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The Skipper Butterflies (Hesperiidae) of Trinidad. Part 11, Hesperiinae, Genera group O

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ABSTRACT

Details are given on the taxonomy, history, description, identification and biology of the Trinidad and Tobago species of genera Group O of the Hesperiidae (Lepidoptera). This is a predominantly Neotropical group of which 12 genera and 32 species occur in Trinidad and five genera and seven species occur in Tobago. *Xeniades orchamus orchamus* Cramer is a new record for Trinidad. *Panoquina panoquinoides* Skinner occurs in distinct island races on both Trinidad and Tobago; these are described, but treated as below the subspecies level. All 32 species are illustrated as adults, and the early stages are illustrated for *Nyctelius nyctelius nyctelius* Latreille, *Niconiades xanthaphes* Hübner, *Aides aegita* Hewitson, *Saliana antoninus* Latreille, *S. longirostris* Sepp, *S. salius* Cramer, *S. saladin culta* Evans, *Thracides cleanthes binota* Evans and *T. phidon* Cramer.

INTRODUCTION

In part 10 of this series (Cock 2000) I completed my treatment of the subfamily Pyrginae, i.e. roughly half the known Hesperiidae from Trinidad. The remaining species belong in the subfamily Hesperiinae. Many of these are small, predominantly brown species whose biology is little known (especially Evans' genera groups I, J, L, M, and N). In contrast, genera groups K and O include larger species, for a proportion of which the biology is now known from Trinidad. Accordingly I have decided to treat these groups first before returning to the other genera groups, by which time, hopefully more information will have accumulated on these.

Most authors now agree that Evans' classification of the Hesperiinae into genera groups is seriously flawed (e.g. Burns 1990), but for the moment no better arrangement has been proposed. Accordingly I do not propose to characterize the genera groups in any detail - at least not at this stage. Evans (1955) characterises his group O as "generally brown species with the antennal club constricted before the apiculus: the length of the nudum on the club = apiculus. The palpi are flattened against the head: third segment short and stout. The termen of the hindwing is straight or excavate". This is a predominantly Neotropical group for which Evans (1955) lists 20 genera and 133 species; of these 12 genera and 32 species occur in Trinidad and five genera and seven species occur in Tobago. *Xeniades orchamus orchamus* Cramer is a new record for Trinidad.

The known larval food plants include grasses and bamboos (Poaceae), palms (Arecaceae) and members of the Epigynae group, including Cannaceae, Marantaceae, Bromeliaceae and Costaceae.

In the treatments of *Panoquina lucas* Fabricius and *Nyctelius nyctelius* I quote the work of Dethier (1942) who reared these species from the ovum, through seven larval instars to pupation. I have reared relatively few species of Hesperiidae from the ovum, and these have always taken five instars. Hence, I should point out that in my treatments of field collected larvae, I have always assumed that the final instar is the fifth, the penultimate instar is the fourth, the one before that the third, and so on. It would probably be more accurate, although clumsier, to refer instead to final instar (n), n-1, n-2, etc., where n is the unknown number of standard instars (e.g. Holloway, Cock and Desmier de Chenon 1987).

Several references, notably Moss (1949), refer to relevant host plants by their common or local names; in some cases, I have located the probable scientific names of these based on internet searches, and inserted these in square brackets without source.

I reiterate my thanks to Dr. C. Dennis Adams, Yasmin Comeau, Bhorai Kalloo and Winston Johnson of the National Herbarium who identified the plants from which I reared Hesperiidae in Trinidad. The following have very kindly assisted in providing access to the collections in their care: Dr. George McGavin of the Hope Entomological Collections, Oxford University Museum (HEC), Dr. Phillip Ackery of the Natural History Museum (NHM) (formerly British Museum (Natural History)), Dr. Mark Shaw of the Royal Scottish Museum (RSM), Mr. Scott Alston-Smith to his private collection (SAS), Professor Julian Kenny and Dr. Gene Pollard of the University of the West Indies, St. Augustine (UWI), Dr. Gerald Legg of the Booth Museum, Brighton, Drs. Lee and Jacqueline Miller of the Allyn Museum of Entomology, Sarasota, Florida (AME).

Once again, I especially thank Scott Alston-Smith who has read and commented on this paper, and provided additional records from his collecting, and observations and food plant records which have not previously been published (indicated as SAS in text).

245. O1 *Calpodes ethlius* Stoll 1782

Calpodes ethlius, the only species in its genus, was described from Suriname, but is found from southern USA to Argentina (Evans 1955), all through the Caribbean (Smith *et al*. 1994), colonised Bermuda some time before 1910 (Cock 1985), and recently colonised the Galapagos Islands (Onore and Mielke 1988).

It was first recorded from Trinidad by Kaye (1904), who considered it a common species, at least around cannas. He later qualified this, stating that it is less common in Trinidad than in Jamaica or Dominica (Kaye 1921). Sheldon (1936) records a Tobago specimen reared from a larva collected on *Canna* sp. at Bacolet by W.J. Kaye; there are two Kaye specimens from Tobago in the AME. There is also a Tobago specimen from the Sheldon collection in the NHM, a male collected i. 1937 at Roxborough by F. d'A. (i.e. Frank d'Abadie).

Plate 1. *Calpodes ethlius* (female), in cop. on canna, Curepe, 14.ix.1979. Scale in mm.

Sexes similar. UPS brown with white hyaline spots; overlay of light brown setae base UPF, base UPH and spaces 1A-1C UPH. UNF dark brown basally, light brown on costa, apical area and along margin to vein 1. UNH light brown. F (male) 24mm; (female) 25-27mm. Illustration of UPS in Lewis (1973, plate 21.24); of (male) in Riley (1975, plate 24.9).

Plate 2. *Calpodes ethlius* (female) UNS, collected as larva on ornamental canna, 20.i.1982 (ref. 82/37B). Scale in mm.

The recorded food plants of this species include several species of Marantaceae and the introduced ornamental canna, *Canna* sp. hybrids (Cannaceae). It is well known as a pest of ornamental cannas (Moss 1949; Reinert *et al*. 1983), *Canna edulis* (Young 1982) and arrowroot, *Maranta arundinacea* (Urich 1932; Myers 1935; Cock 1985). Reinert *et al*. (1983) compared 39 cultivars of cannas for resistance to *Calpodes ethlius* in Florida. Plants with red leaf colour were preferred for oviposition to those with green leaves, and cultivars with red, orange, or scarlet flowers were the most preferred for oviposition, while those with yellow, rose red, yellow-red, or pink flowers were least preferred. Scott (1986) includes *Thallia dealbata* amongst the food plants, and Janzen and Hallwachs (2001) have reared it from *Thallia geniculata*, *Calathea macrosepaia*, both of which occur in Trinidad (Simmonds 1967), and at least one other Marantaceae.

In the 1980s, specimens were submitted to the International Institute of Entomology from Guyana, where they were reported to be causing defoliation of sugar cane (J.D. Holloway, pers. com.). This seems to be the only record of *C. ethlius* as a sugar cane pest (Box 1953).

Moss (1949) illustrates the larva. I have recorded the life history on *Canna indica* in Nevis (Cock 2001). Although I have reared this skipper several times in Trinidad, I did not record the life history in any detail, but I do not think it differs significantly from that which I described from Nevis. Eggs, larvae and pupae are quite easy to find on ornamental canna, and at times this skipper is a pest causing defoliation of this garden flower. Outbreaks usually collapse in a generation or two, probably due to the action of parasitoids.

Calpodes ethlius is a significant pest of arrowroot in St. Vincent, and of ornamental cannas in Bermuda. Natural enemies were studied in Trinidad, as part of a biological control programme against *C. ethlius* in these islands (Urich 1932; Myers 1935; Cock 1985). In Trinidad, the eggs are attacked by two trichogrammatid wasps, *Trichogramma* sp. sometimes incorrectly referred to as *T. minutum* Riley (Bare 1935) and *Xenufens ruskini* Girault, and an encyrtid, *Ooencyrtus calpodei* Noyes (Noyes 1985). The larvae are attacked by a gregarius braconid, *Apanteles talidicida* Wilkinson (the cocoons of which may in turn be hyperparsitised by a *Spilochalcis* sp.), a *Microbracon* sp., two tachinids, *Achaetoneura nigripalpis* Aldrich and *Exoristoides urichi* Aldrich, and a eulophid, *Ardalus scutellatus* Howard (= *Elachertus meridionalis* J.C. Crawford). Although no pupal parasitoids were recorded at the time of this biological control work, a pupa which I collected at the Pax Guest House (14.xi.1995, ref. 95/70) was parasitised by a gregarious *Aprostocetus* sp. (Eulophidae). Some hundreds of male and female adult wasps emerged from this one pupa and immediately started mating.

Xenufens ruskini was originally described from USA (Girault 1916) as an egg parasitoid of *Urbanus proteus* (see Cock 1986). Ainslie (1922) records it from Florida parasitising ova of *Lerema accius* Smith and Abbott, a species recorded from Trinidad but in error for *L. ancillaris ancillaris* Butler (Cock 1982). A *Xenufens* sp. is also recorded to attack the ova of *Caligo* spp.: Malo (1961) record *X.* sp. nr. *ruskini* attacking *Caligo eurilochus* in Ecuador, and Harrison (1963) records *X. ruskini* attacking *C. memnon* in Costa Rica. These authors are likely to be referring to the same parasitoid species, but whether it is *X. ruskini* or a close relative is not clear. Malo and Willis (1961) record an interesting case of phoresy with regard to the latter record. The adult female *X. ruskini* are carried on the termen of the hindwing of the adult female *C. memnon.* When the female alights to oviposit, the wasp moves onto the ovum as it is laid, parasitises it and then returns to the butterfly wing. Perhaps not surprisingly, the ova are heavily parasitised. This behaviour has not been reported for *Calpodes ethlius*, and considering the slow flapping flight of *Caligo* spp. compared to the rapid beating of skipper wings in flight, it may well be impossible to duplicate this behaviour on *Calpodes ethlius*.

Adults of *C. ethlius* can be seen around the food plant, especially when there is an outbreak (e.g. Curepe, 14.ix.1979; Petit Valley, SAS; Ellersie Park, SAS), but otherwise, this skipper is seldom encountered, and not common in Trinidad collections. Smith *et al*. (1994) point out that its flight times are early morning and late afternoon into the early evening. Doubtless linked with this crepuscular flight period, adults are occasionally attracted to light, and I have two specimens caught this way, a male attracted

to a fluorescent light in Toco (3.vi.1978) and a female from my mercury vapour light moth trap in Curepe (4-10.vi.1981). In general, however, the early stages are much easier to find.

Although *C. ethlius* has not been reported to migrate in Trinidad, Williams (1920) describes a mass movement in Panama which may have been migratory, and attributes the sudden mass appearance of this species in North America and in some Caribbean islands to mass migratory movements. The relatively infrequent incidence of canna and Marantaceae suggests they are unlikely food plants to generate the enormous numbers necessary to be noticed in mass movements, but the record of outbreaks on sugar cane (above) makes such population outbreaks much more plausible.

Larvae and adults have been used as model insects in many studies on insect physiology and biochemistry, e.g. Barrett (1984), Delhanty and Locke (1990), Griffith and Lai Fook (1986), Lai Fook (1984), Locke *et al*. (1991), Nichol and Locke (1989), Reisner *et al*. (1989), etc.

***Panoquina* Hemming**

The species of this genus have a similar UPS appearance, brown with white or yellow hyaline spots, and F pointed. The UNH has spots or a discal line of varying clarity and thickness. *Panoquina evadnes* is the only species with a male secondary brand. All species have a distinctive indentation on F margin at vein 2, which is also found in the next genus, *Zenis*. These species are all able to fold down the fore wing in a double fold so that the wing profile is much narrower, as can be seen in the plates of living adults of *P. fusina* (Plate 21) and *Zenis jebus* (Plate 25).

All species for which the biology is known feed on grasses (Poaceae). *Panoquina panoquinoides* seems to be a specialist on a grass from brackish conditions, but whether the other species show ecological preferences is not clear. Several species are minor pests of sugar cane and maize.

245a. O2/2 *Panoquina panoquinoides* Skinner

This is a group of species, subspecies, and forms which I treat here under the general name of *P. panoquinoides*. These are small brown skippers associated with coastal habitats. On the eastern side of the Americas, they have been treated as at least four subspecies, while closely related populations from California and Peru have been treated either as additional subspecies or as distinct species.

Evans (1955) lists material of *P. panoquinoides* from Florida and Texas (type localities), Cayman Is., Tobago and Pernambuco (E. Brazil). Smith *et al.* (1994) specify the non-USA distribution as Yucatan, Belize, the Bahamas, Cuba, Hispaniola, Mona Is., Puerto Rico, Virgin Is., St. Martin, St. Bartholomew and Antigua. However, Mielke (1980) refers to this subspecies extending as far south as Rio de Janeiro and Rio Grande do Sol in southern Brazil.

Godman and Salvin (1896) described *eugeon* as a distinct species from Union Island (Grenadines) and Grenada, mentioning that one Grenada specimen was captured on the seashore. Evans (1955) treats *eugeon* as a subspecies of *panoquinoides*, although Riley (1975) suggests that *eugeon* and *panoquinoides* may be distinct species. Smith *et al*. (1994) add records from other Grenadines, and suggest this taxon is likely to occur on other Lesser Antillean islands. This is confirmed by Corke (1995) who records *eugeon* from Maria Island off St. Lucia and Milligan Cay off St. Vincent.

The Suriname population was described by de Jong (1983) as ssp. *minima*. Mielke (1980) describes and illustrates ssp. *albistria* from a single female from a coastal site in Rio Grande de Sol, Brazil. This subspecies differs from others in that the UNH has a distinctive white stripe UNH, from the base to spaces 3 and 4, and no hind wing spots. Evans (1955) described *calna* as a subspecies of *panoquinoides*, based on two males and a female from Callao, coastal Peru; Brown and Turner (1966) suggest this may prove to be a distinct species.

Panoquina errans was described from California, and is restricted to the marine shoreline of California, USA, and Baja California, Mexico (IUCN 1983). Evans (1955) lists two males in the NHM apparently from South Brazil (Rio Novo Friborgo) which he attributes to this subspecies, but suggests they may be mislabelled. In view of Mielke's (1980) comments on the range of *panoquinoides*, i.e. extending to South Brazil, these two specimens need to be re-assessed. Evans (1955) treated *errans* as a subspecies of *P. panoquinoides*, but Brown and Turner (1966) reinstated it as a distinct species on the basis of differences in the larvae and male genitalia.

Although it is widespread and localised along the eastern coast of the Americas and Caribbean islands from the southern USA to Brazil, *P. panoquinoides* is likely to be overlooked, since brackish habitats are relatively under-collected. There is additional material from Peru, Ecuador, Venezuela and French Guiana in the USNM, and further populations in Trinidad and in Tobago as reported here. The populations from Venezuela, from Trinidad and French Guiana, and from Tobago could easily be considered to represent three additional subspecies, and other populations are likely to appear distinct. Because of the restricted habitat of this species, individual populations are relatively isolated, and so have evolved in isolation. Until more material is available from suitable areas where this species is as yet unrecorded, and someone undertakes a careful study and comparison of the different populations, adding more names to the literature at this time does not seem justified. Accordingly, although I describe the Trinidad and Tobago populations in some detail, I do not name them as new subspecies.

Riley (1975) includes *P. panoquinoides* from Trinidad in his table of butterfly distributions in the West Indies, but this is almost certainly based upon the Tobago specimen in the NHM listed by Evans (1955), since Tobago is not included in the table. Corke (1995) repeats the Trinidad record citing Riley (1975). *Panoquina panoquinoides* was first recorded from Trinidad by Cock (1984), when I pointed out that the species which I had recorded from Nariva Swamp as *Phlebodes* sp. (Cock 1981a, 1982) was actually *P. panoquinoides* and referable to either the nominate subspecies or an undescribed subspecies. Sheldon (1936, 1938) did not know *P. panoquinoides* from Tobago, and the first record from the island is that of Evans (1955) who lists a female in the NHM as ssp. *panoquinoides*.

***Panoquina panoquinoides* Trinidad population**

Male. UPF brown, with a few scattered tawny scales UPH, and diffuse tawny areas in space 12, costal ½ of cell, and an area distal and costal to end cell, space 1B against cell, and on either side of vein 1 for the middle $^1/_3$ of the wing. There is a sharply defined yellowish white spot in space 2, under the origin of vein 3, running from vein 2 to vein 3, and showing individual variation in

thickness from about 0.3-0.7 mm. A similar small spot at base of space 3 at end of cell, and distal to spot in space 2. One apical spot at the base of space 6 may be present in heavily marked specimens, and one specimen also has a dot in space 7. These more heavily marked specimens also have a diffuse yellowish white spot in space 1B on vein 1 in line with the inner margin of the spot in space 2. F 12.3-13.2 mm. UPH brown, unmarked.

Plate 3. *Panoquina panoquinoides* Trinidad population, (male) UPS, Nariva Swamp, milestone 46 1/4 track, 19.viii.1981. Bar = 1 cm.

Plate 4. *Panoquina panoquinoides* Trinidad population, (male) UPS, Caroni Swamp, Cacandee Sluice, 20.ii.1982. Bar = 1 cm.

UNF lighter brown than UPS with scattered tawny scales in distal half of cell, space 12 and the distal ½ to ⅓ of spaces 11 to 3; basal ½ of cell, space 1B to origin of vein 2 and space 1A basal ½ blackish. Veins yellowish, especially vein 3 and the distal ½ of veins 3-7. Spots in spaces 2 and 3 are distinctly larger and whiter than UPF; apical spots may be absent, or may be present in spaces 6 and 7; a quadrate whitish area at beyond ½ in the lower half of space 1B, diffuse on basal and distal margins. UNH lighter brown than UPS with a few scattered tawny scales; veins are pale and yellowish, apart from vein 1B which is whitish; no spots. Fringes yellowish brown, brown from space 2 to apex F.

Plate 5. *Panoquina panoquinoides* Trinidad population, (male) UNS of Plate 3.

Plate 6. *Panoquina panoquinoides* Trinidad population, (male) UNS of Plate 4.

Male genitalia. The male genitalia are shown in Figure 1. They, like those of ssp. *minima*, do not seem to differ significantly from those of ssp. *panoquinoides*, although I have not been able to compare the two. In terms of the characters which Brown and Turner (1966) use to distinguish the male genitalia of *P. errans* and *P. panoquinoides*, the genitalia match those of *panoquinoides.*

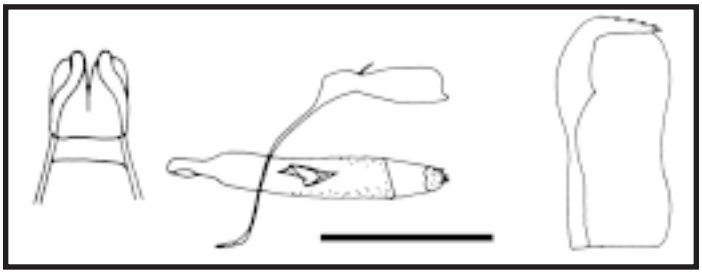

Figure 1. Male genitalia, *Panoquina panoquinoides* from Trinidad. *Left*, uncus and gnathos, dorsal view; *centre*, uncus, gnathos and aedaeagus, lateral view; *right*, left valve, internal view. Bar = 1 mm.

