

## Madagascar's Three-sided Palm – *Neodypsis Decaryi*

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One of the most interesting palms in the Montgomery Palmetum of the Fairchild Tropical Garden near Miami, Florida, is a palm from an island famous for its unusual plants. The island is Madagascar, home of the lace plant, the royal poinciana, the traveler's tree, and many other unusual plants. The palm is *Neodypsis Decaryi* unusual for its pronounced triangular shape caused by the three-sided arrangement of the leaves. This three-sided arrangement is present also in related genera such as *Chrysalidocarpus* and *Dypsis* where there are fewer leaves per crown or where the stems are clustered and crowded so that it is not as noticeable or perfectly arranged as it is in *N. Decaryi*.

The genus *Neodypsis* is composed of fourteen species all of which are restricted to the island of Madagascar. An illustrated account of the different species with a key and descriptions in French may be found in the *Flore de Madagascar et des Comores, 30th Famille-Palmiers*, by H. Jumelle published posthumously in 1945. *Neodypsis Decaryi*, the one species of this genus presently found in cultivation in the Western Hemisphere, can be found only at the Fairchild Tropical Garden where visitors may see several mature specimens of this most beautiful and interesting palm.

*Neodypsis Decaryi* was named for the French botanists Decary who collected specimens of the palm near Fort Dauphin, in the southeastern region of Madagascar sometime before 1933. The species was described by Jumelle in 1933 in the *Annales du Musée Colonial*

*de Marseille*, series 5; volume 1 (1): 15 and was illustrated in figure 1 on page 11 of the third fascicle of the same volume. The seeds from which the plants at Fairchild Tropical Garden were raised were received from Madagascar in July of 1947 through the interest of Professor H. Humbert of the Museum d'Histoire Naturelle, Paris. In the first ten years the plants prospered, acquiring a very ornamental character during the first few years and becoming increasingly interesting with maturity.

The most interesting aspect of *N. Decaryi* is the peculiar arrangement of the large graceful leaves. If one could view the palm from directly above one would see that the leaves radiate in only three directions giving the appearance of a three-bladed propeller. The leaves lie directly one above the other in each of three distinct vertical rows. From the side, only two rows of leaves are visible, these forming a large fan or peacock's tail with the 12-15-foot rigid feathery leaves gracefully curved at their tips. The leaf bases overlap, forming a triangular pattern, and are covered with a rusty brown fuzz. This rusty fuzz or tomentum persists on the leaf bases, the petioles, the bracts of the inflorescence and on the larger branches of the inflorescence. Viewed from any angle this palm is distinctive and I believe it is to become one of the more popular ornamentals in subtropical regions.

*Neodypsis Decaryi* always has a solitary trunk, often up to 20 inches in diameter. The dark brown rind is rough from numerous fissures and narrow leaf scars. The petiole and rachis are rounded

below and concave above. The narrow rigid pinnae are reduplicate and arranged regularly in a single row within a groove along the upper half of the rachis. Toward the middle of each pinna the margins are turned upward giving the pinna the appearance of being induplicate. The tip of each pinna bends in a graceful curve toward the apex of the leaf. The lowermost pinna frequently has a long unpleated rein hanging below the crown. Rusty-brown scales occur on the mid-vein within the slightly folded base of each pinna. These scales darken with age and diminish in size or are brushed off leaving a dark raised scar or callous. New leaves appear singly throughout the year and before unfolding resemble sharply pointed spears.

