

HYBRIDIZATION IN THE BABASSU PALM COMPLEX. II. ATTALEA COMPTA × ORBIGNYA OLEIFERA (PALMAE)

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Balick, Michael J. (New York Botanical Garden, Bronx, NY 10458-5126), Anthony B. Anderson (Museu Paraense Emílio Goeldi, Caixa Postal 399, 66.000, Belém, Pará, Brazil), and Judas Tadeu de Medeiros-Costa (UFPE—Departamento de Botânica, Rua Cons. Silveira de Souza, 1181, 50.721, Recife, Pernambuco, Brazil). Hybridization in the babassu palm complex. II. *Attalea compta* × *Orbignya oleifera* (Palmae). *Brittonia* 39: 26–36. 1987.—A new hybrid palm, ×*Attabignya minarum*, from the Rio São Francisco Valley of Minas Gerais, Brazil is described. It is a natural hybrid between *Attalea compta* Mart. and *Orbignya oleifera* Burret and is quite common in the area studied. Most of the morphological characters of the hybrid are intermediate between those of the parent species. A notable exception is the number of fruits produced; ×*Attabignya minarum* produces more fruits per panicle than either parent species. This is the first report of hybridization between *Orbignya* and *Attalea* and may shed light on the status of *Orbignya*, considered by some to be synonymous with *Attalea*.

The first paper in this series (Balick et al., in press) discussed the role of one hybrid complex in the genus *Orbignya*. This genus contains the economically important babassu palm complex, a group of palms in the tribe Cocoeae and subtribe Attaleinae (Dransfield & Uhl, 1986) widely distributed in lowland Brazil and Bolivia. The most important and widespread species is *Orbignya phalerata* Mart., the fruits of which are harvested to produce oil and charcoal. Approximately two million people collect the fruits of this species, manually crack them to extract the oil-rich seeds, and obtain charcoal from the remaining epicarp and endocarp. The taxonomy of *O. phalerata* is discussed in detail in Anderson and Balick (In press), along with that of another species, *Orbignya oleifera* Burret, which has a more restricted range. Together these two taxa comprise the palms commonly known as babassu (“babaçu” in Portuguese) or less commonly, “coco palmeira.”

Orbignya oleifera is of great interest as a potentially useful plant, due to its abundant production of pistillate (fruit-bearing) inflorescences and higher percentage of oil in the seeds compared to the more widespread *O. phalerata*. Much of our botanical research in the last six years has been directed toward understanding this group and promoting its utilization through improved management practices and the selection of superior germplasm. Because of its unique characteristics, *O. oleifera* is of great importance to this work, and we have made several expeditions to its native range in Brazil to study variation in wild populations.

In 1984 we travelled to the Município of Santa Fe in Minas Gerais, Brazil (ca 165 km E of Montes Claros), where *O. oleifera* is common in the pastures and disturbed forests. The owner of the Fazenda Santa Maria, a farm some 11 km from the town of Santa Fe, granted us permission to collect palms on his property. There we found two palms dominating the landscape, *O. oleifera* and *A. compta* Mart. (Figs. 1, 2). These are known in this region as “coco palmeira” and “indaiá” respectively. We were informed that a similar palm, known as “indaiá mestiço,” was also found in this area. Because the Portuguese word “mestiço” refers to someone of mixed blood, we were intrigued by the possibility that the plant called “indaiá mestiço” might be a hybrid between the local species of *Orbignya* and *Attalea*.

After a detailed survey of the population, three elements were identified. The

first two consisted of intermingled stands of *O. oleifera* and *A. compta*, each species exhibiting the morphological uniformity we had encountered in other populations during five years of fieldwork with this group. The third group consisted of a swarm of individuals with much morphological variation, most of which was in range intermediate between the two species mentioned above. During previous surveys of over 100 populations of *Orbignya*, we never found anything similar in morphology to this third group of palms. However, hybrid complexes were identified in several populations of *Orbignya* where these populations integrated with certain other species or genera in the Attaleinae. This was the first time we had ever found *A. compta* growing with a species of *Orbignya*, and we are convinced that, based on the propensity for natural hybridization within the Attaleinae as well as the intermediate (but still highly variable) morphology of the newly-identified palm, that it is indeed a hybrid and that the parents are *A. compta* and *O. oleifera*.

A search of the literature failed to reveal a previous report of this hybrid palm. We are giving it a nothogeneric name, according to Articles H.3 and H.6 (Appendix I) of the International Code of Botanical Nomenclature (Voss et al., 1983).

The lack of accurate, published species descriptions, especially based on an understanding of variation in the wild, limits our understanding of these two genera. To help resolve this problem, detailed descriptions of the parent species based on our herbarium and field observations are included herein. The description of the new hybrid is based on the specimens cited as well as on observations and measurements of a number of other palms in the population.

