Chamaedorea ponderosa (Arecaceae)

DONALD R. HODEL AND ÁNGELA CANO

When co-author Hodel named and described *Chamaedorea ponderosa* nearly 25 years ago, it was one of the few times he had done so without actually seeing the new species in the field or at least in the living state as a cultivated plant, a practice to which he was not particularly enamored. He had come across several specimens of this then-unidentified species in 1993 in the herbarium of the Missouri Botanical Garden in St. Louis. They were all from the same general location in the Darién region of far eastern Panama and adjacent to the border with Colombia, a legendary and mythical area that was botanically unexplored and largely inaccessible until the late 1960s and 1970s when collectors, mostly from the Missouri Botanical Garden, undertook several expeditions there during which the first specimens of what would eventually be named *C. ponderosa* were collected.

These specimens immediately caught his attention because of the bulky, heavy nature of the inflorescences and large, mostly simple, bifid leaves. He initially thought they were *Chamaedorea murriensis*, from Colombia, and annotated the specimens as such. Later he suspected they were a new species but too late to include in *Chamaedorea Palms*, his just-published monograph of the genus (Hodel 1992). Nonetheless, he worked up a description of the new species, based on the specimens at MO, and published it a few years later along with another new species of *Chamaedorea*, neither of which was illustrated (Hodel 1997). He was excited about this new species because of the large, simple, bifid leaves and shared this discovery and his enthusiasm with other people, including several palm growers and collectors, remarking that ". . . the leaf blades were among the largest if not the largest of simple-leaved *Chamaedorea* and were as large as a page of newsprint."

For over 15 years, *Chamaedorea ponderosa* labored in relative obscurity until Hodel and co-author Cano met at the PALMS 2015 Symposium in Colombia. Cano, who had been working in the Darién region (Cano et al. 2017), showed Hodel photographs of several *Chamaedorea* she had encountered in her work and asked for his help in identifying them. As he perused Cano's excellent photographs of Darién *Chamaedorea*, much to his surprise and delight, he noted several of plants with large inflorescences and simple, bifid leaves that were undoubtedly *C. ponderosa* (**Fig. 1**). Finally, Hodel saw photographs of living plants of this unique and strangely handsome species.

1. M. González provides scale for *Chamaedorea ponderosa* with its unusually large, mostly simple and bifid leaves. Cerro Pirre, Darién, Panama. © Ángela Cano.

2. Holotype of *Chamaedorea ponderosa*, *Hartman 8529* (MO-3233713). © Missouri Botanical Garden.

3. *Chamaedorea ponderosa* is an understory palm growing to 4 m tall and with mostly simple and bifid leaves. Cerro Pirre, Darién, Panama. © Ángela Cano.

Here we provide a description, one expanded with field observations of living plants, and a lavishly illustrated account of *Chamaedorea ponderosa*.

Chamaedorea ponderosa Hodel, Novon 7(1): 35–36. 1997. Type: Panama: Darién: Cerro Pirre, 2–3 miles N. of summit, 7.9333300, -77.7000000, 1000–1100 m, 31 Dec. 1978, *Hartman 8529* (Holotype MO [MO-3233713] [**Fig. 2**]). **Figs. 1–9.**

Habit: solitary (cespitose?), slender, erect, understory palm 2–4 m tall (**Figs. 1, 3–6**).

Stem: 2–2.5 cm diam., ringed, internodes 2.5–5 cm (**Fig. 7**), with adventitious prop roots at base to 1 m long.

