

## ABSTRACT

Palms belong to the family Palmae (Arecaceae) are one of the multiuse monocot, occurring mostly in the tropical regions of the world. About 190 genera and 2364 species are currently recognized in the world. They form a vital component of the forest and agricultural ecosystems providing a wide range of economic products necessary for daily life. In West Bengal the family is represented by 49 species belonging 17 genera of indigenous palms and canes having restricted distribution in *in-situ* conservatories, reserve forests and open scrubs of five broad geographical regions *viz.*, Darjeeling Himalaya, Terai and Duars, North and South Bengal plains, Western undulating high land and plateau and Gangetic delta. Out of five sub families of Arecaceae, West Bengal is represented by four *i.e.*, Calamoideae, Nypoideae, Coryphoideae and Arecoideae and interestingly most of them are under various threatened category. The recorded largest genus is *Calamus* representing 17 species followed by *Phoenix* with five species and *Wallichia*, *Plectocomia*, *Corypha* with three species. *Daemonorops* genus represents two species growing in tropical forests of Terai and Duars of Northern Bengal. From the entire West Bengal a total of 28 species of palms were recorded from various habitats like high and low altitude Himalayas, Terai, Duars, plains of Bengal, Western Plateau and estuarine mangrove forests of Sundarbans, North and South 24 Parganas. After the comprehensive floristic survey, it was observed that the West Bengal has extremely very high number of introduced palm flora in various nurseries, institutions, open parks, Botanical and Horticulture gardens. Total 47 introduced palm species representing three subfamilies *i.e.*, Arecoideae, Coryphoideae and Ceroxyloideae. Subfamily Coryphoideae includes 11 genera with 21 species, Arecoideae represents 14 genera with 25 species and subfamily Ceroxyloideae represents only 1 genus with 1 species.

Most of the Indian palms exhibit highly restricted distribution to ecological niches within biogeographic regions where they exist. Palms populations in the wild are decreasing in very fast manner. Genera like *Calamus*, *Borassus*, *Corypha* and *phoenix* etc. are threatened because of their constant and increasing utilization. Overexploitation is one of the major threats to the survival of many wild palm species. Some inherent characteristics of palms such as monocarpic flowering, poor germination of seeds and

poor establishment of seedlings etc. have also contributed to retard natural regeneration of palm population.

The palm and cane flora are found quite significant for the vegetation of West Bengal. During this dissertation two new taxa *Calamus pseudoerectus* S. Mondal, S.K. Basu & M. Chowdhury and *Daemonorops teraiensis* S. Mondal and M. Chowdhury of Arecaceae were described. Five species i.e., *Areca triandra* Roxb. ex Buch.-Ham. *Calamus numbariensis* Becc., *C. longisetus* Griff., *Plctocomia bractealis* Becc and *Salacca secunda* were first time reported from the boundary of West Bengal. *Nypa fruticans* is one of the important palm in the tidal creeks of Sundarbans and disappearing in its natural habitat at very fast due to scarcity of fresh water flow from upper reaches, over exploitation for making charcoal and thatching materials.

On account of the multifarious flowering behaviours and delayed seed germination in palms it is quite difficult to study the phenology of major members in their natural habitats which is required to great extent in propagation, hybridization and *ex situ* conservation of rare and endangered palms. The thesis deals with the phenological studies of selected interesting genera and species under different subfamilies.

Since the beginning of civilization, local and tribal people have used palms mainly for their sustenance. In addition to their daily basic needs such as medicine, food, fodder, house building materials, making hunting, fishing and war equipments etc. palm and canes have been used in big way, both, for the prevention and cure of various diseases of humans and their house pets.

In the absence of concrete efforts towards their replenishment, some of these wild palms are likely to face severe threats of extinction. Due to drastic habitat loss and climate change, most of the species of palm and canes were under huge threats. IUCN recognized various such species being recorded under different threatened category. *Calamus numbariensis* is only species which is critically endangered and is reported from Kalimpong and Darjeeling district. Four species namely *Areca triandra*, *Phoenix acaulis*, *Phoenix paludosa* and *Phoenix rupicola* are categorized under near threatened category and recorded species like *Nypa fruticans*, *Areca catechu*, *Corypha utan* and *Calamus tenuis* are categorized under least concern category.

Present study showing the clear scenario of diversity of indigenous and introduced palms and canes in West Bengal along with their phenology, ethnobotany, threats and conservation. It is also found that population of wild palms and canes are still quite interesting in various wild habitats facing wide range of threats. More research on this group is required to understand their ecology that can also help to make more scientific strategy towards their conservation.