

References Cited

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135 Vaughan Place, San Antonio 1, Texas, U. S. A.

A PRELIMINARY STUDY OF FOODPLANT PREFERENCES IN
THE *LYCAENA HELLOIDES* COMPLEX (LYCAENIDAE)
IN COLORADO

by DONALD S. CHAMBERS

I. LABORATORY STUDIES OF *helloides* — LIKE POPULATIONS

The purplish Copper of the Rocky Mountains, described from Alberta as *florus* by EDWARDS, has recently been referred to the northeastern *Lycaena dorcas* Kirby because of their very similar appearance. The range of *florus* is, however, isolated from that of *dorcas* and lies in conjunction with the area occupied, at lower altitudes at least, by *L. helloides* Boisduval, and most writers have considered *florus* to be a race of *helloides*. BROWN (1955) sees *dorcas* and *helloides* as a "well-defined cline", but CLENCH (1958) believes they are distinct species for the following reasons: first, they have different determined foodplants (*dorcas* feeds on *Potentilla*, *helloides* on "*Polygonum* and possibly others — but not *Potentilla*"); second, the two are sympatric but easily separable throughout a broad zone in the Michigan to Manitoba area; third, "there is no 'perfect intergradation' across the continent as the authors state, though if large series are not seen it might appear so"; fourth, *dorcas* is single-brooded while *helloides* is multi-brooded. The present study is an attempt to determine the food plant(s) of *florus* and thereby disclose its true affinities.

An oviposition choice situation was presented to three *florus* females (Group I) collected near Gothic, Gunnison County, Colorado (elevation: 10,000 ft.). Freshly cut, roughly equal-sized sprigs from five plants were placed in moist earth in a flower pot covered by a broad lamp chimney with marquisette netting over the top. The tops of the sprigs were leveled so that all were equally accessible to the females. About three inches of open space were left below the cloth. Throughout this and the following

experiments the females were fed honey water daily and given an artificially lighted day of from ten to fourteen hours. Light and warmth were provided by an incandescent bulb placed about three inches above the cloth. With *Linum* and *Chenopodium* serving as controls, the disposition of eggs the first day was as follows:

| PLANT | NO. OF EGGS | LOCATION ON PLANT |
|-----------------------------|-------------|-------------------------|
| <i>Potentilla fruticosa</i> | 16 | upper leaves and stems |
| <i>Rumex</i> | 33 | all on flowers or fruit |
| <i>Polygonum douglassii</i> | 4 | not noted |
| <i>Linum</i> | 0 | -- |
| <i>Chenopodium alba</i> | 6 | on fruit |
| On soil | 2 | -- |
| <hr/> | | |
| 61 | | |

After this test, Group I and two new groups of three females each were presented *Potentilla fruticosa* or *Rumex* sp. (once both) on successive days. The schedules and results were as follows:

| TEST DAY | | <i>Potentilla fruticosa</i> | <i>Rumex</i> |
|----------|------------------|-----------------------------|-----------------|
| Group I | 1 | 15 | -- ¹ |
| | 2 ^{•2} | -- | 21 |
| | 3 | 12 | 25 |
| | 4 | -- | 23 |
| | 5 | 22 | -- |
| | 6 | -- | 15 |
| | 7 ^{••} | 22 | -- |
| | | <hr/> | <hr/> |
| | | total 71 | 84 |
| | | [with previous test 87 | 117] |
| Group II | 1 | 17 | -- |
| | 2 | -- | 72 |
| | 3 | 0 | -- |
| | 4 | -- | 20 |
| | 5 ^{•••} | 4 | -- |
| | | <hr/> | <hr/> |
| | | total 21 | 92 |

Group III produced no eggs.

¹-- means plant not offered this day.

²Each[•] indicates death of one female.

The 329 Gothic eggs produced no larvæ when kept at room temperature for one month followed by three months at 4.5°C and a return to room temperature. Unless all eggs were infertile or killed in the first few days (which is very unlikely), it must be assumed that they entered diapause but subsequently died.

Five females were collected 25 Aug. 1961 in Gunnison, Gunnison County (elevation 7680 ft.), on or next to *Rumex* plants growing along an irrigation ditch; these females were at least 30 yards, and probably many times that distance, from the nearest *P. fruticosa*. They laid 102 eggs when confined with *Rumex*, and 40 larvæ hatched within five days. Twenty-two larvæ were placed on *Rumex crispus* and produced 17 adults about 26 days later.

Most areas near Gothic where the females were found contained both *P. fruticosa* and polygonaceous plants, but one field surrounded by forest was apparently devoid of *P. fruticosa* although *florus* was common.

Thus, there are probably major biological differences between the Gothic and Gunnison populations. It seems certain that the Gunnison population is not a *Potentilla* feeder, and since many late-August eggs developed immediately and hatched, it is apparently at least double-brooded. It is, therefore, best referred to *L. helloides*. The Gothic population is certainly single-brooded; there is, however, some indication that, as with the Gunnison population, *Potentilla* is not the foodplant. More evidence is needed, particularly careful field observation of oviposition choice and perhaps larval survival tests on the possible plants. It may turn out that the high altitude *florus* is not referable to either *dorcas* or *helloides*.

II. A FOODPLANT OF *Lycaena nivalis*

Two females of *Lycaena nivalis browni* Field were observed ovipositing on *Polygonum douglassii*, 7 Aug. 1961 at Gothic, Gunnison County, Colorado. A search of about thirty plants produced five additional *Lycaena* eggs.

Literature Cited

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