



62. A large grove of *Livistona Jenkinsiana* seen along with wild *Musa* species in evergreen forests near Eyo village, Siang Frontier Division, NEFA. A small patch of millet is cultivated in foreground. Photograph by R. S. Rao.

A NOTE ON LIVISTONA JENKINSIANA

Thanks to the kindness of Dr. R. S. Rao, *Livistona Jenkinsiana* is at long last being established in South Florida. When I first opened the parcel he sent, I was immediately impressed with the deep blue color of the ripe fruits and couldn't help think what a welcome change this color would be to the reds and blacks of most ripe palm fruits here.

The seeds germinated readily and I am happy to report that first-leaf seedlings came through the severe winter of

1959-60 with no visible signs of injury. Young seedlings have been distributed to several enthusiastic palm growers in various sections of Florida and California to test the hardiness range of this interesting palm.

Plants are now beginning to take on a definite leaf character that seems distinct from most species of *Livistona* that I am familiar with. *Livistona Jenkinsiana*, especially because of the deep blue coloring of the fruits, should make a welcome addition to the cultivated palms.

NAT J. DE LEON

Two New Species of *Chrysalidocarpus*

HAROLD E. MOORE, JR.

Years ago, a flourishing garden surrounded the home of a Dr. Cabada in Cienfuegos, Cuba. Dr. Cabada had assembled an unusual collection of plants, but chiefly palms, from many parts of the world through his own travels and

correspondence. Unfortunately, the garden was neglected after his death, but from it seeds of an unusually lovely but unidentified palm were collected by Mr. Robert M. Grey and seedlings planted in March 1932 on the grounds of the

vivienda of the sugar mill and the Atkins Garden and Research Laboratory of Harvard University at nearby Soledad. This same palm has since been seen planted in Mérida, Yucatán, and at the Mayaland Lodge, Chichen-Itza, Yucatán, Mexico.

When I first visited Soledad ten years ago, mature trees of this palm were a striking sight with their clusters of graceful green or bluish-green stems, their crowns of arching leaves and their much-branched inflorescences then loaded with bright crimson fruit. During the course of another visit to the garden, flowering material was also secured. Study of the specimens clearly indicated that the palm was a species of *Chrysalidocarpus* but one differing from other described species, all from Madagascar or the Comore Islands, in its red fruit. The "Cabada palm" or *Chrysalidocarpus* 'Soledad,' as it has been called for convenience, seemed closest to *Chrysalidocarpus Humblotianus*, a species from Grand Comore described only from fragments of a leaf and portions of an inflorescence in very young bud and which, moreover, was supposed to have a solitary trunk. Without mature fruit of *C. Humblotianus* no completely reliable comparison could be made even though material of the type number was studied at Paris in 1956. In past years unsuccessful efforts have been made to obtain fruiting material of this species from the Forêt de Combani on Grand Comore through the offices of the local authorities and more recently those of Dr. Harold St. John who visited the island in August, 1961. Dr. St. John wrote that the forest "... had been lumbered and since then has long been plundered by cutters of firewood. There is some forest left, but it is a poor remnant, and much of the area is open pasture or banana plantations. We found only one feather palm, several trees, none over 6

meters tall, and none old enough to flower."

The discrepancies between the Cabada palm and *Chrysalidocarpus Humblotianus* as I now understand it, the difficulty or perhaps even impossibility of ascertaining the character of the fruit in the latter species, and the increasing use of the former in horticulture all suggest that the Cabada palm be formally described despite its unknown origin. It is, therefore, described as *Chrysalidocarpus Cabadae* below, acknowledging a slight possibility that it may eventually prove identical to *C. Humblotianus*. Perhaps even more likely is the possibility that ultimately it may be shown to be a variant of the next, *C. pembana*, to which it assuredly is closely related but from which it differs in characters that seem significant in the light of our present inadequate knowledge of species criteria in the genus.

Specimens of a second red-fruited *Chrysalidocarpus*, described herein as *C. pembana*, were collected as early as 1901 in the Ngezi Forest on the island of Pemba, which lies north of Madagascar, the Comores, and Zanzibar at 5° South Latitude off the coast of Tanganyika in East Africa. Foliage only was collected by R. N. Lyne and sent to the herbarium of the Royal Botanic Garden, Kew, England. Photographs had also been sent to Kew by J. T. Last. In 1929, Dr. P. J. Greenway collected specimens of this same palm and in 1957 he forwarded specimens collected by Mr. R. O. Williams for study at the Bailey Hortorium. Examination of the Williams specimens and comparison with specimens of *C. Cabadae* show the two taxa to be similar in habit but markedly different in characters of the leaf and fruit. The species has been informally described as *Chrysalidocarpus* sp. in R. O. Williams, *The Useful and Ornamental Plants in Zanzibar and*

Pemba 190, 1949. Though *C. pembana* is not cultivated in the United States, it is said to be cultivated in Pemba and Zanzibar.

