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New Subspecies of *Pseudochrysops bornoi* (Lycaenidae) and *Saliana esperi* (Hesperiidae) from Cuba, with a New Island Record and Observations on Other Butterflies

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ABSTRACT. – Results of recent field work on butterflies in several localities in western, central and eastern Cuba are presented. New endemic subspecies of *Pseudochrysops bornoi* (Lycaenidae) and *Saliana esperi* (Hesperiidae) are described, and the lycaenid *Tmolus azia is* newly recorded from the island. Details of new localities for several species of restricted distribution are given, with a discussion of the resident status of others, of continental origin.

INTRODUCTION

The proximity of Cuba to the Yucatan peninsula of Mexico to the west, and to peninsular Florida and the Florida Keys to the north is reflected in records of Central and North American butterfly species, recorded from the island either as rare vagrants or as colonists with varying degrees of success (Alayo and Hernández, 1987). To the east lies Hispaniola, across the narrow Windward Passage, another potential access route to the island. Between 21 September and 6 October 1991, we carried out field work on butterflies in three main regions of Cuba; in the west, in south-central areas and in the old province of Oriente far to the east. Sites visited were as follows:

Pinar del Río Province: Soroa and Pons, Pan de Azúcar.
La Habana: San Antonio de los Baños.
Matanzas: Ciénaga de Zapata, near Playa Larga.
Cienfuegos: Jardin Botánico de Soledad and approaches to Cienfuegos in the Sierra del Escambray.
Sancti Spiritus: Playa Ancón; near Topes de Collantes, Sierra del Escambray.
Guantánamo: Gran Piedra; coastal sites from Sardinero, near Santiago de Cuba to Yateritas, Tortuguilla, San Antonio del Sur and Imías towards Maisí; Baracoa to Río Jaguaní and Minas de Amores and towards Moa.

During this survey, we saw or collected 110 species, about 60% of the faunal list considered by Alayo and Hernández (1987). The records added a resident lycaenid to the island's list, provided new distributional data for several resident Cuban species, and strengthened the evidence of residency of others whose status has been uncertain. Two butterflies were of particular interest: a colony of the skipper *Saliana esperi* found at Soroa, where the insects flew strongly in deep shade of secondary forest and settled in sunlit patches, on broad leaves, and two specimens of the tailed lycaenid *Pseudochrysops bornoi,* found at Yateritas on the southeastern coast, on xeric *Batis maritima/Acacia* flats. These represent new subspecies; they will be described before other observations are mentioned and discussed.

Pseudochrysops bornoi yateritas ssp. nov. (Figs. 1, 2)

Description. —Forewing (FW) length: male, 9 mm; female, 10 mm.

Male. —*Upper surface* black, with violet gloss over much of FW except cell to lateral margin and on hindwing (HW) in a wedge extending from obscure black ocellus; single tail at Cu_2. *Under surface* ground color light grey (faintly brownish), FW with following markings: spot in cell and bar at cell-end, three post-distal spots in straight

line in spaces between R_4 and M_3, angled with respect to spots in M_3-Cu_1 to Cu_2-2A, that in Cu_1-Cu_2 oblique; submarginal series of chevron-shaped spots from near costs to 2A, then a matching series of narrower dashes and a fine black marginal line. Hindwing with three black spots along costal margin and another at base of cell; a line of dark brown markings from cell-end to anal margin and an irregular converging post-distal series. Between the post-distal markings and a submarginal series of bold dark brown spots, ground color is slightly paler than elsewhere; arrangement of spots leaves this band narrow in spaces M_3-Cu_1 and Cu_2-2A. Distal to submarginal markings lies a series of bold, dark brown marginal spots, that in space Cu_1-Cu_2 an angular finely orange-capped ocellus, ringed distally with bright blue to blue-green iridescent scales, also adorning the immediately anterior and posterior marginal markings.

Female. —*Upper surface* dark grey, with violet flush of same tint as male but restricted to cell and spaces Cu_1-Cu_2 and Cu_2-2A, not extending to margin. Hindwing as male; only a few violet scales capping very obscure ocellus. *Under surface* much as in male in greyish ground, placing of FW postdiscal spots and in boldness and disposition of HW markings, including narrow orange capping of ocellar spot and distribution and tint of iridescent marginal scales.

