

It had grown so large that we had to pick it up with our palm-moving derrick. By this time we were developing our ten acres in the country where the much-travelled palmetto, at long last, found its final resting place. It now gracefully decorates our entrance driveway where we see it every day. The clump is nine feet high and thirty-five feet in circumference; the leaves retain that glaucous, bluish color which gives a pleasing contrast to the usual shades of green around it. Since this palm gives every indication that it likes the spot, it serves as a reminder that the "difficult" saw-palmetto can be successfully moved.

When one is well acquainted with these "scrubby" palms, one cannot help but admire them. Rarely do we find members of the plant world with the stamina that they exhibit. They are a hardy, noble palm for they are able to

withstand fire year after year, endure temperatures down to 10° F., as well as severe droughts. But come what may, the following spring they lift their palmate-leaved heads and send forth graceful sprays of delicate, fragrant, honey-laden flowers.

Even though this saw-palmetto, the commonest palm in Florida, still covers thousands of acres of land throughout the state, it is facing future extinction if developers continue to bulldoze it out in order to make way for subdivisions, orange groves and pasture lands. More of them should be used for beautification purposes. Since it is an intrinsic part of our native Florida landscape scene, it should become a part of our planned and more sophisticated picture. This planned Florida garden necessitates the careful moving of these so-called unmovable palms.

The Doum Palms in India

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Botanical Survey of India, Poona. Photographs by the Author.

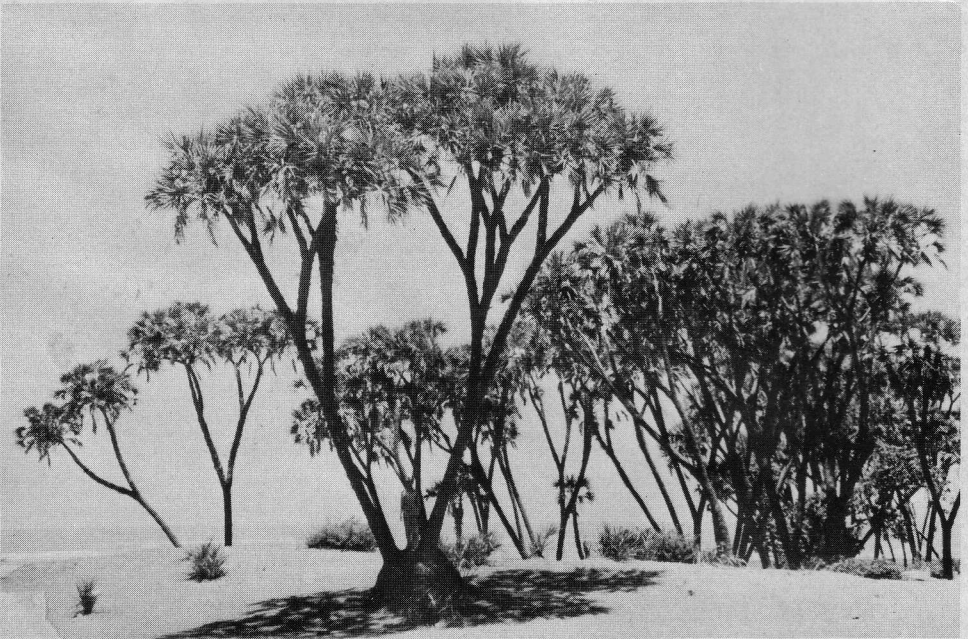
Hyphaene thebaica (Linn.) Mart., popularly called the Egyptian Doum Palm, grows along the valley of the Nile in middle and upper Egypt, which is evidently its original home and also along central and northern Sudan and Israel. This species was introduced during the last century to a few gardens in India, particularly to those along the west coast like Mazagaon Hill garden, Bombay-10, Public gardens, Baroda and also the Indian Botanic Garden, Calcutta. It is also recorded from Royal Botanical Gardens, Peradeniya, Ceylon, and Shaik Othman near Aden where it is evidently introduced, as there is no report of its distribution along the Persian and Arabian coast. It flourishes well in rich sandy loam and the palms seen in Bombay

(Fig. 21) and Calcutta gardens grow well, producing large fruits. Though the palm is propagated by seed, it is interesting to record that it has never spread so far in this period of more than half a century to the coastal area or any other suitable locality outside the garden either on the west coast or east coast. On the contrary, a very closely allied species, *Hyphaene indica* Becc., grows luxuriantly in wild condition at several places along the west coast only.

