

Ptychosperma in Cultivation

FREDERICK B. ESSIG

Department of Biology, University of South Florida, Tampa, FL 33620

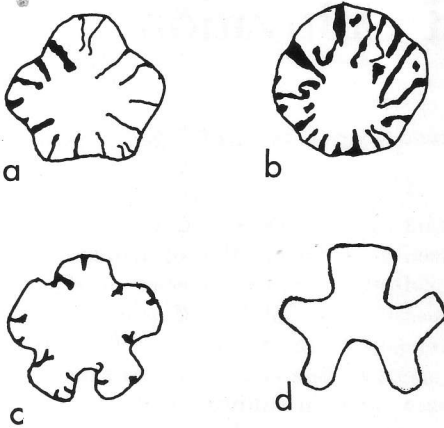
The genus *Ptychosperma* is familiar to tropical gardeners around the world, as several species have been widely cultivated for more than a century. Other introductions over the years have brought the total in cultivation to about 12 of the approximately 28 species known to occur in the wild. Two of the species, *Ptychosperma elegans* and *P. macarthurii*, are widely used in landscaping, but the others have been limited largely to botanical gardens and specialized private collections. In recent years, a few other species have been introduced, but I will consider here primarily those 12 of which mature individuals might be encountered. Several of the species have probably died out completely, though they may be found in some of the older botanical gardens such as that at Bogor in Java. Others appear no longer to exist in cultivation as pure species but have contributed to the formation of hybrids with other species.

This article is intended to serve as a guide for those who would become familiar with the cultivated species of *Ptychosperma*, and who might occasionally encounter an unusual specimen or one that is difficult to identify. I have perhaps too frequently invoked hybridization in explaining such specimens, but this is often the only way to make sense out of a confusing combination of features. It appears that, as in some other palm genera such as *Phoenix*, fertility between the various species of *Ptychosperma* is the rule rather than the exception. This is an opinion based on over six years of experience with both

wild and cultivated specimens. I have seen no documentation of deliberate hybridization between species of *Ptychosperma*; the mixing of genes in this genus is assumed to have occurred spontaneously between plants growing near each other in cultivation. For this reason, persons should propagate ptychospermas from seed with special care. Hand pollination and bagging of the inflorescences must be carried out religiously if particular species are to be preserved in their original form. Otherwise, there is a serious risk of merging many species into one super hybrid species. Distressing signs of this are already evident in specimens of *Phoenix* cultivated in Florida.

Ptychosperma is one of the advanced arecoid genera of palms that are characterized by well-developed crownshafts and infrafoliar inflorescences. *Ptychosperma* itself is further characterized by its apically praemorse or cleft pinnae and, most importantly, by its longitudinally 5-grooved seeds (Fig. 1). *Brassiophoenix* and *Ptychococcus* are genera closely related to *Ptychosperma* and have similar seeds, but the fruits are larger (3.5 cm or more long as opposed to less than 2 cm long for most species of *Ptychosperma*) and have thick, bony endocarps.

In my revision of the genus (Essig 1975b), I recognized three subgenera, one of which is again divided into two sections. The first subgenus, which consists of the former genus *Ponapea*, is characterized by its larger fruit (greater than 2.5 cm long, but without a bony endocarp), and is very rare in cultiva-



1. Seeds of several species of *Ptychosperma* cut in cross section. a, *Ptychosperma elegans*; b, *Ptychosperma salomonense*; c, *Ptychosperma schefferi*; d, *Ptychosperma macarthurii*.

tion. There are juvenile specimens of *Ptychosperma hosinoi* at Fairchild Tropical Garden and of *P. ledermannianum* at the Lyon Arboretum in Honolulu.

Subgenus *Ptychosperma*, characterized by the deeply ruminated endosperm of the seed, includes *Ptychosperma elegans*, *P. salomonense*, and a number of others

not yet cultivated. The new *Ptychosperma mooreanum* (Essig 1975a) belongs here also.

The remaining subgenus, *Actinophloeus*, is characterized by seeds with homogeneous endosperm (or weakly ruminated in *Ptychosperma schefferi*). One section of this subgenus is characterized by black fruit and solitary stems (e.g. *Ptychosperma waitianum*), and the other section by red, orange, or black fruit and stems that usually (but not always) sucker at the base to form clumps (*P. macarthurii*, *P. sanderanum*).