Female. UPF brown with tawny scales in basal ⅓ of wing. White hyaline spots F: quadrate spot in space 2 from origin of vein 3, elongate (basal-distal) spot at base of vein 3; apical spots in spaces 6 and 7, that in space 7 slightly distal to that in space 6. A quadrate white spot in space 1B on vein 1, overlapping with the basal margin of the spot in space 2. F 14.2 mm. UPH brown, with just a trace of spots in spaces 3 and 4.

Plate 7. *Panoquina panoquinoides* Trinidad population, (female) UPS, Oropouche South Lagoon, by Southern Main Road, 23.xii.1981. Bar = 1 cm.

UNF paler brown than UPS; costa and costal half of cell tawny, otherwise basal 1/3 of F blackish. UNF hyaline spots similar the UPS but slightly larger; spot in space 1B clearly larger, whiter and more diffuse. UNH brown as UNF, with veins yellowish brown, except vein 1B whiter; inconspicuous whitish spots at 1/3 in spaces 3 and 4.

Plate 8. *Panoquina panoquinoides* Trinidad population, (female) UNS of Plate 7.

Panoquina panoquinoides Tobago population

Male. UPS brown, with diffuse tawny areas in space 12, basal ½ of cell, space 1B against cell, and on either side of vein 1 for the middle 1/3 of the wing. There is an inconspicuous, diffuse spot of tawny scales in space two, under the origin of vein 3, and just a trace of a spot in space 3, slightly distal to the spot in space 2; no apical spots. F (male) 11.3 mm. UPH brown, with scattered tawny scales.

Plate 9. *Panoquina panoquinoides*, Tobago population, (male) UPS, Speyside, 15.v.1982. Bar = 1 cm.

UNF lighter brown than UPS and extensively overlaid with tawny scales in distal half of cell, space 12 and the distal ½ to 1/3 of spaces 11 to 3; basal ½ of cell, space 1B to origin of vein 2 and space 1A basal ½ blackish. Veins yellowish, especially vein 2 and the distal ½ of veins 3-6. The spot in space 2 is slightly larger and whiter than UPF, but the spot in space 3 is not evident; a broad diffuse whitish area at about ½ in the lower half of space 1B UNH lighter brown than UPH and extensively overlaid with tawny scales, except spaces 1A, 1B and 1C; veins yellowish, apart from veins 1A and 1B which are whitish; no spots. Fringes yellowish brown, brown from space 2 to apex F.

Plate 10. *Panoquina panoquinoides* Tobago population, (male) UNS of Plate 9.

Female. UPF brown with scattered tawny scales in basal 1/3 UPF; weak, diffuse yellow-brown spots in spaces 1B on vein 1 at 2/3, space 2 under origin vein 3, and near base of space 3. UPH brown, unmarked.

Plate 11. *Panoquina panoquinoides* Tobago population, (female) UPS, Tobago, 8.ii.1931, Capt. A.K. Totton (specimen in NHM).

UNF paler brown than UPF, with scattered tawny scales, similarly, but less densely, arranged as in the male. The spots in spaces 2 and 3 are slightly larger than on UPF and the spot in space 1B is distinctly larger, whiter and more diffuse than that on UPF; no apical spots. UNH with veins marked as in male; no spots.

Plate 12. *Panoquina panoquinoides* Tobago population, (female) UNS of Plate 11 (specimen in NHM).

Panoquina panoquinoides is consistently associated with coastal habitats in Trinidad and Tobago. I have now seen this species from four scattered localities in Trinidad, always in or near mangrove swamps. It is quite common along the edges of Nariva Swamp, where accessible from the Cocal and in the accessible parts of the eastern side of Caroni Swamp, such as Cacandee Sluice (ffrench and Bacon 1982). I have also found it beside Southern Main Road at Oropouche South Lagoon and in a patch of mangrove swamp at the base of Point Gourde. SAS has had a similar experience, only finding this species in swamp habitats. It can be expected to occur elsewhere around the coast where brackish conditions occur. I have collected Tobago specimens from Speyside and Military Hill (on flowers by the coast road).

Brown and Turner (1966) and Brown and Heineman (1972) describe the life history of ssp. *panoquinoides* from Jamaica, based on material which Turner found as eggs on *Mimosa pudica*, but reared on *Cynodon dactylon*. The normal food plant of *P. p. panoquinoides* in Jamaica does not, therefore, seem to have been recorded. Brown and Heineman (1972) suggest *P. p. panoquinoides* may have been a recent import in the Cayman Islands and Jamaica on sugar cane plants, however the information now available suggests that sugar cane would not be a natural food plant for this skipper, and so it is more likely that it is a long-term resident that was overlooked by early collectors.

Oviposition has been observed in Trinidad on *Paspalum vaginatum*, a grass only found in brackish conditions near the coast (Cock 1984). The life history of sspp. *eugeon*, *calna*, *minima* and *albistriga* have not been described as yet, but given the consistency of habitat choice, it seems rather likely that *Paspalum vaginatum*, and perhaps other salt grasses, are used by all subspecies throughout the range of *P. panoquinoides*.

The life history of *P. errans* was described from California, USA, by Comstock (1930). This information is summarised by Brown and Turner (1966) and behavioural observations are quoted in Brown and Heineman (1972). They consider the larvae to be sufficiently distinct from those of *P. p. panoquinoides* which they describe from Jamaica, that they are convinced that the two are distinct species. Brown and Heineman (1972), referring to Comstock's work, give the food plant as "salt grass", which Smith *et al.* (1994) refer to as *Sporobolus virginicus*. However, other sources, e.g. IUCN (1983) and Scott (1986), give the food plant as *Distichlis spicata* (Poaceae) which is also known as salt grass. *D. spicata* var. *stolonifera* is the form found locally frequent along the coast in California, and is probably the food plant actually used by *P. errans*, since IUCN (1983), for example, specifically states that the food plants used, grow in moist soil which is at least wetted by high tides.

246. O2/4 *Panoquina ocola ocola* Edwards 1863

This species is widespread, from southern USA (TL Texas) to Argentina (Evans 1955), and the Greater Antilles where it is not a common species (Smith *et al*. 1994). *Panoquina ocola distipuncta* Johnson and Matusik was recently described from a xeric pine forest at 1500-1600m in SW Dominican Republic; it differs from the nominate subspecies by having a yellowish white spot in the cell F (Smith *et al*. 1994).

Panoquina ocola was first recorded from Trinidad by Kaye (1914), from a Trinidad specimen in the Godman collection. Sheldon (1936) includes this species in his Tobago list on the basis of a Speyside record by A. Hall and a specimen which he collected himself. However, there are no specimens of this species from Tobago in the NHM, where the Sheldon collection and many of Hall's Hesperiidae are deposited, nor in the Booth Museum, where the remainder of Hall's collection is held, so *P. ocola* needs confirmation as a Tobago species.

Plate 13. *Panoquina ocola* (male), Andrews Trace, 8.x.1994. Scale in mm.

Plate 14. *Panoquina ocola* (male) UNS, St. Benedict, 16.x.1993. Scale in mm.

Sexes similar. UPS brown with white hyaline spots. UNF dark brown basally, light brown on costa, and distal half. UNH light brown; veins may or may not be darker; paler streak on vein 2; indistinct diffuse row of pale or mauve spots in spaces 3 to 7, usually distinct in 3,4 and 7 but may be absent altogether. Evans (1955) describes the normal form as not having any spots UNH, but most Trinidad material has at least a trace of spots. One exceptional male specimen (St. Benedict, 26.ii.1994, MJWC) has no trace of the UNH line of spots, but the cell and spaces 2-7 are dusted with light blue. F (male) 16-17 mm; (female) 17-18 mm. Illustration of (male) UPS in Lewis (1973, plate 22.22); (male) in Riley (1975, plate 24.14). The absence of a cell spot (rarely present as a dot over the spot in space 2, more evident UNF than UPF) distinguishes *P. ocola* from other members of the genus except *P. panoquinoides*, which is much smaller.

Plate 15. *Panoquina ocola* (male), "sunbathing", St. Benedict, 16.x.1993.

This is a common and widespread species, found throughout Trinidad in open disturbed areas and forest and swamp margins. Adults come readily to flowers, such as *Bidens pilosa* and *Eupatorium* (s.l.) spp. I have one specimen taken at light (Curepe, xii.1981). Although I have records of nearly 30 Trinidad specimens, I found only one in Lamont's collection and four in the NHM. Could it have become more common in recent years?

Wolcott (1951) records the observations of T.H. Jones who reared this species from sugarcane and *Hymenachne amplexicaulis* (Poaceae) but failed to distinguish the larvae from those of *P. lucas*, the commonest skipper on sugar cane in Puerto Rico. It has been noted once as a pest of rice in Mexico (Bell 1942).

247. O2/5 *Panoquina hecebolus* Scudder 1872

In Mexico this species seems quite common, and can be found from there south to Paraguay (Evans 1955). Kaye (1921, 1940) did not record this species from Trinidad. Since there is a male collected in Maraval in ix.1891, presumably by S.J. Kaye, then W.J. Kaye must have seen this specimen, but may well have confused it with the last species. There are no specimens from the W.J. Kaye collection in the AME. The first record from Trinidad is in Box's (1953, 1954) lists of sugar cane insects.

Plate 16. *Panoquina hecebolus* (male) UNS, Curepe, 7.x.1979. Scale in mm.

Sexes similar, but male with more pointed forewings, and F markings less pronounced and slightly yellow. UPS dark brown with yellow-white hyaline markings in space 2, 3, lower cell (against base of space 2), 6-7 (absent in male), and white spot in space 1B. UNS brown with UPS markings repeated. F (male), (female) 18 mm. The plain brown UNS distinguishes this species from other members of the genus. *Panoquina ocola* is similar and some specimens have the UNS unmarked, but *P. hecebolus* has a cell spot not normally present in *P. ocola*. Critical male specimens can be checked by brushing off the scales from the genitalia to show the uncus arms, which are blunt in *P. ocola* and pointed in *P. hecebolus*.

Although not as common as *P. ocola*, this species is widespread and regularly encountered in open disturbed situations and forest margins. Adults come readily to flowers. I have taken one female at light (Curepe, x.1979, IIBC).

Box (1953, 1954) lists this species from sugar cane in Trinidad, and in the NHM there are three females reared from sugar cane by him (ix.1952).

248. O2/8 *Panoquina lucas* Fabricius 1793

This species appears in the literature, including Evans (1955), Cock (1982), Smith *et al*. (1994) as *Panoquina sylvicola* Herrich-Schäffer 1865, which is now considered a synonym of *P. lucas* (Robbins *et al*. 1996; Mielke and Casagrande 2002). This wide-ranging species is found from USA to Argentina (Evans 1955), and throughout the Caribbean except the Bahamas (Smith *et al*. 1994). Strangely, Kaye (1921, 1940) does not record this species from Trinidad, even though there are S.J. Kaye specimens from 1891 in the NHM, and there is a specimen from the W.J. Kaye collection in the AME ((male), Trinidad, 17.x.1920), which Kaye labelled as *Prenes ocola*. Thus, Evans' (1955) listing of three males and a female from Trinidad in the NHM is the first published record from the island. Sheldon (1936) records this species from Tobago on the basis of a specimen collected at Speyside by A. Hall; this specimen, a male collected ii.1932, is in the NHM, along with a pair from Roxborough collected by "F.d'A." (i.e. Frank d'Abadie) from Sheldon's collection.

Plate 17. *Panoquina lucas* (male) UNS, Textel Road, 11.x.1979. Scale in mm.

Plate 18. *Panoquina lucas* (female) UNS, St. Augustine, 27.ix.1981. Scale in mm.

Sexes similar, except with regards to the cell spot F. The male has a distinctive lower cell spot, very elongate and distally overlapping the base of the spot on space 2. In the female the cell spot is small and round, and overlaps the spot in space 2. UPS dark brown with white hyaline markings in cell, spaces 2 (elongate towards margin on lower angle), 3, 6 and sometimes 7; elongate white marking in lower space 1B. UNS brown; the spot in space 1B UNF slightly larger than on UPS. UNH brown, with a purple flush of varying intensity except in space 1A-1C, usually stronger in female, and sometimes also on distal portion of UNF. A distinctive line of small pale spots, usually with a blue or purple tint, runs from space 2 to space 7, in a straight line directed towards the costa just before apex. F (male) 19 mm, (female) 18-19 mm. Illustration of (male) in Riley (1975, plate 24.10).

Like *P. hecebolus*, this species is regularly encountered in open disturbed situations, and comes readily to flowers, such as *Eupatorium* spp.

Jones and Wolcott (1922) treat this species as *Prenes nero* Fabricius due to a mis-identification (Wolcott 1951). Jones and Wolcott (1922) provide a detailed description of the life history and illustrate the larva and pupa with line drawings. This illustration of the larva is reproduced in Wolcott (1951). Dethier (1939, 1942) describes the ovum, seven larval instars and the pupa of this species which he reared in Cuba (as *Prenes nero sylvicola*). The larval food plants noted in Puerto Rico are "sugar cane, bamboo, malojillo grass [*Brachiaria mutica*] and Johnson grass [*Sorghum halepense*]", and in Costa Rica, Janzen and Hallwachs (2001) record larvae from *Oryza latifolia* and *Panicum maximum*. Brown and Heineman (1972) reproduce the description from Jones and Wolcott (1922) although they attribute it to Jones' notes. They note that this description differs only in minor details from notes on the life history in Jamaica which T. Turner provided to them. Turner reared his material on pimento grass, *Axinopus compressus*, but it is not clear whether this is a natural host plant, or only a host plant used to rear ova laid by a captive female.

Jones and Wolcott (1922) note that this is the most common hesperiid larva attacking sugar cane in Puerto Rico, yet it is heavily attacked by parasitoids, to the extent that it is not a pest. The commonest of these is an egg parasitoid, *Trichogramma minutum* Riley (Trichogrammatidae), although it should be noted that *T. minutum* is a species complex (e.g. Bare 1935). This was the only egg parasitoid observed by T.H. Jones in 1912-14, but subsequently *Ooencyrtus prenidis* Gahan (Encyrtidae) has been recorded (Gahan 1946; Wolcott 1951). Jones and Wolcott (1922) also record an eulophid, *Ardalus antillarum* Gahan, noting that the larvae "issue from the caterpillars and form naked black pupae nearby, 16 individuals having been observed to come from one large larva". From what is now known of this group of parasitoids, it would be expected that the larvae actually develop as external parasitoids on the paralysed host, and do not emerge from within the host. The larvae are also attacked by *Cotesia prenidis* Muesebeck, which the wording in Jones and Wolcott (1922) implies to be a gregarious species, and one of the social wasps, *Polistes crinitus* Felton, was recorded to attack a pupa. This species is also recorded to attack *P. lucas* (mis-identified as *P. nero*) in Jamaica (Gowdey 1924).

I have reared this species from larvae collected on maize (Golden Grove, vi.1982) but did not record details. However, the description in Cock (2001) of larvae collected and reared on *Panicum maximum* in Nevis, may help to recognise this species in Trinidad.

249. O2/12 *Panoquina fusina fusina* Hewitson

This variable species is treated as five subspecies by Evans (1955), but there is no clear geographical division of four of these suggesting that more than one species may be involved. Thus, ssp. *jumbo* Evans is restricted to Jamaica but (see below), while the other four ssp. are widespread on the mainland of the Americas: ssp. *evansi* from Texas (TL) and Guatemala, ssp. *sonta* from Panama (TL) and Colombia, ssp. *fusina* Hewitson from Colombia, Guyana, Peru, Bolivia, Upper and Lower Amazon (TL Santarem), ssp. *viola* Evans from Honduras, Colombia, Bolivia, Brazil (TL Rio Grande) and Paraguay.

In Cock (1982) I treated this species as the two subspecies: *P. f. evansi* Freeman and *P. f. sonta* Evans. I have now reviewed Evans (1955) treatment against the types and collection of the NHM. I conclude that based on Evans' treatment, there is just one subspecies in Trinidad, *Panoquina fusina fusina*, which occurs in two different forms: *fusina* Hewitson (which I treated as ssp. *evansi*) and *fufidia* Hewitson (which I treated as ssp. *sonta*). Form *fusina* has the UNH line narrow, c. 1mm, maculate, pale purple apart from the section in space 1C which is white; this line is faint, wider and more diffuse in some specimens. The Trinidad specimen in the NHM (ex. J.J. Joicey coll.) which Evans treated as *evansi* is an extreme of this

type, with the UNH bar broad, c. 2 mm, but very diffuse, indistinct purple; there is nothing comparable in the NHM series of *fusina*, but some of my Trinidad specimens of f. *fusina* approach it. Form *fufidia* has a broad, white line UNH, interrupted by the veins which are brown, and tapered in space 1C. Evans states that the two forms occur together and that they intergrade. While I agree with the former, the Trinidad material before me does not obviously support the latter - the two forms seem discrete, yet I can see no clear difference in the genitalia, and so follow Evans' treatment. Rearing from known parentage would help to elucidate the relationship of the two forms.

Plate 19. *Panoquina fusina* f. *fusina* (male) UNS, Grande Ravine, 13.ix.1980. Scale in mm.

Subspecies *viola* and *jumbo* both have a strong purple flush UNH and apex UNF, which is not seen in Trinidad specimens. Subspecies *sonta* has a solid, white line UNH from vein 1B to costa, wider at vein 2 (3mm) than costa (2 mm). Brown and Heineman (1972), Riley (1975) and Smith *et al*. (1994) note that although Evans described ssp. *jumbo* from Jamaica on the basis of two females in the NHM (Evans 1955; Riley 1975, plate 24.12), this does not appear to be a Jamaican species. Brown and Heineman (1972) suggest the specimens may actually have come from Trinidad or north-east South America, but given the strong purple flush UNS in the two specimens of *jumbo*, Trinidad seems an unlikely provenance. Riley (1975) suggests that the specimens fall within the range of ssp. *fusina*, matching specimens from Brazil, and Smith *et al*. (1994) agree. Evans (1955) considered *jumbo* a modification of *viola*, and the purple flush UNS in common would seem to support this view.

Plate 20. *Panoquina fusina* f. *fufidia* (female) UNS, Cat's Hill, 19.ix.1982. Scale in mm.

This species might be confused with *P. lucas* and possibly with *P. evadnes*. *Panoquina lucas* has a line of purplish spots UNH similar to some specimens of f. *fusina*. However, *P. lucas* is a smaller species, and the male has a very distinctive F cell spot, elongate and basal to the spot in space 2; the female has a normal cell spot over the base of the spot in space 2, whereas that of *P. fusina* is slightly basal to the spot in space 2. *Panoquina evadnes* is larger than *P. fusina*, the UNH white line is broader, and the cell spot fills the width of the cell, whereas that of *P. fusina* is only in the lower half of the cell. F f. *fusina* (male) 21-22 mm, (female) 24 mm; f. *fufidia* (male) 21-22 mm, (female) 23 mm.

