

Regular Article

# Indigenous knowledge and utilisation of Khajuri plant (*Phoenix Sylvestris* Roxb., Arecaceae) in Bhadrak district, Odisha, India

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The study was conducted within the course of two years (2011–2013) to explore the indigenous knowledge and traditional utilization pattern of wild date palm (*Phoenix sylvestris* Roxb.) in Bhadrak district of Odisha, India. The objective of the study was to document indigenous knowledge and traditional handicrafts in order to suggest appropriate conservation and management strategies. The information was gathered largely from literature as well as field collected data and interviewed informants. A brief questionnaire, referring to the vernacular name, plant description, details on their use has been prepared and applied. Khajuri plant (*Phoenix sylvestris* Roxb. Arecaceae) is a long-lived monocotyledonous medium-sized slow growing plant species, found abundantly in road side, wasteland, around homesteads, crop fields, pond and canal bank. The leaves of the plant are used in many religious and socio-cultural functions in the district. This plant has been instrumental for landless traditional craftsmen in providing a substantial livelihood through their own indigenous wisdom in every stage of the palm's maintenance from collection to the processing of products. Collected data show how ecological, geographical features and different cultures are related with the traditionally used handicrafts. Protection and conservation of this plant and some selective habitat is warranted where this species can grow undisturbed.

**Keywords:** Odisha; *Phoenix sylvestris*; traditional handicrafts; traditional knowledge

Nature was the earliest source for human subsistence and has provided a continuous source of raw materials to fulfill various needs for human livelihood. Millions of people, mostly in developing countries, derive a significant part of their subsistence and income from gathered plant products. The field of study of plants used in household products by craftsmen is one of

the most interesting ones and plays vital role in socio-economy of rural people. Various handicraft materials (the items made by hand) from Palms are one such typical use of the plant by the rural people of India to earn their livelihood. The palm family (Palmae, or more recently Arecaceae), with some 2200 species, is distributed all over the tropics and subtropics (Johnson, 1996). This family

contains a number of economically important species, among which some of the most important ones include *Cocos nucifera* L. (coconut), *Borassus flabellifer* L. (palmyra/fan palm), *Areca catechu* L. (betel nut) and *Phoenix sylvestris* Roxb. (wild date palm/date sugar palm). Wild date palm, is one of the oldest fruit trees in the world, having originated most likely in Mesopotamia (modern Iraq) 5,000 to 10,000 years ago (Zohary and Hopf, 2000) and the vast majority of the trees are located in northern Africa, the Middle East, Bangladesh, Sri Lanka, Pakistan and India (Hodel and Pittenger, 2003). Situated in the tropical region, India also houses a number of palms (represented by 20 genera and about 96 species; Uhl and Dransfield, 1987) distributed in diverse geographic, soil and climatic areas, such as, deserts, hilly topography, plain lands and muddy mangrove forests.

*Phoenix sylvestris* Roxb. is a long-lived monocotyledonous medium-sized slow growing plant species, 7-20 m tall, with greyish-green leaves, textured trunk, and yellow inflorescences. Leaves are very developed, erect, arranged in a spiral pattern on the trunk and can reach several square meters in area. Sheathing becomes denser at the top of the tree forming a crown with hundreds of leaves forming a terminal rosette. The leaves are pinnate with needle-sharp tips to defend the plant from grazing animals and reduce water loss. The use of *Phoenix sylvestris* for medicinal purposes and oral dental care has been reported (Barh and Mazumdar, 2008; Mohanty et al., 2012). This plant also provide a multitude of useful products such as handicrafts and mats, screens, thatching and fencing materials, baskets, crates, fuel wood, and house brooms and is the main subsistence resource for the poorest people (Balslev & Barfod, 1987; Zaid, 1999; Dalibard, 2007; Rana and Islam, 2010). Recently, employment and income from small-scale non-farm enterprise activities is gaining importance in the rural

economy of developing countries (Arnold, 1995; Gunatilake et al., 1993).

