

# A New Species of *Pritchardia* and the Re- discovery of *P. lowreyana* on Oahu, Hawaii

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For many years the Koolau Mountains, which rise to about 1000 m elevation and stretch like a spine along the eastern side of the island of Oahu in Hawaii, were considered home to only one species of *Pritchardia*, the highly variable *P. martii*. However, in my recent treatment of *Pritchardia* (Hodel 2007) I showed that at least one more species, *P. kahukuensis*, occurs there and that another taxon, a variant of *P. martii* with exceptionally long infructescences greatly exceeding the leaves, perhaps could be segregated out and recognized as a distinct species. Indeed, a reassessment of this variant of *P. martii*, during preparation of a book on the Hawaiian species of the genus, has shown that it is distinct, and I take great pleasure in naming and describing it here. Nearly simultaneously, the unexpected, recent rediscovery in the Koolau Mountains of *P. lowreyana*, long thought to be extinct or simply reported erroneously, raises an intriguing nomenclatural question and shows that amazing discoveries await intrepid explorers of Hawaiian forests.

## *Pritchardia bakeri*, A New Species

*Pritchardia bakeri* Hodel, sp. nov. *P. martii* affinis sed infructescentibus foliis longioribus differt; *P. hardyi*, *P. kaalae*, et *P. thurstonii* affinis sed fructibus maioribus (35 mm vs. 7–25 mm) differt. Typus: USA. Hawaii. Oahu: Koolau Mountains, Koolauloa District, Lands of

Kahuku, Hodel 2019 (Holotypus BISH). Figs. 1–6.

Solitary, moderate tree palm to 7(–10) m tall (Figs. 1 & 2). Trunk 20–25 cm diam., mostly grayish, sometimes brownish when protected and unexposed, longitudinally grooved, obscurely ringed, internodes 2–5 cm, distal

portion just below crown of leaves frequently retaining a “skirt” of dead leaves and/or leaf bases. Leaves 35–40, stiffly spreading; leaf bases ca. 20 cm long, 20–25 cm wide proximally, tapering to 10–12 cm wide distally; petioles 30–45 cm long, 4–6 cm wide and 1.5 cm thick at blade, convex adaxially, rounded abaxially, margins sharp, blade-like, and proximally with few, coarse, tan fibers, densely covered abaxially and especially proximally with whitish to brownish pink, mealy indumentum, hastula semicircular, 8 mm high; blade ca. 75 × 75 cm, slightly undulate, costapalmate for 15–20 cm, divided to ca. two-fifths into 55–60 segments, middle-lateral ones the largest, these to 60 cm long, 4 cm wide at point of disjunction, free apical portion 15–30 cm long and bifid for two-thirds to nearly same length, tips stiff, long-acuminate, glossy green adaxially, grayish and thickly and completely covered with minute hair-like scales (lepidia) abaxially, indumentum on petiole extending onto segment folds abaxially, most proximal segments 30–35 × 0.5 cm. Inflorescences 5–8, interfoliar, ascending to nearly spreading and ca. equaling subtending leaf and to 1.3 m in long in flower, arching to pendulous and greatly exceeding the subtending leaf and to 2.8 m long in fruit (Figs. 1–3), composed of 1 long peduncle or several long peduncle-like

axes terminating in a relatively short panicle, peduncle or axes to 1 m long in flower and to 2.6 m long in fruit, base 5.5 cm wide, 0.8–1 cm thick, apex 1.0 × 0.8 cm diam., glabrous, ± tightly sheathed in imbricate bracts for nearly its entire length, prophyll to 40 cm long, inserted 3 cm above base, 2-keeled, up to 8 peduncular bracts, these green in flower, tan to brownish in fruit, papery, lightly to moderately covered with grayish tomentum, proximal bracts lanceolate, acute, ± tightly sheathing, distal bracts broadly lanceolate, inflated distally and more loosely sheathing, 2 most distal bracts the smallest and partially covering the proximal branches of panicle; panicles compact in flower (Fig. 3), expanded in fruit, branched to 2 orders, rachis to 18 cm long, proximal branches with sub-peduncle to 2.5 cm long, sub-rachis to 2.5 cm long and with up to 4 rachillae each, distal branches simple rachillae; rachillae to 10 cm long, 4 mm diam., terete, strongly flexuose, glabrous (Fig. 3) or moderately covered with short, velvety hairs, bracts subtending rachillae and panicle branches 5 × 0.8 mm. Flowers 3.5–8.0 mm apart; at anthesis 13 × 16 mm, greenish yellow to nearly orange (Fig. 4); calyx 6.5 × 6.0 mm, tubular, shallowly 3-lobed and yellow distally, greenish proximally, coriaceous, sepals imbricate to apex, mucronate; corolla tubular

1 *Pritchardia bakeri* grows 7–10 m tall and forms rather tight colonies at the type locality in Kahuku at the northern end of the Koolau range on Oahu, Hawaii (Hodel 2019).



at base, base 8 × 7 mm, only slightly exceeding calyx, yellow, distally divided into 3 valvate lobes that fall away at anthesis, these not seen; stamens 6, filament bases connate in a ring exserted 2 mm above corolla base, stamens spreading, borne on short tips 2 mm long of staminal ring, anthers 5–6 mm long, oblong, dorsifixed near base; pistil 7 mm tall, spindle-shaped, exserted 3 mm above staminal ring, columnar, tapered apically. Fruits (green and not fully mature) 40 × 35 mm (Fig. 5), ovoid-oblong, eventually likely turning dark brown to black.

