

## THE EDITOR'S CORNER

With this issue of PRINCIPES we are inaugurating two new features which we hope will become a permanent part of the journal. One of them we are entitling "Garden Tour." This will be a trip to a garden where palms are a conspicuous or dominant part of the landscape theme. We hope to present not only the various species of palms that are growing in the garden, but also a discussion of how they are used and what the companion plants are. In this issue we are taken by Barry Osborne on a tour of Mme. Ganna Walska's garden "Lotusland" set in the hills

above Santa Barbara in California. The second regular feature we are introducing with this issue is entitled "Collector's Choice." Here a member of the Society will present a purely subjective picture of his favorite palm, relating his experiences with that particular species and explaining what it means to him as a connoisseur of palms. Lest anyone doubt the appropriateness of selecting a "favorite palm," let him recall that David Fairchild was not above selecting his favorite palm and proclaiming it from the housetops. It was *Pigafetta elata*, or more correctly *Pigafetta filaris*. W.J.D.

## The genus *Gastrococos* (Palmae-Cocoideae)

HAROLD E. MOORE, JR.\*

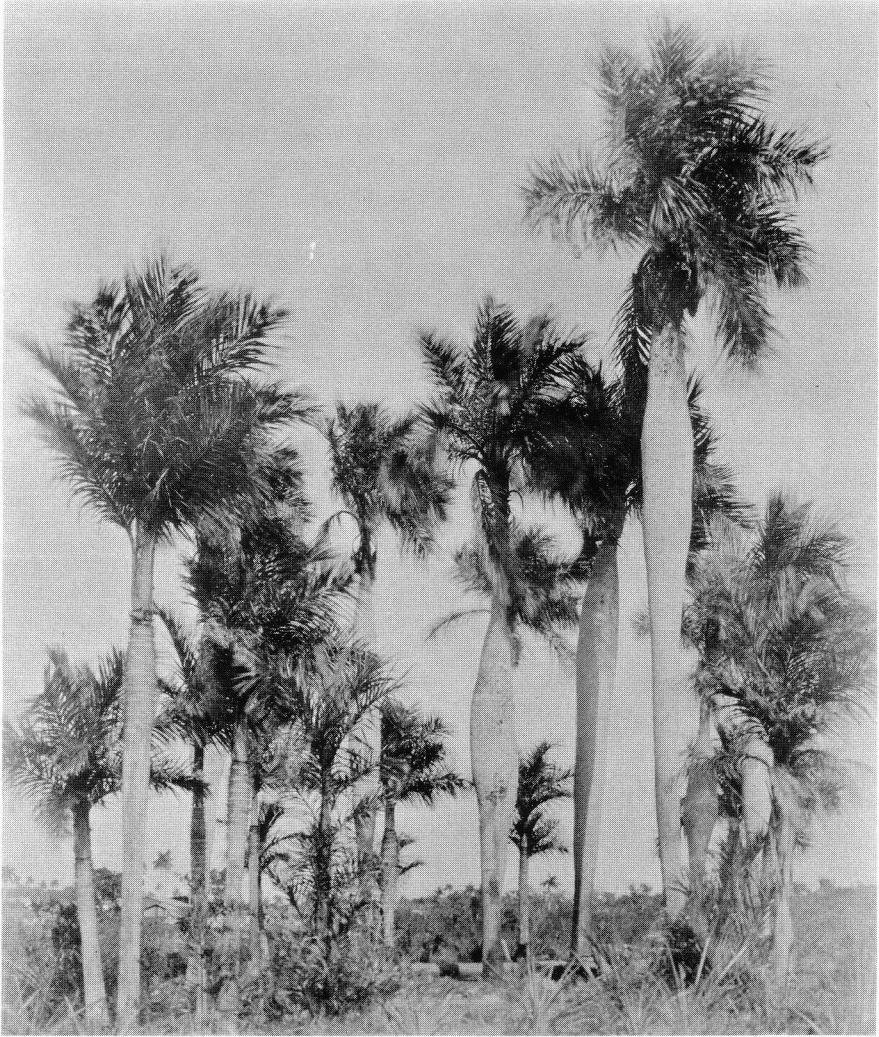
The island of Cuba is the home of a prickly palm sometimes found in cultivation, where it is generally known as *Acrocomia armentalis* or *Acrocomia crispa*. L. H. Bailey included the species in his preliminary study of *Acrocomia*, using the name *A. armentalis* (*Gentes Herbarum* 4: 462. 1941). On the basis of this study, but using an older epithet, the species was listed as *Acrocomia crispa* in a checklist of cultivated palms (*Principes* 7: 124. 1963).

