Original Research Article

Ex-situ conservation of Palms with special reference to endemic and IUCN Red List species in Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah, India

ABSTRACT

The present paper deals with the holistic approach of palms diversity, endemism, conservation status, economic importance of different species of palms in Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG) are discussed.

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Please refer standard paper works to write a robust abstract

Keywords: AJCBIBG, Ex-situ conservation, Endemic and Threatened Palms

1. INTRODUCTION

Palms are the most fascinating group of plants that attracts attention of scientific community all over the world [1]. The family Arecaceae (Palmae nom. alt.) is represented by 2600 species belonging to 181 genera under 28 tribes of 5 subfamilies [2] and primarily distributed in tropical and subtropical regions of the world. Palms have a variety of growth forms such as shrubs, lianas and trees [3] and they are considered to be the economically important plants after ~~to the~~ grasses and legumes, ~~by~~ providing food, shelter and other utility commodities for ~~the~~ mankind, especially for the rural communities in the tropics [4,5,6,7]. In India, the family Arecaceae represented by *c.* 219 species belongs to 71 genera under 5 subfamilies [8]. Among the 219 taxa present in India, 46 taxa belonging to 9 genera, accounting for 21 percentare endemic to the country [9,10], ~~which are~~ mainly distributed in Peninsular India, North Eastern India ~~and~~ , Andaman and Nicobar Islands. ~~and o~~Other 125 species are well introduced and cultivated [1] for their socio-economic values.

Palms shows rich species diversity and its ability to grow in a wide range of habitats from rainforests to deserts enables the garden to develop a dedicated section of palms i.e., 'Palmetum' in the Division no.5 of Acharya Jagadish Chandra Bose Indian Botanical Garden (AJCBIBG). It is worth mentioning that, the popular Large Palm House (LPH), an age-old greenhouse repository for equatorial palms was established by Sir George King and designed by the Govt. Architect, Mr. E.J. Martin during the year 1881-82. The plantation work under the conservatory from different parts of the globe had been started from 1883. The Palm House serves its purpose for ex-situ conservation of germplasm for a large quantity of endemic and threatened species. The main attraction in the LPH is Double Coconut Palm i.e., *Lodoiceamaldivica*(J.F.Gmel.) Pers. which is famous for its largest seed, average living span of 1200 years [11].Other unique representatives of this family present in this garden are Egyptian branching palm [(*Hyphaene thebaica* (L.) Mart.)], Indian branching Palm [(*Hyphaene dichotoma* (D.White bis ex Nimmo) Furtado)] and Tali palm [(*Coryphatalieraa*Roxb.)], of these later species is already extinct from its natural habitat/wild [12].

Palms are an integral part of socio-cultural and family-based economy of many communities due to its applicability in construction, food and fodder for human and animals, boat making, handcrafts, rituals, medicinal and therapeutics. While working on the regular projects viz., Curatorial work in the garden,~~and~~ maintenance,~~and~~ introduction and *ex-situ* conservation of RET species in AJCBIBG, to know the exact species (Palms) in the garden for further introduction of other RET species, authors aimed to document palm diversity in the AJCBIBG.

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2. STUDY AREA

AJC Bose Indian Botanic Garden also known as 'Company Bagan', or 'Royal Botanic Garden' is one of the oldest and largest botanic gardens of South East Asia. It is also

considered as one of the best landscaped gardens of the World.The garden is spread over a sprawling expanse of over 110 hectares (273 acres). It has 24 interconnected lakes, and the lakes are connected to the Ganges through sluices for the regular inlet and outlet of water. The gardens exhibit a wide variety of species including endemic, threatened, medicinal, economical, ornamental plants etc. in 25 divisions[13,14,15,16]. In 1787 Col. Robert Kyd established this garden with a view to introduce socio-economically important trees from all over the globe and now it is serving the purpose for *ex-situ* conservation of endemic, threatened, economically important plants etc. At present this garden is a living repository of about 1400 species [16] including palms.

