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Three New Species of Chamaedorea from Panama

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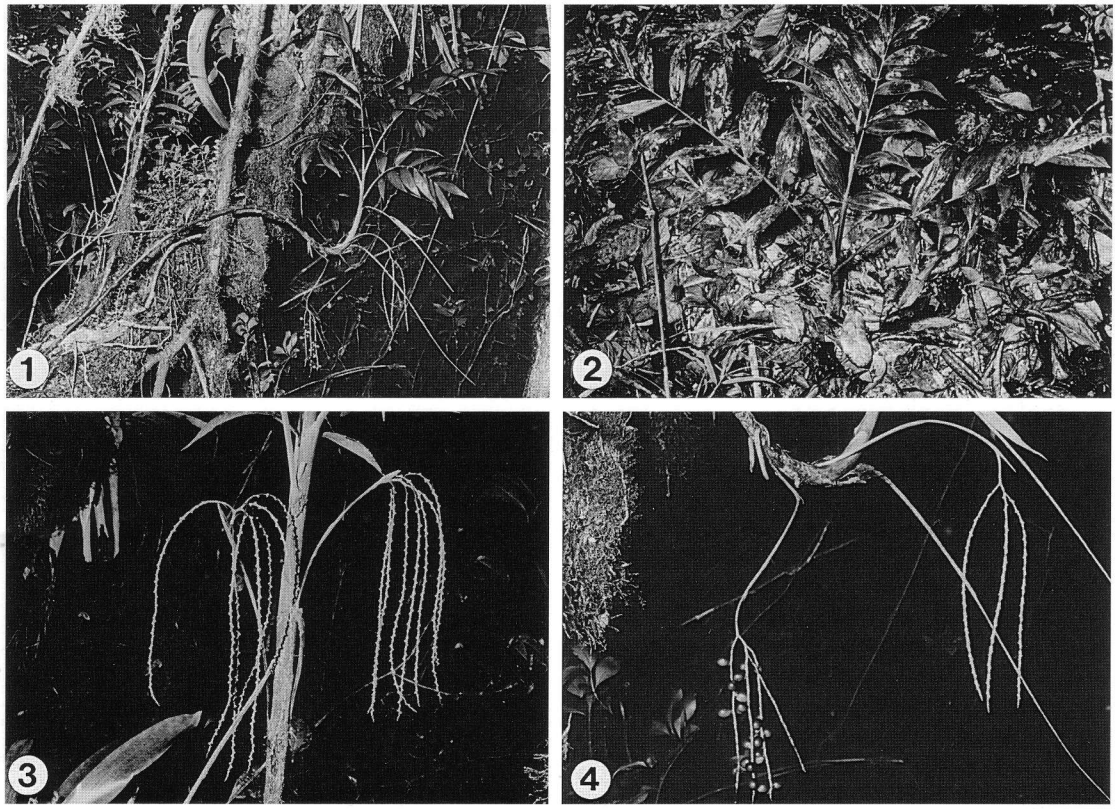
Since the publication of my monograph of *Chamaedorea* (Hodel 1992*a*) and a subsequent article adding several new species (Hodel 1992*b*), field studies in Panama have enabled me to describe and name three new species.

Chamaedorea anemophila Hodel **sp. nov.** (Figs. 1–4).

Subgeneris *Chamaedoropsi* Oerst. inflorescentiis masculis solitariis, floribus masculis solitariis petalis patentibus apicaliter pertinens. *C. dammerianae* Burret affinis sed floribus masculis majoribus petalis tenuibus friabilissimis differt. *C. pittieri* L. H. Bailey affinis sed inflorescentiis foliis brevioribus, rachillis femineis gracilibus cernuis differt. Typus: Panama, Chiriqui, *Hodel et al. 1200* (holotypus BH; isotypi HNT, MO, PMA).

