

Notes on the Tomato Leafminer, *Phthorimaea Lycopersicella*  
Busck, in Hawaii. (Lep.)

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On several occasions small moths have been reared from larvae feeding on tomato leaves in a somewhat different manner from what the larva of *Phthorimaea operculella* (Z.) usually does. The moths that issued were smaller than this species, but for the time were considered to be only undersized specimens of *P. operculella* (Z.). Finally specimens were sent to Mr. August Busck of the U. S. Bureau of Entomology for determination. In a letter from him dated April 13, 1927, he stated that it was the same as the species known in recent literature as *P. glochinella* (Z.), the eggplant leafminer, which has been considered an important pest of late years on tomato and eggplant, especially in California, and Mexico. It is also known in Virginia, Kentucky, Missouri, Louisiana, Texas and Colorado. Later study of the species led to the discovery that it was different from *P. glochinella*, a new species as described by Mr. Busck in the preceding pages under the name *Phthorimaea lycopersicella*.

The first rearing of this moth to come to our attention in Hawaii was from tomato leaves sent from Molokai in August, 1925. The next was from tomato leaves collected February 7, 1926, at Makapuu lighthouse, Oahu. The same month (February 24) it was reared from larvae on tomato leaves collected at Waialua, Oahu. The latest rearing was from Waimanalo, Oahu, March 13, 1927. In the three latter instances the larvae were on leaves of the small-fruited tomato growing wild in waste places. Those from Molokai were from the cultivated tomato.\*

The larva of this moth behaves somewhat differently from other related leafminers. It folds over the edge of the leaf, or fastens together the surfaces of a fold or wrinkle, or makes use of a lobe of a new leaf that has not entirely unfolded yet, for a hiding place,

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\* This species was later reared from larvae on tomato leaves collected March 21, 1928, in a garden at Waimea, Kauai. Thus it is now known on Oahu, Kauai and Molokai. (Editor.)

and feeds on the inner protected surface of the leaf. It does to some extent feed as a miner, the mine extending out from the retreat or hiding place, and it does not remain in the mine when not feeding. Several retreats may be made use of during the life of the larva. Pupation takes place within one of these retreats.

The larvae of the related *P. glochinella* mine the leaves of the eggplant, and are said to feed entirely within the leaf. The larvae of *P. operculella* mine the leaves of several solanaceous plants as: potato, tobacco, tomato, *Datura*, and they also bore into green tomato fruits and potato tubers. So far, here in Hawaii, larvae of *P. lycopersicella* have not been found attacking any other plant than tomato and they have not been found attacking its fruit. From this latter fact, it is not so important a tomato pest here in Hawaii as *P. operculella*, whose larvae infest the tomato fruits very badly at times.

The full-grown larva is 5-6 mm., of a greenish color, with an interrupted mid-dorsal line of purplish fuscous shade, on each side of it a row of patches of the same color, and a spiracular line of smaller similar colored spots, another line of similar spots below the spiracles; spiracles circular, minute; head very pale greenish, eyes black, and black line on posterolateral margin, the portion behind the eyes much widened; cervical plate concolorous, with a wide black line at the posterior margin. The very young larva lacks the purplish markings, has head entirely black and the cervical shield nearly entirely black.

When larvae have been collected for rearing the moth, about half have been found to have been parasitized by *Angitia blackburni* (Cam.). This parasite oviposits in the caterpillar. The latter is not killed till after it makes its cocoon; then the parasite larva finishes its growth, issues from its host and spins its cylindrical light brown cocoon within the host cocoon.