It has become necessary to study this palm more closely to determine whether or not the species properly belongs in *Acrocomia*, whether it is best placed in some other genus of the prickly palms included in the tribe Bactrideae of the subfamily Cocoideae, or whether it should represent a distinct genus for which the name *Gastrococos* Morales is available. The habit and general aspect of the fruit, which appear to have guided Bailey despite the excellent detailed de-

scription of flowers given by Morales, prove deceptive when details of the inflorescence and flowers are studied.

There are significant differences which set *Acrocomia crispa* apart from all other species of *Acrocomia*. Examining the rachillae of the inflorescence in *Acrocomia*, one finds that the female flowers are few, restricted to the thicker basal part of the rachilla, generally accompanied by two lateral male flowers more or less reduced in size, and the group of three flowers, or triad, is subtended by a rather prominent bractlet and appears to be slightly sunken in the rachilla. Male flowers are much more numerous and are borne in a specialized terminal portion of the rachilla. Above the triads, except in *A. crispa*, one finds usually a few male flowers borne in pairs, each pair subtended by a rather prominent bractlet, but the majority are borne singly, each subtended by a prominent thin bractlet which is united with bractlets adjacent to it forming a little cup in which the

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1. A group of *Gastrococos crisper* at Calabazar, Province of Havana, Cuba. Photo by L. H. Bailey.

flower sits. When the flowers are removed, the upper portion of the rachilla looks like a section of honeycomb.

*Acrocomia crisper*, however, has male flowers borne in pairs throughout or nearly throughout that portion of the rachilla above the basal triads. At the tip of the rachilla one may find male flowers borne singly through the loss of one in a pair. Each pair of flowers, or each flower when single, is subtended

by a thin bractlet which is quite free from those adjacent to it, thus there is no appearance of a honeycomb when the flowers are removed.

If we compare flowers, another set of differences becomes evident. The female flowers of *Acrocomia* have a calyx composed of sepals which are distinct and overlapping, a corolla of petals which are free and overlapping or shortly united with each other by their

inner faces but then the margins are free and overlapping at the base. Stamminodes (sterile stamens) are united with each other basally in a 6-lobed tube which may be completely free from the petals or united with them basally. The female flowers of *A. crispa*, in contrast, have short sepals united in a 3-lobed cup, thickish petals united with each other for some distance, then distinct with essentially valvate triangular tips.



2. *Gastrococos crispa* (left) with persistent prickles in rings on trunks, a tree of *Roystonea regia* to right, Camaguey Province, Cuba. Photo by J. A. G. Davy.

The six prominent staminodes are united with each other in a tube as long as or longer than the corolla-tube, to which they are united for about three-fourths their length, then distinct and triangular to awl-shaped.

