



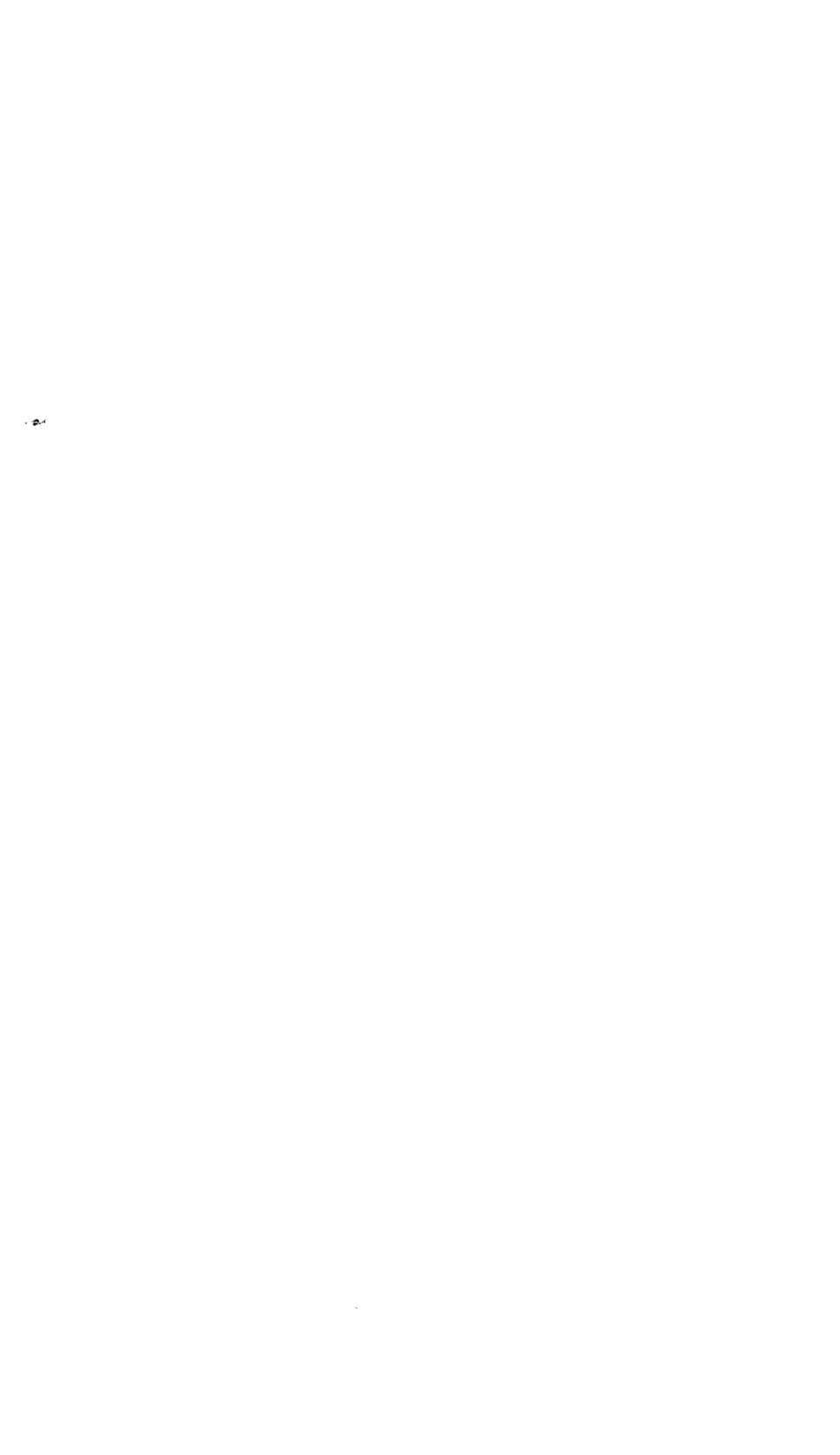
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## Preliminary Taxonomic Studies in the Palm Genus *Attalea* H.B.K.

S. F. GLASSMAN  
DEPARTMENT OF BIOLOGICAL SCIENCES,  
UNIVERSITY OF ILLINOIS, CHICAGO CIRCLE  
AND  
RESEARCH ASSOCIATE  
FIELD MUSEUM OF NATURAL HISTORY

*Attalea* was first established as a genus by Humboldt et al. (1816) in which they described one species, *A. amygdalina*. Closely related genera were later delineated by Martius in 1826 (*Maximiliana*) and 1837 (*Orbignya*), Karsten in 1857 (*Scheelea*), Dugand in 1940 (*Parascheelea*), and Bondar in 1957 (*Markleya*).

Since 1816, a number of authors have treated *Attalea* taxonomically: Martius (1824, 1826, 1844, 1845, 1853), Karsten (1857), Drude (1881), Barbosa Rodrigues (1903), Burret (1929), Bondar (1942a, b, 1964), Dugand (1953, 1954), and Wessels Boer (1965, 1972).

Drude (1881) divided the genus into three sections, ATTALEAE VERAЕ (including a key to six species), CYLINDROSTACHYS (only *A. nucifera*), and PSEUDOSCHEELEA (with a key to two species, *A. princeps* and *A. phalerata*). He also keyed out four other taxa in which the section they belonged to was uncertain. The first two sections have male flowers with flattened petals (the second with flowers spirally arranged rather than in two rows), whereas male flowers in the third section have fleshy or club-shaped petals. In the same article, Drude also recognized five species of *Orbignya* and four taxa of *Maximiliana* (including two species of *Scheelea*, a genus which Drude did not recognize). In 1929, Burret also split *Attalea* into three sections. The first one, *Euattalea* (containing 15 species divided into two groups by size of trunk), was separated from *Chaenostachys* (equivalent to *Cylindrostachys* of Drude) and

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*Dasystachys* (only *A. tessmannii*) by having male flowers arranged in two rows rather than in spirals. The latter two sections were separated by size of trunk, amount of fibers in fruit endocarp, and differences in arrangement of staminate flowers (in lax spirals with lateral branches often irregularly arranged *vs.* in dense spirals, with branches regularly arranged on all sides). Section *Pseudoscheelea* was, in effect, removed from *Attalea* because both *A. princeps* and *A. phalerata* were transferred to the genus *Scheelea* by Burret. It is significant that except for the differences between sections, no key to the species of the first section was given. In the same article, Burret also treated the genera *Maximiliana* (a key to nine taxa), *Orbignya* (a partial key to 19 species), and *Scheelea* (40 taxa, one-half of which were keyed).

Bondar (1942a, b, 1964) described several new species and constructed keys to *Attalea* of Brazil which totalled 16 taxa. In 1964, he also listed Brazilian species of *Orbignya* (14), *Scheelea* (12), *Maximiliana* (3), and *Markleya* (1). Dugand (1953) described three new species of *Attalea* from Colombia and in 1954 he dealt with seven species known from that country. Of these, he was able to key out only five taxa owing to insufficient information about the remaining two.

