

Principes, 35(2), 1991, pp. 72-82

New Species of *Chamaedorea* from Central America

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Since the International Palm Society will publish my treatment of *Chamaedorea* in 1991, I propose several new species here for inclusion in that work. Four occur in Costa Rica, one is found in Nicaragua and two are in Panama.

***Chamaedorea minima* D. R. Hodel sp. nov.** (Figs. 1,2).

Subgeneris *Chamaedoropsi* Oerst. inflorescentiis masculis solitariis, floribus masculis solitariis petalis patentibus apicaliter. *C. pumilae* H. A. Wendl. ex Dammer affinis sed laminis nervis 6-8 utrinsecus, non iridescentibus smaragdinis venetis maculosis differt. Typus: Cult., *D. R. & M. A. Hodel 622A* (holotypus, BH).

Stem solitary, erect or creeping, short, to 25 cm tall, 1-2 cm diam., densely and prominently ringed, internodes 2-3 mm long, often with adventitious roots. Leaves 7-10 (Fig. 1), spreading, simple and bifid, \pm stiff; sheath short, 2.5 cm long, deeply split opposite petiole and clasping completely in circular manner only at base, green, minutely white-spotted; petiole 5-7 cm long, flat and green adaxially, rounded and green abaxially; rachis to 7 cm long, green and angled adaxially, rounded and pale green abaxially, minutely white-spotted; blades simple and deeply bifid to ca. $\frac{1}{2}$ their length, 15 \times 6 cm, 4-5 cm wide at tips, grayish dark forest green, lobes acute-acuminate, coarsely toothed along exterior margin, 6-8 prominent primary nerves on each side of rachis.

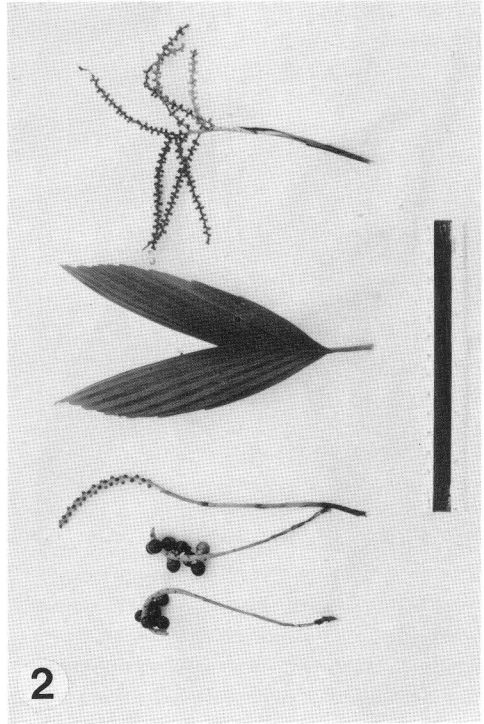
Inflorescences (Fig. 2) interfoliar, enclosed in upper rolled margins of sheath,

erect-spreading; peduncles to 12 cm long, 3 mm wide at base and there \pm flattened, 2-3 mm diam. at apex, green in flower, exposed and orange in fruit; bracts 6-8, tightly sheathing, acute-acuminate, bifid, papery, brownish in flower and fruit, longitudinally striate-nerved, prophyll 0.5 cm long, 2nd bract 1.5 cm long, 3rd 2 cm long, 4th 3 cm long, 5th 4 cm long, 6th 5 cm long, 7th 3 cm long. Staminate inflorescence with rachis 2 cm long, green in flower; rachillae 6, these to 7 cm long, 1-1.5 mm diam., spreading or slightly drooping, green in flower. Pistillate inflorescence spicate; rachis or flower-bearing portion to 7 cm long, 3 mm diam. and green in flower, swollen to 4-5 mm diam. and red-orange in fruit, curved.

Staminate flowers in moderately dense spirals, green and barrel-shaped in immature bud, 1.5 \times 0.75 mm, calyx low, 3-lobed; petals valvate, free, spreading apically. Pistillate flowers in moderate spirals, green and subglobose in immature bud, 1 \times 1 mm; calyx 3-lobed, sepals imbricate; petals tightly imbricate, apically acute, thickened, dark green. Fruits purple-black, \pm globose, 8-10 mm diam.

Distribution: COSTA RICA. Dense, wet forest at middle elevations, exact locality unknown.