Leaves: ca. 5, simple and bifid (**Figs. 1, 3–6**), sometimes pinnate and then with unusually large terminal pinnae and smaller basal pinnae (**Fig. 6**), spreading, drying dark olive-green with a heavy, thick, bulky appearance; leaf base 25–40 cm long, tubular in proximal 4/5, obliquely open apically, longitudinally striated with a raised costa extending from petiole for 5–8 cm, pale green to nearly whitish especially along distal margins; petiole 18–35 cm long, 6–8 mm diam. at apex, 8–10 mm diam. at base, rounded abaxially, flattened but becoming channeled proximally from extensions of distal margins of leaf base, longitudinally striated, light green to nearly whitish with a whitish band abaxially (**Fig. 7**); rachis 40-60 cm long, angled and light green adaxially, rounded and light green to nearly white abaxially; if simple, blade 65–85 × 45–50 cm, oblong, bifid apically ca. 1/3 its length, lobes acute-acuminate, drying dark olive-green with a heavy, thick, bulky appearance, ca. 20 prominent, elevated, sharply angled, primary nerves per side, these elevated but not sharp abaxially, 2–3 secondaries between each pair of primaries, these not too conspicuous adaxially, 1–2 tertiaries between each pair of secondaries or a secondary and a primary, nerves of lesser orders numerous and faint, all nerves light colored; if pinnate, blade 80–90 × 45–50 cm, pinnae 2-8(–16) per side, terminal pair typically largest, 30–45 × 10–15 cm, basal pinnae 30–45 × 2.5–5.5 cm, sigmoid, falcate, long-acuminate, variously nerved depending on width.

Inflorescences: interfoliar, 50–75 cm long, shorter than the leaves, ascending to spreading in flower, spreading in fruit, pistillate branched 1-2 orders; peduncles 40-55 cm, ascending in flower, ascending to spreading and orange in fruit; bracts 5-7, prophyll 2–4 cm long, 1st peduncular bract 10 cm long; 2nd peduncular bract 25 cm long, 3rd peduncular bracts 35 cm long, 4th peduncular bract 15 cm long and shorter than to exceeding peduncle and concealing a 5th peduncular bract 5 cm long, obliquely long-open apically, longitudinally striated, proximal ones acute-acuminate, distal ones long-acuminate, brown in flower, becoming tattered in fruit, tattered in fruit; rachises 12–17 cm long; staminate rachillae 9–31, 25-40 cm long, 1–1.5 mm diam., drooping (**Fig. 7**); pistillate rachillae (7–)13–28, 18-25 cm long, 1.5–2 mm diam., spreading (**Figs. 6, 8**), a few proximal ones sometimes bifurcate, orange in fruit.

4. *Chamaedorea ponderosa* is an understory palm growing to 4 m tall and with mostly simple and bifid leaves. *Cano ACS506*, Cerro Pirre, Darién, Panama. © Ángela Cano.

5. Co-author Ángela Cano stands with two specimens of *Chamaedorea ponderosa*. Cerro Pirre, Darién, Panama. © Ángela Cano.

6. *Chamaedorea ponderosa* sometimes has pinnate leaf blades with a large apical pair of pinnae and several small basal pinnae. *Bernal et al. 4981*, Alto de Las Tatabras, Chocó, Colombia. © Rodrigo Bernal.

7. Staminate inflorescences of *Chamaedorea ponderosa* are drooping. Cerro Pirre, Darién, Panama. Note the green, ringed stem and light green petioles with a whitish abaxial band. © Ángela Cano.

Flowers: staminate in dense spirals 2–3 mm distant, superficial, leaving elliptic scars 1.25–1.5 mm long, flowers in bud 2 × 2–2.75 mm; calyx c. 1 × 2–2.75, deeply lobed, sepals connate in basal 1/3, broadly rounded to acute apically; petals c. 2 × 1.75–2 mm, broadly ovate, valvate, acute, connate apically and there adnate to pistillode and corolla opening by lateral apertures, prominently nerved; stamens 6, 1.25 mm high, filaments 0.5 mm, anthers 1 mm long, dorsifixed near base; pistillode 1.5 mm high, columnar; pistillate in remote spirals, 4–10 mm distant, superficial, leaving elliptic scars 1.75 mm long, 2 × 3 mm, broadly ovoid (**Fig. 9**); calyx 1 × 3 mm, cup-shaped, moderately lobed, sepals imbricate and/or connate in basal 1/2, broadly rounded apically, prominently nerved, yellow; petals 2.5 × 3 mm, broadly obovate-spatulate, imbricate in basal 3/4, rounded apically, prominently nerved, yellow; staminodes not seen; ovary 2 × 2.5 mm, globose, styles lacking, stigma lobes exceeding petals, short, angled, recurved, pale to clear-colored.