Perhaps the most controversial treatments of *Attalea* were published by Wessels Boer in which he recognized seven taxa from Surinam (1965) and 15 species from Venezuela (1972). In the latter paper, only a key to the species was published. The rest of the manuscript (taxonomic treatment) will hopefully appear in the near future because some new species and name transfers were mentioned without Latin descriptions and without basionyms, respectively. Wessels Boer submerged all other closely related genera (*Maximiliana*, *Orbignya*, *Scheelea*, *Markleya*, and *Parascheelea*) under *Attalea* and estimated a total of 100 living species distributed in tropical America. Reasons for his advocating such a viewpoint are that because specimens are usually very large and bulky, adequate collections of this group are seldom made, and descriptions of many species are often based on insufficient material sometimes without indication of the exact type locality. In the field, it is usually difficult to place a particular species in the correct genus because the flowering period is very short. As a result profound confusion exists in the group. The confusion is illustrated, Wessels Boer continued, by the large number of new combinations under these genera. Martius named or combined 17 species in *Attalea* (1826,



1844, 1845, and Martius ex Sprengel, 1825) of which 13 have since been transferred to one of first three genera mentioned above, mostly by Burret (1929); three species in *Maximiliana* (1826, 1844) all of which have been transferred; and of three in *Orbignya* (1844, 1845) one was transferred. Drude (1881, 1887) made four name transfers among *Attalea*, *Maximiliana*, and *Orbignya* and of seven species of *Attalea* described by Barbosa Rodrigues (1875, 1881, 1898, 1899, 1903b) new combinations were made in four. Delimitation of the genera is based mainly on differences in male flower morphology and without male flowers it is often impossible to identify a specimen to genus. Wessels Boer also stated that no correlation with other characters could be found (in some cases, however, there are good correlations of staminate flowers and inflorescence). In fact, endocarp characters proposed by Burret (1929) proved to be very unsatisfactory. *Parascheelea*, described by Dugand has male flowers intermediate between *Scheelea* and *Orbignya*, and *Markleya* was originally designated by Bondar as an intergeneric hybrid between *Orbignya* and *Maximiliana*, but Wessels Boer refuted this view and later transferred it to the genus *Attalea*. He also mentions the work of Tomlinson (1961) in which no anatomical differences could be found to separate the various genera in the group. Wessels Boer concludes that this information furnishes additional arguments for uniting the genera of the *Attalea* alliance into a single genus, *Attalea*. According to him, this alliance is probably the most poorly understood group of American palms. Existing herbarium specimens are inadequate and raise more problems than they solve. Therefore, a great deal of field work in large geographic areas is necessary before a satisfactory taxonomy can be worked out.

Finally, Punt and Wessels Boer (1966) did a palynological study of 20 species in the *Attalea* alliance, and even though they found three general pollen types, these could not always be correlated with a particular genus.

In spite of some convincing arguments by Wessels Boer for maintaining a single genus, there seem to be several distinct genera; but other characters than male flowers must be found in order to properly differentiate them. Research in this group either being currently investigated or planned for the future involves study of pollen morphology, leaf anatomy, chemotaxonomy, and gross morphology.

The following key to the genera, distilled from various sources and including some of my own observations, emphasizes the exclusive use of male flowers as a means of differentiation.

KEY TO *ATTALEA* ALLIANCE

1. Thecae of the anthers separate and divergent, irregularly coiled and inrolled, petals of male flowers usually curved or twisted.
  2. Petals of male flower narrowed below and abruptly broadened above, usually 3 in number, sometimes 2 or 5, stamens usually 12-24 (occasionally 6-9) . . . . . *Orbignya*
  2. Petals of male flower lanceolate, broader below, gradually narrowed above, usually 3 in number, stamens 7-12 . . . . . *Markleya*
1. Thecae of anthers usually straight, sometimes twisted, but with connective continuing through length of the anther, petals of male flowers usually straight, occasionally curved.
  3. Petals of male flowers fleshy, usually plano-convex or terete in cross-section.
    4. Petals of male flowers coherent in a column for one-third their length, the remaining free part curved in form of a hook, anthers helicoidally twisted. . . . . *Parascheelea*
    4. Petals of male flowers free for all or most of their length, erect, anthers straight . . . . . *Scheelea*
  3. Petals of male flowers not fleshy, usually flattened
    5. Stamens usually much longer than the petals, stamens always 6 . . . . . *Maximiliana*
    5. Stamens usually much shorter than the petals, stamens 6-75 . . . . *Attalea*

Since this paper will now deal primarily with species of *Attalea*, a condensed description of the genus follows:

Tall trees with smooth trunks and inconspicuous leaf scars, or lacking trunks (acaulescent); leaves usually very long, pinnately compound, leaf base conspicuous, petiole often short, with fibrous margins; pinnae usually not clustered, sometimes in clusters of 2-5; plants monoecious, flowers unisexual, but female (androgynous) spadices also with male flowers; both female and male spathes woody and deeply sulcate, usually terminating in a long umbo; androgynous spadices usually with many branches, each branch with few to several female flowers along basal part forming triads with two male flowers, the terminal portion slender and with male flowers only; female flowers relatively large, subtended by two bracts, with 3 subequal or equal convex imbricate sepals and 3 similar petals, pistil large with a well developed staminodial ring surrounding the ovary, carpels 3-several, fused, stigmas usually 3, style short or absent; male spadices many branched, male flowers usually arranged in two rows along the rachillae, seldom in spirals around the rachillae; male flowers with 3 short sepals and 3 much longer valvate, flattened petals, stamens 6-75 per flower, usually much shorter than petals, anthers not conspicuously twisted; fruits 1- to several-seeded, exocarp fibrous, mesocarp usually pulpy and fibrous, endocarp stony, usually more than twice as thick as exocarp and mesocarp combined, in cross-section endocarp often dotted with conspicuous clusters of fibers, persistent perianth and staminodial ring usually enlarged in fruit; seeds conforming to size and shape of locules, endosperm homogeneous.

As its title indicates, the present paper is intended as a preliminary study only. In addition to perusing the literature, I have borrowed and studied specimens from a number of herbaria in the United States and Europe. Despite the fact that some of the type specimens are represented by incomplete collections, I have attempted to account for all validly published species names, either originally described in or transferred to the genus *Attalea*. A total of 62 taxa are in this grouping. Subsequently, the 62 taxa were divided into three separate categories: (1) Alphabetical List of Species (28 names, six of which are synonyms) includes those taxa which definitely or most probably belong to *Attalea*, based mainly on male flower morphology; (2) Excluded Species (22 names), those palms which definitely or most probably belong to one of the other genera in the alliance, but not *Attalea*; and (3) Doubtful or Uncertain Species (12 names), mostly include those taxa which cannot definitely be placed in any of the genera in the alliance due to generally poor descriptions and inadequate type specimens, but mainly because male flowers are unknown. There are also included in category 3 a few taxa based on immature specimens, and others which are definitely *Attalea* but may be conspecific with other recognized species because of apparent close similarities.

The following key (based on descriptions, illustrations, and specimens examined) includes 21 species of *Attalea* derived from the Alphabetical List. Unfortunately, *A. amygdalina* could not be keyed out because pinnae in this taxon are unknown. It should be pointed out that since this is a preliminary study, characteristics used here to distinguish species or groups of species may not always be completely reliable because in some cases they are not based on enough material to determine the full range of variability.

Subsequent to the species key, each of three lists (see above) are patterned in the following manner: All species names are arranged alphabetically with the author and original place of publication. Frequently, other pertinent articles are also listed. Complete citations of these and other articles mentioned throughout the text are listed under "References" at the end of this paper. Synonyms, where applicable, are also listed and these are in italics. The type of each species, when known, is listed, and subsequently followed by a list of one or more cited specimens examined by me. Holotypes, isotypes, and lectotypes are specifically listed as such; however when the status of a type is uncertain it is merely called "type." For each specimen, collector and collecting number is followed by a herbar-

ium symbol (e.g., BH, F, MO). Abbreviations of herbaria used here are those listed in *Index Herbariorum* by Holmgren and Keuken (1974).