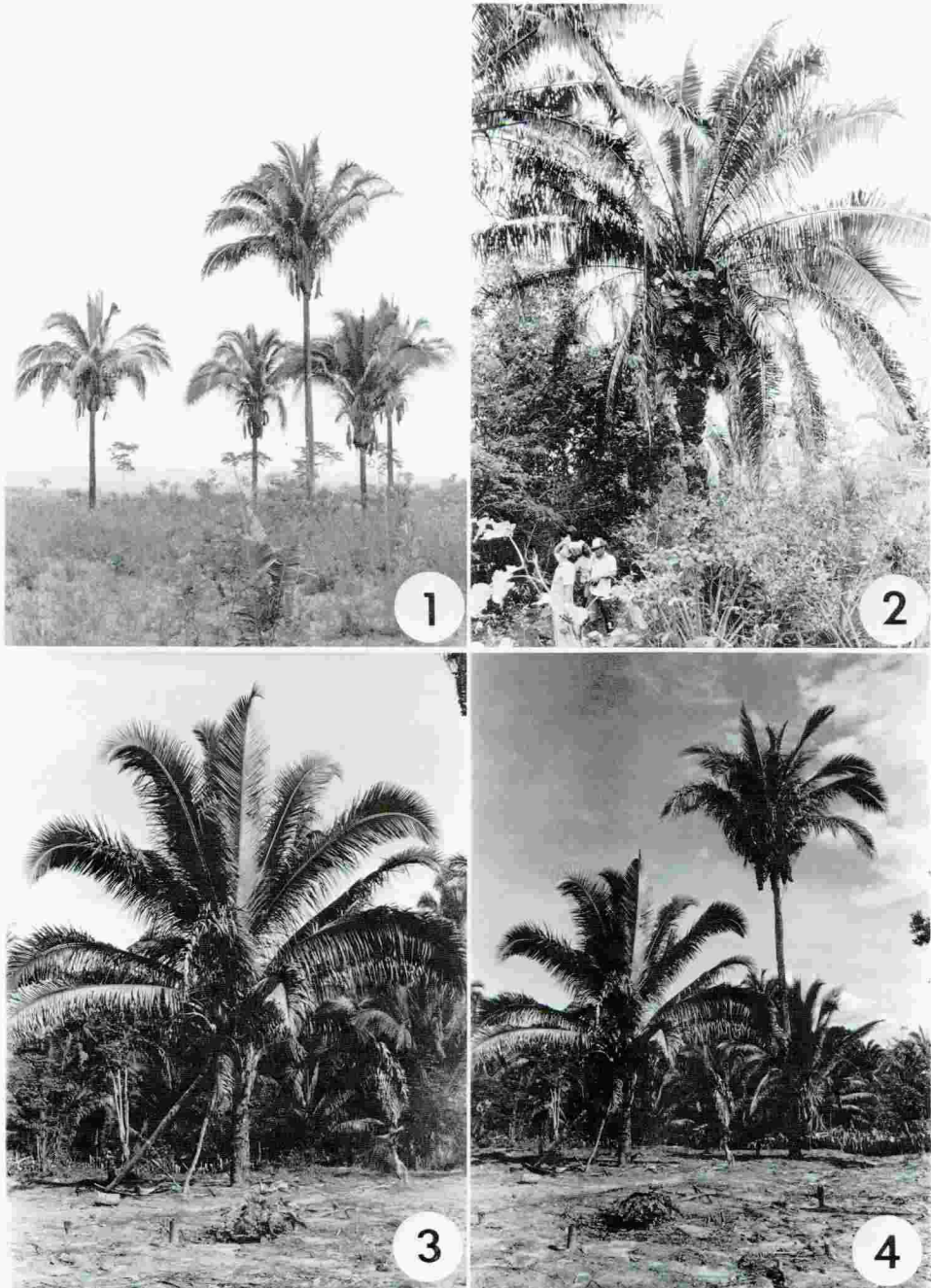
× **Attabignya** Balick, Anderson & Medeiros-Costa, gen. hybr. nov. (Figs. 3, 4)

Attalea H.B.K. × *Orbignya* Mart.

× **Attabignya minarum** Balick, Anderson & Medeiros-Costa, sp. hybr. nov. (Figs. 3, 4)

Notulis morphologicis plurimis inter *Orbignyam oleiferam* Burret et *Attaleam comptam* Martius intermedia et solum inter parentes obvia. Palma 7–11 m alta, trunco solitario 35–40 cm diam. Folia pinnata, pinnis ad racheos basin fasciculatis distaliter ordinatim dispositis; pinnae medianae ±98–110 cm longae, ad medium 4–7 cm latae. Inflorescentia androgyna, rachillis 9–12 cm longis; florum petala anguste elliptica vel ovata; stamina 11–20, thecis rectiusculis vel subtortis vel subcurvatis. Fructus elliptici 9.2–10 × 4.3–6.7 cm; semina saepissime 3–4.