Solitary, slender, erect but sometimes decumbent with age and then leaning on or snaking through adjacent vegetation (Fig. 1), to 4 m tall or long; stem 10–13 mm diam., green, ringed, upper portion often clothed in persistent brown dried leaf sheaths, internodes to 10 cm long, occasionally flowering when appearing stemless (Fig. 2), then stem abbreviated, curved, subterranean, to only 15 cm long, 12–18 mm diam., brown, rough, prominently ringed, nodes strongly congested, internodes 1–3 mm long. Leaves 3–6, erect-spreading, pinnate, ± thick, ± stiff, ± coriaceous, bluish gray-green; sheaths to 19 cm long, tubular, obliquely open apically, ± thick, densely and prominently longitudinally nerved especially when dry with a heavier costa extending onto petiole; petioles (5)10–38 cm long, grooved adaxially, rounded abaxially, lightly white-spotted and nerved laterally especially when dry; rachis 15–30 cm long, angled adaxially, rounded abaxially with a light green or yellowish band extending onto sheath; pinnae 5–8 per side, lower or lower middle ones largest, these 10–19 × 1.75–4.0 cm, apical ones 7–10 × 1.5–2.5 cm, basal ones 9–19 × 1.5–3.0 cm, all pinnae straight, slightly falcate, long-acuminate apically, strongly contracted basally, ± cupped downward, usually drying strongly plicate with a ± conspicuously angled midrib, other nerves not prominent, 2–4 secondary nerves on each side of midrib, tertiaries numerous faint, midrib and secondaries drying green adaxially, yellowish abaxially. Inflorescences 1–2 per plant, mostly infrafoliar, arising from behind dried persistent sheaths (Fig. 3), rarely interfoliar and then only staminate in bud, 15–35 cm long, shorter than leaves; peduncles ascending, to 35 cm long, 5 mm wide at base, 1–2 mm diam. at apex and there drooping, green in flower, orange in fruit where exposed; bracts 4–5(7), prophyll to 4 cm long, 2nd bract to 8 cm, 3rd and 4th to 19 cm, 5th to 19 cm, 6th to 4.5 cm, 7th to 2 cm, uppermost bract exceeding peduncle and extending onto rachis if large or concealed by larger lower bract if small, bracts tubular, green in flower, brown in fruit, thin-papery, longitudinally striate-nerved, lower ones bifid, acute, upper ones obliquely long-open apically, acute-acuminate. Staminate rachis to 7 cm long, 2 mm diam. at base, to 0.8 mm diam. at apex, drying flattened, finely longitudinally striate and ridged; up to 11 rachillae (Fig. 3), to 30 cm long, very slender, 0.5 mm diam., pendulous, finely longitudinally ridged. Staminate flowers with very fragile appearance, in moderate spirals, 2–5 mm distant, ± superficial, leaving narrowly elliptic scars 1.5 mm long, just prior to anthesis flowers 3 × 2–2.5 mm, ovoid, opening to 3 × 4–4.5 mm; calyx 1 × 2.5 mm, cupular, scarcely lobed or only slightly notched, sepals connate nearly to apex, truncate or only slightly rounded, thin, nearly transparent; petals 3–4 × 2–3 mm, ovate, valvate, spreading, distinct nearly to base, thin, faintly few-nerved adaxially; stamens 2–2.5 mm high, conspicuously shorter than pistillode, filaments 0.75 mm long, very slender, anthers 1 mm long, oblong, dorsifixed; pistillode 2.5–3.5 mm high, longitudinally fluted. Pistillate rachis to 2.5 cm long or lacking if spicate or furcate, 0.6–1 mm