KEY TO SPECIES OF *Attalea*

1. Middle pinnae in clusters of 2-5.
  2. Plants acaulescent, androgynous spadix branched or unbranched.
    3. Androgynous spadix many branched, rachillae of male spadix 6 cm. long, each with 25 male flowers, stamens 9 in number . . . . . *A. exigua*
    3. Androgynous spadix unbranched or with short branches mostly 0.5 cm. long, rachillae of male spadix 1-4.5 cm. long, each with 6-15 male flowers, stamens 6 in number. . . . . *A. allenii*
  2. Plants arborescent, 5-25 m. tall, androgynous spadix many branched.
    4. Female flowers up to 2 cm. long, mature fruits 4-4.5 cm. long and 2 cm. in diam., male flowers 10-11 mm. long. . . . . *A. dubia*
    4. Female flowers 2.6-3.5 cm. long, mature fruits 6.5-13 cm. long and 4.2-7 cm. in diam., male flowers 13-20 mm. long
    5. Fruits 13 cm. × 7 cm., 1-2 seeded, male flowers 19-20 mm. long, stamens 6, anthers 4-7 mm. long. . . . . *A. funifera*
    5. Fruits 6.5-7.5 cm. × 4.2-4.5 cm., 1-seeded, male flowers 11-17 mm. long, stamens 9-10, anthers 7-9 mm. long. . . . . *A. concinna*
1. Middle pinnae not clustered, more or less evenly spaced.
  6. Male flowers spirally arranged all around the rachillae.
    7. Stamens 6 in number, male rachillae up to 6 cm. long, anthers 5-6 mm. long . . . . . *A. nucifera*
    7. Stamens 9-12 in number, male rachillae 26-28 cm. long, anthers 4 mm. long. . . . . *A. tessmannii*
  6. Male flowers arranged in 1-2 rows on one side of the rachillae
    8. Stamens 6-9 in number.
      9. Plants usually arborescent, rachillae of male spadix 14-31 cm. long.
        10. Anthers approximately 14 mm. long, male rachillae about 14 cm. long . . . . . *A. concentrista*
        10. Anthers 7-10 mm. long, male rachillae 16-31 cm. long
          11. Rachillae of male spadix about 31 cm. long, male flowers 20-25 mm. long, female flowers 5 cm. long . . . . . *A. piassabossu*
          11. Rachillae of male spadix 16-22 cm. long, male flowers 13-20 mm. long, female flowers 2.5-3.5 cm. long.
          12. Rachillae of male spadix about 16 cm. long, fruits 8-10 cm. long, 1-3 seeded. . . . . *A. burretiana*
          12. Rachillae of male spadix about 22 cm. long, fruits 6.5-7.5 cm. long, 1-seeded. . . . . *A. oleifera*

9. Plants usually acaulescent, rachillae of male spadix 2-8 cm. long.
13. Stamens 9 in number, middle pinnae 40-52 cm. long and 2.5-3.5 cm. wide. . . . . *A. geraensis*
13. Stamens 6 in number, middle pinnae 60-88 cm. long and 3.5-4.5 cm. wide.
14. Male flowers 10-15 mm. long, anthers 12 mm. long, female flowers 3-4 cm. long, middle pinnae about 60 cm. long. . . . . *A. borgesiana*
14. Male flowers 25-35 mm. long, anthers 7 mm. long, female flowers about 2.2 cm. long, middle pinnae about 88 cm. long. . . . . *A. humilis*
8. Stamens 10-75 in number.
15. Stamens 60-75 in number, plants arborescent, anthers 4-5 mm. long. . . . . *A. septuagenata*
15. Stamens 10-21 in number, acaulescent or arborescent, when arborescent anthers 11-12 mm. long.
16. Plants arborescent, anthers 11-12 mm. long
17. Middle pinnae about 109 cm. long and 6 cm. wide, male flowers 18-22 mm. long and 2-3 mm. wide. . . . . *A. compta*
17. Middle pinnae 60-70 cm. long and 3.5-4.5 cm. wide, male flowers 16-18 mm. long and 6-7 mm. wide. . . . . *A. pindobassu*
16. Plants acaulescent, anthers 4-6 mm. long
18. Male flowers 12-15 mm. long, stamens 12-15 in number
19. Male rachillae about 9 cm. long, expanded part of male spathe 50 cm. long and 7 cm. in diam., mature fruits 6.5 cm. long and 4.5 cm. in diam. . . . . *A. guaranitica*
19. Male rachillae 15-20 cm. long, expanded part of male spathe 78 cm. long and 11.5 cm. in diam., mature fruits 8.5-10.8 cm. long and 4-5.5 cm. in diam. . . . . *A. victoriana*
18. Male flowers 18-22 mm. long, stamens 15-21 in number.
20. Rachillae of androgynous spadix 3.5-4 cm. long, middle pinnae 70 cm. long and 3.3 cm. wide, with ferruginous, lepidote margins and tips, staminodial ring of female flower with ciliate margins. . . . . *A. ferruginea*
20. Rachillae of androgynous spadix 20-30 cm. long, middle pinnae 115-125 cm. long and 6-8 cm. wide, margins and tips mostly glabrous, staminodial ring without ciliate margins. . . . . *A. uberrima*

## ATTALEA

**ATTALEA** H. B. K., Nov. Gen. et Sp. 1: 309. 1816.

Type species: *Attalea amygdalina* H. B. K.

## ALPHABETICAL LIST OF SPECIES

*A. allenii* H. E. Moore, *Gentes Herbarum* 8: 191, fig. 82. 1949: Dugand, 1953.

Holotype: Panama (*Allen 4103-MO*).

Specimens examined: Panama, Prov. Colón. *Allen 4103* (MO, holotype; BH, isotype); *Lao & Holdridge 197* (MO); Prov. Canal Zone, *A. Gentry 6298* (MO) Colombia, Dept. Del Valle, *O. F. Cook 64* (US); *Cuatrecasas 16397, 19948* (F); *H. E. Moore et al. 9460, 9468* (BH); *J. A. Duke 11377* (BH); *E. P. Killip 35311* (US); *D. A. M. Gutimes 19* (BH).

This species is well known from its description and is supported by a fair number of collected specimens. The only diagnostic part not seen by me is the androgynous spathe.

*A. amygdalina* H. B. K., *Nov. Gen. et Sp.* 1: 310, t. 95-96, 1816; Dugand, 1940; 1953; 1954.

Lectotype: Colombia, prov. Choco near Zitará (*Humboldt & Bonpland s.n.* — P). c.f. Dahlgren, 1936, p. 38.

Specimens examined: See lectotype above.

Original description contains very little information to delimit it as a distinct species except for size of plant (acaulescent?), branching of androgynous spadix, number of stamens (18-22), and size of fruits. Plates 95-96 show some details of the androgynous spathe and spadix and male and female flowers and fruit. The male flowers definitely belong to *Attalea* but the number of stamens is uncertain. As mentioned above, Humboldt et al. described the male flowers as having 18-22 stamens; but the lectotype (consisting only of four rachillae with one female flower and a packet of male flowers) from Paris has male flowers with only 17-18 stamens. Dugand (1953) discusses the type locality with reference to comments made by Karsten (1857, p. 257). In addition to the locality listed above, Humboldt and Bonpland mentioned that this species was cultivated in orchards near Cartago and Guaduas. Dugand believes that the species seen by these two men in Guaduas was not the same as they saw in Cartago. They passed through Guaduas in April, 1801, but travelled into Cartago in October during the time this species of palm is supposed to flower. He also thinks that the plant seen in

flower here was the basis for Humboldt and Bonpland's description of *A. amygdalina*. In Cartago, they probably were informed by someone that this species originated in the province of Choco, near Zitará because apparently these famous explorers did not visit the Choco region themselves.

Incidentally, *A. amygdalina* is the type species of *Attalea* since it was the first one (and also the only one described by H.B.K.) described under this genus. At present, this taxon is only known from the lectotype (no specimens were cited in the original article) and hence it is based on incomplete information. It is hoped that additional collections from Colombia in the future will be useful in delimiting *A. amygdalina* as a clear cut species.

**A. borgesiana** Bondar, Bol. Inst. Centr. Fom. Econ. Bahia 13: 67, figs. 20-22. 1942b. (sine descr. Lat.); Bondar ex Dahlgren, Trop. Woods 77: 42. 1944. *A. borgesiana* Hawkes, Arq. Bot. Est. São Paulo 2: 176. 1952. *Superfluous name.*

Lectotype: Brazil, Bahia, São Sebastião (*Bondar s.n.*, F-619755), c.f. Glassman, 1972, p. 291.

Specimens examined: See lectotype above.

Neither Bondar nor Dahlgren cited specimens, therefore the above specimen has been designated as lectotype. Even though this taxon is known only from one collection, it seems to be a distinct species.

**A. burretiana** Bondar, Field Mus. Nat. Hist. Bot. 22: 460. 1942a: Bol. Inst. Centr. Fom. Econ. Bahia 13: 63, figs. 17-19. 1942b.

Lectotype: Brazil, Bahia, Aratú (*Bondar 24*, F-619754), c.f. Glassman, 1972, p. 22.

?*A. camposportoana* Burret, Notizbl. 14: 257. 1938. Holotype: Brazil, Minas Gerais (*Burret 17-B*).

Specimens examined: Brazil, Bahia, Aratú (see lectotype above); *Bondar s.n.* (F-619753); *Bondar s.n.* (F); Minas Gerais, *Burret 17* (B, holotype of *A. camposportoana*; RB, isotype — label says *Burret 17 & Brade*).