Solitary, erect, pleoanthic, monoecious palm; stem 2–6 m high, 35–40 cm in diam, with pronounced, closely spaced internodes. Leaves 14–22, fewer in younger or senescent plants, spirally arranged in a broad, arching crown; sheath 70–74 × 31–33 cm, partially clasping, split opposite the petiole, thick, coriaceous, adaxial surface smooth and greenish, abaxial surface weakly gray-lepidote with yellow, longitudinal striations that may extend to the rachis; petiole 5–10 cm long, adaxial surface channelled and smooth, abaxial surface convex and glaucous; rachis 5.37–5.5 m long, base trough-shaped in cross-section, center more or less 4-sided, becoming triangular toward apex, abaxial surface glaucous; pinnae 181–191 per side, in groups of 2–5 at base of rachis, otherwise regularly spaced and in a single plane, rigid to pliant, linear-lanceolate at center of rachis, acute, plicate, basally reflexed at attachment, 1-ribbed with prominent intermediate veins, adaxially green and smooth, abaxially dull-glaucous; basal pinnae 135–152 × 1.2–2.1 cm; middle pinnae 98–110 × 4–7 cm; apical pinnae 14–22 × 0.9–1.4 cm. Inflorescences interfoliar, yellowish at anthesis, bearing a prophyll; peduncular bract 128–140 × 22–27 cm, woody, longitudinally ribbed, brown, swollen in middle, persistent, with acumen 17–20 cm long; peduncle ca 50 cm long; rachis 50–150 cm long; rachillae of staminate inflorescence simple or occasionally much branched,



FIGS. 1-4. 1. *Orbignya oleifera*, from Mun. Santa Fe, Minas Gerais. 2. *Attalea compta*, from Mun. Santa Fe, Minas Gerais. 3. Type tree of \times *Attabignya minarum* growing in an open area behind farmhouse, from Mun. Santa Fe, Minas Gerais. 4. Type tree of \times *Attabignya minarum* (left) growing next to *Orbignya oleifera* (right).

ca 300 in number, 14–30 cm long, linear to slightly undulate, slender, attenuate, arranged spirally around the rachis and subtended by 1 or 2 membranous bracts 0.6–1.4 cm long, bearing staminate flowers arranged in 2 longitudinal rows on abaxial side only; rachillae of androgynous inflorescence simple, frequently curved or contorted, 9–12 cm long, arranged spirally around the rachis, each rachilla subtended by a bract 4–8 mm long and generally bearing 1 pistillate flower at middle (2.5–4 cm above insertion on rachis) and 2 rows of 25–38 staminate flowers on the abaxial side extending to the apex, or bearing exclusively staminate flowers. Flowers unisexual. Staminate flowers yellowish, slightly fragrant, subtended by a bracteole ca 0.5 mm long; sepals 3, free or basally connate, triangular to deltate, 1.2–3 × 0.8–1 mm, membranous to slightly coriaceous; petals (2) 3, free, more or less straight to inrolled, 0.9–1.8 × 2.5–5 mm, narrowly elliptic to ovate, acute at apex, coriaceous with smooth margins; stamens free, 11–20; filaments straight, linear; thecae united, longitudinally dehiscent, linear to loosely coiled and twisted; pollen grains free; pistillode reduced. Pistillate flowers not seen. Fruit ellipsoid, 9.2–10 × 4.3–6.7 cm, 110–176 g (dry weight), brown-lepidote throughout, occasionally channelled on sides, mature fruits with an indistinct ring left by staminodial cupule; stigmatic residue persistent, apical or sometimes slightly eccentric; fruiting perianth indurate, consisting of 3 sepals 3.8–4.4 cm long, 3 petals 5.2–7.2 cm long, and a staminodial ring; epicarp 2–3 mm thick, fibrous; mesocarp 2–5 mm thick, yellow at maturity; endocarp 4–5.2 cm in diam, woody and very hard; seeds generally (2) 3–4, ellipsoid, ca 3–4 cm long; endosperm white, oily, homogeneous; embryo basal.

TYPE: BRAZIL. MINAS GERAIS: Mun. Santa Fe, 11 km from town of Santa Fe near stream called Logra do Rio, on Fazenda Santa Maria, 30 Nov–1 Dec 1984, *M. J. Balick, J. T. Medeiros-Costa, J. M. F. Frazão & J. G. A. Vieira 1694* (HOLOTYPE: CEN; ISOTYPE: NY).

Specimen examined: BRAZIL. Same locality as type, 30 Nov–1 Dec 1984, *M. J. Balick et al. 1692* (CEN, NY).

ATTALEA COMPTA Mart.

