

## Recent Introductions for Biological Control in Hawaii — 1<sup>1</sup>

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The following new introductions or additional releases of beneficial organisms have been made by the Board of Agriculture and Forestry since the last listing was published ("PROCEEDINGS," 15(3):635-638, 1955). Only the first release on each island is given. Unless otherwise noted, references to previous introductions refer to earlier papers in this series.

### **Aerenicopsis championi** Bates

This cerambycid beetle (BIOL. CEN.-AMER., COL. 5:428, 1885) which bores in the stems of lantana was introduced from Vera Cruz, Mexico. A previous attempt at introduction was made in 1902 (H.S.P.A. ENT. BULL. 16:51, 1924). It was released at Kaakepa, Hawaii, in June, 1955, and at Puu Lua, Molokai, in July.

### **Catabena esula** Druce

An addition to the leaf-feeding insects attacking lantana, this phalaenid moth (BULL. SO. CAL. ACAD. SCI. 33:145-148, 1934) was introduced from Los Angeles, California. It was liberated at Halepiula, Hawaii, Kula, Maui, Kalaheo, Kauai, and Tantalus, Oahu, in April, 1955.

### **Xanthaciura connexionis** Benjamin

This is a tephritid fly (U.S.D.A. TECH. BULL. 401:45, 1934) which breeds in the flower heads of pamakani (*Eupatorium glandulosum* (Humboldt, Bonpland, and Kunth)). It was discovered at Cuernavaca, Mexico. Releases were made at Iao Valley, Maui, and Tantalus, Oahu, in May, 1955.

### **Canthon chevrolati** Harold

### **Canthon viridis** (Palisot de Beauvois)

### **Phanaeus daphnis** Harold

### **Pinotus carolinus** (L.)

These dung beetles were sent from Cuernavaca, Mexico, for the control of flies and other insects breeding in dung. *Canthon chevrolati* (BIOL. CEN.-AMER., COL. 2(2):33, 1887), first introduced in 1954, was released at the

<sup>1</sup> This paper is a continuation of a series commenced in 1952 to record the introduction into Hawaii of insects for biological control. The title has been changed to include other groups than insects.

University of Hawaii dairy on Oahu and Molokai Ranch, Molokai, in August, 1955; in September it was liberated in Waimea, Kauai. *C. viridis* (BIOL. CEN.-AMER., COL. 2(2):30, 1887) and *Pinotus* (BIOL. CEN.-AMER., COL. 2(2):52, 1887) were liberated on the Parker Ranch on Hawaii in November, 1954. *Phanaeus* (BIOL. CEN.-AMER., COL. 2(2):61, 1887), also previously introduced in 1954, was released on Molokai Ranch in August, 1955, and in Waimea, Kauai, in September.

#### **Campsomeris annulata** (F.)

#### **Campsomeris manokwariensis** (Cameron)

These two scoliid wasps (PROC. HAW. ENT. SOC. 14(1):137, 1950) were introduced from Guam for the control of various scarabaeid grubs. They were released in the rose gardens at Koko Head, Oahu, in April, 1955.

#### **Bracon gelechiaie** Ashmead

*Bracon gelechiaie* (PROC. U.S.N.M. 11:623, 1889) was one of several parasites reared from lepidoptera infesting mesquite flowers near Tucson, Arizona. It was the only one successfully propagated on the cosmopterygid moth, *Ithome concolorella* (Chambers), which has become a serious pest on this plant in Hawaii recently. Releases of this braconid were made at Fort Shafter, Oahu, in July, 1955; Kawaihae, Hawaii, Olowalu, Maui, and Molokai Ranch, Molokai, in August; and Hanapepe, Kauai, in September. It had been introduced previously in 1945 for the control of the potato tuber moth (BOARD OF AGR. & FOR. BIENNIAL REP. 1944-46: p. 43).

#### **Episimus** sp.

This is an olethreutid moth introduced from Brazil to feed on the leaves of *Schinus terebinthifolius* Raddi, the Christmas berry tree, which has become an undesirable plant in many localities. Releases were made at Naalehu, Hawaii, in December, 1954, and Molokai Ranch in January, 1955. The first release on Oahu was made in Mikiola in October, 1955.

#### **Gonaxis kibweziensis** (Smith)

In August, 1954, about 500 snails (PROC. MALAC. SOC. LONDON 1:165, 1894) were brought from the island of Agiguan in the Marianas and released in Kaneohe, Oahu, to supplement the original stock released there in 1952 to feed on the giant African snail. In March, 1955, a colony was sent to Haiku, Maui.

#### **Euglandina rosea** (Férrusac)

This is a predacious snail of the family Oleacinidae (PHILA. ACAD. NAT. SCI. MONO. 3, 2(1):189, 1946). It was found in citrus groves in Florida and introduced to Hawaii as a predator on the African snail. Releases were made at Hauula, Oahu, in November, 1955.

**Cycloneda sanguinea (L.)**

In September, 1955, this aphid-feeding coccinellid was introduced from Cuernavaca, Mexico, and released on the grounds of the Board of Agriculture. The species was introduced in 1896 (Williams, THE INSECTS AND OTHER INVERTEBRATES OF HAWAIIAN SUGAR CANE FIELDS, 1931, p. 373) but failed to become established.

**Octotoma scabripennis Guérin**

First introduced to the Territory in 1902 (H.S.P.A. ENT. BULL. 16:10, 1924) and again in 1953, this lantana-feeding chrysomelid (BIOL. CEN.-AMER., COL. 6(2):87, 1886) was released at Kalae Ranch, Molokai, in September, 1955, and at Lawai Valley, Kauai, in November.

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The undetermined species of opiine fruit fly parasites from Africa introduced in 1949 ("PROCEEDINGS," 14(2):329, 1951) have been found to be *Opius bevisi* Brues (PROC. AMER. ACAD. ARTS SCI. 61:261, 1926) and *Opius concolor* Szepliget (BULL. SOC. ENT. FRANCE 1910, 244).

In 1953 a chalcid wasp was introduced from Kenya to control the diamond-back cabbage moth ("PROCEEDINGS," 15(2):369, 1954; 15(3):636, 1955). This has been determined to be *Brachymeria boranensis* Masi (RACCOLTE ZOOLOGICHE 3:21-22, 1939).