

REDISCOVERY OF *CHIOIDES MARMOROSA* IN CUBA (LEPIDOPTERA: HESPERIIDAE)

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ABSTRACT.— The endemic Cuban skipper *Chioides marmorosa*, unrecorded for over seventy years, has been rediscovered at a site in La Habana Province. Previous descriptions of adult coloration, based on old museum specimens, are corrected. The habitat, flight behavior, and possible larval foodplant and voltinism of the butterfly are discussed. The size of the population is unknown, but the site adjoins cultivated land and requires rigorous protection and conservation.

KEY WORDS: Antilles, Argentina, *Atalopedes*, Bahamas, behavior, Caribbean, Compositae, conservation, distribution, *Dryas*, *Epargyreus*, *Eunica*, extinction, Grenada, Heliconiinae, *Heliconius*, Hispaniola, Jamaica, Leguminosae, Nymphalidae, *Papilio*, Papilionidae, Paraguay, *Pheraeus*, St. Vincent, Sapindaceae, *Urbanus*, Verbenaceae, voltinism, West Indies, Windward Islands.

Chioides Lindsey is a small, widely ranging Neotropical genus of tailed skippers containing six species, four of which are recorded from the West Indies. Of these, *C. catillus* Cramer occurs on Jamaica as a distinct subspecies *churchi* Bell & Comstock, and is distributed elsewhere from southern North America to Argentina and Paraguay. Each of the remaining three West Indian species is endemic to the Antillean region: *C. vintra* Evans from St. Vincent, the Grenadines and Grenada, *C. ixion* Plötz from Hispaniola and *C. marmorosa* Herrich-Schäffer from Cuba. While *C. catillus churchi*, *C. vintra* and *C. ixion* are fairly common in their respective island ranges, the Cuban species has not been seen, other than a single poorly documented record, for over a century, and has generally been regarded as probably extinct (Riley, 1975; Alayo and Hernández, 1987; Smith *et al.*, 1994).

Chioides marmorosa was described by Herrich-Schäffer in 1865; the holotype and one paratype (both males) from the Félipe Poey collection are preserved in the collection of the Academy of Natural Sciences of Philadelphia. Another male is held by the British Museum (Natural History), and a fourth was until recently housed in the Cuban National Collection, I.E.S., Habana, but is now missing or misplaced. The senior author recently found a further male in the Cuban 'La Salle collection' labelled "#124 Enero 29-23," presumably collected in 1923 and representing the only twentieth century record. Bates (1935) knew of no post-Gundlach records and noted that he had seen only the specimens in the Poey collection. Gundlach (1881) considered the butterfly as very rare and "seen only in the vicinity of La Habana, as far as Cojímar." Skinner and Ramsden (1923) gave a more complete account of its original distribution, mentioning Cojímar as the type locality and citing "Cojímar, Banes" from a manuscript catalog by Gundlach as collecting sites. Skinner and Ramsden further noted that Carlos de la Torre informed them that ". . . the

Banes meant is to the west of Havana between Marianao and Mariel, so the extension of its range is both east and west of Havana, as Cojímar... is to the east of Havana, along the sea coast." With the exception of the La Salle specimen, *Chioides marmorosa* was last seen in the field sometime before Gundlach's death in 1896. Here, we report the rediscovery of this skipper, in 1993/1994, in the Cuban province where it was recorded by Gundlach and within the western limit of its known range.

RECENT OBSERVATIONS

In 1993, the senior author was working in secondary forest/disturbed land some 30 km west of La Habana, in the Río Guajaibón region, estimating population size of the heliconiines *Dryas iulia* and *Heliconius charithonius*. In obtaining a full ecological description of the habitat, other butterflies were recorded, including the common tailed skippers *Urbanus proteus* (L.) and *U. dorantes* (Stoll). In April and May, two fresh male specimens of a skipper, similar to the latter but differing in detail of wing marking and genitalic structure, were randomly collected. We reexamined these specimens in August 1994 and confirmed the suspicion that *Chioides marmorosa* had been found for only the second time during this century.

We visited the locality on 1 September 1994, when several specimens of *C. marmorosa* were seen, and four males collected, between 1000h and 1430h. While the abundant *Urbanus dorantes* flew both in full sun and along shaded paths, *C. marmorosa* was only seen in an open, grassy area just outside the forest, between bushes growing to a height of 2-3m (Fig. 1). While the flight of *U. dorantes* was generally low, the only specimens of *C. marmorosa* confirmed by capture or close observation flew swiftly into the area over the bushes, descending to perch briefly, with closed wings, at the tip of tall grass stems. They were not seen taking nectar, though other skippers visited *Stachytarpheta*