Attalea compta Mart. Hist. Nat. Palm. 2: 137, t. 41, t. 97 (pro parte). 1826. TYPE: BRAZIL. "in plures provincias," *Princ. M. Neovidensis s.n.* (LECTOTYPE: M, n.v., selected by Glassman, Fieldiana Bot. 38: 40. 1977; F, neg. 18551a).

Solitary, erect, pleoanthic, monoecious palm; stem 2.5–7.5 m high, 20–32 cm in diam, with leaf sheaths persistent on upper third and pronounced, closely spaced internodes on lower two-thirds of stem. Leaves 15–30, fewer in younger or senescent plants, spirally arranged in a broad, arching crown; sheath 40–130 × 20–22 cm, partially clasping, split opposite the petiole, thick, coriaceous, adaxial surface smooth and greenish, abaxial surface weakly gray-lepidote; petiole 10–20 × 5–10 cm, adaxial surface channelled and smooth, abaxial surface convex and weakly gray-lepidote; rachis 4.13–6.57 m long, base trough-shaped in cross-section, center more or less 4-sided, becoming triangular toward apex, abaxial surface weakly gray-lepidote; pinnae 132–191 per side, in groups of 2–6 on basal meter of rachis, otherwise regularly spaced and in a single plane, rigid to pliant, linear-lanceolate at center of rachis, plicate, acute, basally reflexed at attachment, 1-ribbed with prominent intermediate veins, adaxially green and smooth, abaxially dull-glaucous; basal pinnae 95–145 × 1–2.5 cm; middle pinnae 93–114 × 3.5–4 cm; apical pinnae 27–40 × 0.8–1 cm. Inflorescences interfoliar, yellowish at anthesis, bearing a prophyll; peduncular bract 75–160 × 11–30 cm, woody, longitudinally ribbed, brown, swollen in middle, persistent, with acumen 13–33 cm long, interior surface yellow at anthesis; peduncle 41–130 cm long; rachis 30–

103 cm long; rachillae of staminate inflorescence simple, 150–448 in number, 5–18 cm long, linear to slightly undulate, slender, attenuate, arranged spirally around the rachis and subtended by a membranous bract 2.5–4 mm long, bearing staminate flowers arranged in longitudinal rows on abaxial side only; rachillae of androgynous inflorescence simple, ca 230 in number, 5–15 cm long, arranged spirally around the rachis, each rachilla subtended by a bract 9–13 mm long and generally bearing 1 pistillate flower at middle (ca 5 cm above insertion on rachis) and 2 rows of ca 20 staminate flowers on abaxial side extending to apex, or rachilla at base of rachis commonly bearing staminate flowers only. Flowers unisexual; staminate flowers yellowish, slightly fragrant, subtended by 1 or 2 bracteoles 0.5–1.5 mm long; sepals 3, free or basally connate, triangular to deltate, ca 2×1.2 mm, membranous; petals 3, free, straight to curved, $1-1.8 \times 4-5$ mm, lanceolate, acute at apex, coriaceous, with smooth to slightly crenulate margins; stamens free, 11–12; filaments straight, linear; thecae united and longitudinally dehiscent; pistillode reduced. Pistillate flowers not seen. Fruits obovate, $7.8-9.4 \times 4.9-5.3$ cm, 76–96 g each (dry weight), brown-lepidote throughout, frequently channelled or grooved on sides, with a weakly defined ring left by staminodial cupule; stigmatic residue persistent, often slightly eccentric; fruiting perianth indurate, consisting of 3 sepals 2.5–4 cm long, 3 petals 4–5 cm long, and a staminodial ring; epicarp 2–3 mm thick, fibrous; mesocarp 2–3 mm thick, oily, bright orange at maturity; endocarp 3.7–4.1 cm in diam, woody and very hard; seeds generally 3–4, ellipsoid, ca 3–4 cm long; endosperm white, oily, homogeneous; embryo basal.

Specimens examined: BRAZIL. MINAS GERAIS: Mun. Uberlândia, 20 km E of city of Uberlândia, near BR-365, adjacent to Rio Araguari, 16 May 1981, *A. B. Anderson 399* (MG, NY); Mun. Santa Fe, 11 km from town of Santa Fe near stream called Logra do Rio, on Fazenda Santa Maria, 30 Nov 1984, *M. J. Balick et al. 1691* (CEN, NY), *1693* (CEN, NY).

ORBIGNYA OLEIFERA Burret

Orbignya oleifera Burret, Notizbl. Bot. Gart. Berlin-Dahlem 14: 240. 1938. TYPE: BRAZIL. MINAS GERAIS: Pirapora, 18 Dec 1937, *Burret & Brade 19* (HOLOTYPE: RB, n.v.).