*Specimens Examined:* USA, Hawaii, Oahu, Koolau Mountains. Koolauloa District: Kahuku Forest Reserve, Lands of Kahuku, upper reaches of Ohia Ai Gulch, to east of trail off Drum Road from Pupukea to Summit Trail, north- and east-facing slopes, ca. 525 m elev., N 21.63617, W 157.98871, *Hodel & Leinau 2019* (BISH). Honolulu District: Honolulu Watershed Forest Reserve, Kuliouou-Niu Ridge, *Obata 87-452* (BISH), *Wood 2613* (PTBG), *Zschokke 1282* (BISH).

The epithet honors Ray Baker of Lyon Arboretum of the University of Hawaii in

Honolulu, who has selflessly toiled for over 30 years in amassing and curating one of the finest collections of tropical ornamental plants in the world.

*Distribution and Ecology:* *Pritchardia bakeri* occurs in wet, low, disturbed, windswept, mostly exposed shrubby and/or grassy areas, sometimes on steep slopes, at the northern and southern ends of the Koolau Mountains, Oahu, Hawaii, 475–650 m elevation (Fig. 6).

*Conservation Status:* Although exact numbers are uncertain, it is estimated that fewer than 250 plants of *Pritchardia bakeri* occur in the Koolau Mountains. It should probably be considered endangered. Threats include severe habitat degradation, rats, pigs and weeds. Its narrow, restricted range increases susceptibility to single, disruptive event, like a hurricane, and to potential damage from weeds, animals and disease. Highly fragmented populations, low seedling recruitment and relatively small overall numbers suppress regeneration. Its occurrence in forest reserves provides the potential for protective management.

*Notes:* *Pritchardia martii* has long been considered to be one of the most variable

2 (left). Joby Rohrer holds infructescences of *Pritchardia bakeri*, which can be twice the length of the leaves. Kuliouou Ridge, southern Koolau range. 3 (right). Like all species of the genus, *Pritchardia bakeri* typically has yellow, compact panicles in flower (*Hodel 2019*).





4 (top). Rachillae may be glabrous, as shown here, or have short, velvety hairs, while the flowers of *Pritchardia bakeri* are yellow (Hodel 2019). 5 (bottom). Fruits of *Pritchardia bakeri* are large and green when immature (Hodel 2019).

species in the genus. Indeed, a remarkable range of variability, including size of plants, shape and size of leaves, amount and type of indumentum on inflorescences, shape and size of fruit and length of inflorescences, is readily apparent over the ca. 40 kilometers that *P. martii* occupies along the crest of the Koolau Mountains. The last character, the length of the inflorescence (and infructescence) relative

to the subtending leaf, can be a critical, diagnostic feature for distinguishing many species of *Pritchardia* (Hodel 2007). Nonetheless I felt that this character was relatively unimportant in circumscribing *P. martii* and settled on a species encompassing individuals with a range of infructescence lengths, from not exceeding the petiole to greatly exceeding the leaf blade.

However, I alluded (Hodel 2007) that, with further study, the variant of *Pritchardia martii* with exceptionally long infructescences perhaps could be segregated out and recognized as a distinct species, and that has now been borne out. Additional study and a reassessment of *P. martii* has shown that infructescence length is less variable than once thought, and two, distinct taxa can be neatly separated within *P. martii*. One, with infructescences generally not exceeding the petioles, is *P. martii*, while the other, with infructescences greatly exceeding the leaf blades, is *P. bakeri*.

*Pritchardia bakeri* has a disjunct distribution, and is known only from the far northern and southern ends of the Koolau range, like bookends, with *P. martii* sandwiched in between. At both ends of the Koolau range it occurs close to *P. martii*, and at the northern end it occurs with *P. kahukuensis*, which, with infructescences about equaling the leaf blades, may have contributed to the perception that *P. martii* had infructescences ranging from shorter than the petioles to greatly exceeding the leaf blades.

*Pritchardia kaalae* from the Waianae Mountains on Oahu, *P. hardyi* from Kauai and *P. thurstonii*

from the Lau Group in Fiji and Eua in Tonga share the exceptionally long infructescences with *P. bakeri*, but they all differ in their much smaller fruit (not exceeding 25 mm in diameter). *Pritchardia bakeri* would key out to couplet 6b in the key to the species of *Pritchardia* (Hodel 2007, p. S-9) and is illustrated in the same publication (Fig. 25, p. S-26) as *P. martii*.

