

Research Article

Floristic Composition and Phytodiversity Status of Bangabandhu Jamuna Eco-Park, Sirajganj, Bangladesh

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Abstract—The present study represents a comprehensive information on current floristic composition and phytodiversity status of Bangabandhu Jamuna Eco-Park, Sirajganj, Bangladesh. This study reveals that a total 279 vascular plant species of 205 genera under 73 families have been documented during 2021 to 2022. From recorded species, 71 species (25.45%) were planted and 208 species (74.55%) were wild in nature. Pteridophytes are represented by six species (2.15%) under six genera (2.93%) of five families (6.85%) and Gymnosperms of two species (0.72%) under two genera (0.97%) of two families (2.73%), Angiosperms are composed of 215 species (77.06%) of 156 genera under 55 families of Magnoliopsida (dicotyledons) and 56 species (20.07%) of 41 genera under 11 families of Liliopsida (monocotyledons). Among the Angiosperm families, Asteraceae with 22 species is the largest dicotyledons family, where Poaceae with 20 species is the largest monocotyledonous family. Among the life-form categories, 85 species are erect herb and rest of 39, 31 and 22 species are represented as large tree, prostrate herb and small shrub, respectively. Seasonal variation is remarkably observed in this study, where the maximum 172 species are found during rainy season, following by 134 and 108 species are recorded during winter and summer seasons respectively. The highest values of both Shannon-Weiner diversity index (2.77) and Simpson diversity index (0.10) are found during rainy season, whereas the lowest values of these indices are calculated as 2.28 and 0.07, respectively during summer season. Similarly, the highest Jackknife species richness value 172.58 is recorded in rainy season and the lowest value 108.75 in summer season. Thus, the eco-park area is floristically quite good and which might serve as an excellent centre for biodiversity conservation by strengthening the existing management plans and adopting necessary policies and strategies.

Keywords—Floristic composition, Phytodiversity, Bangabandhu Jamuna eco-park.

1. Introduction

Bangladesh, a south Asian nation that located between 23°41'15"N latitude and 90°21'3"E longitude with 169 million peoples living in only 14.4 million hectares areas [1]. As, it is one of the most populous and land scarce country, it cannot afford to squander its land in an unproductive manner. Countries around the world today utilize their infrastructure to transform it into a multiuse urban wealth such as construction area with eco-park or national park. Floristic studies cover the fields of species and genera composition, their geographical distribution, life-form categories and threatened plants categorization are act as a phenomenal tool for assessing ecological concept like biodiversity with regulation, conservation and management [2]. Biodiversity exploration and its measurement have a long-term impact on the study of vegetation, ecosystem services, its conservations and the overall sustainable restoration of any ecosystem [3]. Species diversity and richness play a crucial role for existence of ecological processes and dynamics in relation to massive

forest grabbing stresses and evolving environmental hazardous situations [4], [5]. Noticeably, any deterioration in biodiversity may lead to a destruction in ecosystem-level activities [6]. Geographically, Bangladesh is situated adjacent to the Indo-Burma biogeographic region which is a prime hotspot area of the world biological diversity [7]. Bangladesh has a unique geo-physical location and for this it's exceptionally blessed with a rich biodiversity [8] [9] which harboured approximately 5000 species of angiosperms [10]. Muhammed *et al.* (2008a) [11] said that forest areas of Bangladesh are at a critical condition and deteriorating at a dreadful rate due to many biotic-abiotic pressures, socio-economic impendence and heavy pressure of land uses. Many people are depending on forest resources for their livelihoods and income which resulted in degradation of forest resources worldwide. The loss of biodiversity is the outcome of various types of human development interventions that hurt on it by deterioration and degradation of land, aquatic habitats and forest. As the scenario of biodiversity is worsening day by day, Bangladesh government is trying to innovate a policy in solving problems that are unique to this country. So,

government is trying to develop new forest ecosystem by implementing proper management plans in association with any infrastructure and construction area. Government has selected different types of protected areas such as Eco-Park, National Park, Safari Park, Botanical Garden, Wildlife Sanctuary and Game Reserve following IUCN biodiversity management criteria.

2. Related Work

Bangabandhu Jamuna Eco-Park (BJEP) is located along the west bank of the Jamuna River in association with Bangabandhu Jamuna bridge. It was established and gazetted by the Government of Bangladesh in March, 2008. Hadi and Rahman (2013) [12] studied on phytodiversity status of Tilagarh eco-park, Sylhet; Islam *et al.* (2016) [13] studied on phytodiversity status of Sitakunda eco-park, Chittagong. A research work related to floristic diversity of the BJEP area was conducted by Sharif (2014) [14]. But a detailed information about floristic composition, species richness and status of phytodiversity of this park ecosystem is still being unfinished. Therefore, the present study on floristic composition and present status of phytodiversity of the Bangabandhu Jamuna eco-park has been undertaken for providing a comprehensive informative checklist of upper-ground vascular plants in association with their seasonal variations, species richness and phytodiversity status. This research knowledge will help to develop a perspective plan for sustainable conservation, restoration and eco-friendly management of the Bangabandhu Jamuna Eco-Park.