Specimens Examined: CULTIVATED. Costa Rica: Puntarenas, San Vito de Coto Brus, Jardín Botánico Robert y Catherine Wilson, *D. R. & M. A. Hodel 622A* (holotype, BH), *622B* (BH). United States: California, Huntington Beach, garden of Frank Ketchum, *D. R. Hodel 673* (BH).



1. Staminate plant of *Chamaedorea minima* cultivated at Jardín Botánico Robert y Catherine Wilson, San Vito, Costa Rica from which we collected the type specimen, D. R. & M. A. Hodel 622A. 2. Infructescences and pistillate inflorescence (bottom), leaf blade (center), and staminate inflorescence (top) of *Chamaedorea minima*.

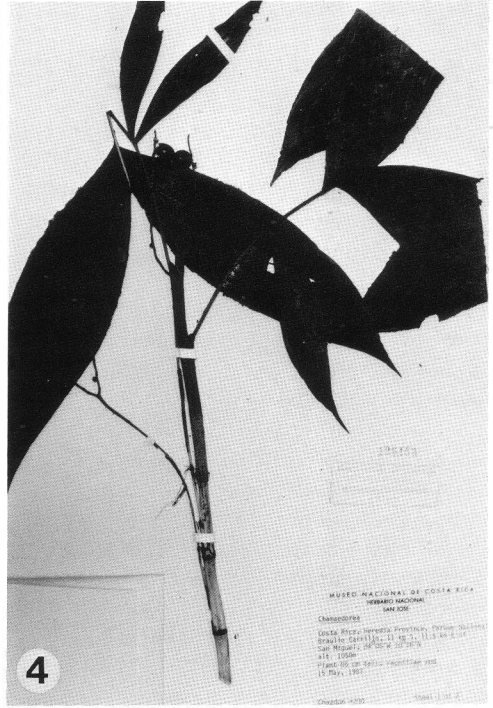
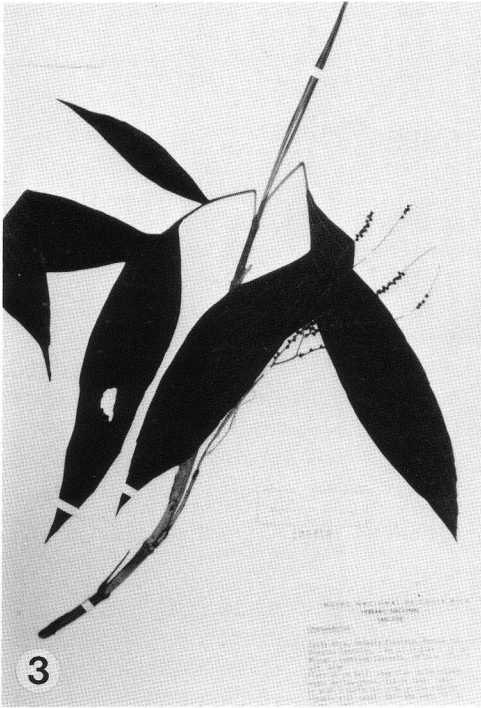
The specific epithet means smallest, in reference to the habit of this species, among the smallest in the genus.

In the late 1960s, Robert Wilson began to plant this species at his garden at San Vito in southeastern Costa Rica. Local collectors brought the plants to him but gave no specific locality other than that they grew in the mountains not too distant from San Vito. Wilson established fruiting populations of this dwarf palm in his garden (illustrated Figs. 6,7 in *Principes* 25(2): 51-52, 1981) and frequently distributed seeds and plants to palm collectors and hobbyists, most of whom lived in the United States. Wilson called this palm dwarf *pumila*, in reference to its similarity to *C. pumila*.

Chamaedorea minima is indeed close to *C. pumila* but can be distinguished by its even more dwarf habit and smaller blades with no more than 8 prominent primary nerves on each side of the rachis. In addition, the blades lack the iridescent, slightly mottled bluish green color so characteristic of those of *C. pumila*. Through Wilson's efforts, *C. minima* is cultivated in Hawaii, California, Florida, and perhaps elsewhere.

***Chamaedorea chazdonii* D. R. Hodel
sp. nov.** (Figs. 3,4).

Subgeneris *Chamaedoropsi* Oerst. inflorescentiis masculis solitariis, floribus masculis solitariis petalis patentibus apicaliter. *C. correae* D. R. Hodel & N. W.



3. Type specimen of *Chamaedorea chazdonii*, R. Chazdon 205, showing leaf blades with large terminal lobes and small basal pinnae and staminate inflorescence. 4. Fruiting specimen of *Chamaedorea chazdonii*, R. Chazdon 200.

