Not GONE, *Not* FORGOTTEN

THE BITTERSWEET STORY OF SANDALWOOD IN HAWAII

BY JON LETMAN • PHOTOS BY FOREST & KIM STARR

Imagine the Hawaiian islands forested with a tree that could be used for firewood, waterproofing and scenting clothing, treating skin ailments, making musical instruments, tools, perfume and as a commercial crop. Imagine closely related species containing an oil so valuable that governments would prohibit its free trade and an active mafia would arise to profit from smuggling the trees (and trunks), even if it meant the taking of life to do so.

From Saudi Arabia to India, China, Australia and across the Pacific to Hawaii and beyond, the same tree would be coveted for this oil and fragrance, making it one of the most celebrated trees known to man. That tree, still found in the forests of Hawaii, is known in Hawaiian as `iliahi—sandalwood.

Most often associated with the Indian species Santalum album, sandalwood is believed to have originated not on the subcontinent but in Australia. Fifteen species of Santalum (and as many varieties) have been dispersed across Australia to the mesic forests of Indonesia, to South India's hot, dry Deccan Plateau and across the Pacific as far north as Japan's Ogasawara Islands and as far east as Juan Fernandez Islands (600 miles west of Chile).

According to Danica Harbaugh, Ph.D., visiting scientist at the Smithsonian National Museum of Natural History, Hawaii's four native species—Santalum freycinetianum, S. ellipticum, S. paniculatum and S. haleakalae—were most likely carried to the islands as early as 1.5 million years ago by migrating birds which ate the fleshy fruits or by "rafting" across the ocean in masses of floating botanical debris.

Since 2002, Harbaugh's sandalwood research has taken her to Australia, Vanuatu, Fiji and to HawaiI, which she calls a "center for sandalwood diversity."

Harbaugh chose to study sandalwood for her doctoral dissertation because of the tree's cultural, economic and conservation value.

She explained that sandalwood oil (found in greatest concentrations in the heartwood of larger, older trees) contains compounds called santalols which give the oil its distinctive fragrance. That smell, so irresistible to humans, acts as a repellant against insects.

The ancients knew this, Harbaugh says, referring to the inclination for people to select sandalwood for their most prized carvings, statues, god-images and temples.

Early Hawaiians also knew sandalwood oil had medicinal properties and used the grated wood as an anti-fungal/anti-microbial treatment of dermatological and urogenital diseases.

Despite the misconception that sandalwood no longer grows in Hawaii, `iliahi is still found, albeit in significantly reduced numbers, on all the main islands including Kaho`olawe, where it was reintroduced in the 1990s.

The reason for the dramatic decrease in sandalwood trees in the Hawaiian forests is that, as in India, where in 1792 the Sultan of Mysore declared sandalwood a "royal tree," so in Hawaii was `iliahi a favored by royalty as a source of income.

It was during the reign of Kamehameha the Great in the early 1790s that American traders restocking supplies in Hawaii en route from the Pacific Northwest to China observed sandalwood growing in Hawaii and saw its potential as a source of great wealth.

Fueled by a hunger for foreign goods ranging from ships and cannons to mirrors and leather, Kamehameha and lower chiefs ordered the maka`ainana (commoners) into the forests to strip as much `iliahi as they could.

Well-documented tales tell of the Hawaiian forests being denuded of large `iliahi trees between 1790 and 1840 when Hawaii was known to the Chinese, the primary buyers of sandalwood, as Tan Heung Shan or "sandalwood mountains."

Forced to neglect their fishing and crops to toil in the mountains, the maka`ainana perished in horrific conditions as the wood they gathered under duress was sold with a zeal usually reserved for gold and diamonds.

One visitor to Kaua`i in 1830 wrote he grieved for the Hawaiians collecting sandalwood. In his words, "they are often driven by hunger to eat wild and bitter herbs, moss, etc. And though the weather is so cold on the hills… I frequently see men with no clothing except the maro [loincloth]."