3. Materials and Methods

3.1 Description of the study area: The Bangabandhu Jamuna Eco-Park is located at south Sirajganj forest range in Rajshahi forest division under Brahmaputra-Jamuna floodplain biogeographic zone [8]. It is adjacent to west part to Bangabandhu Jamuna Bridge and about 12 km south from Sirajganj sadar upazila. It is located beside the north part of national highway N405 road in Elenga. Geographically, this park is situated around 24°24'3.59"N latitude and 89°44'45.59"E longitude. Currently notified area of the park is 124 acre (50.20 ha) of which about 28-30 acres are under the supervision of Bangladesh Army. Based on geo-spatial location, topographic features, habitat pattern and vegetation composition, the present study area has been divided into five different representative sites. The selected representative sites are recognized as- Site-A (*Albizia* dominated low land, 24°24'3.59"N, 89°44'52.8"E), Site-B (*Casuarina-Eucalyptus* mixed forest, 24°24'21"N, 89°44'45.59"E), Site-C (Marginal Forest near east part of Jamuna River, 24°24'3.58"N, 89°45'7.1"E), Site-D (Deep centre forest region, 24°24'32.3"N, 89°44'56.3"E), Site-E (*Casuarina* dominated high land, 24°23'56.4"N, 89°45'7.1"E).

3.2 Field survey, sample collection and identification: For this research purpose, altogether six field trips, each having five days duration were conducted during three distinct seasons (i.e., rainy, winter and summer) of a year from July,

2021 to June 2022. Standard quadrat method [15], [16] were used for vascular plants collection and data recording. The standard quadrat size was determined by using Species Area Curve [17]. The standard quadrat size of different habit categories of plants was recognized as- 2m×2m, 5m×5m, and 10m×10m for herbs, shrubs and trees, respectively. List count quadrat method [15] was used for data collection from each quadrat.

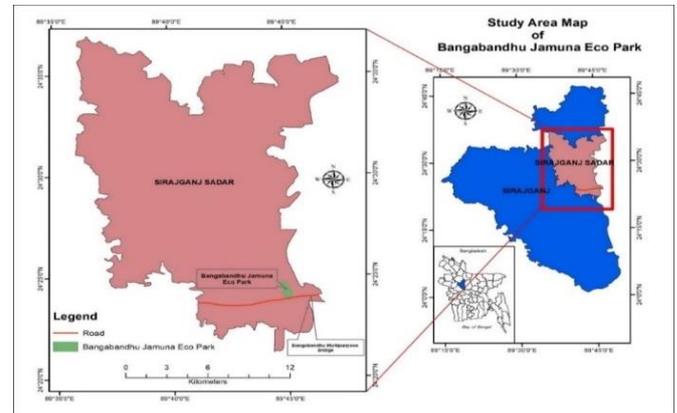


Figure 1. Study Area Map (Bangabandhu Jamuna Eco-Park).

Standard Herbarium techniques [18], [19], [20] were used for processing of plant samples. Processed plant samples were preserved as voucher specimens in the Plant Ecology and Environment laboratory, Jahangirnagar University. Identification of the specimens were completed through discussing with plants experts, matching with pertinent preserved voucher specimens which were preserved at Bangladesh National Herbarium (DACB) and Jahangirnagar University Herbarium (JUH), matching with type image available in different website of relevant institute and through taxonomic descriptions, information and taxonomic keys found in pertinent literatures [21], [22], [23], [24]. Nomenclatural information was verified following online based databases [25], [26]. The Bangla name(s) and uses were verified following relevant literatures as well as through interview with the native people. The families of Pteridophyta, Gymnosperms and Angiosperms have been tabulated following literatures respectively and the genera and species of each plant family alphabetically (in Table 1).

3.3 Analysis of Vegetation: The values of Shannon-Weiner and Simpson's diversity indices were calculated by using the standard methods [27] and [28] respectively. The calculating formulae of these indices are given below:

$$\text{Shannon-Weiner Diversity Index (H')} = -\sum p_i \ln p_i$$

Where, P_i = Proportion of individuals or the abundance species which expressed as a proportion of total cover; \ln = Log base n .

$$\text{Simpson's Diversity Index- (D}_x) = 1 - \frac{\sum n(n-1)}{N(N-1)}$$

Where, N = Total no. of individual of all species;
 n = Total no. of individual of a species.

Jackknife species richness was calculated by the following formula [29]-

$$\text{Jackknife Species Richness (S)} = s + \left(\frac{n-1}{n}\right)^k$$

Where, s = Total no. of species in all quadrat;
n = No. of quadrat studied; k = no. of unique species.