#### Rediscovery of *Pritchardia lowreyana* on Oahu, Hawaii

Beccari, in his monograph of *Pritchardia* (Beccari & Rock 1921), concluded that the Koolau Mountains behind downtown Honolulu was the home of the little known *P. macrocarpa*, despite the fact that Rock, who had searched the Koolau range for many years, had never encountered it there. Beccari surmised that encroaching urbanization and collection for landscape use in Honolulu had likely exterminated it in the wild. He noted that Rock had identified several cultivated specimens of *P. macrocarpa* in Honolulu, the most famous of which is a now fenced, historical specimen in Foster Garden of the Honolulu Botanical Gardens. Rock made a collection from this cultivated specimen, which sketchy records show was collected from

6. Near the southern end of the Koolau range *Pritchardia bakeri* is a small plant and occurs on exposed, steep, windswept slopes along Kuliouou Ridge.





7 (left). Just a few, mostly tall and probably very old specimens of *Pritchardia lowreyana* occur on an unusually steep slope below the summit of Puu Ohulehule in the Koolau range. 8 (right). Inflorescences of *Pritchardia lowreyana* are pendulous when heavily laden with large fruits and about equal the leaf in length.

the not-too-distant Nuuanu Valley behind Honolulu. From this collection, Beccari was able finally to provide a detailed description and purported origin of *P. macrocarpa*.

I showed, however, that *Pritchardia macrocarpa* was a name of uncertain application and best dropped from use, and the appropriate name for these cultivated plants in Honolulu was *P. lowreyana*, heretofore known with certainty only from Molokai, about 45 km east-southeast of Oahu (Hodel 2007). That *P. lowreyana* has leaves with green abaxial blade surfaces lightly and incompletely covered with lepidia, in rather striking contrast to the silvery grayish white abaxial blade surfaces thickly and completely covered with lepidia of all previously known *Pritchardia* in the Koolau range (*P. kahukuensis*, *P. bakeri* and *P. martii*), appeared to bolster the claim by many Hawaiian plant aficionados that these cultivated *P. lowreyana* probably originated not on Oahu but more likely on Molokai. Indeed, for years, they scoffed at the idea that these cultivated plants, including the famous specimen in Foster Garden, could have come

from Oahu because nothing even remotely like them had been found in modern times on the island.

However, intrepid hikers and naturalists Joel Lau and Kenji Suzuki discovered a small colony of *Pritchardia lowreyana* on Oahu in April, 2008, clinging tenaciously at 515 m elevation to a very steep, north-facing slope about 175 m below the summit of Puu Ohulehule, the pyramid-shaped peak on the ridge running to the east from the main Koolau range and separating Waikane and Kahana Valleys (Figs. 7 & 8). Their find is especially significant because it confirms that this species does, in fact, occur there and that Beccari and Rock were correct in referring to it when they wrote of a *Pritchardia* (erroneously referred to as *P. macrocarpa*) with green abaxial blade surfaces that once grew in the Koolau Mountains behind Honolulu and survived only as a few cultivated plants in the city.

Lau and Suzuki's rediscovery of *Pritchardia lowreyana* in the Koolau Mountains on Oahu was also significant because it could affect its nomenclatural standing and that of *P.*

*gaudichaudii*. In my recent review of the genus (Hodel 2007), I contended that the name *P. gaudichaudii* was best applied to material from the Koolau range on Oahu and, thus, is a synonym of *P. martii* because only one species occurred there near downtown or the historic section of Honolulu and it had abaxial blade surfaces completely covered with lepidia. My position, partially based on an examination by Fred Stauffer of the type of *P. gaudichaudii* at Geneva (G) that showed the abaxial blade surface to be completely covered with lepidia (or at least once was), was in contrast to that of Beccari and Rock (1921) who described *P. gaudichaudii* as having green abaxial blade surfaces incompletely covered with lepidia, and occurring on Molokai.

Lau and Suzuki's discovery of a *Pritchardia* with green abaxial blade surfaces in the Koolau Mountains prompted me to wonder if I had misinterpreted what Fred Stauffer had told me about the abaxial blade surface of the type of *P. gaudichaudii* at G. If the type at G actually had abaxial blade surfaces incompletely covered with lepidia, *P. gaudichaudii* would likely be resurrected from synonymy with *P. martii*, and *P. lowreyana* would become a synonym of *P. gaudichaudii*. Fred graciously agreed to reexamine the type of *P. gaudichaudii* at G, which confirmed his earlier finding that the abaxial blade surface was completely

covered with lepidia. Thus, *P. gaudichaudii* remains a synonym of *P. martii*, and *P. lowreyana* is now verified as occurring on Oahu, extending its range from Molokai and making it one of the few Hawaiian *Pritchardia* to occur on more than one island. It also confirms Beccari and Rock's earlier contention that a *Pritchardia* with green abaxial blade surfaces inhabited the Koolau Mountains.

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