A key to the species of *Ptychosperma* known to have been in cultivation at one time or another is presented below, followed by discussion of the species in order of their introduction into cultivation. The most recently introduced species will not be discussed. For complete descriptions of the wild species, and further background on the genus, I refer the reader to my recent revision (Essig 1975b). All herbarium specimens cited are at the L. H. Bailey Hortorium, Cornell University.

Key to the Cultivated Species of *Ptychosperma*

1. Stems suckering to form clumps
 2. Fruit black at maturity
 3. Endosperm of the seed ruminated (Fig. 1c) 4. *P. schefferi*
 3. Endosperm of the seed not ruminated 11. *P. lineare*
 2. Fruit orange to red at maturity
 4. Pinnae very narrow, at most 1.5 cm wide; flowers and fruit densely crowded on the rachillae 6. *P. sanderanum*
 4. Pinnae more than 3.5 cm wide; flowers and fruit not densely crowded
 5. Pinnae regularly arranged along the rachis; inflorescence branches sparsely brown-scaly 5. *P. macarthurii*
 5. Pinnae irregularly arranged along the rachis; inflorescence branches densely dark-scaly 2. *P. propinquum*
1. Stems solitary
 6. Fruit red at maturity
 7. Endosperm of the seed ruminated
 8. Central pinnae very elongate, about 10 times as long as broad, with many pale, elongate, twisted scales on the prominent ribs of the lower surface; seed distinctly 5-angled or -grooved (Fig. 1a) 1. *P. elegans*

8. Central pinnae at most 6-7 times as long as broad, elongate scales lacking on the ribs of the lower surface, or if present then the seed very weakly grooved (Fig. 1b) 10. *P. salomonense*
7. Endosperm of the seed not ruminant
9. Seed deeply grooved (Fig. 1d) 5. *P. macarthurii*
9. Seed shallowly grooved (as in Fig. 1a, but without the rumination)
10. Pinnae at most 6 cm wide; inflorescence branches not scaly (mature individuals rare in cultivation) *P. ledermannianum*
10. Pinnae up to 18 cm wide; inflorescence branches scaly (mature individuals rare in cultivation) *P. hosinoi*
6. Fruit black at maturity
11. Endosperm of the seed ruminant (no mature specimens in the U. S. at present) *P. mooreanum*
11. Endosperm of the seed not ruminant
12. Pinnae broadly cuneate, regularly arranged along the rachis, with many dark, elongate, twisted scales on the ribs of the lower surface; flowers conspicuously dark-scaly 12. *P. waitianum*
12. Pinnae linear to narrowly cuneate, irregularly arranged along the rachis, elongate scales few or lacking on the lower surface of the pinnae, flowers not scaly
13. Pinnae linear, elongate; inflorescence sparsely branched (not known in cultivation in the U. S.) 3. *P. ambiguum*
13. Pinnae narrowly cuneate or with margins nearly parallel in the upper part; inflorescence much branched (not known in cultivation in the U. S.) 9. *P. cuneatum*

Note: Specimens that do not key precisely here may be hybrids. See the following discussions.

1. *Ptychosperma elegans* (R. Brown)
Blume (solitaire palm).

Ptychosperma elegans was introduced into England early in the nineteenth century from its native Australia. Hooker illustrated it in 1857 in *Curtis's Botanical Magazine* (Vol. 83, plate 4961) from a specimen cultivated in England. The species is vigorous and prolific in cultivation and has been widely used in tropical landscaping (Fig. 2). The stem is always solitary, and the pinnae are very elongate, bearing elongate, pale, twisted scales along the ribs on the lower surface. The inflorescences are profusely branched and pale green in color, bearing finally globose to slightly elongate red fruit and seeds with deeply ruminant endosperm.

Ptychosperma elegans has apparently hybridized with several species, including *P. salomonense* and the enigmatic *P. kerstenianum* (for both of which see below). Perhaps most interesting are the many individuals that appear to be hybrids with *Ptychosperma macarthurii*. Characteristics of these plants vary, but they typically have seeds shaped like those of *Ptychosperma macarthurii* (i.e. with three deep grooves and two shallow ones) but with some rumination of the endosperm inherited from *P. elegans*. The inflorescences tend to be pale greenish in color and more robust than is usual for *Ptychosperma macarthurii*, but with the conspicuous bracts subtending the branches that are characteristic of that species. The presence of several to



2. *Ptychosperma elegans* growing in the courtyard of a Miami motel.

many long, twisted scales on the ribs of the underside of the pinnae serves as an indicator of *Ptychosperma elegans*, and is very useful when found in conjunction with features characteristic of other species. One example that can be seen in Fairchild Tropical Garden is no. P-637 in plot 117 (voucher: *H. E. Moore, Jr.* 9584).

