

Notes on *Caryota no* Becc. and Other Malesian *Caryota* Species

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Herbarium Bogoriense, Bogor, Indonesia.

In December 1971 I distributed a large quantity of seed of *Caryota no* Becc. to The Palm Society Seed Bank under the collector's number *Dransfield 2153*. The following preliminary taxonomic note may be of interest to growers who received samples of the seed.

Caryota no is, I believe, when well grown the most massive species of the genus. It was first described in 1871 by Beccari in *Nuovo Giornale Botanico Italiano* (Beccari, 1871), the description being based on Beccari's own collection, *P.B. 3643*—a collection made near Singhi (*sic*), in the First Division of Sarawak, Borneo. The curious specific epithet originates from Beccari's transcription of the local name, *kayu no* (*kayu no*); Beccari also mentions the local Dayak name *onus* as applied to the fibre of the tree—a local name which is used as *unus* to mean the whole tree in South Kalimantan, Indonesian Borneo. It is possible that Beccari was mistaken in the local name *no*, as *enau* (with the "e" hardly pronounced) is one of the most widespread Malay names for *Arenga pinnata*. Beccari distinguished *Caryota no* from other species of the genus by its much greater size, by differences in the shape of the leaflets, and by the presence of two seeds in the fruit. This combination of characters was felt by Beccari in 1871 to be sufficient basis for the separation of *kayu no* as a distinct species. However in 1871 in the first part of Volume One of Beccari's monumental *Malesia*, he had changed

his mind concerning the taxonomic status of *Caryota no*. In this work (Beccari, 1877) he recognizes two species of *Caryota* in the Malesian region and numerous varieties, viz:

- Caryota rumphiana* var. *moluccana* Becc. from the Moluccas
- C. rumphiana* var. *papuana* Becc. from the Key Islands and New Guinea
- C. rumphiana* var. *australiensis* Becc. = *C. albertii* F.v.M. from the Cape York Peninsula of Australia
- C. rumphiana* var. *borneensis* Becc. = *C. no* Becc. from Borneo
- C. rumphiana* var. *javanica* Becc. = *C. maxima* Bl. from Java
- and *C. rumphiana* var. *indica* Becc. = *C. obtusa* Griff from the Malay Peninsula
- and *Caryota griffithii* Becc. from Borneo, Malaya, and Java,
- and *C. griffithii* var. *selebica* Becc. from the Celebes.

Caryota rumphiana Mart. is thought to refer to the large solitary *Caryota* of the Moluccas.

Unfortunately, of all palms, *Caryota* is one of the most difficult to represent adequately on an herbarium sheet, and, as is well known, types of this genus made in the last century without field notes, are extremely fragmentary, difficult to interpret, and virtually useless for trying to match up with more modern collections. A monograph of *Caryota* will involve, I imagine, tedious work matching up fragments, possibly with

the aid of anatomical characters of the leaflets. In a way, therefore, it is not surprising that Beccari found that the easiest solution to the taxonomic problem within Malesian *Caryota* was to recognize two species only: *Caryota griffithii* was applied to small clustering plants, with two varieties (this is apparently no different from *C. mitis* Lour.), and *Caryota rumphiana* applied to larger solitary species. It is most unfortunate that Beccari did not have material from the Philippines at hand for consideration when he wrote his note. In those days of slow travel, Beccari would not have been able to make comparisons between wild populations, and collections in botanic gardens would have been even more incomplete than now; added to this, all *Caryota* species in the herbarium look very much the same. I feel, therefore, that by the time Beccari came to write his note in *Malesia*, the striking impression of the giant Bornean species may have dimmed sufficiently for resemblances to have won over differences, and for *Caryota* *no* to be reduced to *C. rumphiana* var. *borneensis*.

The situation within the genus *Caryota* in the Malesian region today has not much changed since Beccari's day. Several species from the Philippines were unknown to Beccari (*C. cumingii* Lodd., *C. majestica* Lind., *C. nana* Lind., and *C. speciosa* Lind.), and Beccari later described *C. merrillii* from the Philippines (Beccari, 1894), Burret described *C. macrantha* from Sumatra, and Ridley decided that Beccari's later combination *C. obtusa* Griff. var. *aequatorialis* Becc. deserved specific rank as *Caryota aequatorialis* (Becc.) Ridl. There are also several epithets first coined by Blume which are not considered by Beccari. There is hence a very real mess in the nomenclature and taxonomy of *Caryota* with a plethora of names.

I have not seen the type specimens of more than three or four of the specific epithets, so the following notes based on field observations and not on herbarium material, must be regarded as very preliminary.

