



Fig. 1. *Cymoriza abrotalis* Walker, holotype, ♂. Oxford University Museum.

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UNUSUAL COPULATORY BEHAVIOR IN THE NYMPHALIDAE AND SATYRIDAE

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Interspecific, heterosexual coupling among Rhopalocera in the wild is relatively uncommon enough to warrant being recorded in the literature (Hovanitz, 1949; Shigeru, 1956; Stallings et al., 1959; Downey, 1962; Shapiro & Biggs, 1968; Perkins & Gage, 1970; Priestaf, 1970; Platt & Greenfield, 1971). Even more rare are occurrences of intergeneric, heterosexual coupling (Frechin, 1969; Jae, 1972).

To date, however, a search of the literature confirms that instances of neither intraspecific, pleoheterosexual coupling nor intergeneric, homosexual coupling are known. The following account cites examples of each.

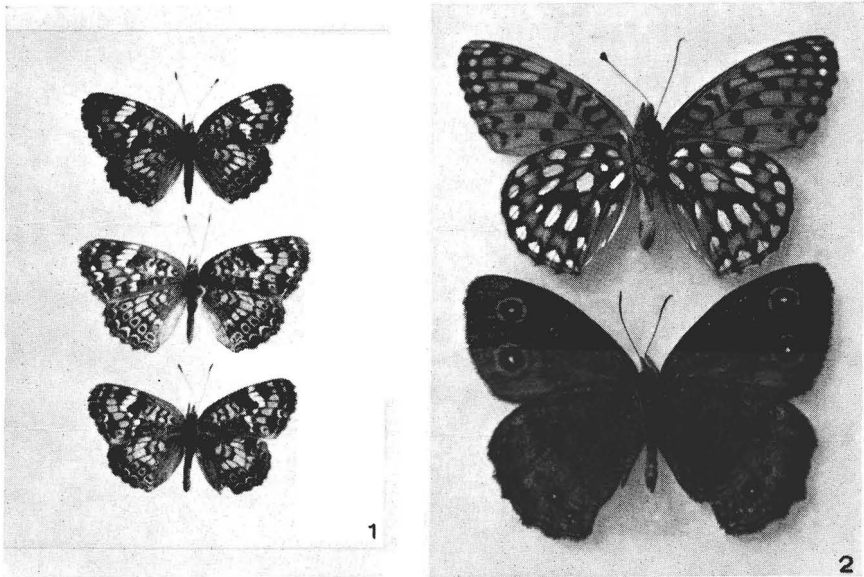
While visiting the Bentsen State Park National Wildlife Refuge, situated thirteen miles northwest of McAllen, Hidalgo County, Texas on 13 November 1962, I came upon a small collateral tributary of the Rio Grande, whose moist sand bar was nearly covered with imbibing butterflies. Bewildered by this spectacle, I cautiously approached and noted several hundred individuals, including examples of *Libytheana bachmanni larvata* Strecker, *Phyciodes phaon* Edwards, *Zerene cessonina* gen. aut. rosa M'Neill, *Danaus gilippus strigosus* Bates, *Papilio cresphontes* Cramer, *Kricogonia lyside castalia* Fabricius, *Eurema lisa* Boisduval, *Hemiargus ceranus zachaeina* Butler & Druce, *Atlides halesus estesi* Clench, and *Myscelia ethusa* Boisduval.

Of particular interest were three specimens that appeared to be *in copula*. Despite their efforts to escape my net, all three were genitally attached and remained so until placed in a cyanide bottle. Examination of the unlikely threesome revealed 2 ♂♂ and 1 ♀ *P. phaon* (Fig. 1).

Twenty-two months later, on 11 August 1964, a similarly surprising event took place at Camp Sherman, Jefferson County, Oregon. This day, while collecting in the lush meadows that border the Metolius River, I had already taken several copulating pairs of *Speyeria cybele leto* Behr, *S. atlantis dodgei* Gunder, and *S. mormonia erinna* Edwards.

Beside a willow-bordered drainage ditch, I noted a tall blade of grass on which two, *in copula* butterflies were at rest: affixed by their claspers were 1 ♂ *S. m. erinna* and 1 ♂ *Cercyonis pegala ariane* Boisduval. When disturbed, the *S. m. erinna* labored upward—in a forward direction—under the weight of the attached *C. p. ariane*, which it pulled after it. The pair (Fig. 2) was captured in flight at 1400 PDT, placed in a separate cyanide bottle, spread and genitally examined at the same time, and given cross-reference data labels in order to minimize the considerable confusion that already prevailed! All specimens are currently housed in the Allyn Museum of Entomology, Sarasota, Florida.

It is tempting to speculate about the overall importance of these observations regarding the breakdown of behavioral and/or mechanical isolating mechanisms within or between species. Certainly, neither of the two particular unions described could definitively subserve any reproductive end. Behavioral aberrations such as these, and that described by Heitzman (1964), not only challenge the "lock and key" hypothesis, but also suggest the possibility of a parallel development in precopulatory



Figs. 1-2. Specimens taken *in copula*: (1) *Phyciodes phaon* males and female (center), dorsal surfaces (Bentsen State Park, Hidalgo Co., Texas, 13 November 1962, E. M. Perkins, collector); (2) *Speyeria mormonia erinna* male (above), and *Cercyonis pegala ariane* male (below), ventral surfaces (Camp Sherman, Jefferson Co., Oregon, 11 August 1964, E. M. Perkins, collector).

behavior and/or chemical configuration of pheromones in certain, dissimilar lepidopterous taxa. It is interesting to note that capture time of specimens in the latter event coincides with frequency polygons of observed mating times for both Nymphalidae and Satyridae (Miller & Clench, 1968). Although the significance of both records is subject to debate, if not entirely enigmatic, these data are placed on permanent record in the hope that they might in some way shed additional light on our knowledge regarding insect behavior, pheromones, and/or evolution.

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NOTES ON THE LIFE CYCLE AND NATURAL HISTORY OF BUTTERFLIES OF EL SALVADOR.

II. ANAEA (ZARETIS) ITYS (NYMPHALIDAE)

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This is the second article of a series dealing with what my sons and I have discovered about the life cycle and natural history of butterflies found in the neighborhood of San Salvador, capital city of El Salvador. The life cycles of many neotropical butterflies are apparently incompletely known, and therefore classification has been solely on the basis of the adult morphological characteristics.

The determination of the species mentioned herein has been done by Dr. Lee D. Miller of the Allyn Museum of Entomology. Adults and at least some specimens of the early stages have been placed in that museum, so as to be available for students of the groups.

In the introduction of our prior article (1973), a rough description of the country, its climatic zones and other pertinent information was given, so as to make an understandable picture of the habitats of the species described in these articles.

Anaea (Zaretis) itys Cramer, belonging to the subfamily Charaxinae, has been placed at different times in several genera: *Papilio* (by Cramer, 1777), *Siderone* (by Westwood, 1850), *Zaretis* (Frühstorfer, 1909); and has been described several times, due perhaps to the great geographical, seasonal and individual variation shown. Comstock (1961) uses the name *Anaea (Zaretis) itys*, leaving open the possibility that valid subspecies might be found later.