At present, I am not certain if *A. camposportoana* is synonymous with *A. burretiana*. After further study, if this proves to be the case, then the former species will become the "correct name" because of priority.

In his article, "New palms of Bahia," Bondar (1942a) cited all specimens for each new species described (four species of *Cocos* and four species of *Attalea*) as isotypes deposited in Field Museum. From this information it was assumed that at least one other set of specimens existed in Brazil. After a number of inquiries over a period of years, however, I have not been able to locate any other sets of specimens for the species described in the above article. Therefore, I have designated all specimens called isotypes by Bondar as lectotypes, in accordance with article 7 of the International Code of Botanical Nomenclature (Stafleu, 1972).

*A. compta* Mart., Hist. Nat. Palm. 2: 137, t. 41, 97, 1826; Bondar, figs. 1-3, 11, 1942b.

Lectotype: Brazil in plures provincias (*Princ. M. Neovidensis s.n.* -M). c.f. Dahlgren, 1959, pl. 26.

Specimens examined: Brazil (see lectotype above); Brazil, *Princ. M. Neovidensis s.n.* (M); Bahia, *Bondar s.n.* (F-619757); *Bondar s.n.* (F); Espirito Santo, *Bondar 18* (F-404618).

The lectotype (consisting of only four separate pinnae) was chosen as such because this specimen contains information similar to that in original article. Martius (1826) listed 10 different provinces in Brazil where this palm grows, but no specimens were cited.

This species seems to be well documented through its description and collections. A complete description of the male spathe and spadix is lacking, however. Kuntze (1898) cites cultivated specimens from Bocaie, Mato Grosso. Specimens I have examined (*Kuntze s.n.* — BH) appear to be another species because some of the pinnae are clustered and fruit endocarp has conspicuous fiber clusters.

*A. concentrista* Bondar, Field Mus. Nat. Hist. Bot. 22: 461, 1942a, b; 1964.

Lectotype: Brazil, Bahia, municipios de S. Antonio de Jesus, Amargosa, Aeria, S. Ignez (*Bondar s.n.*, F-619759). c.f. Glassman, 1972, p. 23.

Specimens examined: Brazil, Bahia (see lectotype above); *Bondar s.n.* (F-619758).

Known only from the above collections, but seems to be a clear-cut taxon.



*A. concinna* (Barb. Rodr.) Burret, Notzbl, 10: 537, 1929. *Pindarea concinna* Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio 5: 17, t. 4c, 1896; t. 59A, 1903a.

Lectotype: Cult. Brazil, Jard. Bot. Rio (Barb. Rodr., t. 59A, 1903a).

Specimens examined: Brazil, Glaziou 14365 (C, MO); Cult. Prov. Rio de Janeiro, Larangeiras, Nov. 3, 1882, Glaziou 14365 (F, P, US).

According to Burret (1929), Glaziou 14365 apparently came from the original tree in Jard. Bot. Rio because the male flowers matched Barbosa Rodrigues' illustration well. No specimens were cited in either article (1896 or 1903a) by Barbosa Rodrigues. Furthermore, the collections from F, P, and US came from Larangeiras, whereas the others (C, MO) have essentially no data except to repeat Burret's 1929 quote about Glaziou 14365. To avoid confusion, I have chosen one of Barbosa Rodrigues' plates as the lectotype, rather than one of the specimens mentioned above.

Even though only a limited number of cultivated specimens have been seen, *A. concinna* is fairly well described and appears to be a distinct species.

*A. dubia* (Mart.) Burret, Notizbl. 10: 537, 1929; Dahlgren, pls. 27-28, 32, 1959. *Orbignya dubia* Mart., Hist. Nat. Palm. 3: 304, t. 169, fig. 6. 1845.

Lectotype: Brazil, prov. Sebastionopolitana (Martius, t. 169-fig. 6, 1845).

*Attalea indaya* Drude, Mart. Fl. Bras. 3: 437, t. 100, fig. 2, 1881. Lectotype: Brazil, Rio de Janeiro, Corcovado (Glaziou 8070-C) c.f. Dahlgren, 1959, pl. 27.

*Pindarea fastuosa* Barb. Rodr., Pl. Nov. Cult. Jard. Bot. 5: 23, t. 5A, 1896; t. 59B, 1903a. Lectotype: Cult. Brazil, Rio de Janeiro (t. 5A). c.f. Glassman, 1972, p. 186.

Specimens examined: Brazil São Paulo, 225 km. s. of São Paulo, Krapovickas et al. 21354 (F). Cultivated, Rio de Janeiro, Corcovado, Glaziou 8070 (C, lectotype of *A. indaya*; F, P), Jardim Botânico, Glaziou 17341 (F, US), 20534 (NY), Dahlgren & Millar s.n. (F-61149).

No specimens were cited by Martius, nor could any be found in Munich. Therefore, the illustration by Martius was chosen as lecto-

type. For *A. indaya*, Drude (1881) cited both *Glaziou 303* and *8070* with no indication of herbarium. *Glaziou 8070* (C) was chosen as lectotype because it was first illustrated in Dahlgren (1959) and is represented by ample material. Specimens of *Glaziou 303* from BR or C could not be found, but photographs of a fruiting spadix was seen.

Even though the geographic distribution of this taxon is uncertain (Angely, 1957 also reported it from the state of Paraná), it seems to be distinct from the other arborescent species with clustered pinnae.

*A. exigua* Drude, Mart. Fl. Bras 3: 439, t. 100, fig. 1, 1881; Burret, 1929.

Holotype: Brazil, Mato Grosso, between Goyaz and Cuyaba (*Weddell 2965* — P).

Specimens examined: Brazil, Mato Grosso (see holotype above; F, isotype — upper portion of leaf only).

This taxon seems to be distinct even though information is lacking on the androgynous spathe and spadix, and relatively few specimens have been collected. I have also seen *Weddell 2022* (B) from Goyaz and *Sneathlage 737* (B) from Maranhão, cited by Drude and Burret, respectively. Neither specimen, however, contain diagnostic parts which can be definitely attributed to this taxon.

*A. ferruginea* Burret, Notizbl. 11: 1044, 1934.

Holotype: Venezuela — Brazil border, Rio Negro (leg. *C. Lako*, comm. *G. Huebner 166* — B).

Specimens examined: Venezuela — Brazil border (see holotype above). Colombia, Vaupes, Rio Negro, San Felipe, *R. E. Schultes*, *R. E. Baker & I. Cabrera 18040* (BH, US). Venezuela, Terr. Amazonas, *Wessels Boer 1894, 1906, 1945, 2322* (U).

*A. funifera* Mart. ex Sprengel, Syst. Veg. 2: 624, 1825; Martius t. 95-96 (fig. 4), 1826; Bondar, figs. 4-8, 1942b.

Lectotype: Brazil, Espirito Santo, Porto Seguro & Bahia (Martius 1826, t. 95-96, fig. 4).

*A. acaulis* Burret, Fedde Rep. 32: 103, 1933; Bondar, 1964.

Holotype: Brazil, Bahia (*Werdermann 3182* — B).

Specimens examined: Brazil, Bahia, *Bondar 21* (F-404620, F-619760); *Werdermann 3182* (B, holotype of *A. acaulis*); *Werdermann 3114* (B); São Salvador, Sand Dunes, *Dahlgren s.n.* (F-614747, F-611639); Cult., Jard. Bot. Rio de Janeiro, *L. H. Bailey & E. Z. Bailey 484* (BH), *Dahlgren s.n.* (F-611639).

No specimens were cited by Martius, nor could any authentic collections be located at Munich or Brussels, therefore the illustrations of Martius were chosen as the lectotype.

Apparently, this taxon is confined to coastal areas in the states of Bahia and Espírito Santo. It seems to be distinct from the other arborescent species with clustered pinnae.

*A. geraensis* Barb. Rodr., *Plant. Nov. Cult. Jard. Bot. Rio de Jan.* 6: 22, t. 7. 1898 (“*ceraensis*”); t. 56, 1903.

Lectotype: Brazil, Minas Gerais, Alfenas (t. 7, 1898). c.f. Glassman, 1972, p. 24.