Uhl affinis sed laminis tenuibus, nervis paucioribus, petiolis viridibus, bracteis paucioribus, rachillis masculis 5–10 patentibus, floribus masculis remotis differt; *C. dammerianae* Burret affinis sed habitu minore, caulibus repentibus, foliis et nervis minoribus numerum, rachillis masculis patentibus, floribus remotis masculis ovoideis calycibus non prominentibus, staminibus aequantibus pistillodum, fructibus globosis differt. Typus: Costa Rica, R. Chazdon 205 (holotypus, CR).

Stem solitary, procumbent and rooting along its length then briefly erect to 1 m tall, 7 mm diam., smooth, green, ringed, internodes to 4 cm long. Leaves 4–5, spreading, pinnate (Fig. 3) or less often simple and bifid; sheath to 7 cm long, tubular, tightly clasping, briefly obliquely open apically, green, finely longitudinally

striate-nerved; petiole to 7 cm long, 2–2.5 mm diam., longitudinally striate, flattened adaxially, rounded abaxially; rachis to 7 cm long, angled adaxially, rounded abaxially, rachis and petiole green adaxially and with a pale band abaxially extending onto sheath; blade if pinnate to 30 × 20 cm with 2 pinnae on each side of rachis, apical pair largest, these to 18 × 5 cm, broadly lanceolate, contracted at base, acuminate, slightly sigmoid, exterior margin remotely and shallowly toothed, 5–6 prominent primary nerves above, 1 secondary between each pair of primaries, tertiaries numerous, faint, primaries and secondaries drying yellow especially below, basal pair of pinnae to 13 × 2.5 cm with 1–2 prominent primary nerves and 1–2 secondaries on each side of this; if blade simple and bifid then to 20 × 16 cm,

deeply bifid apically to $\frac{3}{4}$ its length, lobes broadly diverging, 18×5 cm, 5-7-nerved.

Inflorescences interfoliar, perhaps infrafoliar in fruit; peduncles erect, to 15 cm long, 2-3 mm wide at base, 1-1.5 mm diam. at apex, greenish in flower, orange in fruit; bracts 4-5, tightly sheathing, greenish, membranous, becoming brown and tattered at anthesis, finely longitudinally striated, prophyll 5 mm long, 2nd bract 1.5 cm, 3rd 4 cm, 4th 7 cm long. Staminate inflorescence with 5-10 rachillae, these to 11 cm long, slender, spreading, greenish at anthesis. Pistillate inflorescence furcate (Fig. 4) or with 3 rachillae to 8 cm long, erect, greenish in flower, orange in fruit.

Staminate flowers in loose spirals, 1-3 mm apart in bud, \pm ovoid at anthesis, 2×2 mm, 1 mm wide at apex, cream-colored, superficial leaving elliptic scars 1-1.5 mm long; calyx low, 0.5×2 mm, membranous, 3-lobed, lobes broadly rounded; petals valvate, free to base, erect, deltoid, $2 \times 2-2.5$ mm, acute or slightly rounded; stamens short, filaments short or absent, anthers bilobed, lobes elliptic; pistillode columnar, 1.25-1.75 mm high, reddish and slightly lobed apically. Pistillate flowers in loose spirals, 2-3 mm apart, ovoid, 2×1.5 mm, superficial leaving rounded scars 1.25 mm long; calyx low, 0.5×1.5 mm, membranous, scarcely 3-lobed; petals imbricate basally, free apically, 1.75×2 mm, acute or rounded apically; staminodes present; pistil ovoid, $1.75-2 \times 1.5$ mm, greenish, stigma lobes darkened, flat, recurved. Fruits black, globose, 8-10 mm diam.

Distribution: COSTA RICA. Heredia. Limón. Dense, wet forest on the Atlantic slope, 700-1,100 m elevation.

Specimens Examined: COSTA RICA. Heredia: Braulio Carrillo National Park, *R. Chazdon* 136 (BH), 160, 198, 200 (CR), 205 (holotype, CR); *M. H. Grayum* 6733 (MO). Limón: Volcán Irazú, *R. Ocampo* s. n. (CR).

The epithet honors Robin Chazdon, col-

lector of the type and a majority of the paratypes and who has added immensely to our knowledge of palms in Braulio Carrillo National Park.

