

**SHORT COMMUNICATION**

**Status of tree genetic resources conserved at the Botanic Garden,  
Bangladesh Agricultural University**

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**Abstract**

A total of 410 tree species under 66 families are conserved at the Botanic Garden, Bangladesh Agricultural University, which is about 40% of the total tree genetic resources of Bangladesh. According to IUCN Red List Categories and Criteria (Version 3.0) among the conserved tree species, 190 species are categorized as not evaluated (NE), 10 as data deficient (DD), 125 as least concern (LC), 25 near threatened (NT), 59 threatened and 1 extinct from wild (EW). These collections could be used as a source of materials for both species and habitat restoration programmes.

**Keywords:** Bangladesh, IUCN redlist, tree,

**INTRODUCTION**

A tree could be defined as a woody plant usually with a single stem growing to a height of at least two metres, or if multi-stemmed, then at least one vertical stem five centimetres in diameter at breast height (BGCI, 2021). Trees form the major structural components of forest ecosystems that cover approximately 31% of the world's land surface (FAO and UNEP, 2020), and are of vital importance ecologically, culturally and economically. They have many direct and/or indirect benefits for example, providing habitat for innumerable plant and animal species, and provide a host of other ecosystem services—ranging from timber to food and water, environmental processes like climate regulation, pollination, and air quality improvement, soil formation and rehabilitation, photosynthesis, and nutrient cycling, reduce flood damage and erosion, filter rainwater and improve water quality. Rainforests are some of the largest reservoirs for sequestering atmospheric carbon (Harris *et al.*, 2021). People also enjoy a variety of aesthetic experiences, recreational activities, and associated well-being and health benefits in green areas (especially areas with trees). More importantly, the restoration of trees remains among the most effective strategies for climate change

mitigation (Bastin *et al.*, 2019). The total number of tree species on Earth is ca. 73,000, including roughly 9,000 yet not known to science (Gatti *et al.*, 2022). Bangladesh lies in a transition between the Indo-Gangetic plains and the eastern Himalayas and, in flip, a part of the Indo-Chinese language sub-vicinity of the oriental realm (MoEF, 2004). This country thus acts as an important merging and sharing habitat, land bridge, and biological corridors of flora and fauna between these sub-regions, and is rich in tree genetic resources. The number of tree species has been reported from Bangladesh territory varied from 694 (BGCI, 2021) to a total of 1048 tree species (comprising both indigenous and introduced trees) under 432 genera in 99 families (Basak and Alam, 2015).

Botanic gardens are institutions holding documented collections of living plants and play major roles in plant conservation globally (Edwards and Jackson, 2019). These have four common fundamental functions, including plant introduction and conservation, scientific research, recreational display, and popular science. Over the last few decades, the number of botanic gardens and their activities has grown remarkably worldwide. Recently, the botanic garden has been opinioned as one of the solutions to the plant

extinction crisis (Westwood *et al.*, 2021). The Botanic Garden, Bangladesh Agricultural University (BAUBG) has emerged as a unique centre for plant conservation, education, scientific research, and information relating to plant biodiversity in the national and regional context (Rahman *et al.*, 2017). Approximately 1800 species of vascular plants (including Pteridophytes, Gymnosperms, and Angiosperms) are conserved here. In this paper, I have reported a glimpse of the tree genetic resources harboured at the BAUBG and analyzed their present status according to IUCN Red List Categories and Criteria (Version 3.0) based on the “Developing National Red List of Plants” (Anon., 2023).