Plate 21. *Panoquina fusina* f. *fufidia* (male) at rest, Bush Bush Island, 7.v.1995.

Form *fusina* is commoner than *fufidia* in Trinidad (15 records to 9), and while *fusina* is found in both the north and south of the island, I have records of *fufidia* from the south only. They do occur together, e.g. on 19.ix.1982, I captured two male *fusina* and a male and female *fufidia* at flowers of *Austroeupatorium inulaefolium* in Cat's Hill. This species is much more closely associated with forest situations than others of the genus in Trinidad, and seems to be significantly commoner in the South (Morne Diable, Moreau, Rock, Parrylands, Grande Ravine, Cat's Hill, Bush Bush Island) than the north (Morne Bleu, El Tucuche). Males are collected more frequently than females (21 males to 3 females), and most captures are made at flowers, usually eupatorium.

Moss (1949) illustrates a striped larva, but left no notes about the life history or food plants, and there are no preserved early stages associated with this name in the NHM. Riley (1975) provides notes based on Moss's original figure. He describes a grey-green larva, "with a pair of subdorsal yellowish stripes on either side and grey beneath; head large, grey, rimmed black with a vertical black frontal stripe and a curved black stripe on each cheek."

250. O2/15 *Panoquina evadnes* Stoll 1781

This large and distinctive species is widespread from Guatemala to Argentina (Evans 1955). It was recorded from Trinidad first by Crowfoot (1893) as *Proteides evadnes*.

Plate 22. *Panoquina evadnes* (male) UNS, Waller Field, 2.xii.1980. Scale in mm.

Sexes similar; male has a grey three part brand in lower 1B, upper 1B and 2 forming a slightly interrupted line. UPS dark brown with UPF hyaline white spots in spaces 2, 3, 6, usually 7 and sometimes 8; the hyaline spot in cell extends across the width of the cell and is distinctly yellow; white spot in lower space 1B. UNF brown. UNH chestnut brown, except spaces 1A-1C blackish brown; a sharply marked broad silver-white line from vein 1B to vein 8, across the apex of the cell; the spot in the distal part of the cell is joined to the silver-white line in the male, but slightly separated in the female; a yellow-white mark in space 8 is displaced towards apex. F (male) 22-23 mm, (female) 25 mm. Illustration of UNS in Lewis (1973, plate 84.39).

The male is the only member of the genus with a brand. The chestnut UNH with a broad silver-white line should serve to recognise this species. It is superficially similar to the slightly smaller *P. fusina fusina* f. *fufidia*, but the UNH line of that species is narrow, more diffuse and with dark veins. Furthermore the cell spot of *P. fusina* is only in the lower cell, whereas that of *P. evadnes* fills the width of the cell.

This species is quite uncommon in Trinidad. I have records from scattered localities (Forest Reserve, Manzanilla, Maraval, Palmiste, Port of Spain, St. Augustine, Waller Field) during the months August to January. Most of SAS's 10 specimens are from southern Trinidad. It comes to flowers such as lantana, but not frequently to eupatorium.

Moss (1949) often reared this species from sugar cane. His notes on the larva and pupa are very brief, but sufficient to suggest the early stages do not differ markedly from other grass feeding species of this group. Some of his preserved early stages are in the NHM. Three cast L5 skins have an almost oval head, wider at the base; light, translucent brown in colour (perhaps green in life), with a faint (or very faint) pair of lines from the apex to the stemmata, one more or less straight, the anterior one convex, running roughly parallel to the clypeal sutures. The anal plate is semicircular, covered with erect pale setae. The emerged pupa is elongate and smooth with a strong frontal spike, slightly upturned at apex; the proboscis sheath extends about 3 mm beyond the wing cases to the second visible abdominal segment; the colour is light translucent brown, and so the pupa was probably plain pale green in life; no associated white waxy powder.

251. O3/2 *Zenis jebus janka* Evans 1955

This is one of two species of *Zenis*, the other, *Z. minos* Latreille, having an apparently disjunct distribution, being recorded from Mexico, Honduras and South Brazil (Evans 1955). *Z. jebus* Plötz occurs in three subspecies: *janka* Evans from central America (TL Panama), south to Peru, the Amazon and the Guianas, *beckeri* Mielke and Casagrande (misidentified as *melaleuca* Plötz by Evans 1955) from Venezuela, Colombia, Ecuador and Brazil, and *jebus* from southern Brazil (TL) and Paraguay. First recorded from Trinidad by Crowfoot (1893) as *Carystus minos* Latreille (a misidentification, prevalent in much of the literature).

Plate 23. *Zenis jebus* (male), Maracas Valley, 10.iii.1982. Scale in mm.

Plate 24. *Zenis jebus* (female) UNS, Textel Road, 5.x.1979. Scale in mm.

Sexes similar. UPS black, with white hyaline markings F in lower cell (elongate, alongside spot in space 2), spaces 2, 3, 4, 6, 8 (usually present in Trinidad material, although according to Evans (1955) this spot is absent in this subspecies) and 9, the last five formed a semi-circle; UPH a white discal band from space 2 to space 6. UNF as UPF, but with a purple flush of varying intensity in apical area, and the veins in this area slightly pale. UNH brown with a purple flush except in spaces 1A-1C; a broad cream-coloured discal band from vein 2 to apex; a pale spot on termen in line with discal band; basal half of vein 1B pale. F (male) 18-19 mm, (female) 18-20 mm. The white/cream discal band UPH and UNH,

arrangement of spots F and colouring make this species very distinctive, so that it can be mistaken for no other Trinidad skipper.

Plate 25. *Zenis jebus janka* (male) at rest on *Lantana camara*, Mt. Tamana, 12.xi.1995.

This conspicuous species is normally not very common, but may be over-represented in collections because it is so distinctive and recognisable in the field. Most of my records are from the Northern Range, where it seems to be associated with forested areas. In October 1979 it was common on the eupatorium flowers along the road to Morne Bleu Textel.

This species has not been reared in Trinidad, but Janzen and Hallwachs (2001) have reared it once from a larva on a bamboo, *Rhipidocladum racemiflorum* (Poaceae), but do not show the early stages.

252. O6/1 *Nyctelius nyctelius nyctelius* Latreille 1824

There are two species in the genus *Nyctelius*, the other being *N. paranensis* Schaus, which is unmarked brown above, and restricted to south-east Brazil (Evans 1955). *N. nyctelius* is much more widespread, from Guatemala to South Brazil and occurring on many of the Caribbean Islands (Evans 1955). Ssp. *agari* Dillon was described from Dominica, and occurs in Dominica and St. Lucia, although it may be an extreme form of the general tendency of Caribbean material to have the pale areas UNH a darker purple (Smith *et al*. 1994; Cock 2002).

Kaye (1914) considered this species not rare when he included it in his "additions and corrections" and also listed a G.B. Longstaff specimen from Maraval, 19.xii.1906. He includes it again as *Prenes ares* Felder (a synonym) in the Addenda to his catalogue (Kaye 1921), noting that it occurs in many localities, and probably everywhere that sugar cane is grown since that is the food plant. Kaye (1940) corrects this pointing out the synonymy. A specimen collected by A. Hall at Speyside is the basis of Sheldon's inclusion of this species in his list of Tobago butterflies (Sheldon 1936); there is also a W.J. Kaye specimen from Tobago in the AME.

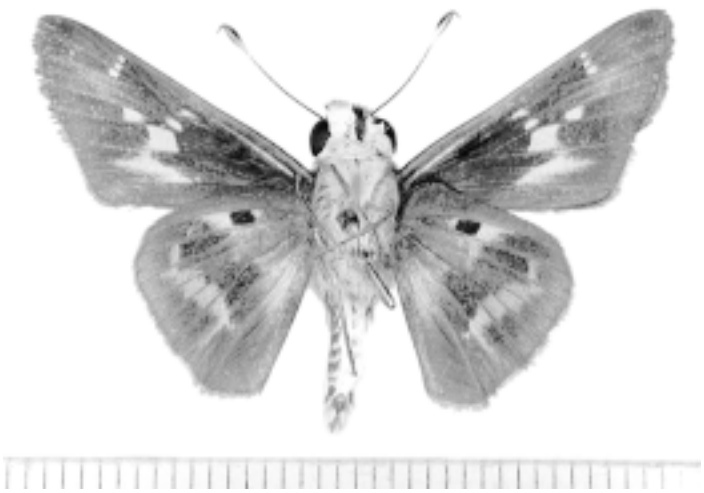

Plate 26. *Nyctelius nyctelius nyctelius* (male) UNS, Textel Road, 7.x.1979. Scale in mm.

Sexes similar; the male has more pointed fore wings, the spot in space 2 F is relatively less broad, and the pale areas UNH have a lilac flush which is almost absent in the female (see also the discussion of this species in Cock (2002). UPS brown with white hyaline spots: 2 (large, quadrate), 3, a row of dots in 6-8, and a double cell spot; white spot in space 1B: a variable, sometimes indistinct triangular spot above vein 1, below inner margin of spot in space 2, and a dot sometimes present against vein 2 before distal margin of spot in space 2. UNF basally brown; costa and distal $^1/_3$ light brown; a large irregular white spot in space 1B. UNH brown with light brown markings: space 1A, basal part of wing, from $^1/_3$ in space 1B to $^2/_3$ in space 7, post-discal band from vein 1B to vein 6 (narrower in spaces 5 and 6, paler in space 1C), and diffuse margin; a dark spot at $^1/_3$ in space 6. F (male) 16-17 mm, (female) 18-20 mm. Illustrations of (male) and (female) UNS in Lewis (1973, plates 84.16 and 84.18); (male) from St. Vincent in Riley (1975, plate 24.16). The double cell spot, dark spot in space 6 UNH and general appearance of markings UNH will serve to distinguish this species.

Plate 27. *Nyctelius nyctelius nyctelius* (male), "sunbathing" on bougainvillea, St. Benedict, 27.ii.1994.

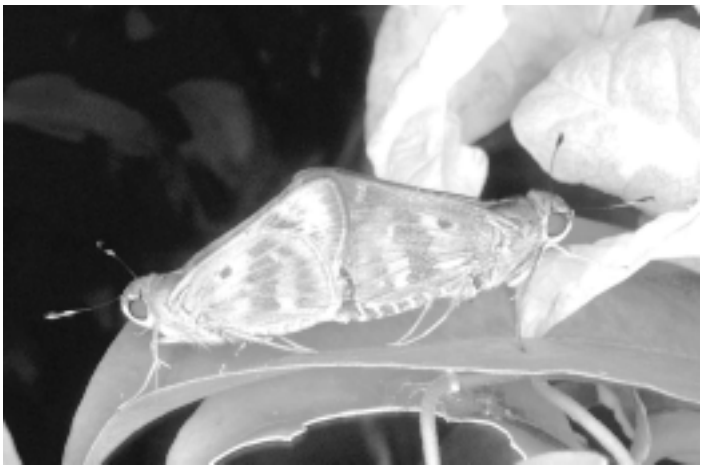

Plate 28. *Nyctelius nyctelius nyctelius* in cop. on bougainvillea, St. Benedict, 27.ii.1994. The male, on the right, has a lilac flush to the pale areas UNH which is absent in the female, on the left.

This is a common and widespread species in Trinidad, coming readily to flowers such as eupatorium.

Dethier (1939, 1942) describes all life history stages, based on material he reared in Cuba from sugar cane, on which it was more common than on native grasses.. He found this species to develop in seven instars (see comments in Introduction). The pattern and colouring of the head is comparable to that which I found in Nevis. Moss (1949) reared this species from sugar cane and a wild cane, and Box (1953, 1954) records it from sugarcane in Trinidad (there are two males and a female reared from sugar cane in Trinidad by H.E. Box (ix.1952) in the NHM). Janzen and Hallwachs (2001) record it from *Panicum maximum* and *Rottboellia cochinchinensis* (Poaceae). I have reared this species from maize, *P. maximum* and *Setaria barbata* in Trinidad and found a larva on *P. maximum* in Nevis (Cock 2001). It probably uses a variety of broad leafed grasses. I have described the larva from Nevis, and also illustrated a Trinidad specimen in Cock (2001).

Dethier (1942) reports that early instar larvae are found near the tips of young leaves, and the larvae cause most damage to small plants, but the older larvae are able to complete development on coarser, more pubescent foliage than other species.

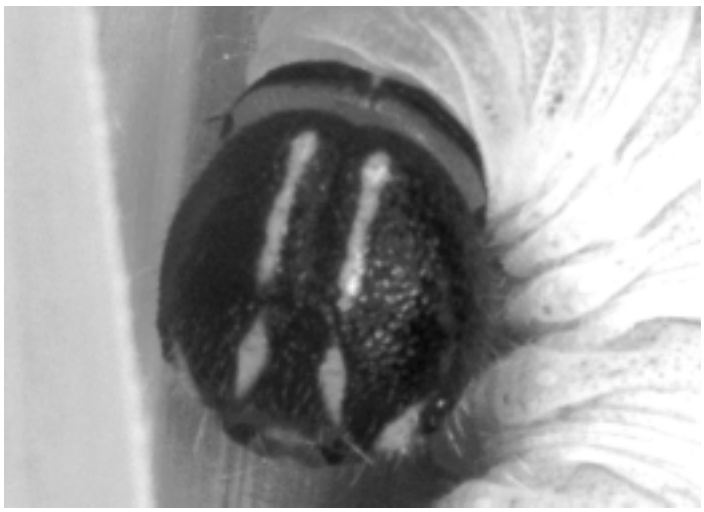

Plate 29. *Nyctelius nyctelius nyctelius* L5 detail of head, collected on *Panicum maximum*, St. Benedict, 11.x.1994 (ref. 93/7).

The fifth instar larva (Plate 21 in Cock 2001) grows to 20 mm or more. Head rounded; predominantly black, narrow yellow lines from near vertex along central suture, continued to labrum apart from a small gap; stemmata in kidney-shaped black marking, within and overlapping the dorsal and ventral margins of a yellow spot; T1 with narrow black dorsal plate and spiracle; legs black; body whitish green, smooth; a few pale setae on the anal plate. More observations from Trinidad and the mainland would be desirable, but it does appear that larvae from Trinidad are distinct from those from the northern Caribbean islands, albeit based on a similar plan of markings. The correlation of larval markings with adult markings and the status of ssp. *agari* need further study (Cock 2002).

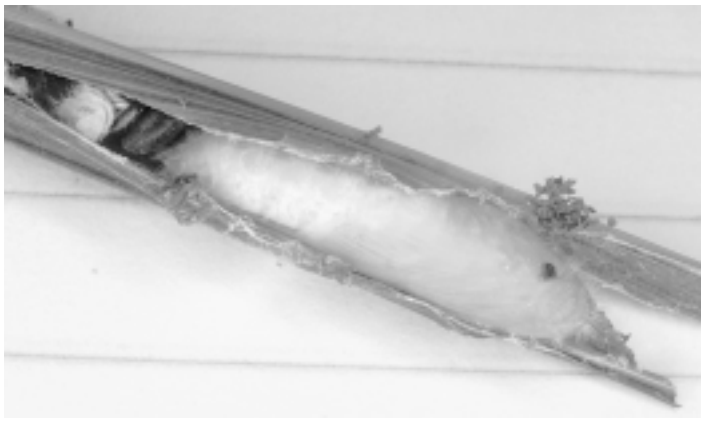

Plate 30. *Nyctelius nyctelius nyctelius* pupa, 22 mm, collected as larva on *Panicum maximum*, St. Benedict, 11.x.1994 (ref. 93/7).

The pupa is translucent; rounded in outline; with long forward-directed pale setae on head; thorax apart from the wing cases and appendages, and abdomen are covered with short, pale erect setae, those on thorax forward directed and those on the abdomen backward directed; proboscis sheath extends 5 mm beyond the wings; spiracle T1 is oval, large and dark brown; other spiracles concolorous. The pupal shelter is formed by rolling a large leaf; the chamber is lined with silk, but no white waxy powder.

There is an emerged pupa from Moss's collection in the NHM. Unlike Trinidad material, there are black markings on the head: a large roughly oval irregular spot filling the frons, a stripe down each eye, a broad band dorsally across the posterior margin of the collar, and a diffuse spot dorso-laterally just posterior to this on T1.

In Puerto Rico, where *N. nyctelius* is a minor pest of sugar cane (Jones and Wolcott 1922), the ova are parasitised by a trichogrammatid referred to as *Trichogramma minutum*, while the larvae are attacked by *Cotesia prenidis* and *Microbracon* sp. (cf. *Panoquina lucas*). In Cuba, Dethier (1942) records parasitism by *Hemiteles* sp. (Ichneumonidae, ?hyperparasitic), *Microgaster* sp. and *Cardiochiles* sp. (Braconidae), disease due to a bacterial "wilt", and that in addition to spiders, ants and lizards, a pentatomid bug *Mormidea pictiventris* Stål and a frog, *Hyla septentrionalis* Bounlingir are important predators. Box (1954) lists *Brachymeria orseis* Walker (Chalcididae) attacking *N. nyctelius* in Trinidad; *Brachymeria* spp. are solitary or gregarious pupal parasitoids.

253. O8/1 *Vacerra bonfilius litana* Hewitson 1866

Only *V. bonfilius* Latreille from this genus of seven species is found in Trinidad and Tobago. Evans (1955) divides it into four subspecies: *aeas* Plötz from Central America to Colombia, *litana* Hewitson from Venezuela, the Guianas and the lower Amazon, *bonta* Evans from Bolivia, and *bonfilius* from Peru to southern Brazil and Paraguay.

This species was first recorded from Trinidad by Kaye (1904), on the basis of a specimen which he captured in July 1901. A. Hall captured this species at Speyside (Sheldon 1936), and this material is in the NHM.

Plate 31. *Vacerra bonfilius litana* (male) UNS, Cumberland Hill summit, 8.viii.1981. Scale in mm.

Sexes similar, but male has inconspicuous grey brands below base of vein 2 and slightly basal to this above vein 1; female larger with wings more rounded. UPS dark brown; with white hyaline spots UPF in cell (across width), 2, 3, 4, 5, 6-8 in a row; white spot in space 1B UPF; UPH a row of white spots in spaces 3-6, of which that in space 5 is relatively large and quadrate, whilst the others are more diffuse; diffuse white spot end cell. UNF dark brown basally, brown discally; the spot in space 1 extends across the width of the space and extends distally. UNH brown in spaces 1A-1C; remainder dark brown with irregular light brown bands across base of wing, along margin, and a narrow discal band in spaces 2-3; diffuse white spot end cell; between the pale marginal band and the dark brown discal area, white spots in spaces 4 (small), 5 (large, as UPS), 6 (narrow); distal to the white spot in space 6 a conspicuous dark brown spot. This combination of white spots and the dark spot in space 6 is distinctive and characteristic, enabling this species to be readily recognised in Trinidad. F (male) 18 mm, (female) 20 mm.

This is an occasional species in Trinidad, particularly associated with less disturbed forest areas. Several captures (e.g. Brigand Hill, Cumberland Hill, Fort George, Mt. Tabor) suggest that the males hill-top. It seems commoner in the north than the south.