Chamaedorea chazdonii is known from only a few collections from the Atlantic slope of Costa Rica in Braulio Carrillo National Park on Volcán Barva and outside the park on Volcán Irazú. It is most closely related to *C. correae* from Panama but this latter species can be distinguished by its gray-green, moderately thick leaves with more nerves on each side of the rachis, gray petioles, staminate inflorescence with 1-3 ascending and more densely flowered rachillae, more peduncular bracts, and yellowish staminate flowers. *C. chazdonii* may also be confused with *C. dammeriana* but this differs in its larger habit, erect stems, more numerous leaves with more nerves, pendulous staminate rachillae, densely placed and globose staminate flowers with a prominent calyx and stamens equalling the pistillode, and oval fruits distinctly narrowed at both ends.

Chazdon (1987) referred to *C. chazdonii* as *Chamaedorea* sp. "chiquita."

Chamaedorea matae D. R. Hodel sp. nov. (Figs. 5-7).

Subgeneris *Chamaedoreae* Mart. ex H. A. Wendl. floribus masculis petalis connatis apicaliter corollis aperturis laterali-bus. *C. warscewiczii* H. A. Wendl. affinis sed foliis pinnis paucioribus (8), rachillis femineis pendulis differt. Typus: Costa Rica, *G. Mata* 497 (holotypus, CR) (Fig. 5).

Stem solitary, erect, to 3 m tall, 1.5-2 cm diam., green, smooth, ringed, internodes 5-12 cm long. Leaves 4-7, spreading, pinnate; sheath to 20 cm long, tubular, tightly clasping, obliquely open apically, longitudinally striated; petiole to 15-25 cm long, green and grooved adaxially, rounded and pale abaxially; rachis 50-70 cm long, green and angled adaxially, rounded with a yellowish band abaxially



5. Type specimen of *Chamaedorea matae*, G. Mata 497.

extending onto sheath; pinnae 4–5 on each side of rachis, broadly lanceolate, basal ones to 30×9 cm, acuminate, strongly sigmoid, thick, leathery, 5–6 prominent primary nerves, these drying yellow and prominent below, end pair of pinnae conspicuously wider, to 15 cm wide, 10–12-nerved (Figs. 5,7).

Inflorescences interfoliar, erect to nodding or arching; peduncles to 50 cm long, 7–10 mm diam., greenish in flower and red-orange in fruit where exposed; bracts 5, \pm loosely sheathing, brownish in flower and fruit, bifid, acuminate, fibrous, becoming tattered, prophyll to 6 cm long, 2nd and 3rd bracts to 15 cm, 4th to 23 cm, 5th to 26 cm; rachises 3–8 cm long, green in flower, red-orange in fruit. Staminate inflorescence with up to 15 rachillae, these to 25 cm long, pendulous, green in flower. Pistillate inflorescence with 7–10 rachil-

lae, these to 15–20 cm long, green and pendulous in flower, red-orange and pendulous in fruit (Fig. 7).

Staminate flowers in moderately dense spirals 1–2 mm apart, \pm ovoid to barrel-shaped, 3×2.5 mm, leaving superficial elliptic scars 2.5–3 mm long; calyx low, 2.5×0.75 mm, scarcely 3-lobed; petals 3.5×2.5 –3 mm, acute, connate at tips and corolla opening by lateral slits, corolla and calyx strongly nerved when dry; stamens shorter than pistillode, anthers 1.5 mm high; pistillode columnar, 2.5–2.75 mm high. Pistillate flowers leaving \pm rounded superficial scars 2 mm long; petals broadly rounded in fruit, imbricate, 2×3 mm, dark-centered, brown-margined; calyx 0.75 mm high, scarcely 3-lobed. Fruits black, \pm oval, 7 – 8×5 – 6 mm; perianth strongly nerved in fruit.

Distribution: COSTA RICA. Puntarenas. PANAMA. Herrera. Dense, moist forest on the Pacific slope, to 400 m elevation.

Specimens Examined: COSTA RICA. Puntarenas: Osa Peninsula, Marengo Biological Station, D. R. & R. J. Hodel 715 (BH, CR); Corcovado National Park, A. Gentry 48472 (MO); R. Liesner 2841 (MO, CR), 3259 (CR); O. Tellez et al. 4197 (CR); Rincón de Osa, G. Mata 497 (holotype, CR); W. Burger & J. Gentry 8905 (MO, F); P. Raven 21516 (F); J. & K. Utley 1189 (F); Carara Reserve, M. Grayum & P. Sleeper 5946 (MO); hills north of Palmar Norte, T. Croat 35184 (MO); G. deNevers et al. 7750 (CR); Esquinas Forest Reserve between Palmar Sur and Golfito, H. E. Moore 6539 (BH). PANAMA. Herrera. Cerro Alto Higo, B. Hammel 4225 (MO).