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3. REVIEW OF LITERATURE

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A scrutiny of literature revealed that initial documentation on Indian Palm diversity with 9 species was carried out by Van Rheededuring1692-1693 [17] in his Hortus Malabaricus. Later Linneaus[18] included these species in his Species Plantarum. Roxburgh [19] described 41 species of palms in his Flora Indica. Martius [20] included 15 Indian species in his Historia Naturalis Palmarum. Griffith [21] described 96 palms in his Palms of British East India. Beccari and Hooker[22] described 71 species of palms in Hooker's Flora of British India(1892 -1894). Later Beccari [23,24,25,26,27]~~was~~ hasalso published series of papers on Malayan, Asiatic and Indian palms. Blatter [28] was given huge information on palms in his work on The Palms of British India and Ceylon. Taxonomic accounts of palms occurring in the respective regions or provinces appeared in the regional Floras ~~done~~ documented by different workers ~~viz.,~~in Bengal [29], Upper Gangetic Plains [30], Bombay [31], Bihar and Orissa [32], Madras [33] and Andaman and Nicobar Islands [34].

Botanical Survey of India, Howrah ~~was~~ has studied considerable volume of work on the taxonomy and phytogeography of Indian palms [35]. Mahabale[36] gave a detailed account on morphology in his Palms of India. Renuka [37,38] gave an account of Rattans of

Western Ghats. Lakshmana [39] worked on rattans of South India. Basu and Chakraverthy[1] published a manual of cultivated palms in India. Rawat [40] brought out a hand book on Palmsfor India. Renuka et al. [41] published Rattans of India. Bhat [4] published Palms of Karnataka.~~,in~~ In this book, he described 56 species belonging to 39 genera of palms. Renuka and Sreekumar [5] brought out a field guide to the palms of India.~~in~~ In ~~this~~ thebook, they reported 105 species belonging to 22 genera from India. Some important scientific works regarding the taxonomy~~,~~ and phytogeography on Indian palms from different regions of India were published by various authors [8,11,15,42,43,44,45,46,47,48,49,50].

4. MATERIAL AND METHODS

Regular field visits to the Palmetum and other sections in the garden were conducted during 2022-2023 to cover all the palm diversity. During the regular field visit, palm species were captured with Nikon Coolpix P900 Digital Camera when it is in flowering and fruiting.~~and~~ ~~f~~Few important specimens were collected for further identification. All the collected plant specimens and images were identified with the help of various palm literature [1,5,21,22,28] and other recent pictorial guides and relevant taxonomic papers were consulted wherever is required. The identified plant names were checked in The International Plant Name Index [51] and The Plants of the World Online [52] for accepted names, basionyms and synonyms.

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5. RESULTS AND DISCUSSIONS

The documentation of palms in AJCBIBG revealed that 110 taxa belonging to 46 genera and 4 subfamilies (Table 1), of which 31 species under 16 genera were indigenous, which were introduced from various regions of India and a total 68 taxa were introduced from more than 50 regions/countries namely Africa, Arabian peninsula, Australia, Borneo, Brazil, Central America, China, East Asia, Florida, South East Haiti, Indonesia, Jamaica, Lesser Sunda Islands, Madagascar, Malesia, Mauritius, Mexico, New Guinea, Philippines, Rodrigues, Seychelles, South America, South East Asia, Taiwan, Thailand, Tonga, Virgin Islands

(Puerto Rico) etc. The garden plays an important role by creating a hub for more than 40% native species diversity of Palms in India. Also, the *ex-situ* conservation of various rare, endangered and threatened germplasm will pave pathway for future taxonomic research and enrichment of floristic diversity.