*A. apoda* Burret, *Fedde Rep.* 32: 105, 1933.

Holotype: Brazil, Minas Gerais (*Glaziou 22266-P*).

Specimens examined: Brazil, São Paulo, Munic. Moji-Guaçu, *G. Eiten & L. Eiten 1902, 2208, 2212, 2220* (BH); Minas Gerais, between Porto do Rio Paracatu & Piquiero, *Glaziou 22266* (P, holotype of *Attalea apoda*; BR, C, G, MO, isotypes).

Even though no specimens were cited by Barbosa Rodrigues in the original articles, his description and illustrations are sufficient to indicate a distinct species. The excellent collections of *Eiten* and *Eiten*, cited above, also corroborate this.

I am tentatively placing *A. apoda* under this taxon because of its close resemblance to *A. geraensis*, in spite of Burret's incomplete description. Fruits are lacking in the description as well as in the type specimens. Even though Burret (1933) did not indicate where *Glaziou 22266* was deposited, the specimen from Paris should be the holotype because it is the only one containing all of the data cited by Burret.

*A. guaranitica* Barb. Rodr., *Palm. Nov. Parag.* 27, t. 4D, 1899; t. 57B, 1903a.

Lectotype: Paraguay, Cordillera de Pirebebuy (*Hassler 1860 - G*).

Specimens examined: Paraguay, Cordillera de Pirebebuy, (see lectotype above); Valenzuela, *Balansa 3316, 4775 (P)*.

Dahlgren (1936) listed *Anizitz* as the type for this species, but Barbosa Rodrigues did not cite this specimen in either article above. In his original paper, however, he does mention in the introduction that collections made by D. Juan Anizitz were a very important contribution to his descriptions of Paraguayan palms. Unfortunately, I have not been able to locate any of Anizitz's specimens. Presumably, they were destroyed by fire along with the personal collections of Barbosa Rodrigues. In view of this in 1972 I listed t. 57B, 1903 as the lectotype, but later discovered that Barbosa Rodrigues cited *Hassler 1860 (G)* in the same article. Since no specimens were actually cited in the 1899 publication, I am designating the above specimen (which only consists of two leaf parts) as the lectotype. The other two specimens examined by me are more complete as both have pinnae, male spadices and male flowers, and 3316 has female flowers and fruits as well. Both specimens came from Valenzuela, close to the locality mentioned in the original article ("Paraguay, ad Cordillera does Altos, propre pueblo Valenzuela, ad ripas Rio Y-aka").

Even though relatively few collections of this taxon have been seen I am recognizing it as a good species because of the fairly complete description and adequate illustrations.

*A. humilis* Mart. ex Sprengel, Syst. Veg. 2: 624, 1825; Mart. 1844, p. 121; 1845, t. 168, fig. 1.

Lectotype: Brazil, plures provincias (*Princ. M. Neovidensis s.n. - M*). c.f. Dahlgren, 1959, pl. 29.

*A. compta* var. *acaulis* Mart., Hist. Nat. Palm. 2: t. 75, 1826.

Lectotype: Brazil (t. 75). c.f. Glassman, 1972, p. 23.

Specimens examined: Brazil, (see lectotype above). Espirito Santo, *Bondar 20 (F-404620), 22 (F-404620)*; cult. Jard. Bot. Rio de Janeiro, *Dahlgren s.n. (F-611620)*.

No localities were mentioned by Martius (1825), but several localities and provinces were listed by him in (1844). Since no collections were cited, the above specimen was selected as the lectotype.

Even though this taxon is incompletely known, it seems to be distinct from other species of *Attalea*. A photo of the lectotype in Dahlgren (pl. 29, 1959) is incorrectly listed from the herbarium in Copenhagen.

*A. nucifera* Karsten, *Linnaea* 28: 255, 1857; t. 68, 1861; Drude, t. 101, 1881; Burret, 1929; Dugand, 1940; 1953; 1954.

Lectotype: Colombia, Guaduas (t. 68, 1861).

No specimens were cited by Karsten in either article listed above, therefore, I am designating t. 68 as the lectotype of this species.

Drude (1881) placed this taxon in a separate section, *Cylindrostachys*, and Burret (1929) also classified it in a separate section, *Chaunostachys*, because of the spiral arrangement of the male flowers around the rachillae rather than the usual arrangement in two rows. Burret questioned the authenticity of Drude's t. 101 and specimen (*Trail 212* — K) and said that his material may be *Orbigynya sabulosa* instead of *A. nucifera*. Dugand (1953) recognized this taxon as distinct from other Colombian species, and said he examined two examples from Dept. Santander collected by A. Ranghel-Galindo and from Dept. Bolivar by Victor Najar which certainly correspond to *A. nucifera*. From this account it was not clear whether the specimens seen by Dugand were actually deposited in the herbarium in Bogotá (COL) because they were not cited in the conventional manner along with collecting numbers. Consequently, a loan of these specimens was requested for future study.

Even though there are probably few collections of this taxon, the information available indicates that it is a distinct species of *Attalea*.

*A. oleifera* Barb. Rodr., *Nov. Rev. Braz.* 7: 123, 1881; t. 58, 1903a; Burret, 1929; Bondar, 1964.

Lectotype: Brazil, Alagoas and Pernambuco, Rio S. Francisco (t. 58, 1903). c.f. Glassman 1972, p. 25.

*A. monogyna* Burret, *Notizbl.* 10: 534, 1929.

Lectotype: Brazil, Goias, Serra dos Pyreneos (*Glaziou 22269* - BR). c.f. Glassman, 1972, p. 25.

Specimens examined: Brazil, Goias, Serra dos Pyreneos, *Glaziou 22269* (BR, lectotype of *A. monogyna*; BH, C, MO, isolectotypes);

Goiás, Rio Vagabine, Meia Ponte, *Glaziou 22270* (BR); Brazil (without locality) *Glaziou 15556* (C, MO).

Barbosa Rodrigues did not cite specimens in either article, hence the selection of t. 58 as the lectotype. Burret did not formally describe *A. monogyna*, but only compared it with *A. oleifera* which legally is a partial description. Since the original specimen cited by Burret from Berlin could not be found, one of the isotypes was designated as the lectotype.

Even though relatively few authentic collections of this taxon exist, it was well described and illustrated by Barbosa Rodrigues. *Attalea oleifera* seems to be most closely related to *A. burretiana* from Bahia.

**A. piassabossu** Bondar, Field Mus. Nat. Hist. Bot. 22: 462, 1942a; figs. 12-14, 1942b.

Lectotype: Brazil, Bahia, Alegre, near Salvador (*Bondar 6*, F-619762). c.f. Glassman, 1972, p. 25.

Specimens examined: Brazil, Bahia (see lectotype above); *Bondar s.n.*, (F-619714, F-619732).

This taxon seems to be distinct because it is backed up by an adequate description and fairly complete collections. Bondar (1964) says that *A. piassabossu* is probably a hybrid between *A. burretiana* and *A. acaulis* (= *A. funifera*). Further field studies should be made before this claim can be substantiated.

**A. pindobassu** Bondar, Field Mus. Nat. Hist. Bot. 22: 462, 1942; figs. 15-16, 1942b.

Lectotype: Brazil, Bahia, center of state (*Bondar s.n.*, F-619761). c.f. Glassman, 1972, p. 26.

Specimens examined: Brazil, Bahia (see lectotype above).

Bondar (1942b) says that this species differs from other *Attaleas* of Bahia in the number of stamens (12), except for *A. compta* which has longer and narrower flowers. *Attalea pindobassu* is well described but the lectotype comprises only pickled rachillae with female and male flowers from an androgynous spadix. It is not certain whether the original collection contained additional material such as leaves, male spadices or fruits, which may have been lost or misplaced.

*A. septuagenata* Dugand, *Mutisia* 18: 3, 1953; 20: 4, 1954; *Caldasia* 7: 145, 1955.

Holotype: Colombia, Amazonas, Rio Miritiparaná, Caño Guacayá (*Schultes & Cabrera 15796* — COL).

Specimens examined: Colombia, Amazonas (see holotype above); *Schultes & Cabrera 15796* (BH, isotype).

