

Introductions for Biological Control in Hawaii, 1973

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The Entomology Branch of the Hawaii Department of Agriculture has maintained a continuous program of beneficial organism introductions for many years. This paper includes a list of beneficial insects introduced for biological control during 1973, and gives notes on the status of some pests and their purposely introduced enemies.

SNAIL PEST CONTROL

Achatina fulica Bowdich (giant African snail).

Giant African snail populations remained at low levels in former high density localities on Oahu and Maui. Efforts to eradicate or contain the snail continued on the islands of Kauai and Hawaii. On Kauai, metaldehyde bait applications were made throughout the year in localized infestations at Poipu and Wahiawa. On Hawaii, a shipment of *Gonaxis quadrilateralis* (Preston) from Oahu was released along the perimeter of the snail infestation in Kahaluu (Kona) in January, and an aerial bait application was made covering 65 to 70 acres in August.

Galba viridis (Quoy & Gaimard) (liverfluke snail).

No recoveries have been made of *Sepedon plumbella* Wiedemann, *S. senex* Wiedemann and *S. n. sp.*, sciomyzids introduced from Southeast Asia in 1971 to aid in the control of *Galba viridis*, the intermediate host of cattle liverfluke. Populations of *G. viridis*, however, were reported at low levels on Oahu, Maui and Hawaii and this may, in part, be attributed to the predation of *Sepedon sauteri* Hendel and *S. macropus* Walker.

WEED PEST CONTROL

Lantana camara var. *aculeata* L. Moldenke (lantana).

The establishment of the lantana stem boring beetle, *Plagiohammus spinipennis* Thomson on Maui appears likely. Numerous adult emergence holes were noted at Ulupalakua and girdling damage by larvae was evident in Iao Valley. Adults were released for the first time on Kauai at Kokee in May and on Oahu at Makaleha Valley in February. Although no evidence of establishment was observed at Kokee, oviposition punctures were noted on lantana stems at Makaleha Valley in June and October.

Ageratina (= *Eupatorium*) *riparia* (Regel) K. & R. (Hamakua pamakani). A promising bio-control candidate, *Oidaematophorus* sp., a leaf defoliat-

ing pterophorid moth, was introduced from Mexico in January and, after completion of host specificity tests, was approved for release by the Board of Agriculture in September. Initial releases were made on Mt. Kaala, Oahu and in Kona, Hawaii. Other promising candidates from Mexico now being screened in the quarantine insectary are: *Procecidochares* near *pleuralis* Aldrich, a stem galling tephritid; *Clinodiplosis* sp., a leaf galling cecidomyiid; and *Rhodobaenus sanguineus* (Gyllenhal), a stem boring curculionid.

INSECT PEST CONTROL

Erionota thrax L. (banana skipper).

Heavy infestations of this banana pest was discovered for the first time in the State at Hickam Air Force Base, Honolulu, Oahu in late August 1973. Eradication efforts were discontinued when continuing surveys disclosed infestations of this hesperiid along the leeward coast, in Honolulu and Wahiawa. By the end of the year it had spread to Pupukea, Sunset Beach, Kaaawa and Kailua. Efforts toward bio-control were initiated with the introduction and release in November of an egg parasite, *Ooencyrtus erionotae* Ferriere from Guam, and a larval parasite, *Apanteles erionotae* Wilkinson, from Thailand in December.

Melipotis indomita (Walker) (monkeypod-kiawe caterpillar).

Foliar damage by this noctuid, ranging from light to heavy, was noted during the year on kiawe and monkeypod trees in various localities on Kauai, Oahu, Maui and Hawaii. An ichneumonid wasp, *Chromocryptus albomarginatus* (Taschenburg), from Bolivia, was approved for release in April to aid in the control of *M. indomita*. Initial releases were made in Honolulu, Oahu and Ka'u, Hawaii.

Psylla uncatoides Ferris & Klyver (acacia psyllid).