Solitary, erect, pleonanthic, monoecious palm; stem to ca 20 m high, 31–53 cm in diam, leaf sheaths persistent just below crown, internodes inconspicuous. Leaves 13–20, fewer in younger or senescent plants, spirally arranged in a broad, erect-arching crown; sheath 100–125 cm long, split opposite the petiole, thick, coriaceous, adaxial surface smooth and brown, abaxial surface rarely with yellow, longitudinal surface striations that may extend to base of rachis, densely white-lepidote; petiole lacking or to 10 cm long; rachis 6.25–7.50 cm long, base trough-shaped in cross-section, center more or less 4-sided, becoming triangular toward apex, adaxial surface smooth, abaxial and lateral surfaces (at middle of rachis) densely white-lepidote; pinnae 156–186 per side, 2–3 basal pinnae grouped, otherwise regularly spaced and in a single plane, very rigid, acute, basally reflexed at attachment, 1-ribbed with prominent intermediate veins, adaxially dark green and smooth, abaxially glaucous; basal pinnae $152-182 \times 1.5-2.5$ cm; middle pinnae $140-168 \times 4.5-6$ cm; apical pinnae $49-69 \times 0.5-1.5$ cm. Inflorescences interfoliar; yellowish at anthesis, prophyll ca 75 cm long; peduncular bract $95-240 \times 28-41$ cm, woody, longitudinally ribbed, brown, opening longitudinally along a more or less distinct invagination, persistent, with acumen 28–52 cm long, interior surface tan to light orange at anthesis; all axes of inflorescences white- to yellow-lepidote at anthesis, peduncle 94–122 cm long; rachis 1–1.7 m long; rachillae of staminate inflorescence simple, up to 365 in number, 13–32 cm long, linear, erect, attenuate, arranged spirally around the rachis and subtended by a membranous bract ca 4 mm long, bearing 69–138 staminate flowers arranged

in 2 or 3 (4) longitudinal rows on abaxial side only; rachillae of androgynous (but functionally pistillate?) inflorescence simple, ca 277 in number, 2–3 × 3–4 mm, arranged spirally around the rachis, each rachilla subtended by a contorted bract 5–6 cm long and generally bearing 1–2 pistillate flowers at base to middle and 2–3 aborted staminate flowers at middle to apex, or more rarely bearing staminate flowers only. Flowers unisexual; staminate flowers yellowish, fragrant, asymmetrical, subtended by 1 or 2 bracteoles, 1–2 mm long on staminate inflorescences, up to 1.5 cm long on androgynous inflorescences; sepals 3, free or basally connate, deltate, ca 1.5 × 1.2 mm, membranous to coriaceous, margins smooth; petals 2 (3), free, incurved, 10–12 mm long, 1 petal 6–7 mm wide and obovate with apex dentate or lobed, the other petal 4 mm wide and narrowly elliptic with apex acute with smooth margins coriaceous; stamens free, 28–32 (37); filaments slender, ca 2 mm long; thecae united, irregularly coiled and twisted; pistillode present. Pistillate flowers yellowish, subtended by a straight to curved or occasionally contorted bracteole 0.8–3.0 cm long; sepals 3–6, imbricate, triangular to deltate, 1–3 cm long at anthesis, coriaceous, margins smooth; petals 3 (5), imbricate, triangular to deltate, ca 2 cm long at anthesis, coriaceous, margins smooth, apex cuspidate; staminodial cupule leaving a ring around the pistil; stigmas typically 3–6, apical, erect. Fruits broadly ellipsoid to oblong, 13–14 × 7.5–8 cm, 152–404 g each (dry weight), brown-yellow-lepidote throughout; staminodial ring strongly defined; stigmatic residue persistent; fruiting perianth indurate, 7–7.5 cm long, containing a ca 1.4 cm long staminodial tube; epicarp 1–2 mm thick, fibrous; mesocarp 2–3 mm thick, mealy, dry, tan-white at maturity; endocarp 5.1–7.6 cm in diam, woody and very hard; seeds generally 4–6, ovate to ellipsoid, 4.3–6 cm long; endosperm white, oily, homogeneous; embryo basal.

Specimens examined: BRAZIL. MINAS GERAIS: Mun. Pirapora, ca 10 km from town of Pirapora on N side of BR-365, adjacent to highway, 14 May 1981, *A. B. Anderson 398* (MG, NY); ca 2 km from town of Pirapora on Fazenda da Prata, 26 Nov 1984, *M. J. Balick et al. 1684* (CEN, NY), 28 Nov 1984, *M. J. Balick et al. 1686* (CEN, NY); Mun. Santa Fe, ca 11 km from town of Santa Fe near stream called Logra do Rio, on Fazenda Santa Maria, 1 Dec 1984, *M. J. Balick et al. 1696* (CEN, NY).

× *Attabignya minarum* shows many characters intermediate between those of the two parent species (Table D), e.g., habit (compare Figs. 1–4), leaves (Fig. 5), inflorescence (Fig. 6), flowers (Fig. 7), and fruits (Figs. 8 & 9).

