BULLETIN OF THE ALLYN MUSEUM

3621 Bayshore Rd.
Sarasota, Florida 34234

Published By
The Florida State Museum
University of Florida
Gainesville, Florida 32611

Number 117 11 August 1988

ISSN-0097-3211

A NEW SPECIES OF CALISTO (SATYRIDAE) FROM HISPANIOLA

Albert Schwartz
Miami-Dade Community College, North Campus, Miami, FL 33167
and
Fernando L. Gonzalez
1825 W. 44th Place, Apt. 402, Hialeah, FL 33012

As our knowledge of the rhopaloceran fauna of Hispaniola has progressed, it has become increasingly evident that there exist undiscovered and distinctive populations of the satyrid genus *Calisto* in a variety of habitats and at a variety of elevations. For instance, one complex of species in the genus inhabits xeric areas (Gali, 1985), and another complex has recently been described from the high uplands (Gonzalez, 1987). This large species radiation of *Calisto* on Hispaniola comes as no surprise; in the past, Hispaniola has been acknowledged as the major area of diversity of this endemic Antillean genus. Each of the islands of Jamaica and Puerto Rico has one species, whereas Cuba (despite its much larger size than, but equal habitat diversity as Hispaniola) is known to harbor only four species. Thus, Hispaniola far exceeds all other West Indian islands in number of *Calisto* species.

Hispaniola is divided unequally between the Republique d'Haïti in the west and the República Dominicana in the east; the latter is about three times as large as the former and still preserves (primarily in the uplands) much of the original flora. Haiti on the other hand, after two and one-half centuries of land misuse, rarely has the original flora and forests remaining. Although it seems likely that there are undiscovered species of *Calisto* in Haiti, they may well be difficult to locate, due to the massive deforestation of much of the Haitian uplands.

The major mountain mass on Hispaniola centers in the República Dominicana as the Cordillera Central; the range includes the highest peak in the West Indies (Pico Duarte, 3175 m). The Cordillera Central extends westward across the Dominico-Haitian border and in the latter country is the Massif du Nord. The range extends about 80 km further NW to near Cap-Haïtien. This entire range is the dominant physiographic feature of the Hispaniolan north island (as the area north of the Cul de Sac-Valle de Neiba plain, in which lie Lago Enriquillo and Etang Saumâtre, has come to be called by biologists).

That the Cordillera Central has been a center of *Calisto* radiation is unquestioned; nine endemic species are now known from this range (*C. galii* Schwartz, *C. arcas* Bates, *C. aleucosticha* Correa and Schwartz, *C. ainigma* Johnson, Quinter, and Mutusik, *C. grannus* Bates, *C. phoinix* Gonzalez, *C. amazona* Gonzalez, *C. dystacta* Gonzalez, *C. micheneri* Clench). Of these, *C. grannus* has two subspecies within that range. Another (primarily lowland) species, *C. pulchella* Lathy has a distinctive upland subspecies in the Cordillera Central. Three of the above species were described from the highlands southeast of

Constanza in the central portion of the range. This village (now town) has long been accessible to biologists; it is only in recent years (since 1977) that collectors have been willing and able to investigate other Central regions, in the hope that these previously unvisited areas might reveal undiscovered taxa. In this assumption, they have been amply rewarded. Not only have they encountered undescribed taxa, but they have also greatly extended the known ranges of these *Calisto* already known.

David K. Wetherbee resided at the upland town of Restauración near the Dominico-Haitian border. Restauración lies within, or is surrounded by, the Cordillera Central. This region is about 100 km NW of the well-collected Constanza area but is of lesser elevation. In 1986, Wetherbee ascended two associated peaks to the south of Restauración: Loma Nalga de Maco and Los Guandules above Guayajayuco. The rhopaloceran fauna is limited at both localities. But, amazingly, at the latter he collected a series of large drab *Calisto*, which appear to be identical with *C. elelea* Bates. Not only do these butterflies agree in color and pattern with *C. elelea*, but they also have male genitalia which are identical with the very distinctive genitalia of *C. elelea* (see Gonzalez and Schwartz, MS). This species has heretofore been known only from the south island Massif de la Selle and Sierra de Baoruco and is totally unexpected in the Cordillera Central uplands.

