

SAVE THE 'ŌHI'A *SAVE THE BIRDS*

WORKING TOGETHER TO PRESERVE NATIVE BEAUTIES

WORDS MARY TROY JOHNSTON





Hawaiians have always revered the ‘ōhi‘a lehua for its exquisite beauty. The beloved tree is a namesake for two lovers, who according to one legend, suffered the wrath of the volcano goddess, Pele. She desired the handsome youth, ‘Ōhi‘a. He turned down her affections, so much in love he was with the beautiful Lehua. Spurned (and fired up more than usual), Pele turned him into a twisted tree. The other gods took pity on Lehua and turned her into a flower where she resides to this day with ‘Ōhi‘a as the red and gold-tipped blossom that adorns his tree. It is customary not to pick the lehua blossom when one first enters the forest because it will surely rain, the tears of Lehua upon becoming separated from her lover.

‘Ōhi‘a lehua belongs to Hawai‘i in a very real sense. It is endemic to Hawai‘i, meaning the tree can only be found here, and its nectar feeds a number of endemic birds, who live and die only in the Hawaiian rainforests. It is no wonder Hawaiians feel a deep cultural attachment to the tree that in earlier times spanned the island, omnipresent *mauka* to *makai* (from the mountains to the shore). *Hula kumu* (teacher of hula) Kēhaulani Kekua on Kaua‘i explains the deep identification with the ‘ōhi‘a among Hawaiians to this day. “In the customary beliefs and practices of traditional hula in our *bālau* (hula school), the ‘ōhi‘a lehua is one of many plants that are revered as *kinolau*, or nature body forms of Hawaiian deities. *Kino* in Hawaiian means, *body*, and *lau* means *many*.”

The tree is significant in nature because it qualifies as a keystone species; that is to say, the integrity of the forest ecosystem depends on the tree. As the foundational tree of Hawaiian forests, the ‘ōhi‘a is estimated to comprise more than 80% of tree growth in the native forests of the islands. Consequently, the very survival of the forest ecosystem depends on it. Besides just sheer presence, the ‘ōhi‘a also has a creative role to play in sustaining the forest. The trees



form so great a part of the upper canopy, which is responsible for gathering the rain and directing it downward to the forest floor, where it gets filtered into deep aquifers, streams and captured in the rich fauna of ferns, lichens, and mosses. The leaves of certain species of ‘ōhi‘a are slightly cupped for this water collection function. If the water were not “captured” and if the ground were dried out, debris-carrying floods would go rushing down the mountainside and end up on our beaches, polluting our coral reefs.

Outreach specialist Kim Rogers for the Kaua‘i Invasive Species Committee (KISC) points out, “Some trees in wet environments like the Alaka‘i grow almost like ground cover or small bushes. Young leaves often have tiny hair-like matter that are great at collecting moisture from the air.” According to cultural practitioner Kēhaulani Kekua, “oral traditions that have been passed down through countless generations” recognized that the ‘ōhi‘a “draws in moisture from the heavens/atmosphere by way of mists and rain clouds.”

The integrity of rainforests in Hawai‘i has been known to be suffering. A team of scientists conducted research on the Big Island in 2008 and discovered that invasive species were taking a toll on the ‘ōhi‘a population there. Some of the invasives had grown taller than the native trees and denied the latter sunlight. ‘Ōhi‘a were discovered to be in retreat. Concern became heightened when Rapid ‘Ōhi‘a Death (ROD) was named and identified on the Big Island in 2014 and went on to ravage hundreds of thousands of trees.

In May 2018, the first identification of the disease was made by a botanist in the Moloa‘a State Forest Reserve on Kaua‘i. As a result, foresters used helicopters and drones to try to determine the scope of the threat. Two other locations infected by ROD, respectively on the North and South shores on the mountainside were identified and, lately, a site was confirmed behind Anahola Mountain. So far, the locations are not in heavily trafficked areas, a positive in terms of prevention. The off-the-track location lessens the chance of hikers spreading the fungus by way of their boots. Kaua‘i also benefits from the enormous efforts and extensive networks of scientists, naturalists, cultural practitioners, and concerned citizens that mobilized action after ROD was discovered on the Big Island.

Both species of fungus that cause ‘ōhi‘a disease have been identified on Kaua‘i. The more virulent species, *Ceratocystis lukuobia* was the most destructive on the Big Island and has only been identified in one location. *Ceratocystis buliobia*, is slower acting and is present in three locations. Still, Kim emphasizes it is a deadly disease. She explains, “It may take months to a year to kill. But that’s still pretty rapid for a tree that can live to be 1,000



years of age.” None of those involved in the campaign to save the ‘ōhi‘a plan to rest even though the disease was discovered relatively early on Kaua‘i.