## METHODOLOGY

The Botanic Garden, Department of Crop Botany, Bangladesh Agricultural University (BAUBG) is situated on the west bank of the Old Brahmaputra River and it lies between 24°43'27.9"N and 90°26'28.2" E. Living collections of the BAUBG tree genetic resources were illustrated with a total of 410 species. All the species had been physically verified and the nomenclature of each species has been updated by consulting “Plants of the World Online” <<https://powo.science.kew.org/>>. Their present status according to IUCN Red List Categories and Criteria (Version 3.0) based on the Fact Sheet of the “Developing Bangladesh National Red List of Plants and Developing Management Strategy of Invasive Alien Species (IAS) of Plants in Selected Protected Areas (PAs) Programme” implemented by the Forest Department (FD) and the Bangladesh National Herbarium (BNH) with the technical assistance of IUCN Bangladesh (Anon., 2023).

## RESULTS AND DISCUSSION

A total of 410 species under 66 families are conserved at the BAUBG (Table 1), which is about 40% of the total tree genetic resources of Bangladesh (Basak and Alam, 2015). Among the families, Fabaceae was the largest represented by 33 species followed by Araceae by 30 species, and 18 families were represented by only single

species each (Table 1). According to IUCN Red List Categories and Criteria (Version 3.0) out of these 410 species, 190 were not evaluated (NE), 10 data deficient (DD), 125 least concern (LC), 25 near threatened (NT), 59 threatened (of different categories) and 1 extinct from wild (EW) (a complete list available on request). The recent works of the FD and the BNH evaluated only 1000 selected plant (forest) species, out of approximate 6000 species in total, where 271 species are categorized as LC, 258 species DD, 69 species NT while the other 394 species are collectively termed Threatened, i.e., CR 5, EN 127 and VU 262 species (Anon. 2023). Many of tree species conserved at the BAUBG have not been under current assessment and categorized as NE. Among the threatened species, 46 are vulnerable (VU), 11 endangered (EN) and 2 critically endangered (CR) (Table 2). Although trees generally act as the source of wood or timber for different commercial uses for example furniture, construction materials, fuel & fibre, gum, dye, paper & pulping materials, etc., most of the threatened tree species are used in traditional medicine (Table 2). The GSPC (Global Strategy for Plant Conservation) target #8 required that “At least 75% of threatened plant species in *ex-situ* collections, preferably in the country of origin” (CBD, 2012). It emphasized both the evaluation of the status (and threat assessments) of biodiversity according to IUCN Red List Categories and Criteria, and the conservation of threatened plant species. Bangladesh is far behind the target (Anon., 2023). As an *ex-situ* conservatory, more priority should be given to the collection and conservation of threatened plant (tree) genetic resources at the BAUBG. These collections not only preserved plant genetic resources from extinction but also can provide a source of material for both species and habitat restoration.

## ACKNOWLEDGMENTS

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**Table 1: Family-wise distribution of tree genetic resources conserved at the BAUBG.**

Sl.No.	Family	Species(no.)	Sl.No.	Family	Species(no.)
1.	Alangiaceae	1	34.	Malvaceae	5
2.	Anacardiaceae	12	35.	Meliaceae	16
3.	Annonaceae	9	36.	Mimosaceae	18
4.	Apocynaceae	11	37.	Moraceae	28
5.	Aquifoliaceae	1	38.	Moringaceae	2
6.	Araucariaceae	4	39.	Myristicaceae	2
7.	Arecaceae	30	40.	Myrtaceae	17
8.	Bignoniaceae	11	41.	Ochnaceae	1
9.	Bixaceae	1	42.	Oxalidaceae	2
10.	Bombacaceae	4	43.	Phyllanthaceae	1
11.	Boraginaceae	3	44.	Pinaceae	2
12.	Burseraceae	4	45.	Poaceae	13
13.	Caesalpinaceae	1	46.	Podocarpaceae	3
14.	Capparaceae	1	47.	Primulaceae	1
15.	Casuarinaceae	1	48.	Proteaceae	1
16.	Celastraceae	1	49.	Punicaceae	1
17.	Clusiaceae	9	50.	Rhamnaceae	2
18.	Combretaceae	7	51.	Rhizophoraceae	6
19.	Cupressaceae	2	52.	Rosaceae	5
20.	Cycadaceae	4	53.	Rubiaceae	11
21.	Dilleniaceae	2	54.	Rutaceae	7
22.	Dipterocarpaceae	5	55.	Santalaceae	1
23.	Ebenaceae	5	56.	Sapindaceae	8
24.	Elaeocarpaceae	2	57.	Sapotaceae	6
25.	Euphorbiaceae	26	58.	Simaroubaceae	1
26.	Fabaceae	33	59.	Sonneratiaceae	3
27.	Fagaceae	5	60.	Sterculiaceae	8
28.	Flacourtiaceae	2	61.	Tetramelaceae	1
29.	Lauraceae	10	62.	Theaceae	2
30.	Lecythidaceae	3	63.	Thymelaeaceae	1
31.	Loganiaceae	1	64.	Tiliaceae	4
32.	Lythraceae	5	65.	Ulmaceae	1
33.	Magnoliaceae	5	66.	Verbenaceae	9