Types.— HOLOTYPE female, in flight over *Batis* at Yateritas, ca. 5 km west of Tortuguillas, Guantanamo Province, Cuba, 11 a.m. 1 October 1991. PARATYPE male, same locality, 5 p.m. 3 October 1991, on flowers of *Acacia farnesiana.* The holotype is in the Cuban National Collection, La Habana, and the paratype in the Hope Entomological Collections, Oxford, England.

Comparative Material Examined

(i) *P. bornoi yateritas:* 1 male (paratype) (National Collection, La Habana, Cuba).

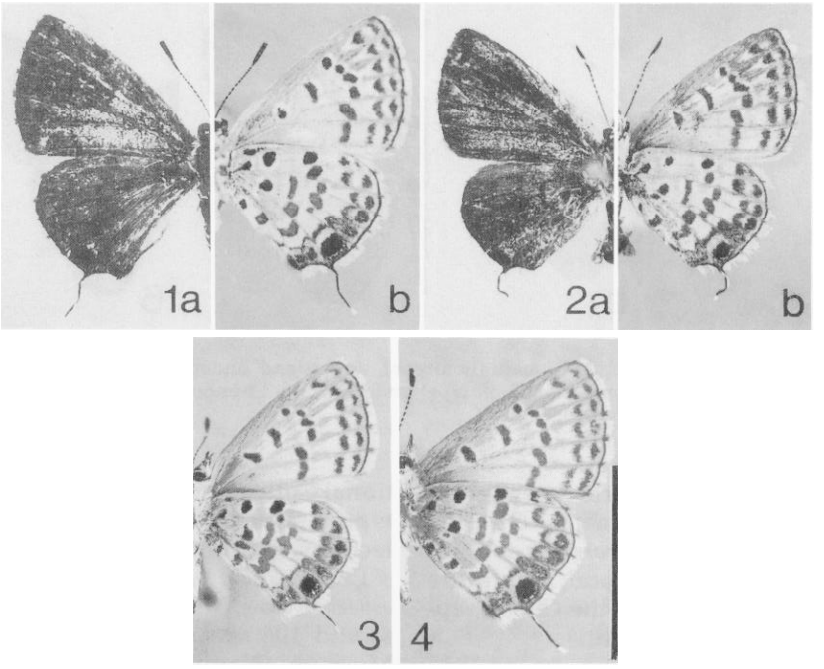
(ii) *P. b. escobioi* (Schwartz, 1987): 18 males and 11 females (S. J. Ramos collection) 2 males and 2 females (Hope Collections).

(iii) *P. b. bornoi:* 1 male paratype (American Museum of Natural History) and 1 female (Allyn Museum of Entomology).

Comparisons and Discussion. —Although only two specimens were collected, these differ so obviously from the nominate subspecies from Hispaniola (Comstock and Huntington, 1943) and from *P. b. escobioi* described from Puerto Rico (Schwartz, 1987) that we regard them as a new subspecies, rather than as strays from the east, as suggested for the sole previous record of this butterfly in Cuba (Alayo and Hernández, 1987). Genitalic comparisons have not been made, but novel aspects of wing pattern of both sexes of *P. b. yateritas* are:

(i) On the upper surface, the black and dark grey ground color in male and female respectively has no brown component, as in the other subspecies. Moreover, the dull purple gloss of the male is of the same tint as in the female, rather than "lavender" as in other populations, and extends over much of the FW surface. In both sexes, the HW marginal ocellus is barely demarcated (as in *P. b. escobioi)* and the prominent marginal series *P. b. bornoi* is absent.

(ii) On the under surface, the primarily clear grey ground color differs from the pale brown of other subspecies. Furthermore, the arrangement of FW postdiscal spots differs from that of both Hispaniolan and Puerto Rican insects, angled rather than arced as in *P. b. bornoi* and not broken as in *P. b. escobioi.* The spots of the inner marginal row are bold; the anteriormost is the largest in the series rather than the faintest, as in the other subspecies. Also, the space between the postdiscal and inner submarginal bands is narrower than in other populations, particularly towards the hind margin in spaces Cu_1-Cu_2 and Cu_2-2A. A spot, rather than a bar lies within the FW cell in the Cuban male and female. On the HW of both male and female *P. b. yateritas,* the band defined by the postmesial and inner marginal spots is only slightly paler than the ground elsewhere, as in the Hispaniolan subspecies, and less contrasting than the almost white band of *P. b. bornoi.* The width of this band is reduced in the Cuban insects by the large size of the markings defining it, and it is particularly narrow in spaces M_3-Cu_1 and Cu_2-

