

Palmyrah Palms in Tamil Nadu, India

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1. *Borassus flabellifer*
in a dry landscape,
Tamil Nadu.

India stands first in the world in terms of its wealth of palmyrah palms (*Borassus flabellifer*) with a population estimated to be nearly 102 million palms. Of this, 50% of the palms are concentrated in the southernmost state of Tamil Nadu, where palmyrah is honored as the State Tree.

In Tamil Nadu, the districts of Tuticorin, Tirunelveli, Ramnad and Kanyakumari, adjacent to the Indian Ocean, are endowed with 10 million palmyrah palms (Sankaralingam et al. 1999) (Fig.1). In these tracts the palm is cultivated and exploited in the wild, and referred to as 'The Tree of Life' with 801 uses, including food, beverage, fiber, fodder, timber and medicines. Among the various edible uses of the palm, the sweet sap tapped from the inflorescence for making palm

sugar is of prime importance. The endosperm of the young fruit, like tender coconut, is a delicacy in summer. The petiole fiber and leaf blade are used to make products such as brushes and handicrafts. The tree serves as a source of raw material for several cottage industries.

Palmyrah prefers a dry climate, growing naturally in sandy plains adjacent to seashores (Fig. 2). The mean annual rainfall in this area ranges from

600–700 mm with temperatures in summer (April, May) ranging from 35–40° C. However, the palm is not suited only to dry climates. It flourishes well under wetter conditions such as on the banks of the perennial River Tambiraparani that runs through the two districts of Tirunelveli and Tuticorin. On the riverbanks in fertile soils, the groves take on the appearance of rain forest (Fig. 3). The palm is so closely woven into the lifestyles of the people of the region that palmyrah fruits are hung as decoration in marriage ceremonies as a symbol of prosperity and happiness.

Palmyrah has separate male and female trees. Sex cannot be differentiated until flowering. The palm is a slow grower compared to the coconut, which is cultivated in areas with good irrigation. The stem of palmyrah is visible only after 4–5 years. In contrast, some dwarf cultivars of the coconut begin bearing at 4–5 years. Palmyrah needs minimum care, and if protected by fencing from stray cattle feeding on its foliage, the palm can come into flower and fruit within 10–12 years. Otherwise, it may take 20–25 years for the palm to flower.

Fig. 2. Palmyrah palms flourishing on sandy soil with a female tree in the foreground.



The palmyrah stem is unbranched, usually growing to a height of 15–20 m, topped by 25–30 large fan-shaped leaves. However, there are dwarf palms that come into bearing even at a height of 4 m. The male palm produces 5–10 inflorescences each year. The male inflorescence is heavily branched with each branch having 2–3 spikes. Each spike has 800–1000 flower clusters, which in turn bear 15–20 little flowers. As a whole, a male inflorescence may have 200,000–250,000 florets. In contrast, the female inflorescence has only 2–3 branches, with each branch bearing 10–12 large, globose flowers. Normally a female palm produces 5–8 inflorescences with a total of 100–150 fruits. However, trees close to water sources may bear nearly 300–400 fruits (Fig. 4). The fruits are generally black-skinned, but red-skinned types also occur.

These palmyrah-growing tracts receive one heavy monsoon during October–November. Flowering is seasonal, and fruiting occurs in September–October. In nature, the fully-ripe, heavy fruits fall down and become buried in the soil. The rainfall received during the season facilitates germination. The fruits are normally 3-seeded and when all of them germinate from a single fruit, they give rise to three palms. Clumps of 2–3 palms are a common sight in the area.

Palmyrah is one of the major sources of palm sugar in Asian countries. The palm is planted on reservoir and lake banks to stabilize them. It is also planted on rice field margins to demarcate them. The palm does not need much water, requires very little maintenance and it is highly disease resistant. It stabilizes unproductive, erosion-prone soils. It can be planted in any type of soil to increase soil fertility and water conservation. It is used as a wind-break in sandy plains to stabilize dunes. Palmyrah is truly a multipurpose palm.

LITERATURE CITED

- SANKARALINGAM, A., G. HEMALATHA, AND A. MOHAMED ALL. 1999. A treatise on palmyrah. Hameed Khan, H. (Ed). All India coordinated Research Project on Palms, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Killikulam, 628252, Tamil Nadu, India, 41 p.



Fig. 3 (top) Palms of different ages growing wild on the banks of the River Tambiraparani. Fig. 4 (bottom). A female palm bearing 300–400 fruits at maturity.

PALM LITERATURE

Response to Dransfield's Review of *The Palms and Cycads of Thailand*

When we present our work in a public forum we take the risk of someone being critical of our work. We also expect our work to be reviewed in a fair, unbiased, and objective manner. I am not at all adverse to fair, unbiased, objective and constructive critique. Although some of the comments in John Dransfield's review (PALMS 44: 98-100. 2000) of my book, *The Palms and Cycads of Thailand*, are fair, I believe most are factually incorrect, and the remaining are rather petty and of no consequence.

Readers of Dransfield's review should be aware of his early involvement with the project. At the 1996 IPS Biennial, Kampon Tansacha asked me to write a popular, illustrated book on Thai palms in time for the 1998 Biennial. I accepted his offer and invited Dransfield and Dr. Anders Barfod to participate, as they had been working toward a scientific account of the Thai palms for some time. They declined my invitation to join the project as junior authors when Kampon backed me as senior author.

Kampon did not commission me to do the project and write the book as Dransfield falsely asserted. I received no payment from Kampon for directing the project and writing *The Palms and Cycads of Thailand*, and I receive no revenue from sales of this book.