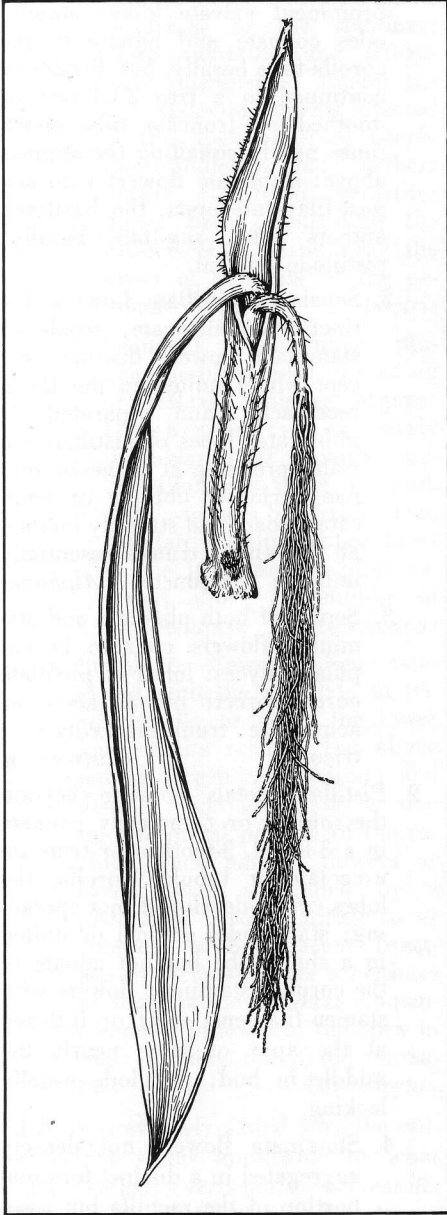
The male flowers also differ. Those of *Acrocomia* have distinct short sepals and a prominent pistillode; those of *A. crispa* have sepals united in a low 3-lobed cup and a short deeply trifid pistillode. The petals are briefly united with the floral receptacle in both. Stamen-filaments in *Acrocomia* are inflexed at the apex in bud and the anthers are dorsifixed and versatile. In *A. crispa*, the stamen-filaments are erect, the anthers basifixed.

Though the fruit of *A. crispa* generally resembles that of *Acrocomia* in shape and color, it is smaller than most and has a thin mesocarp which separates easily from a distinctly pitted endocarp. *Acrocomia* proper has fruit with a thick mesocarp of very short dense fibers adherent to an essentially smooth or more rarely shallowly pitted endocarp. These fibers are removed from the endocarp only by considerable scraping with a scalpel.

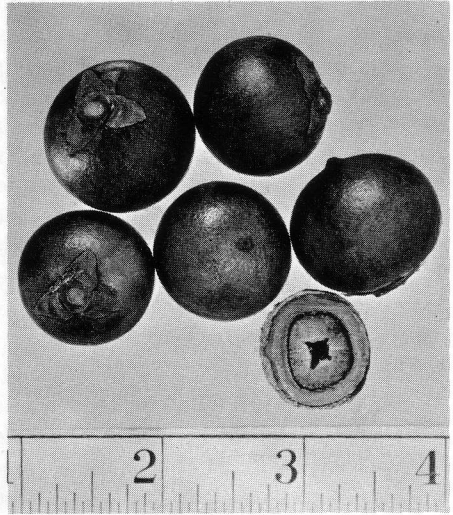
Taking these differences in sum, it appears clear that *Acrocomia crispa* differs from all remaining species of the genus, including others in Cuba, in an assemblage of characteristics despite its general habital resemblance. *Acrocomia* becomes a genus which is readily characterized and recognized even from rachillae lacking flowers when *A. crispa* is removed.

If *A. crispa* cannot be retained in *Acrocomia*, can it be placed in one of the other cocoid genera armed with prickles? *Astrocaryum*, *Bactris* and *Desmoncus* differ markedly in having petals of pistillate flowers united in a tubular 3-lobed, 3-toothed or even truncate corolla as well as in other characteristics so

that *A. crisper* clearly does not belong with them. Comparing with *Aiphanes*, however, one finds many similarities both in inflorescence and flowers. The arrangement of staminate flowers in



3. An old inflorescence of *Gastrococos crisper* with persistent bracts. Reproduced from *Genes Herbarum* 4: 426, fig. 258. 1941.