Hyphaene indica Becc. is a very distinct species, though it has been usually confused with the true Egyptian Doum Palm, *H. thebaica*. *H. indica* was first described by Beccari in his paper on the various African species of *Hyphaene* published in *L'Agricoltura Coloniale* ii,



21. Dichotomously branched upper portion of *H. thebaica* tree at Mazagaon Hill Garden, Bombay.



22. General view of a large grove of *H. indica* along the beach of Daman Grande with several seedlings of the palm along the sandy bed and the Arabian Sea in the background.

Florence, 1908, 137-183, on the basis of the specimens collected from Diu, the small erstwhile Portuguese colony of Saurashtra Coast and sent by Gammie from India. Since then, there seems to be no record of the occurrence of *H. indica* from other parts of the west coast. The author, during his studies on the flora of western India, has observed the luxuriant growth of this species, sometimes represented in considerably large numbers at some places along the northern part of the west coast of India, particularly between 18°-23° Lat., such as the coastal areas opposite Nagaon (on the way to Revdanda from Alibag), Shirgaon (beyond Palghar), Dahanu, Daman (Figs. 22 and 23), Okamundel, Diu (Saurashtra area). It is very likely that this species may occur along suitable sandy coastal areas in the range south of Alibag along the west coast, and also of Daman-Diu range of the Gujarat State (Fig. 24). It does not, however, grow along the rocky coastal belt where there is no sand cover. As such this species is not seen along the rocky coasts near Panjim and Marmagoa of Goa area. With the available data it is clear that it is restricted to the west coast only and that, on the basis of current available information, to the northern part. It would be of interest to record whether this species extends further south to Kerala State along suitable sandy coastal areas and also to Ceylon. Beccari, however, points out, on the basis of some imperfect material of *Hyphaene* collected from Jaffna, the northernmost point in Ceylon, that it differs very much from *H. indica*. It is, therefore, worthwhile to study the collections from Jaffna for proper understanding of the distribution of *H. indica*.

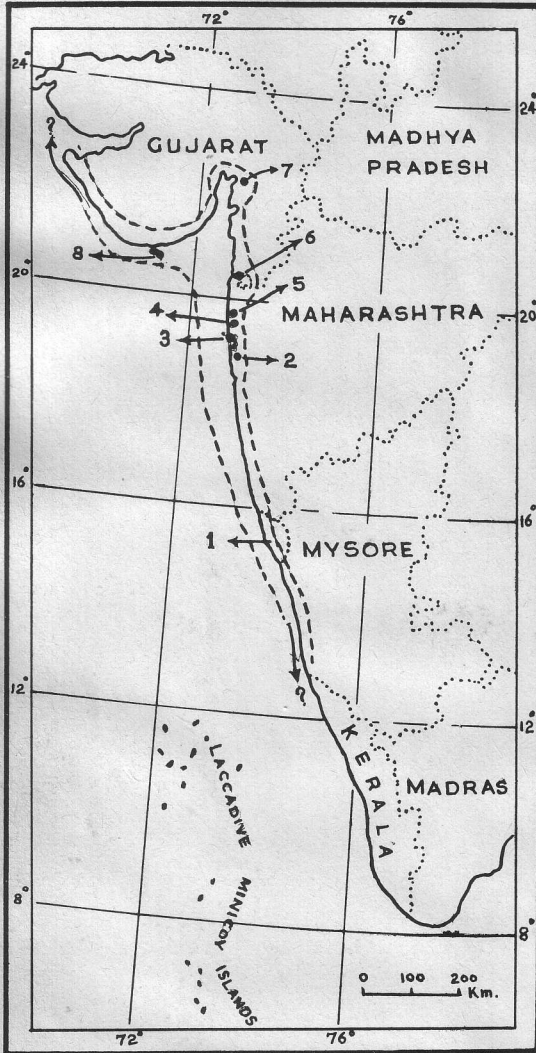
H. indica is locally called in the Shirgaon-Dahanu area "Ravana Tal" and in the Daman area "Makamberu." The name

"Ravana Tal" has an interesting relationship with the epic name Ravana, the ten-headed Demon King of Lanka, the Ceylon of the Indian epic "Ramayana." The name Tal only signifies the common Palmyra tree (*Borassus flabellifer* Linn.), with monopodial stem, and as *H. indica* has several branches, each with a crown of leaves, it is compared with the multi-headed and multi-handed Ravana with a single body.

There is a general belief that all the specimens of *Hyphaene* growing in the gardens of India belong to *H. thebaica*, an introduction from Egypt. But on examination of the specimens sent by Prof.