2. *Ptychosperma propinquum* (Beccari)
Beccari.

Ptychosperma propinquum and a form formerly recognized as *P. keiense* were collected from two different islands in eastern Indonesia in 1872. Plants were successfully established at the Bogor Botanic Garden (then called Buitenzorg) and were eventually distributed from

there. Evaluation of specimens labeled as *Ptychosperma propinquum* is difficult because the type collections were rather meager and no other collections from the original areas have ever been made. The species appears to be closely related to *Ptychosperma macarthurii* and the essential characteristics are as follows: The pinnae are irregularly arranged along the rachis (see Fig. 3), the inflorescence is densely covered throughout with fine, blackish, wool-like scales, and the fruits are about 2 cm long. Few individuals that I have seen match these characteristics well. The best fit I've seen in the New World is a plant labeled *Ptychosperma nicolai* (which see) at Fairchild Tropical Garden. Most living specimens labeled as *Ptychosperma propinquum* (or *P. keiense*), and a number labeled *P. macarthurii*, are probably hybrids between the two species. Herbarium specimens at the Bailey Hortorium that represent hybrids include a series collected at Bogor by van Steenis in 1935 (grown at that garden under the numbers V-K-2, V-K-2a, X-D-83, X-D-83a, XII-E-33, XII-E-70, XII-E-70a) and a specimen from the former Atkins Garden of Harvard University in Cuba (*Moore* 7048).

3. *Ptychosperma ambiguum* (Beccari)
Beccari in Martelli.

This poorly known species from West Irian (western New Guinea) was collected by Beccari in 1872 and plants were established at Bogor. It appears to have died out there before being propagated to other gardens and probably did not contribute to the hybrid gene pool. It is a diminutive palm with reddish inflorescences and black fruit, like its relative, *Ptychosperma waitianum*. It is distinctive, however, in its very narrow, linear pinnae, which are clustered along the rachis.



3. Leaf of a *Ptychosperma* hybrid growing at Fairchild Tropical Garden (no. 3988), labeled *P. nicolai*, but more closely resembling *P. propinquum*.

4. *Ptychosperma schefferi* Beccari in Martelli.

This black-fruited, caespitose palm from the north coast of New Guinea was collected by Teysmann in the early 1870's and planted at Bogor. The species is characterized by the combination of black fruit and seeds with weakly ruminate endosperm (Fig. 1c). From Bogor, seeds were distributed around the world, both as *Ptychosperma schefferi* and under the erroneous name of *Coleospadix oninensis*. Seeds that ultimately reached Florida, however, appear to have resulted from hybridization with *Ptychosperma macarthurii*. An example is the plant grown at the U. S. Plant Introduction Garden at Chapman Field, Florida under the number PI 97545-5480 (voucher *F. B. Essig* 710122-1). I have not seen living specimens in the United States that match the wild material.

5. *Ptychosperma macarthurii* (H. Wendl.) Nicholson (Macarthur palm).

Ptychosperma macarthurii is the caespitose species most frequently encountered in cultivation, probably equaling in popularity the solitary *P. elegans*. The name had rather dubious beginnings, however, having been in use in the horticultural trade for decades before its valid publication under botanical standards. Even then, decades more passed before an adequate description of the species appeared in the literature and before a type specimen was designated (see Essig 1975b). The species is characterized by its robust, caespitose habit (Fig. 4), the regular arrangement of its pinnae, and its sparsely brown-scaly inflorescence with conspicuous bracts subtending the branches, bright red fruit, and seeds that tend to show three deep grooves and two shallow ones



4. A typical clump of *Ptychosperma macarthurii* at Fairchild Tropical Garden.

when cut through the middle (Fig. 1d). It is the most vigorous of the species in the genus, and appears to have hybridized with many of the others.

6. *Ptychosperma sanderanum* Ridley.

This species is very distinctive by virtue of its extremely narrow, elongate pinnae, and secondarily by the very crowded arrangement of the flowers and fruit on the rachillae. Genuine material of this species is very rare in cultivation. I have matched herbarium specimens from Bogor and Hawaii with the original description. In Fairchild Tropical Garden, the plant numbered FG 4155 (Plot 143), and illustrated here (Fig. 5) is the only living specimen I have seen that matches. Other material labeled *Ptychosperma sanderanum* (usually written incorrectly as 'sanderianum') appears to represent hybrids with *Ptychosperma macarthurii* or more complex hybrids



5. *Ptychosperma sanderanum* at Fairchild Tropical Garden. Notice the extremely narrow pinnae.

involving also *P. propinquum*. Herbarium specimens of this sort of hybrid at the Bailey Hortorium are from Brazil (*L. H. Bailey & E. Z. Bailey 421*) and from Singapore (*L. H. Bailey s.n.*, 1925).