4. Representative fruits of *Gastrococos crisper*. Reproduced from *Genes Herbarum* 4: 463, fig. 290. 1941.

pairs above the triads, the union of petals with each other and with the staminodial tube in the pistillate flower, the erect stamen-filaments of the staminate flowers are similar in *A. crisper* and *Aiphanes*. Yet there are differences which in sum again suggest that to include *A. crisper* in *Aiphanes* would destroy the homogeneity of that genus: the sepals of both staminate and pistillate flowers are united in *A. crisper*, distinct in *Aiphanes*; the petals of pistillate flowers are united basally and erect above in *A. crisper*, united basally but with spreading triangular valvate lobes in *Aiphanes*; the pinnae of *A. crisper* are acute to acuminate, those of *Aiphanes* are oblique or truncate, broad, and strongly toothed at the apex; the trunk is swollen in *A. crisper*, essentially uniform in *Aiphanes*; and *A. crisper* occurs in geographic isolation from *Aiphanes* which extends northward only to Puerto Rico in the West Indies.

Both *Aiphanes* and *Acrocomia crisper* appear to have evolved from a common ancestral type yet to different degrees

and in different ways. Thus I prefer to maintain two distinct generic units as the best way of expressing this evolution in a taxonomic scheme: *Aiphanes* for some 40 taxa of Central and South America and the West Indies north to Puerto Rico; *Gastrococos* for the single species of Cuba. The following as yet preliminary key to the six genera which I currently recognize in the Bactrideae may serve to put *Gastrococos* in perspective. *Acrocomia* I consider to include *Acanthococos* as suggested by Wessels Boer (*Flora of Suriname* 5: 122. 1965); *Bactris* includes *Guilielma*, *Pyrenoglyphis* and *Yuyba*.

Preliminary Key to Genera of  
Bactrideae

1. Petals of the pistillate flowers distinct and broadly imbricate, or if sometimes partially connate basally and with an adnate staminodial tube, then at least the margins free and imbricate; pistillate sepals distinct: staminate flowers with distinct sepals and the petals distinct and valvate or adnate basally to the short floral receptacle then free and valvate; stamen-filaments inflexed at the apex in bud, the anthers dorsifixed and versatile: fruit with abundant short fibers in the mesocarp, these strongly adherent to the smooth or only very shallowly pitted endocarp: staminate flowers borne in pairs lateral to the pistillate in basal triads on the rachillae, immediately above the triads in pairs, or mostly or entirely singly and subtended by membranous bractlets adnate on all sides to adjacent bractlets forming cells resembling those of a honeycomb. *Acrocomia*
1. Petals of the pistillate flowers connate  $\frac{1}{3}$ - $\frac{1}{2}$  their length in a campanulate tube with prominent spreading or erect valvate lobes, or more than  $\frac{1}{2}$  their length in an urceolate briefly 3-lobed, 3-toothed or even truncate tube; sepals of the pistillate flowers distinct and imbricate or connate in a shallow to deep cupule: staminate flowers and inflorescences various: fruit lacking abundant short fibers adherent to the endocarp.
2. Pistillate petals connate  $\frac{1}{3}$ - $\frac{1}{2}$  their length in a campanulate tube with prominent valvate lobes; staminodes connate and adnate to the corolla-tube basally, but distinct or continued in a free 3-6-lobed or -toothed or truncate tube sometimes nearly equalling the stigmas above: staminate flowers with stamen-filaments erect, the basifixed anthers often sagittate basally; pistillode evident.
3. Sepals of pistillate flowers distinct and imbricate; sepals of staminate flowers distinct (except where united to the floral receptacle) and separated or imbricate: lobes of pistillate corolla spreading at anthesis: pinnae variously oblique or truncate, broad, and strongly toothed at the apex: trunks essentially uniform in diameter. *Aiphanes*
3. Sepals of both pistillate and staminate flowers connate in cupular calyces: lobes of pistillate corolla erect: pinnae acute or acuminate: trunk markedly ventricose. *Gastrococos*
2. Pistillate petals connate beyond the middle or completely connate in a 3-lobed, 3-toothed or truncate urceolate or tubular corolla, the lobes, when developed, not spreading; staminodes distinct or united in a short tube but not adnate to the corolla: staminate flowers with stamen-filaments erect or inflexed at the apex or from nearly the middle in bud; pistillode usually lacking.
4. Staminate flowers not densely aggregated in a distinct terminal portion of the rachilla but associated with the pistillate in triads or irregularly interspersed