On Loma Nalga de Maco, Wetherbee took a short series of a small species of *Calisto*, quite unlike any species heretofore known from either the Cordillera Central or Hispaniola (or elsewhere in the West Indies). This unexpected find points out clearly the necessity for lepidopterists interested in the Hispaniolan upland fauna to visit areas far removed from those regions which have been amply collected.

This new species of *Calisto* may appropriately be named, in honor of its discoverer,

Calisto wetherbeei, new species

Figure 1. UN, holotype male.

Figure 2. Male genitalia (AS 21291)

Males: FW 15 mm (two specimens); UP dark brown (Pl. 16A11; all color codes from Maerz and Paul, 1950); FW androconial patch even darker brown, conspicuous, its posterior edge based on inner margin of FW, its outer edge following the contour of the outer margin of the FW; HW lobed at anal angle, its outer margin distinctly scalloped, the scallops between the veins with dull yellow to buffy scales; UN brown, slightly paler than UP; UNFW with a small ocellus centering in M^1-M^2, but extending slightly into R^5-M^1 and broadly into M^2-M^3, its center black with one central white "pupil," and ringed with buffy; UNHW with a small ocellus in Cu^1-Cu^2, its center black with one central white "pupil," and ringed with buffy; no white or pale dots in a submarginal series; UNHW pattern distinctive: a dull yellow (Pl. 11J6) diagonal bar or line from mid-costa to anal angle, slightly wider as it approaches the anal angle; a second dull yellow horizontal bar connected to the first in the postdiscal area and extending to the midpoint of the inner margin, the innermost point of this bar attached to the end point of the diagonal line at the inner angle by a margin-following pale yellow bar; the net result is an elongate and attenuate triangle, its base along the posterior half of the inner margin, its "apex" ending at midcosta, its center enclosing a brown "triangle" of ground color, whose shape is distorted by the attenuation fo the pale figure itself; the UNHW ocellus abuts against the posterior edge of the diagonal pale line.

Female. FW 14 mm (but see below); UP like males; UN like males except that on the UNFW there is a very vague and diffuse rusty submarginal-postdiscal area, expanded anteriorly to accomodate the ocellus but narrowed posteriorly, ending just mediad to the anal angle; UNHW pale horizontal bar dull and obscure, as also the dull yellow bar between the horizontal bar and the anal angle.

A fourth specimen is a putative female; the specimen is comprised of a set of wings mounted on index board, one side showing the UP, the other the UN, and covered by transparent tape. The FW is 16 mm. There is no abdomen. Contrary to orthodoxly mounted

specimens, this "set of wings" allows some details of pattern *within* the UNHW dull yellow bars to be seen. The horizontal bar is broken below its costal end; following the break, the outer edge of the dull bar shows a series of three narrow brown apices like tiny obtuse arrowheads, outlined marginad with clear [but not bright) yellow, and another apex, colored as above, near the inner edge of the large pale triangular UNHW area. This last apex is presumably a remnant of the dark attenuate triangle present in males. In this specimen, the entire area between the horizontal and diagonal lines is solidly dull yellow, rather than having an interior distorted triangle as described for males and the female.

HOLOTYPE: Male, from REPUBLICA DOMINICANA: PROVINCIA DE ELIAS PIÑA: summit, Loma Nalga de Maco, *ca.* 1900 m, coll. David K. Wetherbee, 20.xi.1986, *ex coll.* A. Schwartz, now in the Allyn Museum of Entomology, Florida State Museum. Original number AS 21291.