The farmers are applying solely indigenous knowledge (IK) of their own in the farming and management of this resource, exerting a sustainable manner of utilization. Odisha, one of the states of eastern India is famous for her handicrafts which exhibit the skill and creativity of her artisans. Handicrafts are the visible symbol of cultural behaviour. The person who imagines and creates these hand made goods of different origins forms is called as craftsman who is otherwise known as Silpi, Kalakar, Bindhani, Moharana, Karigar etc. The craft culture of India shows the firm base in the country's age old artistic traditions. This is especially true in Bhadrak District. The traditional craftsmen of the district prepare artistic and delicate decorative materials for household purposes. These artistic objects are an integral part of the rituals and various other social functions in rural Odisha from time immemorial. But there has been an overall decline in their traditional handicrafts application due to alternative materials becoming available which proved better or more convenient for the intended purpose. Recently, the importance of farmer's traditional knowledge in managing natural resources has gained increasing recognition from the scientific community (Teklehaimanot et al., 2001). In spite of the role of wild plants a means for livelihoods of the rural people in Bhadrak district, attention has not been given to the inventory and conservation of such species. Considering the importance of indigenous knowledge, the present study was undertaken to explore the indigenous wisdom of rural poor people highlighting the traditional utilization patterns of *P. sylvestris* in Bhadrak district of Odisha, India. The socio-religious as well as socio-cultural significance and socio-economic contribution to rural economy of this ancient craft and the craftsmen in the changing scenario is analysed. The aim of this

study is to determine and introduce the plants traditionally used as handicraft – which are slowly dying out-in different cultures as well as in several countries.

### Materials and Methods

Bhadrak district (20°43'–21°13' N and 86°6'–87° E) is located in northeast Odisha and covers an area of 2505 km<sup>2</sup>, with a population of 1.334 million (2001 Census). It is bordered by Balasore district in the north, Jajpur in the south, Bay of Bengal and Kendrapara district in the east and Koenjher in the west. The district accounts for 1.61% of the state's territory and shares 3.62% of the

state's population. Most of its people live in villages (89.42%) and agriculture is their main occupation. The climate of the district is warm and humid. Three distinct annual seasons are the rainy season (mid June to mid October), winter (mid October to February) and summer (March to mid June). Air temperatures range from 38°C in summer to 13°C in winter, and the annual average rainfall is approximately 1,550 mm. The district is located in the deltaic region near the Bay of Bengal and has all the features of a costal climate, i.e. maritime weather influence, coastal winds and cyclones (Figure 1).