The name honors Guillermo Mata, collector of the type. *Chamaedorea matae* is close to *C. warszewiczii* with which it shares the broadly sigmoid, prominently nerved, leathery pinnae and barrel-shaped staminate flowers with petals connate apically and the corolla opening by lateral slits. However, this latter species has dou-



6. *Chamaedorea matae*, D. R. & M. A. Hodel 715, at Marengo Biological Station on the Osa Peninsula, Costa Rica. 7. Leaf and infructescence of *Chamaedorea matae*, D. R. & R. J. Hodel 715, showing broad terminal pinnae and pendulous fructing rachillae.

ble the number of pinnae and spreading, rather than pendulous, pistillate rachillae.

***Chamaedorea serpens* D. R. Hodel
sp. nov.** (Figs. 8,9).

Subgeneris *Chamaedoreae* Mart. ex H. A. Wendl. floribus masculis petalis connatis apicaliter corollis aperturis lateralibus. *C. pinnatifroni* (Jacq.) Oerst., *C. warscewiczii* H. A. Wendl. et *C. murriensi* Galeano affinis sed habitu minori, repenti et repullulanti ramificanti differt. Typus: D. R. & M. A. Hodel 745 (holotypus, BH; isotypus, PMA).

Stems cespitose, procumbent and sprawling and twisting along ground and through adjacent vegetation to 3-4 m long then shortly erect to 1.5 m tall (Figs. 8,9), 5-10 mm diam., rooting and sprouting at

nodes, smooth, green, prominently ringed, internodes 5-10 cm long. Leaves 4-5, erect-spreading, glossy green, pinnate or rarely simple and bifid; sheath to 20 cm long, tubular, tightly clasping, obliquely open apically, green, longitudinally striated; petiole to 20 cm long, green and flat above, pale and rounded below; rachis to 25 cm long, green and angled above, rounded and with a pale yellow or light green band extending onto sheath; pinnae 2-5 on each side of rachis, all but apical pair lanceolate, 12-18 × 2.5-4 cm, sigmoid, acuminate, narrowed at base, 4-5 prominent primary nerves above, 1 secondary between each pair of primaries, tertiaries numerous, faint, apical pair of pinnae (or if bifid) 27-30 × 8-12 cm, slightly sigmoid, acuminate, 9-12 prominent nerves above, these 1-2 cm apart.



8. A clump of *C. serpens*, D. R. Hodel & M. A. Hodel 745, grows on the near vertical side of a ravine, El Valle, Panama. 9. Portion of a clump of *C. serpens* showing rooting and sprouting stems.

Staminate inflorescences infrafoliar or interfoliar; peduncle to 15 cm long, 5 mm wide at base and there flattened, 1.8–2 mm diam. at apex and there \pm rounded, pale to green at anthesis; bracts 4–5, long-lanceolate, obliquely open apically, finely longitudinally striate-nerved, papery, greenish to brown at anthesis, lower ones acute, upper ones acute-acuminate, prophyll 2 cm long, 2nd bract 6 cm long, 3rd 9 cm long, 4th 10 cm long and exceeding peduncle, 5th 4 cm long and sometimes concealed by the larger 4th; rachis to 3 cm long, greenish in flower; rachillae 6–10, to 10 cm long, slightly drooping.

Staminate flowers in \pm dense spirals, 1–2 mm apart, only slightly immersed in superficial elliptic depressions 3×1.5 mm, \pm globose, $2\text{--}2.5 \times 1.8\text{--}2.5$ mm, greenish yellow at anthesis, drying brownish; calyx $0.8\text{--}1 \times 1.8\text{--}2$ mm, deeply 3-lobed nearly to base, lobes rounded to acute, only lightly nerved; petals valvate, connate apically and there adnate to pistillode and the corolla opening by basal and lateral apertures, petals 2.5×2 mm, acute, \pm thin, lightly longitudinally striate-nerved; stamens 1.25–2 mm long, anthers sessile or nearly so, 2 mm long, longitudinally bilobed; pistillode columnar, 2–2.5 mm tall, very slender, slightly flared apically. Pistillate flowers and fruits not seen.

Distribution: PANAMA. Panama. Coclé. Dense, wet forest and cloud forest at or near the Continental Divide, 800–1,000 m elevation.