1. Old, mature plant of *Chamaedorea anemophila*, *Hodel et al. 1201*, snaking through dense, mossy, cloud forest near Cerro Colorado, Chiriqui, Panama. 2. Young, stemless but flowering plant of *Chamaedorea anemophila* (note pale, slender, barely visible, spicate rachilla emerged lower left of new, vertical leaf spike), *Hodel et al. 1125*, windswept cloud forest near Fortuna, Chiriqui, Panama. 3. Pendulous staminate rachillae of an old plant of *Chamaedorea anemophila* emerged from behind dried, persistent leaf sheaths, *Hodel et al. 1200* (holotype), near Cerro Colorado, Chiriqui, Panama. 4. Few-branched, straight, pistillate rachillae of an old plant of *Chamaedorea anemophila*, *Hodel et al. 1201*, near Cerro Colorado, Chiriqui, Panama.

diam., green in flower, orange in fruit, drying faintly longitudinally striate or ridged; inflorescence with 3–4 rachillae (Fig. 4), or furcate or spicate especially when flowering for first time and/or with little or no above-ground stem evident (Fig. 2), rachillae to 15 cm long, slender, 0.8–1 mm diam., straight or slightly curved, slightly flexuous apically, green in flower, orange and drooping in fruit, drying with longitudinal membranous wings in flower but only faintly so or rounded in fruit. Pistillate flowers with very fragile appearance, light yellow, in moderate spirals, 1.5–4 mm distant, ± superficial, leaving long-elliptic scars 1–1.5 mm long, flowers 2.5–3 × 2.5 mm, ovoid-globose; calyx 0.5–1 × 1.5–2 mm, low-cupular or crownlike, moderately to deeply lobed, sepals imbricate in basal ⅓–½, broadly rounded to truncate apically, thin, membranous especially toward margin when dry, green in life; petals 2.5 × 2.5, broadly triangular, imbricate in basal ⅔–¾, thin, membranous, nearly transparent when dry, acute, erect, faintly nerved; pistil 1.5–2 × 1–2 mm, ovoid, green in life, stigma lobes short, blunt, recurved, shorter than petals. Fruits 11 × 7 mm, obovoid-globose, black; seeds 8 × 6 mm oval shaped.

Distribution: PANAMA. Moist or wet cloud forest usually along windswept ridge tops near or on the Continental Divide; 1,000–2,100 m elevation.

Specimens Examined: PANAMA. Bocas del Toro: Fortuna, along Continental Divide, *Churchill 5540* (MO). Chiriqui: between Quebrada Honda and divide on Caldera-Chiriquicito Trail, *Kirbride & Duke 938* (MO); summit of Cerro Horqueta, *Cochrane et al. 6291* (MO); windswept ridge north of Planos de Hornito and east of road to Chiriqui Grande, *Hodel et al. 1125*, *1222*,

1223 (BH, PMA); above Finca Linares on trail to Cerro Hornito, *Folsom et al. 7217* (MO); along Continental Divide on road near Cerro Colorado, *Mori & Kallunki 5946, 5980* (MO), *Folsom & Collins 1755* (MO), *Folsom et al. 4707* (MO), *Folsom 4887* (MO), *Hodel et al. 1200* (holotype BH; isotypes HNT, MO, PMA), *1201* (BH, HNT, PMA); below Continental Divide on road to Cerro Colorado, *Croat 33050, 33432* (MO), *Hodel et al. 1199* (BH, PMA). Veraguas: Cerro Tute, ridge-top cloud forest, *Mori & Kallunki 5251* (MO), *Mori 6267* (MO). Panama: Cerro Jefe, *Dwyer 7090* (MO), *8495* (F, MO).

The epithet of the new species is from the Greek *anemo*, pertaining to the wind, and *philus*, meaning loving, and refers to its low, windswept, cloud forest ridge habitat. In some places, the forest is open and low enough that larger plants of *C. anemophila* actually penetrate or emerge from the broken canopy. While this habitat is unusual, it is shared by several other species of *Chamaedorea* in Panama, including *C. microphylla*, sometimes a companion species in the Hornito area south of Fortuna; *C. correae*, from similar forest near El Valle, Cocle province; and *C. guntheriana*, which inhabits even more extreme elfin, dwarf forest in Panama province.