By 1840 almost all large stands of accessible sandalwood had been stripped and a kapu was place on the remaining trees. There was an attempt to substitute a native "false sandalwood" (naio), but this wood, which is not in the sandalwood family, was never accepted by the Chinese.

From both a human and ecological standpoint, the sandalwood trade of the early 19th century was devastating.

J. B. Friday, extension forester for the College of Tropical Agriculture and Human Resources (CTAHR) at the University of HawaiI, calls the 19th century Hawaiian sandalwood trade "the first big boom and bust after Western contact."

"There is still plenty of sandalwood in the forests," Friday says, "but certainly it is not what it once was. The huge trees are gone and that is a loss."

Yet Friday and others see potential for sandalwood to make a comeback in Hawaii, either as part of a native forest restoration or grown as a sustainable crop. Along with koa and kou, Friday says that `iliahi is one of the few native trees that could be grown for economic harvest. But to do so, Friday says, a farmer would need to know how long it would take to develop a heartwood from which oil could be extracted. To date, there have been no such successful large-scale commercial plantings in Hawaii.

One Big Island grower who asked to remain anonymous says he knows where Indian sandalwood (S. album) is being grown on O`ahu, but refused to disclose the location. According to this source, one acre with 200 mature trees would have a market value of up to $2 million (about $10,000 per tree).

He sees sandalwood as a "phenomenal potential crop," pointing to successful efforts in Australia, particularly in the Kununurra region of northwest Australia.

Besides concerns about poaching, another consideration for growers is that the trees are hemiparasitic (half-parasitic) and grow best alongside other plants at differing stages of growth.

Marty Fernandes, horticulturist at Na `Aina Kai Garden on Kaua`i's North Shore, explains that after receiving seeds of S. album from the monks at Kaua`i's Hindu Monastery, the garden successfully grew seedlings that were transplanted into the field.

Fernandes says the trees grew slowly but well, producing seeds and flowers, but between four and seven years old, they died after the ironwood trees upon which they were dependent for nutrients were removed. Unlike the mahagony, teak and other hardwords Na `Aina Kai grows, the sandalwood eventually perished except for one remaining row of small trees.

Meanwhile, back at Kaua`i's Hindu Monastery in Wailua, the monks are successfully growing four S. album, the oldest of which is 12 years old. A fifth tree died after heavy rains, but one tree growing between bamboo and teak is doing well.

For Hindus, sandalwood or chandana as it is called in Sanskrit, doesn't just smell nice, it is considered sacred and used for intricate carvings of Hindu deities, incense and in puja ceremonies. Ground sandalwood paste is also applied to the forehead as a bindi mark, which is both spiritually significant and used to calm emotions.

The monastery's Yogi Jivanandanatha spoke of how he and fellow monk Paramacharya Palaniswami tried eating some of the many seeds their trees produced. "They're very tasty after being roasted," Jivanandanatha says, "kind of like a nutty popcorn."

Palaniswami has a vision of creating a stand of sandalwood trees to be left unharvested for 500 years.

Looking ahead, perhaps not quite that far, Steve Smith of Forestry Management Consultants-Hawaii sees sandalwood's potential as a sustainable forest crop and a major component of a healthy native forest. Smith understands growers' reluctance to commit large amounts of money and land to a tree that is still not fully understood or well-established in Hawai`i's hardwood industry.

"There still remain questions about disease management, growth rates and so on," Smith says.

Yet for all the past decimation, the future uncertainty and the continued shroud of caution surrounding sandalwood, Hawaiian `iliahi is around for people to admire and appreciate.

Smith suggests the trees are fairly easily found in Hosmer Grove below the summit of Haleakala, around Koke`e and Waimea Canyon on Kaua`i and of course on the `Iliahi Trail at Hawaii Volcanoes National Park.

"We have this perception that sandalwood was all logged out by 1845, yet if you go into today's forest, it is not endangered. It is prevalent, but most people can't distinguish it from other native trees," Smith says.

"Once you get a sense of what the trees look like, they start jumping out at you." □