The biology of this species seems to be unknown, but Janzen and Hallwachs (2001) have reared two other members of the genus from a bamboo and an unidentified Poaceae, so the food plant of *V. bonfilius litana* is likely to be a bamboo.

***Niconiades* Hübner 1821**

Three members of this neotropical genus of 13 species are found in Trinidad. They form a compact group with a distinctive wing shape and white stripe UNH. Two are common forest species, but the third is rare. The only one for which the food plant is known feeds on *Olyra latifolia*.

254. O11/1 *Niconiades xanthaphes* Hübner 1821

The type locality of this species is unknown; it is found from Mexico to Paraguay, and seems to be particularly common in Trinidad (Evans 1955). It was first recorded from Trinidad by Kaye (1904), on the basis of a specimen which he captured in June 1898. Sheldon (1938) took a specimen at Speyside, which is in the NHM.

Plate 32. *Niconiades xanthaphes* (male), Andrews Trace, 9.iv.1980. Scale in mm.

Plate 33. *Niconiades xanthaphes* (male) UNS, Mt. Tabor, 11.iv.1982. Scale in mm.

Sexes similar, but male has relatively conspicuous grey brands at the base of space 2, immediately under vein 2 and above vein 1. UPS dark brown; white hyaline spots in cell (double, joined in most specimens, but touching in some), and spaces 2, 3, 6, 7 and

sometimes 8; white spot in lower space 1B; overlay of blue-green setae on body UPS and basal quarter UPF, and basal half UPH, extending along vein 1A and termen. UPH with adjacent equal hyaline white spots in spaces 2 and 3. UNF brown; yellow patch on costa next to cell spots and light brown along costa basal to this; extensive white patch across width of space 1B UNF. Strong white line UNH from vein 1B to mid costa and a pale mark in line on vein 1A. The hyaline spot in space 2 is within the white discal line, and that in space 3 is partially within the line. F (male) 17 mm, (female) 17-19 mm. Illustration of (male) UPS in Lewis (1973, plate 84.12). The key features to distinguish *N. xanthaphes* from *N. nikko* are the blue overlay UPS (as opposed to green); white hyaline spots (as opposed to yellow), only two hyaline spots H (as opposed to 3 or 4) which are within or partially within the white discal line (as opposed to partially within or beyond). The separation of *N. xanthaphes* from *N. gladys* is discussed under the latter species.

Plate 34. *Niconiades xanthaphes* adult killed by crab spider, St. Benedict, 16.x.1993.

This is a common and widespread species in forest areas, including disturbed forest, extending to at least 2000 ft. in the Northern Range. It is the commonest and most widespread member of the genus in Trinidad.

I have twice reared this species from larvae collected on *Olyra latifolia* in the forest behind St. Benedict, and SAS has also reared it from this food plant. At least six other Hesperiinae feed on this food plant genus in Trinidad, including *Arita arita* Schaus, *Morys valerius* Möschler, *Orses cynisca* Swainson and *Saturnus saturnus* Fabricius (MJWC unpublished). Janzen and Hallwachs (2001) have recorded *N. xanthaphes* from the same food plant in Costa Rica. The larva which they illustrate has the head uniformly dark brown, shiny rugose, and is not obviously the same as that which I found in Trinidad.

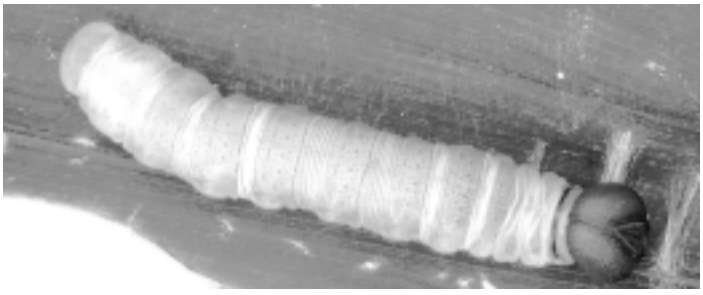

Plate 35. *Niconiades xanthaphes* L5, 20 mm, collected on *Olyra latifolia*, behind St. Benedict, 1.v.1995 (ref. 95/3).

The larvae make a simple leaf roll. The fifth instar larva measures 15 mm when newly moulted and grows to at least 20 mm. The head is rounded triangular in section but relatively narrow, indented at the vertex; mat, rugose, with scattered short setae; brown; slightly darker brown area from the epicranium apex to the stemmata, and along the outside of the clypeal sutures; clypeal sutures narrowly dark brown. In one specimen (ref. 96/2A) the clypeus and adjacent area is dark. T1 shiny, brown plate on posterior margin. Body uniform whitish green. Spiracles pale, inconspicuous. Legs light brown, prolegs concolorous with body.

Plate 36. *Niconiades xanthaphes* L5 detail of head, collected on *Olyra latifolia*, behind St. Benedict, 1.v.1995 (ref. 95/6).

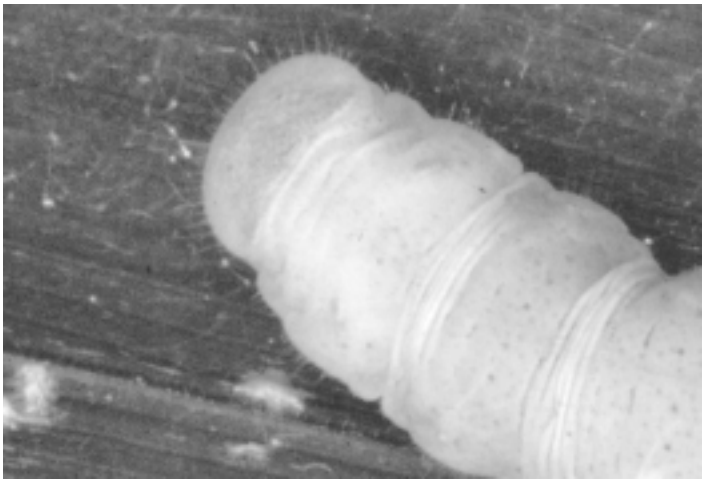

Plate 37. *Niconiades xanthaphes* L5 detail of anal plate, collected on *Olyra latifolia*, 1.v.1995 (ref. 95/3).

A fourth instar larva provisionally associated with this species (ref. 95/6), measured 13 mm. The head was similar in shape to the L5, and plain light brown with a faint shading of darker brown along the epicranial and clypeal sutures, and below apex towards the stemmata which are dark. T1 with shiny black plate on dorsal margin. Body dull translucent green; spiracles pale, quite conspicuous, legs as L5. It moulted to the fifth instar which matched that above, but died before pupating.

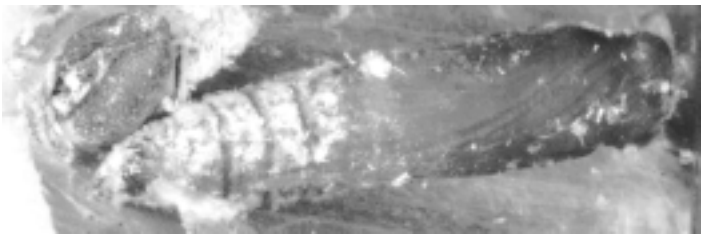

Plate 38. *Niconiades xanthaphes* pupa, 16 mm, collected as larva on *Olyra latifolia*, behind St. Benedict, 1.v.1995 (ref. 95/3).

Pupa 16 (ref. 95/3) to 20 mm (ref. 96/2A). Smoothly contoured, although the bulbous eyes make the head seem flattened; proboscis sheath extends 3-4 segments beyond wing cases. Brown thorax; abdomen green becoming pale brown, with faint dorsal line. White waxy powder on abdomen, in patches on prothorax and eyes; setae along the anterior margin of the eyes and between the eyes accumulate the white waxy powder. Spiracle T1 brown; other spiracles inconspicuous.

255. O11/2 *Niconiades gladys* Evans 1955

Apart from my records from Trinidad (Cock 1982), this species is only recorded from the type locality, Cananche, Cundinamarca, Colombia (Evans 1955).

Plate 39. *Niconiades gladys* (male), Textel Road, 24.x.1979. Scale in mm.

Plate 40. *Niconiades gladys* (male) UNS, Textel Road, 24.x.1979. Scale in mm.

The species is very close in colouring and markings to *N. xanthaphes*, but the two can be clearly separated by the following combination of features: the two cell spots are clearly separate in *N. gladys*, whereas in *N. xanthaphes* they are more or less touching or are joined; the male sex brands are smaller, black and inconspicuous in *N. gladys* whereas those of *N. xanthaphes* are grey and rather conspicuous; the margin H is convex in *N. gladys*, whereas in *N. xanthaphes* it is concave in the male and straight or slightly concave in the female; and the H spots of *N. gladys* are smaller.

I still have just the two records of this species, both from the Morne Bleu Textel Road, a male (24.x.1979) and a female (28.viii.1980). Lacking further records, I suggest this is a species restricted to the higher parts of the Northern Range.

256. O11/6 *Niconiades nikko* Hayward 1948

This widespread species was described from Argentina and occurs from there north to Mexico (Evans 1955); it seems especially common in Trinidad. It was first recorded from Trinidad by Kaye (1904) as *Niconiades caeso* Mabille (a misidentification) without comment.

Plate 41. *Niconiades nikko* (male), Arima-Blanchisseuse Road, milestone 10.5, 5.x.1979. Scale in mm.

Plate 42. *Niconiades nikko* (male) UNS, Arima-Blanchisseuse Road, milestone 10.5, 5.x.1979. Scale in mm.

Sexes similar, but the male has small dark brands at base of space 2 and immediately below vein 2; female is larger, the wings more rounded, the F spots larger and the H spots more pronounced. UPS dark brown with brownish green cilia mostly in basal areas; UPF with pale yellow hyaline spots in cell (double, almost joined in (female)), 2, 3, 6, 7 and usually 8; pale yellow spot in lower space 1B. UPH semi-hyaline pale yellow spots in 2, 3, 4 (in some females) and 5. UNF brown, with a khaki green gloss to the distal half in fresh specimens; the costa yellow-brown adjacent to cell spots, extending to base in some specimens. UNH brown with a green gloss, except in spaces 1B and 1C; a white or pale yellow line from vein 1C to costa just before apex; a white or pale yellow streak in space 1A adjacent to vein 1A, near margin; the yellow semi-hyaline spot in space 2 is either touching or partially within the discal line, that of space 3 is either touching or distal to the discal band. F (male) 18 mm, (female) 20 mm. To distinguish *N. nikko* from *N. xanthaphes* and *N. gladys*, see points under *N. xanthaphes*.

Plate 43. *Niconiades nikko* at *Lantana camara* flowers, Mt. Tamana, 12.xi.1995.

This species is common and widespread in forest areas, including secondary forests. Most records are at quite low altitude, although it certainly extends to over 2,000 ft.

This species has been reared from bamboo in Colombia (AME collection). There is an emerged pupa reared by A.M. Moss in the NHM with an associated L5 larval skin, but no indication of the food plant. The L5 head is oval, but wider ventrally; light brown with two dark stripes, one from the apex, laterally to the stemmata, the other parallel to the epicranial suture, touching the clypeal sutures. The pupa is uniform light brown, smooth, with no frontal spike. There are a few specks of white waxy powder on the posterior part of the abdomen, and more associated with the larval skin.

***Aides* Billberg 1820**

Three of the six species of *Aides* occur in Trinidad, but all are rare, two especially so. These species can be recognised by their large size and the distinctive silvery-white spots UNH.

257. O12/3 *Aides dysoni* Godman 1900

This species is found from Mexico to Ecuador and East to Trinidad (Evans 1955). When Evans (1955) listed a Trinidad male in the NHM, this was the first record from the island.

Plate 44. *Aides dysoni* (male), Trinidad, R. du B. Evans (specimen in NHM).

Male. UPS brown with hyaline white spots; brown brands above vein 1, below vein 2, above vein 2 and along cell in space 2. UNS brown with a chestnut tint to UNH and costa and distal half of UNF; UNS head and a spot on the costa against cell spot yellow-brown; conspicuous silver-white spot covering disc UNH from vein 1B to space 7, with a ground colour inclusion at end cell; small spot above the origin of vein 8.

Plate 45. *Aides dysoni* (female) UNS, Panama (specimen in NHM).

Female. Colouring similar to male, but the UNH is marked with scattered silver-white spots. In both sexes, the silver-white markings UNH are diagnostic.

I have not encountered this species in Trinidad. The male in the NHM has no locality data beyond Trinidad, and no date of collection but the collector was R. du B. Evans. There is no reason to doubt the validity of this record, but confirmation would be desirable. The food plants and life history are unknown.

257a. O12/4 *Aides brino* Stoll 1781

In the NHM collection there are single specimens from Honduras, Colombia, Venezuela, Guyana and French Guiana, together with a series reared in Belem by A. Miles Moss (Evans 1955); obviously it is very rare in collections.

SAS recently added this species to the Trinidad list, having captured a female at Aripo Savannah in February 1986. Since then he has captured a male (Forest Reserve, iv.2000) and two further females (Parrylands, x.1996). All his captures were on forest tracks, where the adults settle on the upper surface of leaves with their wings closed (SAS pers. comm.).

Plate 46. *Aides brino* (male) UNS, Brazil (specimen in NHM).

Male. UPS dark brown; white hyaline spots in spaces 2, 3 and cell (a double spot across width of cell); white opaque spot in space 1B; brands as *A. dysoni*; scattered orange setae across basal half UPF and UPH, densest on costa UPF; small light brown spot UPH middle of space 5, divided by dark sub-vein. UNS head, fore-femora, abdomen light brown. UNF chestnut brown on costa and distal half of wing; termen paler; pale brown spot on costa adjacent to cell spot; white spot in space 1B larger than UPS, extended towards margin. UNH chestnut brown, blackish brown in spaces 1B and 1C; silver-white spots on disc, from space 2 across base of space 3 and end cell, small spot middle of space 5, smaller spot submarginally in space 3.

Plate 47. *Aides brino* (female), Aripo Savannah, ii.1986, S. Alston-Smith (specimen in coll. SAS).

Plate 48. *Aides brino* (female) UNS of Plate 47 (specimen in coll. SAS).

Female. Generally similar to male, but larger and wings more rounded. UPS the orange hairs are more extensive, denser and more conspicuous; UPH spot in space 5 stronger. UNH with silver-white submarginal spots larger, and sometimes linked by a narrow spot in space 4 (not present in the Trinidad specimen).

Moss (1949) reared this species from larvae found on young bushy "bacába" and "pupunha" palms. Interpreting these names in the context of Moss's location in Belem, these species seem most likely to be *Oenocarpus distichus* and *Bactris gasipaes* respectively (Henderson *et al*. 1995). One species of *Oenocarpus* occurs in Trinidad, *O. bataua* v. *interrupta*, and five species of *Bactris* spp., including *B. gasipaes* so these are likely food plants for this species in Trinidad. The elongate white larva has a black spot behind the head, and is covered with white powder. The pupa he describes as being of "a strange unhealthy leaden colour, nearly black; it is elongate, with the proboscis sheath nearly reaching the cremaster, and an upturned hooked frontal spike." There are two empty pupae and associated larval skins from Moss's collection in the NHM. The L5 head is black with a short pale vertical stripe touching the clypeal sutures. One pupa lacks the frontal plate, but that of the other does not have a frontal spike, only a pair of bumps, suggesting there may have been some confusion in Moss's notes or labelling.

258. O12/5 *Aides aegita* Hewitson 1866

This species is found from Panama to Brazil; there is a long series in the NHM reared by A.M. Moss at Belem (the type locality), but otherwise it is quite uncommon (Evans 1955). It was first recorded from Trinidad by Crowfoot (1893) as *Proteides aegita*, and re-recorded by Kaye (1914) as *Paraides anchora* Hewitson (a synonym), from a specimen taken near Port of Spain by H. Caracciolo (now in AME ex W.J. Kaye collection).

Plate 49. *Aides aegita* (male) UNS, collected as larva on coconut palm, 17.ii.1982 (ref. 82/41C). Scale in mm.

Sexes generally similar; female significantly larger with more elongate wings, and male has three very short grey brands above and below vein 2 and above vein 1B; other differences detailed below. UPS dark brown with golden scales and setae on body, head and basal third of wings, much stronger and more extensive in female; basal half of costa UPF as far as cell spot reddish brown, overlaid with golden scales in female. Pale yellow hyaline spots

in spaces 2, 3 and across cell F; opaque pale yellow spots in lower space 1B UPF, and space 5 UPH. UNS head and fore femora yellow-orange, UNS abdomen pale yellow; rest of body UNS reddish brown. UNF black, costa and distal half of wing extending to vein 1 on margin reddish brown, overlaid with yellow-green scales; pale yellow spot in space 1B slightly larger than UPF. UNH matches distal half UNF, spaces 1A and 1C lack the overlay of yellow-green scales; space 1B black with yellow-green scales in basal half; variable silver-white reflective spots UNH: from vein 1B to base of space 3, widest at vein 2, small submarginal spots in spaces 3 and 4, that in space 4 closer to the margin; middle of space 5. Fringes H white from tornus to space 5 in male and to space 7 in female; fringes F white from tornus to space 2. F (male) 22 mm, (female) 26-27 mm. Illustration of (male) and (female) UNS in Lewis (1973, (female) plate 80.16, (female) plate 84.45 as *Paraides anchora*).

The arrangement of silvery-white spots UNH is distinctive. In *A. dysoni*, the discal spot reaches vein 2, not vein 1B as in *A. aegita*, the spots in spaces 3-5 are aligned along their distal margin, and the UNS is clearly reddish-brown, lacking the greenish yellow scales of *A. aegita*. The male of *A. brino* is immediately distinct with the silvery-white spots joined together. The arrangement of silvery-white spots in the female *A. brino* is clearly different: there are spots in cell and usually space 6 and sometimes space 7, which are absent in *A. aegita*; the staggered arrangement of the spots in space 1C - 3 (widest across the width of space 2, the spot in space 1C aligned with the distal end of the spot in space 2 and that in space 3 aligned with the basal end), whereas the corresponding spots in *A. aegita* are in line, and the spot is widest at vein 2.

There is an atypical female specimen in the NHM, taken by A. Hall (Northern Mountains xii.1938-i.1939); this specimen has no silver-white markings UNH, only a small white spot in the middle of space 1C adjacent to vein 2. There is a female in coll. SAS from Mayaro (iii.1993) which is transitional to this, having the white spot larger, and silver-white dots at the base of space 3, submarginally in space 3, and a larger spot in space 5.

Plate 50. *Aides aegita* (female) UNS atypical, Northern Mountains, xii.1938-i.1939, A. Hall (specimen in NHM).

Plate 51. *Aides aegita* (female) UNS atypical, Mayaro, iii.1993, S. Alston-Smith (specimen in coll. S. Alston-Smith).

