

mann 10808) and seen photographs of Wendland's type of *C. martiana* from Göttingen. I see no significant differences and hold them to be the same.

In horticulture, *C. cataractarum* has been confused with *C. atrovirens*. In 19th-century Europe, this latter name was erroneously applied to material of *C. cataractarum* and, in many instances, this is still the case today in Florida, California, Hawaii, and Australia. On the other hand, some material grown as *C. cataractarum* is actually *C. oreophila*.

*Chamaedorea cataractarum* is unusual in its habitat and habit. One of the few rheophytes in the palm family, it inhabits the banks of rivers and streams of the Atlantic slope of México in the states of Oaxaca, Tabasco, and Chiapas, often occurring in the water and being wholly or partially submerged during heavy rains and floods. It was originally found near waterfalls and cataracts, hence the specific epithet. In Chiapas, I observed large clumps several meters across growing along the banks of streams or small rivers. These clumps, like giant bull rushes, tended to capture and trap debris during times of high water. The debris line on the clumps of the palms was an indication of how high the water rose.

*Chamaedorea cataractarum* is also unusual in its habit of dichotomous branching. With age, plants tend to creep along the ground with their horizontal stems branching in a dichotomous manner. Fisher (1974) provides a thorough and well illustrated account of this stem form. This dichotomous branching habit results in thick clumps with a sturdy network of thick, horizontal stems which grow along the ground, anchoring the clump securely. Along with flexible leaves and leaflets that tend to bend and sway with an opposing force, the creeping and securely anchored stem enables *C. cataractarum* to grow and survive in and along streams where it is occasionally inundated by swiftly moving water.

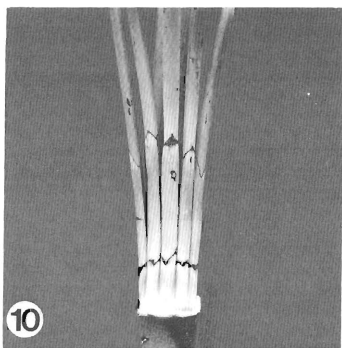
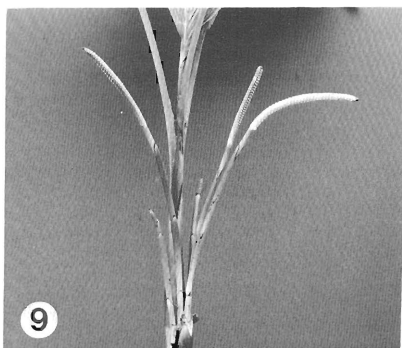
***Chamaedorea crucensis* D. R. Hodel  
sp. nov. (Fig. 7).**

*C. allenii* affinis sed floribus masculinis albidis, antheris exsertis differt; *C. zamorae* affinis sed antheris exsertis, fructibus nigris, segmentis 9–11 utrinsecus differt. Typus: Costa Rica, D. R. & M. A. Hodel 706A (holotypus, BH; isotypus, CR).

Stem solitary, erect or rarely decumbent, 1–2 m tall, 1.8–2 cm diam., green, smooth, ringed, basally with prominent brown stilt roots to 10–15 cm high, internodes 4–8 cm long. Leaves 5, erect-spreading, pinnate; sheath to 30 cm long, obliquely open at the apex and split opposite the petiole, green but distinctly pale or yellow-margined, longitudinally striate-nerved; petiole to 50 cm long, slightly grooved adaxially toward the base, rounded and pale-banded abaxially; rachis to 80 cm long, green and angled adaxially, rounded and pale abaxially; pinnae 9–11 on each side of the rachis, shining green, subopposite, regularly arranged, lanceolate, to 35 × 6.5 cm, sigmoid, falcately long-acuminate, slightly drooping at the tip, slightly contracted at the base, 9 prominent and equidistant primary nerves adaxially, the apical pinnae slightly wider.

Inflorescences interfoliar but often infrafoliar in fruit, erect, long-pedunculate, spicate or sometimes the staminate furcate; peduncles to 30 cm long, pale at anthesis, orange in fruit; bracts 5–6, green, deciduous; staminate with the rachis or flower-bearing portion to 10–15 cm long, pendulous; pistillate with the rachis or flower-bearing portion to 10 cm long, straight and stiff at anthesis, curved, swollen and red-orange in fruit.