"Work on just the historic collections in the herbaria at Kasetsart University (BK) and the Royal Forest Department (BKF) in Bangkok would have added further species to his list. It is surprising that these, at least, are not included." [Dransfield's statements from the published review are given in bold.]

That Dransfield criticized me for not apparently examining available herbarium specimens is remarkable on two accounts. First, I am surprised that a popular treatment of palms requires an examination of herbarium specimens. Second, I actually did examine all available palm specimens at these two herbaria as well as those at the herbarium in Surattani. I spent an entire day at BKF since it was said to have the largest number of palm specimens; however, I was greatly surprised and disappointed at the dearth of specimens available for study. There were not more than 100 specimens of Thai palms at BKF, a surprisingly small amount considering that

researchers, Dransfield included, have been periodically working on Thai palms for over 20 years. The herbarium cases holding the palm collections were mostly empty, with few specimens scattered here and there.

It was obvious these cases had held many more specimens at one time. What had happened to them? Under the most unusual, suspicious and mysterious of circumstances, the herbarium officer at BKF told me that he had been ordered to place the herbarium specimens off limits and made unavailable specifically to me. Another person independently corroborated these incredible circumstances. Perhaps I should have gone to Europe or elsewhere and examined Thai palm specimens there although by then I doubted I would have been received in any more of a cooperative spirit than I had been at BKF in Thailand. Besides, the expense and time to visit European herbaria were not warranted, especially for a popular (not scientific or technical monograph) book. Dransfield has since told me that he was and is unaware of any conspiracy to deny me access to palm collections in Thai herbaria.

"That it gives equal treatment to all the palms, all confidently identified and named ... gives a superficial air of completeness to the book as if it purported to be a complete monograph of the palms of Thailand."

I clearly and unequivocally stated in the preface of the book that, "It must be stressed this book is a popular account, not a monographic treatment". Later in the preface I added, "This work is not intended to be the final word on Thai cycads and, especially, the palms." Past reviewers and others, Dransfield included, have written glowing words of praise about other popular palm books, but never did they criticize or discount them because the authors did not examine herbarium specimens.

"Perhaps the most unfortunate aspect of the book is that it appears to have been written without any contact being made with the very active palm botanists Saw Leng Guan and Lim Chong Keat who live just over the border in Malaysia."

In fact, I relied heavily on Saw's excellent 1997 monograph of *Licuala* of the Malay Peninsula in making determinations, and I still stand behind my work. As for Lim, he had co-authored a short article with Dransfield in *Principes* in 1992 about a species of *Areca* from northern Malaysia that extends just across the border into far southern Thailand. Dransfield called this article to my attention. I agreed with him and was able to

incorporate the name of the palm in the book in time to include it before going to press. Dransfield did not, however, indicate to me that Lim would have been such a critical resource for the project as he purported in the review. For one who thought Lim or Saw was such a critical resource for the project, Dransfield did not show it. Certainly Dransfield could have simply told me of their possible contributions to the project in 1996.

Nevertheless, since the book was printed, Lim and Saw (including Barfod) have weighed in with their opinion and interpretation of *Pinanga*, *Iguanura*, *Breca*, and *Licuala* in Thailand. They accepted some of my species boundaries and rejected others. They are entitled to their opinion. Where to draw the line between species has been and always will be a source of healthy, contentious debate of opinions and interpretations.

"...the authors follow the latest monograph of the genus (*Phoenix*) by Barrow, whose work predates the book. . . [yet] there are no explicit references to her monograph."

I did not reference Sasha Barrow's *Phoenix* monograph simply because I did not use it. It was not published until after *The Palms and Cycads of Thailand* went to press. Sasha herself, through personal communication, was one of the sources of information I used for *Phoenix*, and I noted her contributions in the Acknowledgments, as I did for other researchers with whom I had communicated.

"The authors have not seen for themselves all the taxa included in the book. For example, *Calamus spectatissimus*... Unfortunately, no source of information is cited..."

It is correct that I did not see all the taxa. I saw only 150 of the 162 (93%) species, as my photographs indicate. The remaining 12 species I included without photographs. I made no citations in the book because it is a popular account, as I clearly stated in the Preface. Instead, I relied on the literature listed in the Selected

References, several of which are Dransfield's own works, including *A Manual of the Rattans of the Malay Peninsula*, published in 1979. Although not without its own errors and omissions, this work was still the best, most up-to-date treatment on the rattans. In this work, six of the 12 remaining species I did not see are noted as also occurring in Thailand, so I included them.

There are positive aspects of the book that another reviewer might have mentioned. *The Palms and Cycads of Thailand* is the only handsomely-illustrated account of Thai palms, and I believe it can be a starting point for a future scientific and technical taxonomic monograph, the need for which Dransfield noted in his review. Since the book is written in a popular style and format, the information is accessible to everyone, no matter his or her level of interest or expertise. Also, *The Palms and Cycads of Thailand* is the only modern, colorfully and extensively-illustrated account of numerous Old World palms, many of which are poorly known and rarely or never illustrated. The rattans, a group of palms mostly ignored in popular palm literature, are especially well illustrated. In many respects, the book is a badly-needed introduction and guide to Old World palms. The project resulted in new species and new published records of palm species for Thailand, the latter including 25 *Calamus*, 10 *Daemonorops*, and four *Korthalsia*, among others, and the collection of over 200 herbarium specimen vouchers, which are now accessible to Dransfield and his co-workers.

Phrases such as "The authors...show a certain irresponsibility and disregard of taxonomic convention" and "It could have been written honestly and rapidly without compromising taxonomic convention" question my integrity. I was honest and sincere in all my work for this book, as I have been in all my other work.

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