

## Recent Liberations of Beneficial Insects in Hawaii

By PHILIP W. WEBER

BOARD OF AGRICULTURE AND FORESTRY

The following liberation records have heretofore escaped notice in these "PROCEEDINGS."

### *Introductions by the Board of Agriculture and Forestry:*

#### **Campoplex phthorimaeae** (Cushman).

This ichneumonid parasite of the potato tuber moth, sent by W. F. Sellers of the Commonwealth Bureau of Biological Control in Riverside, California, was liberated at Waimano Home, Oahu, and Olinda, Maui, in May, 1948.

#### **Cactoblastis cactorum** (Berg).

A stock of this phycitid moth was secured from the Australian Prickly Pear Board. Eggs raised in Honolulu were placed on the range makai (seaward) of Puu Opele and on the Kamuela-Kawaihae road about 2 miles towards the mountains from Kawaihae, Hawaii, in April, 1950.

#### **Melitara prodenialis** Walker.

#### **Melitara bollii** (Zeller).

The first of these cactus-feeding phycitids was introduced from material collected at Palacios, Texas, and the second from collections made at Crystal City, Texas. According to E. Mortensen, who collected our material, the two have different habits and food preferences. Carl Heinrich (Proc. U. S. Nat. Mus. 86:341, 1939) considers pinned specimens indistinguishable. Eggs from both sources were distributed at Puu Opele, Kawaihae, and Waimea, Hawaii, in October, 1949.

#### **Moneilema crassa** LeConte.

Adults of this cerambycid beetle, collected in the vicinity of Carrizo Springs, Texas, were first liberated in Waimea, Hawaii, on May 25, 1950. At the same time a number of eggs and larvae bred in Honolulu were put out.

#### **Dactylopius opuntiae** (Cockerell).

A strain of this mealybug introduced from Pomona, California, where it was attacking *Opuntia littoralis*, proved incapable of surviving on *O. megacantha*. However, it developed readily on *O. cordobensis*, a long-spined species, and was released on a colony of this plant at Puu Hue, Hawaii, on May 28, 1949. A second strain secured from the Australian Prickly Pear Board, and originally found on *O. streptacantha* in Mexico,

proved adaptable to *megacantha*. It was released at Kawaihae, Hawaii, in August, 1949.

**Thyrecephalus albertisi** (Fauvel).

This staphylinid beetle has been released on only two islands, most of them on Oahu. Adults collected at Lipa, Luzon, P. I., were put out in Waianae Valley, Oahu, in August, 1947. In 1950, propagation was discontinued and the stock on hand released in Kona, Hawaii, on April 18.

**Trybliographa daci** Weld.

Laboratory-bred material of this cynipid, originating in Malaya, was first released in Nuuanu Valley, Oahu, on October 28, 1949; at Lihue, Kauai, on November 15; in Iao Valley, Maui, on November 25; at Waiakea, Hawaii, on December 6; and at Mapulehu, Molokai, on May 22, 1950.

**Opius longicaudatus** (Ashmead).

The original liberation of this species was made in small numbers in Manoa Valley, Oahu, in May, 1947, from material sent by Dr. L. B. Uichanco, of the College of Agriculture at Los Baños, P. I. Liberation of large numbers of insectary-bred material from stock sent by N. L. H. Krauss from Malaya was begun in September, 1948. Original liberations were made in Hilo, Hawaii, September 12; in Iao Valley, Maui, September 9; at Lihue, Kauai, September 8; at Kalae, Molokai, and at Lanai City, Lanai, October 4.

**Opius persulcatus** (Silvestri).

There is doubt as to the identity of this species. A few females from Dr. Uichanco's Philippine material were liberated March 15, 1947, at Maunawili, Oahu. Large scale liberations were begun in November, 1948, again originating from Mr. Krauss' Malayan material. Releases were made at Lihue, Kauai, December 14; at Iao Valley, Maui, December 20; at Mountain View, Hawaii, January 11, 1949; and at Mapulehu, Molokai, January 25.

