Northwest Horticultural Society

Horticulturally Yours

Fortnightly Plant Column from DANIEL SPARLER

Metrosideros: Life & Death on the Lava Flow

He aliʻi ka ʻāina, he kauā ke kanaka
(Land is the chief and people are its servants)
—Hawaiian proverb

Dear NHS Members and Friends,

In the last chapter of Horticulturally Yours we praised two species of *Illicium*, one from Mexico, the other from China. For this first springtime segment, we have hopped halfway back across the Pacific to investigate the fate of Hawai'i's most iconic and essential tree, ***Metrosideros polymorpha***[1], known locally as ʻōhiʻa lehua[2]. It is the keystone species in Hawai'i's wooded landscapes: Comprising the largest portion of wet-forest canopy, ʻōhiʻa also plays a vital role in soil development and ecological succession on lava fields. Yet, although this *Metrosideros* seems in some ways indestructible, it is increasingly imperiled.

I first focused on ʻōhiʻa and its incarnadine blossoms about 30 years ago during my initial visit to the Hawai'i Volcanoes National Park, where I marveled at its ability to grow straight out of rocky fissures that support little other plant life. ʻŌhiʻa is the pioneering arboreal colonizer of recent lava flows, germinating and flourishing just a few years after the emergent magma has cooled. Every part of this astonishingly variable plant is fascinating, from its handsome, grizzled bark to its leathery, oval leaves (which may be woolly or smooth) to the tightly clustered glaucous spheres of flower buds. However, it is the fiery-red shaving-brush blossoms, produced throughout the year, that first catch the eye; it's not surprising that ʻōhiʻa blossoms, often called simply "lehua," are the official flower of the Big Island of Hawai'i.

It's hard to overstate the ecological importance of the emblematic ʻōhiʻa, which is endemic to Hawai'i, occurring naturally nowhere else. By far the state's most abundant native tree, ʻōhiʻa old-growth forests are vital in protecting watersheds and providing habitat –both food and nesting sites– for several endangered avian and invertebrate species. Growing from sea level up to 8,000 feet, *Metrosideros polymorpha* thrives in bogs, rain forests, arid shrublands, lava fields and windswept slopes alike. In form, it takes on shapes as diverse as prostrate natural bonsai to towering 100-foot behemoths. Although most commonly cardinal-red in color, blossoms on other varieties of *M. polymorpha* (eight are recognized) may be cream, yellow, orange or pink in hue.[3]

In terms of human culture, ʻōhiʻa is prized above all other trees by native Hawaiians, its enduring wood employed to make musical instruments, religious icons, and weapons; its leaves, buds and floral stamens used medicinally; its blossoms –ubiquitous in traditional stories, songs and chants– a key component in lei making. ʻŌhiʻa lehua is also instrumental in lore surrounding Pele, the goddess of volcanoes and fire, "she who shapes the sacred land".

In light of these dichotomies and polarities, it's somehow fitting (if no less disturbing) that *M. polymorpha* is currently facing a distinctly 21st century challenge. About 10 years ago groves of ōhiʻa, some centuries old, began dying in alarming numbers in the Puna District south of Hilo. In 2014 the culprit was identified as a pathogenic fungus in the genus *Ceratocystis*.[4] The fatal disease, dubbed Rapid ʻŌhiʻa Death (ROD), has since spread all over the Big Island as well as to Kauaʻi, and isolated examples have popped up on Oʻahu and Maui.

Subsequent research revealed that ROD is caused by two species of *Ceratocystis*, previously unknown to science, that appeared at the same time. It fell to Dr. Lisa Keith, plant pathologist at USDA Agricultural Research Service labs in Hilo, where the new fungi were identified, to name the species. She consulted with indigenous experts in the Hawaiian language, who recommended the specific epithets, *C. huliohia* ("changes the nature of ʻōhiʻa") and *C. lukuohia* ("destroyer of ʻōhiʻa"). The former causes cankers that weaken and eventually kill trees, the latter –much more aggressive– causes systemic wilt and rapid death. This marks the first time Hawaiian-language terms have been employed to name plant pathogens.

Is this new blight in some part due to excessive and abusive human intervention in the islands' ecosystem? Is it exacerbated by climate change? State and national research scientists are devoting considerable effort and expense to answer these questions and search for solutions. In the meantime, let's each do our part to tread lightly on the land. Madame Pele will be pleased.

Horticulturally yours,
Daniel

p.s. Want to know more? Watch the triple Emmy Award-winning 2019 documentary "Saving Ohia: Hawaii's Sacred Tree". It's free to view on YouTube.

Notes:

1) *Metrosideros*, named by inveterate botanical explorer Joseph Banks in 1788, derives from the Greek *metra* ("heartwood") and *sideron* ("iron"), an acknowledgment of the superb strength of its wood. The nearly 60 species of *Metrosideros* are found mainly on Pacific Islands, from New Caledonia and New Zealand to Hawaii.

2) Pronounced "oh-**HEE**-ah lay-**HOO**-ah".

3) French botanist Charles Gaudichaud-Beaupré selected the spot-on species name *polymorpha*, meaning "many shapes or forms" in 1830.

4) Other *Ceratocystis* species have long been known to attack food crops such as cacao, mango, pineapple, and sweet potatoes.