BACTRIS × MOOREI, A HYBRID IN PALMS

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SUMMARY

Bactris × moorei W. Boer *hybr. nov.*, a spontaneous hybrid between *B. oligoclada* and *B. humilis*, is described. A few other cases of hybridization in palms and their significance for the delimitation of genera are discussed.

1. INTRODUCTION

In the undisturbed tropical rainforests of the extreme north-eastern part of the state of Bolívar, Venezuela, near the village El Palmar one isolated palm was found which could not be identified with any species known to the author. An intense search on the spot for other plants matching the first one remained fruitless. The only plant seen, a clustered palm with an old stem 2 m tall and 4 cm in diameter with several small basal shoots, was found in the understorey of a well-developed dense forest with trees up to 30–40 m tall and a rather poor and open undergrowth. In the field the said palm was reminiscent of *Bactris humilis*, a species only occasionally found in the area and, i.a., different in the stem, the armature, and the fruits. The *Bactris* species found to be locally widespread but not frequent was *B. oligoclada*, a species described as late as 1932 from Guyana (BURRET 1932).

A detailed comparison of the characters of *B. humilis* and *B. oligoclada* showed the plant in question to be intermediate which points to hybrid origin, an assumption confirmed by the almost sterile inflorescence bearing but two, still very immature, fruits.

2. COMPARISON OF THE CHARACTERS

B. oligoclada usually has a well-developed, arundinaceous stem to about 2 (–3) m tall and 1½–2 cm in diameter, internodes about ½ dm long, only armed with a group of slightly flattened, 1–2 cm long black spines just below the insertion of the leaves; basal shoots present.

B. humilis is a clustered, virtually acaulescent palm or with a short stem without internodal elongation, only rarely up to 1 m tall and 6 cm in diameter, rough by congested leaf-scars, unarmed.

The supposed hybrid has a stem 2 m tall and about 4 cm in diameter, internodes about 4 cm long, unarmed or with very few, rather thick, about 1½ cm long black spines just below the leaf-scar; basal shoots present.

B. oligoclada has leaves with a sheath 2–3 dm long, a petiole 4–5 dm long, and a rachis 5–7 dm long; sheath, petiole, and rachis very sparsely armed with about 2 (—5) cm long, stout, black spines to virtually unarmed; 7–10 pairs of pinnae inserted in groups of 2–3 about 1–2 dm apart, pinnae brownish underneath when dry. Lamina in cross-section with a limited number of fibrous strands at the same level as the vascular bundles and a few smaller fibrous strands scattered throughout the mesophyll; the abaxial hypodermis cells with a homogeneous tanniniferous deposit; the chlorenchyma without distinct palisade layers (*fig. 1*).

B. humilis, being rather variable in size depending on environmental conditions, has leaves with a sheath 3–5 dm long, a petiole 5–14 dm long, and a rachis 1–2 m long; notably the sheath densely armed with unequal, black, needle-like spines ½–5 cm long, this armature decreasing in the lower part of the petiole, the rachis often virtually unarmed; 11–26 pairs of pinnae aggregated into groups of 2–4 or in the apical part up to about 8 pairs at regular intervals, pinnae greyish-green concolorous when dry. Lamina in cross-section with many fibrous strands at the same level as the vascular bundles and numerous smaller fibrous strands in majority near the adaxial hypodermis; the abaxial hypodermis cells without a tanniniferous deposit; the chlorenchyma without distinct palisade layers (*fig. 3*). At variance with the observations of TOMLINSON (1961) in neither species anything could be found of a conspicuous adaxial palisade. Also, the long fibre-sclereids suggested to be a very distinctive character and diagnostic for the genus *Bactris* are lacking. Since Tomlinson examined material of *B.*

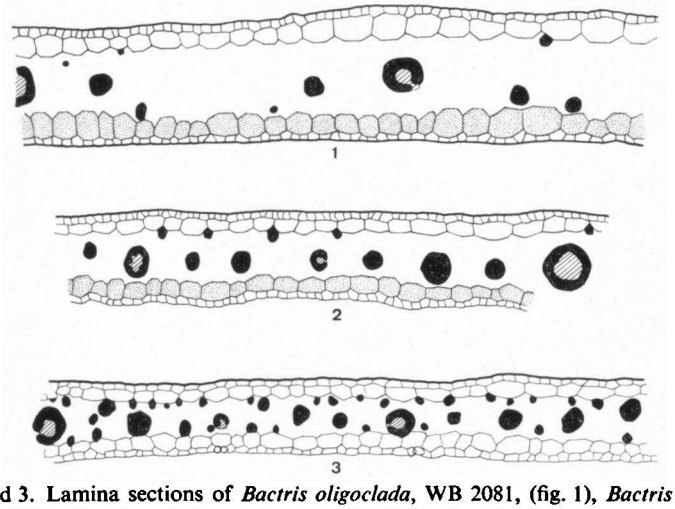

Fig. 1, 2 and 3. Lamina sections of *Bactris oligoclada*, WB 2081, (fig. 1), *Bactris* × *moorei*, WB 2092, (fig. 2), and *Bactris humilis*, WB 2062, (fig. 3), all drawn at the same scale and in the same way. The epidermal and hypodermal cells are copied precisely; the fibres exhibiting birefringence in polarized light are drawn solid black, the less or not anisotropic part of the vascular bundles is hatched; the tanniniferous hypodermal cells are shaded.

