



The 1.5-mm erythrina gall wasp (1) lays its eggs in the leaves of the native wiliwili, prompting the tree to create galls, or tumor-like balls, around the nests (2 and 3). (4) A flowering native wiliwili prior to the arrival of the gall wasp. (5) A native wiliwili left bare after being attacked by gall wasps. Photos: (1) Michelle Tremblay, CTAHR, (2) Forest Starr (3) Keahi Bustamente (4) (5) Art Medeiros

Whither the wiliwili?

Will a tiny wasp spell extinction for one of Hawai'i's native trees?

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Some people believe that we may now be witnessing the sudden extinction of the native wiliwili tree, due to an alien species of wasp that was just discovered in the islands last April.

The native wiliwili, a fairly common species of the erythrina genus, had a relatively healthy population throughout Hawai'i not even a year ago. But now the tiny wasp, commonly called the erythrina gall wasp, is threatening to wipe out the native species, along with the related Indian coral tree and "tall wiliwili," popularly used as a windbreak.

What's particularly unsettling is the speed of the destruction caused by the wasp, which was first identified as a distinct species in 2004. Just 1.5 millimeters long, it lays its eggs in the leaves

of certain erythrina species, and in defense, the tree forms a gall – a thick, tumor-like knot – around the nest. After a short time, the infestation gets so severe that most, if not all, of the tree's green tissue falls off, stunting the growth of the plant, and in the most extreme cases, killing it.

The wasp was originally found on O'ahu, where it has since attacked nearly every native wiliwili tree. Within six months, it had spread to all the islands. Now some fear the worst for the native wiliwili, an endemic species whose buoyant wood was used traditionally for surfboards and canoe outriggers.

Art Medeiros, a U.S. Geological Survey research biologist, said that the wasp has already hit about 60 to 70 percent of the native wiliwili trees on Maui, including those in one of the state's most extensive wiliwili

forests, the Pu'u o Kali Preserve, located on the southern slope of Haleakalā. In 2005, the wiliwili on the preserve had one of its best flowering years in recent memory, but Medeiros said that some people are now saying it may have been the last.

The prospect of losing any native species is disheartening, but for the wasp to potentially kill off the entire population of native wiliwili – a keystone species of the native low dryland forest, one of Hawai'i's rarest habitats – is especially worrisome.

"We've always had alien weeds and insects that posed problems to our native forests," Medeiros said. "But we've never had something that specifically attacks a keystone species so intensely. This is unprecedented in Hawai'i. If the wiliwili goes down, the whole [low dryland] ecosystem falls."

Several efforts are under way to save the native wiliwili. Across the state, scientists and volunteers are gathering tens of thousands of wiliwili seeds to preserve the genetic diversity of the species. At the Waimea Audubon Center,

home to one of the largest collections of erythrina species in the world, staff has begun propagating the various trees from seeds and cuttings in quarantined mesh enclosures.

Some people are turning to several systemic insecticides that can either be injected into the soil around the tree or into the tree itself. Tommy Boyd, the head groundskeeper for Bishop Museum, said that the Amy B.H. Greenwell Ethnobotanical Garden on Hawai'i island, which the museum runs, has had some success with the chemical, and that he's also planning to start using it soon.

But some experts complain that the insecticide is expensive and slow to act. "It's unrealistic to expect to use the insecticide forever," said the U.S.G.S.'s Medeiros, who helped apply the chemical to some 800 trees on Maui.

The most promising gall wasp defense may come from the introduction of another alien wasp. An entomologist from the state Department of Agriculture's biological control section took

a two-month trip to East Africa, where the erythrina gall wasp may have originated, to search for its natural enemy. The scientist found a wasp from the eurytoma family in Tanzania that feeds on the larvae and pupae of the erythrina gall wasp.

The eurytoma wasp is undergoing extensive lab tests to make sure it doesn't pose a threat to any other species, especially other native insects that cause plants to create galls. "We know there are concerns about introducing another alien species to the state," said Ken Teramoto, the head of the state's biological control section. "So we're trying to be very careful." He said that he is encouraged by the results of the testing, but added that it could take a year or more before the eurytoma wasp gets the green light.

Hopefully, the wiliwili can last that long. "The future of the native wiliwili is not looking good if something isn't done," said Maya LeGrande, a botanist who specializes in the species. "We're just trying to be optimistic."