Specimens Examined: PANAMA. Panama: Cerro Campana, letter and photograph from H. F. Loomis to H. E. Moore, G. Fairchild & H. Loomis s. n. (BH). Coclé: El Valle de Antón, D. R. & M. A. Hodel 745 (holotype, BH; isotype, PMA).

The epithet is from a Latin word meaning creeping and rooting, in reference to the stems of this species. *C. serpens* is one of the most unusual members of the genus with its sprawling, procumbent, slender stems rooting and sprouting at the nodes along their length. The stems appear to

grow upright until about a meter tall at which point they tend to fall over. In this manner, they form a rather loose colony of tangled stems several meters across and a meter high. The only other member of the genus approaching it in the branching habit of the stems is a form of *C. elatior* from Veracruz and Oaxaca, Mexico, that is easily distinguished by its long, vining, climbing stems and leaves with 10 or more, often deflexed, pinnae on each side of the rachis.

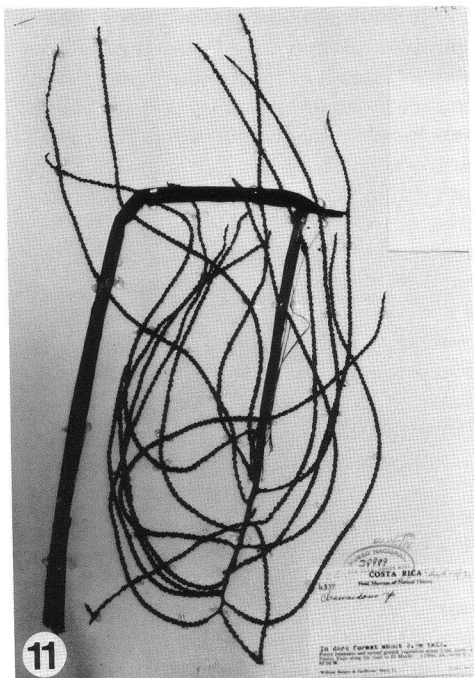
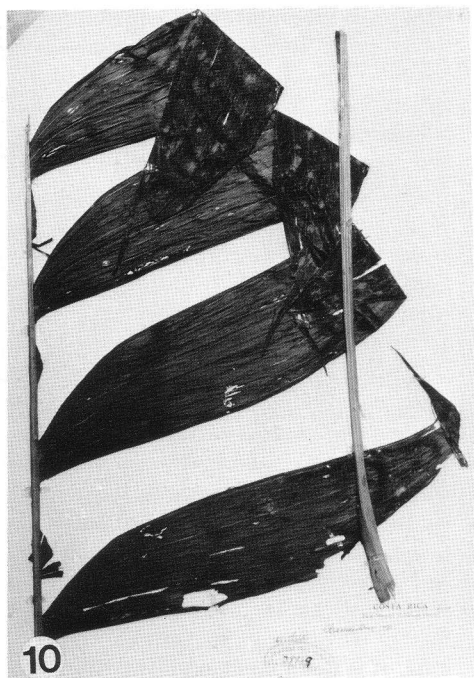
Florally, *C. serpens* is close to *C. pinnatifrons* from northern South America and related species including *C. warscewiczii* and *C. murriensis*. However, *C. serpens* is amply distinct in its creeping stems rooting and sprouting at the nodes and generally much smaller overall habit.

Chamaedorea serpens occurs in wet forest and cloud forest at about 1,000 meters elevation in western central Panama. It is not a common plant. We found it on the sides of steep ravines near El Valle where it occurs in dense forest often shrouded in clouds. This is an area rich in chamaedoreas; nearby grow *C. allenii*, *C. amabilis*, *C. corraeae*, *C. costaricana*, *C. pinnatifrons*, *C. sullivaniorum*, *C. tepejilote*, *C. warscewiczii*, and *C. woodsoniana*.

***Chamaedorea selvae* D. R. Hodel sp. nov.** (Figs. 10–12).

Subgeneris *Chamaedoropsi* Oerst. inflorescentiis masculis solitariis, floribus masculis solitariis petalis patentibus apicaliter. *C. tepejiloti* Liebm. ex Mart., *C. deneversianae* Grayum & Hodel et *C. murriensi* Galeano habitu affinis sed subgeneri diverso pertinens subgenere differt. *C. vistae* Hodel & Uhl, *C. carchensi* Standl. & Steyerm. et *C. woodsonianae* L. H. Bailey affinis sed pinnis paucioribus (3–8 utrinque versus 20 vel plus) latioribus differt. Typus: Costa Rica, W. Burger & G. Mata 4337 (holotypus, CR; isotypus, F).

