, pers. comm. 2011) so it may be that the type is lost. Kaye (1914) includes in his description of *Phanis sylvia* "hind-wing ... below the veins showing clearly pale brownish on a pale purplish brown ground; a series of elongated grey spots between

Fig. 37. ♀ *Morys geisa geisa*, Lalaja Ridge, 18.xii.1981.

Fig. 38. Detail of head of final instar caterpillar of *Morys geisa geisa,* collected on *Orthoclada laxa*, Arena Forest, 6.v.1995, 21 mm, ref. 95/15.

Fig. 39. Lateral view of pupa of *Morys geisa geisa,* collected on *Orthoclada laxa*, Arena Forest, 21.v.1995, 22 mm, ref. 95/15.

the veins midway between the cell and outer margin", whereas Kaye's illustration shows a much darker UNH. Based on the description, *sylvia* does seem to be correctly placed as a synonym of *M. geisa*.

In both sexes (Figs. 35-36) there are white hyaline spots UPF in spaces 2, 3 and 6-8, and a trace of a diffuse pale spot in space 1B; UNF there is a diffuse pale area in space 1B; the apex UNF and the UNH apart from spaces 1A-1C are dark brown with a purple sheen; UNH has pale blue-grey spots in spaces 1C-7, that in space 4 being elongate and displaced basally compared to the others. The male has a two-part black brand along the base of space 2, widest above the base of vein 2, and adjacent to this a line below vein 2 in space 1B; otherwise the sexes are similar apart from the more pointed forewings of the male.

Twenty records from Trinidad (14 ♂♂, 6♀♀) show this is only a moderately common species. However, it is widespread, with records from Cedros Forest Reserve in the far south-west (♀, Southern Main Road, milestone 66¼, 2.ix.1980) to Toco in the far north-east (♂,♀ 3.iii.1939 [N. Lamont], UWI, NMS), and from near sea level to around 2200 ft. (670 m) on the north face of El Naranja (♂ 11.viii.1979). Records are mostly from more or less natural forest areas, extending into secondary forest, and 80% of captures were made between October and March.

The only published food plant record seems to be that by Beccaloni *et al.* (2008), citing my personal communication of a record from a grass, *Orthoclada laxa*, in Trinidad. This record was based on collection 95/15 in Arena Forest, 6.v.1995 (Fig. 36). I have also reared a specimen from a prepupa collected 6.x.1994 on *Setaria barbata* in Port of Spain (ref. 94/61). At the time, the early stages appeared to me to be the same as those of *M. valerius* above and no observations were recorded, but fortunately photographs were taken (Figs. 38-39).

?*Morys* sp.

Fig. 40.

I have a single female specimen from Point Gourde, 12.vii.1997, which is currently unidentified. See under *M. compta* above regarding the species which Kaye treated as *M. compta*. This specimen has white hyaline spots in spaces 2, 3, 6 and 7 F, and the UNH is plain brown with a chestnut tint.

Fig. 40. Unidentified ♀ ?*Morys* sp., Point Gourde, 12.vii.1997.

***Tigasis* Godman 1900 in Godman 1899-1901**
Fig. 41.

This genus of nine species (Mielke 2004) occurs from Central America to Brazil, and all species seem to be uncommon (Evans 1955). The males have a more or less complete stigma from base vein 3 to vein 1 (Evans 1955).

Beccaloni *et al.* (2008) include no food plant records, but Janzen and Hallwachs (2011) have reared *Tigasis simplex* (Bell) 20 times in Costa Rica on *Rhipidocladum racemiflorum* (Poaceae). Based on their photos of the caterpillar, I believe that a parasitized caterpillar that I collected on *Setaria barbata* at Mt. St. Benedict, 5.x.1994 (ref. 94/59B) was a *Tigasis* sp., and given the locality, likely to be *T. garima garima* (Schaus). It was found in a leaf shelter made from the apical portion of a leaf, the leaf lamina rolled downwards on each side to make a tapered cone, and the lamina eaten to the midrib on both sides basal to this, allowing the midrib to flex so that the shelter hung downwards. The caterpillar (Fig. 41) was 20 mm and relatively slender, compared to a caterpillar of *Cymaenes tripunctus theogonis* collected in a similar shelter on the same food plant on the same occasion (ref. 94/89A). Head translucent light green; posterior margin slightly darker; a narrow brown line from vertex laterally to mouthparts; anterior to this line, a broad white line; a narrow brown line from vertex down epicranial suture, continuing as a finer line halfway down frons. T1 concolorous with body. Body dull translucent green with tightly packed yellow speckles in a broad subdorsal line which defines the dorsal line, and a narrow dorsolateral line; trachea visible through cuticle as a lateral line; spiracles and all legs concolorous. A solitary braconid parasitoid emerged from the caterpillar and spun a flimsy white cocoon in the leaf shelter, emerging 2-3 weeks later.

