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## SYMPATRIC SPECIES OF *CALISTO* IN CUBA (LEPIDOPTERA, SATYRINAE)

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The butterfly genus *Calisto* consists of about 19 species, several of them with described subspecies, and all from the Greater Antilles and the Bahamas. As indicated in a review of the genus (Michener, 1943) and subsequent papers (Clench, 1943, 1943a), 13 of the species are confined to Hispaniola, one to Puerto Rico, and one to Jamaica. The remaining group, consisting of very closely related forms, occurs in Cuba and the Bahamas, there being in Cuba five named populations, to which a sixth is added in this paper.

One form, *Calisto herophile herophile* Hübner, occurs apparently throughout Cuba and in the Isle of Pines. Dr. S. C. Bruner of the Estación Experimental Agronómica, Santiago de las Vegas, writes that so far as he remembers *herophile* has been found in every suitable location visited, except perhaps above 4000 feet. It does not occur in deep forest, but is found in more or less shady spots around fields, along roadsides, and the like. *Calisto herophile parsonsi* Clench and *C. smintheus muripetens* Bates were described from the Trinidad Mountains of southern central Cuba. Nothing has been recorded of the sort of environment in which they occur.

In the province of Oriente no fewer than three additional forms of *Calisto* occur, each apparently in a limited area. Two of them are known to occur with the widespread *C. herophile*, while the third probably does so. They are extremely closely related to *C. herophile*. *C. smintheus smintheus* Bates was collected in the Sierra del Cobre between 2750 and 3325 feet altitude. Here, unlike *herophile*, it occurs in the deep woods, so that there is evidently relatively little mixture with the population of

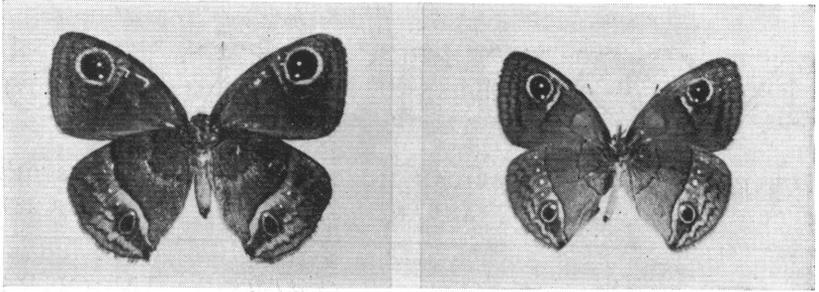


FIG. 1. Left, under surface of allotype of *Calisto bruneri* Michener. Right, under surface of *Calisto herophile* Hübner, from Santiago de las Vegas, Cuba.

*herophile* which occurs in the same general region. *C. delos* Bates, which might well be considered a subspecies of *smintheus*, occurs on Pico Turquino, between 4000 and 6000 feet altitude, less than 70 miles from the Sierra del Cobre.

The third form, morphologically more different from *herophile* than are *smintheus* and *delos* but in appearance more similar to *herophile*, has recently been sent to me by Dr. Bruner. It was collected at sea level at Moa, on the north coast of Oriente, where it occurred with *C. herophile* but was somewhat less abundant than that species. This new species is named *C. bruneri*.

It is evident that reproductive isolation exists between the geographically restricted *Calisto* populations of Oriente and the widespread *C. herophile* population. As has been recently emphasized (Mayr, 1947), it is unlikely that reproductive isolation can arise between contiguous populations. It is therefore probable that such isolation arose when the populations were geographically isolated from *C. herophile*.

How they were isolated from *herophile* is not evident. Possibly *C. herophile*, like the others, was limited in distribution at one time, permitting geographical isolation, and only recently, perhaps as a result of deforestation by man, spread to occupy the whole of Cuba. Possibly *C. bruneri* arose on an outlying island or even on one of the Bahamas which lie near the northeast coast of Cuba, and only later reached Cuba.

#### ***Calisto bruneri*, new species**

This species is very similar to the common and well-known *C. herophile* Hübner, from which it differs as follows: Size on the average larger; coloration, especially beneath, darker. Red

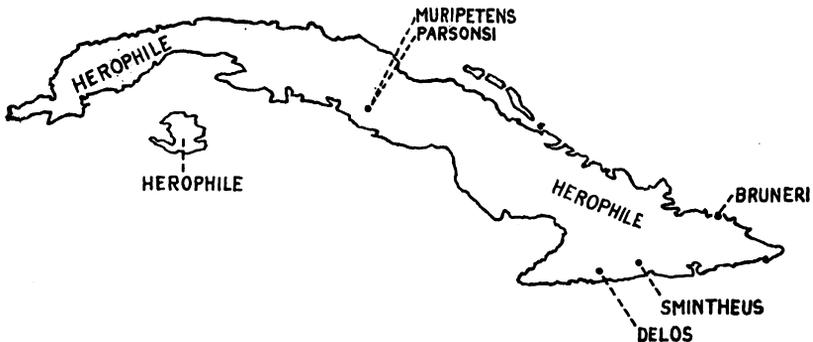


FIG. 2. Map of Cuba showing the distribution of the Cuban forms of *Calisto*.

area on under surface of forewing longer than in *herophile*, often as long as broad and sometimes longer than broad; dark line which limits outer margin of red area usually angulate medially. White dot in oval eye spot of under surface of hind wing usually inserted in line with yellowish margin of eye spot, this margin often extending towards wing base to form a short lobe enclosing white dot; white dots usually absent in cells  $R_3$  and  $M_1$ . Uncus of male longer and more slender than in either *C. herophile* or *C. smintheus*, being over 1.5 times as long as ninth tergum; distal portion of harpe more slender and shorter than in related species.

**TYPE MATERIAL:** Holotype male, allotype female, and five paratypes from Moa, Oriente, Cuba, February 24 to 27, 1948 (F. de Zayas and J. Ferrás). One additional paratype from the same locality, April 13 to 22, 1945 (J. Acuña). Two paratypes have been returned to Dr. Bruner and one has been sent to the Museum of Comparative Zoölogy. The rest of the type material is in the American Museum of Natural History.

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