Flowers densely packed, contiguous in bud. Staminate flowers white; calyx prominent, sepals 3 × 1 mm, joined in a very low rim with narrow lobes to 2 mm long, lobes ± double along the truncate upper margins; corolla with the petals distinct, valvate, opening distally, 3.5 × 2.25 mm; stamens with the filaments 4 × 0.75 mm,



7. *Chamaedorea crucensis*, D. R. & M. A. Hodel 806A, the individual from which the type specimen was collected, grows in rain forest near San Vito, Costa Rica. Note the staminate inflorescence below the hand. 8. *Chamaedorea deckeriana*, D. R. & M. A. Hodel 718, grows in dense, wet rain forest along the Río Sarapiquí near San Miguel, Costa Rica. Note the simple, bifid leaves and infructescence with densely packed fruits. 9–10. The spicate, staminate inflorescences of *C. deckeriana* are multiple at a node. Figure 10 shows the basal portions of the inflorescences with the leaf base removed from that node. Both photographs are of a plant cultivated in Los Angeles, D. R. Hodel 797, grown from seeds originally collected near the Río Sucío, Costa Rica.

curved distally, anthers  $1 \times 0.5$  mm, borne at the tips of the filaments and exerted above the petals at anthesis, forming a stellate pattern on the surface of the flower; pistillode columnar,  $2.5 \times 0.5$  mm, at a

lower level than the anthers. Pistillate flowers irregular,  $2.5\text{--}3.5 \times 2.5$  mm, yellowish; calyx prominent, sepals forming a complete ringlike sheath around each flower, 1.5 mm high, no definite sepal tips

but very low notches between some sepals; corolla with the petals not open, imbricate, hooded, flat distally; staminodes lacking; pistil nearly globose, 2 mm diam. Fruits densely packed, angled by mutual pressure, 8–10 mm long, green when immature changing to red or orange near maturity and then black when completely ripe; seeds ellipsoid, 5–7 mm long.

*Distribution*: COSTA RICA. Puntarenas: dense, wet forest on the Pacific slope, 1,000 m elevation. Probably endemic.

*Specimens Examined*: COSTA RICA. Puntarenas: San Vito de Coto Brus, in forest remnants adjacent to Jardín Botánico Robert y Catherine Wilson, 1,000 m elev., *D. R. & M. A. Hodel 706A* (holotype, BH; isotype, CR); *706B* (BH, CR); *H. E. Moore, Jr. 9430, 9991* (BH); *H. E. Moore, Jr. & M. V. Parthasarathy 9444* (BH). CULTIVATED. United States. California: Huntington Beach, in the garden of Frank Ketchum, received as seedlings grown by R. Wilson from seeds collected at the type locality, *D. R. Hodel 776* (BH).

The epithet is taken from the type locality near the Jardín Botánico Robert y Catherine Wilson (JBRCW), formerly well known to botanists and horticulturists as Las Cruces Tropical Botanical Garden. *C. crucensis* occurs in forest remnants adjacent to JBRCW near San Vito, Puntarenas in southeastern Costa Rica (Fig. 7). Wilson established the species in his garden and over the years distributed seeds and seedlings to palm collectors and hobbyists.

*Chamaedorea crucensis* is similar to *C. allenii* but can be distinguished by the white staminate flowers with the stamens (anthers) protruding beyond the corolla at anthesis. It can be distinguished from *C. zamorae* in the anthers protruding beyond the corolla at anthesis, black fruit, and 9–11 pinnae on each side of the rachis with the end pair not as broad as the others combined.

Apparently not widely distributed, *C. crucensis* has been collected with certainty

only at or near the type locality. It is unfortunate that numerous, similar collections from the Pacific slope of Costa Rica are pistillate specimens since staminate material is better for diagnosing this species and related taxa. Future collections of staminate material may result in a broadening of the range of *C. crucensis*.

**Chamaedorea deckeriana** (Klotzsch)

Hemsl. in Godman & Salvin, Biol. Centr. Amer., Bot. 3: 404, 1885.

*Stachyophorbe deckeriana* Klotzsch, Otto. & Dietr. Allg. Gartenzeit. 20: 364, 1852. Type: Cult., *Klotzsch s. n.* (HAN, destroyed).

*Dasystachys deckeriana* (Klotzsch) Oerst., Vidensk. Meddel. Kjoeb. 1858: 25, 1859.

*Nunnezharia deckeriana* (Klotzsch) O. Kuntze, Rev. Gen. Plant. 2: 730, 1891.

Stem solitary, 0.3–2 m tall, erect but sometimes procumbent for a short distance, green, smooth, conspicuously ringed, internodes 2–5 cm long. Leaves 4–5, simple and bifid (Fig. 8), 90–125 cm long; sheath 15–25 cm long with an oblique and  $\pm$  elongated opening, only about the lower  $\frac{2}{3}$  tightly clasping the stem in a circular manner; petiole 15–25 cm long, green and flattened adaxially with the lower margins of the leaf faintly visible as they extend on either side to the sheath, rounded and pale abaxially; rachis 20–35 cm long, angled adaxially, rounded and pale abaxially; blade thin, 50–70  $\times$  25–35 cm, obovate in outline, cuneate at the base, deeply incised at the apex, lobes broadly lanceolate, 25–35  $\times$  15–20 cm, outer margins coarsely serrate, primary nerves 20 on each side of the rachis.

Inflorescences interfoliar, emerging from behind the leaf bases although sometimes infrafoliar in fruit, spicate, erect although pendulous when heavily laden with fruits. Staminate inflorescences 4–10 per node (Figs. 9, 10), the middle one developing and opening first; peduncle 20–25  $\times$  0.5–1