

Recent Introductions for Biological Control in Hawaii—VIII

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INTRODUCTION

This paper includes a list of new introductions and additional releases of beneficial organisms for biological control in Hawaii made since the last published listing (Davis and Krauss, 1962) and gives a few notes on the status of organisms recently introduced for the control of snail, weed, and insect pests.

SNAIL PEST CONTROL

Lymnaea ollula Gould (liverfluke snail).

The propagation of *Sepedon praemiosa* Giglio-Tos was discontinued after substantial numbers were released on Oahu, Hawaii, Maui, and Kauai. Neither *S. praemiosa* or *Atrichomelina pubera* (Loew) were recovered and to date, *Sepedon macropus* Walker is the only introduced marsh fly that is reported occasionally from Maui, Oahu, and Kauai.

Achatina fulica Bowdich (giant African snail).

Gonaxis quadrilateralis (Preston): Populations of this carnivorous snail were active at most release points, particularly on Tantalus Drive, Oahu, where approximately 40 acres are occupied by this effective African snail predator.

WEED PEST CONTROL

Four recoveries of introduced weed insects were made and these are mentioned briefly as follows:

Tetraeuresta obscuriventris Loew. This tephritid was introduced from Fiji [PROCEEDINGS 18 (1) : 128] for the control of *Elephantopus mollis*, an introduction to Hawaii. The first recoveries were made on Kauai in February, 1962, followed by a Hawaii recovery at Kalopa in June, 1962. Since that time it has been recovered at virtually all release points on Kauai and is well established.

Bruchus atronotatus Pic. This Christmas berry seed weevil, re-introduced from Brazil in 1961, was recovered for the first time at Kiola-kaa, Kau District, Hawaii in August, 1962. This was followed by the first recovery on Oahu at Heeia in October, 1962.

Uroplata girardi Pic. This Brazilian leaf mining hispid of *Lantana camara* var. *aculeata* appears to be successfully established in east Lawai

Table 1.—New Introductions and Additional Releases for Biological Control in Hawaii
1962

Pest Needing Control	Organism Introduced	Source	Collector	Date Rel'd (1962)	Number **	Release Point **	
1. WEED PESTS <i>Lantana camara</i> var. <i>aculeata</i> (L.) Moldenke (Lantana)	* <i>Aerenicopsis championi</i> Bates (Coleoptera: Cerambycidae)	Veracruz, Mexico	N.L.H. Krauss	Apr. 4	20	Kukuiolono Park, Kalaheo, Kauai	
	* <i>Plagiohammus spinipennis</i> Thomson (Coleoptera: Cerambycidae)	Jalapa area, Veracruz Mexico	N.L.H. Krauss	Feb. 15	82	Kahauloa, Kona, Hawaii	
	* <i>Diastema tigris</i> Guenée (Lepidoptera: Noctuidae)	Merida, Yucatan, Mexico	N.L.H. Krauss	May 10 May 15	75 130	Puu Opaе, Kauai Panaewa Farm Lots, Hawaii	
				June 21	250	Tantalus Round Top, Oahu	
				June 27	150	Keokea, Maui	
	<i>Ulex europaeus</i> L. (Gorse)	* <i>Apion scutellare</i> Kirby (Coleoptera: Curculionidae)	Sintra, Portugal	N.L.H. Krauss	Apr. 16	10	Olinda, Maui
	<i>Emex australis</i> Steinh. and <i>Emex spinosa</i> (L.) Campd. (Emex)	<i>Apion violaceum</i> var. <i>harcyniae</i> (Hubenthal) (Coleoptera: Curculionidae)	Praia das Macas, Portugal	N.L.H. Krauss	Apr. 16 Apr. 16	195 365	Omaopio, Maui Waiakoa, Maui
		<i>Apion neofallax</i> Warner (Coleoptera: Curculionidae)	Rabat, Morocco	N.L.H. Krauss	May 9	600	Molokai Ranch, Molokai
					May 29	120	Omaopio, Maui