among the triads and subtended by short distinct bractlets.

5. Erect plants: upper pinnae not modified into spreading or reflexed spinose organs: flowers all or nearly all borne in triads or the staminate more numerous and irregularly interspersed among triads: stamen-filaments inflexed at the apex or from nearly the middle in bud; anthers mostly dorsifixed, versatile: upper bract subtending the inflorescence borne near the lower at the base of the peduncle.

*Bactris*

5. Scandent plants: upper pinnae modified into spreading or reflexed spinose organs: flowers in triads nearly throughout the rachilla: stamen-filaments erect in bud, short; anthers basifixed, erect, sagittate basally: upper bract of the inflorescence often inserted above the middle of the peduncle

*Desmoncus*

4. Staminate flowers often associated with the pistillate in triads basally or along the lower part of the rachilla but above paired or generally solitary and densely aggregated in a distinct terminal portion of the rachilla, each pair of flowers or each flower subtended by a prominent bractlet adnate to or coherent with adjacent bractlets to form a cupule sometimes as high as the flowers: stamen-filaments inflexed at the apex in bud; anthers dorsifixed, versatile.

*Astrocaryum*

I have previously stated why the epithet *crispa* seems applicable to what Bailey called *Acrocomia armentalalis* (*Principes* 7: 171-172. 1963). It remains now to transfer the epithet to *Gastrococos*, to provide synonymy super-

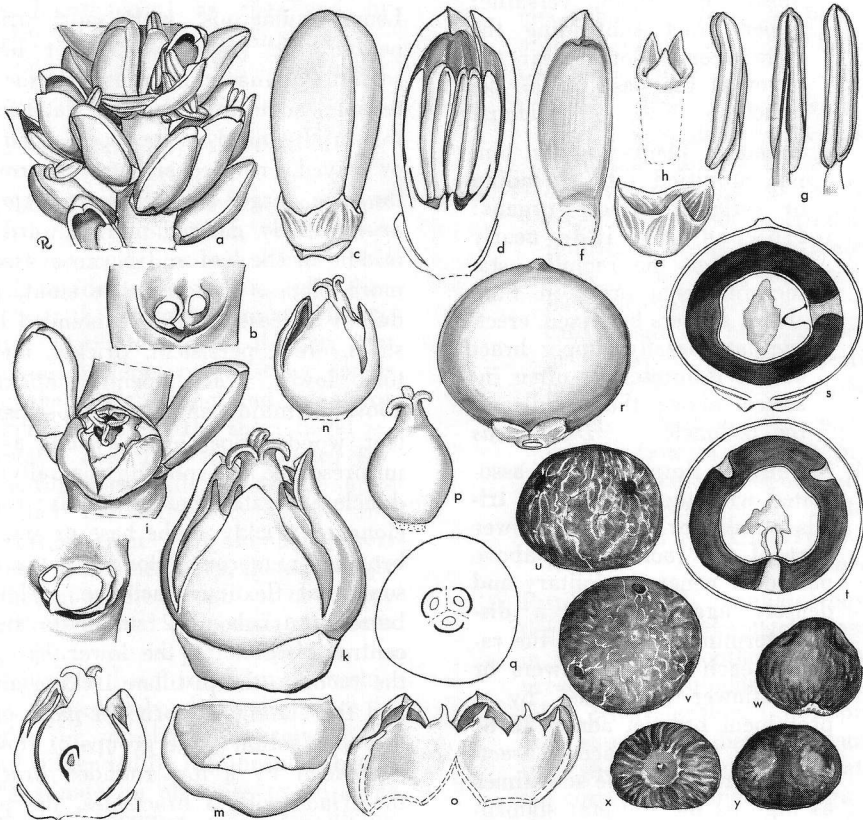
seeding that given in the checklist of cultivated palms, and to supply descriptions of genus and species.

