

PRELIMINARY AND MINOR PAPERS

LESSER BUD-MOTH

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During the spring of 1912, while engaged in apple spraying experiments at Benton Harbor, Mich., the senior author noticed the work of a small larva in the buds of unsprayed apple trees. The injury inflicted was severe in a neglected orchard near the laboratory, and this insect, among others, was the most important factor in the destruction of the entire crop of fruit. Because of the character of the injury, the attack on the swelling buds, and the tying together of the growing leaves, the damage was at once attributed to the eye-spotted bud-moth (*Tmetocera ocellana* Schiff.).

In 1913 a study was made of the life history and habits of this insect, presumably the eye-spotted bud-moth, and experiments with remedial measures were tried. The first discrepancy noticed between the habits of this insect and those of the eye-spotted bud-moth, as recorded in literature, was the fact that the hibernacula were not necessarily situated near the buds, but were to be found in any suitable place upon the limbs. Following this, many other even more striking differences in habits were noted during the course of the season, and the fact was soon impressed upon the writers that they had to deal with an insect whose economic importance had not been recorded in the United States.

The adult moths, upon submission to August C. Busck, of the Bureau of Entomology, were identified as *Recurvaria crataegella* Busck (1903),¹ a species described by him (with no indication of its life history) in 1903 from material submitted by Mr. William Dietz, of Hazleton, Pa., who reared it from hawthorn (*Crataegus tomentosus*). At that time, however, Busck admitted the probability of the identity of his *R. crataegella* and the *R. nanella* of European authors.

Our own observations of the life history of the lesser bud-moth correspond in detail with those of Houghton (1903), who published a short though complete account of the life history of *Recurvaria nanella*. The *R. crataegella* of Busck is therefore to be regarded as a synonym of *R. nanella*, and in support of this decision Busck has recently furnished the following statement:

Recurvaria crataegella Busck (Proc. U. S. Nat. Mus., v. 25, p. 811, 1903) is identical with the European *R. nanella* Hübner, as already suggested in the description. At that time the life history of the species was but fragmentarily known in Europe, and it was deemed the soundest course to give the American form a separate name, even though it was realized that it would probably prove the same as the European species. The subsequent careful study of the life history in Europe by J. T. Houghton and in this country removed all doubt about the synonymy.

¹ Bibliographic citations in parentheses refer to "Literature cited," p. 162.

Stephens (1834) recorded *Recurvaria nanella* as "not very uncommon in gardens within the metropolitan district, frequenting the trunks of apple trees in June and the beginning of July."

Stainton (1854) recorded the larva as feeding in May on the pear, making a gallery across the flowers with pieces of the petals and stamens interwoven with silk.

Rössler (1871-72) observed the tying together of the young leaves of fruit trees by larvæ of *Recurvaria nanella* and its effect in hindering the development of the new leaves. The insect was present in such large numbers as to attract the attention of the public to the deformed trees and to arouse the fear that serious harm would result. In view of the fact that the larva was so small, ate so little, and did not attack the blossoms, Rössler considered that it was not to be feared.

Houghton (1903) published an account of the life history and habits of *Recurvaria nanella* from an economic point of view, as observed by him in England. His attention was directed to the insect in an apricot orchard, where the crop had been practically destroyed by it in previous years. He was the first to note the fact that the larva, after hatching, passes the time before hibernation as a miner in the leaf. He also observed that it was the habit of the larvæ to bore into the swelling buds in the spring. The larvæ appeared in swarms on peaches and apricots and less commonly on cherries and plums. He mentions the different colors assumed by the caterpillars as they near maturity, and this observation corresponds with our own.

The distribution of *Recurvaria nanella* in Europe is given by Staudinger and Rebel (1901) as follows: Central Europe, Sweden, northern Spain, southern France, central and northern Italy, Dalmatia, and south-western Russia.

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