

now its archaic condition threatens its survival. On the other hand *Pieris napi* has kept its evolutionary mobility and its subspecies have occupied a variety of environments, some still changing rapidly; in that sense the species has retained its youth.

Literature Cited

- BOWDEN, S. R. 1964. The maintenance for experimental purposes of form "sulphurea" of *Pieris napi*. J. Lepid. Soc. 18: 91-100.
- DESCIMON, H. 1966. À propos de la plante nourricière de *Pieris ergane* Geyer. Alexanor 4: 207.
- DETHIER, V. G. 1954. Evolution of feeding preferences in phytophagous insects. Evolution 8: 32-54.
- EHRlich, P. R. AND P. H. RAVEN. 1964. Butterflies and plants: a study in co-evolution. Evolution 18: 586-608.
- HOVANITZ, W. AND V. C. S. CHANG. 1962. Three factors affecting larval choice of food plant. J. Res. Lepid. 1: 51-61.
- LORKOVIĆ, Z. 1941. Die Chromosomenzahlen in der Spermatogenese der Tagfalter. Chromosoma 2: 155-191.
- 1968. Systematisch-genetische und ökologische Besonderheiten von *Pieris ergane*. Mitt. schweiz. ent. Ges. 41: 233-244.
- ROTHKE, M. 1931. Einige Notizen über Vorkommen und Lebensgewohnheit von *Pieris napi* L. in Nordamerika. Int. ent. Z. 25: 262-263.
- STRAATMAN, R. 1962. Notes on certain Lepidoptera ovipositing on plants which are toxic to their larvae. J. Lepid. Soc. 16: 99-103.
- VERSCHAEFFELT, E. 1910. The cause determining the selection of food in some herbivorous insects. Proc. Acad. Sci. Amsterdam 13: 536-542.
- VOSS, E. G. AND W. H. WAGNER. 1956. Notes on *Pieris virginianensis* . . . hitherto unreported from Michigan. Lepid. News 10: 18-24.

THE BRAZILIAN "CERCYONIS" (SATYRIDAE)

LEE D. MILLER

Allyn Museum of Entomology, 712 Sarasota Bank Building, Sarasota, Florida
and

THOMAS C. EMMEL

Department of Zoology, University of Florida, Gainesville

Much confusion has occurred in the delimitation of the genus *Cercyonis* Scudder (1875). Periodically various authors have sought to unite these American butterflies with the Palearctic *Satyrus* Latreille (1810), and *Minois* Hübner (1819) whereas other authors have pointed out the distinctness of *Cercyonis*. Miller (1968, pp. 99, 120) showed that the Nearctic *Cercyonis* are members of the satyrine tribe Maniolini, and in fact, the only American representatives of this basically Palearctic tribe,

whereas *Satyrus* and *Minois* structurally belong to the Satyrini. The only representative of the Satyrini in the New World is *Neominois* Scudder (1875), from the western United States. Emmel (1969) has described the genus *Cercyonis* and by implication restricted it to the Nearctic.

The southern South American satyrid fauna has suffered from attempts to relate the butterflies found there to Holarctic genera that were familiar to the northern hemisphere systematists that first described the species. Many species belonging to the strictly American Pronophilini and Euptychini were described and long retained in such northern genera as *Satyrus* (Satyrini) and *Epinephele* (= *Maniola*: Maniolini). Such insects are illustrated particularly in the *Elina* and *Lymanopoda* series of the Pronophilini (Miller, 1968, pp. 117–118). A similar situation exists with regard to *Cercyonis*. Weymer (1912, pp. 228–230) listed the various Nearctic *Cercyonis* and includes the South American *glaucope* (C. & R. Felder) from southern Brazil and *gustavi* (Staudinger, 1897) from Bolivia. Forster (1964, p. 136) transferred the latter to the genus *Argyrophorus* Blanchard (1852), a pronophiline. The more recently described *Cercyonis leuderwaldti* Spitz (1931) must also be considered in this review of the extra-Nearctic "*Cercyonis*."

Should *glaucope* and *leuderwaldti* indeed be *Cercyonis*, a vast zoogeographic problem would arise: how did these butterflies get from the Nearctic to the southern Neotropics without leaving intervening populations, when did this occur and by what route(s)? Furthermore, to which Nearctic species are these isolated populations related? The problem is purely academic, because *leuderwaldti* and *glaucope* are not even in the same tribe, and neither is a member of the Maniolini, as is *Cercyonis*.

