

SYMBIOTIC RELATIONSHIP OF AN ECUADORIAN SKIPPER
(HESPERIIDAE) AND MAXILLARIA ORCHIDS

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On the eastern side of the Andes in Ecuador lies the small town of Puyo, the terminal point for biologists wishing to travel into the Oriente or Amazonian Basin. Lush rain forest and rich butterfly faunas are found both in the Andean foothills to the west and the lowlands to the east. The town itself is at an elevation of 3,650'. On an expedition to this region in August and September 1969, I observed a most interesting pollinating relationship, apparently mutualistic, between a large skipper butterfly species, *Perichares philetos dolores* (Reakirt), and a native arboreal orchid *Maxillaria ontoglossom*.

At the orchid gardens of Mr. Joseph Brenner, manager of the Hostoria Turingia in Puyo, a number of these *Maxillaria ontoglossom* orchids from the surrounding forest are under cultivation. On September 8, I observed a female *P. philetos dolores* visiting the flowers of these plants around 10 a.m. Mr. Brenner noted that this species of skipper, quite distinctive in size and coloration (see Fig. 1), visits these flowers daily (observations of about 18 months).

This species of skipper seems adapted specifically for feeding from and pollinating flowers like those of this long-tubed species of *Maxillaria* orchid. It has an extraordinarily long proboscis (Fig. 2). In the female I examined (forewing length of 27.0 mm, and a body length from head to tip of abdomen of 22.0 mm), the tongue was fully 43.0 mm long when extended. This long proboscis can be flexed at any or several points by the insect, and seems perfectly adapted for probing through the extensively convoluted corolla tube to reach the nectaries.

The orchid deposits several pollinia (sticky packets of pollen grain) on the proximal end of the proboscis and these are carried on to the next flower the butterfly visits. Examination of the orchid blossoms showed that the extremely long, convoluted, and constricted corolla throat prevents entrance by bees or flies and that the nectar can only be reached by a very long-tongued insect. This skipper species was never observed visiting other orchids or flowers of any kind.

Thus it is suggested that this is a mutualistic symbiosis, with the skipper species having a guaranteed nectar source barred from other insects, and the orchid being pollinated by a specific pollinator which

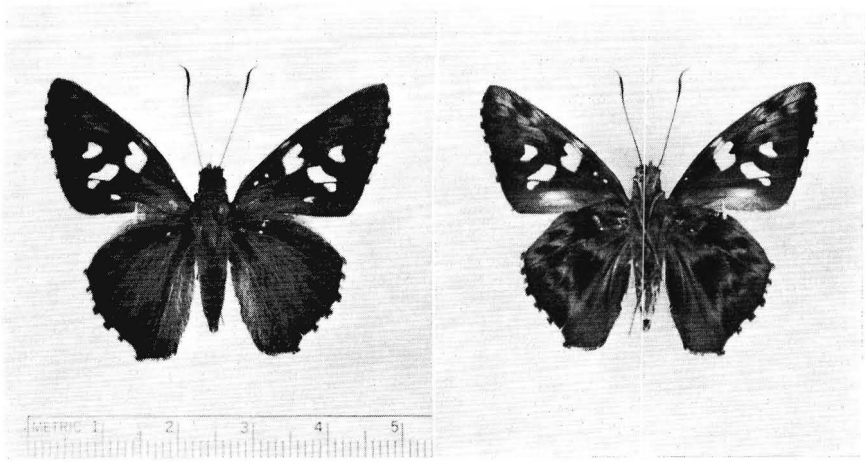


Fig. 1. *Perichares philetes dolores* (Reakirt), dorsal and ventral surfaces of female.

apparently visits, at least primarily, these flowers of *Maxillaria ontoglossom* in the Puyo area of Ecuador. Since the skipper does occur north through the Neotropics (Seitz 1913), it undoubtedly uses a variety of orchids or other plant species in the various parts of its range, and it

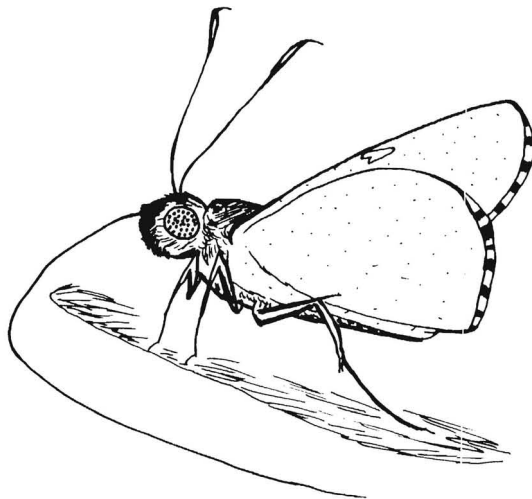


Fig. 2. *Perichares philetes dolores* perched on lip of the orchid *Maxillaria ontoglossom*, preparatory to feeding. The proboscis is normally extended straight downward at about a 30° angle from the body plane during feeding (distal portion recurved in above sketch to conserve space).

would be interesting to have detailed data on specificity (or lack of it) in these other areas.

Acknowledgments

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Literature Cited

- SEITZ, A. (editor). 1913. The Macrolepidoptera of the World. Vol. V. The American Rhopalocera. Stuttgart.
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FIELD TECHNIQUES FOR INVESTIGATIONS OF POPULATION STRUCTURE IN A "UBIQUITOUS" BUTTERFLY

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Because information about population structure is necessary for a proper understanding of the ecology, evolution, and geographic variation of any species of Lepidoptera, it is surprising that there have been so few effective population studies of these organisms. The investigations of Dowdeswell, Fisher, and Ford (1940, 1949), Turner (1963), Keller, Mattoni, and Seiger (1966) and Ehrlich (1965), among others, are notable exceptions. These studies have all documented essentially similar population structures, and have led to the belief that the subdivision of butterfly species into small isolated or semi-isolated populations with limited interchange of individuals is a general rule.

Studies conducted in 1962, and 1967-1969 on the satyrine *Erebia epispodea* Butler, however, have revealed a population structure quite different from those previously reported (Brussard & Ehrlich 1970a, 1970b). We have now determined that the population studied in the vicinity of Rocky Mountain Biological Laboratory (RMBL), Gunnison County, Colorado may cover hundreds of square kilometers. There is a great deal of individual movement, and, although these butterflies are capable of recognizing and leaving ecologically unsuitable areas, these areas are not barriers that subdivide the population into smaller units.