Fig. 1. a. Arial view of Palmetum; b. Large Palm House; c. Palmetum; d. *Corypha taliera* Roxb.; e. *Bentinckia nicobarica* (Kurz) Becc.; F. *Calamus andamanicus* Kurz; g. *Hyphaene thebaica* (L.) Mart.; h. *Hyophorbe lagenicaulis* (L.H.Bailey) H.E.Moore

5.1. *Conservation of Endemic Palms*

Endemic/threatened plants are of high biological and conservation value. In fact, endemic floristic elements of a country or geographical region throw light on the biogeography of the

area, centres of speciation, areas of extinction, vicariance and adaptive evolution of the flora occurring in the area [53]. Insofar 11 species under 8 genera are represented in AJC Bose Indian Botanic Garden which are endemic to the different regions of our country (Table 1). The endemic species in the garden are: *Arengawightii* Griff. (W. Ghats: Goa, Karnataka, Kerala, Maharashtra,Tamil Nādu), *Bentinckiacondapanna* Berry ex Roxb. (W. Ghats: Kerala, Tamil Nādu), *Bentinckianicobarica* (Kurz) Becc. (Nicobar Islands), *Calamus andamanicus*Kurz. (Andaman and Nicobar Islands), *Calamus baratangensis* Renuka &Vijayak. (Andaman Islands), *Calamus rheedei* Griff. (W. Ghats: Karnataka, Kerala), *Daemonoropsrarispinosa* Renuka &Vijayak. (Andaman and Nicobar Islands), *Phoenix rupicola* T. Anderson (E. Himalaya: West Bengal), *Pinangamanii*Becc. (Andaman and Nicobar Islands), *Rhopaloblasteaugusta* (Kurz) H.E.Moore (Nicobar Island), and *Trachycarpustakil*Becc. (W. Himalaya: Uttarakhand). These palms were collected from various phytogeographical regions and successfully established in the garden by many botanists/staff of the garden. Maintenance of the 24% Indian endemic palms in the garden has ~~highly~~ high?conservation value.

5.2. *Conservation of Threatened Palms*

Of the 219 recorded species in the country, it is found that the about 95 species (43%) of palms are in the IUCN Red List. Of the conserved 108 species in the garden, it is found that 46 species (43%) are IUCN Red List species. These species are categorised under 7 different threat categories (Table 1). Tali Palm (*Coryphataliera*Roxb.) was discovered in 1919 by William Roxburgh and he considered it to be endemic to Bengal [19,54,55]. The last record of this palm growing in the wild was in Birbhum district of West Bengal (India) in a village near Shantiniketan [1,55,56]. A single individual is available in University Campus of Dhaka, Bangladesh and assessed as Extinct in the Wild (EW) in the year 1998 by Johnson [12], further he declared the identity of the species in University Campus of Dhaka is

uncertain. At present a single individual is confirmed in the palmetum section of AJCBIBG, Howrah.

Fourteen (14) threatened species are conserved in the garden, of these three (03) are Critically Endangered (CR) species namely Carrossier Palm(*Attaleacrassispatha*(Mart.) Burret) which is native of South East Haiti, Bottle Palm (*Hyophorbelagenicaulis* (L.H.Bailey) H.E.Moore) from Mauritius and Spindle Palm *Hyophorbeverschaffeltii* (W.Bull ex J.Dix) H.Wendl. from Rodrigues were introduced and conserved in the garden. Four (04) Endangered species namelyBentickia Palm(*Bentinckianicobarica* (Kurz) Becc.) introduced from Nicobar Islands (India); Blue laten Palm(*Latanialoddigesii* Mart.) from Mauritius; Red laten Palm (*Latanialontaroides* (Gaertn.) H.E.Moore) from Reunion Islands; Halifax fan Palm(*Livistonadrudei* F. Muell. ex Drude) were introduced from Australia. Seven (7)Vulnerable species were introduced from various countries. Manila Palm(*Adonidiamerrillii* (Becc.) Becc.) from Philippines, Wight's Sago Palm(*Arengawightii* Griff.) from South East Asia, Hill areca nut (*Bentinckiacondapanna* Berry ex Roxb.) introduced from India (Western Ghats: Kerala, Tamil Nādu), Triangular Palm(*Dypsisdecaryi* (Jum.) Beentje&J.Dransf.) from South East Madagascar, Taraw Palm(*Livistonasaribus*(Lour.) Merr. ex A.Chev.) from South East Asia, Black Palm(*Normanbyanormanbyi* (W. Hill) L. H. Bailey) from Australia, Nicobar Majestic Palm(*Rhopaloblasteaugusta*(Kurz) H.E. Moore) from India (Nicobar Islands) were introduced.