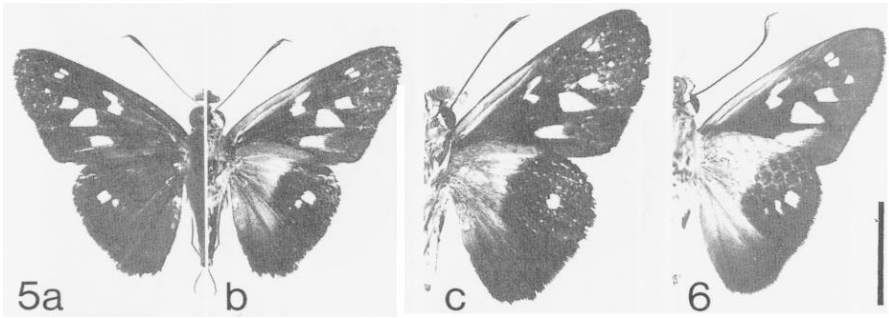


FIGS. 1-4. *Pseudochrysops bornoi yateritas.* 1a, b, male (paratype), upper- and under surfaces; .%, b, female (holetype), upper- and under surfaces. 3. *Pseudochrysops bornoi escobioi,* female under surface, Guánica forest, Puerto Rico, July 1986 (Hope Entomological Collections). 4. *Pseudochrysops bornoi bornoi,* female under surface, Pedernales Province, Dominican Republic, May 1984 (Allyn Museum of Entmology, Sarasota). Scale bar Figs. 1-4: 10 mm.

2A. The orange marginal color is more restricted than in either of the other subspecies, forming only a narrow ocellar cap. Finally, the iridescent HW marginal scales are blue, rather than "green" as in *P. b. escobioi* or "golden green" as in the nominate subspecies. To facilitate comparison, figures of the under surface of the female of *P. b. escobioi* (Fig. 3) and *P. b. bornoi* (Fig. 4) are included. The male paratype of the new Cuban subspecies, in the National Collection, La Habana, was also found in the vicinity of Yateritas. The upper surface of this specimen was illustrated (as a female) by Alayo and Hernández (1987:Plate 20, Fig. O). It is more worn than that described above and shows more restricted violet gloss, but the patterning of the under surface matches that of *P. bornoi yateritas,* and we are confident that it represents an example of the Cuban population rather than a stray from the east.

In both of the Cuban insects described above, all components of the underside pattern on fore- and hindwings are bold, each is more or less clearly ringed by whitish scales and the overall impression of the two unusually small butterflies is of heavy, yet very crisply defined and boldly contrasting markings.

Throughout its range, *Pseudochrysops bornoi* is a rather inconspicuous butterfly of xeric areas. In Haiti and the Dominican Republic, it is generally found in harsh, low lying and exposed areas of *Acacia* scrub (Schwartz, 1987). The Puerto Rican subspecies was described from a region of xeric thorn scrub in the southwest of the island, and S. J. Ramos introduced us to the butterfly in the nearby dry Guánica forest, The Cuban specimens were collected near sea level in an extensive open area **of** *Salicornia* flats interspersed with stands of *Acacia farnesiana,* in which *Brephidium exilis* was very abundant. *Pseudochrysops bornoi* was flying with *Hemiargus a. ammon* and in flight they resembled worn specimens of that species. A considerable area of southeast-



FIGS. 5-6. *Saliana esperi soroa.* 5a, b, male (holotype), upper- and under surfaces; 5c, female (paratype), under surface. 6. *Saliana esperi esperi,* male (holotype) under surface, Chimbo, Ecuador, 1891 (British Museum (Natural History)). Scale bar Figs. 5-6: 10 mm.

ern Cuba is occupied by xeric thorn scrub, in places with stands of cactus. On Hispaniola and Puerto Rico *P. bornoi* is at times relatively common, albeit local, and future field work may well reveal the Cuban representative in the same light.

Saliana esperi soroa ssp. nov.
(Figs. 5, 7)

Description. Forewing (FW) length: male, 18.3 mm (18-18.5; $n = 3$); female, 20.5 mm.