This taxon is certainly one of the most distinctive in *Attalea* and apparently the only one with male flowers having as many as 75 stamens.

*A. tessmannii* Burret, *Notizbl.* 10: 538, 1929; Macbride, 1960.

Holotype: East Peru, upper Amazon, Soledad (*Tessmann 5167* - G).

Specimens examined: East Peru, upper Amazon, Soledad, *Tessmann 5167* (G, holotype — male and female rachillae and flowers; B, F, NY, isotypes — male rachillae and flowers only); *Tessmann s.n.* (B — fruit).

According to Burret (1929), the female and male rachillae were collected from two different trees which he accordingly designated as *5167* and *5167a*. He also cited *Tessmann 5395*, Middle Ucayali, Yarina Cocha (with male flowers and fruit illustrations), but I have not been able to locate this specimen.

Burret did not indicate in which herbarium the original specimens were deposited, but the sheet from (G) is the only one with both male and female flowers and with data cited exactly as in Burret (1929).

Even though pinnae were not described or collected and the species is known only from a few collections, nevertheless, it appears to be distinct because the male flowers are arranged all around the rachilla rather than in pairs.

One discrepancy should be noted here. Burret describes the male flowers as having 12 stamens. None of the flowers examined by me had more than nine stamens.

*A. uberrima* Dugand, *Mutisia* 18: 4, 1953; 1954.

Holotype: Colombia, Caldas (*R. Jaramillo — Mejia 199* — COL).

Specimen examined: see holotype above.

Dugand also cites *Jaramillo — Mejia 24* (COL) from the same locality as a paratype. He says that this species is probably close to *A. amygdalina*, but it would be difficult to equate the latter taxon with *A. uberrima* because of its incomplete description and the fact that *A. amygdalina* is still only known with certainty from the type collection (which in itself is incomplete — consists mainly of male rachillae and male flowers).

*A. victoriana* Dugand, *Mutisia* 18: 9, 1953; 1954.

Holotype: Colombia, Valle, Correg. Galicia & Ceilan (V. M. Patiño 29718 — COL).

Specimens examined: (see holotype above) Colombia, Valle, 12 km. de Bugalagrande, V. M. Patiño 1 (F).

Besides the type specimen listed above, Dugand also cites nine other numbers, 29721 through 29729, in the same article. In 1954, he gave a detailed description of the fruits of this species, and compared them with the smaller fruits of *A. uberrima* (10-12 cm. long  $\times$  5-7 cm. diam. v. s. 8.5-10 cm.  $\times$  4-5.5 cm.).

## ATTALEA

### EXCLUDED SPECIES

*A. attaleoides* (Barb. Rodr.) Wessels Boer, *Indig. Palms Suriname* 157, 1965. *Maximiliana attaleoides* Barb. Rodr. 1875, p. 41. *Englerophoenix attaleoides* (Barb. Rodr.) Barb. Rodr. 1903a, t. 60A.

Lectotype: Brazil (Barb. Rodr., t. 60A, 1903). c.f. Wessels Boer, 1965, p. 157.

In his original article, *Barbosa Rodrigues 355* was cited, but this specimen apparently has been destroyed. Therefore, in the absence of specimens, a lectotype was chosen from the illustration. The male flowers are described as having lanceolate, dorso-convex petals with blunt tips and stamens included in the corolla. Wessels Boer cites the following specimens under this name: *Wessels Boer 1204, 1430, 1431* (U) from Surinam. He also says that this species with its typical *Scheelea* flowers and its typical *Maximiliana* fruits cannot be



placed satisfactorily in one of these genera and supports the idea of one large genus, *Attalea*. According to my current thinking on the subject, this taxon probably belongs in *Scheelea* but needs further study. At any rate, there already exists *Scheelea attaleoides* Karsten, 1857, based on another type.

*A. cephalotes* Poeppig ex Mart., *Palmet. Orbign.* 119, 1844; Martius 1845, t. 169. = *Scheelea cephalotes* (Poeppig ex Mart.) Karsten, 1857, p. 269; Dahlgren 1959, pl. 371.

Lectotype: Peru (*Poeppig s.n.* — M, photo-oversize sheet).

It is not certain whether original material went to Vienna or Munich; but since the Vienna specimen (illustrated by Dahlgren, 1959) was destroyed, I am designating the sheet from Munich as the lectotype.

According to the original description, male flowers are linear and thick, and therefore should be included in the genus *Scheelea*.

*A. cohune* Mart., *Palmet. Orbign.* 121, 1844; t. 167, 1845. = *Orbignya cohune* (Mart.) Dahlgren ex Standley, 1932, p. 3.

Lectotype: Honduras (Mart., t. 167, 1845). c.f. Glassman, 1972, p. 23.

In the absence of type specimens, I have designated the above as the lectotype.

Male flowers have coiled anthers and abruptly narrowed petals, hence this well known palm belongs in the genus *Orbignya*.

*A. crassispatha* (Mart.) Burret, *Sv. Vet. Akad. Handl.* 6: 23, t. 8-11, 1929a; Bailey, 1939, figs. 167-170. *Maximiliana crassispatha* Mart., *Palmet. Orbign.* 110. 1844.

Lectotype: Haiti (Plumier, *Nov. Pl. Amer. Gen.* t. 1, 1703). c.f. Dahlgren, 1936, pp. 209-210.

Specimens examined: Haiti, Fond des Negres, *E. Ekman* 7164 (NY); *O. F. Cook s.n.* (BH); *L. H. Bailey* 299 (BH); *L. Figueiras & P. Louis* 2785 (F); between Cavaillon and Aux Cayes, *H. Loomis & T. Fennell s.n.* (US).

Since no specimens were cited by Martius, Plumier's plate was chosen as the lectotype.

Even though this species is relatively rare and probably confined to one region of Haiti, it is very distinct and well known botanically (except for the male spathe and spadix which apparently has not been described nor collected).

The male flowers (from the androgynous spadix) have coiled and twisted anthers and fleshy and curved petals, suggesting either *Orbignya* or *Parascheelea*.

Cook (1939) described this taxon under a new genus, *Bornoa* (which is invalid because it was published without a Latin description); and Moore (1963) thought that Cook was perhaps correct in considering this taxon as a distinct genus (from *Attalea* as well as other allied genera).

*A. dahlgreniana* (Bondar) Wessels Boer, Indig. Palms Suriname 158, 1965. = *Markleya dahlgreniana* Bondar, Arq. Jard. Bot. Rio de Jan. 15: 50, 1957.

Lectotype: Brazil, Pará, Bragança, (*Bondar s.n.* — RB).

Specimens examined: Brazil, Pará, Bragança (see lectotype above; F, isolectotype).

Wessels Boer (1965) also cites 805, 1587 (U) from Surinam.

Even though Bondar noted that material was deposited in three different herbaria no actual specimens were cited in his article. Therefore, the above specimen (RB) is designated as lectotype.

In his original article, Bondar speculates that this taxon is probably a hybrid between *Orbignya speciosa* and *Maximiliana regia* because it grows in conjunction with these two species. Wessels Boer, however, refutes this idea because the large uniform populations he saw in Surinam produced fertile fruits.

The male flowers have twisted and coiled anthers, suggesting *Orbignya*, but the petals are flat and curved similar to *Parascheelea*. At present, I am not sure of its generic status, but it should be excluded from *Attalea*.

*A. excelsa* Mart. ex Sprengel, Syst. Veg. 2: 624, 1825; Mart., t. 96 fig. III, 1-2, 1826; t. 169, fig. 3, 1845. = *Scheelea martiana* Burret, 1929, p. 661.

Type: Brazil (*Martius s.n.* — M, not seen)

Burret (1929) transferred this species to *Scheelea*, but was obliged to give it a new name because *Scheelea excelsa* Karsten (1857), based on a different type, was already published. Male flowers were not mentioned in Martius' original description, however Burret justified his transfer to *Scheelea* on the presence of fiber clusters in the endocarp of the fruit. This is a questionable distinction because some species of *attalea* also have clusters of fibers in the endocarp.

*A. humboldtiana* Spruce, Journ. Linn. Soc. 11: 163, 1871; Drude, t. 99, fig. 1, 1881. = *Scheelea humboldtiana* (Spruce) Burret 1929, p. 658.