Apart from 14 threatened species 33 other IUCN category species are also conserved in the garden. Of the 33 species, Nearly Threatened (NT) species (3) are *Arengatremula* (Blanco) Becc., *Hyphaene dichotoma* (D. White bis ex Nimmo) Furtado and *Phoenix rupicola* T. Anderson. Least Concerned (LC) category species (28) are *Acoelorraphewrightii*(Griseb. & H. Wendl.) H. Wendl. ex Becc.,

Archontophoenixalexandrae(F. Muell.) H. Wendl. &Drude, *Archontophoenixcunninghamiana*(H. Wendl.) H. Wendl. &Drude, *Areca triandra*Roxb. ex Buch.-Ham., *Arengaobtusifolia* Mart., *Arengawesterhoutii* Griff., *Attalea cohune* Mart., *Attalea speciosa* Mart., *Bactris major* Jacq., *Bismarckianobilis*Hildebrandt & H. Wendl., *Caryota mitis* Lour., *Caryotaurens* L., *Chrysalidocarpusmadagascariensis* (D.T.Fish) Becc., *Coccothrinaxargentata* (Jacq.) L. H. Bailey, *Coryphautan* Lam., *Elaeisguineensis* Jacq., *Heterospatheelata*Scheff., *Hyphaene coriacea*Gaertn., *Hyphaene thebaica* (L.) Mart., *Livistona decora* (W. Bull) Dowe, *Phoenix loureiroi*Kunth, *Phoenix reclinata* Jacq., *Ptychosperma elegans* (R. Br.) Blume, *Roystonea regia* (Kunth) O. F. Cook, *Sabal mauritiiformis* (H. Karst.) Griseb. & H. Wendl, *Sabal palmetto* (Walter) Lodd. ex Schult. &Schult.f., *Syagrusromanzoffiana* (Cham.) Glassman, *Washingtoniafilifera*(T. Moore & Mast.) H. Wendl. ex de Bary Data Deficient (DD) species are *Areca catechu* L. and *Coryphaumbraculifera* L.

Table 1. List of Palms (Arecaceae) with their distribution, IUCN and endemic status, present in AJCBIBG

S. No.	Scientific Name	Common name	Distribution	IUCN/Endemic status
1.	*Acoelorraphewrightii*(Griseb. & H. Wendl.) H. Wendl. ex Becc.	Silver Saw Palm	West Indies, Florida	LC
2.	*Adonidiamerrillii* (Becc.) Becc.	Manila Palm	Philippines	VU
3.	*Aiphaneshorrida* (Jacq.) Burret	Ruffle Palm	Trinidad to S. America	
4.	*Archontophoenix alexandrae* (F. Muell.) H. Wendl. & Drude	Alexander Palm	Eastern Australia	LC
5.	*Archontophoenixcunninghamiana* (H. Wendl.) H. Wendl. & Drude	Banglow Palm	Eastern Australia	LC
6.	*Areca catechu* L.	Betel Nut Palm	South East Asia	DD
7.	*Areca triandra*Roxb. ex Buch. - Ham.	Wild Areca Palm	East Asia	LC
8.	*Arengaaustralasica*(H. Wendl. & Drude) S. T. Blake ex H. E. Moore	Australian Arenga Palm	Australia	
9.	*Arengacaudata*(Lour.) H. E. Moore	Hooker's Fish Tail Palm	South East Asia	