Stem solitary, (rarely cespitose? *Ste-*



10, 11. Portion of leaf (10) and staminate inflorescence (11) of *W. Burger & G. Mata 4337*, holotype of *C. selvae*.

vens 24461), erect, to 2 m tall, 2 cm diam. Leaves 4–5, spreading, pinnate; sheath green with no pale stripe extending onto rachis abaxially; petiole to 35 cm long, robust; rachis to 66 cm long; pinnae 3–8 on each side of rachis (Fig. 10), to 45 × 9 cm, broadly lanceolate, sigmoid, falcately acuminate, thin-papery, 6–10 primary nerves prominent and elevated adaxially, 1 secondary between each of 2 primaries, tertiaries numerous, faint, primaries paler abaxially, end pair of pinnae sometimes very large, then each lobe to 50 × 30 cm on a rachis 40 cm long with 30 primary nerves on each side, outer margin remotely toothed toward apex.

Inflorescences infrafoliar, attached well below the leaves; peduncles erect, ± robust, to 75 cm long, 7–8 mm diam.; bracts 5–6, tubular, tightly sheathing, acuminate, fibrous, longitudinally striate-nerved, prophyll to 3 cm long, 2nd bract to 10 cm,

3rd to 25 cm, 4th to 40 cm, 5th to 35 cm, 6th to 30 cm. Staminate inflorescence with rachis to 10 cm long, straight; up to 17 rachillae (Fig. 11), these to 30 cm long, slender, pendulous. Pistillate inflorescence with rachis to 7 cm long, ± straight; up to 11 rachillae (Fig. 12), these to 20 cm long, drooping in flower, pendulous and orange in fruit.

Staminate flowers in superficial and elliptic depressions 1.25 mm long, not strongly nerved abaxially when dry, in bud arranged in moderately dense spirals but not contiguous, 0.5–1 mm apart, ± dome-shaped, 1 × 1.25–1.5 mm; calyx coriiform, 1.5 mm across, ± thick, deeply 3-lobed, lobes rounded, 0.5 × 1.5 mm, sepals connate and/or imbricate basally; petals valvate, spreading, 1 × 1.5 mm, acute, stamens with anthers 0.65 mm high, tightly appressed around pistillode, pistillode columnar, 0.75 mm high, apically

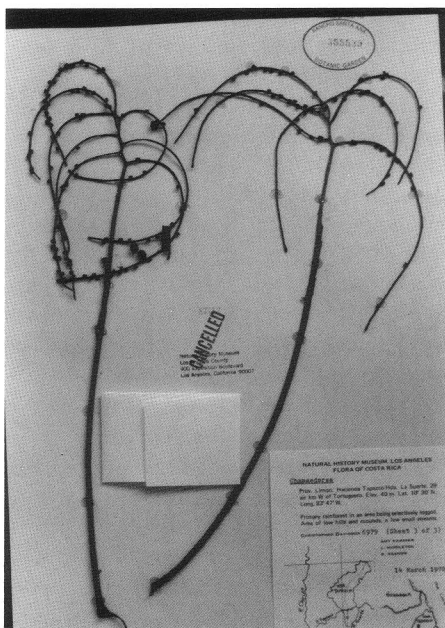
lobed. Pistillate flowers in moderately dense spirals 1–2 mm apart, leaving shallow elliptic scars 1.5 mm long, \pm globose, 2×2 mm, sepals of fruiting perianth imbricate basally, broadly rounded, 0.75×1.75 mm; petals of fruiting perianth imbricate basally, 1.75×2.5 mm, acute, petals and sepals lightly nerved adaxially; pistil ovoid, 1.25 mm high, stigma lobes pointed, erect, darkened. Fruits green when immature, oblong, 7×5 mm, maturing black.

Distribution: COSTA RICA. Limón. Heredia. San José. NICARAGUA. Río San Juan. Hillsides in wet, lowland forest on the Atlantic slope mostly below 200 m but occasionally to 700 m elevation.