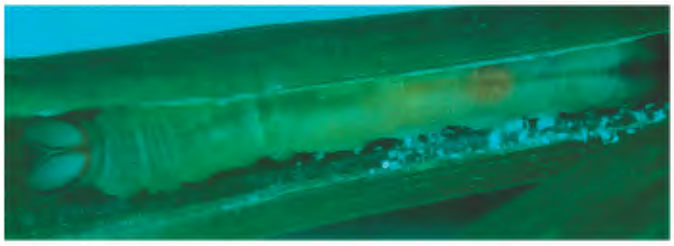

Fig. 41. Probable final instar caterpillar of *Tigasis* sp., collected on *Setaria barbata,* at Mt. St. Benedict, 5.x.1994, photo 8.x, 20 mm; ref. 94/59B.

J44/1 *Tigasis garima garima* (Schaus 1902)
Figs. 42-43.

This species was described from Trinidad (Schaus 1902) and is also reported from Ecuador (Evans 1955). A second subspecies *massarus* (Bell 1940) occurs in southern Brazil (Evans).

Although Bell (1940, Fig. 4) illustrates the male genitalia of ssp. *massarus*, the only illustration for ssp. *garima* is that provided by Evans (1955). However, Evans' (1955) illustration of the clasper of *massarus* shows some differences from Bell's (1940) figure, so the situation may be more complicated, with additional taxa. Anyway, the application of the name *garima* to Trinidad material is clear, given this is the type locality.

Kaye (1940, no. 399B) includes this species in his additions to the catalogue stating that he had not seen this species.

UPF both sexes have a white spot in lower space 1B, white hyaline spots in spaces 2 (wider at top and bottom than middle), 3, 6, 7 (sometimes) and both upper and lower cell spots; a more or less diffuse white area in space 1B UNF; UNH brown with only very slight purple sheen, and variable pale spots in spaces 1C-3, 5 and end cell. The male brand from below the origin of vein 3 to vein 1 is interrupted mid space 1B. The female has longer, more rounded forewings.

I have only six Trinidad records (4♂♂, 2♀♀). Although *T. g. garima* is widespread in Trinidad, the locali-

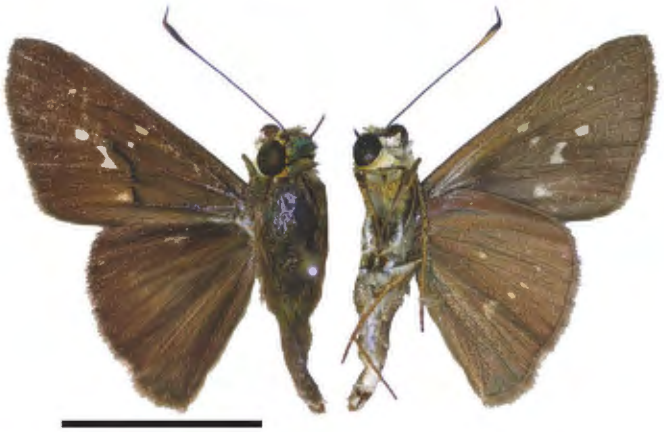

Fig. 42. ♂ *Tigasis garima garima*, Mt. Tamana summit ridge, 14.x.1995.

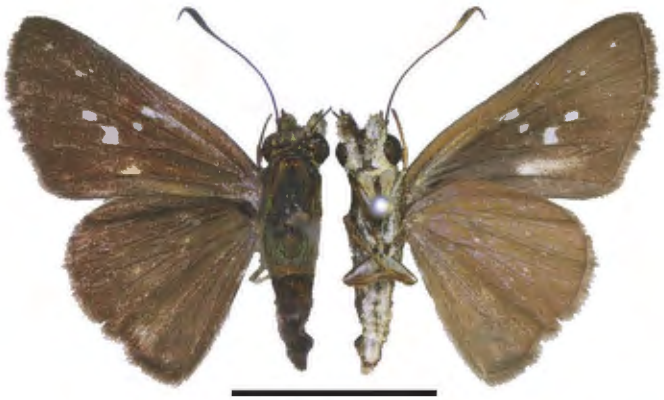

Fig. 43. ♀ *Tigasis garima garima*, Rio Claro-Guayaguayare Road, eupatorium flowers, 11.x.1993.

ties show no clear pattern: Manzanilla Windbelt Reserve, Mt. Tamana summit ridge, Northern Mountains, Rio Claro-Guayaguayare Rd., Mt. St. Benedict. However, four of the specimens with months of capture were taken in October, one at eupatorium flowers (♀, Rio Claro-Guayaguayare Rd., 11.x.1993).

