

Recent Introductions for Biological Control in Hawaii - XII

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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, 1966) and gives a few notes on the status of organisms recently introduced for the control of snail, weed and insect pests.

SNAIL PEST CONTROL

Achatina fulica Bowdich (giant African snail)

Attempts to eradicate incipient infestations of the giant African snail on Kauai and Hawaii continued and no live snails were found during the past year in the infested localities.

The introduced rosy predator snail, *Euglandina rosea* (Ferussac), continued to spread in the Hana District on Maui and on the Island of Hawaii, particularly in the Hilo, Puna and Kona Districts. Urban development on Oahu has unfortunately eliminated some very outstanding habitats of the carnivorous snails, *Gonaxis* spp.

Lymnaea ollula Gould (liverfluke snail)

Sepedon sauteri Hendel, an introduced sciomyzid snail predator from Fukuoka, Japan, arrived on the 13th of September, 1966. It was successfully propagated and releases were made on the islands of Kauai and Oahu. *S. sauteri* has wide Asiatic distribution, being found in the Ryukyus, Taiwan, Hong Kong, Philippines, Thailand, Nepal, India, East and West Pakistan. No recoveries have been made to date.

WEED PEST CONTROL

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

Octotoma scabripennis Guérin—Méneville. The lantana leaf beetle is now lightly distributed throughout the Kona District from sea-level to 2000 ft. Although found feeding on *Origanum* sp. and a weed, *Salvia occidentalis*, no evidence of breeding was found.

Uroplata girardi Pic. The lantana hispid has spread from Lawai to Hanapepe valleys on Kauai and occupies an area of approximately 8000 acres. On Oahu it became very abundant on Tantalus, and on Hawaii it is becoming established in the Kipahoe Forest Reserve, South Kona, and Kukui Paddock, Kau District.

Plagiohammus spinipennis Thomson. Damage to lantana at

TABLE 1. *New introductions and additional releases for biological control in Hawaii 1966*

(All introductions by Entomology Branch, Hawaii Department of Agriculture)

Pest Needing Control	Organism Introduced	Source	Collector	Date Rel'd (1966) **	Number **	Release Point
WEED PESTS						
<i>Rubus</i> spp. (blackberry)	<i>Priophorus morio</i> (Lepeletier) (Hymenoptera: Tenthredinidae)	Oregon, Washington, California	N.L.H. Krauss	June	75 adults 330 larvae	Waiakamoi, Maui
				June June 30	74 30	Olinda, Maui Mt. Kaala, Oahu
	<i>*Bembecia marginata</i> (Harris) (Lepidoptera: Aegeriidae)	Near Stayton, Marion Co., Oregon	N.L.H. Krauss	Aug 26 Aug 2	13 15	Waiakamoi, Maui Mt. Kaala, Oahu
	<i>Apotoforma</i> sp. (Lepidoptera: Tortricidae)	Jalapa, Veracruz, Mexico (1963)	N.L.H. Krauss	Aug 24	1 lot	Kahuku Ranch, Kau, Hawaii
	<i>Schreckensteinia festaliella</i> Hübner (Lepidoptera: Heliodinidae)	California (1963)	N.L.H. Krauss	Aug 24	1 lot	Kahuku Ranch, Kau, Hawaii
<i>Lantana camara aculeata</i> (L.) Moldenke (lantana)	<i>*Plagiohammus spinipennis</i> Thomson (Coleoptera: Cerambycidae)	Jalapa area, Veracruz, Mexico	N.L.H. Krauss	Feb 15	31	Palani Ranch, Kona, Hawaii
	<i>*Aerenicopsis championi</i> (Bates) (Coleoptera: Cerambycidae)	Mocambo, Veracruz, Mexico	N.L.H. Krauss	Feb 7	65	Kilohana, Kauai
<i>Melastoma malabathricum</i> L. (Indian rhododendron)	<i>Selca brunella</i> Hampson (Lepidoptera: Arctiidae)	Kuala Lumpur and Singapore, Malaysia (1964)	N.L.H. Krauss	Feb 15	55 larvae 200 pupae	Huleia, Kauai

— Continued —

TABLE 1 (Cont.). *New introductions and additional releases for biological control in Hawaii 1966*

(All introductions by Entomology Branch, Hawaii Department of Agriculture)

Pest Needing Control	Organism Introduced	Source	Collector	Date Rel'd (1966) **	Number **	Release Point
INSECT PESTS						
<i>Nezara viridula</i> (L.) (southern green stink bug)	<i>Trissolcus mitsukurii</i> (Ashmead) (Hymenoptera: Scelionidae)	Shikoku, Japan	Keizo Kiritani Prefectural Inst. of Agr. & Forest Sci., Nangoku, Shikoku, Japan	Jul 29	500	Hilo, Hawaii Kalopa, Hawaii
				Jul 29	480	
<i>Musca domestica</i> L. (House fly)	<i>Spalangia cameroni</i> Perkins (Trinidad strain) (Hymenoptera: Pteromalidae)	Riverside, California (1964)	E. Fred Legner, Univ. of California, Riverside	Jan 25	1,500	Kukuiula, Kauai Lawai, Kauai Molokai
				Jan 25	1,500	
				Apr 1	19,000	
<i>Musca domestica</i> L. (House fly)	<i>Spalangia endius</i> Walker (Hymenoptera: Pteromalidae)	Riverside, California (1964)	E. Fred Legner	Jan 25	1,200	Kukuiula, Kauai Lawai, Kauai Molokai
				Jan 25	1,000	
				April	15,000	
<i>Lymnaea ollula</i> Gould (liver fluke snail)	<i>Sepedon sauteri</i> Hendel (Diptera: Sciomyzidae)	Fukuoka, Kyushu, Japan	C. J. Davis and K. Yasumatsu	Nov 15 Nov 22	75 200	Pearl City, Oahu Hanapepe, Kauai

* Previously introduced.

