



## Diversity in Palmyrah (*Borassus Flabellifer* L.) in North Konkan Coastal Region of Maharashtra State

### KEYWORDS

Palmyrah, sex determination

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**ABSTRACT** *Palmyrah (Borassus flabellifer L.) is a tropical palm. It is commonly occurred in Thane district of Maharashtra state. It is still underutilized important palm in the north konkan region of Maharashtra. Out of total area in Maharashtra, 90 per cent area is in only Thane district. Each part of this palm is commercially exploited. It is dioecious palm and there is wide range of diversity. The survey was carried out during the years 2008 to 2010 in Thane district of Maharashtra state to study the diversity of palms with special reference to sex determination and to collect the elite types of palmyrah having peculiar characteristics. From the surveyed palms the male : female ratio was 1 : 1.47. The variability was found from palm to palm. The palms having peculiar characteristics like high potential of Toddy tapping, nut and kernels quality, growth performance were also identified and selected for further evaluation.*

Palmyrah (*Borassus flabellifer* L.), a tropical palm, occurs in Tamil Nadu (TN), Andhra Pradesh, Orissa, West Bengal, Bihar, Karnataka and Maharashtra. It is a multipurpose tree and is exploited for food from the fruit and tuberous seedlings, beverage and sugar from the sap, fiber from the fruits and leaves for brushes, cordage weaving and plaiting, and trunk wood for construction and fuel. Due to its multifarious uses, the Government of Tamilnadu has declared it as a 'state tree' (Sankaralingam, et.al., 1999).

It is the one of the most important palm in the north konkan region of Maharashtra. In Maharashtra out of total occurrence, 90 per cent area is in only Thane district. This palm is found in a belt of Dahanu, Palghar, Vasai (Near seashore) tahsils of Thane district and some part of Raigad district and middle track of north konkan region. Palmyrah is a dioecious palm with the great majority of its economic products such as immature endosperm, mesocarp pulp, tuberous seedlings obtained only from female palms. But sweet sap from the inflorescence, toddy, palm sugar, brush fibre and wood are obtained irrespective of whether the palms are male or female. However, differences in their yield or quality have been reported. Thus female palms are supposed to yield more toddy on tapping from the inflorescence (Davis et.al., 1987) and the female tree gives better and hard timber than the male tree, and is also more expensive (Kalarani et.al., 1991).

As this palm is underutilized crop, there is no systematic plantation but the occurrence is scattered. It has unique importance in the economy of the farmers in the district. The farmers approach towards the management of Palmyrah palm is increasing day by day because now a day it is an economically important crop. Every part of the palm is utilized like coconut. The fresh fruits as well as Toddy of Palmyrah palm of Thane are very famous in India. The kernel of young nut is hollow, soft as jelly, and translucent like ice, and is accompanied by a watery liquid, sweetish and potable which has a great demand in Mumbai and nearby markets.

In north konkan region of Maharashtra, the maximum cultivation is on the bunds of the rice field, barren lands and the palms have been established since last century (More than 80 to 100 years old). Most of the palms have vigorous productivity in terms of toddy recovery and nut recovery.

Due to improper management practices as the farmers are unknown regarding scientific management practices like manuring, irrigation, plant protection, etc. it remained minor crop.

The palms are slow-growing perennials and have no distinguishing features to identify the sex until flowering. The palm commences flowering only after 12 to 15 years of maturity. On account of the dioecious nature and long juvenile period, farmers have hesitated in planting this multipurpose tree. Breeding and crop improvement would be highly facilitated if gender could be determined at the seedling stage itself. This would help farmers while selecting the seedlings and maintain an optimum sex ratio at plantation.

To improve the status of the above problems a systematic research work on palmyrah with multidiscipline approach has been initiated by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. In this context, the survey was carried out in Thane district of Maharashtra state to study the diversity of palms with special reference to sex determination and to collect the elite types of palmyrah having peculiar characteristics.

### MATERIALS AND METHODS :

The survey was carried out in coastal tahsils of the Thane districts during 2008 to 2010. For survey work palm pockets were randomly selected and male, female palms were recorded. In the year 2008-09, 310 palms were surveyed and in the year 2009-10, 177 palms were surveyed. The fruiting behaviour i.e. No. of nuts per spadix, male female ratio, no. of kernels per nut were also observed and palms those have peculiar characteristics were recorded.