A number of intermediate characters can also be found in the size and shape of the fruit (Fig. 9). The apex of the fruit of *O. oleifera* (Fig. 9c) is quite prominent, that of *A. compta* (Fig. 9a) rather indistinct, while that of the hybrid (Fig. 9b) is intermediate. The cross-sections (Fig. 8) show a fruit of × *A. minarum* (Fig. 8b) with two seeds, a rare condition (3–4 seeds per fruit is usual). Thus, hybridization does not always produce intermediate morphological characteristics.

One striking character that is not apparent from Figure 8 is the color and consistency of the mesocarp. In *A. compta* the mesocarp is bright yellow and oily, while in *O. oleifera* it is white, powdery, and relatively low in oil. × *Attabignya minarum* has a light yellow mesocarp that is much more powdery than that of *A. compta*. The mesocarp of *Orbignya* is a commercial and subsistence product, used both for food and medicine (May et al., 1985); analysis of the mesocarp of × *A. minarum* might reveal similarly useful products. Additional intermediate morphological features of the hybrid, not included in Table I, can be found in the descriptions of the three taxa.

Some characteristics of the hybrid are radically different from the parents. For example, the number of fruits produced in the androgynous inflorescence of *A. compta* ranges from 81 to 120 while in *O. oleifera* the range is from 98 to 189. The type tree of × *A. minarum* produced ca 298 fruits in the inflorescence, far

TABLE I

A SELECTIVE MORPHOLOGICAL COMPARISON OF *Orbignya oleifera*, *Attalea compta*, AND THEIR HYBRID, \times *Attabignya minarum*

Character	<i>Orbignya oleifera</i>	\times <i>Attabignya minarum</i>	<i>Attalea compta</i>
Stem			
Diameter	31–53 cm	35–40 cm	20–32 cm
Leaf			
Length of petiole	0–10 cm	5–10 cm	10–20 cm
Arrangement of pinnae	regular except at extreme base of rachis	regular except in basal $\frac{1}{10}$ of rachis	regular except in basal $\frac{1}{4}$ – $\frac{1}{6}$ of rachis
Length \times width of middle pinnae	140–168 \times 4.5–6 cm	98–110 \times 4–7 cm	93–114 \times 3.5–4 cm
Length of rachis	6.25–7.5 m	5.37–5.5 m	4.13–6.57 m
Inflorescence			
Length of acumen on peduncular bract	28–52 cm	17–20 cm	13–33 cm
Androgynous inflorescence			
Length of rachilla	2–3 cm	9–12 cm	5–15 cm
Position of pistillate flower on rachilla	0–2 cm above insertion on rachis	2.5–4 cm above insertion on rachis	ca 5 cm above insertion on rachis
Rows of pistillate flowers on rachis	9	17	13
Staminate Flower			
Texture of sepals	membranous to coriaceous	membranous to slightly coriaceous	membranous
Number of petals	2 (3)	(2) 3	3
Shape of petals	narrowly elliptic to ovate	narrowly elliptic to ovate	lanceolate
Number of stamens	28–32 (37)	11–20	11–12
Attachment of thecae to filaments	at midpoint	almost throughout length	throughout length
Orientation of thecae	irregularly twisted and coiled	more or less straight to twisted and coiled	straight
Fruit			
Length	13–14 cm	9.2–10 cm	7.8–9.4 cm
Width	7.5–8 cm	4.3–6.7 cm	4.9–5.3 cm
Shape	broadly ellipsoid to oblong	ellipsoid	obovate
Dry weight	152–404 g	110–176 g	76–96 g
Channelling on surface	absent	moderate	pronounced
Maximum length of calyx	7–7.5 cm	5.2–7.2 cm	4–5 cm
Color of mesocarp	white	yellow	orange
Consistency of mesocarp	dry	dry to oily	oily
Diameter of endocarp	5.1–7.6 cm	4–5.2 cm	3.7–4.1 cm

more than in either parent. Visual inspection of other hybrid plants confirmed that the androgynous inflorescences bore greater numbers of fruit than those of either *A. compta* or *O. oleifera*. A survey of palms in the Fazenda Santa Maria and adjoining farms carried out during our fieldwork indicated that the mean number of androgynous inflorescences produced by four hybrid individuals was 4.5, slightly greater than the 4.3 produced by ten individuals of *O. oleifera* and much greater than the 2.25 produced by four of *A. compta*. The larger number



FIGS. 5 & 6. 5. Comparison of leaves from this hybrid complex: *Orbignya oleifera* (left), \times *Attabignya minarum* (center), *Attalea compta* (right). Note the intermediate-sized rachis and pinnae of the hybrid. 6. Comparison of inflorescences from this hybrid complex: *Attalea compta* (left), \times *Attabignya minarum* (center), and *Orbignya oleifera* (right). Note the intermediate size of the bracts and panicle of the hybrid, as well as the greater number of fruits per individual panicle in the hybrid than in either of the parents.