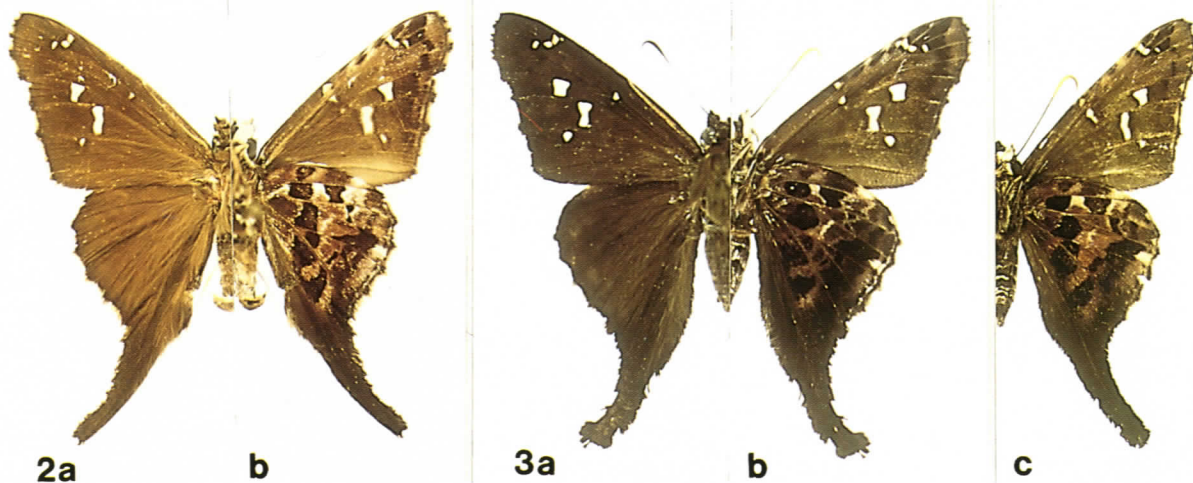


Fig. 1. The Río Guajaibón site.

Fig. 2. Nineteenth century male *Chioides marmorosa* (a: upperside, b: underside; "Holguin") from the British Museum (Natural History).

Fig. 3. *Chioides marmorosa* males collected at Río Guajaibón 1 September 1994; a: upperside, b, c: undersides. [Scale bar 10mm: for Figs 2 and 3]

(Verbenaceae), *Bidens* (Compositae), and the orange flowers of another composite, *Wedelia rugosa*. All collected specimens of *C. marmorosa* were fresh and, viewed in bright sunlight, the dark marbled patterning of the underside hindwing was strikingly washed with a blue-violet gloss, particularly obvious in the pale areas, while the apical region of the forewing showed a bronze-green sheen. These colors are transient and not obvious after setting, perhaps through loss of transparent, iridescent overscaling.

COMPARISONS AND DESCRIPTION

Previous descriptions and color illustrations (Williams, 1926; Riley, 1975; Alayo and Hernández, 1987; Smith *et al.*, 1994), all based on nineteenth century specimens (Figs 2a,b), do not accurately record the coloration of the fresh insect. The upperside ground color is dark chocolate (Fig. 3a), fading to a paler, more reddish tint in the old specimens. On the underside, the forewing ground color is dark grey-brown when fresh, again fading to a lighter hue. The most striking change is seen on the hindwing (Fig. 3b), where in a recently emerged specimen the reticulated pattern is overscaled with deep purple-brown with a tracery of blue, and contrasts little with the ground. Either as a color variant or resulting from scale loss in flight, somewhat less fresh specimens (Fig. 3c) are more clearly patterned but the reddish

brown areas of old museum specimens remain darker and more purple-tinted. There is no 'white' component in the pattern; the bright gloss on fore- and hindwing in fresh specimens, mentioned above, is also absent from previous descriptions. Although Gundlach (1881) accurately mentioned the forewing hyaline spots as "more yellowish than in [*U. dorantes*] *santiago* and more lustrous," this tint is very pale even in fresh specimens, and has been incorrectly recorded as "white" in recent descriptions. The male genitalia of a recent specimen are illustrated in Fig. 4 and are identical to a paratype dissected in Philadelphia by LRH. *Chioides* species are readily identified by genitalic structure (Evans 1952; Pl.14) and *C. marmorosa* differs from its congeners most notably in the deeply indented postero-dorsal margin of the valva, adjacent to an incurved and heavily sclerotized toothed process, and in the shape of the bifid termination of the uncus. The wing markings of *C. marmorosa* are distinctive; it most closely resembles the Hispaniolan *C. ixion*, but in that species the forewing hyaline spots are yellow and greatly enlarged, and the variegated underside hindwing pattern includes a conspicuous pale ray at the cell-end in M_1 - M_3 and lacks the light marginal wedge in M_3 - Cu_1 , obvious in *C. marmorosa*. The dark purplish hindwing ground color of *C. marmorosa* is similar to that of *C. ixion*, and particularly to that of *C. vintra*.