Specimens Examined: COSTA RICA. Limón: 29 air kms west of Tortugera at Hacienda Tapezco and Hacienda La Suerte, *C. Davidson et al.* 6979 (RSA); 8 kms north of Linda Vista, *R. Liesner et al.* 15449 (CR); Cerro Coronel, east of Laguna Danto, *W. Stevens & O. Montiel* 24461 (CR). Heredia: 5 kms north of Puerto Viejo, *W. Burger & G. Mata* 4337 (holotype, CR; isotype, F); Puerto Viejo, La Selva, *M. Grayum* 9625, 9627 (CR), *H. E. Moore & G. Hartshorn* 10122 (BH), *N. Hammer & S. Gonzales* 112 (FTG). San José: Braulio Carrillo National Park, Sendero Chacón, *N. Zamora & P. Sanchez* 446 (CR); Estación Carrillo, *I. Chacón & G. Herrera* 1625 (CR). NICARAGUA. Río San Juan: between San Juan del Norte (Greytown) and Delta de San Juan along Río San Juan, *G. Bunting & L. Licht* 873 (F).

The specific epithet is derived from the Spanish *selva* meaning jungle (lowland tropical rain forest). A majority of the collections comes from such a habitat below 200 m elevation; four of the collections are from La Selva, the O.T.S. station near Puerto Viejo. Only the two collections from Braulio Carrillo National Park are from above 200 m elevation.

Leaves of *C. selvae* are very similar to those of *C. tepejilote*, especially in the nervation. However, the short peduncles,



12. Pistillate inflorescence of *C. selvae*, *C. Davidson et al.* 6979.

contiguous staminate flowers, and prominent yellow stripe on the abaxial surface of the rachis and petiole distinguish this latter species. *C. deneversiana* is also somewhat similar vegetatively but differs in the flexuous rachises of the inflorescences, fewer and shorter rachillae, and apically connate staminate petals.

Perhaps *C. vistae*, *C. carchensis*, and *C. woodsoniana*, all from higher altitudes, are most closely related to *C. selvae*. However, these three are amply distinct in their narrower and more numerous pinnae (20 or more on each side of the rachis versus 3–8 for *C. selvae*). In addition, *C. vistae* and *C. carchensis* have many more staminate rachillae (80–100 and 40 respectively versus 17 for *C. selvae*).

The only species of subgenus *Chamaedoropsis* that occurs in the same range as *C. selvae* is the highly variable *C. dameriana*. However, the interfoliar inflorescences, few-branched staminate inflorescences, usually spicate or furcate

pistillate inflorescences, and much smaller habit (about half the size of *C. selvae*) distinguish this latter species.

Chamaedorea selvae is rare over its range and should probably be considered endangered due to destruction of lowland forest in Limón, Heredia, and Alajuela provinces of Costa Rica and adjacent portions of Nicaragua. In fact, several of the collections are from forest remnants, indicating that suitable habitats for its growth are noncontiguous and isolated. *C. selvae* does exist in protected areas; it is well documented at La Selva as *Chamaedorea* sp. nov. fide Moore (Chazdon 1985, 1987; Moore and Chazdon 1985).

Principes, 33(3), 1989, pp. 00-00

Acknowledgments

I thank John Dransfield and Natalie Uhl for reviewing and offering helpful suggestions on the manuscript.

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Palmy Extracts

compiled by Bill Gunther

"Palms are excellent, graceful, and durable decorators from regions where their strong roots can reach the water. Remember, then, never to let palms dry out at the roots, and when watering, soak them thoroughly. Brown tips may be caused both by drying out in warm surroundings, as well as by an overly wet condition at their roots, especially when cold."

by Alfred Byrd Graf, in EXOTICA 3, 1968.

"We can have, right in New York, during our summer, a temperature and humidity every bit as tropical as Jakarta, Java, or Belem, Brazil—excepting only for the absence of the daily tropical rains. Only because the unmerciful cold season following forbids it, are we without the visual evidence in the landscape of the real tropics, the graceful palm tree."

by Alfred Byrd Graf, in EXOTICA 3, 1968.

"Rio de Janeiro is enchanting and tropical, spreading between conical mountains of the Serra de Carioca and Guanabara Bay, a maze of beautiful vistas and picturesque valleys. Slender palms testify to a warm and humid climate, and none is more imposing than the Royal palm, *Roystonea regia*."

by Alfred Byrd Graf, in EXOTICA 3, 1968.

"On the island of New Georgia in the Solomons group, during World War II, the Japanese used a 'fairly palace supported by a hundred columns' to conceal an aerodrome which they were making. The trunks (of the palms) were cut, but the crowns remained, supported by cross cables. One day there was a coconut plantation and the next revealed to American aviators an air-strip in use."

E. J. H. Corner, THE NATURAL HISTORY OF PALMS, 1966.