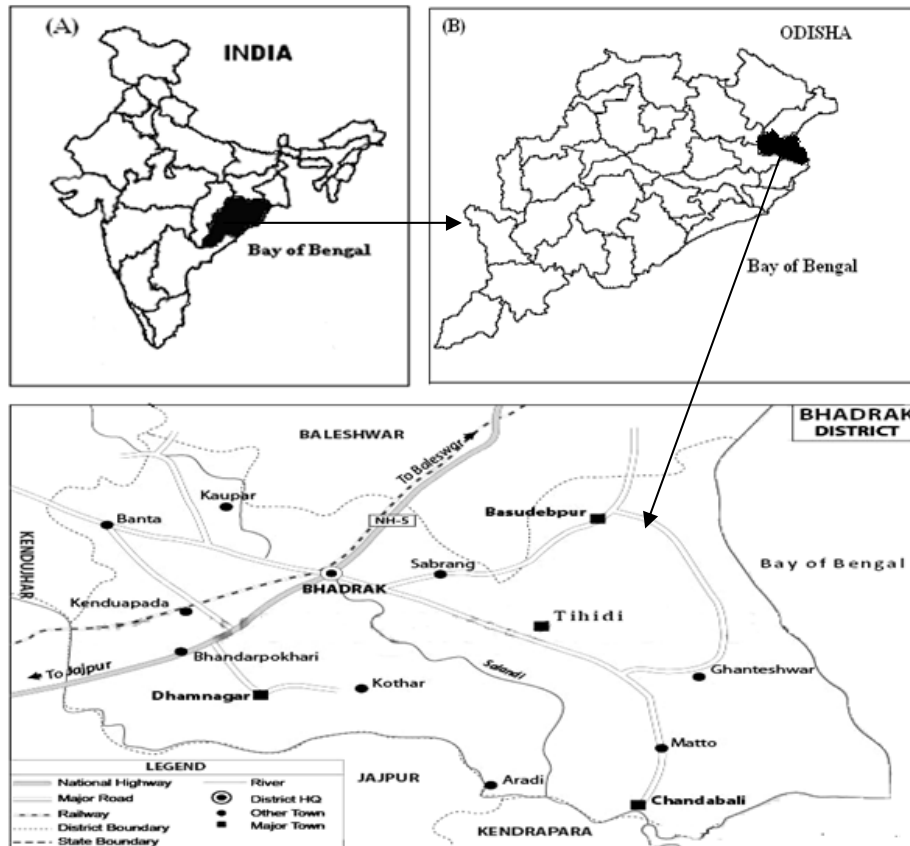


Fig.1. Map of the study site

The present work is the outcome of the ethnobotanical survey conducted in Bhadrak district of Odisha, India during the year 2011-13. Prior to undertaking field

research, the objectives of the study were discussed with the local village heads. Consent was granted by the local people for the dissemination of their traditional

knowledge. A preliminary socio- economic survey was carried out to ascertain important socio-economic parameters of the study areas to select the respondents for detailed study and interviewed using a semi-structured questionnaire (e.g., cross-checking the land holdings, occupations, date palm possession, contributions of date palm in economy, land for homesteads and other operations like agriculture or fallow). Different habitats with abundant growth of 'Khajuri' plant of the district were visited and plant samples collected for taxonomic study (Haines, 1925;

Saxena and Brahmam, 1994) and herbarium preparation. Voucher specimen was deposited in the herbarium of Department of Botany, Chandbali College, Chandbali. Visit to the traditional craftsmen and their workshops were made to collect first-hand information regarding, the mode of collection, processing and preservation; - types and method of preparation of craft materials, their trade etc. The data were recorded by consultation with different experienced craftsmen engaged in the same profession.



Fig.2.A. Naturally regenerated Khajuri plant in crop field, B. Khajuri plant near the ails, C. Rural scene showing natural regeneration along the road, D. Khajuri plant near the canal, E. Khajuri plant near the pond, F. Khajuri plant near the homestead, G. A farmer in tapping leaves of Khajuri, H. Leaves at ground, I. Collected leaves.

### Results

The percentage of literacy rate in the study area is very low i.e. less than 10%. Eighty

percent of families have no agricultural land and the remaining with marginal land. The people (both men and women) are earning

their livelihood on daily wage basis. The average earning member of family was minimum, in our study area landless (80%) and marginal (20%) farmer possess date palm as their primary occupation. *Phoenix sylvestris* Roxb., locally called 'Khajuri', is an attractive

landscape specimen found growing over the entire study area. It was observed that natural regeneration of Khajuri trees occurs in five different habitats namely crop fields, roadsides, canal and pond banks and homesteads (Figure 2A, C-F).



**Fig.2. J. Sun drying, K-M. Artisan at work, N-Q. Finished products(brooms and mats used for domestic purpose), R. Man in marketing, S. A mat used in cowshed, T. Leaves used in fencing**

In crop fields, the wild date palm is found on the ails (slightly raised embankments used as a border between crop fields, figure 2B). There

was no 'Khajuri' orchard in the study area; most of the trees developed naturally. Farmers had the rights to the trees growing

along roadsides and canal banks, though they did not have tenure on the lands since the lands were government properties. Access to trees growing on government land is regulated by customary law of the country. When a tree grows on government land, such as a roadside or canal bank, the owner of the parcel of land adjacent to the government land holds tenure of the tree. The same tenure rule is applicable for the use of other tree species growing on government lands in rural areas. The leaves are harvested from the tree manually by the craftsmen after attaining a minimum age of 6-8 years old, sun dried for a week, bundled and stored for future use (Figure 2G-J).