PARATYPES; AS 21300 (male), FLG 5086 (female), same data as holotype; AS 20126 (female ?), same locality and collector as holotype, but taken *ca.* 16.vii.1986. AS 20126 will be deposited in the collection of the Museo Nacional de Historia Natural de Santo Domingo.

Comparisons: Because of its very distinctive UNHW pattern, *C. wetherbeei* requires comparison with no other (including Jamaican, Puerto Rican, or Cuban) member of the genus. The UNHW pale yellow bars, interconnected to give a triangle enclosing, at least in males, a dark area of ground color, is unique. However, there are several other species that are similar in a general way; of them, one occurs on Nalga de Maco, syntopic with *C. wetherbeei: Calisto galii.* In that species (which is larger; FW 16-18 mm in males, 17-19 mm in females), the UNHW pattern is white (not dull yellow), and forms a distinctive but broken white Y with the base of its stem on the costal margin. Some female *C. galii* have this pattern much reduced (almost to its absence). The FW in *C. galii* has a distinctive shape in that the apex is slightly elongate and the outer margin, postapically, is slightly concave, thus giving, in combination, a FW outline that is elongate apically. The FW shape, the broken white "Y" UNHW pattern, and the size, will all easily distinguish *C. galii* from *C. wetherbeei.*

Elsewhere on Hispaniola, there are three other species that are similar to *C. wetherbeei: C. chrysaoros* Bates, *C. choneupsilon* Schwartz, and *C. archebates* Ménétriés. *Calisto choneupsilon* occurs on the Sierra de Neiba, and *C. chrysaoros* on the three south island massifs (La Hotte, La Selle, Baoruco). These two species are related to *C. galii*, and differ from *C. wetherbeei* in the same ways (although the extent and completeness of the UNHW white Y figure varies among them) as does *C. galii.* The third species, *C. archebates*, is also a south island species on the Massif de la Selle and Sierra de Baoruco. It is a larger species (FW 18-21 mm in males, 18-22 mm in females), and the UNHW pattern consists of (in males) a solid broad bright yellow diagonal bar; in females, this bar is yellow-gray or olivaceous, but nonetheless obvious. Riley (1975:Pl. 3, Figs, 1a and 1b) shows both sexes. There four species are similar to, but far from identical with, *C. wetherbeei.* The new species somewhat resembles *C. archebates*, although it is amply distinct from that species.

Male genitalia. The male genitalia of *C. wetherbeei* place the species in Bates's (1935) *Archebates* group *(C. archebates, C. loxias, C. chrysaoros, C. galii,* and *C. choneupsilon)* in Section I (Gonzalez and Schwartz, MS). The penis (not completely present) is slightly sinuate; the saccus is slightly inflated basally and sharply curved upward, tapering toward the anterior end. The tegumen is almost flat, and the uncus is elongate and set off from the tegumen by a deep pretegumental groove, not resembling the typical bird's head shape known in most *Calisto* male genitalia. In addition, the vinculum is not specialized. Gnathoi are absent, and the elongate valvae extend posteriorly beyond the apex of the uncus.

The characteristics of the male genitalia of *C. wetherbeei* conform to the overall male genitalic characters of the *Archebates* group and show similarities to its members (see Gonzalez and Schwartz, MS): saccus like that of *C. loxias* and *C. chrysaoros;* tegumen like that of *C. archebates*; uncus like that of *C. choneupsilon.*

In short, the male genitalia of *C. wetherbeei* once again demonstrate that, in the genus

Calisto, the male genitalia should not be regarded as a sole means of identification, because the degree of difference in male genitalia is far less than the degree of variation in morphology.

It would also be pertinent here to describe the female genitalia (see Johnson, Quinter, and Matusik, 1987). Unfortunately these were unavailable for dissection in this case.

