Miconia may have predator

Kia'i Moku
By Lissa Strohecker

Miconia's reputation for invasiveness in Hawaii is well deserved. When unchecked, the fast-growing tree with huge leaves smothers all other plants, transforming forests and watersheds into deserts devoid of biodiversity, filled only with purple and green miconia. But travel to Brazil, miconia's native home, and ask the locals where to find this notorious pest and they'll give you a puzzled look. Plants in the genus miconia, of which there are many species, are not extraordinary in Brazil, and they can be difficult to find, they don't even have a common name. A local botanist might know of them, but you'll spend hours searching, as Robert Barreto, Brazilian researcher and professor, knows well - sometimes he finds a single, shabby-looking specimen alongside a stream.

In Brazil, diseases, insects and fungi hammer miconia to scarcity. These pests evolved specifically to prey on miconia, so they aren't found in Hawaii. By introducing these naturally occurring miconia predators to Hawaii, scientists hope to take the superinvader down a notch or two. A tiny nematode only recently discovered, Ditylenchus galleaformans, presents great promise as a way to control miconia and miconia's cousin, the widespread clidemia.

Clidemia overruns many of Hawaii's forests. Everyone working in the field of resource management, from foresters and national park service rangers to watershed crews, struggle with clidemia. Impossible to stop with current methods, waves of clidemia have spread throughout the state. The tangled shrub hinders work in wilderness areas.

"Right now, clidemia is keeping us from getting to the miconia," explains Maui Invasive Species Committee field crew leader Mike Ade. If the nematode is introduced, the clidemia tangles will act as a nematode freeway, bringing the nematode to dense miconia infestations as well as scattered, satellite populations.

"I'm really excited about this. There's a lot of potential," explained Robert Barreto.

Tracy Johnson, a researcher with the U.S. Forest Service in Hilo agrees - "This nematode is awesome, we can't pass it up!"

When a miconia plant is attacked by the nematode, the leaves begin to shrivel and curl up as the nematode lays its eggs inside the leaf tissue. Each gall releases a warehouse full of nematodes that spread to new leaves, swimming upwards when the leaves are moist, or as leaves fall from the plant. The galls survive for several months on dead plant material, waiting until conditions are right to spread.

A natural predator introduced for invasive species control undergoes intense scrutiny beforehand. The organism must not have any unintended consequences, either on other plants or animals. In Brazil, Barreto has done preliminary research to see what types of plants the nematode can survive on; he found that it only lives on species of miconia and clidemia. But before the nematode can be introduced to Hawaii, more rigorous testing will be conducted to see if it affects plants specific to Hawaii.

There are several obstacles to releasing the nematode in Hawaii, beginning with the difficulty of raising it in captivity. In Brazil, Barreto was able to let it breed freely outside, in the "miconia garden" on the university campus where he works because the nematode and miconia species are native to the area. But in Hawaii, both miconia and the nematode have to be isolated from the environment. They must be tested in the Hawaii Department of Agriculture's research facility on Oahu. The level of containment at this facility is even greater than that of a building designed to study human disease.

Above:Miconia in Brazil takes a beating from diseases, insects and fungi. They can be difficult to find in the wild. A nematode that attacks miconia shows promise for use in Hawaii, where miconia grows freely.ROBERT BARRETO photo.

But the building's aging climate control equipment, while still functional, cannot reproduce the nematodes' ideal climate, as researchers learned in 2006. They struggled to raise captive nematodes. Plans are currently under way to solve these problems and bring more nematodes to the facility for more research.

Miconia is a problem throughout the state. On Oahu and Kauai, the populations are small enough that attempts at eradication stand a chance of success, but on Maui and the Big Island miconia is here to stay. Efforts to control miconia have been in full swing since 1996, and we need a helping hand, or microscopic roundworm, as the case may be, to keep this superinvader in check.

Until there is an effective natural predator for miconia, report any miconia plants on Maui to the Maui Invasive Species Committee by calling 573-6472.

■ *Lissa Fox Strohecker is the public relations and education specialist for the Maui Invasive Species Committee. "Kia'i Moku,"(Guarding the Island) is prepared by the Maui Invasive Species Committee to provide information on protecting the island from invasive plants and animals that can threaten the island's environment, economy and quality of life. For more information visit www.mauiisc.org*

As published in the Maui News, December 11th, 2011.