acanthocarpa, *B. minor*, and *B. major*, species normally occurring in rather open, exposed, and sunny habitats and in his case originating from botanical gardens, whereas the present material was taken from wild plants representing species adapted to thrive in the undergrowth of dense tropical rainforests, the observed differences possibly rather reflect the different ecological conditions than are of much taxonomic interest. Certainly these differences are not of diagnostic value at the generic level and do not offer any evidence for the separation of *Guilielma* from *Bactris*.

The supposed hybrid has leaves with a sheath 4½ dm long, a petiole 8 dm long, and a rachis 20 dm long; sheath, petiole, and rachis virtually unarmed, 23 pairs of pinnae inserted in groups of 2–5, pinnae brownish underneath when dry. Lamina in cross-section with fibrous strands at the same level as the vascular bundles and a limited number of smaller fibrous strands near the adaxial hypodermis; the abaxial hypodermis cells with a homogeneous tanniniferous deposit; the chlorenchyma without distinct palisade layers (*fig. 2*).

B. oligoclada often has more or less condensed inflorescences with a rachis 1–2 cm long bearing 5–9 rachillas ½–1 dm long about 2 mm in diameter, densely covered with male flowers and intermixed female flowers; the fruit is smooth, without black setae.

B. humilis has the inflorescence often more or less hidden among the leaf-bases, the rachillas only becoming partly free from the second bract forming a suitable place for small termite colonies; the rachis is ½–1 dm long with many, often about 25–40, slender rachillas about 1 mm in diameter when dry and up to about 8 cm long, beset with flower triads of one female flower and two male flowers or with male flowers only in the terminal part; fruit beset with black setae up to about 4 mm long.

The supposed hybrid has an inflorescence about 3 dm long, also with the rachillas partly enclosed within the second bract and with the habitual termites; the rachis is about 5 cm long with 20 rachillas about 1 dm long and 1 mm in diameter covered with male flowers and intermixed female flowers; the only two, still very immature fruits seen are glabrous.

Since the discussed plant proves to be intermediate in several respects between *B. oligoclada* and *B. humilis* its formal description as a new hybrid seems justified and follows here.

3. DESCRIPTION OF THE HYBRID

Bactris × moorei W. Boer, *hybr. nov.*

(*Bactris oligoclada* Burret × *Bactris humilis* (Wallace) Burret)
Caudice bene formato, internodiis longitudine et latitudine aequalibus, parcissime armatis, foliis ca. 3 m longis, inermibus, paribus pinnarum 23.
Inflorescentia ca. 3 dm longa, rhachide ½ dm longo et rhachillis 20 ca. 1 mm diametro instructo, floribus masculis plurimis femineis irregulariter intermixtis.
Typus: Wessels Boer 2092, Venezuela, Edo Bolívar, near El Palmar, tropical rainforest, alt. about 75 m (U; *isotypus* MER).

Clustered palm, one stem 2 m tall, 4 cm in diameter, internodes about 4 cm long, unarmed or with very few, rather thick black spines about 1½ cm long just below the leaf-scars; basal shoots present; 10 contemporaneous leaves; sheath 4½ dm long, petiole 8 dm long, rachis 20 dm long; sheath, petiole, and rachis unarmed, densely brown-leprose except for the adaxial side of the rachis; 23 pairs of pinnae from the base toward the apex in groups of 2, 3, 3, 2, 3, 3, 2, 5, slightly crisp; pinnae at the middle of the rachis about 4 dm long and 6 cm wide, slightly sigmoid, gradually narrowed towards apex and base, pergamentaceous; costa prominent above, 5 pairs of longitudinal secondary slender veins, other longitudinal veins inconspicuous, transverse commissures prominent above when dry, pinnae brownish underneath when dry.

Inflorescence with a 15 cm long, unarmed, basal bract, second bract 21 cm long, only for the basal 4 cm enclosed by the basal bract, the free part densely beset with 3–8 mm long, dark brown aciculae; peduncle 15 cm long; rachis 5 cm long, with 20 rachillas to 10 cm long and about 1 mm thick (i.e. to about 2 mm thick at base and about ½ mm thick at apex), densely beset with male flowers and intermixed female flowers. Fruit without aciculae, with a cupule about 6 mm in diameter, calyx very small, annular, corolla irregularly laciniate.

It is a pleasure to name this new hybrid for Dr. H. E. Moore, Jr., whose contributions towards a better understanding of the taxonomy of palms do not appear to have been always adequately appreciated.