10.	*Arengaengleri*Becc.	Taiwan Sugar Palm	Taiwan	
11.	*Arengaobtusifolia* Mart.	Sumatra Sugar Palm	South East Asia	LC
12.	*Arengapinnata* (Wurmb) Merr.	Sugar Palm	South East Asia	
13.	*Arengatremula* (Blanco) Becc.	Philippine Dwarf Sugar Palm	South East Asia	NT
14.	*Arengaundulatifolia*Becc.	Jaka Palm	South East Asia	
15.	*Arengawesterhoutii* Griff.	Sugar Palm	Eastern Himalaya	LC
16.	*Arengawightii* Griff.	Wight's Sago Palm	South East Asia	VU/ Western Ghats
17.	*Attalea cohune* Mart.	Cohune Palm	Mexico, Central America	LC
18.	*Attaleacrassispatha* (Mart.) Burret	Carrossier Palm	South East Haiti	CR
19.	*Attalea speciosa* Mart.	Babassu Palm	South America	LC
20.	*Bactris major* Jacq.	Peach Palm	South America	LC
21.	*Bentinckiacondapanna* Berry ex Roxb.	Hill Areca Nut	South India	VU/ Western Ghats
22.	*Bentinckianicobarica* (Kurz) Becc.	Bentickia Palm	Nicobar Islands	EN/ Nicobar Islands
23.	*Bismarckia nobilis* Hildebrandt & H. Wendl.	Bismarckia Palm	Madagascar	LC
24.	*Borassus flabellifer* L.	Toddy Palm	India, South East Asia	
25.	*Butiacapitata* (Mart.) Becc.	Butia Palm	Brazil	
26.	*Calamus andamanicus*Kurz.	Andaman Cane Palm	Andaman Islands	Andaman and Nicobar Islands
27.	*Calamus arborescens* Griff.	Sweet Flag	India, South East Asia	
28.	*Calamus baratangensis* Renuka &Vijayak.	Baratang Island Palm	Andaman Islands	Andaman Islands
29.	*Calamus erectus*Roxb.	Cane Fruit Palm	India	
30.	*Calamus floribundus* Griff.	Myanmar Cane	E. Himalaya to N. Myanmar	
31.	*Calamus guruba*Buch. -Ham. ex Mart.	Climbing Palm	South East Asia	
32.	*Calamus latifolius* Roxb.	Gouri Bet	E. Nepal to Indo-China and Peninsula Malaysia	
33.	*Calamus leptospadix* Griff.	Himalayan Rattan Palm	India	
34.	*Calamus longisetus* Griff.	Rattan Palm	India, Thailand	
35.	*Calamus melanochaetes*(Blume) Miq.	Giant Devil Palm	E. Himalaya to Taiwan	
36.	*Calamus metzianus*Schltdl.	Odiyan-Chooral	SW. India	
37.	*Calamus rheedei* Griff.	Vetra	W. Ghats,	Western

			Karnataka, Kerala	Ghats
38.	*Calamus rotang* L.	Common Rattan	SE. India, Sri Lanka	
39.	*Calamus viminalis*Willd.	Bitter Rattan Palm	NE. India to China	
40.	*Carpentaria acuminata* (H. Wendl. &Drude) Becc.	Carpentaria Palm	Australia	
41.	*Caryota mitis* Lour.	Burmese Fishtail Palm	India, South East Asia	LC
42.	*Caryotaurens* L.	Fishtail Wine Palm	India, Myanmar	LC
43.	*Chamaedorea elegans* Mart.	Parlor Palm	Mexico to Honduras	
44.	*Chrysalidocarpuslutescens*H. Wendl.	Golden Cane Palm	Madagascar	
45.	*Chrysalidocarpusmadagascariensis* (D. T. Fish) Becc.	Butterfly Palm	Madagascar	LC
46.	*Coccothrinaxargentata*(Jacq.) L. H. Bailey	Florida Silver Palm	Florida, Mexico	LC
47.	*Cocos nucifera* L.	Coconut	Indian sub-continent, Oceania	
48.	*Coryphataliera*Roxb.	Tali Palm	India, Bangladesh	EW
49.	*Coryphaumbraculifera* L.	Talipot Palm	Indian sub-continent	DD
50.	*Coryphautan* Lam.	Cabbage Palm	Indian sub-continent	LC
51.	*Cyrtostachysrenda* Blume	Sealing Wax Palm	Thailand to W. Malesia	
52.	*Daemonoropsjenkinsiana* (Griff.) Mart.	Major Jenkins Palm	Indian sub-continent	
53.	*Daemonoropsrarispinosa* Renuka &Vijayak.	Rattan Palm	Andaman and Nicobar Islands	Andaman and Nicobar Islands
54.	*Dictyosperma album* (Bory) Scheff.	Princess Palm	Coastal Forest of Mascarene	
55.	*Dypsisdecaryi*(Jum.) Beentje & J. Dransf.	Triangular Palm	SE. Madagascar	VU
56.	*Elaeisguineensis* Jacq.	Oil Palm	Africa	LC
57.	*Heterospatheelata*Scheff.	Sagisi Palm	Australia	LC
58.	*Hyophorbelagenicaulis* (L. H. Bailey) H. E. Moore	Bottle Palm	Mauritius	CR
59.	*Hyophorbe verschaffeltii* (W. Bull ex J. Dix) H. Wendl.	Spindle Palm	Rodrigues	CR
60.	*Hyphaene coriacea*Gaertn.	Ilala Palm	Ethiopia to S. Africa, Madagascar	LC
61.	*Hyphaene dichotoma* (D. White bis ex Nimmo) Furtado	Branching Palm	India	NT
62.	*Hyphaene thebaica* (L.) Mart	Egyptian Doub Palm	Arabain peninsula	LC
63.	*Kerriodoxa elegans* J. Dransf.	White Backed	Thailand	