7. *Ptychosperma nicolai* (Hort. Sander) Burret.

This name is associated with some hybrid specimens. The species was described nearly 80 years ago from a juvenile plant in cultivation, and no herbarium specimens were ever made, nor were flowers or fruit ever described from



6. The original illustration of *Ptychosperma nicolai*, from *The Gardener's Chronicle*, ser. 3, vol. 33, p. 245. 1903.

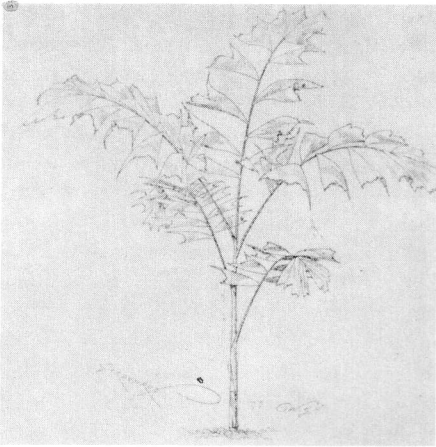
authentic material. From the original illustration (Fig. 6) one can see a unique combination of characteristics. The plant appears to be caespitose, as there are several stems of varying age arising from the base of the plant. This suggests an affinity with *Ptychosperma macarthurii* and other caespitose species. The pinnae are rather broadly cuneate, however, which is unlike any of the known caespitose species. The pinnae are regularly arranged along the rachis, and according to the original description, the foliage is reddish when first emerging. It seems fairly likely, then, that *Ptychosperma nicolai* is, or was, a legitimate species. However, I have not seen any specimen, living or preserved, with this combination of characteristics, and the species may never be properly identified.

The few herbarium specimens I have seen bearing this name appear to repre-

sent hybrids with *Ptychosperma propinquum* as one parent. Several such specimens were collected in Cuba (*L. H. Bailey* 328, in Havana, and *H. E. Moore* 7054, at the former Atkins Garden of Harvard University, Cienfuegos), and a living specimen can be seen at Fairchild Tropical Garden (no. 3988, beside the Rare Plant House; voucher *F. B. Essig* 710123-4). Aside from the name tag, the only characteristic linking these specimens with *Ptychosperma nicolai* is the reddishness of the young foliage, which cannot always be seen in the plant at the Fairchild Garden. Otherwise these specimens are difficult to distinguish from *Ptychosperma propinquum*. The pinnae are narrow, not cuneate, and irregularly arranged (Fig. 2), and the inflorescence is densely dark scaly, as is characteristic of the latter species. For the present, at least, the name *Ptychosperma nicolai* should not be used for any cultivated plants.

8. *Ptychosperma kerstenianum* (Hort. Sander) Burret.

The circumstances surrounding this species are very similar to those surrounding *Ptychosperma nicolai*. The two were probably brought back together from New Guinea by Micholitz, for they were presented to the public within a year of one another by Sander in England. As in *Ptychosperma nicolai*, the species was described from a juvenile plant, without preservation of a type, and no description of flowers or fruit was ever made. Later efforts by botanists to fix the identity of this species are in conflict with one another as they were based on different herbarium specimens from cultivation, none of which could be reliably identified as authentic material (see Essig, 1975b). The illustration accompanying Sander's note (Fig. 7) is even less useful than that accompanying *Ptychosperma nicolai*. The plant figured was solitary and had



7. The original illustration of *Ptychosperma kerstenianum*, from *The Gardener's Chronicle*, ser. 3, vol. 24, p. 391. 1898.

broadly cuneate pinnae, but little else can be discerned. As such, the plant may be matched with several known species of *Ptychosperma* (such as *P. waitianum* or a number of others not yet in cultivation), or even with species of other genera such as *Balaka* or *Drymophloeus*. It does not match any recently cultivated specimens I have seen, however. Two herbarium specimens bearing the name *P. kerstenianum* appear to represent hybrids with *Ptychosperma elegans*. One specimen is from Rio de Janeiro (*Toledo 49483*) and the other from the Langlois estate in the Bahamas (*H. E. Moore, Jr. & M. Langlois 5861*). These two specimens resemble *Ptychosperma elegans*, but the pinnae are somewhat cuneate rather than tapered at the tip as in that species. The puzzle of what the true *Ptychosperma kerstenianum* was or is can probably never be solved and the name should be abandoned.

