

OBSERVATIONS AND NEW RECORDS OF HYMENOPTERAN PARASITES OF LYCAENID EGGS (LEPIDOPTERA)

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Two species of parasites were recovered from eggs of *Plebejus* (*Icaricia*) *icarioides* (Bdv.), a polymorphic polytypic butterfly occurring in western North America. *Trichogramma minutum* Riley (Trichogrammatidae) was recovered from eggs of the host butterfly collected in Utah, Nevada, and California, and *Telenomus* sp. (Scelionidae) was reared from eggs of a Utah population.

T. minutum is of widespread occurrence throughout the United States and Canada, and it is known to parasitize more than 100 species of butterflies. Other than *Plebejus icarioides* reported here, only one species in the subfamily Plebejinae (*Hemiargus hanno* Stroll) has been recorded as a host (Muesebeck *et al.*, 1951). *T. minutum* was reared from eggs of *P. icarioides* collected in the following localities (the number after each locality is the number of eggs collected; the percentage of eggs parasitized is in parentheses): Parley's Canyon, Salt Lake Co., Utah, 14 (57); Austin, Lander Co., Nevada, 12 (33); Lamoille, Elko Co., Nevada, 7 (57); Pequop Summit, Elko Co., Nevada, 118 (52); Rutherford, Napa Co., California, 36 (69); and Fawn Lodge, Trinity Co., California, 28 (28).

Telenomus sp. emerged from 13 of 45 eggs of *P. icarioides* (Bdv.) collected at 5200 feet elevation in Big Cottonwood Canyon, Salt Lake County, Utah. The parasite is prob-

ably an undescribed species. A nearby locality, Parley's Canyon, Salt Lake County, Utah, 6,000 feet elevation, had a higher percentage of parasitized eggs (57%), but all the parasites were *Trichogramma minutum* Riley which was not found in the former population. Only one other species of the genus *Telenomus* has been recorded as a parasite in the family Lycaenidae (*T. grapta* Howard, parasite of *Lycaena phlaeas hypophlaeas* (Bdv.)).

Although the infra-specific taxonomy of the polymorphic host remains to be settled, the Great Basin populations of the butterfly mentioned above have been considered as belonging to the subspecies *P. i. ardea* (Edw.), while the California populations could be assigned to *P. i. icarioides* (Bdv.).

Newcomer (1911) has described the complete life cycle of *P. icarioides* (Bdv.) under the name *Lycaena fulla* Edw. He reported that a considerable number of field-taken larvae had tachinid eggs on them, and he also obtained a braconid parasite from a larva which had hibernated. As far as known to me, Newcomer's records and those mentioned above are the only records of parasites of this butterfly.

The host has a somewhat localized, semi-clustered distribution of populations throughout western North America, following the spotty distribution of the lupine plants on which the larvae feed. This distribu-

tion is somewhat misleading in terms of commonness and rareness of the butterfly. Local concentrations of the lupines and the unequal distribution of eggs on the plants undoubtedly give rise to local concentrations of egg parasites. However, the non-specificity of *T. minutum* would suggest that the heavy parasitism of some of the populations may be the result of an unusual increase in numbers of the parasite on hosts other than *P. icarioides*. The early spring emergence of the host populations in most areas and the shorter period of time available for oviposition in populations from more stringent ecological areas (desert and Great Basin populations) lend weight to this belief. However, the percentage of eggs parasitized seems to be greater later in the year.

An unsuccessful attempt was made to correlate site of oviposition with parasitism in populations from which large numbers of eggs were collected. There were as many parasitized eggs found on the upper surfaces of the leaves as were taken on the lower surface, the petioles, and the stems. Percentage of parasite emergence from eggs laid at these sites was also comparable.

Several cases of "superparasitism" (Salt, 1936) were observed in which more than one parasite occurred in one egg. In two eggs thus superparasitized (one from Fawn Lodge, California, and one from Pequop Summit, Nevada) the chalcids failed to emerge. However, eight adult parasites were recovered from four eggs collected at Lamoille, Nevada, and many egg shells of other hosts populations were noted which had more than one emergence hole.

The size and color of the individuals of *T. minutum* varied considerably in the samples observed from the three-state area. As an aftermath of such studies as Salt (1941) on the effects of hosts on parasites, there has been even more emphasis placed on the population aspects of host-parasite relationship, and a followup study on this morphologically variable parasite on a morphologically variable host seems desirable.

The fact that as many as 69% of the eggs of a population of *P. icarioides* can be destroyed by *T. minutum* implies that egg parasitism may be a significant factor in population density in some areas. If it does affect density, the reproductive rate of these isolated populations will be lowered considerably and, through random selection, parasitism may account for part of the intra-population variation observed in the host.

I am grateful to Dr. R. L. Doutt of the University of California for identification of the parasites. Representatives of all of the parasite populations discussed have been deposited in the collection at the University of California, Gill Tract Insectary, Albany, California.

LITERATURE CITED

- MUESEBECK, C. F. W., *et al.* 1951. Hymenoptera of America north of Mexico, synoptic catalog. U. S. Dept. Agric., Agric. Monog. No. 2: 1420 pp.
- NEWCOMER, E. J. 1911. The life histories of two Lycaenid butterflies. *Can. Ent.*, 43:83-88.
- SALT, GEORGE. 1936. Experimental studies in insect parasitism. IV. The effect of superparasitism on populations of *Trichogramma evanescens*. *Jour. Exper. Biol.*, 13: 363-375.
1941. The effects of hosts upon their insect parasites. *Biol. Rev.*, 16:229-264.