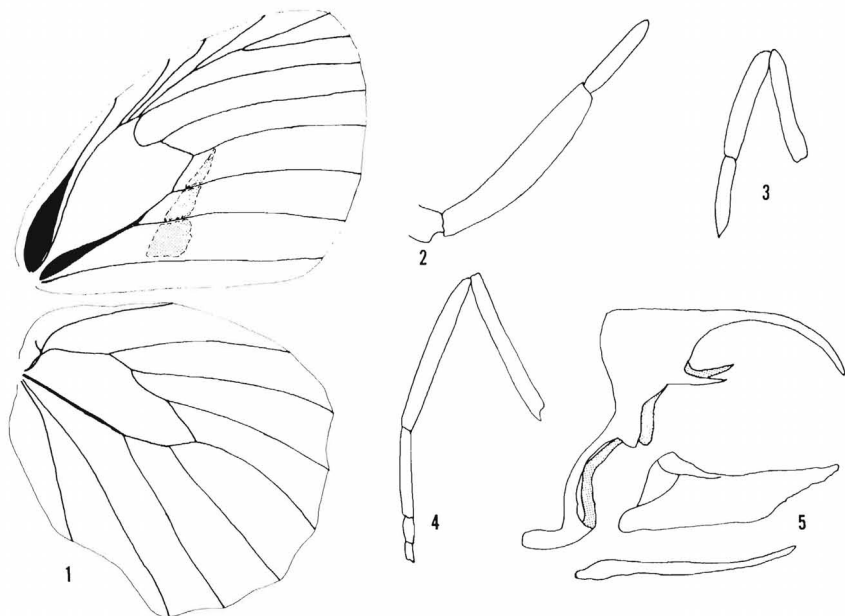
For comparison the venation, palpus, male and female forelegs and the male genitalia of *Cercyonis* are given in Figs. 1–5.

***Cercyeuptychia* Miller and Emmel, new genus**

Type-species: *Cercyonis leuderwaldti* Spitz. 1931. Rev. Ent. Sao Paulo 1: 46 (Brazil).

This genus is a member of the Euptychiini and conforms in the important characters with other members of the tribe, as defined by Miller (1968, pp. 90–92). A formal description follows:

Eyes naked. Antennae short, between two-fifths and one-half length of wing; club weakly developed, occupying distal quarter of antenna and slightly more than twice thickness of shaft at its thickest point. Palpi (Fig. 7) about two and a half times length of head, erect and slightly convergent at tips; third segment two-fifths length of second, hairs of second segment less than twice greatest segmental width.



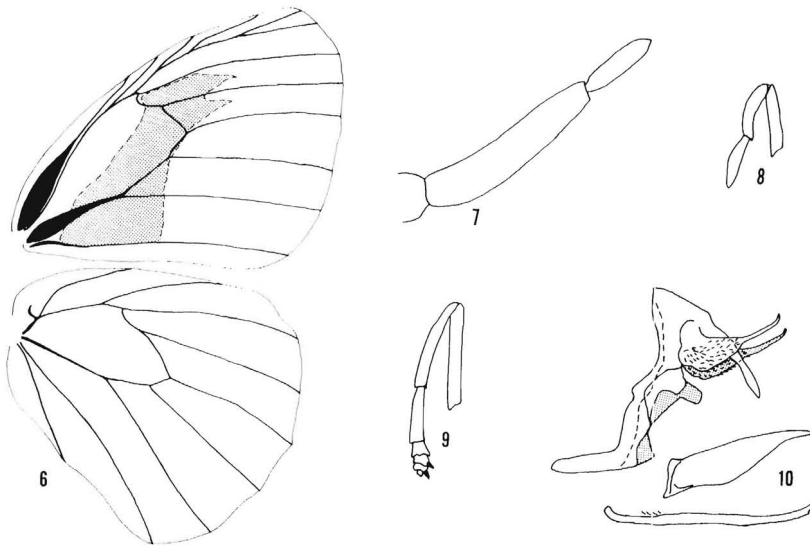
Figs. 1-5. *Cercyonis pegala* (Fabricius). 1, *C. p. alope* (Fabricius), ♂ venation (approx. 2×), Connecticut, New Haven Co., Hamden (Allyn colln.); 2, same, palpus (approx. 12×) (LDM slide M-2107); 3, same, ♂ foreleg (approx. 12×) (same slide as Fig. 2); 4, *C. p. texana* (Edwards), ♀ foreleg (approx. 12×) (LDM slide M-2113); 5, *C. p. alope*, ♂ genitalia (approx. 12×) (LDM slide M-2108).