The habit of *Chamaedorea anemophila* is also unusual but, like its habitat, is not without parallel in the genus. Early in life plants of *C. anemophila* pass through a phase where they have normal, adult-sized leaves but lack a visible stem. However, plants actually possess a short, curving, rooting subterranean stem with highly congested nodes, and they begin to produce much reduced, spicate, furcate, or few-branched inflorescences during this "stemless" phase (Fig. 2). Later, after perhaps as many as several years, they produce a visible, elongated stem to several meters in length with normal-sized and much branched inflorescences (Fig. 1). This stemless phase may be an establishment period to anchor the plant more securely in a relatively harsh environment prior to the development of the elongated, above-ground stem. Plants of the two phases are easily mistaken as distinct species since their habit and inflorescences differ dramatically. Other species of the genus exhibiting this or a similar phenomenon include *Chamaedorea dammeriana* and *C. macrospadix* from Costa Rica and Panama, *C. volcanensis* from Guatemala, and *C. queroana*, *C. radicalis*, and *C. whitelockiana* from Mexico (Hodel 1992*a*).

Chamaedorea anemophila is somewhat intermediate between *C. pittieri* and *C. dammeriana*. *Chamaedorea pittieri* differs in its smaller habit and thicker stem, long-open, thick, prominently striate leaf sheaths, inflorescences exceeding the leaves, thicker, less fragile petals, and rigid, stiff fruiting rachillae. In the monograph of *Chamaedorea* (Hodel 1992*a*), I tentatively referred collections of *C. anemophila* to *C. pittieri*; Plates 73F and 75B-D depicting *C. anemophila* were identified as *C. pittieri*. *Chamaedorea dammeriana* differs in its thicker, stiff fruiting rachillae and smaller, densely placed staminate flowers with deeply lobed calyx, thicker, less fragile petals, and stamens equalling the pistillode. In the key to subgenus *Chamaedoropsis* (Hodel 1992*a*, p. 120), *C. anemophila* would key out next to *C. oblongata*, found from Mexico to Nicaragua. *Chamaedorea oblongata* differs dramatically in its larger habit, thicker, glossy green leaves, staminate flowers drying black, and thick, stiff fruiting rachillae.

The inflorescences, rachillae, and especially the flowers of *Chamaedorea anemophila* are among the most delicate and fragile in the genus; only *C. microphylla* has flowers which approach or surpass in delicacy and fragility those of *C. anemophila*.

Chamaedorea recurvata Hodel **sp. nov.** (Figs. 5–6).

Subgeneris *Chamaedoropsi* Oerst. inflorescentiis masculis solitariis, floribus masculis solitariis petalis patentibus apicaliter pertinens. *C. dammerianae* Burret affinis sed inflorescentiis valde recurvatis differt. Typus: Panama, Chiriqui, *Hodel et al. 1209* (holotypus BH; isotypi MO, PMA).

Solitary, slender, erect, to 2.5 m tall (Fig. 5); stem 1 cm diam., green, prominently ringed, white-spotted, internodes 3–8 cm long. Leaves 3–4, spreading, pinnate, dark glossy green; sheaths to 15 cm long, tubular, obliquely open apically, green, white-spotted, drying longitudinally striate; petioles 10–15 cm long, 3–5 mm diam., ± rounded or slightly flattened adaxially, rounded abaxially; rachis 35 cm long, slightly angled adaxially, rounded abaxially, petiole and rachis green but white-spotted, abaxially drying with paler band extending onto sheath as a slightly raised, narrow costa; pinnae 4–7 per side, middle ones largest, these to 21 × 5 cm, basal ones to 15 × 3 cm, apical ones often confluent, to 12 × 7 cm, all pinnae lanceolate, sigmoid, glossy green and ± obscurely nerved in life, drying thin-papery, nearly