Starting with the island of Java, I recognize here two taxa within the genus:

Taxon 1) is a lowland clustering, small species with spreading leaflets and small one-seeded fruit; this is the taxon widely known as *C. mitis* Lour.; this same palm I have seen with relatively little variation other than in size throughout the lowlands of Sumatra, the Malay Peninsula, and the Minahasa Peninsula of the North Celebes. In South Borneo there is a palm, very similar in all respects, except that the leaflets are somewhat broader, thicker and somewhat concave. I do not know whether this slight difference is constant in cultivation, but, slight though the difference in the leaflets is, it is sufficient to make the whole plant look a bit different from the clustering *Caryota* of Java, Sumatra, the Malay Peninsula, and North Celebes.

Taxon 2) is a giant solitary *Caryota* with drooping primary pinnae, drooping leaf apex, and pendulous leaflets, bright pinky-red fruit containing one seed only (very very rarely does one find two seeds). This palm is no longer common in Java and is found normally above 1,000 m. in the mountains. This palm corresponds, I think, with Blume's *Caryota maxima* and Beccari's *Caryota rumphiana* var. *javanica*. In the *Flora of Java* (Backer and Bakhuizen van den Brink) it is referred to as *Caryota rumphiana* Mart. I have found a palm identical to the Javanese taxon 2) throughout the main range (Bukit Barisan) of Sumatra from Lampung in the south to Aceh in the north. I have been near the type locality of Burret's *C. macrantha*

and I can see only what I regard as the one widespread taxon there. Similarly, I can see no difference at all between the Sumatran/Javanese taxon and the giant mountain *Caryota* in the Malay Peninsula. I therefore do not as yet believe in the existence of the taxon *Caryota rumphiana* var. *indica* Becc. = *C. obtusa* Griff. = *C. obtusa* var. *aequatorialis* Becc. = *C. aequatorialis* (Becc.) Ridl. as distinct from *C. maxima* Bl. = *C. rumphiana* var. *javanica* Becc. = *C. rumphiana* Mart. sensu Backer and Bakhui-zen of Java and of Sumatra (sensu Dransfield). The giant *Caryota* from the mountains of South Thailand may well turn out to be this same widespread taxon 2).

Apart from these two taxa mentioned above as found in Java, I know of no other wild species of *Caryota* in Sumatra and the Malay Peninsula. In Borneo as far as I know, taxon 2) is missing. There is however another plant.

Taxon 3), the biggest *Caryota* of all, solitary, with a bulging trunk like that of *Roystonea regia*, vast leaves with stiff main rhachis, stiff primary pinnae and pendulous leaflets, huge inflorescences ultimately bearing large dark purple, almost black fruit, about 98 percent of which contain two hemispherical seeds. This plant is a lowland plant and I have not seen it above 400 m. altitude. This corresponds I believe with *Caryota no* Becc. = *C. rumphiana* var. *borneensis* Becc.

In the Minahassa Peninsula of North Celebes is Taxon 4), a solitary, medium-sized plant rarely exceeding 15 m. with a uniform trunk 15–20 cm. in diameter, the leaves with main rhachis and primary, slightly drooping, pendulous leaflets, and the first two or three primary pinnae on each side highly reduced and spidery, bearing slender, highly serrated leaflets, the whole reminiscent of *Pteri-*

