

A Survey of Palms from Jnanadweepa Campus and Studies on their status of conservation

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Abstract : Members of the plant family Palmae, also known as Palmaceae, or more recently rechristened as Arecaceae are mostly found in hot tropical, subtropical and warm temperate regions of the world. Apart from exhibiting enormous diversity in their morphological features, palms are known to inhabit almost all types of habitats ranging from tropical rainforests to desert habitats. They feature amongst the most extensively cultivated botanical families and have been very close to mankind since the origin of civilizations. Whilst various historical accounts depict palms as symbols of fertility, peace, wellbeing and victory, in recent times the palm tree has come to symbolize vacations at exotic locations and also, their significance in all the major religions of the world continues unquestioned. Besides being sources of ethno-medicines, foods, oils and various other products of utility, palms are also widely used in landscaping, horticulture and gardening. The popularity of palms has increased with times.

The biodiversity of palms occurring on Jnanadweepa, Vidya Prasarak Mandal's college campus, popularly known as Thane college campus was studied in the current investigation. Different varieties of palms were recorded, dominant among them, on the college campus, being *Cocos nucifera* (coconut palm), *Areca catechu* (areca palm) and *Chrysalidocarpus lutescens* (golden cane palm). *Caryota urens*, with its majestic appearance and multi faceted utility potential, and *Rhapis* spp. (lady palm) were also recorded in the study. *Ravenala madagascariensis*, popularly referred to as traveller's palm; but not actually a true palm, was also observed and included in the findings as a special listing. The economic importance and status of conservation of the listed palms is also mentioned.

Key words : Biodiversity, palmae, arecaceae, palms, Thane college campus, *Cocos nucifera*

Introduction

The majestic palms prominently feature amongst the best known and most extensively cultivated plants in the world today. These members of the botanical family Arecaceae, previously known as Palmae, are generally found in hot tropical, sub tropical and warm temperate regions. Further north or south, they are prized as popular indoor, conservatory, glass house or hot house specimens. Palms exhibit an enormous diversity in their morphological features and are also known to inhabit almost all types of habitats ranging from tropical rainforests to desert habitats (Leaser, 2005). Acknowledged amongst plants for their imposing appearance, heights, dimensions of leaves, seeds and inflorescence; palms hold undisputed records for the tallest monocotyledonous plant in the world, largest leaves, largest seeds, largest flower clusters and largest inflorescence in the plant kingdom. As sheer numbers would testify, some palms bear up to 15 million flowers on a single plant (Riffle, 2008).

Palm trees have been intimately associated with human civilizations throughout the history of mankind (Dekhane, 2003); having being quoted in ancient Indian literature (Bedekar, 1993; Nene, 1997a), acknowledged from excavation sites of ancient civilizations (Mehra, 1997; Tamboli and Nene, 2005), mentioned in mythological legends and folklore (Gandhi and Singh, 1989), historical memoirs and records (Nene, 1997b; Kumar, 2008), religious texts inclusive of both Old and New testaments of the Bible and writings associated

with the major religions of the world wherein they have been attributed with symbolic significance (Kadari, 2009; Schulze, 2012) as well as classics (Doyle, 1981). Various civilizations have associated them with symbolism depicting aspiration, fertility, honour, life, peace, resurrection, truth, value, victory, vitality and warmth, to name a few and their usage in religious rites and rituals of all major religions has continued since ancient times. In recent times, palms have come to symbolize leisurely vacations at exotic tropical seaside locations.

Members of the palm family have been supplying all the basic necessities of life to human civilizations in the tropics since times immemorial; providing them with livelihood and sustenance, and, subtly entering their lives by becoming a part of socio- religious functions and rituals. In acknowledgement of their contribution and anthropological importance, the renowned botanist Carolus Linnaeus referred to them as 'princes of the plant kingdom'. Currently, while over 200 genera with around 2600 species of palms are known all over the world (Wikipedia), around 63 palms are reported indigenous to India and an equal number introduced from other countries, collectively putting the numerical diversity of palms in India at over 125 types (Mahabale, 1982). In spite of this rich and impressive background, information available on Indian palms is scattered and relatively scanty. Hence, to create awareness on this rich natural heritage, it was planned to carry out a survey of members of the family arecaceae (palmae) on Jnanadweepa, Vidya Prasarak Mandal, Thane's college

campus, popularly known as Thane college campus as part of an exercise for documentation of palm flora on the campus.