It requires no complicated tools to make the craft. Only sharp edged knives and needles are used. The leaf is cut into different shapes as per requirement, coloured and weaved to give the final structure (Figure 2K-M). Various craft materials made from the Khajuri plant by the artisans of Bhadrak are depicted in Figure 2.N-Q. In the study area it was observed that in the selecting of planting materials, maintenance and in the processing of the products male and female members including children participate simultaneously, on the other hand marketing were only done by the male (Figure 2R). In several areas of the study area the mats after use by human is used for cowshed (Figure 2S). The whole leaf or the leaf rachis of *Phoenix sylvestris* are one of the preferred fencing materials in the areas where the palm abounds. In many villages of the Bhadrak, it is still common to see houses fenced with this palm (Figure 2T). For fencing, usually most of the mature leaves are harvested, leaving only those that are still too tender.

### Discussion

Traditional knowledge systems associated with various plant use developed through trial and error method as well as by the creative mind of the indigenous people have become recognized worldwide for their

contribution to science and conservation (Radhakrishnan et al., 2000; Gemedo-Dalle et al., 2005; Leduc et al., 2006; Martinez et al., 2006; Kunwar and Bussmann, 2008; Albuquerque et al., 2009; Dahlberg and Trygger, 2009), and the need to preserve biological diversity and the associated indigenous knowledge has been emphasized since the Rio Convention on Biological Diversity (Convention on Biological Diversity, 1992). Craftwork products are designed for various purposes, and these items have notable and or religious significance. The plants employed in making these handicrafts are usually local and have served as major resources contributing to people's livelihood.

Traditional handicrafts based on plant material are components of folk culture throughout the world. Indian handicrafts are known the world over for their rich variety and skilled work. Handicraft objects are generally artistic and/or traditional used both for utilitarian and decorative purposes. The traditions of handicraft in rural people of India continue over centuries safeguarding the wide and varied artistic wealth of India. Some rural people are good craftsmen and are adept in making handicrafts using locally available plant resources. Crafts associated with Khajuri (*Phoenix sylvestris*) have generally been carried out by rural people of Bhadrak district since ancient times. The natural distribution of Khajuri palms in the rural landscape suggests that the tree has wide ecological amplitude for growing on a variety of sites and that it has a capacity to grow in biotically disturbed sites such as roadsides or canal banks that are normally used grazing.

In Bhadrak district, *P. sylvestris* farmers do not have any improved technology and employ their own indigenous knowledge in every aspect of its processing. However, the net return from *P. sylvestris* products sale is not satisfactory and contributes a minimal share to annual household income. The rural

women in the study area are usually illiterate and palm husbandry can be utilized as a potential sector for their employment. The prices of the different products produced from palm vary seasonally and on the basis of locality of the enterprises. The price of the product varies with size, quality and local demand. The handicraft material made from *P. sylvestris* is much superior to the synthetic industrial product widely used in modern day craft making. It is also eco-friendly as biodegradable and freely available from the surrounding natural habitat. It provide livelihood to a sizeable number of artisans in rural Bhadrak. The ethnobotanical information presented here draws support from earlier studies in different parts of India (Kulkarni and Mulani, 2004; Reddy et al., 2008). The studied plant for handicraft use is also reported from Odisha (Mohanty et al., 2011). *P. sylvestris* possessed economic potential and could thus supplement family income and generate incentives for biodiversity conservation (Hamilton, 2004).

### Conclusion

Nowadays, the use of handicraft materials is disappearing and has lost their necessity in our daily lives. The advancement of plastic technology and polymer science has however hit this craft badly. The principal reasons are realities of the modern life: loss natural habitats due to population explosion and consequent human activities like construction of roads, housing, fishery, farming etc., industrialization of traditional farming, the modern tools for various household purposes, partial adoption of modern material, the reduced number of craftsman etc. The skills transmission through generations is in danger and much more threatened with extinction. As a result, new generations of the artisan's family are looking for some other source of income leaving this age old practice. Hence, protection of some selective habitat is warranted where this species can grow undisturbed. Moreover,

there is an urgent need of popularization as well as patronization of these craft materials by the Govt. or some NGOs to uplift the economic condition of the artisans. It will be helpful in conservation of this unique craft for the benefit of the posterity as well as national identity.

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