

circumscribed *C. geomiformis*. We did not consider the name as potentially applicable to the Osa palm until chancing upon a specimen (*Kreuzpointner 1188*) so identified at M. The latter specimen matches the recent Osa and Guatemala collections in all respects, and all of this material agrees in all important details with Wendland's description of *C. tenella* (there is some variation in the degree of marginal serration of the leaf-blades; however, we do not regard this as significant at the species level).

It is extremely likely that Kreuzpointner's plant came from the same source as Wendland's material, or, indeed, even from Wendland himself. The label gives no such indication; however, the collection was made in the same country, and only a few years following the publication of Wendland's description. Since Kreuzpointner's specimen is, moreover, well prepared and representative of our concept of *Chamaedorea tenella* (and, more importantly, of Wendland's concept), we have chosen to designate it as the neotype (no material of this species having been located at GOET).

Complete descriptions of the preceding two *Chamaedorea* species will be presented in a forthcoming treatment of the Palmae for *Flora Costaricensis* (W. C. Burger, ed.).

Species New to Science: Desmoncus

The remarkable new species of *Desmoncus* described below was first collected by Guillermo Mata Ulloa, of Guadalupe de Goicoechea, Costa Rica, in 1964:

Desmoncus stans Grayum & de Nevers, sp. nov. TYPE: Costa Rica. Puntarenas: 7 km W of Rincón de Osa, ridge between Río Riyito and Quebrada Bane-gas, 8°41'N, 83°32'W, 200–300 m, *de Nevers et al. 7760* (holotype, MO; isotypes, CAS, CR, NY). Figures 5–8.

Planta caespitosa; caules infirme stantes, nunquam scandentes, 2–2.5 m alti; petiolus 5.5–12 cm longus; petiolus et rhachis spinis rectis 0.6–4.5 cm longis sparsim armata; rhachis folii 18–41 cm longa, in filamentum gracile inerme 1.3–14 cm longum apice prolongata; lamina pinnata pinnis in quoque latere 3–7; pinnae pro parte maxima 11–19 cm longae, 3–5 cm latae, anguste ellipticae, ad apicem piliferae vel cirrhosae; prophyllum 13–15 cm longum vagina folii prominenter exsertum; pedunculus ca. 19–22 cm longus; pedunculus et bractea pedunculi inermis; bractea pedunculi 13–18.5 cm longa, ca. 2 cm lata ubi expansa, ad pedunculum supra medium et ca. 2–4 cm subter inflorescentiam affixa; inflorescentia spiciformis, 6–12 cm longa, rhachillae nullae; triens infima inflorescentiae floribus aggregatis ternis, flos femineus unus cum floribus masculinis duobus; trientes superae inflorescentiae solum flores masculinos ferentes; bractea florum scariosae, margine remotiuscule villosa-dentatae; flores masculini calyce scarioso, 1–1.8 mm longo, calyci florum femineorum simili; flores masculini petalis tribus, lanceolatis, cremeis, in aestivatione imbricativis, 6–9 mm longis, 1.5–2 mm latis; antherae ca. 2 mm longae, basi sagittatae, basifixae, filamentis ca. 1 mm longis; flores feminei petalis connatis per duos longitudinis trientes, pisis, ca. 3 mm longis; staminodia sex, linearia, minuta; fructus maturi scarlatini, obovoidei, 1.9–2.1 cm longi, 1.4–1.6 cm lati.

Plants caespitose with 3–5 stems, these 2–2.5 m tall, 5–12 mm in diameter, erect or leaning on surrounding vegetation. Leaves 4–7; sheath tubular 21–29 cm long, with remote, straight spines ca. 5–6 mm long; petiole arising 7–13 cm below the apex of the sheath, channeled above, 3–4 mm diameter, 5.5–12 cm long; petiole and rachis closely brownish-pannose, with 1–12 dark brown, straight, somewhat flattened spines 0.6–4.5 cm long; lamina pinnate with pinnae 3–7 per side, mostly 11–19 × 3–5 cm, narrowly elliptic, nar-



5. *Desmoncus stans* (Grayum et al. 8115); apex of leaf, showing unarmed filamentous extension (barely visible) of rachis. 6. *Desmoncus stans* (Grayum et al. 8115); unopened inflorescence, showing long peduncle, with peduncular bract (thickened portion) inserted distally.

rowly acute at the base, long-acuminate to piliferous or cirrhous at the apex, the margins somewhat undulate; midrib of pinnae below with 0-2 straight spines to ca.