The area of study viz. Jnanadweepa, popular amongst locals as Thane college campus is a spacious 13.5 acre island campus situated in the Chendani area of Thane city, alongside the Thane creek, near Thane railway station (Central Railway) on the outskirts of Mumbai, the commercial capital of India. Apart from housing some of the best educational institutes in the region (VPM, 1996, 2013), the world class campus also sports a huge biodiversity of micro and macro flora, both natural and cultivated. The avenues in the campus and the carefully laid out jnanapath viz. the walking track along the circumference of the campus are for a major part lined with coconut and other palms. The overwhelming majority of palms, especially the coconut palm (*Cocos nucifera* Linn.), on the campus prompted the current investigation.

Materials And Methods

The study was carried out by employing the survey method for collection and compilation of data over a period of 12 months, from November 2012 to October 2013; wherein a physical count and survey of all specimens belonging to the family Arecaceae (Palmae/ Palmaceae) was carried out in the area of study. Specimens planted at permanent locations in the ground, potted specimens as well as transplanted saplings were considered for documentation and recording in the study. The specimens were identified in the field and in the department of botany, B.N Bandodkar College of Science, a NAAC reaccredited A Grade institute from amongst the VPM Group of Institutes, situated on the campus, using standard literature. The related facts presented in the section of results and discussion, were compiled from various sources, duly cited in the references section.

Results And Discussion

The study revealed an impressive 279 single specimens of palms and a further 31 number of clumps of the golden cane palm (*Chrysalidocarpus lutescens*) exhibited both, as potted specimens as well as in the ground at permanent locations in the area of study. This was in addition to 2 clusters comprising collectively 10 specimens of the 'palm like' member of the botanical family Musaceae, more recently classified under the bird-of-paradise family Strelitziaceae. viz. Traveller's palm (*Ravenala madagascariensis* Sonn.). The 279 single palm specimens recorded, belonged to 5 different genera; the majority of the recorded specimens belonged to genus *Cocos* viz. the coconut palm (*Cocos nucifera* Linn.) followed by genus *Areca* viz. Areca nut palm (*Areca catechu* Linn.). The genera recorded in lesser numbers, but nevertheless of value from

the biodiversity point of view were genus *Livistona* viz. Fan palm (*Livistona chinensis* R. Br.), genus *Caryota* viz. Fish tail palm (*Caryota urens* L.) and genus *Rhapis* viz. lady palm (*Rhapis* spp.). All the specimens recorded were cultivated, having being planted or introduced in the area of study at different times since establishment of the educational campus in late 1960s. The results are depicted in Table 1.

The coconut palm (*Cocos nucifera* L.) is of common occurrence in the Konkan area under which the area of study falls; growing best near the sea coast (Pfleiderer, 1990) and results are in agreement with the same. This palm has been cultivated in India since ancient times. All parts of this tree being useful to mankind, has earned it the name 'kalpavriksha', one among the 5 legendary devavrikshas, the 'all giving trees' (Markrose, 2008). The roots, trunk, leaves, flowers, fruits, seeds, kernel, pulp, coconut milk, coconut water, oil, oil cake, mature coconut shell, coir, wood and pith are valuable assets yielded by this tree which can be put to a vast multitude of uses in various fields of utility inclusive of their reputed medicinal uses (Chopra *et al.*, 1969; Agarwal, 1986; Tiwari and Pande, 2005; NISCAIR, 2010). The entire tree is of importance in horticulture and landscaping (Gopaldaswamiengar, 1991), considered as sacred, the nuts being part of socio religious functions and rituals (Bhatla *et al.*, 1984) and is also a valuable source of pollen and nectar for honey bees (Alexander and Daniel, 2012). An impressive total of 187 coconut palms were recorded in the area of study during the investigation; some were newly transplanted, some well settled and showing excellent growth, while many were the original specimens planted soon after establishment of the campus, in late 1960s and early 1970s.

The betel-nut palm (*Areca catechu* L.), common in the coastal regions from Maharashtra to Kerala and Tamil Nadu, is almost equally useful; its roots, young shoots, leaves, nuts, juice of nuts, burnt nuts, green kernel, husk are put to several uses which also includes several medicinal uses (CSIR, 1948; Pullaiah and Naidu, 2003; Kirtikar and Basu, 2006). These nuts are also a part of socio religious functions. The chewing of betel-nuts is believed to induce oral cancer and unripe fruits are believed to harm the eyesight (Parrotta, 2001; Chen *et al.*, 2013). A total of 79 areca-nut palms were recorded on the campus during the study. Most of the specimens surveyed were young specimens in large pots, exhibited at vantage points for ornamental purposes and landscaping.