Male. — *Upper surface* dark brown, FW with seven pale yellow hyaline spots, that in cell hook-like and spot in space M_2-M_3 very small; hindwing (HW) with square hyaline spot in space M_2-M_3 and small spot beneath in space M_3-Cu_1. *Under surface,* FW with spots as above, basal half of costal dull ochreous; ground color deep grey, greyish brown from distal edge of cell to apex and along anterior half of lateral margin. HW costs grey, basal half of wing dirty white with reddish brown scaling at wing base; outer half dark purple-brown, enclosing two spots as on upper surface, and area beyond hindwing fold to anal angle dark grey.

Female. — FW apex more rounded; HW with single spots in space M_2-M_3, otherwise coloration as in male but with some dirty yellowish scaling at HW base on under surface.

Types. — HOLOTYPE male, Soroa, Pinar del Río Province, Cuba, 11.30 a.m. 22 September 1991. PARATYPES 2 males, 1 female; same data. The holotype is in the Cuban National Collection, La Habana, and the paratypes are in the Hope Entomological Collections, Oxford, England.

Comparative Material Examined. — *Saliana esperi* (Evans, 1955); holotype (male) (Fig. 6) and 106 specimens in series in British Museum (Natural History) arranged by Evans, Two males, two females in Hope Entomological Collections; one male in the National Collection, La Habana, Cuba. We dissected two males (St. Anns', Trinidad; Zamora, Ecuador) from the series examined by Evans and two males (Port-of-Spain, Trinidad; Cache, Costa Rica) from the Hope Entomological Collections. In addition, genitalic dissections of other members of the genus prepared by Evans, in the British Museum (Natural History) were examined.

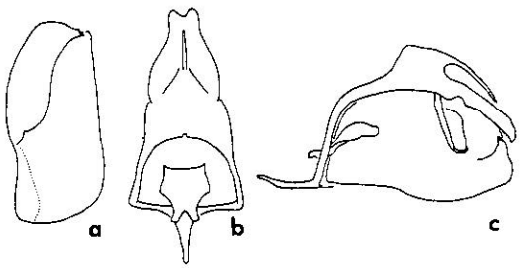


FIG. 7. *S. e. soroa,* male (paratype) genitalia: 7a, left valva, inner aspect (omitting setae present on external surface of posterior half); 7b, dorsal view of genital capsule; 7c, lateral view of genital capsule with left valva removed. (Drawings prepared from photographs.)

Previous Records of Saliana in Cuba. —Saliana was not mentioned in the works of Gundlach (1881a, b, 1891) on the butterflies of Cuba, or in the accounts of Williams (1931), Bates (1935) or de la Terre (1974). The presence of this largely South American genus on the island was first noted by Riley (1975) who cited a "Cuban race,' differing from continental populations in lacking a forewing hyaline spot in space 4 [M_2-M_3] and in the sullied hindwing basal area. However, the figure accompanying the account (Plate 24, Fig. 18) is from a painting of an insect that differs little from continental *S. esperi* in general tint. This puzzle cannot at present be solved: Evans did not mention Cuba in his list of localities for this species, and although the British Museum (Natural History) collection includes a space to accommodate a single specimen for "Cuba," no such specimen can now be found. Alayo and Hernández (1987:Plate 47, Figs. Y, Z) illustrate a male from Rangel, Pinar del Río, which, although paler in the color reproduction, generally matches our recent specimens. They also mention a further example from Baracoa, housed in the U.S. National Collection, Washington, D.C., which we have not seen.

Comparisons and Discussion.— The underside coloration of the four specimens of *Saliana* collected at Soroa, Cuba, is not matched in the extensive series of *Saliana* species in the British Museum. On sight, the alignment of these with *S. esperi* would not be obvious. The most unusual features of the Cuban insects include the lack of at least some brightly colored areas on the fore- and hindwing beneath (other than the dull yellowish forewing costa), the extent of dark grey over much of the forewing, and the unrelieved dark purple-brown of the outer half of the hindwing adjoining a drab and heavily sullied basal area. The dark hindwing area is approached in tone by *S. morsa* but there it is relieved by a brighter bluish marginal flush. Among the series of the very variable *S. salius* examined, occasional specimens resemble Cuban *Saliana* in the sullied appearance of the hindwing base, but there the distal zone, whether chestnut or purple-chocolate is always lightened by some marginal overscaling.