3.4 Statistical Analysis: Data were statistically evaluated and calculated by using MS EXEL (Version 2019) and SPSS (Version 16.0) softwares. One way ANOVA (DMRT) was used to justify the significance differences among the observed data at 5% ($\alpha = 0.05$) level of significance.

4. Results and Discussion

The present study reveals the occurrence of a total 279 upper-ground vascular plant species belonging to 205 genera under 73 plant families within the boundary of BJEP (Table 1). From the recorded species, 71 (25.45%) species were planted and 208 (74.55%) species were wild in nature which exhibited the natural regeneration potentiality. Among the recorded species, Pteridophytes were represented by six species (2.15%) of six genera under five families, where Gymnosperms were found to be composed of two species (0.72%) of two genera under two families. Besides, Angiosperms were comprised of 215 species (77.06%) belonging to 156 genera under 55 plant families of Magnoliopsida (dicotyledons) and 56 species (20.07%) of 41 genera under 11 families of Liliopsida (monocotyledons) (Table 1 and Figure 2).

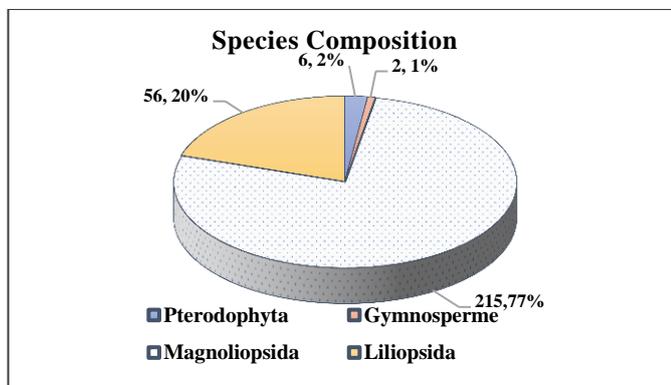


Figure 2. Species composition of different plant groups.

Among the recorded species, herbs, shrubs, trees and climbers were comprised with 148 (53.05%), 39 (13.97%), 73 (26.16%) and 19 (6.81%) species, respectively. This study depicted the occurrence of 73 plant families, where number of species in each family were varied from 1 to 22. There were 29 families having monospecific family which consisted with single species of each. The most dominant 10 families including Asteraceae (22), Fabaceae (21), Poaceae (20), Moraceae (11), Araceae (10), Lamiaceae (8), Cyperaceae (8), Euphorbiaceae (8), Malvaceae (8), and Amaranthaceae (7) were represented the maximum number species (Figure 3).

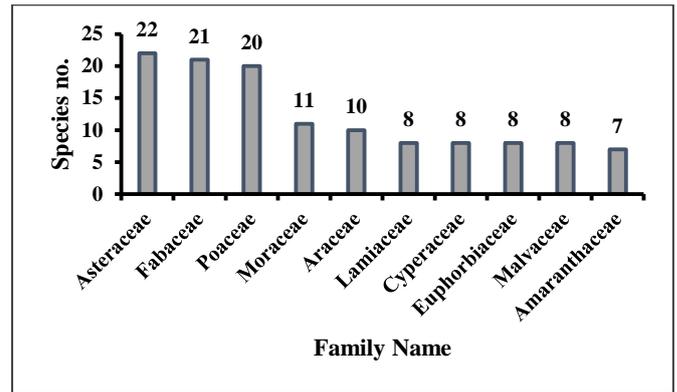


Figure 3. Ten dominant plant families containing maximum species.

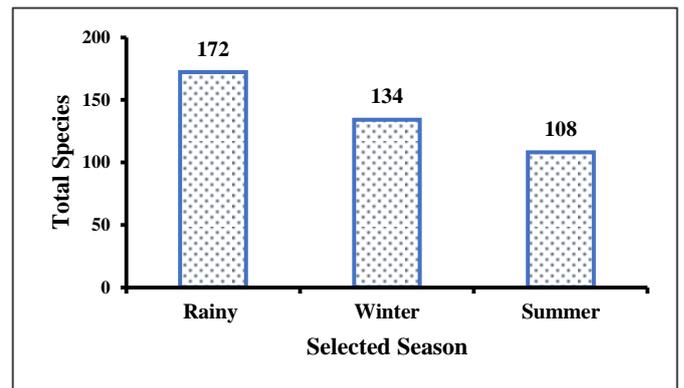


Figure 4. Seasonal variation of total species number.

