

# The Many Faces of Koa

By Bob Hobdy

Photos by Forest and Kim Starr



*Koa* (*Acacia koa*) is the monarch of the Hawaiian forests. Its name also means warrior and brave one. With a name like this, it is no coincidence that it is the largest and most dominant tree in the forest. Its wood is one of the most beautiful in color and grain and it has great workability and stability. The Hawaiians prized it as the premier wood for canoes, and the harder dryland woods were used for tools, weapons and paddles.



*Koa* is also a benevolent parent tree to its smaller neighbors in the mesic forests. Its great spreading crowns are relatively open, allowing ample light to filter through for the smaller trees, shrubs and ferns in the understory, while its roots, in partnership with symbiotic rhizobial bacteria, produce nitrogen that also nourish the understory plants. Where the finest *koa* forests grow, the most luxuriant *maile* vines proliferate.

*Koa* is also extremely variable in stature and appearance throughout its statewide range. So much so that at one time three segregate species were recognized. High elevation trees look different than low elevation trees, and wet forest trees look different than dry forest trees. *Koa* has adapted to a wide range of habitats and changed to better survive in these habitats. As an example, the *koa* forests at high elevations (4,000-6,000 ft.) on the leeward slopes of Hawai‘i and Maui have developed extremely wide leaves. These “leaves” in *koa* are actually enlarged leaf petioles called phyllodes that are thick and leathery.



These have evolved to replace the delicate bipinnate true leaves, apparently as a means for minimizing desiccation in dry climates. Typical *koa* has long sickle-shaped phyllodes 15-30 mm wide. The high elevation *koa*, however, have phyllodes 40-55 mm wide that are blunt tipped and only slightly curved. One theory is that wide phyllodes provide more surface area for condensing water out of fog. In upper Kula and Kahikinui where these trees grow, the annual rainfall averages about 40 inches.

This is peripherally low for *koa*, which prefers 60- 150 inches per year. On these leeward slopes, however, there is usually a thick cloud bank that forms from the gentle orographic lifting of warm air during the day. This dense *naulu* cloud is full of moisture, but little of it falls as rain.

These broad phyllode *koa* condense great amounts of water from these clouds to the point that it “rains” under these trees, nearly doubling the actual precipitation and creating a more ideal climate for these trees and their understory beneficiaries. *Koa* trees in both wetter and drier forests away from this *naulu* cloud have phyllodes of normal width. Of special note are the *koa* trees that grow in lower Kipahulu Valley. These trees have long, extremely narrow (6-8 mm wide) phyllodes that give these trees a lacy appearance.

The range of *koa* forest on East Maui is of interest. On the leeward Kula and Kahikinui slopes it lies in an elevation band between 3,500 and 6,000 feet, consistent with the occurrence of the *naulu* cloud. But *koa* does not naturally occur on the windward slope



where rainfall is too high for its liking due to the trade wind effect. So *koa* wraps around the edges of Haleakala only to Kailua on the northwest corner and only to Kipahulu on the southeast corner, and then abruptly stops where rainfall exceeds about 200 inches per year. The great Kipahulu Valley is literally filled with *koa* forests while the adjacent Waiho‘i Valley to its north has but a handful.

Likewise on the northwest corner a dense *koa* forest occurs at Honopou then suddenly gives way to a lowstatured ‘*ohi‘a* and fern forest at Kailua. Another interesting characteristic of these two endpoints is also tied to rainfall. Where the trade winds wrap around Haleakala the isohyets (lines of equal rainfall) lie vertically on the shoulders of the mountain rather than horizontally as they do on both the windward and leeward slopes. Thus the zone of ideal rainfall for *koa* (60-150 inches per year) stretches from near sea level to 7,000 feet. On the northwest it runs from lower Peahi up to upper Waikamoi and Hosmer Grove, and on the southeast it runs up Kipahulu Valley from just above the highway to the upper reaches of the valley below Kuiki and Pohaku Palaha. On the map the range of *koa* looks like a boomerang with parentheses on each end.

Also of botanical and cultural interest is the low-statured, gnarly, dry forest species known as *koai‘a* or *koai‘e* (*Acacia koaia*). This allied species grows in the hot lowlands between 1,200 and 2,000 feet on the leeward side of the island. It has an interesting range as there is a considerable space between where it grows and the *koa* which is higher on the slope. The name *koai‘a* connotes *koa* with connection to fishing. Indeed great shark hooks were crafted from curved roots or branches of this strong wood. The name *koai‘e* connotes *koa* with a connection to *kapa* (barkcloth) mallets, which in fact was another major use.

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