I have seen Trinidad specimens from Caparo (female), F. Birch, in NHM), Palmiste (female) before 1915, N. Lamont in UWI; (male) 29.iv.1922, N. Lamont in RSM), Port of Spain (female), i.1897, Dr. Rendall, in NHM), St. Augustine (male), Santa Margarita Road, 22.x.1981, J. and F. Preston). SAS considers this species uncommon rather than rare, having scattered records, including one from El Tucuche, showing that this species will occur at all altitudes in Trinidad. There seems no reason for this species not to be widespread in Trinidad wherever coconut or other suitable palms are found. Nevertheless, although I have found larvae several times, I have never encountered adults in the field. June and Floyd Preston's male specimen from Santa Margarita Road was captured at lantana flowers, and I have no other information on the adult biology of this species.

Plate 52. *Aides aegita* adult (female), collected as larva on coconut, Lalaja Ridge, 6.v.1995 (ref. 95/16).

Moss (1949) notes that the larvae, which feed on coconut palm (*Cocos nucifera*), are very long, and surrounded by an abundance of white powder. Moss's L5 head capsules in the NHM are mostly covered with white waxy powder, and beneath this they are pale brown with dark markings of variable extent. Two dead pupae show the exit holes of a *Brachymeria* pupal parasitoid (Chalcididae).

In Trinidad, I have found larvae and pupae on coconut palm several times: Caura Valley, 17.xii.1981, ref. 81/25C; Lalaja Ridge 6.v.1995, ref. 95/16; St. Augustine, 17.ii.1982, ref. 82/41C; St. Benedict, 1.v.1995, ref. 95/5 and 4.v.1995, ref. 95/13), and once on Manila palm, *Veitchia merrillii*: St. Augustine, 2.xi.1981, ref.

81/12B. Apart from ref. 81/41C which was found in the crown of a felled 3m coconut palm, all larvae were collected from fronds of young palms while standing on the ground. SAS has reared this species from another, as yet unidentified palm (Moruga East, ii.1982).

Plate 53. *Aides aegita*, L4 detail of head, collected on coconut palm, St. Benedict, 1.v.1995 (ref. 95/5).

Larger larvae form a shelter from a single leaflet, rolling the edges downwards, held in place by a series of stout silk strands, and lined with white waxy powder. When disturbed, the larva will regurgitate a green liquid, presumably from the fore-gut. The female L5 grows to 57mm; the larva is elongate and covered with white waxy powder, so that the markings are not normally visible. Head 3.5mm wide, 4mm high; almost parallel sided in lower half, rounded over the epicranium, and slightly indent at vertex. The following is based on the dead larva of ref. 95/5 with the white waxy powder removed: head mat rugose, with very inconspicuous short pale setae; ground colour brown; clypeal sutures dark brown; a broad dark brown stripe down each side of the face on the epicranium, parallel to the epicranial suture and running to the outer corner of the clypeus, the stripe diffusely bordered, especially on the posterior margin; in other specimens (refs. 81/12B, 82/41C), the head is paler and the dark stripe not obvious. The body is green, but covered with white waxy powder and the only features evident are a dark lateral spot over the spiracle T1, and a larger dorso-lateral spot on T2; these spots seem to be diagnostic for this species. The anal plate is semi-circular on the posterior margin, flanged and with a fringe of long pale setae. The L4 and L3 larvae are similar, except that the centre of the face is shiny brown, without white waxy powder. L2 lacks the dark stripe on the head, which is light brown.

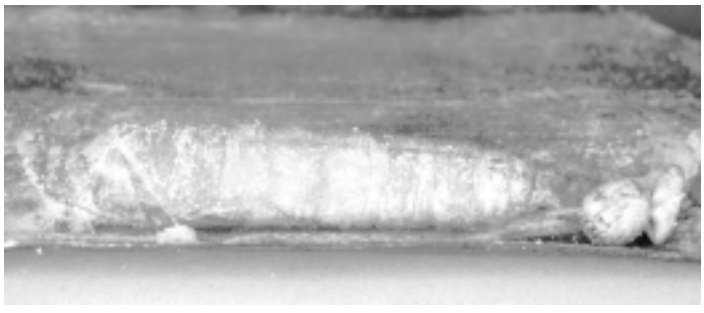

Plate 54. *Aides aegita* pupa, 34 mm, collected as larva on coconut palm, Lalaja Ridge, 6.v.1995 (ref. 95/16).

The pupal shelter is a rolled leaflet; the anterior and posterior ends of the shelter are blocked by a loose flocculence of silk and white waxy powder. The pupa is pale yellow-brown, and measures 34-35 mm. It is elongate and cylindrical, with a 3mm frontal spike, strongly curved upwards so that the apex is vertical; a tuft of erect white setae in front of the eye, and another behind; these setae trap white waxy powder; dorsally on the thorax some eight backward projecting setae and 4 forward projecting setae hold in place the silken girdle which supports the pupa; the proboscis sheath almost reaches or extends slightly beyond the cremaster tip, which is bent downwards. Pupation took 13-14 days.

One 8 mm larva corpse on coconut (St. Benedict, 4.v.1995, ref. 95/13) was associated with a flimsy 4.5 mm parasitoid cocoon, which subsequently emerged. The parasitoid has not been identified.

259. O13/1 *Xeniades chalestra chalestra* Hewitson 1866

Evans (1955) recognises two subspecies of *X. chalestra*: *pteras* Godman from Costa Rica, Panama, Colombia and Venezuela, and *chalestra* which is widespread in South America, as far south as Paraguay. It was first recorded from Trinidad by Kaye (1914), as *X. pteras* Godman, from a specimen taken by J.L. Guppy at Chaguanas, 5.xi.1913 (a female, now in AME ex coll. W.J. Kaye). There is an additional male in the NHM labelled only "Trinidad".

Plate 55. *Xeniades chalestra* (female) UNS, Oropouche South Lagoon, 23.xii.1981. Scale in mm.

Female. UPS dark brown, with green setae on thorax and basal third UPF, and UPH extending along termen; large, well-separated pale yellow hyaline spots in cell and spaces 2, 3, 6-8 F; opaque pale yellow spot in lower 1B UPF, 3, 4, 6 and cell UPH; tip of abdomen russet. UNS head, fore femora and abdomen pale yellow. UNF black basally; reddish brown on costa, and apex, extending to vein 2 on margin; pale yellow spot in space 1B extends into upper space 1B, and along vein 1 to margin; a dusting of pale yellow scales in space 1A and in spaces 4 and 5 between the spots in spaces 3 and 6. UNH reddish brown, except space 1B and 1C blackish; an even 2 mm wide pale yellow line runs from costa at about $^1/_3$ to space 2 where it is acutely angled back to vein 1B; distal $^1/_3$ of space 1A pale yellow; pale yellow, almost white, spots with inconspicuous black margins in spaces 3, 4 and 6. Fringe white H and pale UPF spaces 1A-2, otherwise brown. Evans (1955)

refers to the UNF having a yellow patch on the costa adjacent to the cell spot, but this is no more than a few scales in my Trinidad female. The male is similar, but has more pointed wings and Evans (1955) describes the brands as small, grey or black, at the base of space 2, under and over vein 2 and over vein 1. F (female) 24 mm.

The large size and strong pale yellow or white line UNH distinguishes the two Trinidad *Xeniades* spp. from other skippers. *Xeniades chalestra* can be immediately separated from *X. orchamus*, by the arrangement of pale yellow spots UPH in spaces 3, 4, 6 and cell; *X. orchamus* having no cell spot UPH. Also, the setae of the UPS body and wing bases are orange in *X. orchamus*, and the pale line UNH is white, and wider near the tornus.

I have encountered this species just once, when I captured a fresh female beside Southern Main Road, between the sea and Oropouche South Lagoon (23.xii.1981). More recently SAS has collected this species from Santa Flora ((female) vii.1990), and several times from North Post ((male)(male) vi.1999, x.2000; (female)(female) x.99, x.2000 (2), xii.2000) where they can be seen regularly.

The larva is similar to that of the next species, according to Moss (1949), but more maroon coloured. It feeds on dwarf or ground bamboo. Moss's cast L5 skins in the NHM are mostly covered with white waxy powder, but it can be seen that the head and body are covered with pale brown setae up to 3 mm long; the head is dark brown, but I cannot make out any markings. The pupa is formed in a silk lined shelter, which in the anterior part is lined with small bits of loose white flocculence. The pupa is brown with forward pointing light brown setae on the thorax and backward pointing setae on the abdomen. No frontal plates are visible, so the form of the frontal spike (if any) is not known. The proboscis sheath extends to the cremaster.

Based on material in the NHM, H.E. Box reared this species in Guyana (under his reference no.63) but the food plant is not recorded. Box's notebook of reared Hesperiidae in Guyana was in the IIBC library in Curepe in 1982, but I have not been able to locate it on visits since 1988 and it may have been lost.

259a. O13/2 *Xeniades orchamus orchamus* Cramer 1777

This species is widespread in South America, from Panama to Argentina (Evans 1955), but has not previously been recorded from Trinidad.

Plate 56. *Xeniades orchamus* (male) UNS, 20.ix.1994, F.C. Urich (coll. MJWC). Scale in mm.

Male. UPS dark brown; orange brown setae on basal part of both wings and thorax; pale yellow hyaline spots in spaces 2, 3, 4 (dot), 6-8 and cell F; pale yellow opaque spots in space 1B UPF (extending slightly into upper half of space, and the upper edge extended towards margin), and spaces 3, 4 and 6 (dot) UPH. Abdomen black with orange-brown setae on basal segments; white ventrally, and laterally on the posterior margin of the distal five segments, extending almost all the way around the abdomen on the last of these. UNF black basally; reddish brown on costa and apically, extending to vein 2 at the margin; spot in space 1B white, otherwise similar to UPS. UNH reddish brown, black on termen and in spaces 1B and 1C, white in distal part of space 1A; a yellow-white line from mid costa where it is 1.5 mm wide, running to space 2 where it is 2.5 mm wide and completely white; white spots in spaces 3 (joined to white line), 4 (separated from last only by the dark vein 3), 5 (two small staggered spots) and 6 (small). F (male) 24 mm. Illustration of UPS in Lewis (1973, plate 88.31). The identification of this species is discussed under *O. chalestra*.

The first specimen of this species to come to my attention was a male taken at light by Clive Urich at his Sans Souci Estate, Sangre Grande (20.ix.1994), but SAS has specimens he collected at Grand Ravine ((male) iii.1995), Guapo ((male) ix.1981, at light on an oil rig), Inniss Field ((female) x.94, at eupatorium flowers), Sangre Grande ((male) iii.1986, at flowers) and two females collected by Clive Urich (Sangre Grande, vi.1999, at light). Thus, this species is widespread in southern and central Trinidad, and occasionally comes to flowers and to light.

Moss (1949) found larvae of this species mostly on a yellow stemmed bamboo. The larva he describes as "crimson velvet supported laterally by light down", with the extremities brown. The last larval shelter in which the pupa is formed is a bundle of bamboo leaves at the tip of a bough, held by silk, with white powder and flocculence. Some of Moss's material of emerged pupae and cast L5 skins is in the NHM, but the larval skins are covered with white flocculence and indistinguishable from those of *X. chalestra*. The silk lined shelter seems more robust than that of *X. chalestra*, and the white waxy powder is quite heavily spread on the pupa apart from the wing and appendage cases. The emerged pupae are dark brown, with erect brown setae on the head and thorax, and shorter backward pointing brown setae on the abdomen. The proboscis sheath extends to the cremaster. None of the emerged pupae seem to have associated frontal plates, but a dead, parasitised pupa has a short, stout frontal spike with a widened truncate tip with light brown setae on it. Moss's material includes a series of a gregarious *Brachymeria* sp., black with partially yellow legs.

***Saliana* Evans**

This genus has a uniform pattern of spotting, and in most species the UNH is divided into a paler basal area and a darker distal area. F hyaline spots in 1B, 2, 3, 6 and 7, and sometimes in spaces 4, 5 and 8; H with discal spots in spaces 4 and 5 and sometimes 3.

Moss (1949) reared several species of this genus (which at that time was treated as part of *Thracides*), including *S. triangularis*, *S. antoninus*, *S. longirostris* and *S. salius*, as well as some species undescribed at that time. The confusion over the taxonomy of the genus meant that descriptions and illustrations are not included in his paper. The food plants on which he found larvae include *Monotagma contractum*, *M.* sp., *Ischnosiphon ovatus*, *Calathea*

lutea (all Marantaceae), and *Canna coccinea* (Cannaceae). I have reared four species of the genus from *Heliconia* (Heliconiaceae), *Costus* (Costaceae) and *Calathea*; all four species are easily distinguishable as larvae. Janzen and Hallwachs (2001) have also reared several *Saliana* spp. in Costa Rica, for which the taxonomy has not yet been clarified; their recorded food plants include five *Calathea* spp. and arrowroot, *Maranta arundinacea* (Marantaceae), two or three species of *Costus*, *Heliconia latispatha* and a *Renealmia* sp. (Zingiberaceae).

Eight species of this genus occur in Trinidad. Several are confusingly similar, and difficult to identify from individual specimens, especially those in poor condition. *Saliana esperi* is close to *S. antoninus*, which is close to *S. longirostris*, which is close to *S. salius*, which is close to *S. saladin*. Indicative of the difficulties, several of the specimens from the W.J. Kaye collection (in AME) were mis-labelled by Kaye.

Saliana hewitsoni is immediately distinguished by its uniform dull green UNH, but there are similar species known from the mainland which could turn up in Trinidad. The first two species, *S. mathiolus* and *S. triangularis*, are separated from the remainder, as the cell spot F is restricted to the lower half of the cell, whereas in the remaining four species it extends into the upper, costal half of the cell, and their UNH markings are quite distinctive. Of the remaining five species, *S. esperi* is consistently smaller and has a distal streak from spot in space 1B UNH, while the remainder can be separated by a combination of UNS markings, of which those of the apical area UNF seem most clear cut. Thus, *S. antoninus*, is uniformly light chestnut brown (with just a trace of lighter colouring in spaces 4 and 5 in fresh specimens), *S. longirostris* has a quadrate grey-brown area in the basal part of spaces 4 and 5 and the remainder of the apical area dark chestnut brown, *S. salius* has spaces 3-5 purple-brown and spaces 6 to costa dark chestnut brown, and *S. saladin* has the apical area uniformly dark purple-brown.

260. O14/1 *Saliana mathiolus* Herrich-Schäffer 1869

The type locality of this rare species is not known, but there are specimens from Venezuela, Trinidad and South Brazil in the NHM (Evans 1955). Riley (1921) described this species as *Thracides verecundus* from a Trinidad specimen, taken by F.W. Jackson at St. Joseph, but this name is now considered a synonym of *mathiolus*.

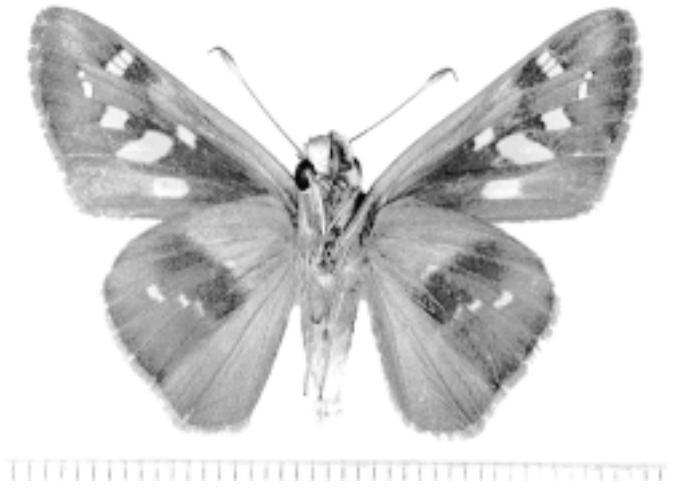

Plate 57. *Saliana mathiolus* (female) UNS, Lower Morne Catherine, 21.v.1982. Scale in mm.

UPS dark brown with white hyaline spots. UNF brown with the following diffuse and not very distinct shading: costa pale brown; pale area on costa covering base of spaces 8-9 and filling most of space 10; similar submarginal area in spaces 6 and 7; distal part of costal half of cell with tawny setae; the area distal to the cell and basal to the spots in spaces 4 and 5 light brown; the submarginal area distal to spots in spaces 2 and 3 similar; a yellow streak from apical angle of spot in space 1B runs towards the tornal angle of the spot in space 2; distal to this light brown with a tint of lilac. UNH with hyaline white spots in 2 and 3-4; basal area light brown with a lilac flush, sharply demarcated across space 2, cell, 6, 7 and costa; distal half of space 1A, and spaces 1B and 1C apart from base tawny brown, shading into basal area; distal to the pale basal area and basal to the H spots, brown; distal to the H spots and along costa to join basal pale area, light brown with a lilac flush and diffuse margins, but not as pale as basal area; margin spaces 2-6 brown shading into the light brown area. The distinct straight margin to the UNH basal pale area, running from vein 2 at right angles to vein 8 is the best feature to distinguish this species from others of the genus in Trinidad. F (male) 19 mm, (female) 21 mm.

This is a rare skipper in Trinidad collections. I have just seven records, from Fort George ((male) ix.1891, in NHM), St. Georges ((male) x.1891, C.W. Ellacombe in NHM), Hololo ((male), 17.xi.1920, W.J. Kaye in AME) Maupertuis (20.iv.1922, N. Lamont in RSM), Caura Valley (female) ii.1930, A. Hall, ex coll. W.J. Kaye - identified as *Thracides triangularis*, in AME), Morne Jean to the west of Diego Martin (12.xii.1978) and from the lower slopes of Morne Catherine ((21.v.1982). 19). SAS has further captures from Andrews Trace ((male) iii.1990), North Post ((male) xii.1998), ((male) x.1999), 2 ((female) ix.2000) and Quinam ((female) viii.1993). The localities suggest this species may be commoner in the north-west of the island than elsewhere.

Life history and food plants unknown.

261. O14/4 *Saliana triangularis* Kaye 1914

This widespread, but not very common species was not described until 1914, having been misidentified by earlier workers, either as *S. salius* Cramer or as *Vacerra hermesia* Hewitson (Evans 1955). It is found from Mexico to Argentina (Evans 1955).

Kaye (1914) described this species from Trinidad, on the basis of a G.E. Tryhane specimen taken in St. Ann's Valley. In his 1921 catalogue, Kaye records a N. Lamont specimen, taken Rock Road Penal, 1.i.1921. Kaye (1921) also records it as occurring in Jamaica, but must have made an error since no *Saliana* spp. are known from Jamaica (Brown and Heineman 1972; Smith *et al*. 1994). Kaye (1940) subsequently incorrectly treats this as a synonym of *S. antoninus*.

Plate 58. *Saliana triangularis* (female) UNS, Mt. Tamana, 13.vii.1997. Scale in mm.

UPS dark brown with yellowish hyaline spots; tawny setae on basal areas, both wings and termen UPF. UNF costa to 2/3 yellow; rest of costa and apical part of wing as far as vein 2 at margin, reddish brown with a purple sheen visible at some angles, especially in the female, and especially around the apical spots; all of spaces 1A and 1B, cell and space 2 basal to the spots black. UNH male: basal half yellowish brown, shading evenly into distal half brown; space 1B with the basal half paler. UNH female: spaces 1A, 1B and 1C light brown, the basal half paler especially in space 1B; basal part of the remainder to end cell and 2/3 on costa lilac, this shades into a distal area of reddish brown, with a strong purple sheen, so that at some angles this part of the wing looks dark purple; costa diffuse yellow to a variable degree, absent in some specimens. The evenly shaded transition from the basal to the distal part of the hind wing is the best character to distinguish *S. triangularis* from other Trinidad *Saliana* spp. F (male) 20-21 mm, (female) 22-23 mm. Illustration of UPS in Lewis (1973, plate 86.38).