		Palm		
64.	*Latanialoddigesii*Mart.	Blue Laten Palm	Mauritius	EN
65.	*Latanialontaroides*(Gaertn.) H.E.Moore	Red Laten Palm	Reunion Islands	EN
66.	*Licuala grandis* (T. Moore) H. Wendl.	Palas Palm	Vanuatu Islands	
67.	*Licuala peltata*Roxb. ex Buch. - Ham.	Swamp Fan Palm	Himalaya to South East Asia	
68.	*Licuala spicata* Becc.	Sarawak Mangrove Palm	Borneo	
69.	*Licuala spinosa* Wurmb	Mangrove Fan Palm	South East Asia	
70.	*Livistonachinensis*(Jacq.) R. Br. ex Mart.	Chinese Fan Palm	East Asia	
71.	*Livistona decora* (W. Bull) Dowe	Ribbon Fan Palm	Australia	LC
72.	*Livistonadrudei*F. Muell. ex Drude	Halifax Fan Palm	Australia	EN
73.	*Livistonajenkinsiana*Griff.	Fan Palm	Indian sub-continent	
74.	*Livistonasaribus*(Lour.) Merr. ex A. Chev.	Taraw Palm	South East Asia	VU
75.	*Lodoiceamaldivica*(J. F. Gmel.) Pers.	Double Coconut	Seychelles	
76.	*Normanbyanormanbyi*(W. Hill) L. H. Bailey	Black Palm	Australia	VU
77.	*Phoenix acaulis* Roxb.	Dwarf Date Palm	Himalaya to Bangladesh	
78.	*Phoenix dactylifera* L.	Date Palm	Arabian Peninsula to Pakistan	
79.	*Phoenix loureiroi*Kunth	Mountain Date Palm	Indian Subcontinent	LC
80.	*Phoenix pusilla*Gaertn.	Ceylon Date Palm	South East Asia	
81.	*Phoenix reclinata* Jacq.	Wild Date Palm	Africa	LC
82.	*Phoenix roebelenii* O'Brien	Pygmy Date Palm	South East Asia	
83.	*Phoenix rupicola* T. Anderson	Cliff Date Palm	India	NT/ Eastern Himalaya, West Bengal
84.	*Phoenix sylvestris* (L.) Roxb.	Silver Date Palm	India	
85.	*Pinangacoronata* (Blume) Blume	Ivory Cane Palm	Lesser Sunda Islands	
86.	*Pinangamanii*Becc.	Pinanga Palm	Andaman and Nicobar Islands	Andaman and Nicobar Islands
87.	*Pritchardiapacifica* Seem. & H. Wendl.	Fiji Fan Palm	Tonga	
88.	*Ptychosperma elegans* (R.Br.) Blume	Elegant Palm	Australia	LC
89.	*Ptychospermamacarthurii*(H.	Macarthur Palm	Australia	