1.5 cm long; rachis 18-41 cm long, extending beyond the pinnae as a slender, naked filament 1.3-14 cm long (occasionally bearing a terminal reduced pinna).



7. *Desmoncus stans* (Grayum et al. 8115); opened inflorescence (past anthesis), showing spicate (unbranched) rachis. Note undulate pinna margins. 8. *Desmoncus stans* (Grayum et al. 8115); mature fruits (note persistent peduncular bract).

Inflorescences axillary, produced from 15 cm above the ground to the stem apex; prophyll 13–15 cm long, exerted 5–13 cm from the leaf sheath; peduncle ca. 19–

21.5 cm long; peduncular bract 13–18.5 cm long, attached well above the middle of the peduncle and ca. 2–4 cm below the spadix, striate when dry, unarmed,

expanding to ca. 2 cm wide at anthesis, whitish within, with a rather flattened apex ca. 1.5–3 cm long, persistent to the fruiting stage; rachis of inflorescence 6–12 cm long, spicate (unbranched); proximal third of rachis with triads of 1 pistillate and 2 staminate flowers; central third with pairs of staminate flowers; distal third with solitary staminate flowers; floral bracts scarious, the lower ca. 1×2.5 –3 mm, the upper ca. 1.5×1 mm, the margins villose-toothed. Staminate flowers with the calyx 1–1.8 mm long, the sepals scarious, with prominently thickened veins externally, connate into a trilobed cup; petals 3, distinct, imbricate, cream-colored, lanceolate, mostly 6–9 mm long and 1.5–2 mm wide, basally adnate to the receptacle; stamens 6, erect, arising from the receptacle, filaments ca. 1 mm long, anthers ca. 2 mm long, sagittate at the base, basifixed; pistillode minute. Pistillate flowers with calyx as in staminate flowers; petals light green, connate in a prominently veined, ovoid cup enveloping the ovary, apically trilobed to ca. $\frac{1}{3}$ the distance to the base, 3 mm long, persistent and spreading open in fruit; staminodes 6, linear, minute, basally adnate to the petals; stigmas 3, linear, sessile, ovules 3, basal, only one developing. Ripe fruits (*Grayum et al. 8115*) bright red, obovoid, 1.9 – 2.1×1.4 – 1.6 cm; endocarp marked with radiating fibers, rather thin; endosperm homogeneous.

Additional Specimens Examined. COSTA RICA. PUNTARENAS: Rincón de Osa, *Mata 483* (CR); cultivated in Las Cruces Botanical Garden, ca. 4 km SE of San Vito de Coto Brus, *Grayum et al. 8115* (MO, CR).

Distribution and Phenology. *Desmoncus stans* is known in the wild only from the type locality, in primary forest on slopes and ridges between the valley of the Quebrada Banegas and that of the Río Riyito (Laguna Chocuaco), at the northeastern

corner of the Península de Osa, Costa Rica. Elevations in this region are in the 200–300 m range. Here it is locally common.

Interestingly, we encountered, immediately after our discovery of *Desmoncus stans* on the Osa, two healthy clumps of this species (correctly identified to genus!) in cultivation on the grounds of the Las Cruces Botanical Garden. This site, previously discussed under *Chamaedorea brachyclada*, is located at about 1,100–1,200 m elevation, on the Pacific slope of mainland Costa Rica just opposite the Península de Osa. Although it is not uncommon for plant species to span the elevational and geographical range between San Vito and the Osa, we have been unable to locate natural populations of *D. stans* in the forests adjacent to the Garden, and the species is apparently not native in the immediate vicinity of Las Cruces. To the best recollection of the Garden's founder and patriarch, Mr. Robert G. Wilson, his material was originally collected on the Atlantic coast! We have as yet seen no herbarium material from the Atlantic slope of Costa Rica, but this sort of disjunction is quite plausible and is seen in many other plant species.

