

Investigations on Biological Control of melastoma (*Melastoma malabathricum* L.)

N. L. H. KRAUSS

STATE DEPARTMENT OF AGRICULTURE, HONOLULU, HAWAII

(Submitted for publication December, 1964)

INTRODUCTION

Melastoma or Indian rhododendron, *Melastoma malabathricum* L. (family Melastomaceae), is a shrub up to 15 feet high, native to India and southeast Asia. It was introduced into the island of Kauai, Hawaii about 1916 as an ornamental, and subsequently escaped and became a serious pest. Another species, *M. decifidum* Roxburgh, has become established in the Mountain View area of the island of Hawaii where it and *M. malabathricum* are spreading.

Melastoma malabathricum is estimated by the Weed Branch, Hawaii Department of Agriculture, to occur on 8,000 acres on Kauai, of which 1,000 acres are of heavy infestation. *M. malabathricum* and *M. decifidum* are estimated to infest 30,500 acres on the island of Hawaii, of which 2,500 acres are heavily infested.

My investigations on *Melastoma* insects were carried on in various countries of southeast Asia and islands of the western Pacific. Several promising species were sent to Honolulu by air, and the propagation and testing in a quarantine insectary, and release of one approved species were carried on by Q. C. Chock, C. J. Davis, Harry Nakao, Mabel Chong, Nobuo Miyahira, and other members of the staff of the Entomology Branch, State Department of Agriculture. Among the persons who aided me in this project I would like to mention especially the late Santiago R. Capco, Entomologist, Bureau of Plant Industry, Department of Agriculture and Natural Resources, Manila, Philippines and Ahmad bin Yunus, Acting Senior Entomologist, Division of Agriculture, Ministry of Agriculture and Cooperatives, Kuala Lumpur, Malaysia. Insects were identified by the Entomology Research Division, U.S. Department of Agriculture; Commonwealth Institute of Entomology, London; D. T. Fullaway; D. Elmo Hardy; J. L. Gressitt; J. W. Beardsley; E. O. Essig; and L. J. Stannard. Fungi were named by Mycology Investigations, Crops Protection Research Branch, U.S. Department of Agriculture and the Commonwealth Mycological Institute, Kew.

INSECTS SENT TO HAWAII

In October 1957, larvae of the pyraustid moth *Bocchoris fatualis* (Lederer) were found rolling leaves of *Melastoma polyanthum* Blume in the hills above Paete, Laguna, Philippines. A shipment of the larvae was sent to Honolulu, and

after feeding tests on various species of economic plants were negative, this species was released on Kauai (Knudsen Gap, Koloa, Huleia, near Kipu, Puhī, Hukia Valley and Half Way Bridge) beginning in March 1958 and on the island of Hawaii (Ainako, Kaumana, Saddle Road and Panaewa Forest) beginning in April 1958. It was found established at Knudsen Gap, Kauai in April 1959 by Stephen Au, State Department of Agriculture Entomologist, but has not proved to be an effective control for *Melastoma*.

At present, three other species of Lepidoptera collected on *M. malabathricum* at Kuala Lumpur and Singapore, Malaysia in September-November 1964 are under study in the quarantine insectaries of the State Department of Agriculture at Honolulu and Kahului. They are *Bocchoris adipalis* Zeller (Pyraustidae): greenish larvae feeding on the leaves; *Agrotera basinotata* Hampson (Pyraustidae): the larvae feed on the leaves; *Selca brunella* Hampson (Arctiidae): the reddish-brown larvae feed on the leaves and fruits.

OTHER INSECTS ON MELASTOMA SPP.

The host is *M. malabathricum* unless otherwise noted.

THYSANOPTERA

Phlaeothripidae

Dolichothrips (*Dolichothrips*) sp. Mt. Lamlam, Guam, February, on young leaves of *M. mariannum* Naudin.

Probably *Dolichothrips* sp. Hills above Paete, Laguna, Philippines, Mar. 18, on young leaves of *M. polyanthum*.

Thripidae

Thrips sp. Sun-Moon Lake, Taiwan, May, on *Melastoma* sp. flowers. Nago, Okinawa, June, on *M. candidum* flowers. Kuala Lumpur, Malaysia, August, on flowers.