We compared the Cuban insects with the long series of *S. esperi* used by Evans (1955) in his revision of the genus. Throughout its wide range from southern Mexico to southern Brazil and Bolivia this skipper varies little in the bright red-brown tint of the underside forewing apex and the outer half of the hindwing; the inner hindwing cream or yellow area is often sullied to some extent, but never as heavily as the corresponding whitish patch in the Soroa specimens. The hyaline markings are similar in both groups; the forewing spot in "space 4" is present in each of our specimens and throughout the continental series, with the single exception of a male from "British Guiana."

Evans' description of *S. esperi* made use of color and pattern features only. There was no mention of genitalic characters, although he included line figures of the male structures. The genitalia of a Cuban specimen are shown in Figure 7. They are identical in all respects to four continental examples of *S. esperi*. We thus refer the specimens collected at Soroa to *S. esperi,* as a distinctive subspecies, while noting that the simplified figures of the genitalia of this and other *Saliana* species given by Evans (1955: Plate 86 0.14) are, in varying degrees, misleading. Evans' drawings suggest that the valvae and other structures of the genital capsule of *S. esperi* vary considerably from those of related species, while we found the variation to be quite limited. The valva of the new subspecies is as shown in Figure 6a, with the tip of the cuillar spined, as in several species, although mentioned by Evans only for *S. salona.* The contour of the uncus seen from above (Fig. 6c) seems characteristic of *S. esperi:* the bifurcation of the posterior tip of this structure diverges more strongly in *S. salius, salona, antoninus* and *longirostris,* while in *S. morsa* the tip is more slender than in *S. esperi.*

We believe that *Saliana esperi soroa* is a resident, perhaps even a widely distributed butterfly of Cuba that has virtually escaped detection. In addition to the specimens collected and seen at Soroa and the

individual from Rangel, in the same province, another sight record was made two weeks later in Sancti Spiritus province at Topes de Collantes, in the Sierra del Escambray. As mentioned above, a *Saliana* was collected once in the far east of the island. Regardless of the range of this butterfly, Cuban populations lie a considerable distance from any on the continent and it appears that a skipper that remains quite uniform throughout much of its wide range has diverged markedly in its only known outpost in the Greater Antilles.

NYMPHALIDAE

Dynamine mylitta Cramer 1782

This species has entered the Greater Antilles only in Cuba, where it has been regarded as sporadic and generally rare. Alayo and Hernández (1987) mention that it has been found, occasionally in large numbers, on the Guanahacabibes peninsula at the extreme west of the island, and that at such times it may stray eastwards into La Habana province. In September 1991, we found it quite commonly east of the peninsula, at Pens, Pan de Azúcar, Pinar del Río province, flying at the forest edge and seldom straying into open land. Several specimens collected were fresh and the butterfly was clearly resident at the time. In this locality, only *D. mylita* was seen, while the widely distributed and endemic *D. egaea calais* was found only in a similar locality near Playa Larga in the Ciénaga de Zapata, Matanzas province.

[*Anartia lytrea* Godart 1819]

Alayo and Hernández (1987) cited Gundlach's record of "a new species of *Anartia*" among material supposedly collected in Cuba during the last century. They found a specimen of *A. lytrea* in the Gundlach collection, noting that the occasional occurrence of this Hispaniolan butterfly in the extreme east would be less improbable than in the west, as implied by Gundlach. However, in September 1991 at Pan de Azúcar, Pinar del Río, we saw a single specimen resting open-winged, that greatly resembled *A. lytrea*, among many *A. chrysopelea*, the Cuban endemic species. Unfortunately, the butterfly was not collected and we mention this indefinite record to alert lepidopterists working in Cuba to the possible presence of *A. lytrea*, flying with its often abundant congener, from which it is indistinguishable on the wing.

Atlantea perezi Herrich-Shaeffer 1862

This endemic Cuban butterfly was noted as generally restricted to the northeastern areas of Moa and Baracoa, occasionally straying south to Santiago de Cuba (Alayo and Hernández, 1987). In October 1991 it was seen, sparsely, in only one locality west of Baracoa. Along the road to Minas de Amores, the butterflies flew slowly along a steep ravine, occasionally moving up the banks and ascending to the top of small trees at the ravine edge, then circling slowly downwards. When disturbed, their flight became relatively agile and at times the butterflies entered the adjacent forest cover. All specimens collected were fresh.