9. *Ptychosperma cuneatum* (Burret)
Burret.

This black-fruited species from northern New Guinea was introduced to Bogor Botanic Garden in 1903, but apparently

never spread from there. It is a close relative of *Ptychosperma waitianum*, but differs from that species in its more elongate, narrowly cuneate pinnae that are irregularly arranged along the rachis, and in its larger, more branched and more sparsely scaly inflorescence. The species has not been grown in the New World, but I collected herbarium specimens from the wild in New Guinea in 1971 and sent a small number of seeds to The Palm Society Seed Bank. They were distributed under the numbers *Essig LAE 55097* and *55098*.

10. *Ptychosperma salomonense* Burret
(*Strongylocaryum* spp.).

Seven species of *Ptychosperma* have been described from the Solomon Islands, three of them under the generic name *Strongylocaryum*. After considerable study of herbarium specimens from nearly every major island in the chain, I came to the conclusion that they all represent forms of one highly variable species. I confess however to a lack of firsthand field knowledge of the Solomon Island *ptychospermas*, and someone more intimately familiar with them might have a different opinion. I am provisionally using the earliest published name for the entire complex, having failed to find meaningful or consistent differences between the supposed species.

The first *ptychospermas* from the Solomon Islands to be cultivated were sent by Dr. J. D. Campbell in 1940. The kind grown as *rakii* is very robust, resembling *Ptychosperma elegans*, while *takasi* is more diminutive with a delicate inflorescence that takes on an orange tinge as the fruit ripen. Plants introduced as *Strongylocaryum latius* are much like that grown as *takasi*.

Ptychosperma salomonense is characterized primarily by the extreme shallowness of the five longitudinal grooves of the seed. The seeds, in fact, often ap-

pear completely round in cross section. It was this characteristic that prompted Burret to erect the genus *Strongylocaryum*. However, seeds from Bougainville have very distinct grooves and there are others from throughout the range that show varying degrees of grooving. For this reason the genus *Strongylocaryum* was abandoned. Most of the plants in cultivation can be distinguished by this characteristic however. At least some of those that cannot be so distinguished appear to be hybrids. Hybridization between *Ptychosperma salomonense* and *P. elegans* is not obvious, since the two species are rather similar. Perhaps some of the specimens with weakly distinct grooves belong in this category. More distinctive is an apparent hybrid between *Ptychosperma salomonense* and *P. macarthurii* collected from the Jennings estate in Miami in 1959 (*H. E. Moore, Jr. 7729*). The seeds have three deep grooves and two shallow grooves, as is so common in cultivated *Ptychosperma macarthurii*, but the endosperm is somewhat ruminate. The inflorescence has the general appearance and scaliness of *Ptychosperma salomonense*, but prominent bracts subtend the branches as in *P. macarthurii*. These two species are in different subgenera, suggesting again that barriers to hybridization may be lacking throughout the genus.

11. *Ptychosperma lineare* (Burret) Burret.

This species is closely related to *Ptychosperma macarthurii* except that the fruits are black instead of red. As the

name implies, the pinnae also tend to be somewhat narrower than in species, but occasional specimens of *Ptychosperma macarthurii* can be found with equally narrow pinnae. Unless they are in fruit, one can hardly distinguish between the two species. *Ptychosperma lineare* was sent to Florida by L. J. Brass in 1953 from southeastern Papua New Guinea where it is native. Some fine examples can be seen at Fairchild Tropical Garden in plot 149 (*FG 3174*, voucher: *F. B. Essig 710127-1*).

12. *Ptychosperma waitianum* Essig.

Ptychosperma waitianum, which has recently been described and illustrated (Essig 1972), is one of the newest and most distinctive members of the genus to be introduced into cultivation. It too was sent to Florida by L. H. Brass from southeastern Papua New Guinea, this time in 1956. It is a diminutive palm, with broadly cuneate pinnae that have many dark, twisted scales below, and a small, densely dark scaly inflorescence that has few branches. The flowers are reddish and the fruit is black. The name honors Lucita Wait for her service to The Palm Society. Plants can be seen at Fairchild Tropical Garden in plots 127 and 149 (*FG 57-22*, voucher *F. B. Essig 710121-1*).

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