Fruits: 8 × 7 mm, subglobose, orange (perhaps aging black).

Distribution and Ecology: *Chamaedorea ponderosa* is known mostly from Cerro Pirre in Darién Province in far eastern Panama near the Colombian border where it occurs in low- to middle-elevation cloud forest on the Pacific slope from 675–1550 m elevation. Hodel (1997) suspected that it likely occurred in adjacent Colombia because one collection, *Gentry et al. 28690*, is from "cloud forest exactly on the Panama/Colombia border." Indeed, in 2014, Rodrigo Bernal and co-author Cano collected it at Alto de las Tatabras, Department of Chocó, in Colombia.

Other palms associated with *Chamaedorea ponderosa* at the Cerro Pirre locality are *Dictyocaryum lamarckianum* and *Prestoea acuminata*. *Chamaedorea pygmaea*, the only other species of the genus in the vicinity, occurred at a lower elevation (575 m) and in wet forest, not cloud forest. At the Colombian locality of Alto de Las Tatabras, Chocó, *C. ponderosa* occurred with *Bactris obovata*, *C. woodsoniana*, *Geonoma triandra*, and *Synechanthus warscewiczianus*.

Additional Specimens Examined: COLOMBIA. Chocó: Municipio de Unguía, corregimiento de Balboa, alto Río Bonito, camino de la finca de la familia Toro hacia la Serranía del Darién, Alto de Las Tatabras, 8.232778, -77.232000, 1137 m, 19 Nov. 2014, *Bernal et al. 4968*, *4969* (COL-000440348 and COL-000440347 respectively); Municipio de Unguía, corregimiento de Balboa, alto Río Bonito, camino de la finca de la familia Toro hacia la Serranía del Darién, Alto de Las Tatabras, 8.231500, -77.226278, 1070 m, 21 Nov. 2014, *Bernal et al. 4981* (COL- 000440062). PANAMA. Darién: a Rancho Plástico, 7.990111, -77.708167, 1053 m, 9 Dec. 2014, *Cano et al. 506* (G, PMA); Camp Summit between Morti and Sasardi, 8.966600, -77.8833300, 600 m, 6–7 Mar. 1967, *Duke 10681* (sterile) (MO-2003771); Cerro Pire, ridgetop near Rancho Plástico, 7.9700000, -77.7000000, 1200 m, 10–20 Jul. 1977, *Folsom 4296* (pistillate) (MO-2620508); Cerro Pirre, 7.9225000, -77.7158333, 1000–1400 m, 29 Dec. 1972, *Gentry 7037* (staminate) (BH, MO-26886-

8. Pistillate rachillae of *Chamaedorea ponderosa* are green and spreading in flower. Cerro Pirre, Darién, Panama. © Ángela Cano.

9. Pistillate flowers of *Chamaedorea ponderosa* are broadly ovoid and yellow. Cerro Pirre, Darién, Panama. © Ángela Cano.

75, MO-2688674); Alto de Nique, 7.7250000, -77.7416666, 1300–1520 m, 19 Apr. 1980, *Gentry et al. 28690* (pistillate) (MO-2782316, MO-2782317); Cerro Pirre, on trail immediately SE. of summit, 7.8666667, -77.8000000, 1400 m, 14 Jul. 1977, *Hartman et al. 4590* (MO-3238370); Cerro Pirre, SE. of summit, 7.9333300, -77.7000000, 1300 m, 15 Jul. 1977, *Hartman et al. 4801* (staminate) (MO-3238371, MO-3238372); Cerro Pirre, N. slopes, 7.9275000, -77.7025000, 700–950 m, 6 Apr. 1976, *Mori & Kallunki 5452* (pistillate) (MO-3595422, MO-3595423).