The number of total species during different season represented a changing pattern where maximum 172 species were recorded in rainy season following by 134 species and 108 species were found during winter and summer season, respectively (Figure 4). Shannon-Weiner and Simpson's diversity index values were varied in different sites during three different seasons. The highest Shannon-Weiner diversity index value 2.77 was found in rainy season followed by 2.29 was found in summer season, whereas the lowest value 2.28 was recorded during winter season. Among the sites, the highest Shannon-Weiner diversity index value 2.61 was found in site B and followed by 2.51 in site A, whereas the lowest value 2.28 was found in site C (Table 2). Similarly, the highest Simpson's diversity index value 0.10 was found in both rainy and winter seasons, and the lowest value 0.07 was found in summer season. Data also showed that the highest Simpson's diversity index value 0.10 was found in both the site A and site D, whereas the lowest index value 0.07 was found in site B (Table 2). The highest Jackknife species richness 172.58 was found in rainy season and lowest 108.75 in summer season. Data also revealed that during three season the highest richness value 76.31 was found in site E and lowest value 61.47 found in site B. Average Jackknife species richness value of all sites during three season was 138.65 (Table 2).

Bangabandhu Jamuna eco-park is a wonderful eco-park of Bangladesh. It was found as moderately diversified in respect to plant diversity. As a new ecosystem of Bangladesh, floristic composition species richness and status of phytodiversity were studied to assess the present condition of

this eco-park. Study have showcased a changing pattern in diversity during three different seasons. The maximum species were found in rainy season due to suitable condition for undergrowth species regeneration. As during winter and summer season, the condition that was suitable for undergrowth species development was worsening, so the occurrence of the number of species also declining gradually. Plant diversity also significantly varied in different sites. Maximum diversity index value was found in site B during rainy season and minimum diversity index value was found in site B during summer season. The study is carried out by a unique methodology, the findings of the research will be an important guideline for introduction of any perspective plan for eco-park restoration, conservation and management of phytodiversity resources of Bangabandhu Jamuna Eco-Park of Bangladesh.

Table 2. Duncan's Multiple Range Test (DMRT) of different diversity indices and richness values of selected sites and seasons.

Selected sites and seasons		Diversity Index Value		Jackknife species richness
		Shannon-Weiner	Simpson's	
Site	A	2.51a	0.10a	66.59a
	B	2.61a	0.07a	61.47a
	C	2.28a	0.09a	62.53a
	D	2.44a	0.10a	68.34a
	E	2.39a	0.08a	76.31a

Season	Rainy	2.77b	0.10a	172.58b
	Winter	2.28a	0.10a	134.63a
	Summer	2.29a	0.07a	108.75ab

Note: The average values are depicted in different columns. Values in the same column that do not contain same letter after each value are significantly different at 5% ($\alpha = 0.05$) level of significance in different sites during different seasons after DMRT.

Findings of the present survey revealed that the average values of Shannon-Weiner diversity index, Simpson's diversity index and Jackknife species richness among the selected sites did not represent significant difference, but they showed significant difference during selected seasons at 5% level of significance after DMRT. Result showed that the values of Shannon-Weiner diversity indices in rainy season have showed highest and traced significantly different from the observed values found in winter and summer season. The average observed values of Simpson's diversity indices did not show significant difference during three seasons. The average observed values of Jackknife species richness during rainy season have found the highest, having similarity with summer season and showed significant difference from observed values of winter season at 5% level of significance after DMRT.

Table 1. A comprehensive checklist of vascular plant species recorded from Bangabandhu Jamuna Eco-Park during 2021-2022.

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
PTERIDOPHYTA Schimp.					
Lygodiaceae M. Roem.					
1	<i>Lygodium flexuosum</i> (L.) Saw.	Suralata	Herb,vi;w	O	Ashraf 534
Pteridaceae E. D. M. Kirchn.					
2	<i>Ceratopteris thalictroides</i> (L.) Brongn.	Paniletuce	Herb,er;w	O	Ashraf 339
3	<i>Pteris vittata</i> L.	Imodi pteris	Herb,pr;w	Vg	Ashraf 539
Polypodiaceae J. Presl.					
4	<i>Pyrrosia longifolia</i> L.	Unknown	Herb,ep;w	O	Ashraf 429
Thelypteridaceae Ching ex. Pic. Serm.					
5	<i>Ampelopteris prolifera</i> (Retz.) Copel	Deki shak	Herb,cr;w	Vg	Ashraf 437
Athyriaceae Alston.					
6	<i>Diplazium esculentum</i> (Retz.) Sw.	Deki shak	Herb,er;w	O, Vg	Ashraf 533
GYMNOSPERMAE Prantl					
Araucariaceae Henkel & W. Hochst					
7	<i>Araucaria heterophylla</i> (Salisb.) Franco	Araucaria	Tree,l;pl	O, T	Ashraf 521
Cupressaceae Gray					
8	<i>Thuja plicata</i> Donn. ex D. Don	Thuja	Tree,l;pl	O, M	Ashraf 519
MAGNOLIOPSIDA Brongn.					
Magnoliaceae Juss.					
9	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Champa	Tree,l;pl	M, O	Ashraf 425
Annonaceae Juss.					
10	<i>Annona squamosa</i> L.	Shorifa	Tree,s;pl	Fr, Fw	Ashraf 428
11	<i>Artabotrys hexapetalus</i> (L. f.) Bhandari	Kathali champa	Shrub,sc;pl	M	Ashraf 431
12	<i>Polyalthia longifolia</i> (Sonn.) Thwaites	Devdaru	Tree,l;pl	O	Ashraf 332
13	<i>P. suberosa</i> (Roxb.) Thwaites	Barachal	Tree,s;pl	M	Ashraf 535
Lauraceae Juss.					
14	<i>Litsea glutinosa</i> (Lour.) C. B. Rob.	Kukurcheeta	Tree,m;pl	M	Ashraf 147
15	<i>L. monopetala</i> (Roxb.) Pers.	Boro kukurcheeta	Tree,m;pl	M	Ashraf 536
Piperaceae Giseke					
16	<i>Peperomia pellucida</i> (L.) Kunth.	Luche pata	Herb,pr;w	M	Ashraf 246