GASTROCOCOS S. A. Morales, in *Reperitorio Físico-Natural de la Isla de Cuba* 1: 57, 30 Mai 1865.

Trunk solitary, ventricose and spindle-shaped at maturity, densely armed when young with stout dark prickles in rings, sometimes becoming nearly or quite smooth in age except on new growth. Leaves numerous, with short prickly petiole, the rachis prickly or nearly smooth; pinnae numerous, narrow, attenuate, acute to acuminate but becoming briefly bifid at the apex when old or frayed, crowded and very narrow at the base, larger and regularly arranged or in poorly defined pairs toward the middle of the leaf and borne in two or more planes. Inflorescence stout, pendulous at least in fruit, subtended by a short, erect, persistent, prickly, ancipitous lower bract opening abaxially above the middle and a tomentose persistent, woody upper bract as long as the inflorescence and splitting abaxially; peduncle elongate, densely prickly; rachis elongate, prickly at the base or smooth, bearing numerous elongate unarmed somewhat flexuous rachillae. Flowers borne in triads of 2 staminate and a central pistillate in the lower  $\frac{1}{3}$ - $\frac{1}{2}$  of the rachilla, the pistillate lacking above and the staminate borne in pairs or at the apex solitary, the groups of flowers subtended by a low rounded bractlet, the triads with 3 bracteoles, the pairs with 1 bracteole: staminate flowers with a short 3-lobed cupular calyx much exceeded by the 3 valvate petals which are basally adnate to the floral receptacle; stamens 6, the filaments distinct, subulate, erect, the anthers linear, basifixed, erect, sagittate basally, acute or briefly bifid apically; pistillode short, deeply trifid: pistillate flowers with a short 3-

lobed cupular calyx much exceeded by the 3 petals, these connate about  $\frac{1}{3}$  their length basally, valvate and erect above; staminodes nearly as long as the petals, connate nearly three-fourths their length in a 6-lobed tube adnate basally to the petals, free above; pistil ovoid, very minutely trichomatous, trilocular, triovulate, stigmas 3, recurved at anthesis, ovule attached near the middle of the locule, the micropyle at right angles to

the attachment. Fruit globose or depressed-globose, with apical stigmatic residue; exocarp smooth; mesocarp pulpy with flat fibers, readily separated from the pitted endocarp; endocarp thick, bony, with pores slightly above the middle; seed somewhat irregular with homogeneous hollow endosperm and lateral embryo. Chromosome number:  $n = 15$  (R. W. Read, in *Principes* 10: 66. 1966).



5. *Gastrococos crispera*. a, portion of rachilla with staminate flowers  $\times 2$ ; b, portion of rachilla, staminate flowers removed  $\times 4$ ; c, staminate bud  $\times 4$ ; d, staminate bud in vertical section  $\times 4$ ; e, staminate calyx  $\times 4$ ; f, staminate petal, interior view  $\times 4$ ; g, stamens in three views  $\times 4$ ; h, pistillode  $\times 8$ ; i, basal portion of rachilla with triad  $\times 2$ ; j, triad, flowers removed,  $\times 2$ ; k, pistillate flower  $\times 4$ ; l, pistillate flower in vertical section  $\times 2$ ; m, pistillate calyx  $\times 4$ ; n, pistillate flower, calyx removed  $\times 2$ ; o, pistillate corolla and staminodes expanded, interior view  $\times 2$ ; p, pistil  $\times 2$ ; q, ovary in cross-section  $\times 1$ ; r, fruit  $\times 1$ ; s, fruit in vertical section  $\times 1$ ; t, fruit in cross-section  $\times 1$ ; u, v, endocarp in lateral and top views  $\times 1$ ; w, x, y, seed in top, lateral and bottom views  $\times 1$ . a-q from material of *Read 821* preserved in liquid; r-y from dried material of *Walsingham s. n.*