The cane palm (*Chrysalidocarpus lutescens*) is essentially an ornamental palm introduced from Madagascar (Mahabale, 1982), equally suitable for indoor, semi-outdoor as well as outdoor locations. The clumping habit adds beauty to this palm. Thirty one clumps of this palm were

recorded, each clump comprising few to several individual specimens; both, plants at permanent locations as well as potted specimens were recorded during the study.

Seven specimens of the Chinese fan palm (*Livistona chinensis* R. Br.) at permanent locations in the campus as well as in pots were recorded during the study. This versatile palm is capable of growth indoors, to a certain extent, as well as outdoors and is exhibited as an impressive ornamental palm.

The fish tail palm (*Caryota urens* L.) is commonly seen in evergreen forests of peninsular India (Santapau, 1967) and is also renowned as an ornamental tree (Swarup, 1997) planted in gardens for its distinctive looks and silhouette. The tree has several other uses viz. its yield of strong kitul fibre, food value for large animals such as elephants, timber value, source of sweet toddy, palm jiggery, sago and medicinal value (CSIR, 1992; Parrotta, 2001; Sahni, 2005). All parts of this palm are useful. Four specimens of this handsome palm were recorded during the current investigation.

The lady palm (*Rhapis spp.*) has been reported as a slow growing ornamental plant, suitable for indoor as well as outdoor locations, preferably in shade (Beri, 1987). Two potted specimens of this beautiful palm were observed and recorded during the study.

The palm-like member of plant family Musaceae, or recently Strelitziaceae, viz. Traveller's palm (*Ravenala madagascariensis* Sonn.) has its own charming beauty. Its large woody trunk resembles that of palms, while the leaves are more like those of banana, to which botanical family it belongs. Ten specimens of the palm were recorded from

two locations, one location showing a cluster of 9 plants, most of which had arisen from the sides of the parent plant as is the case with banana. This is not actually a true palm and has been included in the study as a special listing due to its resemblance to palms.

Conclusion

The investigation revealed an overwhelming, healthy and vigorous population of palm specimens thriving on Jnanadweepa, VPM's college campus, popularly known as Thane college campus. All the specimens recorded were healthy, free from diseases and actively growing; many also showed flowering and fruiting, indicating a natural, healthy and undisturbed environment suited for growth and development. The best of the conservation efforts were observed to be carried out by the support staff under instructions from authorities to maintain the healthy and thriving population of palms on the campus. There is no doubt that the palms investigated in the current study, along with the rich flora on the Jnanadweepa educational campus housing VPM's group of institutions, serve as green lungs for all the surrounding areas in the vicinity.

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Table 1: Palms recorded on VPM's Jnanadweepa campus, Thane, India

S. No	Botanical name	Common Names (English, hindi, Marathi, Sanskrit)	Specimens Recorded (*Nos./ **clumps)
1	<i>Cocos nucifera</i> L.	coconut palm, nariel, nariyal, narikela	187*
2	<i>Areca catechu</i> L.	areca palm, areca-nut palm, betel-nut palm, supari, pophali, gubak, guvaka, kramuka, puga, tantusara	79*
3	<i>Chrysalidocarpus lutescens</i> syn. <i>Areca lutescens</i> , <i>Dypsis lutescens</i> (H. Wendl.)	bamboo palm, butterfly palm, cane palm, golden cane palm, golden feather palm, madagascar palm,	31**
4	<i>Livistona chinensis</i> R. Br.	chinese fan palm, fan palm, fountain palm	7*
5	<i>Caryota urens</i> L.	fish tail palm, horse tail palm, Indian sago palm, kitul palm, Malabar palm, wine palm, bankhajur, berli, berlimad, dirgha, dhoajavriksha,	4*
6	<i>Rhapis</i> spp.	lady palm, little lady palm, broadleaf lady palm, ground rattan palm	2*

(In addition to the above palms, 10 specimens of the palm akin Traveller's palm (*Ravenala madagascarensis* Sonn.) in two clusters comprising 9+1 specimens were also recorded)

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