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
Menispermaceae Juss.					
17	<i>Tiliacora racemose</i> Colebr.	Baghlata	Shrub,ty;w	M	Ashraf 223
Cannabaceae Martinov					
18	<i>Trema orientalis</i> (L.) Blume	Ban jhiga	Tree,l;w	T	Ashraf 426
Moraceae Gaudich.					
19	<i>Artocarpus lakoocha</i> Roxb.	Deowa	Tree,m;pl	Fr, Fw	Ashraf 432
20	<i>A. heterophyllus</i> Lam.	Kanthal	Tree,m;pl	Fr, T	Ashraf 148
21	<i>Ficus benghalensis</i> L.	Bot	Tree,l;pl	Fw	Ashraf 540
22	<i>F. asamica</i> L.	Asam bot	Shrub,s;w	Fo	Ashraf 251
23	<i>F. carica</i> L.	Unknown	Shrub,s;w	Fo	Ashraf 252
24	<i>F. hispida</i> L.	Kakdumur	Tree,s;w	Vg	Ashraf 149
25	<i>F. heterophylla</i> L. f.	Bhuidumur	Shrub,s;w	M, Vg	Ashraf 150
26	<i>F. racemose</i> L.	Jagdumur	Tree,l;pl	M	Ashraf 249
27	<i>F. religiosa</i> L.	Aswath	Tree,l;pl	T	Ashraf 537
28	<i>F. rumphii</i> Blume.	Khair bot	Tree,l;pl	M, T	Ashraf 328
29	<i>Streblus asper</i> Lour.	Sheora	Tree,l;pl	M, Fw	Ashraf 134
Urticaceae Juss.					
30	<i>Laportea interrupta</i> (L.) Chew	Chotrapata	Herb,er;w	M	Ashraf 139
31	<i>Pauzolia zeylanica</i> (L.) Benn.	Kullaruki	Herb,er;w	Vg	Ashraf 132
Casuarinaceae R. Br.					
32	<i>Casuarina equisetifolia</i> L.	Jhau	Tree,l;pl	T	Ashraf 109
Tamaricaceae R. Br.					
33	<i>Tamarix gallica</i> L.	Tamarix	Tree,s;w	M	Ashraf 438
Nyctaginaceae Juss.					
34	<i>Boerhavia diffusa</i> L.	Purnarva	Herb,pr;w	O, M	Ashraf 319
Amaranthaceae Juss.					
35	<i>Achyranthes aspera</i> L.	Apang	Herb,er;w	M	Ashraf 232
36	<i>Alternanthera philoxeroides</i> (Mart.) Griseb	Henchi	Herb,fr;w	M, Vg	Ashraf 417
37	<i>A. sessilis</i> (L.) R. Br. ex DC.	Malancha	Herb,pr;w	Vg, M	Ashraf 418
38	<i>A. paronychoides</i> A. St.-Hill	Jhuli kata	Herb,pr;w	Vg	Ashraf 317
39	<i>Amaranthus spinosus</i> L.	Kantanotey	Herb,er;w	M, Vg	Ashraf 214
40	<i>A. graecizans</i> L.	Unknown	Herb,er;w	M	Ashraf 216
41	<i>A. viridis</i> L.	Notey shak	Herb,er;w	M	Ashraf 215
Polygonaceae Juss.					
42	<i>Persicaria barbata</i> (L.) H. Hara	Biskatali	Herb,er;w	M	Ashraf 123
43	<i>P. hydropiper</i> (L.) Delarbre	Pani Biskatali	Herb,er;w	Fo	Ashraf 124
44	<i>P. minor</i> (Huds.) Opiz	Choto Biskatali	Herb,er;w	Fo	Ashraf 219
45	<i>P. lapathifolia</i> (L.) Delarbre	Panimarich	Herb,er;w	Wd, M	Ashraf 220
46	<i>Polygonum plebium</i> R. Br.	Khudi Biskatali	Herb,er;w	Gm, M	Ashraf 427
47	<i>Rumex dentatus</i> L.	Bon palang	Herb,er;w	Wd, M	Ashraf 224
Dilleniaceae Salisb.					
48	<i>Dillenia indica</i> L.	Chalta	Tree,l;pl	Fr	Ashraf 538
Clusiaceae Lindl.					
49	<i>Mesua ferrea</i> L.	Nageshwar	Tree,s;pl	O, M	Ashraf 143
Bombaceae Kunth.					
50	<i>Bombax ceiba</i> L.	Shimul	Tree,l;pl	Fb	Ashraf 122
51	<i>B. pentandra</i> L.	Kata shimul	Tree,l;pl	Fb, M	Ashraf 127
Malvaceae Juss.					
52	<i>Grewia asiatica</i> L.	Pholsa	Shrub,s;w	O	Ashraf 536
53	<i>G. nervosa</i> Vahl.	Unknown	Shrub,s;w	O	Ashraf 534
54	<i>Melochia corcohrifolia</i> L.	Tiki-okra	Shrub,ty;w	Fb	Ashraf 143
55	<i>Sida acuta</i> Burm. f.	Kureta	Herb,er;w	M	Ashraf 231
56	<i>S. cordata</i> (Burm. f.) Bross. Walk.	Pitberela	Herb,er;w	Wd	Ashraf 233
57	<i>S. rhombifolia</i> L.	Lal Berela	Herb,er;w	M	Ashraf 322
58	<i>Triumfetta rhomboideia</i> Jacq.	Bon Okra	Shrub,ty;w	Fb, M	Ashraf 324
59	<i>Urena lobata</i> L.	Atlera	Shrub,ty;w	Wd	Ashraf 121
Lecythidaceae A. Rich.					
60	<i>Barringtonia acutangula</i> (L.) Gaertn	Hijal	Tree,m;w	M, O	Ashraf 247
Cucurbitaceae Juss.					

