OBSERVATIONS ON *CALLOPHRYS MACFARLANDI* (LYCAENI-DAE), IN THE SANDIA MOUNTAINS, NEW MEXICO

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There are some peculiarities, in the habits of *Callophrys* (Sandia) macfarlandi Ehrlich & Clench, which are worth noting.

Daily Activity of Adults. The butterflies crawl up from within the depths of the Nolina clumps (where they spend the night) between 8:00 and 9:00 A.M., if it is sunny. They then sun themselves, on the leaves of the Nolina clumps, before they begin to fly about. Even if there is a high wind, they will be up early, if the sun is shining. At the time these insects are on the wing in May and June windy mornings are frequent in the Sandia Mountains. If the wind continues all morning, they may never be observed on the wing, but can be discovered as they sit in the clumps. If alarmed under these conditions (early in the morning), the butterflies will sometimes simply drop and flutter deep down into the clump, where they can often escape capture. They stay close to the Nolina clumps most of the time, but occasionally alight in other nearby plants, such as scrub oaks. During the heat of a windless day, they are more active, and will be seen darting around the clumps, chasing each other, etc. After a warm day, they will remain active until dusk, definitely after sunset, while it is still light. Such behavior is rarely observed in butterflies. I have observed similar early evening activity in Habrodias grunus Bdv., as it flies around its food plant (Ouercus chrysolepis) in the San Gabriel Mountains of southern California. It is exceptionally active just before dusk, after a hot summer day.

When I visited the type locality of *C. macfarlandi* and other nearby colonies, in late May and early June, 1960 and 1961, the population was at the peak of its flight period. (My original capture on 4 May 1958 represented an early specimen of the first brood.) It would be of interest to learn where the second brood, or later-emerging females oviposit, because by late June, the *Nolina* blossoms are gone, and the green seed capsules (which are also readily eaten by the larvae) are beginning to dry up. This leaves nothing suitable as food for larvae until the following spring, when new blossoms will shoot up within the clumps. Therefore, the question is, what becomes of the eggs of late females, and how do the resulting first instar larvae manage to locate suitable food? From rearing experiments which I carried out in 1959 and 1960, it is evident

that most of the pupae overwinter, and a few hatch the same season, in June. But, do the eggs of late females also overwinter?

On 15 June 1961, I collected a number of freshly emerged females, along with others in fair to poor condition. This was near the end of the period of emergence, and all the *Nolina* clumps had completely finished flowering. The green seed capsules were well formed by then, and some of them were beginning to dry out. From two seed stalks that were still green, I shook over 50 larvae, ranging in size from 3 mm long to last instar.

Larvae are easily brought through to pupation, on one or two stalks full of green seed capsules. The stalk can be kept in suitable condition for two weeks or more, by storing it in a plastic bag, and airing it often enough to retard mold. (Stalks with blossoms deteriorate much more rapidly, after being picked.) Larvae reared in this manner in June, 1959, formed pupae which were exposed to cold outdoor temperatures (in northeastern Kansas) for part of the winter. These pupae were then brought indoors, in February, 1960, and all emerged in good condition shortly thereafter. (This was, of course, not the normal time for emergence, but was caused by warmer temperatures, after a period of cold.)

One of the best locations for observing and collecting *C. macfarlandi*, and an easier one to reach than the type locality, is along Highway 66, east of Albuquerque, New Mexico, in the boulder-covered foothills of the Sandia Mountains, where scrub oaks and *Nolina* clumps are abundant. It is hoped that the type locality will be spared by collectors; it is possible that the Highway 66 location will eventually be engulfed, as Albuquerque expands eastward toward Tijeras Canyon.

The food plant of *Callophrys macfarlandi* may not be *Nolina microcarpa* S. Wats.; typical *N. microcarpa* has a flowering stalk which extends well above the clump itself. It is a common and widespread species from central to southeastern Arizona, and from central to southern New Mexico. *N. microcarpa* is described by Benson and Darrow (1954), pp. 72–74, and is illustrated by photographs on Plate XII (E, G). The *Nolina* growing in the type locality of *C. macfarlandi* has a flowering stalk which rarely extends above the clump of leaves. Of course, this feature could vary from one locality to another. I have no specimens of this plant, so am not able to check it for other morphological differences, if such exist.

LITERATURE CITED

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