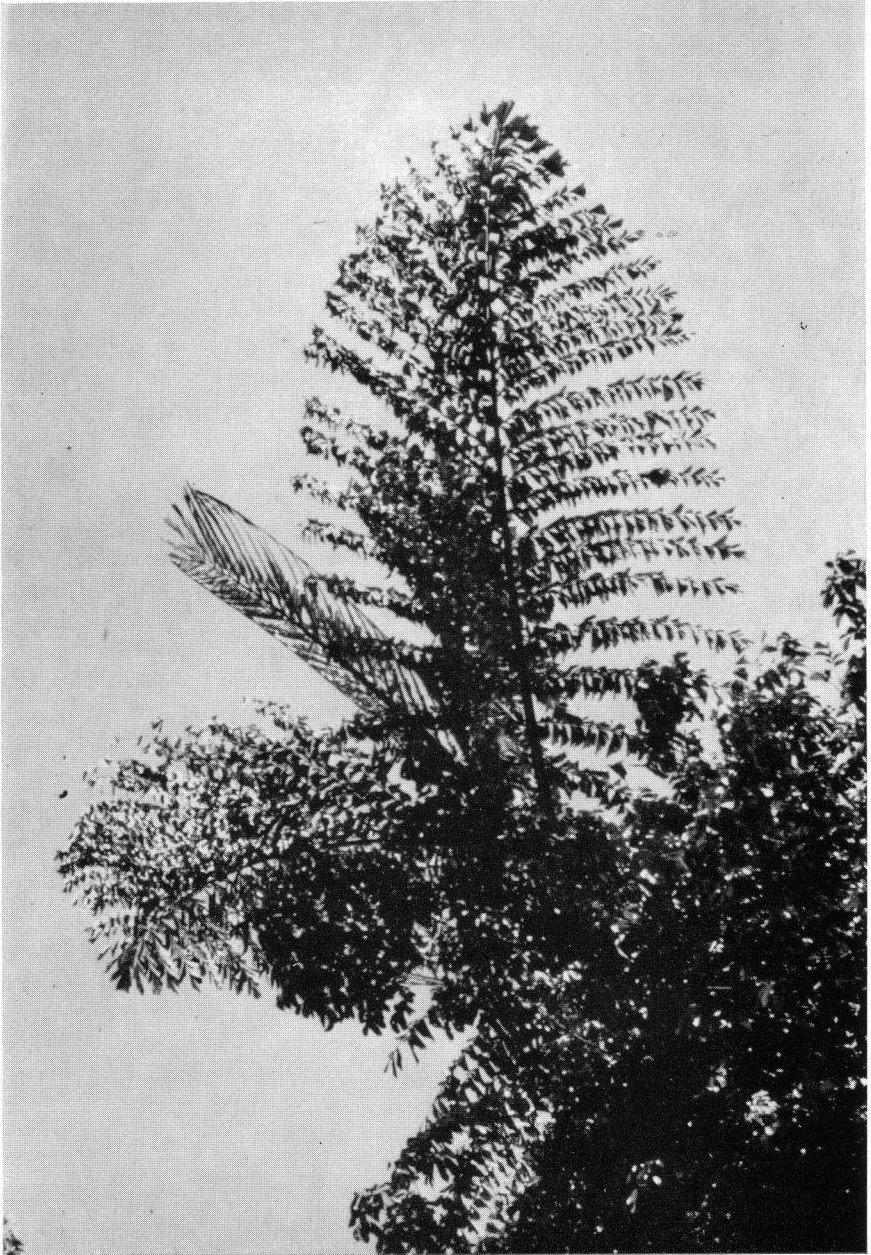
dophytæ aplebiae, quite different from the other pinnae, and not observed by me in any other *Caryota* taxon; the fruit is pinky-red, and about 95 percent of the time contains two small hemispherical seeds. This palm is widespread and common from about 20 m. to 1,200 m. altitude, a very wide ecological range. (Incidentally in November 1973, I distributed seed of this taxon to the Seed Bank under the collector's number *Dransfield 3732, Caryota* sp.). I have not been able to match this palm with any published epithet.

Photographs of a lowland, solitary, moderate-sized *Caryota* from Ceram in the Moluccas taken by Dr. Charles Lamoureux of the University of Hawaii look somewhat similar to taxon 4) but have stiff primary pinnae and main rhachides. I have no doubt that this is Beccari's *Caryota rumphiana* var. *moluccana* and hence the true *Caryota rumphiana* Mart. Seedlings of this species brought back from Ceram have rounded seeds still attached; though these may represent freak one-seeded fruits of a two-seeded palm, I think it more likely that this is a one-seeded palm.

I know nothing of *Caryota* in New Guinea and Australia and would very much like to receive information on habit, leaf orientation and flowers and fruit, on New Guinea and Australian populations. Beccari does mention that the fruit of *C. rumphiana* var. *papua* is one-seeded.

When the palms of the Bogor Botanic Gardens are examined however, the situation is much more confused; in many cases records have been lost or are incomplete, and the *Caryota* spp. show confusingly intermediate forms. It is possible that some of these may be of hybrid origin, or may originate from outside the Malesian region.

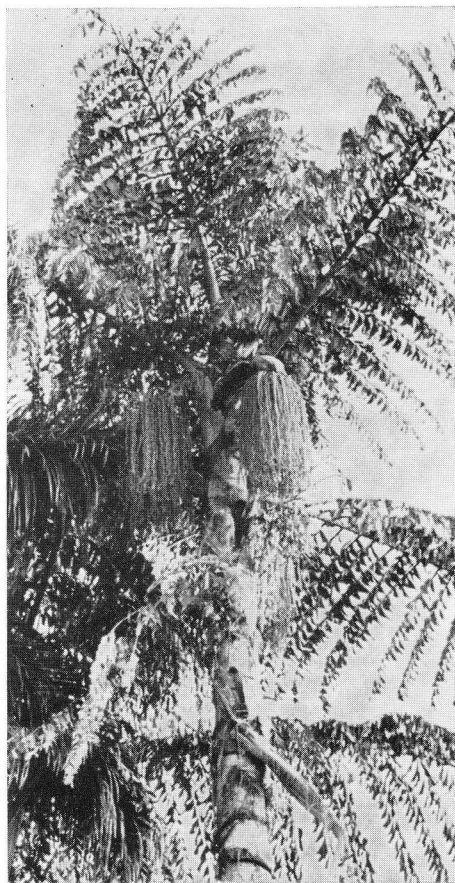
My field observations in Java, Malaya,



1. Looking up at the crown of *Caryota no* near Ranau road, Sabah. From color transparency by H. E. Moore, Jr.



2. *Caryota no* in the Kebun Raya, Bogor, Indonesia, planted in 1957.