Desmoncus stans, currently known to occur naturally in only one small, unprotected area, must be regarded as an extremely threatened species.

Our single wild collection of *Desmoncus stans*, which is slightly pre-anthesis, was made in late May. Mata's original collection, representing a fruiting individual, is from early January. Plants in cultivation at the Las Cruces Botanical Garden were at anthesis and bore ripe fruits in early March.

Discussion. *Desmoncus* is a notorious genus among palm specialists in that a great many species have been described on the basis of relatively few dried (and sometimes sterile) specimens, with little or no understanding of the actual biological entities in the field. Nevertheless, we feel confident in describing *D. stans* as new,

since it exhibits a unique combination of several highly unusual features.

Desmoncus stans is remarkable in lacking all the vegetative features normally serving to distinguish *Desmoncus* from the closely related genus *Bactris*: the new species comprises erect, self-supporting, altogether non-scandent understory plants that never develop spines or retrorse hooks (representing modified pinnae and properly termed "acanthophylls") on the filamentous extension of the leaf rachis. A scandent habit and the possession of acanthophylls are so fundamental to the generic concept of *Desmoncus* that most generic keys (Standley 1920, Macbride 1936, Bailey 1943b, Standley and Steyermark 1958, Wessels Boer 1971, Read 1979, Moore and Chazdon 1985, Galeano and Bernal 1987) allude to these features alone, omitting any reference to floral or fruit differences between *Desmoncus* and *Bactris*.

According to contemporary circumscriptions of *Desmoncus* (e.g., Galeano and Bernal 1987, Uhl and Dransfield 1987), *D. stans* is also highly unusual in having unarmed peduncular bracts, and unique in its spicate inflorescences (Fig. 7) and, perhaps, its prominently exerted prophylls. Thus, although the new species strikes one immediately as a *Desmoncus* on the basis of "gestalt" characteristics, our assignment of it to that genus appears to require some defending.

The filamentous extension of the leaf rachis (Fig. 5) in the new species might be adduced as evidence that we are dealing with a *Desmoncus*, even in the absence of acanthophylls; this feature occurs regularly, however, in species of unrelated genera, such as *Geonoma seleri* Burret (MHG, pers. observ.), and at least occasionally in some *Bactris* (e.g., *Ocampo 1895*, CR; species unknown).

Fortunately, however, *Bactris* and *Desmoncus* do exhibit important floral differences (Uhl and Dransfield 1987) that permit an objective and unequivocal assignment of the new species to the latter

genus. Especially significant in this regard are the distal insertion of the peduncular bract and the basifixed, erect anthers with stamen filaments erect in bud.

Actually, in spite of most recent characterizations of *Desmoncus*, it turns out that none of the "aberrant" features of *D. stans* is unique within the genus; rather, it is the possession of all these features in combination that delimits the new species. *Desmoncus prostratus* Lindm., from the Mato Grosso (holotype S!), also lacks acanthophylls; in fact, this species may be non-scandent as well, according to the original description (Lindman 1900), in which the word "arbuscula" (a small tree) is used to describe the habit. *Desmoncus prostratus* differs from *D. stans* in many respects, however, most notably in its branched inflorescence. An unidentified *Desmoncus* from Goyaz Province, Brazil, represented by *Glaziou 22278* (BR, G), likewise lacks acanthophylls, but differs from *D. stans* in having curved spines on the leaf rachis, a densely spiny peduncular bract and a branched inflorescence.

An unidentified *Desmoncus* from Bahia, Brazil, represented by *Lewis & de Carvalho 813* (K), has unarmed peduncular bracts, but differs from *D. stans* in having acanthophylls and a branched inflorescence. Finally, *Desmoncus vacivus* L. Bailey, as represented by *Tessmann 5236* (G) from Amazonian Peru (det. Medeiros-Costa), has a spicate inflorescence; however, it possesses acanthophylls and has curved spines on the leaf rachis.

Due to its exclusive possession of straight rather than curved spines, *Desmoncus stans* is here assigned to Burret's (1934; see also Bailey 1943a) section *Orthacanthium* (his other section, *Campylacanthium*, is characterized by having curved prickles). Although we had considered erecting a new section for this aberrant species, the other exceptional species discussed in the preceding paragraphs argued against any modification of the existing infrageneric classification of *Desmoncus*.

