

## Melittobiopsis ereunetiphila Timberlake, an Efficient Parasite on the Sugar Cane Bud Worm in Hawaii

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Of late years there has been much less evidence of the work of the bud worm (*Ereunetis flavistriata* Walsm.) on sugar cane at the Experiment Station, H.S.P.A., in Honolulu. On April 27, 1939, a half hour search in the leaf sheaths of a plot of well-grown cane, failed to reveal a single larva. Eight cocoons were found, however, four of which contained empty pupal cases from which moths had issued. The other four cocoons contained dried-up caterpillars and empty pupal skins of *Melittobiopsis*, a parasitism of 50%.

On further search in the same plot of cane on May 1, two dozen bud worms were found; also 55 cocoons were collected, which were examined with the following results:

- 1 cocoon from which a moth had issued.
- 2 cocoons with caterpillars ready to pupate.
- 3 cocoons empty, uncertain as to history.
- 35 cocoons from which parasites had issued.
- 2 cocoons with parasite larvae on caterpillars: 10, 22 respectively.
- 7 cocoons with parasite pupae: 24, 23, 20, 22, 17, 30, 14 respectively.
- 5 cocoons with adult parasites.

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49 cocoons which yielded parasites, equivalent to a parasitism of 89% by *Melittobiopsis ereunetiphila*.

This insect was first discovered as a parasite of *Ereunetis flavistriata*, March 1908, at the Experiment Station, H.S.P.A., grounds in Honolulu. Observations made on it at that time were included in Experiment Station Bulletin No. 6, pp. 28-30, 1909, by the present writer, where it was discussed under the name *Melittobia hawaiiensis* Perkins. This latter insect had but recently become known in Honolulu at that time, and the parasite of the cane bud worm was so similar in appearance, and apparently had similar habits of life history, so that the mistake was easily made.

Later, when Mr. Timberlake studied this parasite, he recorded it as a "Tetrastichine near *Melittobia*," his No. 108 on page 442 of Proceedings Hawaiian Entomological Society, V, 1924. It was described by him as *Melittobiopsis ereunetiphila* in Proc. Haw. Ent. Soc., VI, p. 319, 1926. It is smaller than *Melittobia*, more metallic, and the funicle has only two joints, and the male closely resembles the female, whereas the male of *Melittobia* is very different from the female, having abortive wings and a very peculiarly developed antenna. These are figured on Plate IV, figs. 8-10, of Bulletin 6 above referred to. These figures were not made from

specimens reared from the bud worm, but from specimens of *Melittobia* reared from wasp larvae. This material was more readily obtained at the time, and was then thought to be the same species. (*Melittobia hawaiiensis* has been reared from *Megachile* larvae, and the larvae of several species of wasps.)

The type specimens of *Melittobiopsis ereunetiphila* were reared from *Ereunetis flavistriata* at the Experiment Station, H.S.P.A., January 7-9, 1924, and one specimen from *Ereunetis* on coconut at Grove Farm, Kauai, September 13, 1907, which would be its earliest date. In December 1917, at Waipio Substation, Oahu, a bud worm cocoon was found containing an adult and several larvae of *Melittobiopsis*. In the Experiment Station collection is a specimen collected in a pod of *Cassia bicapsularis* in Niu Valley, February 26, 1918. As *Ereunetis minuscula* feeds in the old pods of this plant, as well as in other old pods, it is likely that the larvae of this moth are also hosts for *Melittobiopsis*. Also in the Experiment Station collection are three specimens found in an old cocoon of the cane borer (*Rhabdocnemis obscura*) May 27, 1925, at the Station grounds. All of these specimens were collected by Swezey, and this is the extent of our knowledge of the distribution of this parasite at the present time.\*

The following life history notes are quoted from H.S.P.A. Ent. Bull., 6, p. 29, 1909:

"Apparently the female enters the bud worm's cocoon before it is entirely completed, stings the worm and deposits eggs upon it. Or it may be that after entering the cocoon, she waits till the bud worm is assuming the inactive condition previous to the transformation to pupa, and then deposits her eggs upon it; either stinging the bud worm to prevent further transformation, or else the young larvae hatch and begin eating so quickly that further transformation is prevented. The egg is white, cylindrical, slightly curved, ends rounded, 0.3 mm. long by 0.12 mm. wide. They are laid indiscriminately on the surface of the host, singly or several together. They hatch very quickly and the young larvae feed externally upon the bud worm, becoming full-grown in about a week. They are footless grubs, just a little more than 1 mm. in length, and transform to pupae in two or three days. They rest in the pupa stage about two weeks. So many of this parasite develop upon one host, that it should be a very valuable parasite upon the bud worm."

\* More recently, Mr. K. Sakimura reported having reared this parasite from larvae of *Ereunetis flavistriata* on pineapple fruits at Wahiawa, Oahu, May 29, 1939.