Chrysalidocarpus Cabadae and *C. pembana* differ from each other as noted below but both share the graceful habit of *C. lutescens*. The latter, however, has larger fruits which mature purplish-black and pinnae with usually several very prominent scales on the midnerve near the base below as well as many minute shining chestnut-brown scales on the secondary and some tertiary nerves. *C. glaucescens*, which may be only a form of *C. lutescens*, differs in the yellow-green fruit.

Pinnae lacking scales on the under-surface except for a few large scales on the midnerve; leaf-sheath bright green with a glaucous bloom and sparsely dotted with minute rusty hairs when young, the peduncle of the inflorescence sparsely rusty-tomentose, the rachis and primary branches glabrous from the first: fruit 10-11 mm. long, 4.5-5 mm. in diameter at maturity *C. Cabadae*

Pinnae copiously dotted with minute shining brown linear scales on all the nerves of the undersurface and with usually a few large medifixed scales on the mid-nerve below; leaf-sheath, and peduncle, rachis and primary branches of the inflorescence copiously rusty tomentose at least

when young; fruit 14-15 mm. long, 7 mm. in diameter at maturity

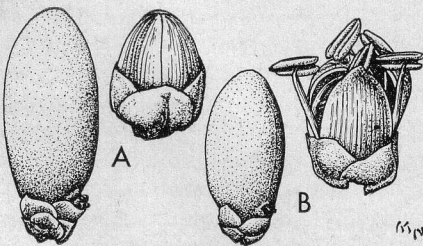
C. pembana.

Chrysalidocarpus Cabadae

Chrysalidocarpus Cabadae H. E. Moore, sp. nov.

Palma caespitosa *C. lutescenti* affinis sed fructu rubro, minore, 10-11 mm. longo, 4.5-5 mm. diam., pinnis subtus sparse squamosis vel esquamosis, rachillis ad anthesim glabris differens.

Caespitose with as many as 14 trunks to 10 m. high or more, 9 cm. in diameter at breast height, concentrically and prominently pale-ringed, smooth, glossy, green, straight, the internodes 9-12.7 cm. long. Leaves about 10 in a spreading elongate crown, the sheaths 50-75.5 cm. long, bright green with a glaucous bloom and, when young, floccose with rather dense brown fimbriate-tomentose scales, at first closed, at length splitting opposite the petiole and eventually deciduous with the blade, the petiole short, 25-32.5 cm. long or to 60 cm. long in young leaves, with a prominent callous pad at the base and canaliculate above, convex below, unarmed, the rachis to 17 dm. long, bifacial and green above, convex and glossy yellowish below, arcuate at the tip; pinnae from 24 in leaves from young plants to about 60 on each side of the rachis at maturity, regularly spaced in one plane but ascending from the rachis, darkish green and glossy above, paler below with prominent yellowish midvein and marginal veins essentially glabrous except for a few medifixed scales on the midnerve near the base, stiffish, acute, 10.8-57.7 cm. long, 11-25 mm. wide, the tips arcuate but soon split and pendulous. Inflorescence interfoliar, glabrous except for the sparse to dense cover of minute fimbriate rusty scales, at least when young, on lower part of peduncle and bracts, about 1.5 m. long, erect from the leaf-



63. Fruit ($\times 2$) and staminate flower ($\times 5$) of *Chrysalidocarpus pembana* (A) and *C. Cabadae* (B).

sheath, green, unarmed, subtended by an outer persistent ancipitous green or glaucous bract inserted about 13.5 cm. from the base of the peduncle and measuring ca. 38 cm. long, 4 cm. wide, splitting obliquely at the apex, and an inner rounded or slightly two-edged green or glaucous short-rostrate bract inserted ca. 33 cm. from the base of the peduncle, measuring ca. 54 cm. long, 4 cm. wide, inserted below the rachis, splitting on one side as the inflorescence expands and eventually caducous; peduncle 67.5 cm. long; rachis 70 cm. long, glabrous at anthesis, primary branches of the inflorescence about 30, glabrous, the lower branches to 55 cm. long, again branched with compound, furcate, or simple shortly and slenderly spine-tipped rachillae, the uppermost 8-10 all simple or furcate; flowers in triads spirally arranged and about 2 mm. apart throughout the rachillae, the staminate flowers about 4 mm. long when fresh, 3.2 mm. long when dry, fragrant, the sepals imbricate, green, 1.8 mm. high, the petals valvate, yellow-green, 3 mm. long, spreading, stamens 6, spreading, with slender white filaments connate basally and adnate to petals and pistillode for about 1 mm., distinct above, anthers short, oblong in outline, introrsely dehiscent, exerted from the flower and exceeding petals by ca. 1 mm., pistillode 3-angled, columnar, white, equalling the petals; pistillate flowers observed only in young bud, the perianth in dried fruit shining straw-colored with brown margins, the sepals ca. 1.4 mm. long, petals ca. 2.4 mm. long, staminodes dentiform. Fruit oblong-ovoid, scarlet with dark basal stigmatic residue, 10-11 mm. long, 4.5-5 mm. in diameter, the exocarp smooth, mesocarp thin, fleshy, reddish, fibrous, endocarp thin and more or less adherent to seed; seed oblong-ovoid, ca. 8 mm. long, 4 mm. in diameter with lateral embryo in homogeneous endosperm, the



64. *Chrysalidocarpus Cabadae* at Soledad, Cuba.

raphe branches ascending from the base and loosely anastomosed. Seedling with furcate first leaf, occasionally a few castaneous scales present on the lower surface.