LYCAENIDAE

Strymon bazochii Godart 1822

Bates (1935) based his description of *S. b. gundlachianus* on a series collected in the Sierra Maestra, Cuba. Populations of this hairstreak on Jamaica and Hispaniola are also generally regarded as conforming to this subspecies and uniformly distinct from continental *S. b. bazochii* (Riley, 1975). It is regarded as rare in Cuba; Alayo and Hernández (1987) note that it has been collected more frequently in recent years at the summit of Gran Piedra, Santiago de Cuba, and in several localities near the southeastern coast of Guantánamo province. In October 1991 we recorded one specimen at Verteintes, east of Baracoa in the north east of the island.

Tmolus azia Hewitson 1873

This hairstreak was newly recorded from Cuba in September 1991, when we found it on open, disturbed land, bordering the forest margin, at Pens, Pan de Azúcar, Pinar del Río province. It was occasionally seen perching on the upper surface of broad leaves but was common visiting the flowers in patches of *Mimosa pudica*. In October,

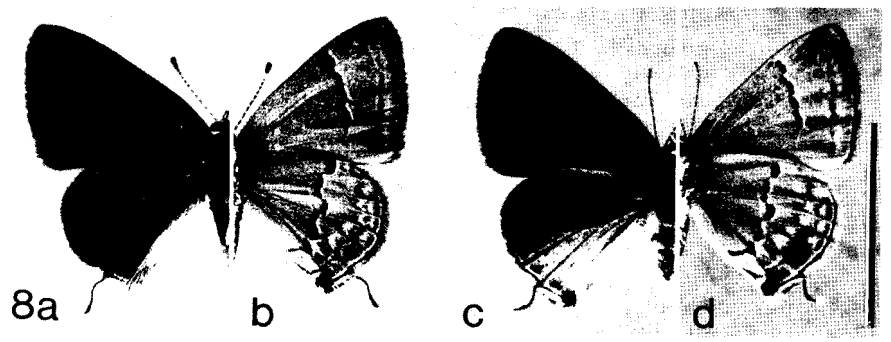


FIG. 8. *Tmolus azia.* 8a, b, male upper- and under surfaces; 8c, d, female upper- and under surfaces (Pens, Pan de Azúcar, Pinar del Río, Cuba). Scale bar Fig. 8: 10 mm

we added two further localities: the coastal area of Playa Ancón, near Trinidad, Sancti Spiritus province, dominated by stands of the exotic leguminous shrub *Cailliea glomerata* on which the butterflies were nectaring, and amongst roadside vegetation in the Sierra del Escambray, near Topes de Collantes, and at San Bias, Cienfuegos province. Of the 15 specimens collected in Pinar del Río and five in the other localities mentioned, only one male was included. At first sight, the discovery of a butterfly, unrecognized in previous surveys, in five localities in Cuba may seem remarkable, but this matches the pattern of its addition to faunal lists elsewhere in the Caribbean.

This widespread Central and South American species was first recognized in the Antilles on Jamaica (Vyhmeister, 1980) and has now been found, at times commonly, in southern Florida, in many localities on Hispaniola (Schwartz, 1989) and on Mona Island (Smith et al., 1988). S. J. Ramos (pers. comm.) recently collected it in western Puerto Rico. This is a very inconspicuous butterfly in flight and at rest; furthermore, each adult brood may be on the wing for a very short time. It seems more probable that *T. azia* was long overlooked in its insular range than that it enjoyed recent and spectacular colonizing success.

Over its wide continental range, this butterfly is remarkably constant in wing pattern, and no subspecies have been described. We considered that a distinct race might have evolved in isolation in Cuba, and compared the series from Pinar del Río and from the other Cuban localities with examples from elsewhere in the Antilles. We examined a series of *T. azia* from near La Romana and Boca de Yuma, Dominican Republic; from Mona Island, a specimen from Puerto Rico, and a series from southern Florida. These butterflies were uniform in both sexes, and identical with those from Cuba (Fig. 8).