Stepped-up seed banking of ‘ōhi‘a seeds throughout Hawai‘i is among the efforts to prepare for the future. On Kaua‘i, the National Tropical Botanical Garden is a sponsor of collecting and conserving the seeds of the different varieties and species. Dustin Wolkis, who manages the seed bank and laboratory there, emphasizes how vital the conversation stage is to the survival of the seed. Dustin says, “thankfully, ‘ōhi‘a has seeds that are orthodox,” meaning they can tolerate the conditions requisite for “long-term storage.” Moisture has to be removed from the seeds (desiccation), and storage takes place at sub-freezing temperatures. He also observes that “seeds are relatively small” which means “storage space is less of an issue.” The lab still faced its challenges. The process of cleaning seeds, he described, was causing a “huge bottleneck in the lab.”

The seed itself is contained in a capsule, known as a “dehiscent” capsule. Nature designed it to break open when it is still attached to the mother tree in order to yield seed. A way needed to be found to separate the seed efficiently from the capsule without harming the seeds. The team found they were able to adapt “a consumer grade food processor by rubberizing the blade.” As a result, the team “can now place entire seed lots into the food processor which encourages seed dispersal from the capsules” and permits them “to clean hundreds of thousands of seeds in minutes.”

Dustin has actually tested the seeds for survivability and has found promising results. He expects “viability to remain above 50% of initial of maximum germination (i.e. half life) for timescales of decades to centuries.” The dedicated plant conservationist is able to find optimism in the “really talented people from around the world all working on different aspects of combating and understanding ROD.”

It is important to remember that the ongoing efforts are not only to save the ‘ōhi‘a, but to save an ecosystem. The forest birds are of special concern because of the love for their song among islanders. According to Jim Denny, author of *A Photographic Guide to the Birds of Hawai‘i* (University of Hawaiian Press, 2011), the bird most affected will be the ‘*apapane* as its major food source is the nectar of the lehua. The intense red feathers of the ‘*apapane*, one variety of the Hawaiian honeycreeper, were used to adorn the garments of royals, for instance, to create the *mahiōle* (feathered helmet). The bird expert states, “Three other endemic honeycreepers feed on the lehua as well—‘*i‘iwi*, ‘*anianiau*, and ‘*amakihi*.”

If the keystone tree species dies out, the future is bleak for





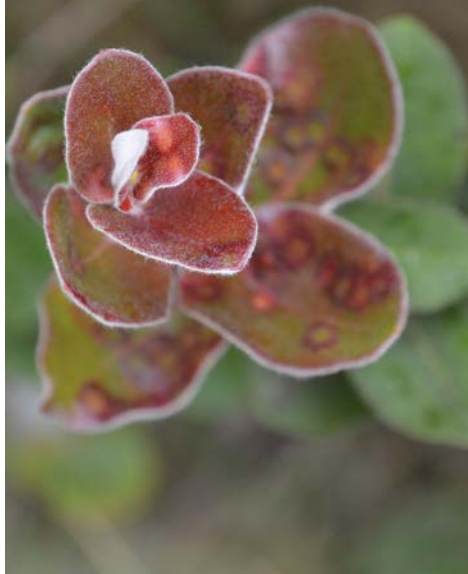


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these birds as they depend on the ecosystem anchored by the ‘ōhi‘a. “If the ROD fungus takes hold in the Alaka‘i, I fear it will be a nail in the coffin for these birds,” Jim laments, after having described how threats, “introduced rats, avian malaria, avian pox, and invasive plants...” have already seriously reduced the numbers of native birds. “In my lifetime, it has been depressing for me to hear the cacophony of bird song reduced to nothing but the sound of ‘wind in the trees and water dripping off the leaves,’” Jim concludes echoing the words Andrew John Berger wrote in *Hawaiian Birdlife* (University of Hawaii Press, 1972).

We discover the sound of the wind when it rattles the trees. Future generations deserve to make that discovery. Losing the forests would be tantamount to turning back the clock millions and millions of years, the period of time it took to produce these incredible feats of nature.

How can we help with ROD prevention on Kaua‘i?

KISC makes the following recommendations:

1. Avoid injuring ‘ōhi‘a, because wounds leave the tree open to infection.
2. Clean your shoes and gear before and after entering the forest. This is a two-step process: 1. Remove all soil/debris from boots, gear, and tools. 2. Spray items with 70% rubbing alcohol.
3. Wash vehicles (cars, trucks, motorcycles, bicycles) to remove mud.
4. Don’t move ‘ōhi‘a. (Fungal spores can remain alive even in dead wood.)
5. Report ‘ōhi‘a with ROD-like symptoms (the sudden browning of leaves) to Kaua‘i Invasive Species Committee.

For more information, visit cms.ctahr.hawaii.edu/rod/ or call (808)821-1490, or email saveohia@hawaii.edu.