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1. WEED PESTS (continued) <i>Tribulus terrestris</i> L. (Puncture vine)	<i>Microlarinus lareynii</i> Duval (Coleoptera: Curculionidae)	California	J.K. Holloway	Aug. 9	375	Kekaha, Kauai
2. INSECT PESTS <i>Nezara viridula</i> var. <i>smaragdula</i> (Fabr.) (South- ern Green Stink Bug)	<i>Telenomus basalis</i> Wollaston (Hymenoptera: Scelionidae)	Canberra, A.C.T., Australia	D.F. Waterhouse	Feb. 6	1,900	Moilili, Honolulu, Oahu
		Trinidad, West Indies (Nov. 1962)	F.D. Bennett			
	<i>Trichopoda pennipes</i> var. <i>pilipes</i> F. (Diptera: Larvaevoridae)	Trinidad and Montserrat, West Indies	F.D. Bennett	Apr. 2	8	Makaha Valley, Oahu
	<i>Ooencyrtus submetallicus</i> (Howard) (Hymenoptera: Encyrtidae)	Trinidad, West Indies	F.D. Bennett	Sept. 24	45	Nuuanu, Oahu
	<i>Ooencyrtus trinidadensis</i> Crawford (Hymenoptera: Encyrtidae)	Trinidad, West Indies	F.D. Bennett	Oct. 1	350	Waimano Home, Oahu

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2. INSECT PESTS (continued)	<i>Xenoencyrtus niger</i> Rick (Hymenoptera: Encyrtidae)	Canberra, A.C.T., Australia	D.F. Waterhouse	Oct. 25	500	Waianae, Oahu
Aphids and Coccids	* <i>Adalia bipunctata</i> (L.) (Dark and pale forms). (Coleoptera: Coccinellidae)	Funchal, Madeira	N.L.H. Krauss	July 24 July 27	55 55	Olinda, Maui Kapiolani Park, Honolulu, Oahu
	<i>Adonia variegata</i> (Goeze) (Coleoptera: Coccinellidae)	Funchal, Madeira	N.L.H. Krauss	July 24 July 27	100 27	Olinda, Maui Kapiolani Park, Honolulu, Oahu
	<i>Scymnus (Pullus)</i> <i>subvillosus</i> (Goeze) (Coleoptera: Coccinellidae)	Funchal, Madeira	N.L.H. Krauss	July 25 Aug. 15	50 15	Dept. of Agriculture grounds, Honolulu, Oahu Makawao, Maui
	<i>Scymnus</i> (s. str.) <i>levaillanti</i> Mulsant (Coleoptera: Coccinellidae)	Funchal, Madeira	N.L.H. Krauss	July 30	20	Foster Garden, Honolulu, Oahu
<i>Ithome concolorella</i> (Chambers)	<i>Orius tricolor</i> (White) (Hemiptera: Anthocoridae)	East Tucson and Chandler, Arizona	C.J. Davis	May 15	300	Waianae, Oahu

*Previously introduced

**Applies to initial release on each island only.

Valley, Kauai. All stages of development were noted on infested lantana leaves and it was estimated that the area of infestation covered approximately 4000 square feet.

Microlarinus lareynii Duval. The puncture vine seed weevil, *M. lareynii*, was introduced from California in August, 1962 and liberated in a 25-acre infestation of *Tribulus terrestris* L. at Mana, Kauai. In October at least two generations had been completed and all stages of development were noted in severely damaged seeds.

Plagiohammus spinipennis Thomson, the destructive stem- and root-boring lantana cerambycid, is firmly established at Kahauloa, Kona District, island of Hawaii. Twelve or more emergence holes, severe girdling damage to trunks and stems, and collapsing of large branches were noted for the first time.

INSECT PEST CONTROL

Calosoma peregrinator Guerin, introduced from Arizona in 1954 and liberated on the Parker Ranch and at Naalehu, Hawaii was recovered for the first time by Mr. Harold Baybrook, retired Agriculturist of Parker Ranch. This carabid was introduced for the control of armyworms and cutworms.

Bubulcus ibis L., the introduced cattle egret, is steadily increasing on Ewa Coral Plain, Oahu, and as many as 150 egrets have been sighted. They were observed foraging for insects in alfalfa mowing operations, water-cress farms, mill ponds (for rat-tailed maggots) and were frequently seen on the backs of cattle.

MISCELLANEOUS

The exploratory phase of the biological control program was carried on by the junior author; the propagating and testing of all organisms considered for liberation were conducted by the senior author, assisted by Harry Nakao, Mabel Chong, and Nobuo Miyahira. The assistance of collaborators, determinations by the Insect Identification and Parasite Introduction Section, United States Department of Agriculture and others are gratefully acknowledged.

INSECTS OF HAWAII

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The following volumes are available from the University of Hawaii Press, Honolulu, Hawaii 96822, U.S.A.

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