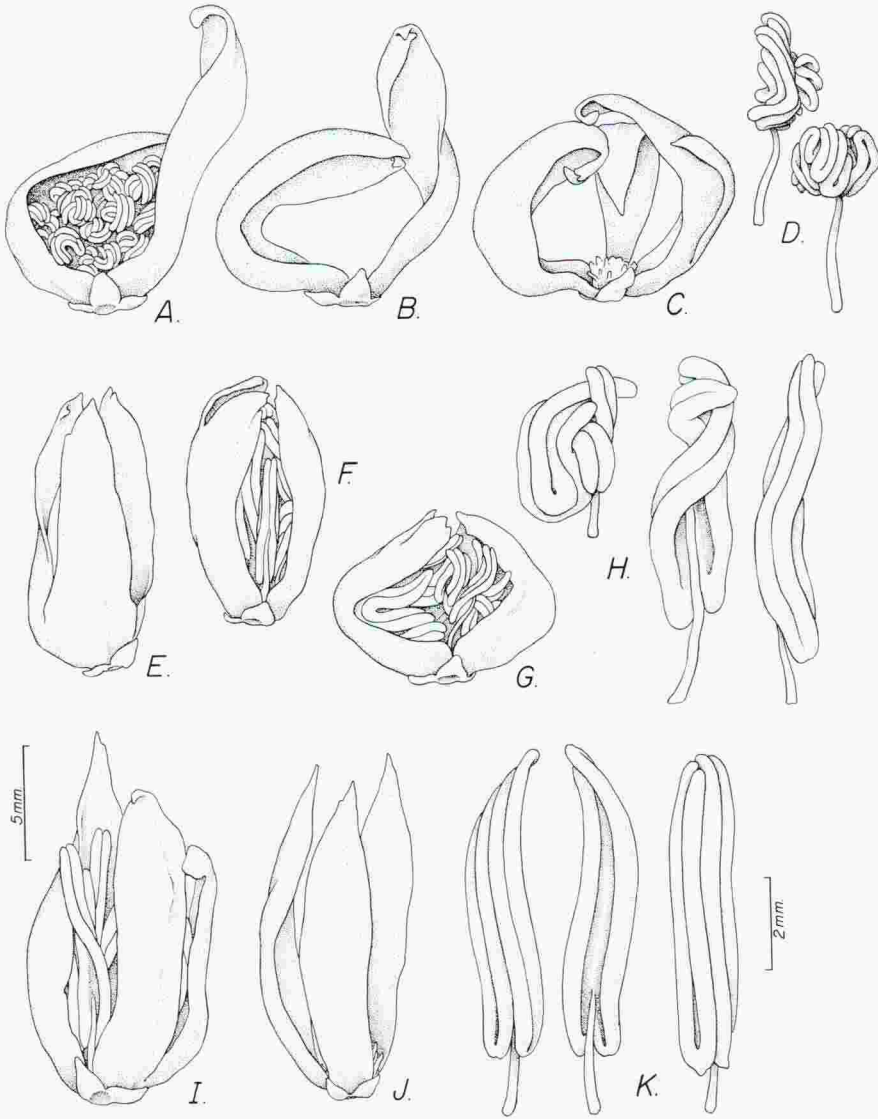
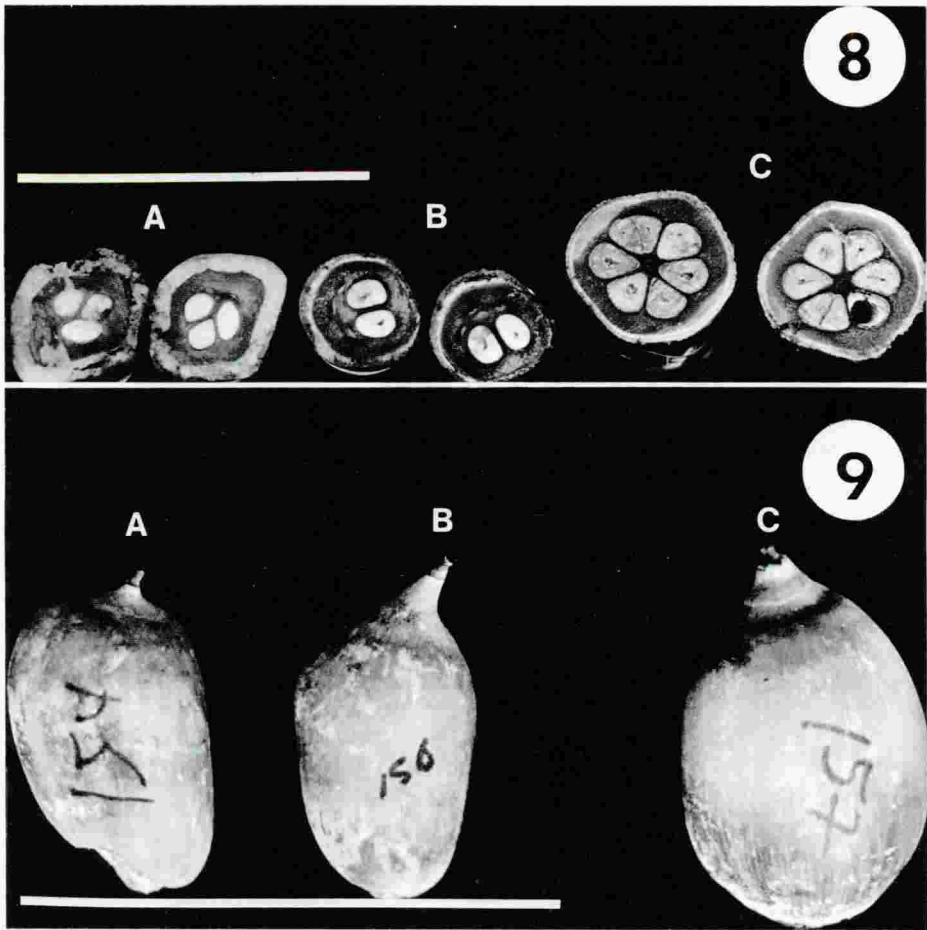


