



Biological Control of *Miconia calvescens*: Natural Enemies from Costa Rica

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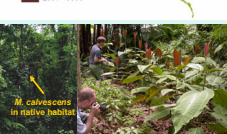


Proyecto Miconia

For the past three years entomologists at the University of Costa Rica have searched for insect enemies of *Miconia calvescens*, continuing work begun in the 1990s by the Hawaii Department of Agriculture. Although it overwhelms forest ecosystems in Tahiti and threatens to do the same in Hawaii, *Miconia calvescens* is very sparsely distributed in its native range, and its insect fauna is concomitantly rare. Despite these challenges, our team has discovered a variety of enemies with potential for biological control of this devastating weed. Two potential agents are being studied in detail and soon will be imported to Hawaii for quarantine testing. Additional agents await funding for detailed evaluation.



Costa Rica



Outplantings of *M. calvescens* (such as this plot on the UCR campus) facilitate observation and collection of insect agents under natural conditions.



Euselasia chryside (Lepidoptera: Lycaenidae: Riodininae)

Larvae of this butterfly eat miconia leaves. Clusters of eggs (65 on average) are laid on the underside of leaves. Larvae molt, move and feed together in groups throughout development. The life cycle requires approximately 1 month under laboratory conditions. Butterflies did not mate or lay eggs in small cages, but did lay eggs on large plants in large field cages and in a small forest at UCR. Although adult behavior remains poorly understood, we are now able to generate substantial numbers of eggs for quarantine studies in Hawaii. This species and two congeners also collected on *M. calvescens* appear to be very host-specific, probably attacking only a few species of *Miconia*. There are few lycaenids (and no riodinines) in Hawaii, so this species may possibly escape parasites that limit impacts of other lepidopteran biocontrol agents.



Dicledophlebia sp. (Homoptera: Psyllidae: Psurocephalinae)

This potential biocontrol agent is new to science (manuscript in preparation). These small orange-red psyllids infest young leaves and flower buds, sucking plant fluid. Their presence is readily detected by white threads of wax they excrete as nymphs. This species is easy to rear on potted host plants in the greenhouse. Development of eggs and five nymphal instars to adults requires about 4 weeks in total. Although field populations are typically small, under laboratory conditions infestation can severely stunt miconia plants. This species and its close relatives appear to be highly specific, each attacking a few closely related melastomes. Its susceptibility to parasites and predators of psyllids already in Hawaii remains to be evaluated.

POTENTIAL BIOCONTROL AGENTS Feeding on *Miconia calvescens*

HIGH PRIORITY (merit further evaluation of biology and impact)

TAXON	SPECIES	ATTACKS
Psyllidae	<i>Dicledophlebia</i> sp.	Shoots/inflorescences
Lycaenidae	<i>Euselasia chryside</i>	Leaves
Argidae	unidentified sawfly	Leaves
Cecidomyiidae	unidentified midge	Flowers
Coleophoridae	<i>Mompha</i> sp.	Flowers
Lycaenidae	<i>Thecla opisena</i>	Fruits
Lepidoptera	unidentified borer	Fruits
Curculionidae	<i>Anthonomus</i> sp.	Fruits
	<i>Pedinus hallecoides</i>	Fruits
	<i>Cryptorhynchus melastomae</i>	Stem
	gall-forming nematodes	Leaves/shoots

LOW PRIORITY (less promising impact / more difficult to evaluate)

Cerambycidae	<i>Platyarthron chilense</i>	Stem
	unidentified borer	Stem
Chrysomelidae	<i>Margaritis</i> sp.	Leaves
	<i>Perclopsis</i> sp.	Leaves
Curculionidae	<i>Typophorus variabilis</i>	Leaves
	<i>Macrosiphus bicolor</i>	Stem
	species of <i>Dorosiom</i>	Leaves?
	<i>Pentecostis</i> sp.	Leaves
Arctiidae	<i>Mictis</i> sp.	Leaves
Gracillariidae	unidentified leaf miner	Leaves
Lycaenidae	<i>Euselasia aurantia</i>	Leaves
	<i>Euselasia bellina</i>	Leaves
	<i>Theclia maera</i>	Leaves
	<i>Ancyluris inca</i>	Leaves
	<i>Anteros formosus</i>	Leaves
	<i>Symmachia bicolor</i>	Leaves
Noctuidae	<i>Antiblemma</i> sp.	Leaves
	Species of <i>Plusiinae</i>	Leaves
Notodontidae	unidentified species	Leaves
	<i>Meraglia</i> sp.	Leaves
Decapodidae	2 unidentified species	Leaves
Phenorthidae	unidentified species	Leaves?

REJECTED (generalist, low impact, rare, etc.)

Orthoptera	unidentified spp.	Leaves
Cicadellidae	unidentified spp.	Sap
Cicadellidae	<i>Cicadelliptera</i> sp.	Xylem
Membracidae	<i>Microrhagus</i> sp.	Phloem
Pseudococcidae	unidentified spp.	Phloem
Chrysomelidae	<i>Metricaneta</i> sp.	Leaves
Xucosellidae	<i>Xucosella</i> sp.	Leaves
Curculionidae	<i>Exophthalmus jelskianus</i> cf.	Leaves
Apanteles	<i>Zanola impuncta</i>	Leaves
Apanteles	species of <i>Cheloniche</i>	Leaves
Crambidae	unidentified spp.	Leaves
Gecomyridae	1 spp.	Leaves
Cycadidae	<i>Cycadella</i> sp.	Leaves
Limonacidae	<i>Talima aurora</i>	Leaves
	<i>Euclea zygia</i>	Leaves
	<i>Paracaulimnobia</i>	Leaves
	<i>Epiperone patula</i>	Leaves
	<i>Natania</i> sp.	Leaves
	<i>Rhynchidius</i>	Leaves
Notodontidae	unidentified species	Leaves
Psyllidae	<i>Hyalista continua</i>	Leaves
Saturniidae		Leaves



Stem boring weevil
Cryptorhynchus melastomae



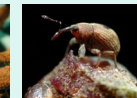
Leaf rasping sawfly
(unidentified argid)



Leaf gall associated with
unidentified nematodes



Flower feeding butterfly
Thecla opisena



Fruit feeding weevil
Anthonomus sp.

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