**Table2:ListofthreatenedspeciesconservedattheBAUBG.VUVulnerable,ENEndangered,CRCriticallyEndangered,EWExtinctintheWild.**

Sl.No.	LocalName	BotanicalName	Family	Status	EthnobotanicalUses*
1.	Khalisha, Khalshi	<i>Aegicerascorniculatum</i> (L.)Blanco	Primulaceae	VU	Medicinal. woodforknifehandles, fuel
2.	Boilam, Boilsur	<i>Anisopterascaphula</i> (Roxb.)Kurz.	Dipterocarpaceae	VU	Timber(general)lightconstruction
3.	Bankanthal, Dewa	<i>Artocarpuslacucha</i> Buch.-Ham.	Moraceae	VU	Fruitedible, medicinal, tannin, fibre, termites-resistant timber
4.	Mitingsbash	<i>Bambusaburmanica</i> Gamble	Poaceae	VU	Roofing, thatching, construction, basketmaking
5.	RaktaKanchan	<i>Bauhiniavariegata</i> L.	Fabaceae	VU	Medicinal, budsasvegetables, woodwoolboard, tannin, oil, gum, fibre
6.	Bixa, Doirong	<i>Bixaorellana</i> L.	Bixaceae	VU	Colourant, medicinal
7.	Mailaam	<i>Boueaoppositifolia</i> (Roxb.)Meissner	Anacardiaceae	VU	Fruitsfood&vegetables, ornamental, Timber&Products
8.	Maj, majot	<i>Brownlowiaelata</i> Roxb.	Tiliaceae	VU	Medicinal
9.	Kumbhi	<i>Careyaarborea</i> Roxb.	Lecythidaceae	VU	Fruits edible, medicinal, dye, gum, tannin, wood
10.	FishTailPalm	<i>Caryotamitis</i> Lour.	Arecaceae	VU	Ornamental, makingsago, constructionmaterials
11.	Monkata	<i>Catunaregamspinosa</i> (Thunb.)Tirveng.	Rubiaceae	VU	Medicinal
12.	Ram-tejpata	<i>Cinnamomumbejoghota</i> (Buch-Ham.)Sweet	Lauraceae	VU	Condiment, medicinal, sourceofessentialoiland wood.
13.	Tejbal, Gondroi	<i>Cinnamomumglaucescens</i> (Nees)Meiss.	Lauraceae	VU	Timber, essentialoilforperfumeryandmedicine
14.	Adagach, Dudhia	<i>Crotonpersimilis</i> Müll.Arg.	Euphorbiaceae	VU	Medicinal, ornamental
15.	Ashphal, Katlitchu	<i>Dimocarpuslongan</i> Lour.	Sapindaceae	VU	Fruitsfood&vegetables, medicinal, tough, veryhard, highlydurable wood, fuel
16.	DhuliGarjan	<i>Dipterocarpusgracilis</i> Blume	Dipterocarpaceae	VU	Commercial grade plywood, resin usedin paint oils, coatfor waterproofingpaper