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
61	<i>Coccinia grandis</i> (L.) Voigt	Telakucha	Herb,vi;w	Vg, M	Ashraf 129
62	<i>Lagenaria siceraria</i> (Molina) Standl.	Lao	Herb,vi;w	Vg, M	Ashraf 329
63	<i>Luffa cylindrica</i> (L.) M. Roem.	Dundhul	Herb,vi;w	Vg	Ashraf 248
64	<i>Momordica charantia</i> L.	Korolla	Herb,vi;w	Vg	Ashraf 327
65	<i>Mukia mederaspatanus</i> (L.) M. Roem.	Agmukhi	Herb,vi;w	Vg	Ashraf 542
66	<i>Solena amplexicaulis</i> (Lam.) Gandhi	Rakhal Sosha	Herb,vi;w	Vg	Ashraf 543
Salicaceae Mirb.					
67	<i>Salix tetrasperma</i> Roxb.	Salix	Tree,s;w	Fo	Ashraf 529
Cleomaceae Bercht.					
68	<i>Cleome rutidosperma</i> DC.	Nil hurhurey	Herb,er;w	M	Ashraf 126
69	<i>C. viscosa</i> L.	Halud hurhurey	Herb,er;w	Vg	Ashraf 130
Sapotaceae Juss.					
70	<i>Mimusops elengi</i> L.	Bokul	Tree,s;pl	O, M	Ashraf 435
Mimosaceae R. Br.					
71	<i>Acacia mangium</i> Willd.	Akashmoni	Tree,m;pl	Gu	Ashraf 221
72	<i>Albizia procera</i> (Roxb.) Benth.	Shada koroï	Tree,l;pl	T	Ashraf 113
73	<i>A. lebeck</i> (L.) Benth.	Kalo koroï	Tree,l;pl	Fw	Ashraf 114
74	<i>A. saman</i> (Jacq.) Merr.	Shirish	Tree,l;pl	T	Ashraf 412
75	<i>A. richardiana</i> (Voigt.) King & Prain	Raj shirish	Tree,l;pl	M	Ashraf 413
76	<i>A. lucidor</i> (Steud.) I.C Nielsen	Motor koroï	Tree,l;w	Fw	Ashraf 221
77	<i>Mimosa pudica</i> L.	Lojjaboti	Herb, pr;w	O, M	Ashraf 331
Caesalpiniaceae R. Br.					
78	<i>Bauhinia acuminata</i> L.	Kanchan	Tree,m;pl	M, O	Ashraf 436
Fabaceae Lindl.					
79	<i>Aeschynomene americana</i> L.	Shola	Herb,er;w	Fd, Fu	Ashraf 233
80	<i>Alysicarpus rugosus</i> DC.	Pinnata	Herb,er;w	Fd, Gm	Ashraf 527
81	<i>A. vaginalis</i> DC.	Pinna shak	Herb,er;w	Fd, Gm	Ashraf 516
82	<i>Atylosia scarabaeoides</i> (L.) Thouars	Banurkalki	Herb,cr;w	M	Ashraf 434
83	<i>Butea monosperma</i> (Lam.) Taub.	Palash	Tree,m;pl	O	Ashraf 222
84	<i>Cajanas cajan</i> (L.) Millsp.	Arhar	Shrub,ty;w	Vg	Ashraf 334