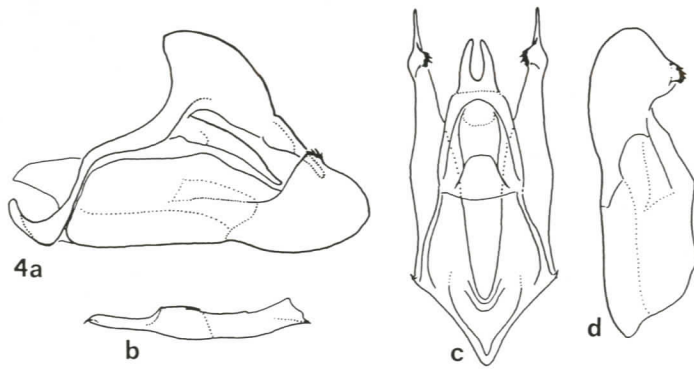


Fig. 4. *Chioides marmorosa* male genitalia: a: lateral view of genital capsule, b: lateral view of aedeagus, c: dorsal view of genital capsule, d: left valva, inner aspect (setae present on external surface and margin omitted).

DISCUSSION

Extinction is difficult to recognize in a less than thoroughly documented fauna and, as Smith *et al.* (1994) noted, for such species as *Chioides marmorosa*, not seen for many decades, all that can safely be said is that as time passes, the probability of their survival recedes. In this category may be placed such butterflies as the Cuban *Eunica heraclitus* and the endemic subspecies of *Papilio polyxenes*, *Pheraeus unia* known only from two early Hispaniolan specimens, and the skipper *Atalopedes carteri*, recorded only from New Providence Island, Bahamas, and not seen for almost half a century. At a time when the probability of extinction faces an ever increasing number of animals and plants, the rediscovery of a single butterfly feared lost is heartening, and serves to underline the importance of continued field survey and collection in less exhaustively studied parts of the world. The rediscovery of *Epargyreus spanna* on Hispaniola in 1983 (Gali and Schwartz, 1983) after over a century during which the butterfly was known only from the ancient holotype provides a striking parallel with the history of *C. marmorosa*, and the 'commonness' or 'rarity' of butterflies on the Greater Antillean islands is continually subject to reassessment (Schwartz, 1989; Smith and Hernández, 1992; Smith *et al.*, 1994).

Perhaps more surprising than the rediscovery of this butterfly is the location of the site, in a readily accessible and far from undamaged region near the capital city. Although the Río Guajaibón area (with the adjacent Río Mosquito) in Mariel municipality, west of Ciudad de La Habana, is designated as protected as a 'Tourist Natural Area/Faunal Refuge,' it has suffered some recent land clearing and includes fields in current use only 100m from the habitat of *C. marmorosa*. The woodland is secondary, obviously of very recent regrowth, merging with a plantation of mature tropical Asiatic teak trees (*Tectona grandis*, Verbenaceae). The small area in which *C. marmorosa* was found seems entirely undistinguished, cleared and with bushes and grasses.

Gundlach (1881) noted that larva of *C. marmorosa* pupates within a shelter of leaves of 'guara' (*Cupania americana*) sewn together by a dense silken web, without further describing the immature stages. If this tree is indeed the larval foodplant, its distribution cannot be limiting since it is common in lowland,

coastal areas of Cuba, including the locality where *C. marmorosa* has been found. Moreover, it is potentially available as a foodplant for other Greater Antillean *Chioides* species, being widely distributed on these islands (Adams, 1972). However, of these butterflies, the immature stages are known only of *C. catillus*, and then from Continental rather than Jamaican populations; common legumes including *Phaseolus*, *Mimosa* and *Tephrosia* serve as larval foodplants. Gundlach's record of a member of the Sapindaceae remains unusual, but now verifiable.

Gundlach's experience of finding the butterfly only in La Habana Province is maintained. The recently discovered locality is some 30 km west of the capital city and about 2-3 km inland, close to the coastal town of Mariel which, as mentioned above, was known to Gundlach as the western limit of its range in the nineteenth century. If *C. marmorosa* was indeed extremely local over a century ago, yet using a widely distributed foodplant, its long-term restriction to this small part of a very extensive island, and in a heavily cultivated area now probably without a vestige of primary habitat, seems quite baffling. All lepidopterists working in Cuba since Gundlach's time, including ourselves, must often have sampled 'tailed' skipper populations, in many localities, in a spirit of hope, if not of expectation, that *C. marmorosa* might be found. We have worked in several localities in La Habana Province, including the area of the Río Guajaibón where *Urbanus dorantes santiago* (Lucas) and *U. proteus domingo* (Scudder) are abundant, and where smaller populations of *C. marmorosa* could readily have evaded desultory sampling. We now know that the flight pattern and habits of this *Chioides* may differ just sufficiently from *Urbanus* to facilitate the search. Moreover, the capture of newly emerged adults in April, May and the beginning of September suggests that *C. marmorosa* is at least bivoltine, with the January data for the La Salle specimen suggesting that it may well prove to be continuously brooded. Details of the biology of this butterfly not recorded by Gundlach are now accessible. Its distribution may be reassessed: while Gundlach knew it only from La Habana Province, the locality label of "Holguin" on the old specimen in the British Museum (Natural History) may encourage a wider search for *C. marmorosa* on the island. In the short term, frequent monitoring of the single known population is important; the size and area occupied by the colony must be established and rigorous protection of the vulnerable site ensured.

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