Thrips or *Taeniothrips* sp. of the complex including *Thrips florum* Schmutz and *Taeniothrips hawaiiensis* (Morgan). Hills above Paete, Laguna, Philippines, March 18, on *M. polyanthum* flowers.

HEMIPTERA

Miridae

Hyalopeplus vitripennis Stål. Kuala Lumpur, Malaysia, August, on leaves.

HOMOPTERA

Aphididae

Aphis gossypii Glover. Near Gampola, Ceylon, August; Paete, Laguna, Philippines, March 18, on *M. polyanthum* leaves; Taipei, Taiwan, May 18, on *M. candidum* leaf; Lami, Viti Levu, Fiji, February, on *Melastoma* sp. leaf.

Aphis sp. Singapore I., Malaysia, August, on leaves.

Cercopidae

Sp. ? Sha Tin, New Territories, Hong Kong, April, nymphs in spittle on branches of *M. sanguineum*.

Cicadellidae

Krisna sp. Peak area, Hong Kong I., May 7, on *M. candidum* leaf.

"*Tettigoniella*" sp. Kuala Lumpur, Malaysia, August, on leaves.

Coccoidea

Coccus hesperidum L. Paete, Laguna, Philippines, March, on *M. polyanthum* twig.

Coccus viridis (Green). Mt. Lamlam, Guam, February-March, on *M. mariannum* leaves.

Probably *Drosicha* sp. Sun-Moon Lake, Taiwan, May, on *Melastoma* sp. branch.

Icerya sp. Maeda, near Naha, Okinawa, June, on *M. candidum* leaf.

Phenacaspis injay Banks (tentative identification). Sampoloc, Rizal, Philippines, March, on *Melastoma* sp.

Pseudococcus (*Planococcus*) *dorospinosus* Ezzat and McConnel. Hong Kong Island, April, on *M. sanguineum* leaf.

Pseudococcus sp., seems close to *citriculus* Green but not identical. Hong Kong I., April on *M. sanguineum* leaf.

Pseudococcus sp., close to *P. comstocki* (Kuwana) but not identical. Sha Tin, N.T., Hong Kong, April, on *Metastoma* sp. stem.

Pseudococcus sp. Taipei, Taiwan, May 18, on *M. candidum* branch.

Pulvinaria psidii Maskell. Mt. Lamlam, Guam, February-March, on *M. mariannum* leaves. Singapore I., Malaysia, August, on leaves.

Rastrococcus sp. Kuala Lumpur, Malaysia, August, on leaves.

Fulgoroidea

Species of Derbidae. Paete, Laguna, Philippines, March, on *M. polyanthum* leaf.

Phylliana inclinata (Melichar). Hills above Paete, Laguna, Philippines, October, on *M. polyanthum* branch.

Pochazia antica Gray. Kuala Lumpur, Malaysia, August, on leaves.

Membracidae

Ebbul varius (Walker). Kuala Lumpur, Malaysia, August.

Gargara luconica (Fairmaire). Hills above Paete, Laguna, Philippines, October, on *M. polyanthum* branches.

Gargara sp. Kuala Lumpur, Malaysia, August.

Leptocentrus taurus (F.). Near Lumban, Laguna, Philippines, October, on branches of *M. polyanthum*; Paete, Laguna, Philippines, March, on branches of *M. polyanthum*. Singapore I., Malaysia, August, on branches; Kuala Lumpur, Malaysia, August.

Nilautama minutispina Funkhouser. Lutuk, Negri Sembilan, Malaysia, August.

Sipylus dilatatum (Walker). Kuala Lumpur, Malaysia, August.

Sipylus sp. Lutuk, N.S., Malaysia, August, on branch.

Tricentrus fairmairei (Stål). Paete, Laguna, Philippines, March, on branches of *M. polyanthum*.

Tricentrus sp. Kuala Lumpur, Malaysia, August. Singapore Island, Malaysia, August, on branch.

LEPIDOPTERA

Arctiidae

Species of Lithosiinae. Kuala Lumpur, Malaysia, August, moth reared from small hairy caterpillar boring in fruit.

