

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 de 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,

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.

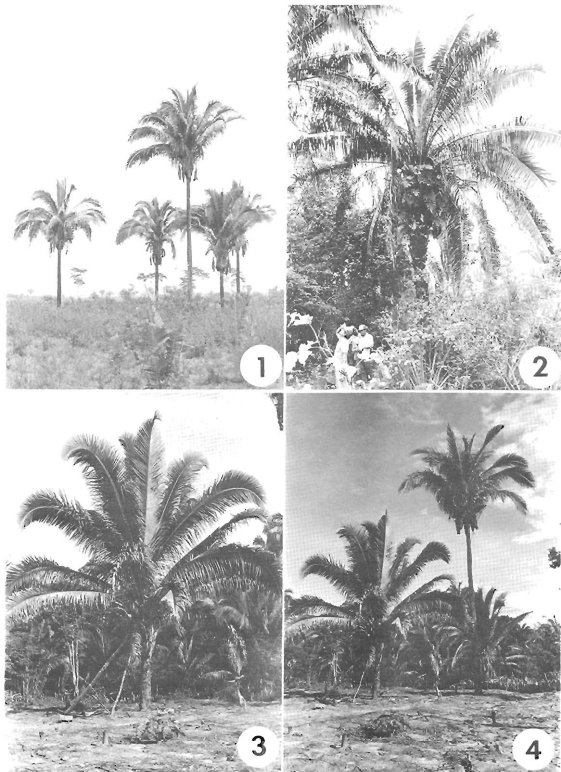
TYPE: BRAZIL. MINAS GERAIS: Mun. Santa Fe, 11 km from town of Santa Fe near stream called Logra do Rio, on Fazenda Santa Maria, 30 Nov–1 Dec 1984, *M. J. Balick, J. T. Medeiros-Costa, J. M. F. Frazão & J. G. A. Vieira 1694* (HOLOTYPE: CEN; ISOTYPE: NY).

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–



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).