PIERIDAE

Eurema larae Herrich-Schaeffer 1862

This species was noted by Alayo and Hernández (1987) as abundant in only a few localities, notably near Trinidad, Sancti Spiritus province, and to the east at three sites in Granma province. In September and October 1991 we found it in two further, and widely separated regions of the island. At Pens, Pan de Azúcar, Pinar del Río, it was frequent at the edge of woodland and around clumps of bushes in open fields, flying with *E. dina dina* and *E. nise nise.* Near Minas de Amores, west of Baracoa, it was locally common, flying at the forest margin and only briefly venturing onto open ground where *E. lisa* occurred.

Eurema boisduvaliana C. and R. Felder 1865

Alayo and Hernández (1987) suggest that this butterfly reached Cuba during the present century. It has been recorded only from Soledad, Cienfuegos province, and from several localities in La Habana province. In September and October 1991 we

found it quite commonly in clearings in woodland near Playa Larga, in the Ciénaga de Zapata and, more sparsely, at Topes de Collantes in the Sierra del Escambray, near the border between Sancti Spiritus and Cienfuegos provinces. At the former site it flew with *E. dina dina;* the two were similarly agile, taking cover in the forest when disturbed. Several pairs of *E. boisduvaliana* were seen. At Topes de Collantes, it was seen along open roadsides bordering woodland, again flying with its congener and nectaring on *Bidens alba.*

HESPERIIDAE

Aguna claxon Evans 1952

Ranging on the continent from Mexico to central Brazil, this distinctive skipper was first recorded from Cuba in 1962, when several worn specimens were collected on the Guanahacabibes peninsula, presumably vagrants from Yucatan (Alayo and Hernández, 1987). These authors note that *A. claxon* has been found, more recently, in the Cienaga de Zapata, well to the east, where we encountered it in September 1991, at the edge of recently cleared secondary forest, flying with, and more frequently than *Aguna asander.* The butterflies flew swiftly in the sun, occasionally perching with open wings on the tip of a low plant. Two fresh specimens were collected, and we believe that the species was resident at the time of our visit.

Pyrgus crisia Herrich-Schaeffer 1864

In the past, this skipper was reported from the Sierra Maestra and Santiago de Cuba (Bates, 1935), but in recent years has been found only near La Habana (Alayo and Hernández, 1987). In September 1991, we found it at Soroa, Pinar del Río, flying with and about as common as *Pyrgus oileus* and *Parachoranthus magdalia,* along hedgerows and in unmown grass in a garden. Its small size and dark coloration makes it quite distinct from *P. oileus* in flight; the two settle similarly, with open wings. We sought *P. crisia* without success in other localities, where its relative is very abundant.

Hispaniolan populations of this species were described as subspecies *P. c. odilia* Oberthur 1917, a separation followed by Schwartz (1989). We compared the recent Cuban material with series from the Dominican Republic; in both the size of the white markings on the upper surface is quite variable in each sex. We detected no consistent differences.

Synapte malitiosa Herrich-Schaeffer 1865

This shade-loving skipper flies with *Cymaenes tripunctus,* but is less widely distributed in Cuba. Alayo and Hernández (1987) mention it as abundant in the extreme east of the country but scarce or absent elsewhere. We saw occasional specimens just within the edge of the forest at Pens, Pan de Azúcar, Pinar del Río, but it was abundant along tracks through dense woodland near Playa Larga, in the Ciénaga de Zapata, and in deeply shaded areas of the Jardin Botánico de Soledad (formerly Atkins Institution of Harvard University), Cienfuegos province.

Oarisma bruneri Bell 1959

One male of this elusive skipper was collected in October 1991, west of Baracoa, along the road to Minas de Amores, in a small open grassy clearing bordering the Río Jaguaní in secondary woodland. Only three specimens of this insect have been reported; it was described from two males collected at "Moa" where Alayo and Hernández (1987) note that it has subsequently been seen but not captured. They record another male, collected in December 1951 at Songo, Santiago de Cuba. The female is unknown. The distribution of the butterfly seems tied to the areas of lateritic soil of the extreme east of the island.

Oarisma nanus Herrich-Schaeffer 1865

Alayo and Hernández (1987) note this butterfly as very local, although at times abundant, and restricted to pinelands and more open, dry localities on lateritic and serpentine soils. They record it from Pinar del Río, from the Cerro de Pelo Malo, Santa Clara, and near Camagüey, and it also flies on the Isle of Pines. Gundlach (1881) recorded it from Matanzas, and Bates (1935) mentions Mayarí, in present Guantánamo

province, noting specimens in the U.S. National Collection from Baracoa. In October 1991 we found it with *Atlantea perezi* at Minas de Amores, between Baracoa and Moa, where it was common but remarkably inconspicuous in its flight just above the stony ground.