Male foreleg (Fig. 8) reduced (forefemur-tibia-tarsus just over one-fifth length of same segments of midleg) with monomeric, unspined tarsus; femur somewhat longer than tibia. Female foreleg (Fig. 9) reduced, less than one-third length of midleg, femur somewhat longer than tibia, with a pentamerous, clubbed tarsus bearing spurs on the third and fourth subsegments. Ambulatory legs rather short, slender; midtibia less than twice length of proximal midtarsal subsegment, slightly spiny dorsad and with well-developed terminal spurs; midleg slightly shorter than hind leg.

Forewing cell square-out, slightly excavate along m_1 - m_2 , and about half length of forewing costa. Forewing radial veins arising from cell in two branches, R_s and M_1 arising separately, M_2 arising slightly near M_1 than M_3 , Cu_1 arising nearer M_3 than Cu_2 . Androconial patch of mealy and hairlike scales extending from 2A across cell to M_1 - M_2 , dentate distad in M_2 - M_3 . Sc and cubital stem inflated basally, 2A not. (Fig. 6).

Hind wing cell straight, slight distal migration of m_2 - m_3 along M_2 , and produced at origin of M_3 : length of cell to origin of M_3 about three-fifths length of wing to end of M_3 . Vein 3A slightly longer than Sc R_1 , M_3 and Cu_1 arising well separated and M_2 arising nearer M_1 than M_3 . (Fig. 6).

Male genitalia (Fig. 10) typical of those of many euptychiines (Forster, 1964), especially as regards the free gnathos, a condition typical of many Euptychiini, but not in Maniolini or Pronophilini. Genitalia similar to those displayed by genera



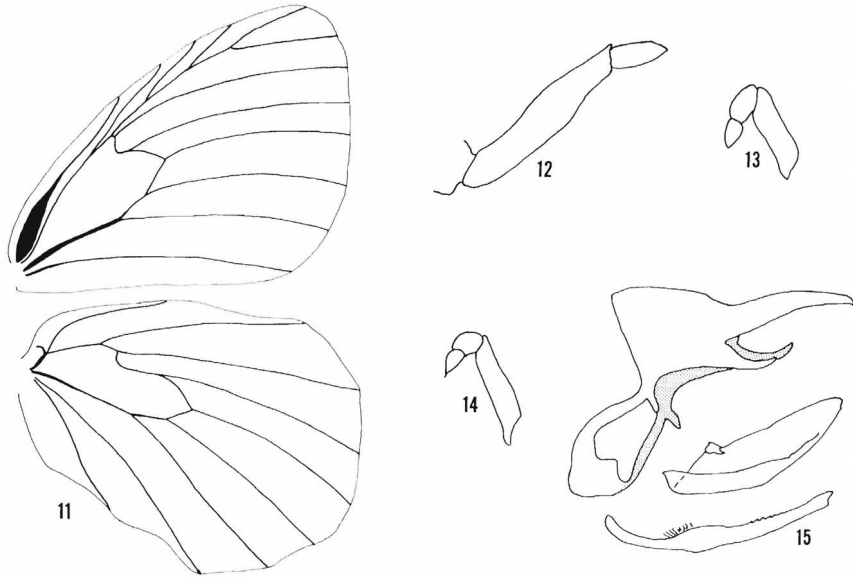
Figs. 6–10. *Cercyeuptychia leuderwaldti* (Spitz). 6, ♂, venation (approx. 2×) Brasil, D. F., Sobradinho, Brasília (Allyn colln.); 7, palpus (approx. 12×) (LDM slide M-2105); 8, ♂ foreleg (approx. 12×) (same slide as Fig. 7); 9, ♀ foreleg (approx. 12×) (LDM slide M-1724); 10, ♂ genitalia (approx. 12×) (LDM slide M-2109).