17.	Ban Bokul	<i>Drypetesassamica</i> (Hook.f.) Pax & K. Hoffm.	Euphorbiaceae	VU	Fruitsfood, wood-making charcoal
18.	Rangirata, pitraj	<i>Dysoxylumnectariferum</i> (Roxb.) Hook.f.exBeddome	Meliaceae	VU	Medicinal
19.	Khuskadumur	<i>Ficusshirta</i> Vahl	Moraceae	VU	Fruitedible, medicinal
20.	Ficus	<i>Ficusvariegata</i> Blume	Moraceae	VU	Fruitedible, medicinal, latex, fuelwood
21.	Jarul	<i>Lagerstroemia macrocarpa</i> Wall.	Lythraceae	VU	Medicinal, timberofexcellentquality
22.	Jarul(Nil)	<i>Lagerstroemia parviflora</i> Roxb.	Lythraceae	VU	Medicinal, ediblegum, veryhardandddurabletimber
23.	RuffledFanPam	<i>Licuala grandis</i> (T.Moore)H.Wendl.	Arecaceae	VU	Ornamental, constructionmaterials
24.	Batna, Kalibatna	<i>Lithocarpusfenestratus</i> (Roxb.)Rehder.	Fagaceae	VU	Fuelwood
25.	Raktan	<i>Lophopetalumwightianum</i> Arn.	Celastraceae	VU	Medicinal, timberusedas perupok
26.	Dulichampa	<i>Magnoliapterocarpa</i> Roxb.	Magnoliaceae	VU	Woodsuitableforteaboxes, firewood
27.	Khirmi	<i>Manilkara hexandra</i> (Roxb.)Dubard	Sapotaceae	VU	Fruitedible, medicinal, rootstocksfor sapodilla
28.	Phul Kadam	<i>Mitragynadiversifolia</i> (Wall.exG.Don)Havil.	Rubiaceae	VU	Medicinal
29.	Phuti/KeliKadam	<i>Mitragynaparvifolia</i> (Roxb.)Korth.var. <i>microphylla</i> (Kurz)Ridsdale	Rubiaceae	VU	Medicinal, increasequantitiesofbreastmilkin lactating mothers, lactodepurant, wood
30.	Bontejpata	<i>Neolitsea cassia</i> (L.)Kosterm.	Lauraceae	VU	Medicinal, buildinghouses, planks, andrafters
31.	Duddahgach, Tali	<i>Palaquium polyanthum</i> (Wall. exDC.) Engl.	Sapotaceae	VU	Housebuilding, makingboats, plywoodflushdoors&blackboards, latex
32.	Kuki-tetui	<i>Parkia timoriana</i> (DC.)Merr.	Mimosaceae	VU	Medicinal, ornamental, firewoodandlumber
33.	Ban-kanchan	<i>Piliostigma malabaricum</i> (Roxb.)Benth.	Fabaceae	VU	Medicinal

Continued.