Species of Lithosiinae. Sun-Moon Lake, Taiwan, May, moth reared from hairy caterpillar feeding on leaves of *M. candidum*.

Gelechiidae

Idiophantis sp. Kuala Lumpur, Malaysia, August, moths reared from smooth reddish caterpillars boring in green fruits.

Hyponomeutidae

Argyresthia leuculias Meyrick. Kuala Lumpur, Malaysia, October, ex fruits.

Lymantriidae

? species. Kuala Lumpur, Malaysia, August, larva feeding on flowers.

Noctuidae

Eublemma versicolor (Walker). Kuala Lumpur, Malaysia, September, larvae on plants.

Nola sp. Mt. Lamlam, Guam, February, hairy brown caterpillars feeding on leaves of *M. mariannum*.

? *Selepa* sp. Rangoon, Burma, February, larva feeding on leaves of *Melastoma* sp.

Psychidae

? species. Taipei, Taiwan, May and June, caterpillars feeding on leaves of *M. candidum* ?

Thyrididae

Dysodia rajah Boisduval. Hong Kong I., May, larva feeding on leaves of *M. sanguineum*.

Tortricidae

Archips micacaeana Meyrick. Kuala Lumpur, Malaysia, November, reared from larvae on plants.

COLEOPTERA

Chrysomelidae

Pagria sp. Hills above Paete, Laguna, P.I., October 10, on leaves of *M. polyanthum*, fed on leaves in the laboratory; peak area, Hong Kong I., May, on leaves of *M. sanguineum*, fed on leaves in the laboratory.

Phytorus lineolatus Weise. Mt. Lamlam, Guam, February, adults eating holes in leaves of *M. mariannum*.

Phytorus sp. near *lineolatus* Weise. Hills above Paete, Laguna, P.I., October 10, on leaves of *M. polyanthum*.

Curculionidae

Alcidodes sp. Kuala Lumpur, Malaysia, August, on young shoot.

Ceutorhynchus sp. Kuala Lumpur, Malaysia, August, in flowers.

Cryptorhynchus sp. Kuala Lumpur, Malaysia, August, adult found with snout in flower bud.

Rhynchites helleri Voss. Hills above Paete, Laguna, P.I., October 10, adults on *M. polyanthum* leaves; fed on leaves in the laboratory.

Tychinae, possibly *Imerodes* sp. Singapore I., Malaysia, August, in flowers.

Scarabaeidae

Anomala sp. Hsientien, Taiwan, May, adults feeding on flowers of *Melastoma* sp.

Popillia sp. Hsientien, Taiwan, May, adults feeding on flowers of *Melastoma* sp. Peak area, Hong Kong I., July, adults feeding on flowers of *M. candidum*.

Protaetia sp. Kuala Lumpur, Malaysia, August, on flowers.

HYMENOPTERA

Formicidae

Oecophylla smaragdina (F.) (tree ant or tailor ant). Port Dickson, Malaysia, August, in nests of leaves webbed with silk from larvae.

DIPTERA

Tephritidae

Dacus dorsalis Hendel. Kalutara, Ceylon, July, larvae in fruit; Colombo, Ceylon, August, pupae in fruit.

Dacus (Strumeta) pedestris (Bezzi). Kuala Lumpur and Singapore, Malaysia, August-November, larvae and pupae in fruits. Many larvae pupate in the fruits, and a black exudate of pulp and seeds forms on the outside of the fruit. The larvae are parasitized by *Opius incisi* Silvestri and *Opius* probably new species (Braconidae).

FUNGI AND PARASITIC PLANTS ON MELASTOMA SPP.

Cercospora melastomobia Yamamoto. Peak area, Hong Kong I., leafspot on *M. candidum*, April; leafspot on *M. sanguineum*, September.

Mukiodothis melastomata (Höhn.) Theiss. and Syd. Peak area, Hong Kong I., September, on leaf of *M. candidum*; Koya, Okinawa, June 6, on leaves of *M. candidum*.

Cassytha filiformis L. Lake Gardens, Kuala Lumpur, Malaysia, August 12, a parasitic plant twining over the *Melastoma* plants.