Godartiana Forster (1964) and *Praefaunula* Forster (1964), but spined gnathos typical of present genus.

The pattern of these butterflies (Figs. 16–19) is also reminiscent of *Godartiana* and *Praefaunula* with the heavily striated under surface of both wings and the lack of distinct bands that are prominent in most other Euptychiini. The well-developed ocelli of *Cercyeuptychia leuderwaldti* are only faintly indicated in any *Godartiana*, but well-developed in some *Praefaunula*, and the wings of the present genus are rounded, as in *Praefaunula*, not angular, as in *Godartiana*.

This remarkable genus is most closely related to *Godartiana* and *Praefaunula*, but quite distinct from both and immediately recognizable by the spiny gnathos and much longer penis, and from *Godartiana* by the wing shape. One of us (LDM) is working currently on the Euptychiini and considers the present genus to be somewhat more advanced than either *Godartiana* or *Praefaunula*, perhaps derived from one of them. K. S. Brown (*in litt.*) states that the present genus has comparable habits to *Praefaunula armilla* (Butler).

The name of the genus is feminine and derived from the similarity of these butterflies to the Nearctic *Cercyonis*.



Figs. 11–15. *Pseudocercyonis glaucope* (C. & R. Felder). 11, *P. g. boenninghauseni* (Foetterle), ♂ venation (approx. 2×), Brasil, S. Paulo, Campos do Jordão (Allyn colln.); 12, same, palpus (approx. 12×) (LDM slide M-2106); 13, same, ♂ foreleg (approx. 16×) (same slide as Fig. 12); 14, *P. g. glaucope* (C. and R. Felder), ♀ foreleg (approx. 16×) (LDM slide M-1725); 15, *P. g. boenninghauseni*, ♂ genitalia (approx. 12×) (LDM slide M-2110).

Pseudocercyonis Miller and Emmel, new genus

Type-species: *Epinephele glaucope* C. and R. Felder, 1867 [1864–1867]. Reise der . . . Fregatte "Novara" . . . Lep. Rhop., (3): 493–494; pl. 67, figs. 5, 6 (TL-"Brasilia").

This genus is a member of the tribe Pronophilini and conforms in major respects to the general characterization of that tribe by Miller (1968, pp. 110–114). A formal description follows:

Eyes naked. Antennae short, about two-fifths length of wing; club rather well developed, occupying distal quarter of antenna, about three times thickness of shaft and flattened at tip. Palpi (Fig. 12) about twice length of head, semi-porrect and somewhat divergent; third segment less than one-fourth length of second, hairs of second segment more than three times that of greatest segmental width.

Male foreleg (Fig. 13) greatly reduced (forefemur-tibia-tarsus only one-ninth length of those segments of midleg), with a stubby, monomeric, unspined tarsus; femur much longer than tibia. Female foreleg (Fig. 14) as aborted as that of male with a monomeric, unspined tarsus bearing no spurs; femur much longer than tibia. Ambulatory legs rather short and stubby; midtibia slightly more than twice

length of proximal midtarsal subsegment, sparsely spiny dorsad and with well developed terminal spurs; mid- and hind legs subequal.

Forewing cell square-cut, slightly excavate along m_1 - m_2 , and less than half length of forewing costa. Forewing radial veins arising from cell in two branches, R_s and M_1 approximate but separate at their origins, M_2 arising midway between M_1 and M_3 and Cu_1 arising midway between M_3 and Cu_2 . No distinct androconial patch. Sc greatly inflated at base, the cubital stem slightly inflated basad and 2A not at all (Fig. 11).

Hind wing cell "stepped" distad with a definite distal migration of m_2 - m_3 along M_2 and produced at origin of M_3 ; length of cell to origin M_3 slightly less than half length of wing to end of M_3 . Sc- R_1 subequal to 3A, M_3 and Cu_1 arising well separate and M_2 arising somewhat nearer M_3 than M_1 (Fig. 11).

Male genitalia (Fig. 15) quite distinct from those of either *Cercyonis* (Fig. 5) or *Cercyeuptychia* (Fig. 10) but somewhat like those of *Argyrophorus* Blanchard, 1852 (Forster, 1964, pp. 135, figs. 168-169; Hayward, 1958, p. 254, fig. 43) and *Tetraphlebia* C. and R. Felder, 1867 (Hayward, 1958, p. 257, figs. 45, 47), but the longer, dorsally toothed penis immediately distinguishing the present butterflies.