FIG. 7. Staminate flowers and stamens. A–D. *Orbignya oleifera* (M. J. Balick et al. 1996). A. Flower containing stamens. B. View of flower with stamens removed; note hooded petals. C. Flower with three petals. D. Stamens with inrolled thecae characteristic of this genus. E–H. \times *Attabignya minarum* (M. J. Balick et al. 1994). E. Flower with stamens removed; note three petals. F. Flower containing stamens. G. Complete flower with two hooded petals. H. Stamens illustrating variation in thecae shape from more or less linear to loosely inrolled. I–K. *Attalea compta* (M. J. Balick et al. 1993). I. Complete flower with three petals. J. Flower with stamens removed. K. Stamens with linear thecae.

of individual fruits per panicle and the larger number of androgynous inflorescences per palm appear to be an example of hybrid vigor, which could have important implications in the effort to select genetically superior forms of babassu and related palms for potential domestication. For example, based on observations at this site, approximate annual fruit production per tree in *A. compta* can be estimated at 34 kg, in *O. oleifera* at 150 kg, and in \times *A. minarum* at 169 kg.



FIGS. 8 & 9. A comparison of fruits (scale bar = 15 cm). 8. Fruit cross-sections. A. *Attalea compta*. B. \times *Attabignya minarum*. C. *Orbignya oleifera*; note hole in one seed chamber caused by insect predation. 9. Fruits. A. *Attalea compta*. B. \times *Attabignya minarum*; note the intermediate nature of the fruit apex in the hybrid. C. *Orbignya oleifera*.

\times *Attabignya minarum* appears to be quite common in the type locality, especially in lower-lying areas near streams. Its seeds produce viable embryos and the hybrid appears to be regenerating. The type tree (Fig. 3) has been protected for many years in a clearing behind a house as it is a source of food and other products for the household. It was not destroyed to make the type collection. Although the actual current distributions of the parent species are not known, it is reasonable to expect that \times *A. minarum* could be found in other sites where *A. compta* and *O. oleifera* are sympatric.

The existence of this hybrid provides evidence that could prove useful for evaluating the status of *Attalea*. This genus was considered by Wessels Boer (1965) to include *Orbignya*, *Scheelea*, *Markleya*, and *Maximiliana*. Other workers (Dransfield & Uhl, 1986; Glassman 1977a, 1977b, 1978a, 1978b; Moore, 1973) maintained *Attalea*, *Scheelea*, and *Maximiliana* as separate genera. \times *Attabignya minarum* is the first reported hybrid between *Attalea* and *Orbignya* (sensu stricto). Another intergeneric hybrid in the Attaleinae is *Markleya dahlgreniana* Bondar, a hybrid between *O. phalerata* and *Maximiliana maripa* (Correa de Serra) Drude.

Given the propensity for hybridization between *Attalea*, *Orbignya*, and *Maximiliana*, with resultant fertile offspring (Wessels Boer, 1965; J. M. F. Frazão, unpubl. data), the recognition of separate genera is questionable. We are well aware that continued research may lead to a uniting of all genera in *Attalea*, but the resolution of such a longstanding question is beyond the scope of this paper. Through future field studies, including in-depth analyses at the population level, we hope to be able to understand better the complex interactions in the Attaleinae and contribute towards a taxonomic hierarchy based on true biological relationships.

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