This is an occasional species restricted to the forests of Trinidad. I have records from Manzanilla, Morne Catherine, St. Ann's, Las Lappas Trace, Las Lomas, Mt. Tamana, Morne Diable and Parrylands. All specimens were taken beside forest tracks or within the forest.

A.M. Moss reared this species and there are emerged pupae and L5 skins in the NHM, although the food plant cannot now be associated. Jansen and Hallwachs (2001) reared *S. triangularis* regularly from *Maranta arundinacea*, and less frequently from four species of *Calathea*. Larvae are likely to be found on these or related Marantaceae in Trinidad.

The triangular head of Moss's L5 material is indent at the vertex; it is brown, with the face light brown, although the margin between the two areas is diffuse. The larva illustrated by Jansen and Hallwachs (2001) has the head dark brown, with red eye spots in front of the stemmata and a red area at the front of each apex. It may well be that Moss's material curated as *S. triangularis* represents a different species.

Moss's pupae are elongate, smooth, with a short upturned frontal spike; the proboscis sheath extends well beyond the cremaster; no associated white waxy powder; colour translucent white (hence green in life) with a dorso-lateral row of small brown spots on T1-2, and on the anterior margins of T3 and A2-A7. Moss's material includes cocoons of a gregarious *Apanteles* (s.l.) sp. associated with an L5, and a tachinid fly.

262. O14/10 *Saliana hewitsoni* Riley 1926

This uncommon species occurs from Panama to Bolivia, and was described from the Upper Amazons. It was added to the Trinidad list by Cock (1982).

Plate 59. *Saliana hewitsoni* (female) UNS, Textel track, 17.ix.1980. Scale in mm.

UPS brown with white hyaline spots. UNF dark on disc to tornus, with apical area dull green. UNH uniform dull green. F (female) 26 mm. This is the only *Saliana* sp. with a uniform dull green UNH recorded from Trinidad, although in older specimens, such as the only one known from Trinidad, this colour fades to more of a purple-brown tint. Evans (1955) treats three other *Saliana* spp. with a plain green UNH, all of which are recorded from the Guyanas and could turn up in Trinidad. In *S. fischeri* Latreille the cell spot does not reach the upper edge of the cell, and the spot in space 3 UNH is larger than those on either side; *S. nigel* Evans is like *S. fischeri* except the cell spot reaches the upper edge of the cell; and *S. vixen* Evans has the F hyaline spots yellow, not white.

I know of just one Trinidad record, a female in rather poor condition captured on the old track between milestone 10.5 on the Arima-Blanchisseuse Road and Morne Bleu Textel, 17.x.1980 (Cock 1982). The butterfly was flying within the forest when it paused to feed at flowers (I think of *Stromanthe tonkat*) at the forest edge and was caught. This track was completely overgrown when I last visited in the late 1990s. The location suggests that this may be a high altitude species in Trinidad.

A specimen in the AME was reared on "ginger". There is an emerged pupa from the A.M. Moss collection in the NHM labelled as *S. hewitsoni*. It is smooth, elongate, with a short, blunt frontal spike, and the proboscis sheath extends well beyond the cremaster. There are no associated larval remains.

263. O14/12 *Saliana esperi* Evans 1955

Kaye (1940) adds this species to the list as *Thracides telegonus* Esper, an unavailable homonym, subsequently renamed *esperi* by Evans (1955). Evans (1955) described this species from Ecuador, and records a distribution from Mexico to South Brazil. Trinidad material is particularly well represented in the NHM, compared to other areas. Although Sheldon (1936, 1938) does not record this species from Tobago, there are a male and female from his collection in the NHM (see also comments under *S. antoninus*).

Plate 60. *Saliana esperi* (male) UNS, Brasso, 1.x.1994. Scale in mm.

UPS dark brown with slightly yellow hyaline spots, which are paler in the female; tawny setae basally on both wings and on termen UPF. In the female, there are normally two hyaline spots H in

spaces 4 and 5, but the male may also have a smaller spot in space 3. UNF costa yellow-brown to 2/3; apical area to vein 2 at margin reddish brown; disc to tornus dark. UNH space 1A yellowish white basally shading to reddish brown at margin; space 1B and 1C yellow to 2/3, distal 1/3 grey-brown; remainder of UNH dirty white basally and reddish brown distally, the dividing line clear and contrasting, in an arc from about ½ on space 2 to just before apex in space 8, so that the reddish brown area forms a semi-circle on the margin of the wing. F (male) 19-20 mm, (female) 19-20 mm. Illustration of the (male) in Riley (1975, plate 24.18). This species is similar to the next four in markings, but consistently smaller. *S. esperi* also differs from these species in that the spot in space 1B UNF has a pale streak towards the margin, running either from the apical angle or the distal margin.

This is probably the commonest member of the genus in Trinidad, and like the other members of the genus is associated with forested areas. I have relatively few records from the Northern Range, most are from central and south Trinidad.

There is a female specimen in the NHM reared from a "wild plant (Zingiberaceae) in deep jungle" in Guyana by H.E. Box. The rearing records of Jansen and Hallwachs (2001) support this as they have regularly reared this species on *Costus bracteatus* and *C. scaber* (Costaceae, but note earlier authors included this family within Zingiberaceae) in Costa Rica, and most probably *Costus* spp. are also the food plant in Trinidad.

Moss reared this species in Belem, and there are emerged pupae, parasitised pupae, L5 cast skins and associated parasitoids in the NHM, but no indication of the food plant. The L5 has a rounded head, narrower dorsally, and slightly indent at vertex; uniform light brown in colour, the head and body are covered with long, semi-recumbent pale setae. No other members of the genus have setae on the head and body, and neither does the larva illustrated by Jansen and Hallwachs (2001). I conclude that Moss's material is misidentified, and incorrectly associated with the adults which he reared. The larva illustrated by Jansen and Hallwachs (2001) has a plain, shiny, smooth black head.

264. O14/13 *Saliana antoninus* Latreille 1824

This species was described from Brazil, and occurs from Guatemala to South Brazil (Evans 1955). It was first recorded from Trinidad by Crowfoot (1893) as *Thracydes antonius* (a mis-spelling). Kaye (1921) adds a record from St. Joseph (15 Jan, F.W. Jackson). Sheldon (1936) records catching this species at Speyside, but the only *Saliana* spp. from Sheldon's collection in the NHM, are a male and female *S. esperi*, suggesting that Sheldon misidentified his material.

Plate 61. *Saliana antoninus* (male) UNS, collected as larva on *Costus scaber*, Point Gourde, 8.x.1995 (ref. 95/45). Scale in mm.

UPS dark brown with yellow hyaline spots; costa UPF tawny brown and tawny setae on basal portions of both wings. UNF costa yellow to 2/3; apical area distal to upper part of cell spot to margin at vein 2 light chestnut brown; disc, termen and tornus to vein 2 black; in fresh specimens, the quadrate area in spaces 4 and 5 between end cell and the spot (or trace) in space 4 is slightly paler, but this rapidly becomes indistinguishable in older specimens. UNH space 1A dirty white to 2/3, then shading to chestnut brown; spaces 1B and 1C yellow to 2/3 then shading to chestnut brown, with a dark area each side of vein 1B at margin; rest of wing creamy white basally, dark reddish brown distally, slightly paler at apex, the contrasting line running in a weak arc from ½ on vein 2 to just before apex in space 8. F (male) 22-23 mm, (female) 22-24 mm.

Very similar to *S. esperi* in markings but consistently larger, lacking the extension of spot in space 1B UNS, and the brown areas UNS are more of a chestnut colour and not as dark as in *S. esperi*. The basal area UNH is much paler than that in any of the following three species, and the UNF apical area is distinctly lighter in tone.

This is a fairly common and widely distributed species in forested areas of Trinidad.

There is a series in the NHM reared by A.M. Moss, but unfortunately the early stages and food plants are not associated (see comments under *Saliana* above); they may have been confused with the next species.

I have reared this species twice, both times from fourth instar larvae collected on *Costus scaber* (Costaceae), once from near the summit of Morne Catherine (26.ii.1994, ref. 94/17) and once from Point Gourde (8.x.1995, ref. 95/45). In Trinidad, *C. scaber* is also known to be the food plant of *Cyclosemia herennius* (Cock 1991) and *Saliana salius* (below), and it is likely to be the food plant of *S. esperi* (above).

In the two examples listed above, the L4 had been feeding from the apical part of the leaf which had then been folded under, one diagonally, and the other at right angles to the mid-rib. Another L4 collected off the Rio Claro - Guayaguayare Road, near the junction with Saunders Trace (11.x.1993, ref. 93/11) had eaten a large patch from the edge of the basal half of a leaf, and formed a shelter by folding over upwards the margin of the distal part of the leaf to make a shelter 2cm wide at the basal end adjacent to the feeding, and 6cm long, tapering to a point.

Plate 62. *Saliana antoninus* L5 detail of head, collected on *Costus scaber*, Point Gourde, 8.x.1995 (ref. 95/45).

The L5 grows to about 50 mm. The head is rounded triangular in shape, indent at the vertex; finely rugose; light brown, posterior margin dark brown dorsally; a short, smooth, yellow streak just below the apex of each epicranium, parallel to the epicranial suture; a smooth, yellow, roughly rectangular spot anterior to the stemmata; the area on each side between the two yellow spots is distinctly paler than the light brown ground colour; clypeal sutures brown for dorsal half. The markings of the head, especially the yellow spots are distinctive and characteristic for this species. T1 concolorous with body. Body dull, translucent dark green; dorsal line only slightly darker; gonads not obvious; spiracles pale and joined by a tracheal line; paler ventro-lateral flange; all legs concolorous with body. The wax glands develop in a single sub-ventral mass on each side of the body from the posterior margin of A7 to the anterior margin of A9. The L5 head capsule loses the yellow coloration when shed at pupation.

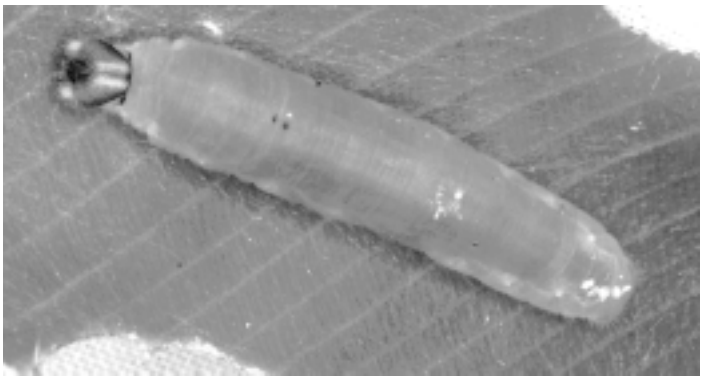

Plate 63. *Saliana antoninus* L4, 22 mm, collected on *Costus scaber*, Morne Catherine, 26.ii.1995 (ref. 94/17).

The L4 grows to about 22 mm; it is similar to the L5, except that the area on the head between the two yellow spots is not paler, leaving the yellow spots more conspicuous; T1 a short, brown, transverse dorsal plate.

Plate 64. *Saliana antoninus* pupa, 41 mm, collected as larva on *Costus scaber*, Point Gourde, 8.x.1995 (ref 95/45).

The male pupa measures 41 mm; it is elongate, cylindrical and smooth; a 2mm frontal spike, slightly upturned at apex; proboscis sheath extends 6mm beyond cremaster; colour uniform pale green, spiracles inconspicuous. Pupation took 12-19 days. The pupa cuticle after emergence of the adult is very flimsy, and easily crumpled.

The larva from the Rio Claro - Guayaguayare Road (ref. 93/11) was parasitised by a tachinid larva which emerged from the mature L5 after the formation of the wax glands, but the adult fly failed to emerge from the resultant puparium.

265. O14/15 *Saliana longirostris* Sepp 1848

This species, which occurs from Mexico to South Brazil, was described from Surinam (Evans 1955). It was first recorded from Trinidad by Kaye (1904), based on a single specimen from Tunapuna, and later (Kaye 1921) suggests this may be the commonest species of the genus. Although the Tunapuna specimen which Kaye recorded is a male *Saliana antoninus* (Trinidad, [19]02, Guppy, ex coll W.J. Kaye – labelled *antoninus longirostris* - in AME), this is a valid Trinidad species. Subsequently, Kaye (1940) incorrectly treats this as a synonym of *S. antoninus*.

Plate 65. *Saliana longirostris* (male) UNS, collected as larva on *Heliconia hirsuta*, Mt. Tamana, 13.vii.1997 (ref. 97/205). Scale in mm.

UPS brown with yellow hyaline spots; tawny setae on basal parts of wings, especially on lower half of cell F, and on termen UPF. UNF costa beige to end of cell spot, space 11 yellow-brown to same point; apical portion of wing from end of beige area on costa to vein 2, including upper part of cell distal to cell spot chestnut brown; the basal portion of spaces 4 and 5 to spot in space 4 and extending slightly further towards margin in space 5 grey-brown - this feature becoming increasingly less distinct as specimens become more worn; remainder of UNF, i.e. cell basal to cell spot, lower part of cell distal to cell, spaces 1A, 1B and 2 (apart from a marginal triangle which is chestnut brown) dark, blackish. UNH space 1A basal half yellow-brown, distal half chestnut brown; space 1B basal half clearer yellow, distal half blackish; space 1C basal half as 1A, distal half as 1B; remainder of wing divided by an arc from middle of vein 2 to just before apex; basal half light brown with a plum tint to basal part of costa and a grey-lilac tint to distal area (becoming more yellow in worn specimens); distal half dark reddish brown, with a diffuse grey-brown area in margin spaces 3-7. F (male) (reared) 23 mm, (female) 25-26 mm.

The grey-brown area in spaces 4 and 5 UNF is a distinctive character for this species - at least when specimens are fresh. Worn specimens are similar to worn *S. antoninus*, but normally the paler basal area UNH and the lighter chestnut apical area UNF in *S.*

antoninus are still apparent.

This species seems quite uncommon, but widespread in forested areas throughout Trinidad. SAS considers it commoner in the south of the island.

I have reared this species from a second instar larva found on *Heliconia hirsuta* on Mt. Tamana (13.vii.1997, ref. 97/205). Although the adults of *S. antoninus* and *S. longirostris* are confusingly similarly, the food plants and larvae are reassuringly different. Thus, whereas *S. antoninus* feeds on *Costus scaber*, *S. longirostris* feeds on *Heliconia* sp(p)., and whereas the larva of *S. antoninus* has a distinctive light brown head with yellow markings, and a dull green body, the larva of *S. longirostris* has a plain brown head and reddish green body.

Plate 66. *Saliana longirostris* L5, 35 mm, collected on *Heliconia hirsuta*, Mt. Tamana, 13.vii.1997 (ref. 97/205).

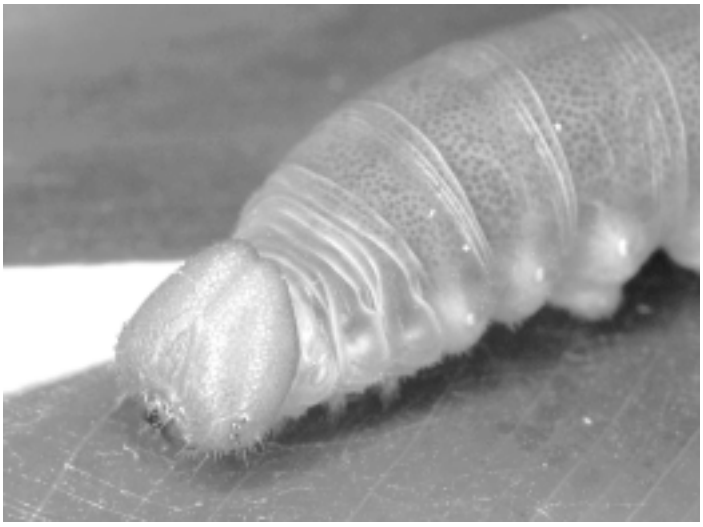

Plate 67. *Saliana longirostris* L5 detail of head, collected on *Heliconia hirsuta*, Mt. Tamana, 13.vii.1997 (ref. 97/205).

The newly moulted L5 measured 35 mm, but by the end of the instar the larva measured 54 mm. Head rounded triangular, indented at vertex; shiny rugose; uniform light brown; ocelli brown. T1 pale. Body dull translucent green with red cuticle; ventrally pale, without red colouring; yellow male gonads. All legs pale, concolorous with ventral surface. Spiracles pale. Wax glands one patch each side ventro-laterally on A7-A8.

Plate 68. *Saliana longirostris* L3, 17 mm, collected as larva on *Heliconia hirsuta*, Mt. Tamana, 13.vii.1997 (ref. 97/205).

The newly moulted L4 measures 17 mm. Similar to L5 but head only slightly rugose; uniform light reddish brown. T1 pale with brown transverse plate on posterior margin. Body reddish green, pale ventrally; yellow gonads visible. Spiracles and all legs pale; strong tracheal line. L3 similar to L4, but body colour darker and body surface shinier. L2 similar to L3; it measures 11 mm before moulting, and the gonads are not apparent. L1 not seen.

The male pupa measured 41 mm including a 2 mm frontal spike which is curled over upwards at the tip; proboscis sheath extends 6 mm beyond cremaster; smoothly elongate; light green; spiracles pale.

Moss (1949) provides an illustration of this species, but no description. The illustration shows a larva with a dark head and translucent body. A.M. Moss's material of early stages in the NHM appears to represent two different species. One head capsule appears to be of this species, while the other seems to be *S. saladin*. Similarly there is one pupa with relatively slender frontal spike which may be this species, and four with a much more robust frontal spike (although lacking the pupal markings noted below for *S. saladin*). Without associated adults this material must be interpreted with caution.

266. O14/17 *Saliana salius* Cramer 1775

This species was described from Surinam, and is found from Guatemala to Uruguay (Evans 1955). It was first recorded from Trinidad by Kaye (1914) as *Perichares salius*, when he found it to be "not rare" in St. Ann's Valley. Subsequently, Kaye (1940) inadvertently adds this species to the Trinidad list again as *Thracides salius*, noting his captures from St. Ann's Valley and adding a specimen from Manzanilla, captured by F.W. Jackson, 29.i.1922.

Plate 69. *Saliana salius* (male) UNS, collected as larva on *Costus scaber*, Rio Claro - Guayaguayare Road, milestone 7, 1.x.1994 (ref. 94/48). Scale in mm.