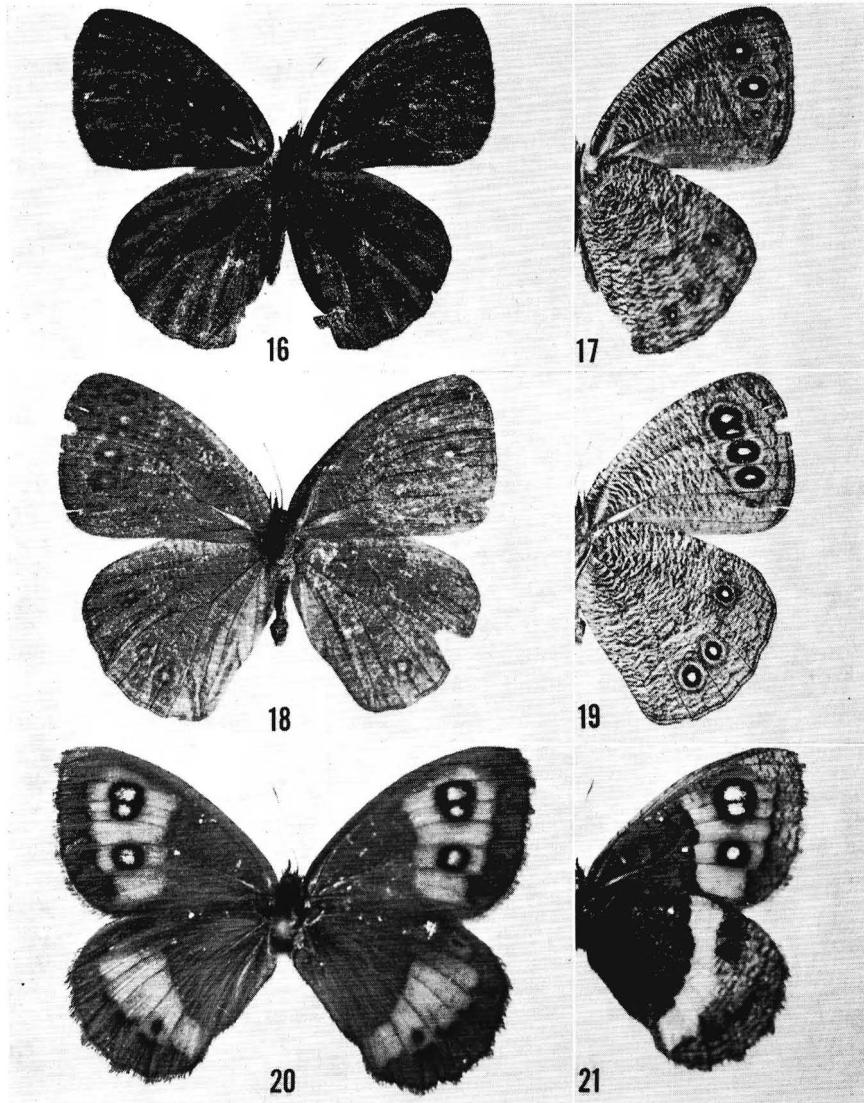
The pattern of these butterflies (Figs. 20-21) is distinctive, but somewhat reminiscent of *Tetraphlebia germainii* C. and R. Felder, 1867 (Hayward, 1958, pl. 4, fig. 161). Only by stretching the imagination could *glaucope* be considered a *Cercyonis*, but it is not easily referred to *Epinephele* (= *Maniola*) in which it was described, either.

This singular genus resembles at least the type-species of *Tetraphlebia* superficially, but genitally it is nearest *Argyrophorus*, the type of which is the amazing aluminum colored *A. argenteus* Blanchard (1852) from the mountains of Chile and Argentina. The venation of the present genus is rather close to that of *Argyrophorus* (Miller, 1968, p. 112, fig. 279), differing in minor details; the present genus does not have a distinct androconial patch. The elongate, dorsally toothed penis of this genus is characteristic. The present genus belongs to the *Elina* series of the Pronophilini (Miller, 1968, pp. 110, 117).