### RESULTS AND DISCUSSION :

It is revealed from the data presented in table 1(A), that out of 310 surveyed palms 70 (22.58 per cent) palms were in juvenile phase where sex determination could not be possible. 149 (48.06 per cent) were female palms and 91 (29.35 per cent) were male palm. The male : female ratio was 1 : 1.64. From the data presented in table 1(B), that during 2010 out of 177 surveyed palms 47 (26.55 per cent) palms were in juvenile phase, 73 (41.24 per cent) were female palms and 57 (32.20 per cent) were male palm. The male : female ratio was 1 : 1.28. The average

male : female ratio was 1 : 1.50.

The palms having peculiar characteristics like high potential of Toddy tapping, nut and kernels quality, growth performance were also reported and given in Table 2.

From the finds from the survey, SWOT analysis was done as given below.

**Strength :**

1. Every part of palm is useful like coconut – Trunk, leaves, nuts, etc.
2. Different value added products are being prepared from nuts.
3. Higher economic value.
4. Soil conservation on beds of the rice field, hardy crop.
5. Availability of sufficient land for area expansion
6. Metropolitan markets like Mumbai, Thane, Kalyan, Surat are in close proximity.
7. Industrial belt for processings.
8. Adequate manpower from tribal community.

**Weakness :**

1. Still underutilized palm.
2. Slow growth, long gestation period.
3. Doicious in nature (Male and female palms).
4. Lack of knowledge regarding cultivation practices.

**Opportunities :**

1. Possible for commercial exploitation.
2. Source of employment for tribal community.
3. Product based industrialization.
4. Helps to waste land, marshy land development

**Threats :**

1. Diversification in other plantation crops like coconut, arecanut, etc.
2. Alternate host to eriophyd mites of coconut.

**Future line of Research Work :**

1. Standardization of propagation method.
2. Standardization of production technology.
3. Reduction of juvenile phase.
4. Mechanization in harvesting and tapping.
5. Development of Palmyrah based cropping system.
6. Plant protection – IDM.
7. Value addition.
8. To treat as coconut as each part of the palm is useful.
9. Establishment of AICRP (Palm) centre at Palghar.
10. Extension – transfer of technology, creation of awareness in farmers

**Table 1 (A). Occurrence of male and female Palmyrah palm (Year 2008-09)**

Sr. No.	Location	Male palms	Female palms	Remarks
1.	Kelwa (Revale)	27	39	11*
2.	Vadrai (Sea shore)	21	43	29*
3.	Sarawali (Boisar)	18	28	14*
4.	Kolgaon	9	9	3*

5.	Shri. Anand Baram Raut, Vadrai	7	18	5*
6.	Nilakant Raut, Haranwadi	3	7	5*
7.	Shri. Vinod More, Dhansar	6	5	3*
	Total	91	149	70*

**Male : Female Ratio :- 1 : 1.64**

**Table 1 (B). Occurrence of male and female Palmyrah palm (Year 2009)**

Sr. No.	Location	Male palms	Female palms	Remarks
1.	Kurgaon (Palghar)	14	11	7*
2.	Chinchani (Dahanu)	8	8	5*
3.	Chikhala (Dahanu)	14	20	12*
4.	Dapoli (Palghar)	21	34	23*
	Total	57	73	47*

(\* Small and not started flowering)

**Male : Female Ratio :- 1 : 1.28**

**Table 2. Identified types having peculiar characteristics**

Sr. No.	Name of Farmer	Village	No. of identified types	Peculiarity
I)	(Year 2009-10)			
1.	Shri. Vinod More,	Dhansar	2	High yield of Toddy (25lits/day)
2.	Shri. Anand Raut	Vadrai	7	Heavy bearing, more than 3 kernels per nut, large size, regular bearing.
3.	Shri. Hareshwar Patil	Kolgaon	1	Heavy bearing and more than 3 kernels per nut.
4.	Not owned by any farmer	Road side in Mahim, Mahim Palghar road	1	Heavy bearing (50 to 70 nuts/spadix and 8-12 spadix per palm)
5.	Not owned by any farmer	Seashore of Vadrai	3	Heavy bearing, Large size nuts
6.	Shri. Nava-neet D. Mali	Satpati	2	High yield of Toddy
7.	PWD	Gathanipada, Palghar Boisar Road	2	Heavy bearing (200 nuts/palm)
8.	PWD	Kelwa Mahim Raod	4	Heavy bearing
II)	(Year 2009)			
1.	Road side Palghar Bypass road	Palghar	1	Early and Heavy bearing (Compact) (might be a dwarf type)
2.	Kolgaon	Kolgaon	2	High yield of Toddy (21-25 lit/day)

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