23. A lonely graceful tree of *H. indica* near the sea on the Daman (small) coast.



24. Map of western India showing the distribution of *Hyphaene indica* Becc. Index to localities: 1, Goa; 2, Nagaon; 3, Bombay; 4, Shirgaon; 5, Dahanu; 6, Daman; 7, Baroda; 8, Diu.

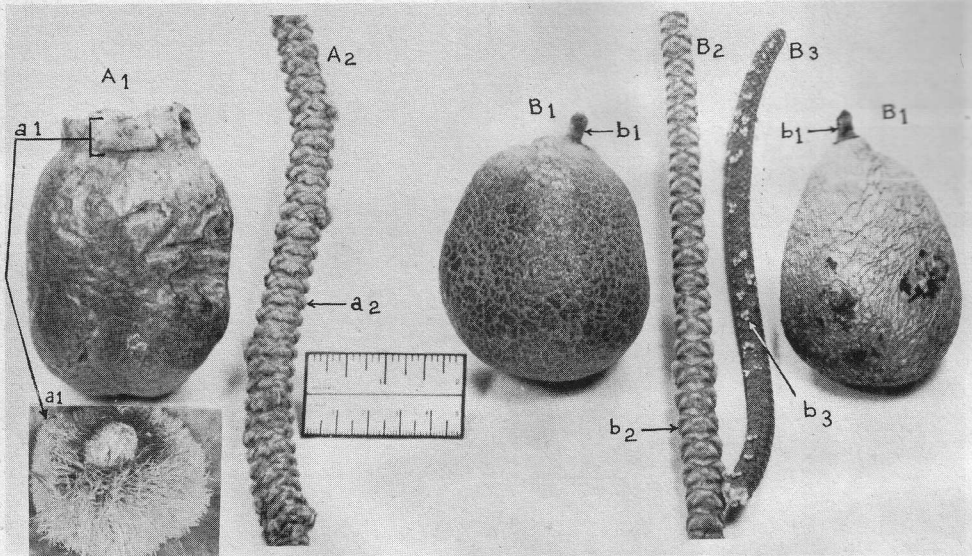
A. R. Chavan of M. S. University, Baroda, from trees growing in the Public Park, Baroda, it is evident that *H. indica* has also found a place in the gardens, possibly introduced inadvertently from the seed material of the palms growing along the Gujarat coast. Sim-

ilarly, the author's recent scrutiny of the young and old specimens of Doum Palms growing in the Indian Botanic Garden, Sibpur, Calcutta, brings out an interesting feature of the occurrence of three young trees of *H. indica* which have now started producing fruits. As the general record of the palm species in the Garden indicates *H. thebaica* only, which is represented by very old tall palms, it is quite possible that *H. indica* was introduced inadvertently from seeds obtained from the West Coast of India.

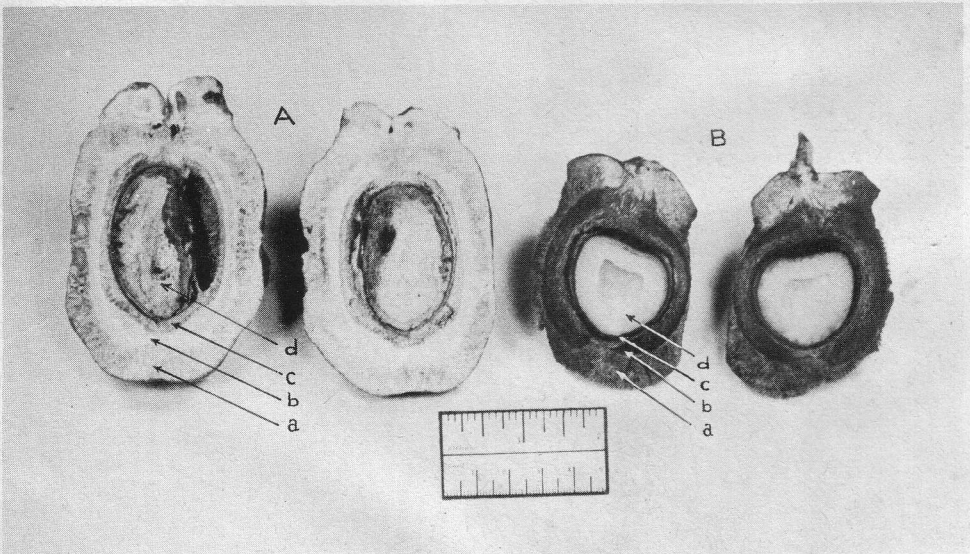
From the general habit of the palm it is quite difficult to distinguish the two species of *Hyphaene*. The fruits are, however, very distinct, particularly in the dried surface texture of the exocarp, which is smooth and shining in *H. thebaica* and rough and cracked in *H. indica*; and in the pedicel, which is indistinct and surrounded by a thick, bushy, hairy cushion, thus making it broader than high in the former, and distinct, elongate up to 10-15 mm., with short fine hairs, in the latter. The axis of the female inflorescence is also distinct, particularly in the hairy texture and the rhomboid tomentose cushion-like structures which are more in number in each spiral and distinctly protruding out more in the former than in the latter (Fig. 25). There is practically no difference in the internal structure of the fruit of either species (Fig. 26). Sometimes two carpels instead of one develop in *H. indica*, forming a two-seeded fruit, but this is mostly seen in young fruits only. Such a double fruit in a fully mature state has not been observed so far. Undeveloped fruits of varying sizes, which become shrivelled and fall off, show sufficiently long pedicels, even extending to 17 mm.