85	<i>C. scarabaeoides</i> L. Thouars	Kalki	Herb,ty;w	Vg	Ashraf 335
86	<i>Cassia fistula</i> L.	Bandarlathi	Tree,m;pl	M	Ashraf 441
87	<i>Crotalaria pallida</i> Aiton	Jhunjhuni	Herb,er;w	Fo	Ashraf 225
88	<i>Dalbergia sissoo</i> DC.	Sisoo	Tree,l;pl	T	Ashraf 115
89	<i>Delonix regia</i> (Hook.) Raf.	Krishnochura	Tree,l;pl	O	Ashraf 526
90	<i>Desmodium gangeticum</i> (L.) DC.	Salpan	Shrub,s;w	Fw	Ashraf 154
91	<i>D. triflorum</i> Roxb.	Unknown	Shrub,s;w	M	Ashraf 155
92	<i>Lathyrus sativus</i> L.	Shim	Herb,vi;w	Vg	Ashraf 541
93	<i>Leucaena leucocephala</i> (Lam.) de Wit	Ipil-Ipil	Tree,l;pl	T	Ashraf 326
94	<i>Mucuna pruriens</i> (L.) DC.	Bilaichimti	Herb,Li;w	M	Ashraf 509
95	<i>Pongamia pinnata</i> (L.) Pierre	Karach	Tree,m;pl	T	Ashraf 119
96	<i>Senna alata</i> (L.) Roxb.	Dadmardan	Shrub,sc;w	M	Ashraf 111
97	<i>S. sophora</i> (L.) Roxb.	Kalkeshunda	Shrub,sc;w	O	Ashraf 213
98	<i>Tamarindus indica</i> L.	Tetul	Tree,l;pl	Fr, M	Ashraf 320
99	<i>Vigna radiata</i> Lour.	Motor	Herb,cr;w	Vg	Ashraf 433
Lythraceae J. St. Hill					
100	<i>Ammannia multiflora</i> Roxb.	Acidpata	Herb,er;w	M	Ashraf 338
101	<i>Lagerstroemia speciosa</i> L.	Jarul	Tree,m;pl	O, T	Ashraf 330
Myrtaceae Juss.					
102	<i>Eucalyptus camaldulensis</i> dehn.	Eucalyptus	Tree,l;pl	T	Ashraf 203
103	<i>Psidium guajava</i> L.	Peyera	Tree,s;pl	Fr, Fw	Ashraf 313
104	<i>Syzygium cumini</i> (L.) Skeels	Kalojham	Tree,l;pl	M, Fr	Ashraf 421
105	<i>S. jambos</i> (L.) Alston	Golapjham	Tree,s;pl	Fr, Fw	Ashraf 422
Onagraceae Juss.					
106	<i>Ludwigia adscendens</i> (L.) H. Hara.	Khesordham	Herb,fr;w	Fo	Ashraf 244
107	<i>L. hyssopifolia</i> (G. Don) Excell	Panipaalong	Herb,er;w	Fo	Ashraf 245
Combretaceae R. Br.					
108	<i>Combretum indicum</i> (L.) De Filippis	Madobi lata	Shrub,s;pl	O	Ashraf 456
109	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Arjun	Tree,l;pl	O, M	Ashraf 311
110	<i>T. bellirica</i> (Gaertn.) Roxb.	Bohera	Tree,l;pl	M	Ashraf 312