UPS dark brown, hyaline spots yellow; tawny setae in basal parts of both wings, especially along costa. UNF costa yellow-brown to end of cell spot; beyond this, including the upper half of cell distal to the cell spot, as far as vein 5, dark chestnut brown; space 5, 4, 3 and margin of 2 purplish brown; remainder of UNF black. UNH space 1A basal half yellow-brown, distal half dark chestnut brown, margin black; spaces 1B and 1C basal half as 1A, distal half black; remainder of UNH divided as for others of the genus, basal half pink-brown, costa sometimes more mauve, distal part may be paler, closer to lilac; distal half dark purple-brown, with marginal area in spaces 4 to 7 paler. F (male) 24 mm, (female) 24 mm. Illustration of (female) UNS in Lewis (1973, plate 86.35).

This species is close to *S. longirostris*, but has UNF spaces 3-5 purple brown to the margin, whereas in *S. longirostris* they are dark chestnut brown like the rest of the apical area, apart from the distinctive grey brown patch on spaces 4 and 5 distal to the cell.

Plate 70. *Saliana salius* adult male, collected on *Costus scaber*, Rio Claro - Guayaguayare Road, milestone 7, 1.x.1994 (ref. 94/48).

This is a fairly common and widely distributed species in forested areas of Trinidad.

There is a single emerged A.M. Moss pupa labelled in the NHM as this species; it is translucent white with no markings; smooth, elongate, with a short straight frontal spike.

I have reared this species just once, from an L4 collected 1.x.1994 in the forest near the Rio Claro - Guayaguayare Road at milestone 7. The food plant was *Costus scaber*, as for *S. antoninus*, although SAS has also reared this species from banana (Mt. Tamana, i.2000). Similarly to *S. antoninus*, the larval shelter on *C. scaber* was constructed by the larva folding over the distal part of a leaf where it had been feeding, at right angles to the mid-rib.

The 35 mm pupa is elongate, smooth; frontal spike; uniform green with no wax. Pupation took 19 days.

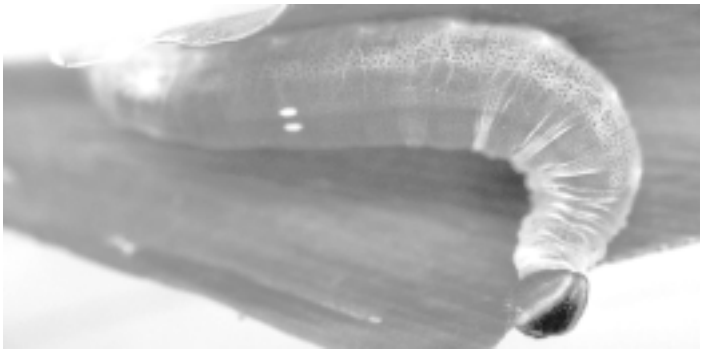

Plate 71. *Saliana salius* L5, 35 mm, collected on *Costus scaber*, Rio Claro - Guayaguayare Road, milestone 7, 1.x.1994 (ref. 94/48).

Plate 72. *Saliana salius* L5 detail of head, collected on *Costus scaber*, Rio Claro - Guayaguayare Road, milestone 7, 1.x.1994 (ref. 94/48).

The L5 measured 45 mm when mature. Head rounded triangular, indent at vertex; chestnut brown; a light brown stripe from apex down middle of epicranium to stemmata; stemmata pale; a central dark patch lies between these stripes occupying the middle half of the face. T1 concolorous with body. Body dull translucent green, paler below; a pale, diffuse, speckled fat body visible through cuticle; gonads small, yellow; spiracles pale, inconspicuous; all legs concolorous with body. The wax glands develop sub-ventrally on the posterior margin A6, A7 and the anterior margin of A8.

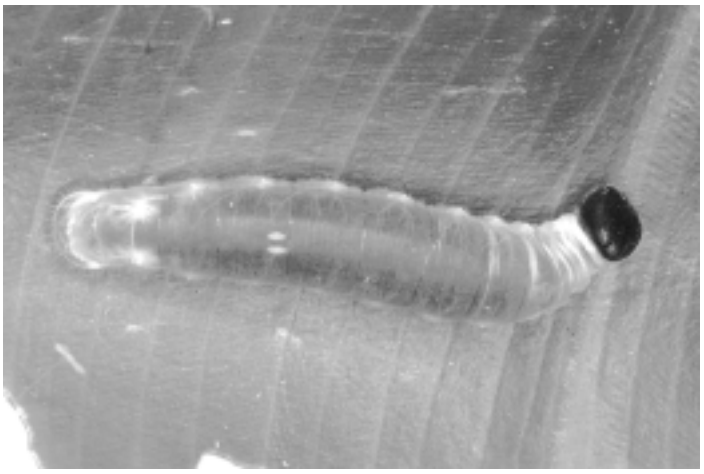

Plate 73. *Saliana salius* L4, 20 mm, collected on *Costus scaber*, Rio Claro - Guayaguayare Road, milestone 7, 1.x.1994 (ref. 94/48).

The L4 measured 20 mm. Head dark brown, slightly lighter ventrally. T1 with only a trace of colouring on the dorsal plate. Body dull translucent green, paler below; gonads visible; spiracles pale, conspicuous; legs concolorous with body.

267. O14/18 *Saliana saladin culta* Evans 1955

Three subspecies are recognised and described by Evans (1955): *saladin* Evans found from Mexico to Peru, *culta* Evans from Trinidad, the Guianas and the lower Amazon, and *catha* Evans from South Brazil. Evans' (1955) inclusion of a Trinidad specimen in the type series of *culta* is the first record from Trinidad: a male collected at Caparo by F. Birch.

Plate 74. *Saliana saladin* (male) UNS, collected as larva on *Calathea grandis*, Mt. Tamana, 12.xi.1995 (ref. 95/67A). Scale in mm.

UPS dark brown, white hyaline spots; tawny setae in basal areas of wings. UNF costa to end of cell spot yellow-brown, space 11 yellow to same point; a small area covering upper half of cell, and basal parts of spaces 8-10 dark chestnut brown; remainder of apical area to vein 2 at margin uniform dark purple-brown; rest of UNF black. UNH spaces 1A, 1B and 1C basal half yellow-brown, paler in space 1B, and distal half dark brown, shading to black in a triangle each side of vein 1B at margin; remainder of wing divided as for other members of the genus, basal half lilac, tinted brown in base of cell and space 2; distal half dark chestnut brown, with marginal area of spaces 6-7 dark lilac-purple. F (male) 25-27 mm.

The uniform dark purplish apical area UNF is a good diagnostic character for *S. saladin*. Although slightly larger than *S. salius*, worn specimens could easily be confused, but the UNF apical markings should still be distinguishable.

Plate 75. *Saliana saladin* adult male, collected as larva on *Calathea grandis*, Mt. Tamana, 12.xi.1995 (ref. 95/67A).

This species is rare in Trinidad collections, but could be confused with *S. salius*. I have a male from Parrylands (16.x.1980) which I had mistaken for *S. salius*, and one reared male from Mt. Tamana, where the larvae can be found with some searching. SAS also has a male from Parrylands (ii.1993) and has reared a female from Matura (xi.2000).

Saliana saladin is confusingly similar to *S. salius*. However, it is larger, the spots UNH are further apart, and the apical area UNF has a uniform purple flush extending from vein 3 to the apex and along the costa as far as the apical spots, whereas the flush in *S. salius* is more mauve in colour and only fills the area from vein 3 to vein 6.

The larval food plant on Mt. Tamana is *Calathea grandis*, which appears in the Flora of Trinidad and Tobago (Simmonds 1967) as *C. altissima*. Simmonds (1967) considers this an uncommon plant in Trinidad, with records from Cedros, Platanal, Oropouche Cave and Cumuto. There is also a specimen from Mt. Tamana in the National Herbarium (Y. Comeau, pers. comm). I found *C. grandis* quite common in the forested areas around the summit ridge of Mt. Tamana, in places dominating the ground cover. The specimen SAS reared from Moruga was collected off *Calathea lutea* (Marantaceae).

Plate 76. *Saliana saladin* L5 detail of head, collected on *Calathea grandis*, Mt. Tamana, 12.xi.1995 (ref. 95/54).

The larval shelter is a simple fold from the edge of the leaf. The newly moulted fifth instar larva measures 34 mm, and it grows to 48 mm, before shrinking to 43 mm as a prepupa. The head is rounded triangular in shape, 4.5 - 5.0 mm high and 4.0 - 4.5 mm wide at the level of the stemmata; slightly indent at vertex; rugose, slightly shiny; light yellow-brown, with a conspicuous dark triangular marking on the face covering the clypeus, and extending to half the width of the clypeus further onto the epicranium; the epicranial suture is yellow-brown within the dark marking. T1 concolorous with body, but with a translucent dorsal plate. Body dull translucent green; dorsal line slightly darker; spiracles white, conspicuous due to a star of surrounding trachea; tracheal line; yellow gonads on each side of the dorsal line, A6; anal plate almost round, with short setae on posterior margins. The wax glands develop ventro-laterally from the posterior margin of A6 to the anterior margin of A8.

The fourth instar larva is similar to the fifth, but the ground colour of the head is brown, and the triangular marking is diffuse. The third instar larva measures up to 18 mm; the head is uniform light brown.

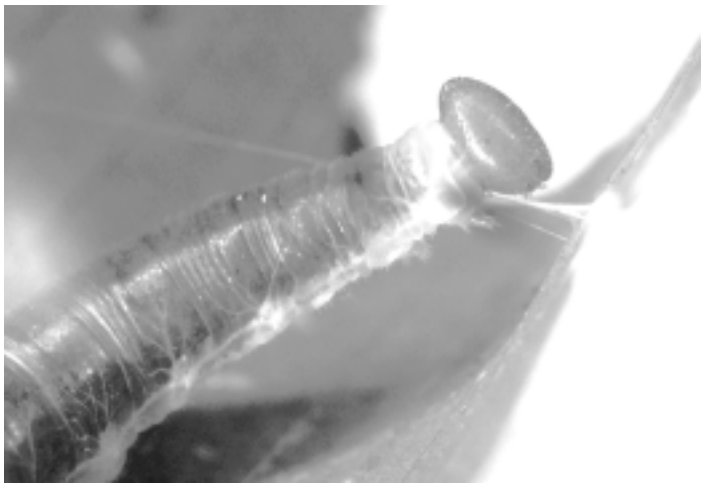

Plate 77. *Saliana saladin* L3 detail of head, collected as larva on *Calathea grandis*, Mt. Tamana, 12.xi.1995 (ref. 95/67B).

Plate 78. *Saliana saladin* pupa, 43 mm, collected as larva on *Calathea grandis*, Mt. Tamana, 12.xi.1995 (ref. 95/67B).

The pupa is formed in the last larval shelter; the cremaster is attached to a stout cross bar of yellowish silk, and the pupa is held in place by a single strand of silk over the thorax; no wax in shelter or on pupa. The pupa is smooth (no setae) and elongate; quite broad; parallel sided for most of its length; a straight frontal spike of 2.5 mm; proboscis sheath extends to cremaster tip. Colour light green; darker green dorsal line on abdomen; single yellow male gonad on posterior margin of A5; black dots as follows: an equally spaced row of four on collar near anterior margin, the lateral ones just behind eyes; thorax (T2) a sub-dorsal spot, repeated in parallel row on T3, A2-7 and displaced towards dorsum on A8; dorso-lateral spot mid-segment T3; a row of dorso-lateral dots on posterior margins of A1-8, those of A1-6 slowly diverging from dorsum, those of A7-8 converging.

Two larvae died at the pre-pupal stage for no obvious reason; they may have been diseased.

268. O15/1 *Thracides cleanthes binota* Evans 1955

The range of this species extends from Colombia to Paraguay, but Evans (1955) divides it into six subspecies. Of these, *binota* Evans occurs in Colombia, Venezuela and Guyana, while *telmela* Hewitson is from French Guiana and the Amazon basin. The other subspecies, including the nominate subspecies, *cleanthes* Latreille (TL Brazil) are found further South. Subspecies *binota* is characterised by a lower spot in space 1B and a narrow constricted spot in space 2 F. The number, placing and shape of the forewing spots is variable, confusing the classification set out by Evans, since several forms can occur in each subspecies, and these forms repeat themselves in other subspecies.

Trinidad specimens are consistent in markings and sexually dimorphic. Thus, all the males I have seen have small white hyaline spots in spaces 1B and 2 F, while the females have none. Trinidad females would be considered f. *aspilota* Mabille and Boullet following Evans' treatment.

Plate 79. *Thracides cleanthes* (male), Rio Claro-Guayaguayare Road, 11.x.1993. Scale in mm.

Plate 80. *Thracides cleanthes* (female) UNS, Spanish Farm, 30.iv.1982. Scale in mm.

UPS blue with an orange patch at the tornus H, in spaces 1A and 1B; small white hyaline spots in spaces 1B and 2 in males; fringes white. UNF blue on disk, reddish brown on costa and apical area as far down as vein 2 on margin; within the reddish brown area a diffuse pale submarginal band. UNH brown; blue in spaces 1B and 1C; margin of space 1C white; margin of spaces 3-6 diffuse white; the orange spot at tornus as UPH. Body dark, except UNS head, fore femora and apex of abdomen UNS dark orange.

I have found this an uncommon species in Trinidad . There is

a female in the NHM (Siparia, x-xii.1920, A. Hall), and a specimen in the ICTA collection, labelled "Trinidad / F.W. Urich / 69-55 / coconuts", the implication probably being that it was reared from coconut. I have recorded this species four times, all from lowland forest situations: Las Lomas, Bush Bush Island, Parrylands, and off the Rio-Claro Guayaguayare Road, opposite Saunders Trace. SAS, however, considers this species not rare along tracks in southern forests and the larva fairly easy to obtain on a palm as yet unidentified.

The food plant at Belem is coconut (Moss 1949) and the larva is described as elongate and white, with a predominant subdorsal black spot on T2. The pupa is emerald green, and although the shelter is dusted with white powder, none is found on the pupa. I have found two larvae on a small plant (1 m) of the climbing palm, *Desmoncus orthacanthus*, growing in shade at Bush Bush Island (28.iii.2003, Ref. 03/235) on which the following is based.

The egg-bases associated with both larvae were strikingly large, 2 mm in diameter. A third instar larva (Plate 81) measured 17mm. Head 2.5 mm tall x 2 mm wide; rounded, wider basally, flattened dorsally and slightly indent at vertex; light brown, epicranial suture narrowly brown, a parallel stripe on epicranium which is wider ventrally; the lower part of the head covered with white waxy powder. Body dull pale green, the posterior segments and the expansion creases in front of each segment divide are dull white; body covered with white waxy powder ventrally. At 25 mm, this larva moulted to L4, but died soon afterwards. Head of L4 similar in shape to that of L3; light brown, with a broad brown stripe down each epicranium, the inner edge, sharply defined and parallel to the epicranial and clypeal sutures, the outer edge irregular and rather diffusely defined.

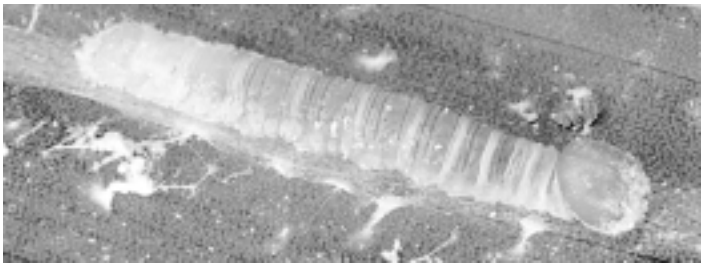

Plate 81. *Thracides cleanthes binota* third instar larva, 17 mm, collected on *Bactris* sp., Bush Bush Island, 28.iii.2003 (ref. 03/235B).

An L5 larva measured 54 mm (Plates 82, 83), and made a shelter by rolling a leaflet to make a tube, and lining the inner surface with silk and white waxy powder. Head 5mm high x 4 mm wide; covered with white waxy powder except for mouthparts; the epicranial suture appeared paler, with a dark stripe adjacent; dark spot over stemmata. Body white; dorsal line narrowly darker; distinct expansion creases anterior to each segment division; covered with white waxy powder. Anal plate rounded posteriorly, with a fringe of 1 mm setae. Note that contrary to Moss's description above, there is no subdorsal spot on T2.

Plate 82. *Thracides cleanthes binota* fifth instar larva, 54 mm, collected on *Bactris* sp., Bush Bush Island, 28.iii.2003 (ref. 03/235A).

Plate 83. *Thracides cleanthes binota* fifth instar larva, detail of head, as Plate 82.

The pupa from this L5 larva was formed on the lid of the rearing chamber, but as described by Moss (above), the surrounding area was covered with white waxy powder, while the pupa was not. Male pupa 39 mm; smooth, elongate; frontal spike 2.5 mm, parallel-sided, blunt; proboscis extends to just short of cremaster apex; colour uniform pale green, the frontal spike with a slight brown tint.

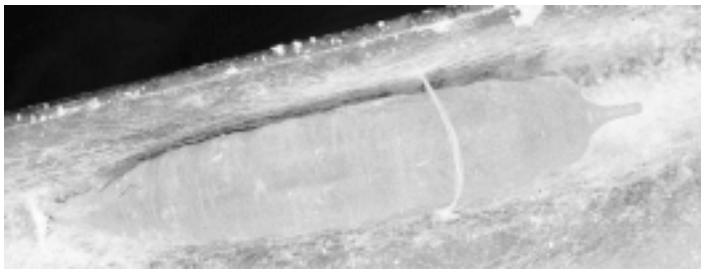

Plate 84. *Thracides cleanthes binota* pupa, 39 mm, as Plate 82.

268a. O15/5 *Thracides nanea nanea* Hewitson 1871

Evans (1955) listed specimens of the nominate subspecies from along the Amazon (TL Maranhan) and describes a further subspecies, *nida* Evans, from Colombia. A male specimen taken at Rio Claro on 15.ii.1926 by Sir N. Lamont is Kaye's basis for adding this species to the Trinidad list (Kaye 1940). In Cock (1982) I did not attribute a subspecies to this Trinidad record since I had not at that time seen Lamont's specimen. Having now examined Lamont's specimen, which is in the RSM, I can state that it belongs to the nominate subspecies.

Plate 85. *Thracides nanea nanea* (male) UNS, Rio Claro, 15.ii.1926, N. Lamont (specimen in National Museum of Scotland).

Male. UPS dark, the thorax and wing bases with a blue gloss; white hyaline spots. UPF male stigma black. UNS palpi orange-red. UNF dark brown; cell basal to cell spots iridescent blue-green. UNH plain dark reddish brown. Cilia H white from vein 1A to vein 3, otherwise cilia brown. The female has the F spots larger, the two cell spots often touching, and that in space 2 extending on its dorsal margin towards margin; UNF an extensive white area in space 1B. Illustration of UPS in Lewis (1973, plate 87.37).

Until quite recently, Lamont's specimen from Rio Claro remained the only Trinidad record of this species. SAS has caught this species several times from Guanapo Valley ((male)(male) iii.1988, xii.1998), Guayaguayare ((female) i.1983), Mt. Harris ((male) i.1989), Parrylands ((male) vii.1982, (female) x.1996).