3. Inflorescences of *Caryota no* at Bogor.

Sumatra, Borneo and the North Celebes do suggest to me that the four taxa I have enumerated above are really very distinct, and also that the differences are sufficient for the taxa to be given equivalent taxonomic categories; that is, if we are going to call the clustering taxon 1) *C. mitis*, then the other three taxa must receive specific rank rather than receiving subspecific rank within *C. rumphiana*. Owing to the extraordinary difficulty of representing *Caryota* in the herbarium and the terrible scraps we have, I am unimpressed by the similarity of the specimens in the Herbarium. I feel field characters are of far more

significance in the taxonomy of this genus.

Because of this, I shall continue to use for the giant Bornean *Caryota* the wonderful name *Caryota no* rather than *C. rumphiana* var. *borneensis*, until any monographic treatment of the genus should make it advisable to change the name. Indeed the differences between taxon 2) and taxon 3), for instance, are as great, if not greater, than between taxon 1) and taxon 2), and are greater than the differences between species in many other palm genera.

After this clarification or further confusion of *Caryota* some notes on *Caryota no* as a plant may be of interest.

I first saw wild *Caryota no* in May 1971 near Samarinda in East Kalimantan—here it was growing in an old *ladang* (unit of shifting cultivation), was still young and not yet flowering, and despite growing in a scorched open habitat, was still a grand plant with its swollen trunk and vast leaves. In October 1971, I returned to Borneo, this time to South Kalimantan, and was fortunate enough to see a very well grown individual of *Caryota no* growing in rich riverside alluvium at the edge of a rubber plantation. The palm presented a wide range of stages of flowering and fruiting and particularly welcome were large quantities of ripe fruit. The trunk was to 20 m. tall, ventricose, up to 70 cm. in diameter at the widest point. The leaves measured about 5 m. long, with a spread of 4 m. The inflorescences hung down in great two-meter-long tresses and the fruits seemed to ripen purplish-black without passing through an intermediate pink stage. Beneath the tree were great piles of fruit, in various stages of fermentation and rotting; insect activity was quite considerable within the pile of fruit, and mixed in with the rotting fruit were thousands of seed-

lings almost forming a lawn under the palm. These seedlings probably originated from the first (most distal) infructescence which, when we visited the palm, was shrivelled and dead. To cut down this magnificent tree seemed sacrilegious, yet to climb it was impossible. Collections were finally made after two weeks thought while we were elsewhere in the forest, by making a bridge-ladder of bamboo which our tree-climber used to cross from the top of a nearby rubber tree which he had climbed, into the crown of the *Caryota*. As we finished making the collections, a pied hornbill (*Anthracoceros coronatus convexus*) flew clumsily on to the ripe infructescence and daintily ate about twenty ripe fruit by swallowing them whole—each mouthful being accompanied by a toss of the head—and then flew off. As in all Caryotoideae the mesocarp contains many irritant oxalate crystals. How does the hornbill survive the crystals, where even to the human hand the mesocarp is wildly irritating? This is an unanswered problem. It is also interesting to note that the *musang* and the *dedes* (*Paradoxurus hermaphroditus* and *Viverra malaccensis*, two types of civet cat) in Java are fond of the fruit of *Caryota* (taxon 1) and (taxon 2)—their dung is often full of the seeds the germination of which is not impaired and is possibly enhanced by passage through the civet cats' guts.

In Bogor in the Kebun Raya are two well grown trees of *Caryota no* planted in 1957; these two trees originate from seeds sown in the Gardens, collected by A. J. G. H. Kostermans under the name *Pinanga* sp. from Samarinda, East Kalimantan. In February 1973 one of the trees produced its first inflorescence. Sixteen years from seed to maturity, and maturity at a great size, suggests a very fast rate of growth. Because of its lowland habit *Caryota no* should prove to be an excellent avenue tree for cities in the lowland tropics; its quick growth and relatively short life cycle of about 20 years from seed to death after flowering should not deter its use—after all, roads in cities nowadays rarely last 10 years without some alteration or widening.

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