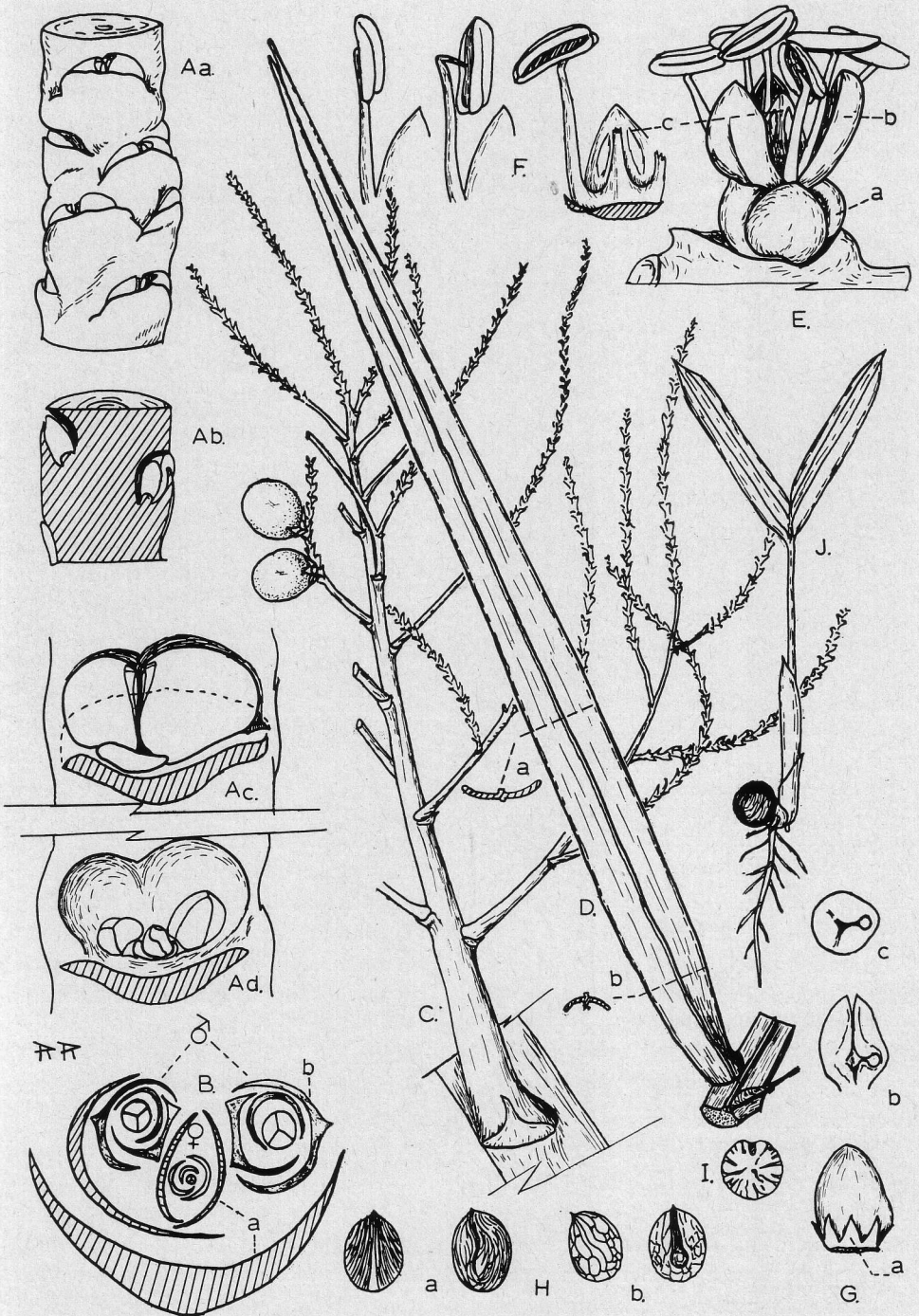
Inflorescences appear throughout the year in Florida but primarily during the spring months. They arise from among the leaves and rest on the next lower petiole (although Jumelle stated that they arise below the leaves). Each inflorescence is subtended by two large enclosing bracts. The first or outer bract is barely exposed from among the leaf sheaths, and is bicarinate (like a two-bladed sword) and persistent. The second bract, which emerges through the lower side of the first, attains twice the length of the first and looks much like a pointed club. It dries and falls soon after the inflorescence emerges through the split lower side. Pressure from the leaf bases may rarely hold the second bract in place. The inflorescence is branched three times, each branch being sub-

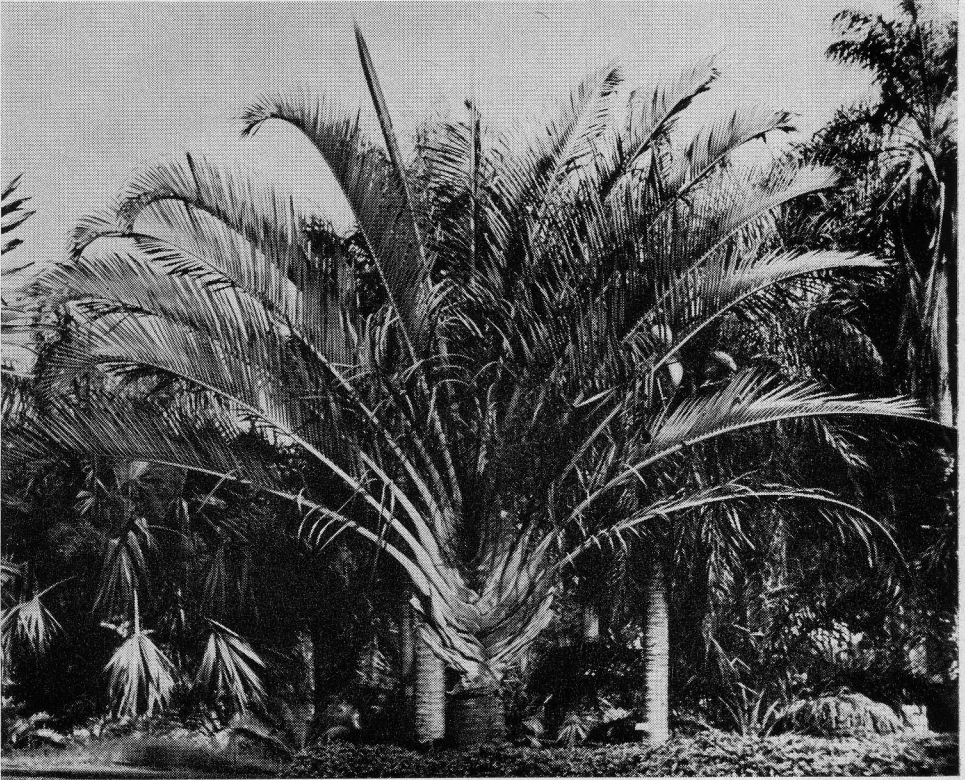
tended by a short abruptly pointed bract. The bracts of the ultimate branches are very small and rounded.