Remarks. Wetherbee (*in litt.*, 12.xii.1986) made the following comments (paraphrased) about the type-locality and behavior of *C. wetherbeei*. On Loma Nalga de Maco, only two species of *Calisto* were seen and taken: *C. wetherbeei* and *C. galii.* They were noticeably different in the field. No *C. wetherbeei* were seen at Pino Claro, a lower spur of Nalga de Maco, where *C. galii* was abundant. The summit itself is densely wooded with elfin-like broad-leaved trees and shrubs with many adhering lichens and mosses, rather like a quasi-cloud forest. However, the summit is not always cloud-covered, and thus the area can become dry. There are a few scattered old "guava" trees *(Pinus occidentalis),* and the name "Pino Claro" suggests that at one time at least that spur had a cover of pines, the typical high upland forest on well-drained soils. *Calisto wetherbeei* flies only in sunshine, not when the weather is cloudy or foggy; in this, it differs from other high upland *Calisto*, such as *C. archebates* and *C. sommeri* Schwartz and Gali, both of which frequently fly during heavy mist and even continuous light rain or drizzle. *Calisto wetherbeei* flies above and in the canopy, not near the ground as is customary with most *Calisto*. The best tactic for catching them is cutting an opening near a shrub in flower and waiting, rather than going in search of them. In behavior, *C. wetherbeei* is like other *Calisto* in that, upon alighting, they orient themselves broadside to the direction of maximum light, quickly assuming a position of repose with the wings closed. Where they are syntopic, *C. galii* greatly outnumbered *C. wetherbeei.*

ACKNOWLEDGMENTS

We are in the dept of David K. Wetherbee for allowing us to describe this interesting and unexpected species from the Cordillera Central. The UN photograph is the work of Juan Carlos Espinoza, and we thank him for his labor on our behalf.

LITERATURE CITED

Bates, M. 1935. The satyrid genus *Calisto*. Occ. Papers Boston Soc. Nat. Hist. 8:229-248.

Gali, F. 1985. Five new species of *Calisto* (Lepidoptera: Satyridae) from Hispaniola. Contr. Milwaukee Public Mus. Biol. and Geol. 63:1-16.

Gonzalez, F. 1987. Three new species and one new subspecies of Hispaniolan *Calisto* (Lepidoptera: Satyridae). Bull. Allyn Mus. Entom. 108:1-17.

----------, and A. Schwartz. (in press). The unity and diversity of Hispaniolan *Calisto* (Lepidoptera: Satyridae). Caribaea.

Johnson, K., E. L. Quinter, and D. Matusik. 1987. A new species of *Calisto* with a review of the female genitalia of Hispaniolan congeners (Satyridae). J. Res. Lepidoptera 25(2):73-82.

Maerz, A., and M. R. Paul. 1950. A dictionary of color. McGraw-Hill Book Co., New York: 208 pp., 56 pls.

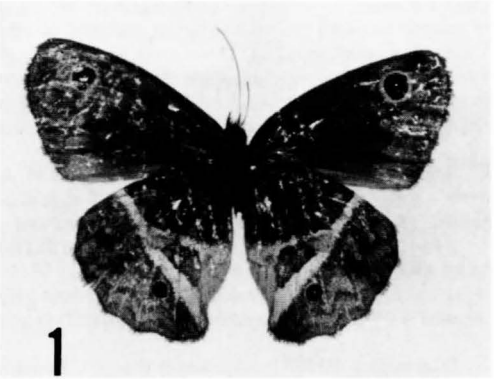

Fig. 1. *Calisto wetherbeei*, holotype male, UN.

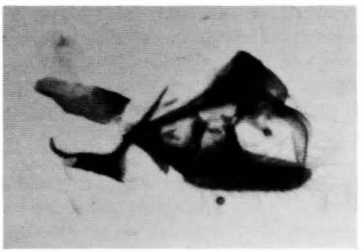

Fig. 2. *Calisto wetherbeei*: male genitalia (AS 21291).

This public document was promulgated at a cost of $360.00 or $0.61 per copy. It makes available to libraries, scholars and all interested persons the results of researches in Entomology.