Economic Uses

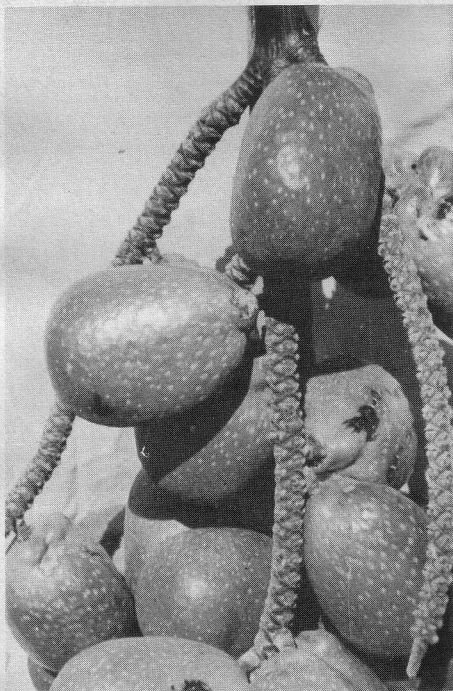
The fleshy, fibrous exocarp of the fruit of both species is somewhat sweet and bitter and is eaten by boys along the



25. Photo showing the fruit (A1) and female inflorescence axis (A2) of *Hyphaene thebaica* and those of *H. indica* (B1 and B2) and also male inflorescence axis (B3) with small male flowers (b3) of *H. indica* showing variation in pedicel (a1 and b1), surface texture of exocarp and the tomentose cushions (a2 and b2). Pedicel of *H. thebaica* (a1) is much enlarged, showing bushy hairy cushion around indistinct stalk in the middle.



26. Longitudinal section of the fruits of *H. thebaica* (A) and *H. indica* (B) showing fibrous exocarp (a), hard stony mesocarp (b) and soft endocarp (c) with white endosperm (d) in the innermost portion.



27. Fresh fruits of *H. indica* with shining spotted surface, attached to the axis by distinct stalks.

west coast of India and also in Egypt. This pulp is considered astringent and anthelmintic. The unripe kernel (endosperm) in both species is also edible. *H. indica*, however, produces fruits profusely in bunches (Fig. 27). The young leaves of *H. thebaica* are eaten by camels in Egypt.

The hard kernel from the mature, dry fruits of *H. thebaica* is used as vegetable ivory for making buttons and beads. As the nuts, the buttons and beads are some-

times attacked by scolytid beetles, *Coccotrypes dactyliperda* Fabr., treatment by boric acid 3% or zinc chloride 5% or copper sulphate 5% has been recommended as a preventive measure. Though it is considered that such buttons in India are made from the nuts of *H. thebaica* only, imported from Egypt, it is very likely that the nuts of *H. indica* also get mixed up for such work and may be considered as useful along with the vegetable ivory extracted from the talipot palm (*Corpyha umbraculifera* Linn.) for making buttons and beads as a profitable cottage industry.

Along the west coast where the plants are abundant, the leaves like those of many other palms are used for thatching. As the plants are always in limited number, they are never cut by the villagers, though the wood is useful for posts, beams, etc.

H. indica is also quite an attractive palm and though the young stems look rugged, covered by spiny-margined leaf bases and petioles, the cluster of leaves presents a graceful appearance. This species, which is propagated by seed, would be a good and interesting botanical acquisition if introduced in the botanical and public gardens and also palm gardens of tropical coastal parts of the world.

The author wishes to express his thanks to Prof. A. R. Chavan of Baroda for kindly sending the material from Baroda and to Dr. H. Santapau, Director, Botanical Survey of India, for facilities provided for this work.