Notes: *Chamaedorea ponderosa* is distinctive in its thick, bulky, heavy-looking inflorescences and unusually large, mostly simple and bifid leaves. Indeed, the epithet for this species, *ponderosa*, means weighty or heavy and alludes to the large and heavy appearing inflorescences and leaves. The species likely has the largest simple and bifid leaves of any species in the genus. It is like *C. murriensis* from Colombia but this latter species differs in its smaller habit, smaller leaves with fewer primary nerves, shorter and smaller inflorescence rachises, remotely placed staminate flowers, mostly nerveless sepals and petals, and brown fruits. *Chamaedorea ponderosa* might not always be solitary; one collection, *Cano ACH506*, notes that it might be cespitose. The staminate flowers with petals connate apically and there adnate to the pistillode and the corolla opening by lateral slits seemingly place *C. ponderosa* in subgenus *Chamaedorea* (Hodel 1992).

Hodel (1992) had divided the genus *Chamaedorea* into eight subgenera based solely on morphological characters, primarily flower structure and inflorescence arrangement. However, more recent molecular data show that while subgenera *Eleutheropetalum* and *Stephanostachys* are monophyletic, the two most species rich subgenera, *Chamaedorea* and *Chamaedoropsis*, are not monophyletic and are likely untenable (Cuenca et al 2007, Thomas et al. 2006). Hodel (1992) had distinguished these latter two subgenera by whether the petals of the staminate flowers were connate and adnate to the pistillode with the corolla opening by lateral slits between the petals (subgenus *Chamaedorea*) or the petals were free and spreading (subgenus *Chamaedoropsis*). Hodel (1992) even noted several species that seemed to be intermediate between the two subgenera, some in subgenus *Chamaedorea* having staminate flowers with petals that were initially connate apically and adnate to the pistillode and the corolla opening by lateral slits but later became free and spreading while a few species in subgenus *Chamaedoropsis* had staminate flowers with the petals spreading apically but only slight so, the tips remaining incurved over the stamens and nearly adnate to the pistillode. A more detailed and complex redefinition of these two subgenera is sorely needed. From a morphological perspective, other characters, such as staminate flower petal color, scent, and perhaps most importantly, petal and fruiting perianth nervation, might be more illuminating.

In the most recent molecular-based study, Cano (2018), using NGS sequence capture data technology, arrived at a similar conclusion as did Cuenca et al. (2007) and Thomas et al. (2006) in that a morphologically based definition of the subgenera of *Chamaedorea* was not fully

supported for all subgenera, especially *Chamaedorea* and *Chamaedoropsis*. She placed *C. ponderosa* on a clade with members of subgenus *Chamaedorea* (*C. murriensis*, *C. pinnatifrons*, and *C. rojasiana*) but also a member of subgenus *Chamaedoropsis* (*C. subjectifolia*).

Because of its large, dramatic leaves, *Chamaedorea ponderosa* would be a striking addition to horticulture. However, seeds would be rarely available and should only be obtained in a sustainable manner, preferably from cultivated sources. Production of seeds for sale of this species and other desirable horticultural subjects from cultivated mother blocks might be an appropriate income source for local residents.

Another problem for this species in horticulture might be its origin in wet mountain cloud forests with relatively narrow and exacting environmental parameters of temperature, root zone moisture, humidity, light, and water quality. Successful cultivation might only be achieved in locales with similar habitat, like some places in Hawaii, or in expensive artificial growth structures.

Acknowledgements

We thank Michael Grayum and Thomas Croat, both of the Missouri Botanical Garden (MO), for providing information about the Garden's early collecting program in the Darién region of Panama. We also thank Grayum for facilitating imaging of the holotype of *Chamaedorea ponderosa* at MO and MO for posting it in their TROPICOS website. We thank Rodrigo Bernal for sharing his photograph of *C. ponderosa* from Colombia.

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Publication Date: 29 June 2021.

PalmArbor: *http://ucanr.edu/sites/HodelPalmsTrees/PalmArbor/*
ISSN 2690-3245
Editor-In-Chief: Donald R. Hodel
Hodel Palms and Trees: *http://ucanr.edu/sites/HodelPalmsTrees/*