Holotype: Colombia, Banks of the Orinoco, Cassiquiari River (*Spruce 43* — K).

Burret (1929) transferred this species to *Scheelea* mainly on the basis of its fruits, but probably also because Drude included it in the section *Pseudoscheelea*. Spruce was not sure of the genus because male flowers were not collected by him. Dugand (1955) recognized it as a good species of *Scheelea* in his account of Colombian palms, based mainly on a comparison of Spruce's detailed description with photographs of this palm growing in abundance along the margins of the Bajo Guaviare and the Orinoco.

*A. insignis* (Mart.) Drude, Engl. & Prantl, Naturl. Pflanzenf. II. 3: 80, 1887. *Maximiliana insignis* Mart., Hist. Nat. Palm. 2: 133, t. 94, 1826 = *Scheelea insignis* (Mart.) Karsten 1857, p. 269.

Lectotype: Brazil, Rio Negro, Rio Japurá (*Martius s.n.* — M). c.f. Dahlgren, 1959, pl. 372.

No specimens were cited in original article, but the specimen mentioned above was chosen as lectotype because it contains information on the original localities mentioned by Martius.

Karsten (1857) transferred this taxon to the genus *Scheelea* because the male flowers have fleshy petals as described and illustrated in Martius (1826).

*A. lydiae* (Drude) Barb. Rodr., Sert. Palm. Bras. 1: 65, 1903a = *Orbignya lydiae* Drude 1881, P. 448, t. 102.

Lectotype: Brazil, Cult. Jard. Bot. Rio de Janeiro (*Glaziou 9006* — C). c.f. Dahlgren, 1959, pl. 341.

According to Drude's original description and illustration, anthers of the male flowers are coiled and inrolled, thus excluding this species from *Attalea*.

*A. macropetala* (Burret) Wessels Boer, Indig. Palms Suriname, 155, 1965; 1972. = *Maximiliana macropetala* Burret 1929, p. 699.

Holotype: Venezuelan Guiana, Rosalia (*Passarge 63-B*, destroyed).

Stamens are slightly longer than the petals, therefore this species probably belongs in *Maximiliana*. Wessels Boer (1965) says that the male flower structure of this taxon is intermediate between *Scheelea* and *Maximiliana*.

*A. maracaibensis* Mart., Palmet. Orbign. 124, 1844; t. 167, fig. 3, 1845; Wessels Boer, 1972. = *Scheelea maracaibensis* (Mart). Burret 1929, p. 676.

Holotype: Venezuela, Maracaibo (*Plee s.n.* — P, not seen).

Burret (1929) gave no reason for making a new combination under *Scheelea*, but it was probably due to the fiber clusters in the endocarp of the fruit. Dugand (1941) said this taxon (which was originally described solely on its fruit) approaches *Scheelea butyracea* (Mutis ex L. f.) Karsten ex Wendl. from the coast of Colombia because both species have small fruits and are found in adjoining geographical localities. Wessels Boer (1972) recognizes this as a good species and keys it out next to *Scheelea osmantha* for the palms of Venezuela.

*A. maripa* (Correa de Serra) Mart., Palmet. Orbign. 123, 1844; t. 167, fig. 5, 1845; Wessels Boer, 1972. *Palma maripa* Correa de Serra 1806, p. 75. = *Maximiliana maripa* (Correa de Serra) Drude 1881, t. 104.

Type: No type listed or illustrated in original article. Distributed in the Guianas and Surinam. In male flowers stamens are more than twice as long as petals, hence this taxon belongs in *Maximiliana*. Wessels Boer (1965) considered it synonymous with *Attalea regia* (Mart.) Wessels Boer (= *M. martiana* Karsten), but in 1972 placed it back into *A. maripa*.

*A. parviflora* Barb. Rodr., Bull. Herb. Boiss. ser. 2,3: 625, 1903b.  
= *Scheelea parviflora* (Barb. Rodr.) Barb. Rodr. 1903, t. 45A.

Holotype: Paraguay, Concepcion (*Hassler 7165* — G).

Descriptions, illustrations, and holotype specimen all demonstrate that male flowers are fleshy and petals are about twice the size of the stamens; therefore this taxon belongs in *Scheelea*.

*A. pixuna* Barb. Rodr., Enum. Palm. Nov. 43, 1875. = *Orbignya pixuna* (Barb. Rodr.) Barb. Rodr., Prot. App. 49, 1879; t. 49, 1903.

Lectotype: Brazil, Rio Tapajoz (t. 49, 1903). c.f. Glassman, 1972, p. 26.

No specimens were cited by Barbosa Rodrigues, therefore the above illustration was designated as the lectotype.

According to the description and illustration of Barbosa Rodrigues (t. 49), male flowers have twisted petals and coiled stamens; therefore, this taxon should be excluded from *Attalea*.

*A. princeps* Mart., Palmet. Orbign. 113, t. 4, fig. 3, t. 31B, 1844. = *Scheelea princeps* (Mart) Karsten 1857, p. 269.

Type: Bolivia, Moxos and Chiquitos (*d'Orbigny 16-P*, not seen).

A specimen from (M) labelled *A. princeps* Mart. with no other data except No. 855 was examined. It consists of a packet of broken female flowers, and pencilled illustrations of female flowers and flowers of *Cocos botryophora* as well.

Both the description and illustration of Martius (t. 31B) indicate that the petals of the male flowers are fleshy and the stamens are shorter than the petals; hence the transfer to *Scheelea* by Karsten appears to be justified.

*A. regia* (Mart.) Wessels Boer, Indig. Palms Suriname 150, 1965  
= *Maximiliana martiana* Karsten 1857, p. 273.

Type: Brazil (no specimens cited). Based on *M. regia* Mart., 1826 which is a homonym for *M. regia* Mart. in Schrank, 1819 (Cochlospermaceae). This species should be excluded from *Attalea* because male flowers have fleshy petals which are much shorter than the stamens.

*A. sagotii* (Trail ex Im Thurn) Wessels Boer, Indig. Palms Suriname 162, pl. 18. 1965; 1972. = *Orbignya sagotii* Trail ex Im Thurn 1884, p. 276.

Holotype: French Guiana (*Sagot 831* — K).

Wessels Boer (1965) transferred the above species to *Attalea* because of his lumping all genera in this alliance under *Attalea*. The male flowers have incurved petals and coiled stamens, therefore I am placing *Attalea sagotii* back into *Orbignya*.

*A. speciosa* Mart., Hist. Nat. Palm. 2: 138 t. 96, fig. 3-6, 1826; t. 169, fig. 4, 1845; Wessels Boer, 1965; 1972.

*Orbignya speciosa* (Mart.) Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio 1: 32. t. 9, fig. B 1-9, 1891; t. 5B, 1896; Burret 1929, t. 9 = *O. barbosiana* Burret 1932, p. 690.

Type: Northern Brazil (no specimens cited).

According to descriptions and illustrations, male flowers of this taxon are characteristic of *Orbignya*. Moore (1963) says that there is some confusion as to the application of the name *O. speciosa* and hence accepts *O. barbosiana* as the correct name. Wessels Boer (1965) considers *O. barbosiana* as a superfluous name. Burret (1932) originally gave this taxon a new name because it was confused with *O. cohune* as well as other species of *Orbignya*.

*A. spectabilis* Mart., Hist. Nat. Palm 2: 136, t. 96, fig. 1-2, 1826; Wessels Boer, 1965; 1972. = *Orbignya spectabilis* (Mart.) Burret 1929, p. 508.

Lectotype: Brazil, Pará (*Martius s.n.* — M). c.f. Burret, 1929, p. 508.

According to Wessels Boer (1965), male flowers have curved petals and coiled stamens; therefore, the taxon should be excluded from *Attalea*. The same author, however, says that male flowers are of the *Markleya* type since there are only 6-9 stamens, and uses this example as further evidence for lumping the six allied genera into one large genus, *Attalea*.

*A. spectabilis* var. *polyandra* Drude, Mart. Fl. Bras. 3: 440, 1881. Superfluous name. = *Orbignya pixuna* (Barb. Rodr.) Barb. Rodr., 1882, p. 29.