In spite of being, all things considered, the most anomalous *Desmoncus* yet described, *D. stans* is surprisingly unprepossessing in the field. Had the Osa population not been in fertile condition during our most recent visit, we would undoubtedly have passed the plants over as juveniles of some more typical (i.e., high-climbing) species, as was presumably done during several previous excursions to the same site. Could these plants, indeed, simply be precociously flowering juveniles that would ultimately become scandent? We consider this exceedingly unlikely. The Las Cruces clones have been in cultivation there for about 10 years, and are thriving, flowering and setting fruit. However, they show absolutely no tendency toward climbing, nor toward the production of modified terminal pinnae.

Certain typically scandent (as adults) species of *Desmoncus* are known to have a free-standing juvenile stage (e.g., in the Amazon basin; A. Henderson, pers. comm.). Thus, the small stature and non-scandent habit of *Desmoncus stans*, as well as the production of inflorescences to near ground level, suggest that neoteny may have played an important role in the evolution of this species. Under this scenario, these unusual features would have to be regarded as derived within the genus. Other characteristics (lack of modified distal pinnae, unarmed peduncular bracts, spicate inflorescences, etc.) may be subject to the same considerations.

By virtue of its erect habit, manageable size, relative spinelessness and showy fruits (Fig. 8), *Desmoncus stans* is highly suitable for cultivation as an ornamental; it may well be the only species of its genus in this category.

Geonoma

The following distinctive *Geonoma*, which we first encountered in the Osa in October, 1984, represents an undescribed species which had not been previously collected:

Geonoma scoparia Grayum & de Nevers, sp. nov. TYPE: Costa Rica. Puntarenas: 7 km W of Rincón de Osa, ridge between Río Riyito and Quebrada Bane-gas, 8°41'N, 83°32'W, 200–300 m, *de Nevers et al.* 7757 (holotype, MO; iso-types, CAS, CR). Figures 9, 10.

Caulis solitarius, gracilis, ca. 1.5–3 m altus, usque 0.9 cm diametro; petiolus 21–59 cm longus; lamina semper trijugata, late ovata; rhachis laminae 27.0–31.5 cm longa; pinnae late sigmoideae, 14–26 cm longae, 4.9–9.5 cm latae; prophyllum ca. 6–8 cm longum; bractea pedunculi prophyllum subaequilonga, extus ferrugineo-pannosa; pedunculus ca. 2.3–3.8 cm longus; inflorescentia paniculata, 16–22 cm longa, 21–38 cm lata; rhachillae inflorescentiae tenuissimae, minute exasperatae, ca. 0.5 mm diametro, 8.5–11 cm longae, apice aristatae; foveae florales distantes, quam rhachillae latiores, bilabiatae, intus glabrae, orificio ca. 1.2 mm lato; labium superum foveae angustum obsolescensque, labium inferum vade emarginatum vel acute retusum; flores masculini ca. 2 mm longi; stamina sex, loculus antherarum valde inflexis; flores feminei ca. 1.5 mm longi, tubo staminodiorum apice crenato; fructus maturi nigri, subglobosi, in sicco ca. 5 mm diametro, tessellati.

Stems slender, solitary, ca. 1.5–3.0 m tall, 0.9 cm diam. Leaves consistently trijugate, 19 counted on one plant; petiole (including sheath) 21–59 cm long, channeled adaxially, rounded abaxially; sheath 7–11 cm long ($\frac{1}{6}$ – $\frac{1}{3}$ total length of petiole); lamina broadly ovate in outline, the pinnae broadly sigmoid, ca. 14–26 × 4.9–9.5 cm (the proximal pair narrowest), the primary ribs ca. 23–27 (6–8 per pinna), diverging from the rachis at an angle of 50–58° on the two distal pairs of pinnae, 73–75° on the proximal pair, prominent and narrowly raised adaxially, convex abaxially; rachis 23.0–31.5 cm long and essentially glabrous. Inflorescences infrafoliar, paniculate, 16–22 cm long, 21–38