The generic name is feminine and refers to the fact that the type-species was wrongly considered a member of the Nearctic *Cercyonis* by many authors.

Discussion

The southern Neotropical "*Cercyonis*" are no more members of that Nearctic genus than is true *Cercyonis* synonymous with the Palearctic *Minois*. In fact, *Cercyonis* (Maniolini), *Minois*, (Satyrini), *Cercyeuptychia* (Euptychiini) and *Pseudocercyonis* (Pronophilini) are members of totally different tribes within the Satyrinae. The similar facies and the equivalent ecological niches shown by these four genera, as well as some South African Dirini, suggest a possible adaptive advantage to a morphological appearance such as shown by *Cercyonis*, etc., even though



Figs. 16–19. *Cercyeuptychia leuderwaldti* (Spitz). 16, ♂ upper surface, Brasil, Goiás, Ponte Funda (Emmel colln.); 17, same specimen, under surface; 18, ♀ upper surface, Brasil, Goiás, Orizona (Emmel colln.); 19, same specimen, under surface.

Figs. 20, 21. *Pseudocercyonis glaucope boenninghauseni* (Foetterle). 20, ♂, upper surface, Brasil, S. Paulo, Campos do Jordão (Allyn colln.); 21, same specimen, under surface. *Note:* All figures approx. 1.5×.

the butterflies are only remotely related. All appear to be scrub country species, some in low country, as some *Cercyonis* and *Minois*, others at high elevations, such as other *Cercyonis* and *Pseudocercyonis*. Such assemblages of ecological equivalents are not uncommon among the Satyridae, as demonstrated by the "*Erebia* series" of unrelated montane butterflies, including the Holarctic *Erebia* Dalman (1816) (Erebiini), the *Lymanopoda* series (Pronophilini) from the high Andes, *Percnodaimon* Butler (1876) and other New Zealand Hypocystini and some South African Dirini. Careful morphological examination is necessary on members of supposedly cosmopolitan, and particularly pantropical, groups to confirm or deny relationships that have all too long been taken for granted.

Acknowledgment

We should like to thank Dr. Keith S. Brown, Jr., of Rio de Janeiro, Brazil, for providing material and observations on the ecology of the south Brazilian "*Cercyonis*."

Bibliography

- EMMEL, T. C. 1969. Taxonomy, distribution and biology of the genus *Cercyonis* (Satyridae). I. Characteristics of the genus. Jour. Lepid. Soc. 23: 165-175.
- FORSTER, W. 1964. Beiträge zur Kenntnis der Insectenfauna Boliviens XIX. Lepidoptera III, Satyridae. Veroff. Zool. Staatssamml. München 8: 51-188.
- HAYWARD, K. J. 1958. Satiridos argentinos (Lep. Rhop. Satyridae) III. Guía para su clasificación. Acta. Zool. Lilloana 15: 199-295.
- MILLER, L. D. 1968. The higher classification, phylogeny and zoogeography of the Satyridae (Lepidoptera). Mem. American Ent. Soc. 24.
- WEYMER, G. 1910-1912. Satyridae. in Seitz, A. Die Grossschmetterlinge der Erde, vol. 5 (Die Amerikanische Tagfalter). Stuttgart.

CONSUL PANARISTE (NYMPHALIDAE) IN VENEZUELA

I secured two fresh males of *Consul panariste* (Hewitson) on 5 and 6 February 1968 while collecting in the Venezuelan Andes with Albert Gadou of Caracas. They were taken on banana bait at approximately 1000 meters elevation on the Barinitas to Santa Domingo road in the state of Barinas. This is a humid tropical forest situation, transitional to cloud forest. Albert reported having taken previous examples of the species in the same location.

Comstock (1961. Butterflies of the American Tropics: The genus *Anaea*, p. 188) stated that *Consul panariste* is known to occur only in Colombia. *C. panariste* has been traditionally placed in the genus *Anaea*, before Comstock allied it with *Consul fabius* (Cramer) (= *Protogonius hippona* Fabricius). Although Comstock considered *Consul* to be a subgenus of *Anaea*, contemporary usage usually elevates the subgenera in his monograph to generic rank.

JOHN H. MASTERS, *Lemon Street North, North Hudson, Wisconsin.*