CULTIVATED: Atkins Garden and Research Laboratory of Harvard University, Soledad, Cienfuegos, Cuba, nativity unknown, Feb. 20, 1953, *H. E. Moore, Jr. 6517* (holotype, BH); Feb. 26, 1952, *H. E. Moore, Jr. 6101* (paratype, BH).

Chrysalidocarpus pambana

Chrysalidocarpus pambana H. E. Moore, sp. nov.

Chrysalidocarpus sp. in Williams, *The Useful and Ornamental Plants in Zanzibar and Pemba* 190. 1949.

Palma caespitosa *C. Cabadae* affinis sed fructu majore, ca. 15 mm. longo, 7 mm. diam., pinnis subtus squamis nitentibus brunneis linearibus copiose vestitis, rachillis ad anthesim ferrugineo-tomentosis differens.

Stems several, green, clustered, to about 18 m. high, to 15 cm. in diameter,

strongly ringed, the internodes to 24 cm. long. Leaves to 2.4 m. long, the pinnae 40-50 inserted in the groove on each side of the rachis, linear-attenuate, regularly disposed at intervals of 4-5 cm., dark green and glabrous with a prominent elevated midnerve above, somewhat glaucous below with a dense cover of minute waxy peltate hairs (when dry) and, on all the nerves, numerous shining brown linear appressed scales lacking a hyaline margin, the midnerve rarely with one or a few irregularly placed, large, medifixed scales with brown center and broad irregularly lacerate margins or ends, the lowermost pinna narrow, ca. 76 cm. long, 1.3 cm. wide, the lower ca. 70 cm. long, 2.8 cm. wide, the median ca. 90 cm. long, 3.2 cm. wide, upper 45 cm. long, 2.4 cm. wide, and the apical pair 14.5 cm. long, 1.4 cm. wide, the marginal nerves and midnerves stout, the 4-5 secondaries on each side slender, interspersed with about 10 very fine tertiary nerves between each pair of secondaries. Inflorescence 3-4 times branched, the peduncle stout, more or less flattened, densely ferrugineous-tomentose, more than 30 cm. long, bending at right angles below the first branches with the fruiting branches pendant, the branches densely ferrugineous-tomentose in flower becoming pale-tomentose to glabrescent in fruit, the lower branches ca. 90 cm. long with ca. 15 secondary branches, the ultimate rachillae to 15 cm. long, 2 mm. in diameter, the upper branches furcate to simple, outer bract glabrous but dull waxy, inner bract not seen: triads of flowers 2-3 mm. apart, the staminate flowers (in bud) with sepals 1.6 mm. long, 1.8 mm. wide, 1.6 mm. deep, keeled and basally umbonate, glabrous except for very minutely denticulate lateral margin, the outermost sepals only about 1 mm. deep, petals 2.8 mm. long, 1.6 mm. wide above the base, the

stamens 6, nearly as long as the petals in bud with the anthers infolded, the pistillode angled-columnar, nearly as long as the stamens in bud: fruit "sealing-wax" red, oblong-ovoid, 14-15 mm. long, 7 mm. in diameter when dry, the stramineous persistent cupule ca. 2.5 mm. high. PEMBA: Ngezi Forest where common with *Phoenix reclinata* and *Elaeis guineensis*, R. O. Williams H177/56-7, Jan. 21, 1957 (holotype, BH; isotype, EA). Ngezi Forest, July 1901, R. N. Lyne 100 (K). Ngezi Forest, Feb. 18, 1929, Greenway 1488 (K).

Chrysalidocarpus pembana is called *mpapindi* on Pemba where it grows wild in the Ngezi Forest, but the species is also cultivated according to Williams.

I am indebted to Dr. William J. Dress for assistance with Latin diagnoses, to the American Philosophical Society for grants (nos. 1183, 1951, and 1522, 1952) that made possible study of living material of *C. Cabadae*, and to the John Simon Guggenheim Memorial Foundation for the opportunity to study material of *Chrysalidocarpus* at Kew and Paris in 1956. I wish also to express my gratitude to authorities on Grand Comore and to Dr. Harold St. John for their efforts in my behalf.



65. Even *Sabal* does the "twist."