Sl.No.	LocalName	BotanicalName	Family	Status	EthnobotanicalUses*	Continued.Table2.
34.	RamGua	<i>Pinangagracilis</i> Blume	Arecaceae	VU	Fruitas masticator	
35.	Pine	<i>Pinuskesiya</i> Royleex Gordon.	Pinaceae	VU	Fruitedible,medicinal, greendye, woodsforboxes, paperpulp, temporaryelectricpoles	
36.	Ceyloncherry	<i>Prunusceylanica</i> (Wight)Miq.	Rosaceae	VU	Medicinal(inSriLanka)	
37.	Putrajhiva	<i>Putranjivaroxburghii</i> Wall.	Euphorbiaceae	VU	Medicinal	
38.	Momchina	<i>Sapiumsebiferum</i> (L.)Roxb.	Euphorbiaceae	VU	Medicinal,fatforsoapandcandle,woodformakingfurnitureand incense	
39.	Joyna	<i>Schleicheraoleosa</i> (Lour.) Oken.	Sapindaceae	VU	Edibleleaves,shoot&fruits,Medicinal,oil,tannin,dye, wood	
40.	Bhela	<i>Semecarpusanacardium</i> L.f.	Anacardiaceae	VU	Food,medicinal,oil,gum,makingpermanentmarkingink	
41.	Kuchila	<i>Strychnoslucida</i> R.Br.	Loganiaceae	VU	Medicinal,fishpoison	
42.	Khudijam	<i>Syzygiumcymosum</i> DC.	Myrtaceae	VU	Dyefrombark,woodformakingpanels	
43.	Hatiyal,Harra	<i>Terminaliacitrina</i> (Gaertn.)Roxb.exFleming	Combretaceae	VU	Medicinal,sourceoftanninsandwood.	
44.	BelatiTentul	<i>Vangueriamadagascariensis</i> Gmel.	Rubiaceae	VU	Fruitfood,medicinal, wood	
45.	Dudkarach,Dudhi	<i>Wrightiaarborea</i> (Dennst.)Mabb.	Apocynaceae	VU	Medicinal, Timber	
46.	Dhdhi,Pallam	<i>Wrightiacoccinea</i> (Roxb.) Sims.	Apocynaceae	VU	Ornamental,medicinal,firewood	
47.	Chatim (Big)	<i>Alstoniamacrophylla</i> Wall.ex.G.Don.	Apocynaceae	EN	Medicinal,constructionmaterials	
48.	Berria	<i>Berryacordifolia</i> (Willd.)L.Laurent	Malvacea	EN	High-qualitytimber,fibre	
49.	Dhup	<i>Canariumresiniferum</i> BraceexKing.	Burseraceae	EN	Medicinal,resin	
50.	Mussanda (White)	<i>Canthiumglabrum</i> Blume	Rubiaceae	EN	Medicinal	
51.	Cycad-Moniraj	<i>Cycaspectinata</i> Buch.-Ham	Cycadaceae	EN	Food&vegetable,medicinal,makingsago, glue	
52.	Monther	<i>Erythrinasuberosa</i> Roxb.	Fabaceae	EN	Ornamental,medicinal,fuel	
53.	Swarnakhiri	<i>Garciniamorella</i> (Gaertn.)Desr.	Clusiaceae	EN	Fruitsfood&vegetable,medicinal,resin,rootstockformangosteen	
54.	Thoikar	<i>Garciniapedunculata</i> Roxb.exBuch-Ham.	Clusiaceae	EN	Fruitsfood&vegetables,medicinal,timberusedforplanks,beams,etc.	
55.	Bharal	<i>Intsiabijuga</i> (Colebr.)O.Kuntze.	Fabaceae	EN	Medicinal,constructingthemainhull,masthead,maststep and steeringoarofocan-goingcanoes.	
56.	Bongajari	<i>Miliusatomentosa</i> (Roxb.)J.Sinclair	Annonaceae	EN	Fruitsfood,medicinal	
57.	Boncula	<i>Pterospermumlanceifolium</i> Roxb.exDC.	Malvaceae	EN	Wood,fuel	
58.	Chalmogra	<i>Hydnocarpuskurzii</i> (King)Warb.	Flacourtiaceae	CR	Medicinal	
59.	Banspata	<i>Podocarpusnerifolius</i> D. Don	Podocarpaceae	CR	Fruitedible,medicinal,woodusedforconstruction,making furniture,musicalinstruments,carvings,paper	
60.	Talipalm	<i>Coryphataliera</i> Roxb.	Arecaceae	EW	Leavesaswritingpaper,ornamental	

\*<<https://mpbd.cu.ac.bd/index.php>>; <<https://tropical.theferns.info/>>; <<https://www.wikipedia.org/>>; <<https://indiabiodiversity.org/>>;<<https://www.natureinfo.com.bd/mpb/>>

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