Endemic to Cuba, where found on calcareous soils in all the provinces according to León, *Flora de Cuba* 1: 245. 1946.

*GASTROCOCOS CRISPA* (Humboldt, Bonpland & Kunth) H. E. Moore, *tr. nov.*

*Cocos crispa* Humboldt, Bonpland & Kunth, *Nova Genera et Species Plantarum* 1: 302 [folio 242]. 1816.

*Acrocomia crispa* (Humboldt, Bonpland & Kunth) C. F. Baker ex Beccari, in *Pomona College Journal of Economic Botany* 2: 364. 1912.

*Gastrococos armentalis* S. A. Morales, in *Repertorio Físico-Natural de la Isla de Cuba* 1: 58. 1865.

*Acrocomia armentalis* (S. A. Morales) L. H. Bailey, *Hortus Second* 22. 1941.

Trunk to 18 m. (60 ft.) high. Leaves large: sheath and petiole 7.5 dm. (2½ ft.) long, the sheath densely covered with upward-pointing slender brown prickles of varying lengths to 3 cm. (1 3/16 in.) long and occasional much

longer and stouter prickles, the upper margins fibrous and extending along the petiole nearly to the first pinnae, the free portion of the petiole about 45 cm. (18 in.) long with brown or yellowish prickles, some very stout; rachis more than 2.5 m. (8½ ft.) long, often with short yellowish prickles along the lower margin and on the lower surface near the junction with the petiole; pinnae to 120 or more on each side of the rachis, the lower ones short, narrow, and closely placed, those in the center to 1 m. (3½ ft.) long, 3 cm. (1 3/16 in.) wide, the midnerve green, the lower surface pale. Inflorescence to 1.5 m. (5 ft.) long or more, the upper bract brown tomentose; peduncle about 7.5 dm. (2½ ft.) long, densely brown or yellowish prickly; rachis about as long as peduncle, smooth or with prickles at base; rachillae to 30 cm. (1 ft.) long or more. Flowers yellow to orange, the staminate 8-9 mm. (11/32 in.) long with calyx about 2 mm. (3/32 in.) high, the females about the same height. Fruit smooth, yellow to orange at maturity, 2.5-2.75 cm. (1-1½ in.) in diameter.

## Hybrids in *Chamaedorea*

DAVID BARRY, JR.

In June 1923, the *Journal de la Société Nationale d'Horticulture de France* (ser. 4, 24: 223-244, 1923) ran an article on the cultivated *Chamaedorea* by Dr. M. A. Guillaumin of the Jardin des Plantes, Paris. After describing about fifty species the author lists several hybrids. These are referred to as recent hybrids, meaning that they were made after the turn of the century. They would indeed be recent when compared to the dates given for the introduction to horticulture of various species of *Chamaedorea*. The first species was introduced in 1794 to the Im-

perial Garden of Schoenbrunn, near Vienna. The author adds that the voyager Warszewicz, and especially Linden, the celebrated horticulturist of Ghent, introduced the major part of the species in those early days. Many were introduced between 1840 and 1890.

The first hybrid was made by a Russian, F. Katzer, of Pavlosk, about 1899. It was described as *Chamaedorea* × *Katzeri* Loebner, in *Gartenwelt* 13: 159. 1909. The parents were *C. concolor* and *C. Ernesti-Augusti*. The plant was suckering, the terminal leaves simple, like