The biology and food plants are not known (Mielke 2005; Beccaloni *et al.* 2008), but see comments under *Tigasis* above.

J44/4 *Tigasis physcoa* (Hewitson 1868)
Figs. 44-45.

This rare species was only known from Venezuela (Hewitson 1868; Evans 1955) until Cock (1982) first reported it from Trinidad. The only illustration of the male genitalia is that in Evans (1955).

The male (Fig. 44) generally has only a very small white hyaline spot in space 3, while the female (Fig. 45) has spots in spaces 2 (widest against vein 2), 3 and 6-7. The apex UNF and UNH is brown with a strong chestnut-purple tint and variable yellow spots in spaces 1C-5 and end cell. The black male brand is almost continuous from the base of space 3 to vein 1B, and hardly interrupted at mid space 1B.

Fig. 44. ♂ *Tigasis physcoa*, Maracas-Caura Ridge, 14.iii.1982.

Fig. 45. ♀ *Tigasis physcoa*, El Naranja, 2000 ft. (610 m), in cop., 19.vi.1979.

I have records of seven males and four females of this species from Trinidad, all taken on the higher parts of the Northern Range at around 2000 ft. (610 m): Maracas-Caura Ridge; north side of El Naranja; Andrew's Trace (Arima-Blanchisseuse Road, milestone 9¾); Arima-Blanchisseuse Road, milestone 10½, Textel track; by Morne Bleu Textel Installation; and on the ridge from the Morne Bleu Textel Installation to Morne Bleu. The months of capture are evenly spread through the year.

There are no records of the food plants or early stages (Mielke 2005; Beccaloni *et al.* 2008).

DISCUSSION

Based on their early stages as documented here, *Cymaenes*, *Cobalopsis*, *Lerema* and *Morys* could all be congeneric - compare the caterpillars of *Cymaenes tripunctus* (Fig. 4), *Cobalopsis nero* (description in text), *L. ancillaris* (Fig. 25), *Morys valerius* (Fig. 31), *M. compta* (description in text) and *M. geisa* (Fig. 38). Conversely, the caterpillars of *Arita arita* (Fig. 17) and *Tigasis* sp. (Fig. 41) are obviously different, and not necessarily closely related. Equally, the pupae of *Cymaenes*, *Cobalopsis*, *Lerema* and *Morys* are similar – cylindrical, elongate at both ends, green, with or without pale longitudinal subdorsal and dorsolateral lines, while that of *A. arita* (Fig. 18) is brown, more rounded and has no frontal spike. Cock and Congdon (2012) have noted a similar pattern in the tribe Baorini in Africa where in one genus, *Parnara*, the pupa is brown, rounded and without a frontal spike, while the others that are known (*Zenonia*, *Pelopiodas*, *Borbo* and *Gegenes*) are very similar to those grouped here, as well as those of a variety of genera in other tribes of Hesperiinae. The authors hypothesise that this shared pupal form and colouring reflects a common need for camouflage for those species that do not make fully enclosed pupal shelters, but rather pupate in a partly open shelter or under a grass or palm leaf with no shelter. Conversely those species that form a completely closed pupal shelter do not need to be camouflaged in shape or colour and so lack the elongate shape, frontal spike and green colouring.

Given the similarity of the caterpillars shown for *Cymaenes*, *Cobalopsis*, *Lerema* and *Morys*, it may well be that these genera form a monophyletic group. Amongst the main differences between the genera is the presence or absence, and form when present, of the male brands UPF. These secondary sexual characters are thought to be relatively easily lost within genera, perhaps controlled by a single gene (Burns 1964, 1989; De Jong 1982) so that the differences in brands may not be as important phylogenetically as they seem. Patterns in the form of the

genitalia are likely to be more important in defining these generic groups in future.

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The type specimens of *Cymaenes finca* shown in Figs. 6 and 7 are in the NHM, and the specimen of *Cymaenes* sp. nr. *campestris* in Fig. 8 is in NMS. I thank Andy Warren and James Logan who checked the MGCL and HEC respectively for types and historical specimens, and sent me photographs of key specimens; Olaf H.H. Mielke who shared photographs of type specimens with me; and Scott Alston-Smith for adding information based on his observations.

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