DISCUSSION

Colonization of an island by vagrant dispersal may be documented, a circumstance very different from distribution attributed, by inference, to vicariant origins in the geological past (Miller and Miller, 1989). Among the butterflies of Cuba are a number of species, notably the pierids *Eurema nise* and *Anteos clorinde* that are believed to have colonized the island successfully from Central America during the present century, since they went unrecorded by the indefatigable Gundlach (Alayo and Hernández, 1987). Similarly, a few Nearctic species including the nymphalids *Phyciodes phaon* and *Euptoieta claudia* became established during the present century following dispersal from North America. At the other end of the spectrum are shadowy records from the distant past, as of the Neotropical skippers *Ouleus fridericus* and *Callimormus radiola.* In between, numerous butterfly species have reached Cuba as vagrants over the years and recorded perhaps once or twice with others that have enjoyed transient success as colonists, flourishing briefly then failing for reasons that are seldom clear. Here may be mentioned *Hamadryas amphinome,* arriving perhaps from Mexico around 1930 and again in 1976, or the Nearctic *Pontia protodice* that bred locally on the island from 1971.

Our recent field observations provides some information on the last mentioned group. Evidence that *Eurema boisduvaliana* and, by inference *Dynamine mylitta* and *Aguna claxon* were present as breeding residents in 1991 strengthens the probability that they have been established for some time. Localities where the last two were found included the general area of past records, but may well not have been visited by lepidopterists for over a decade. Our records provide only a datum point, from which the status of the butterflies may be assessed by future field work. The presence of *Eurema boisduvaliana* in two new localities, in one as an undoubted breeding population, suggests increasing success as a colonist.

The recognition of the distinctness of *Pseudochrysops bornoi* and *Saliana esperi* on Cuba adds to the list of butterfly taxa endemic to the island. Within the count of about 185 species considered by Alayo and Hernández (1987) including casuals however infrequent and excluding only a few insects of uncertain status, the level of endemism is just over 40%, with 31 endemic species and 45 represented by subspecies not known to have dispersed from the island. Of butterflies known to be resident, this level approaches 45%, a figure exceeded on Hispaniola mainly through radiation of the genus *Calisto.*

For the Cuban representative of *Saliana esperi,* the divergence from the conservative continental insect argues for long isolation of the island race, but provides little clue to its origin. Although a butterfly with a swift and powerful local flight, *S. esperi* has little inclination for over water dispersal. It is common on Trinidad but does not seem to have entered the Lesser Antillean island chain. On the other hand, *Pseudochrysops bornoi,* a butterfly unlikely to possess dispersive ability, is present on and has phenotypically diverged between three of the Greater Antillean islands on which it occurs in widely separated populations, determined by uniform restriction to similar xeric habitats. Moreover, its relationship to members of continental faunas remains obscure. Other than the absence of representation on Jamaica, its distribution parallels that of species of the endemic Greater Antillean nymphalid genus *Atlantea.* A further group of butterflies, including the danaids *Anetia pantherata* and *A. briarea* are endemic to, and have evolved distinct subspecies on Cuba and Hispaniola alone. As suggested by Miller and Miller (1989), it is possible that the range of, and divergence between island races of these butterflies provides a glimpse of vicariant history; that such pairs, trios and quartets evolved from common ancestors, in populations isolated one from another

during the course of formation of the Greater Antilles.

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Note Added in Proof

On 23 August 1992, we revisited Soroa and collected four males of *S. esperi soroa.* These were found in same locality as on our earlier visit, again basking in patches of early morning sunlight. Another specimen was collected on 1 August at Río Jaguaní, Moa, near the Guantánamo–Holguin border, supporting our belief that this skipper may have a wide distribution in Cuba. *Pyrgus crisia* was again very common at the Soroa locality and a long series was collected. Examination of these specimens further supports our suggestion that populations in Cuba and Hispaniola do not differ significantly. From 19-21 August we found *Aguna claxon* in several localities within the Guanahacabibes National Park, most commonly near Cabo Corrientes. *Tmolus azia* was recorded from two localities on the north coast of Matanzas, on 26 August, in disturbed land east and west of Varadero, on the Hicacos peninsula.