Populations of this pest of *Acacia* spp. were generally low on Kauai, Oahu, Maui and Lanai throughout the year. On Hawaii, populations were heavy early during the year and again during the summer months, especially along the Mauna Loa Strip Road in the Hawaii Volcanoes National Park. In cooperation with the Entomology Dept., University of Hawaii, initial releases of two Australian coccinellids, *Diomus* sp. and *Harmonia conformis* (Boisduval) were made during January and February to aid in combating *P. uncatoides*. To date, only *H. conformis* has been recovered.

Plutella xylostella (L.) (diamondback moth).

Populations of this cabbage pest was generally light throughout the year in commercial cabbage producing areas of Waianae, Oahu; Kula, Maui; and Volcano, Hawaii. Occasional heavy infestations were noted in small farm plantings and in backyards. An ichneumonid, *Thyraeella collaris* Gravenhorst and a braconid, *Apanteles plutellae* Kurdjumov were introduced from the West Indies but no recoveries have been made.

TABLE 1.—*Introductions for Biological Control in Hawaii, 1973*
 (Unless otherwise indicated, all introductions by Entomology Branch, Hawaii Department of Agriculture)

Pest Needing Control	Organism Introduced	Source	Sender	Date Rel'd (1973)	No. ‡	Release Point
WEED PEST						
<i>Ageratina</i> (= <i>Eupatorium</i>) <i>riparia</i> (Regel) K. & R. (Hamakua pamakani)	<i>Oidaematophorus</i> sp. (Lepidoptera: Pterophoridae)	Contreras, Mexico	W. E. Rose	Oct. 4	600	Mt. Kaala, Oahu
				Oct. 9	925	Kona, Hawaii
INSECT PESTS						
<i>Erionota thrax</i> L. (banana skipper)	<i>Ooencyrtus erionotae</i> Ferriere (Hymenoptera: Encyrtidae)	Yona, Guam	R. Muniappan	Nov. 8	200	Hickam Air Force Base, Oahu
<i>Haematobia irritans</i> (L.) (horn fly)	<i>Onitis alexis</i> Klug (Coleoptera: Scarabaeidae)	Canberra, Australia	D. F. Waterhouse	Sept. 11	300	Keamoku, Hawaii
				Sept. 11	500	“ “
<i>Melipotis indomita</i> (Walker) (monkey pod-kiawe caterpillar)	<i>Chromocryptus albomarginatus</i> (Taschenburg) (Hymenoptera: Ichneumonidae)	Cochabamba, Bolivia	W. E. Rose	May 1	6	Honolulu, Oahu
				June 6	41	Ka'u, Hawaii
<i>Plutella xylostella</i> (L.) (diamondback moth)	<i>Thyraeella collaris</i> Gravenhorst (Hymenoptera: Ichneumonidae)	Trinidad, West Indies	F. D. Bennett	Jan. 10	56	Kula, Maui
				Feb. 15	170	Poipu, Kauai
				Mar. 9	650	Kula, Maui
				Apr. 10	300	Volcano, Hawaii
<i>Psylla uncatoides</i> Ferris & Klyver (acacia psyllid)	<i>Diomus</i> sp. (Coleoptera: Coccinellidae)	†Albany, California	K. S. Hagen	Feb. 3	5	Kohala, Hawaii
				Feb. 3	58	Hawaii Volcanoes National Park
				Jan. 11	60	Kohala, Hawaii
				Feb. 23	89	Hawaii Volcanoes National Park
	<i>*Harmonia conformis</i> (Boisduval) (Coleoptera: Coccinellidae)	†Albany, California	K. S. Hagen	Jan. 11	60	Kohala, Hawaii
				Feb. 23	89	Hawaii Volcanoes National Park

* Previously introduced.

† Originally collected in Australia. Importation arranged by J. W. Beardsley, University of Hawaii.

‡ Applies to initial release only.

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