4. DISCUSSION

B. × moorei is interpreted here as a spontaneous hybrid between *B. oligoclada* and *B. humilis*, both species growing together in the same locality. The only plant found of **B. × moorei** had a single inflorescence which was almost sterile except for two very young fruits, or, perhaps more correctly, two female flowers some time after anthesis. These two persistent flowers or young fruits may indicate a limited fertility but the fruits are too young to reach a definite conclusion. However, the mere fact of hybridization between these very distinct species in an undisturbed habitat is remarkable. *B. humilis* was placed by BURRET (1933) in the subgenus *Amylocarpus* (*Yuyba*), *B. oligoclada* in the subgenus *Eubactris*, two subgenera based on the arrangement of flowers on the rachillas. These have even been proposed as genera, although with a somewhat different delimitation, but this is generally not accepted in current literature (*cf.* BURRET 1953). This hybrid, too, would seem to offer some evidence against such a separation.

Since the days of Karsten and H. Wendland the taxonomy of American palms suffers from an unhappy tendency to cut up genera into vague groups of closely allied species and their synonyms which often cannot be distinguished from other genera and lead to new splitting until perplexion is complete. Fortunately this process seems to come to its end now, as is demonstrated, i.a., by numerous remarks in CORNER's admirable book "The Natural History of Palms". It also becomes clear from recent taxonomic work on palms in which hybrids have been studied.

In this context it is appropriate to mention the studies by, *e.g.*, HARDON & TAN (1969), HARDON (1969), and GLASSMAN (1968). Hardon (& Tan) have studied interspecific hybrids in the genus *Elaeis*. From the articles can be quoted: "*E. guineensis* and *E. oleifera* were found to hybridize. Interspecific barriers

were only partially developed as was evident from reduced seed set in the interspecific cross and occasional incomplete pairing of chromosomes in the F_1 hybrids" (*l.c.*, p. 372). "The data on the morphology and crossability of *E. guineensis* and *E. oleifera* and the vigour, cytology and fertility of their F_1 hybrids clearly indicate that the two species are genetically closely related. The gene exchange between the two species can be easily affected. Therefore, there is no justification for placing these species into separate genera (...). There is some ecological and morphological differentiation but in spite of the lower seed set on crossing, reduced F_1 viability and fertility, vigorous F_1 plants can be easily obtained. It seems that in spite of geographical isolation on two distant continents, strong isolation barriers did not develop" (*l.c.*, p. 379). "The general growth of the hybrid palms is very good. In fact some hybrid vigour is apparent in the general size of the fronds, size of the individual leaflets and the (...) branches on the female inflorescences" (*l.c.*, p. 386). "Some interesting patterns of inheritance emerge from the present hybrids. Values intermediate between the two parent species were obtained for the relative amounts of mesocarp, shell and oil per fruit as well as the chemical composition of the oil. Over dominance was evident for some growth characteristics but not for height increment. Of special interest, however, is the complete or partial dominance of *E. oleifera* in many reproductive characters and in the orientation of the leaflets, whereas *E. guineensis* did not possess dominance for any character measured" (*l.c.*, p. 387). GLASSMAN (1968) in his studies in the palm genus *Syagrus* questioned once again the wisdom of segregating genera in the *Syagrus* alliance on the basis of fruit and seed characters alone. He then concluded that the genus *Arecastrum* cannot be maintained as a separate genus besides *Syagrus*, among other reasons because: „in Brazil there is good evidence to show that *S. romanzoffiana* hybridizes with *S. coronata* in the state of Bahia and with *S. oleracea* in the state of São Paulo. In adition to this, hybrids between *S. romanzoffiana* and various species of *Butia* have been reported..." (*c.*, p. 384).

Several years ago the late BONDAR (1957) described an unknown palm taxon of assumed hybrid origin. His *Markleya dahlgreniana* was supposed to be an intergeneric hybrid between *Orbignya speciosa* and *Maximiliana regia*. Field work in Suriname revealed the existence of large, uniform populations of these palms producing fertile fruits and certainly representing a good species and not a hybrid (WESSELS BOER 1965). Apart from this observation the present author fails to understand how a palm intermediate between two closely allied genera and supposed to be an intergeneric hybrid can be used as a basis for describing a new genus; instead, it offers good evidence for uniting the genera involved, in our case under the genus *Attalea s.l.* It must be noted that the apparently rare and little known endemic palm of Hispaniola, *Maximiliana crassispatha* Martius = *Attalea crassispatha* (Martius) Burret, with its 9–11 stamens and twisted anthers, resembles the *Markleya* staminate flower type. Also in this case a separate genus was founded, *Bornoa* O.F. Cook (1939), but this name does not meet the requirements of the code and is invalid.

The recently described hybrids discussed above are all evidence in favour of a

broader concept of palm genera, as is the modern tendency. A careful examination of other hybrids in palms would seem to be of considerable general interest for a more natural delimitation of genera in palms.

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