Drude (1881) apparently described the above taxon as a new variety, but he also listed *Attalea pixuna* Barb. Rodr., in synonymy. Therefore, the name is superfluous because the epithet *pixuna* should have been used for the variety name instead of *polyandra*.

*A. transitiva* Barb. Rodr. Prot. App. 49, 1879; Les Palmiers 29, 1882. Superfluous name.

This is a superfluous name for *Attalea attaleoides* (which has male flowers like *Scheelea* and has been previously discussed). After describing *Maximiliana attaleoides* as a new species in 1875, Barbosa Rodrigues (1879, 1882) decided that it was a transitional species between this genus and *Attalea*. Therefore, he renamed it *Attalea transitiva*.

*A. wallisii* Huber, Bull. Herb. Boiss. Ser. 2, 6: 267, 1906 = *Scheelea wallisii* (Huber) Burret 1929, p. 657.

Type: Brazil, Amazonas, Rio Purus (no specimens cited).

Original description by Huber is mainly a comparison of characters with *A. humboldtiana* which it most closely resembles.

Burret probably transferred the species to *Scheelea* because of its close resemblance to *A. humboldtiana* (see previous discussion).

In 1934 he gave *S. wallisii* a rather lengthy description, except for male flowers, and cited the following specimen which I have seen: Brazil, Rio Purus, at mouth of Rio Acre (*A. Ducke*, Com. G. Huebner 163 — B).

## ATTALEA

### DOUBTFUL OR UNCERTAIN SPECIES

*A. agrestis* Barb. Rodr., Enum. Palm. Nov. 42, 1875; Sert. Palm. Bras. 1: t. 55, 1903a. *Orbignya agrestis* (Barb. Rodr.) Burret 1929.

Lectotype: Brazil, R. Uauincha (t. 55). c.f. Glassman, 1972, p. 22.

*Barbosa Rodrigues 324* was cited in the original article, but his specimen could not be found. Therefore, I designated the above illustration as the lectotype. It is difficult to determine the genus

because male flowers are not mentioned in the description and not shown in t. 55. Burret (1929) transferred this species to *Orbignya* because of its resemblance to *O. sabulosa* Barb. Rodr.

*A. blepharopus* Mart., Palmet. Orbign. 116, t. 5, fig. 2, t. 31C, 1844; Hist. Nat. Palm. 3: t. 167, 1845. *Scheelea blepharopus* (Mart.) Burret 1929, p. 674.

Type: Bolivia (*d'Orbigny 34* — P? not seen).

Burret (1929) transferred this species to *Scheelea* without explanation but probably because male flowers were described as fleshy by Martius (1844). Male flowers illustrated by Martius (t. 167), however, do not definitely indicate this feature. Since no other specimens (besides the type) have been collected which can be attributed to this taxon, it should be considered an uncertain species.

*A. goeldiana* Huber, Bull. Herb. Boiss. ser. 2, 6: 268, 1906. *Scheelea goeldiana* (Huber) Burret 1929, p. 658.

Type: Brazil, Rio Acre (no specimens cited).

I am considering this species as doubtful because Huber's description is woefully inadequate and for the lack of illustrations. Burret probably transferred it to *Scheelea* because Huber placed it in section *Pseudoscheelea* Drude of the genus *Attalea*.

*A. gomphococca* Mart., Hist. Nat. Palm. 3: 301, t. 167, fig. 6, 1845. *Scheelea gomphococca* (Mart.) Burret 1929, p. 666.

Lectotype: Central America (t. 167, fig. 6). c.f. Glassman, 1972, p. 24.

Since Martius' original description and illustration is based mainly on the fruit, and since the exact locality is in doubt, it would be difficult to delimit this taxon with any degree of confidence. Apparently, Burret had no basis for transferring it to *Scheelea* because the male flowers were not described.

*A. hoehnei* Burret, Notizbl. 10: 522, 1929.

Holotype: Brazil, Mato Grosso — Acre, Agua Limpa, Campo (*F. C. Hoehne 2196* — SP?, not seen).



Entire description of Burret indicates this taxon is probably based on immature specimens. Size of the pinnae, male spadix, rachillae, and male flowers are all very small for this genus, and hence difficult to compare with other species.

*A. lapidea* (Gaertner) Burret, Notizbl. 10: 533, 1929. *Cocos lapidea* Gaertner, Fruct. Sem. Pl. 1: 16, t. 6, fig. 1. 1788.

Lectotype: Brazil, Bahia (t. 6, fig. 1, 1788). c.f. Glassman, 1972, p. 91.

Burret placed this palm close to *A. funifera*, based on the similarity of the fruits; however, it should be considered as *species dubia* because there is virtually no information on the leaves, spathes, spadices, flowers, or size of the plant.

*A. microcarpa* Mart., Palmet. Orbign. 125, 1844; t. 168, fig. 2, 1845; t. Z16, fig. 5, 1849. *Orbignya microcarpa* (Mart.) Burret 1929, p. 507.

Type: Brazil, Pará (*Martius s.n.* — M, not seen).

The description and illustrations are insufficient for determination (neither leaves nor male flowers are mentioned), but Burret thought it may be an *Orbignya*. No specimens were cited by Martius, however, according to Burret the fruiting spadix illustrated by Martius (t. 168) was preserved in the Munich collections. Nevertheless, this name should be relegated to *species dubium* because even the genus to which it belongs is uncertain.

*A. monosperma* Barb. Rodr., Enum. Palm. Nov. 42, 1875; t. 57A, 1903a. *A. spectabilis* var. *monosperma* (Barb. Rodr.) Drude 1881, p. 440.

Lectotype: Brazil, Pará (t. 57A, 1903). c.f. Glassman, 1972, p. 25.

Burret (1929) says this palm may be an *Orbignya*, but different than *O. spectabilis*. Male flowers were neither described nor illustrated by Barbosa Rodrigues or Drude, hence determination of the genus is doubtful. No specimens were cited by Barbosa Rodrigues, but Drude listed *Sagot 601* and *831* from French Guiana. The latter specimen (*Sagot 831*) is part of the type collection of *Orbignya sagotii*, previously discussed.

*A. phalerata* Mart. ex Sprengel, Syst. Veg. 2: 624, 1825; Martius 1844, p. 123; 1845, t. 169 fig. 5 =? *Scheelea phalerata* (Mart. ex Sprengel) Burret 1929, p. 669.

Type: Brazil, Goias (no specimens cited).

Described without male flowers in all three of Martius' articles, but Burret assumed that this taxon was conspecific with *S. corumbaensis* (Barb. Rodr.) Barb. Rodr.

*A. racemosa* Spruce, Journ. Linn. Soc. 11: 166, 1871; Wessels Boer, 1972. *Orbignya racemosa* (Spruce) Drude 1881, p. 448.

Holotype: Venezuela, Rio Negro (*Spruce 54* — K; P, isotype).

Male flowers are not described in either article by Spruce (1871) or Drude (1881), nor are male flowers present in the type specimens (cited above); therefore, the genus to which this taxon belongs is doubtful. Wessels Boer (1972), however, equates *A. racemosa* with *A. ferruginea*. At present, I cannot accept this designation without further study.

*A. rhynchocarpa* Burret, Notizbl, 12, 617. 1935; Dugand, 1940, 1954,

Type: Colombia, Rio Frio, bei Salonique (*Dryander s.n.* — B, destroyed?).

The description for this taxon is woefully incomplete. Neither male nor female spathes, spadices or flowers, nor length and width of pinnae are described; hence, Dugand (1954) lists *A. rhynchocarpa* as an insufficiently known species for the Attaleas of Colombia.

*A. rostrata* Oersted, Vidensk. Meddel. Kjoeb. 1858: 50, 1859. *Scheelea rostrata* (Oersted) Burret 1929, p. 688.

Type: Costa Rica, Puntarenas (no specimens cited or illustrations in either article).

A condensed description by Oersted is: Trunk 15-20 ft. high, leaves 12-15 ft. long, pinnae 3 ft. long, 2 in. wide, spathes 5-6 ft. long. Burret probably transferred this species to *Scheelea* because Oersted said it resembled *A. blepharopus* which Burret also considered to be in that genus.

Because of the lack of pertinent information, I am placing *Attalea rostrata* in the uncertain category.

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