Moss (1949) refers to this species having an elongate, white powdered larva, living in folds of *Cyclanthus bipartitus* (Cyclanthaceae), which has been collected occasionally in forests of both north and south Trinidad (Philcox 1986). Moss illustrates the fifth instar larval head, which from the front is pale, and has dark patches at the indented vertex, dorso-laterally and ventro-laterally; the clypeus is dark, and the two lateral patches project towards it. The preserved L5 skins in the NHM confirm this - the head ground colour is light brown. Emerged pupae are translucent white, hence green in life; elongate, smooth; proboscis sheath reaching cremaster tip; no markings or setae; pupal shelters with a light dusting of white wax powder, but none on the pupae; the frontal spike is slightly expanded into an irregular and variable knob at the apex. Moss's material includes cocoons of what appears to be an *Apanteles* (s.l.) sp. associated with the L5; the cocoons are attached to the shelter, scattered although usually touching other cocoons and consistently aligned with the larval body in the shelter.

SAS has reared this species twice (Mt. Harris, i.1989; Guanapo Valley, xii.1998), from *Asplundia rigida* (Cyclanthaceae). *Asplundia rigida*, known locally as mammoo, is a root-climbing liana up to 10m long, which is occasionally terrestrial; it occurs quite widely in Trinidad and Tobago in forest areas (Philcox 1986). I have seen empty hesperiid shelters on this plant on Mt. Harris (25.iii.2003), which most likely were made by *T. nanea*; the shelters were at the apex of leaves, at a height of 2-3 m; no shelters were seen on plants growing on the ground.

269. O15/7 *Thracides phidon* Cramer 1779

This species was described from Surinam and occurs from Mexico to South Brazil (Evans 1955). It was first recorded from Trinidad by Kaye (1904) without comment, although he later states that it is not rare (Kaye 1921).

Plate 86. *Thracides phidon* (female) UNS, Parrylands, pupa on *Heliconia* sp., 30.i.1980, J.O. Boos (coll. MJWC). Scale in mm.

This species, especially when fresh, is one of Trinidad's most beautiful hesperiids. Evans (1955) states that it is a very variable species, but whether this is within populations or between populations is not clear; the following is based on single male and female specimens before me. UPS dark, blackish; the base of the wings and the thorax iridescent blue; white hyaline spots. The UPF male brand is grey and inconspicuous; it is a straight line obliquely angled in three parts: a dot above and below vein 2, and a line running from the middle of space 1B to vein 1. UNF costa and space 11 white to the level of the cell spot; costa reddish brown beyond this as far as apical spots; distal to the apical spots the apex is whitish brown; space 3 distal to the hyaline spot and spaces 4 and 5 dull reddish brown; disc and termen black, except space 1B and in the female space 1A filled with a large quadrate white marking which starts below the inner margin of the cell spot and extends almost to the margin. UNH basal area white sullied with brown scales, extending along space 1B about halfway to the margin; whitish spots in spaces 3-6 with deeply excavate external margin, and a trace of a spot in space 7; basal to these white spots the discal area is reddish brown as on the UNF costa; distal to the spots, light red-brown with a white submarginal suffusion; space 1A reddish brown except base; spaces 1B and 1C dark apart from white basal area. F (male) 24 mm, (female) 26 mm. Illustrations of UPS and UNS in Lewis (1973, plates 87.38 and 87.39).

Plate 87. *Thracides phidon* (male), collected as larva on *Heliconia* sp., Chinchina, Colombia, 8.vii.1996 (ref. 96/108).

Contrary to Kaye's (1921) statement that this species is not rare, in my experience the adults are decidedly rare in Trinidad, and I have just one male taken as an adult (Parrylands, 13.ix.1980). I have also seen specimens from the "Northern Mountains" (female) xii.1938-i.1939, A. Hall, NHM, Port of Spain (female) i.1897, Dr. Rendall, NHM, St. Anns Valley ((male), NHM), Symonds Valley (female) iii.1930, A. Hall, ex coll. W.J. Kaye, AME and two males and two females with no locality details in the NHM. In contrast, the larvae are more commonly found.

Moss (1949) records the food plants as banana, *Heliconia* and similar plants. He illustrates the head, which is comparable to that described below. There is a head capsule in the NHM, but it is damaged and the markings are obscured by white waxy powder. Emerged pupae are translucent white, elongate, smooth; the proboscis sheath extending well beyond the cremaster; the frontal

spike curls over at the apex. Jansen and Hallwachs (2001) reared this species regularly from larvae on both banana and *Heliconia latispatha*.

I have reared this species from a larva which I collected on an ornamental *Heliconia* sp. at Chinchina, Caldas, Colombia, and have found, but not successfully reared, similar larvae in Trinidad, e.g. on *Heliconia* sp. (Spanish Farm, 16.i.1982, ref. 82/35B), on *H. wagneriana* (Morne Catherine, 24.iii.1982, ref. 82/57, and 26.ii.1994, ref. 94/18; Inniss Field, 1.x.1994, ref. 94/57). In addition, SAS has reared this species from banana in Trinidad.

Plate 88. *Thracides phidon* larval shelter on *Heliconia wagneriana*, Morne Catherine, 26.ii.1994.

The mature larval shelter is made from the basal part of a whole leaf, with the distal area eaten away to a lesser or greater extent. The leaf lamina is folded downwards at an angle on each side of the midrib to give a parallel sided shelter; this angle in the lamina close to the midrib is held with short silk threads attached close to the midrib and connecting to the midrib; in addition, several (e.g. seven in the example I recorded, ref. 94/18) longer threads are attached about 1.0 - 1.5 cm from the midrib, and pass directly to the opposite half of the leaf lamina. I measured shelters of 13 - 14 cm along the midrib. The larva rests upon the ventral surface of the midrib, which is covered in white waxy powder.

Plate 89. *Thracides phidon* L5, 58 mm, collected on *Heliconia wagneriana*, Morne Catherine, 26.ii.1994 (ref. 94/18).

Plate 90. *Thracides phidon* L5 detail of head, collected on *Heliconia* sp., Chinchina, Colombia, 8.vii.1996 (ref. 96/108).

The elongate fifth instar larva grows to 60 mm in length. The head is about 4mm high, 3 mm wide at the stemmata, and indented at the vertex. It is light brown in colour, with black spots at the vertex, dorso-laterally on the face, covering the stemmata and covering the clypeus; however, this is often not clear in living specimens as the head and body are covered with white waxy powder; these spots are less well defined in earlier instars. The body has a distinctive transversely grooved appearance around the intersegments, with smoother spaces in between; the anal plate is flattened posteriorly, with a rounded margin and strong backwardly directed setae. The wax glands develop laterally on A7-8.

Plate 91. *Thracides phidon* pupa, 44 mm, collected as larva on *Heliconia* sp., Chinchina, Colombia, 8.vii.1996 (ref. 96/108).

The pupa measures 35-44 mm; light green with no markings; elongate, smooth, with a 3.0 - 3.5 mm frontal spike, slightly upturned at the apex - thus differing from Moss's material in the NHM (see above). The substrate around the pupa is covered with white waxy powder, but the pupa itself is largely clear.

In Trinidad, larvae of an *Apanteles* sp. often emerge from pre-pupae. On one occasion (ref. 82/57) I found a larval shelter with the basal part blocked with tangled silken threads and small white waxy blobs (probably put in place by the larva preparing to pupate), and distal to this the host larva remains, and then a loose mass of *Apanteles* cocoons within a loose flocculence, the cocoons mostly orientated at right angles to the midrib. These cocoons had already emerged, but cocoons reared from another larva (ref. 94/18A)

yielded 26 adults, three males and 23 females, but many cocoons failed to emerge successfully.

270. O16/3 *Neoxeniades braesia braesia* Hewitson 1867

Three subspecies are recognised by Evans (1955): *aqua* Evans from Colombia and Ecuador, *braesia* from French Guiana, the Amazon Basin and Bolivia, and *andricus* Mabille described from Brazil.

I added this species to the Trinidad list (Cock 1982), based on a male which I captured within forest at Parrylands (3.iii.1980). Since SAS has captured a full series from Inniss Field (male), 3 (female) i.1983; (female) vi.1987; (male) vi.1999), Moruga East (2 (male) ii.1983), Mt. Tamana ((male), (female) ii.2001).

Plate 92. *Neoxeniades braesia* (male), Parrylands, 3.iii.1980. Scale in mm.

UPS dark brown with white hyaline spots; head and thorax with green setae. In the female the spots are larger, and the cell spots are not so deeply indented on the distal margin. UNS paler, head whitish, thorax with orange tint; white markings on costa from base to end of cell spot, space 1B below spot in space 2 (lower margin extended basally), basal third of costa UNH.

SAS notes that this species flies very quickly, and settles below leaves on forest tracks. The male he caught on Mt. Tamana was 'sunbathing' with its wings open, returning to the same spot after flights.

Although it is not included in Moss (1949), Moss did rear this species and there is preserved material in the NHM. One female specimen in the NHM is labelled "Para garden fl. *Callithea* big sp."; this is probably a reference to the use of a *Calathea* sp. (Marantaceae) as larval food plant but could refer to an adult nectar source. The single associated cast L5 skin has a white body, with setae on the anal plate; the head capsule is almost oval, wider ventrally; it is covered with white waxy powder, but appears to be light brown with an irregular dark line close to the epicranial and clypeal sutures. The pupal shelter contains white waxy powder, but this does not seem to extend to the pupa. The emerged pupa is translucent light brown, smooth, elongate, with no setae; the proboscis sheath reaches the cremaster tip; the T1 spiracle appears to be light brown; no frontal spike. There is also an associated parasitoid cocoon mass in the NHM, reminiscent of *Bracon* spp.

271. O16/6 *Neoxeniades scipio fulguratoides* Kaye 1925

There are five subspecies in Evans (1955) treatment of *N. scipio* Fabricius. Kaye (1925) described subspecies *fulguratoides* from Trinidad on the basis of specimen collected 15.iv.1922 by F.W. Jackson at St. Ann's at 1300 ft. Evans (1955) examined the type and notes that it is a female. The specimen was in Kaye's collection and is presumably now in the Allyn Museum of Entomology. Evans (1955) also lists specimens from French Guiana, and a long series from Belem.

Plate 93. *Neoxeniades scipio fulguratoides* (female) Inniss Field, iii.1983, SAS (specimen in coll. S. Alston-Smith).

Plate 94. *Neoxeniades scipio fulguratoides* (female) UNS of plate 93.

UPS dark brown; white hyaline spots; overlay of light blue setae on head and thorax, base and narrowly along termen of F and broadly on base and termen H; blue paler in female. UNS head white; UNS thorax dull green-brown; UNS abdomen light purple-brown with a pair of pale longitudinal lines. UNF with dark green along costa diffusing into purplish at apex; disc dark purple-brown, pale on termen; extensive white spot in 1B under hyaline spot in 2. UNH light purple-brown in spaces 1A-C; remainder UNH green with conspicuous white spot end cell, and traces of spots in spaces 3 and 4. Fringes, light brown, paler on UNS.

Moss (1949) not infrequently found the larvae of this subspecies on pineapple plants (*Ananas sativus*) at Belem. Jansen and Hallwachs (2001) record larvae quite commonly on two terrestrial bromeliads: *Achmaea magdalenae* and *Bromelia pinguin*. *Achmaea magdalenae* is recorded from Trinidad, but is probably not indigenous, although several other members of the genus are,

and *B. pinguin* is not a Trinidad species, although the congeneric *B. plumieri* is quite widespread (Smith and Pittendrigh 1967). SAS has reared this species from terrestrial bromeliads in Trinidad.

Apart from the type specimen, the only other Trinidad specimens have been collected or reared by SAS: Edwards Trace, Moruga ((female) iii.1983), Guayaguayare ((male) ix.1999), Inniss Field ((female) i.1983; (male), (female) ii.1983), Sangre Grande (male) i.1989). SAS has also noted larvae at North Post and Matura.

The adults are very territorial, and pick a spot along a forest track and fly up and down very quickly, returning to the same spot (S. Alston-Smith pers. comm. 2001). Such adults seem to be in poor condition due to this behaviour.

Moss (1949) illustrates the head capsule and describes the larva and its behaviour in some detail. Plants growing in shade are preferred for oviposition, and the ova are laid at the tip of a blade. The newly hatched larva feeds from the tip of the blade and pulls the edges of the blade together with silk strands below the apex to form a shelter. The mature larva measures 60mm; very dull yellow-green; irregular olive green dorsal line; spiracles ochreous; black sub-dorsal spots on each of the last two segments. Head deep ochre on face, black posteriorly; six black marks on face, narrow close to epicranial sutures, rounded above stemmata, and intermediate in between. SAS notes that the larva from Trinidad is as Moss reports but the Trinidad form has five black spots on the head capsule and not six.

When mature, the larva cuts the silk strands, lines a hollow in the leaf with white waxy powder and pupates. The pupa has a stout frontal spike and the proboscis sheath reaches the cremaster; white waxy powder present; light creamy colour, lightly freckled with brown dots dorsally.

I have examined A.M. Moss's material in the NHM. A preserved ovum in the NHM is large, smooth and hemispherical. The head capsules of the cast L5 skins in the NHM have variable markings and waxy powder - and I believe more than one species is represented. One form matches that illustrated by Moss (1949) and Jansen and Hallwachs (2001). One of these is associated with a gregarious *Apanteles* (s.l.) sp. whose cocoons are irregularly arranged in a loose mass of flocculence. The emerged pupae in the NHM also represent more than one species, and the following is based on the form clearly associated with a pupal shelter made from a robust bromeliad leaf. The emerged pupa is opaque white with black dots covering the dorsal part of the thorax and abdomen. The light brown frontal spike is robust, straight and blunt. Moss reared a gregarious *Brachymeria* sp, in which the emerging adults each made their own exit hole in the host pupa.

The larva illustrated by Jansen and Hallwachs (2001) matches Moss's description reasonably well. It has a light brown head with a dark posterior margin, a row of three black spots down each epicranium and another over the stemmata, the clypeus black and a black inverted V above the clypeus. The body is dull, pale translucent green with a pale sub-dorsal line, broadly pale subventrally, brown spiracles and black spots on the last two segments. The pupa is white with black spots on the head and thorax.

272. O19/2 *Pyrrhopygiopsis socrates orasus* Druce 1876

Evans (1955) treats this species as three variable subspecies: *orasus* Druce is widespread in northern South America, while *crates* Mabille and Boullet is restricted to the Upper Amazons, and *socrates* Ménétriés is found from Belém south to Argentina. As is the case for *Thracides cleanthes*, there is confusing variation repeated between subspecies, and further study and rearing is needed. Typically subspecies *orasus* has a white patch at base UNH, which is absent in form *socrates*. However, all Trinidad specimens that I have seen match form *socrates* in that they have no white area at base of UNH, apart from one specimen in coll. SAS ((male) vii.1988, Inniss Field) which is f. *orasus* and has this white patch.

Plate 95. *Pyrrhopygiopsis socrates orasus* f. *socrates* (male) UNS, Parrylands, 13.ii.1980. Scale in mm.

The UPS resembles a *Pyrrhopyge* sp., being dark shiny blue, with white fringes and the head and apex of the abdomen orange. However, it is less robust than *Pyrrhopyge* spp. and the antennae are obviously clubbed before the reflexed portion whereas those of *Pyrrhopyge* spp. are reflexed before the clubbed portion (Cock 1981b). UNS head and distal half of abdomen orange. UNF dark blue in basal part of wing, olive-brown on costa and distal portion extending to below vein 2 on margin; veins dark in distal olive-brown area. UNH of f. *socrates* olive-brown with dark veins, except spaces 1A-1C dark shiny blue. Illustration of UNS f. *socrates* in Lewis (1973, plate 96.18). UNH of f. *orasus* similar to f. *socrates*, but basal area white in spaces 2, cell, 7 and costa, and basal $^1/_3$ of costa UNF also white.

Plate 96. *Pyrrhopygiopsis socrates orasus* f. *orasus* (male) UNS, Inniss Field, vii.1988, SAS (specimen in coll. S. Alston-Smith).

Sir Norman Lamont's capture of a specimen from Morne Diable (6.iv.1917) is the first record from the island (Kaye 1921); this male specimen is now in the RSM. Adults of this species are uncommon in collections, but larvae can be found on coconut, usually in forested areas. I have further records from Palmiste ((male) 5.iv.1934, N. Lamont, RSM), Parrylands, forest clearing ((male) 13.ii.1980, MJWC) and Las Lomas, Spanish Farm ((female) 30.v.1982, MJWC). SAS has records from Fondes Amandes ((male) iv.1990), Forest Reserve (male) iv.2000), Morne Catherine (male) i.1979), North Post ((male) iii.2002) and Quinam ((male) iv.1990). I have found larvae in Caura Valley, and Clive Urich reared a male from a larva on coconut at his Sans Souci Estate, Sangre Grande (v-viii.1982, MJWC).

Apart from the specimen of f. *orasus* which SAS captured at Inniss Field, he has seen one other specimen of this form at Forest Reserve (iv.2000), settling along a forest track.

Moss (1949) reared this species from larvae found on coconut palm and "assahy" palm [*Euterpe oleracea*]. In his notes, he refers to the larva as white, but his plate shows a larva with a row of three dark spots down each side of a pale head, and the body with a pale subdorsal stripe. Moss's plate matches my observations from Trinidad (below).

I have collected larvae on coconut palm near the head of Caura Valley (17.xii.1981; ref. 81/22C). In view of Moss's observations above, manac, *E. broadwayana* (Freeman and Williams 1928) may also be a food plant in Trinidad. The larval shelter was formed from the apex of a leaflet, the edges rolled upwards and held by silk, and the larva fed from the leaf lamina basal to the shelter. The final instar larva is about 40 mm long; head rounded, slightly narrower at apex and slightly indent at vertex, 4 mm diameter; pale brown, with a row of three black spots down each side of the face, the lowest of which covers the stemmata; a narrow, dark streak down the clypeus, the clypeal sutures and a dark streak on epicranium, close to and parallel to the clypeal suture; body translucent dark green, through which the trachea are evident; a broad white dorso-lateral stripe; spiracles brown with a yellow tint around them; gonads yellow. When preparing the pupal shelter, the larva develops white wax glands subventrally on segments A3-7, just behind the prolegs. The head capsules of instars 4 and 3 are similar, although the dark spots are less pronounced in the younger instars.

The pupa measures 36-38 mm; I did not record the colouring in life, but the emerged pupal case before me is light brown. The pupa is elongate and smooth, with a distinctive frontal spike shaped like a question mark or hook; the proboscis sheath extends to the base of the cremaster, which is bent under at the apex.

One pupa collected at Caura Valley (ref. 81/24C) had been parasitised by a gregarious *Brachymeria* sp., but the parasitoids failed to emerge. On a visit to Inniss Field (17.v.1999) SAS and I found two adults dead on leaves at about 1m above ground along a partially shaded forest track. They had been killed by a fungus, *Cordyceps tuberculata* (identified by Harry Evans, CABI Bioscience under reference no. I99-1170).

Plate 97. *Cordyceps tuberculata* on adult *Pyrrhopygiopsis socrates orasus*, Inniss Field, 17.v.1999.

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