The flowers, both male and female on the same inflorescence, are sunk in pits beneath modified bracts along the ultimate branchlets. Two male flowers with a single female between them in each pit is the usual arrangement; however the female does not develop in the majority of the groups. The male flowers have three imbricated (overlapping) sepals and three valvate (non-overlapping) petals, six stamens with the anthers on hinge-type filaments which are inflexed in bud and a large pistillode two-thirds the length of the petals. The female flowers, when present, are subtended by two small bracts; the sepals are imbricated and the petals are imbricated with valvate tips. The pistil is encircled at its base by six small staminodes. The young pistil is slightly swollen on one side, indicating the position of the fertile locule with its single ovule. Two other locules are reduced and apparently bear no ovules.

Mature fruits are oval, glaucous olive-green and may have one or two partially developed carpels as lobes at the base. The mesocarp consists of a very thin yellow-green flesh over a rather fibrous inner layer. The seed is ovoid with a depression on the upper surface below which lies the tiny embryo embedded in deeply ruminant (mottled) endosperm. The mode of germination is adjacent ligular as defined in the *Ameri-*

42. *Neodypsis Decaryi*. Aa, portion of an ultimate rachilla showing groups of buds x 5; Ab, rachilla in vertical section showing pits x 5; Ac, group of buds with bract cut away exposing two staminate buds x 10; Ad, same group of buds with sepals removed from staminate buds to expose pistillate bud in center x 10; B, diagrammatic arrangement of bracts (a) and sepals (b); C, primary branch of inflorescence x  $\frac{1}{4}$ ; D, pinna from middle portion of leaf with cross sections at a and b x  $\frac{1}{4}$ ; E, staminate flower with sepals (a), petals (b), pistillode (c) x 5; F, development of stamens during anthesis; Ga, pistil of pistillate flower with staminodes x 5; Gb, Gc, longitudinal and horizontal sections of pistil with solitary ovule x 5; Ha, fruit with exocarp removed to show mesocarp fibers x  $\frac{1}{2}$ ; Hb, seed x  $\frac{1}{2}$ ; I, seed in cross section showing rumination x  $\frac{1}{2}$ ; J, seedling with bifid eophyll x  $\frac{1}{4}$ .





43. *Neodypsis Decaryi* cultivated at the Fairchild Tropical Garden. Photograph by R. Read.

*can Horticultural Magazine* 40: 17. 1961. Two tubular sheaths precede the single deeply bifid eophyll or first seedling leaf-blade; subsequent leaves are pinnate with many pinnae.

#### Culture

Jumelle stated that *N. Decaryi* is found in mesophytic forests at about 100 meters elevation between Mandrare and Fort Dauphin. It is interesting to note that the native region for this species is at the same latitude south ( $25^{\circ}$  S.) as Miami is north ( $25^{\circ}$  N.). The plants at Fairchild Tropical Garden are growing near sea level on porous oolitic limestone. There has been little or no nutritional or disease problem. An attack by ambrosia beetles was halted by in-

jection of Dieldrin into the borings before the beetles had a chance to continue their damage. Plants grown in full sun mature earlier, fruiting almost two years before shade-grown plants. Plants growing in the shade of a large live-oak, although later in maturing and having a more slender habit, are no less beautiful than those in full sun. Any well drained soil should satisfy the requirements of this species. Once established supplemental water seems unnecessary as plants seem to enjoy a medium dry climate. The plants at Fairchild Tropical Garden were subjected to temperatures as low as  $28^{\circ}$  F. for several hours a night for two nights during the winter of 1957-58 without any sign of injury.