	Wendl. ex H. J. Veitch) H. Wendl. ex Hook.f.			
90.	*Ptychospermasanderianum*Ridl.	Sanderianum Palm	New Guinea	
91.	*Rhapisexcelsa* (Thunb.) A. Henry	Lady Palm	China	
92.	*Rhapis humilis* Blume	Slender Lady Palm	China	
93.	*Rhopaloblasteaugusta* (Kurz) H. E. Moore	Nicobar Majestic Palm	Nicobar Islands	VU/ Nicobar Islands
94.	*Roystoneaborinquena* O. F. Cook	Rico Royal Palm	Hispaniola to Virgin Islands	
95.	*Roystonea regia* (Kunth) O. F. Cook	Royal Palm	Florida, Mexico	LC
96.	*Sabal mauritiiformis* (H.Karst.) Griseb. & H.Wendl.	Bayleaf Palm	Central America	LC
97.	*Sabal palmetto* (Walter) Lodd. ex Schult. &Schult.f.	Cabbage Palm	USA	LC
98.	*Salaccazalacca* (Gaertn.) voss	Snake Palm	Indonesia	
99.	*Saribusrotundifolius*(Lam.) Blume	Footstool Palm	South East Asia	
100.	*Syagrusromanzoffiana*(Cham.) Glassman	Queen Palm	South America	LC
101.	*Syagrusschizophylla*(Mart.) Glassman	Arikury Palm	Brazil	
102.	*Thrinaxparviflora*Sw.	Broom Palm	Jamaica	
103.	*Trachycarpusfortunei*(Hook.) H. Wendl.	Chinese Windmill Palm	India (Sikkim), China	
104.	*Trachycarpusmartianus*(Wall. ex Mart.) H. Wendl.	Martius Fan Palm	North East India and S.E. Asia	
105.	*Trachycarpustakil*Becc.	Kumaon Palm	W. Himalaya, Uttarakhand	Western Himalaya, Uttarakhand
106.	*Veitchiaarecina*Becc.	Montogomery Palm	VanautuIslanda	
107.	*Wallichiadisticha*T. Anderson	Distichous Fishtail Palm	North East India	
108.	*Wallichiatriandra*(J. Joseph) S. K. Basu	TibetianArenga Palm	SE. Tibet to Arunachal Pradesh	
109.	*Washingtoniafilifera*(T. Moore & Mast.) H. Wendl. ex de Bary	California Fan Palm	USA	LC
110.	*Wodyetiabifurcata*A. K. Irvine	Foxtail Palm	Australia	

6. CONCLUSION

The palm diversity in AJC Bose Indian Botanic Garden possesses many horticultural and economic importance. Starting from very common Coconut (*Cocos nucifera* L.), date (*Phoenix dactylifera* L.) to the species extinct in wild *Coryphataliera*Roxb. Palm remains very useful in socio-economic context. *Cocos nucifera*, *Phoenix dactylifera* L., *Borassus flabellifer*L. are taken as fruits; *Elaeisguineensis* Jacq. vegetable oil is extracted; *Attalea speciosa* Mart., *Bentinckianicobarica* (Kurz) Becc. and *Rhopaloblasteaugusta* (Kurz) H. E. Moore, are useful in construction purposes indigenously, the leaves of *Borassus* L. can be useful in fan making, plate making; *Adonidiamerrillii* (Becc.) Becc., *Hyophorbelagenicaulis* (L. H. Bailey) H. E. Moore, *Hyphaene thebaica* (L.) Mart., Royal Palm, foxtail palm etc. are useful in landscaping.

It is worthy to mention that at present situation when everyone is looking for a sustainable, organic, environment friendly option in their daily lifestyle coconut coir andvegetable oil, plates and fan made from palm leaves will definitely be in huge demand in coming future. Government is also focusing on making nature friendly options over the plastic or readymade plates which not only boost small industry and Self-Help Group (SHGs) making these items also promote 'Make in India' campaign. Conservation of this highly important representative will create an awareness among common people as well create area of research.

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