** Applies to initial release on each island only.

Kukui Paddock, Kau District, Hawaii, by the introduced lantana cerambycid continued to mount and as many as 16 larvae were found in the trunk of one plant. According to Dr. K. Harley, Australian Research Scientist, "A partial survey of the incidence of this insect has revealed that several acres of lantana are under heavy attack. It may be anticipated that within 2 or 3 years effective control of the weed may be effected. The position is excellent and should be viewed with optimism."

Rubus spp. (blackberry)

Considerable dieback of terminal blackberry stems was noted in some localities at Kokee (4000 ft) Kauai and this was attributed to the introduced blackberry skeletonizer, *Schreckensteinia festaliella* Hübner. Population peaks appear to be reached about the middle of the year with considerable subsidence by the end of the year.

The introduced tortricid, *Apotoforma* sp., is established at Kokee but has not reached the damaging levels observed at Olinda and Waiakamoi, Maui.

The raspberry crown borer, *Bembecia marginata* Harris, was reintroduced from Oregon and liberated on Maui. The first release of the sawfly *Priophorus morio* Lepeletier from the Pacific Coast states was made at Olinda and Waiakamoi, Maui and on Mt. Kaala, Oahu.

This gives a total of 4 insects which have been liberated for potential control of wild blackberry species.

Hypericum perforatum (Klamath weed)

The introduced Klamath weed gall midge, *Zeuxidiplosis giardi* (Kieffer), is now well established on Mt. Hualalai and extending its range.

The chrysomelid, *Chrysolina quadrigemina* (Suffrian) appears to be in the second Hawaiian generation, although no larvae have been observed in limited surveys at various times of the year.

Melastoma malabathricum L. (Indian rhododendron)

This noxious melastomaceous weed and closely related species sustained severe damage by the introduced melastoma borer, *Selca brunella* Hampson (Arctiidae). Much dieback has been noted in the Hilo and Puna Districts and flowering and fruiting has been inhibited in some localities.

Tribulus cistoides L. and *T. terrestris* L. (puncture-vine)

The puncture-vine stem weevil, *Microlarinus lypriformis* (Wollaston), is now established on all major Islands, having been discovered at Kamiloa, Lanai in August, 1966 and at Kawaihae, Hawaii in December, 1966. The spread to these islands was accomplished without intentional assistance by man.

Schinus terebinthifolius Raddi (Christmas berry)

The introduced bruchid seed weevil, *Bruchus atronotatus* Pic, was found well established in Hookena, South Kona in November 1966, about 30

miles from the original release point at Kiolakaa, Kau. *B. atronotatus* was released at Kiolakaa on April 25th, 1960.

INSECT PEST CONTROL

Nezara viridula (Linnaeus) (southern green stink bug)

The introduced parasites, *Trichopoda pennipes* var. *pilipes* Fabricius (Trinidad stink bug tachinid) and the scelionid, *Trissolcus basalis* (Wollaston), continued to exert strong pressure on southern green stink bug populations. There were no serious crop losses reported in the State during the year.

Through the cooperation of Dr. K. Kiritani of Japan a shipment of the scelionid *Trissolcus mitsukurii* (Ashmead) was received and these were liberated on the Island of Hawaii beginning in July, 1966. No recoveries of this parasite were made.

Schistocerca vaga Scudder (vagrant grasshopper)

Through the cooperation of Dr. V.P. Rao, Bangalore, India, a trogid, *Trox procerus* Har. and a tenebrionid, *Pimelia inexpectata* Senac were received for trial on the immigrant vagrant grasshopper, *S. vaga*. *T. procerus* was released on Sand Island on the 28th of November, 1966 but the stock of *Pimelia* was ordered destroyed because the adult beetles nibbled radish, spinach, lettuce and head cabbage seedlings to ground level.

Pseudaletia unipuncta (Haworth) (armyworm)

There have been no serious outbreaks in pasture grasses by *P. unipuncta* since the introduction of the braconid, *Apanteles militaris* (Walsh) in May, 1960 from Riverside, California. Original releases of *A. militaris* were made in Kahua and Parker Ranches on the island of Hawaii in May, 1960 and the parasite is exceptionally well established in these localities. In April, 1966 the parasite was found near the summit of Mt. Hualalai, a considerable extension of its range.

BENEFICIAL LIVESTOCK INSECTS

The introduced histerid, *Pachylister lutarius* Erichson, was recovered for the first time at Honouliuli, Oahu on February 25th, 1966. *P. lutarius* was introduced from Ceylon in 1958 for trial on horn fly larvae and other dipterous livestock pests.

MISCELLANEOUS

Bubulcus ibis L.

Cattle egrets were sighted on the Islands of Kauai and Hawaii during the latter part of 1966 thus substantiating earlier reports in 1965. The present egret population on Oahu is estimated at 2000, an increase of 1000 over the previous year. Reliable reports at a piggery in Ewa indicate that the egrets are feeding on centipedes and mice and it is alleged that fly populations around the sties have been reduced considerably.

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