Rust ruins rose apple; guardians fear for ohia

Kia‘i Moku
By Lloyd Loope

Other strains pose threat to forest, watershed, more.

A friend from the Kaupakalua area emailed me in February 2006, asking: “All the new growth on the rose apple trees is curling up and drying out. When the shoots are dry, they are covered by a yellowish powder. What is causing this?”

Sixteen months later, the 30-ft rose apple trees in front of his house were dead, despite repeated efforts by the trees to produce new leaves. As it turned out, this condition was soon to be seen throughout much of windward Maui.

The yellowish powder my friend had described was spores of the rust fungus (Puccinia psidii), a newly arrived non-native plant pathogen that had been first noticed on an ohia sapling in an Oahu nursery in April 2005. The rust had reached Maui by August of that year and quickly spread statewide.

In spite of its often lethal effects on rose apple, the rust has had only minor effects on ohia to date. Most rust fungi have a very narrow range of “host” species. This rust is unusual both for having a broad host range within the myrtle family and for the intensity of its damage to susceptible young growth. Hawaii and Florida are the only two U.S. states with native species in the myrtle family.

Scientists with the Hawaii Department of Agriculture (HDOA) promptly identified the pathogen and named it “ohia rust” on their pest advisory, recognizing the potential threat to ohia (*Metrosideros polymorpha*), our overwhelmingly important endemic forest tree in Hawaiian nature and culture.

The rust thrives in Hawaii’s environment and gives every indication of posing high risk to all native (2 genera, 7 species) and non-native (27 genera, 211 species) Myrtaceae in Hawaii.

But by far the most serious concern is for ohia, the species that comprises 80% of the native forest on all major Hawaiian islands, providing stable watersheds and essential habitat for most Hawaiian forest birds and plants.

In hindsight, the rust probably arrived on infected decorative foliage from the mainland, most likely California, the source of most of Hawaii’s imported juvenile eucalyptus and myrtle foliage. In 2006-07, Maui’s HDOA inspectors repeatedly intercepted rust-infected myrtle shipped from several California counties.

The rust can be seen on ohia (photo above by Rob Anderson) and rose apple (left, photo provided by Forest and Kim Starr).

Ohia rust was first described scientifically on the host common guava in its native Brazil in 1884 and became notorious for its host jump to non-native eucalyptus when it caused substantial economic damage to large Brazilian timber plantations in the 1970s.

This rust got a foothold in the U.S. in Florida in 1977. Since the rust was already established in the U.S., the federal Department of Agriculture (USDA) has considered it a non-actionable, non-reportable pest nationally. Scientists believe repeated introductions of the pathogen from outside Florida have increased the genetic variety of the rust, making increasing numbers of species vulnerable to infection in that state over three decades.

So far, Hawaii’s native ohia has been affected only lightly, while rose apple has been decimated.

The strain we have in Hawaii is apparently genetically non-variable and unable to evolve; however, the potential for introducing new, more variable genetic strains of this little-studied rust is a real risk, especially since other strains have been reported, and there are likely very many more.

A number of internet sites indicate that there is geographic reshuffling of flowers and foliage among the far-flung firms in the trade, especially for bouquet-making. Since ohia rust is a non-regulated pest in the U.S., foliage and flowers of the myrtle family can move freely into the U.S. and from state to state throughout the country. Rust spores can survive for 2-3 months, allowing ample time for reshuffling followed by live shipment to Hawaii.

In August 20007, Hawaii’s Board of Agriculture recognized the huge threat to Hawaii’s one million acres of ohia forests and to Hawaii’s watersheds and unique biodiversity. The Board unanimously approved a 12-month interim rule banning importation of plants in the myrtle family from “infested areas,” specified as South America, Florida, and California. However, the interim rule has not been made permanent by HDOA.

Enforcement of stringent Hawaii quarantine regulations would seem to provide the only effective means of protecting our ohia forest. If we lose ohia, we lose our forest.

For more information see the website at www.hear.org/species/puccinia_psidii/

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As submitted to The Maui News. Published December 14, 2008. Page C7.