**Opius incisi** Silvestri.

One female with a short ovipositor, bred from Dr. Uichanco's Philippine material, and presumably of this species, was released at Maunawili, Oahu, on March 15, 1947. Mass liberations of progeny bred from material sent from Malaya by Mr. Krauss were begun in November, 1948. Releases were made at Iao Valley, Maui, December 20; at Lihue, Kauai, December 23; Kamaili, Hawaii, December 29; Mapulehu, Molokai, on January 25, 1949; and at Miki Camp, Lanai, June 24, 1949.

*Introductions by the cooperative fruit fly project:*

**Opius kraussii** Fullaway.

This species probably was included in an *Opius* "complex" released at Round Top, Oahu, on January 6, 1950, and at Hilo, Hawaii, January 12. The first records of its liberation as a distinct entity are at Lihue, Kauai, on January 24; at Waiakea, Hawaii, February 1; at Waihee

Valley, Maui, February 10; at Pawaa, Oahu, February 10; and at Mapulehu, Molokai, on March 22. The original breeding material of *O. kraussii* came from Queensland, Australia.

***Opius deeralensis* Fullaway.**

This Queensland species was probably present in the complex referred to above. Releases as a recognized species were made at Keaukaha, Hawaii, on January 19, 1950; at Kealia, Kauai, January 24; at Pawaa, Oahu, February 4; at Iao Valley, Maui, February 10; and at Mapulehu, Molokai, on March 22.

***Opius fijiensis* Fullaway.**

Field-collected material of *O. fijiensis* was first released at Round Top, Oahu, on January 6, 1950; at Lihue, Kauai, on January 10; at Hilo, Hawaii, on January 12; at Mapulehu, Molokai, March 22; and at Iao Valley, Maui, March 24.

***Opius formosanus* Fullaway.**

Insectary-bred material was liberated at Hawi, Hawaii, and at Hooehua, Molokai, on July 31, 1950; at Wailua, Kauai, August 1; at Omaopio, Maui, August 4; and in Manoa Valley, Oahu, October 23.

***Opius skinneri* Fullaway.**

Liberations of field-collected material from Mindanao, P. I., were made in Nuuanu Valley, Oahu, September 15, 1950, and at Kilauea, Kauai, September 19.

***Opius watersi* Fullaway.**

Insectary-bred material was released at Makaha Valley, Oahu, on February 1, 1950; at Waiakea, Hawaii, February 6; at Wailua, Kauai, February 21; at Kihei, Maui, February 24; and at Mapulehu, Molokai, February 27. The original material came from Bareilly, United Provinces, India.

***Opius* spp.**

Two species of *Opius* from Africa were liberated at Kaalaea, Kahana, and Wahiawa, Oahu, on September 27, 1949; Kaumana, Hawaii, Iao Valley, Maui, and Wilcox Valley, Kauai, on September 30. These are the species referred to on page 16 of this volume (PROCEEDINGS, 14[1]). According to C. F. W. Muesebeck, they are undescribed.

***Dirhinus giffardii* Silvestri.**

A strain differing from that already present in Hawaii by the hairs on the thorax and head being silver instead of golden, was introduced from Australia. Liberation records are given in the event the two should be found worthy of separation. It was released at Waiakea, Hawaii, on January 3, 1950; Haiku, Maui, on January 7; Lihue, Kauai, on January 17; Mapulehu, Molokai, on March 22; and Kaaawa, Oahu, on April 4.

***Bracon fletcheri* Silvestri.**

A large number of this braconid bred from *Zizyphus jujuba* collected at Agra, India, was liberated in Kalihi Valley, Oahu, on April 17, 1950.

**Tetrastichus dacicida** Silvestri.

The actual introduction of this species is questionable. The original stock from Africa was bred and liberated under this name until July, 1950, when the laboratory production was examined by chance and found to consist of only *giffardianus*. In the event that *dacicida* is later found, the dates of liberation are as follows: Olowalu, Maui, on February 7, 1950; Lihue, Kauai, on February 14; Waiakea, Hawaii, on March 2; Mapulehu, Molokai, on March 22 and Waimanalo, Oahu, on May 10.

**Syntomosphyrum indicum** Silvestri.

Three small lots of this eulophid were liberated on Oahu in August, 1938, but establishment apparently was not successful. This material was obtained from Fiji. Field-collected material from Coonoor, India, was liberated at Waiaha, Hawaii, on December 13, 1950, and at Haiku and Lanikai, Oahu, on December 30.