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
111	<i>T. chebula</i> Retz.	Horitoki	Tree,l;pl	M	Ashraf 310
Cornaceae Bercht.					
112	<i>Alangium salviifolium</i> (L. f.) Wangerin	Ankura	Tree,m;pl	Fu	Ashraf 157
Olacaceae R. Br.					
113	<i>Nyctanthes arbor-tristis</i> L.	Sheoli	Tree,s;pl	O	Ashraf 449
Euphorbiaceae Juss.					
114	<i>Acalypha ciliata</i> Forssk.	Unknown	Herb,er;w	M	Ashraf 107
115	<i>A. indica</i> L.	Muktajhuri	Herb,er;w	Fo	Ashraf 108
116	<i>Croton bonplandianus</i> Baill.	Bandhone	Herb,er;w	M	Ashraf 112
117	<i>Euphorbia hirta</i> L.	Dhudia	Herb,pr;w	Fo	Ashraf 558
118	<i>E. milli</i> Des. Moul.	Kata Mukut	Herb,pr;w	O	Ashraf 559
119	<i>E. tiithymaloides</i> L.	Rangchita	Shrub,s;w	O	Ashraf 545
120	<i>Ricinus communis</i> L.	Bherenda	Shrub,s;w	M	Ashraf 325
121	<i>Trewia nudiflora</i> (L.) Kulju & Welzen	Medda	Tree,l;pl	T	Ashraf 319
Phyllanthaceae Martinov					
122	<i>Phyllanthus cochinchinensis</i> (L.) Skeels	Chitki	Shurb,s;w	M	Ashraf 116
123	<i>P. emblica</i> L.	Amloki	Tree,s;pl	Fr	Ashraf 314
124	<i>P. niruri</i> L.	Bhuiamla	Herb,er;w	M	Ashraf 561
125	<i>P. virgatus</i> G. Frost.	Sarnapati	Herb,er;w	Fo	Ashraf 562
126	<i>P. urinaria</i> L.	kalochitki	Herb,er;w	M	Ashraf 447
Putranjivaceae Endl.					
127	<i>Putranjiva roxburghii</i> Wall.	Putranjiva	Tree,l;pl	T	Ashraf 212
Rhmaceae Juss.					
128	<i>Ziziphus mauritiana</i> (L.) Mill.	Boroi	Tree,l;pl	Fr	Ashraf 439
Vitaceae Juss.					
129	<i>Cayratia trifolia</i> Roxb.	Angurlata	Herb,vi;w	M	Ashraf 110
Anacardiaceae R. Br.					
130	<i>Lannea coromandelica</i> (Houtt.) Merr.	Jiga	Tree,l;pl	Gu	Ashraf 522
131	<i>Mangifera indica</i> L.	Aam	Tree,l;pl	Fr	Ashraf 160
Meliaceae Juss.					
132	<i>Apanamixis polystachya</i> (Wall.) R. Parker	Pithraj	Tree,m;w	Oy	Ashraf 442
133	<i>Azadirachta indica</i> A. Juss.	Neem	Tree,m;pl	M	Ashraf 430
134	<i>Khaya anthotheca</i> (Welw.) C. DC.	Lombu	Tree,l;pl	T	Ashraf 427
135	<i>Melia azedarach</i> L.	Goranim	Tree,m;pl	M	Ashraf 342
136	<i>Swietenia mahagoni</i> (L.) Jacq.	Mehagani	Tree,l;pl	T	Ashraf 345
137	<i>S. macrophylla</i> King	Boro Mehagani	Tree,l;pl	T	Ashraf 346
Rutaceae Juss.					
138	<i>Aegle marmelos</i> (L.) correa	Bel	Tree,m;pl	Fr, M	Ashraf 559
139	<i>Citrus maxima</i> (Burn.) Osbeck	Jambura	Tree,s;pl	Fr	Ashraf 522
140	<i>Glycosmis pentaphylla</i> (Retz.) A. DC.	Datmajoni	Shrub,ty;w	M	Ashraf 235
141	<i>Micromelum minutum</i> (L.) Correa	Unknown	Shrub,s;w	Fo	Ashraf 234
142	<i>Murraya paniculata</i> (L.) jack	Kamini	Tree,s;pl	O	Ashraf 409
Oxalidaceae R. Br.					
143	<i>Averrhoa carambola</i> L.	Kamranga	Tree,s;pl	Fr	Ashraf 511
144	<i>Oxalis corniculata</i> L.	Amrul	Herb,pr;w	Vg	Ashraf 244
145	<i>O. debilis</i> Kunth.	Golapi amrul	Herb,pr;w	O	Ashraf 245
Apiaceae Lindl.					
146	<i>Centella asiatica</i> (L.) Urb.	Thankhuni	Herb,cr;w	M	Ashraf 211
147	<i>Oenanthe javanica</i> Benth. & Hook.	Bon-dhonia	Herb,er;w	Fo	Ashraf 336
Apocynaceae Juss.					
148	<i>Alstonia scholaris</i> (L.) R. Br.	Chhatim	Tree,l;pl	T, M	Ashraf 508
149	<i>Calotropis gigantea</i> (L.) W. T. Aiton	Akondo	Shrub,ty;w	M	Ashraf 557
150	<i>Ichnocarpus frutescens</i> (L.) Aiton	Parallia	Shrub,s;w	Fd	Ashraf 241
151	<i>Oxystelma secamone</i> (L. f.) Small.	Unknown	Herb,vi;w	Fo	Ashraf 440
152	<i>Pergularia daemia</i> (Forssk.) Chiov.	Dudhilata	Herb,vi;w	M	Ashraf 411
153	<i>Tabernaemontana divaricate</i> L. R. Br.	Tagar	Shrub,ty;w	O	Ashraf 407
154	<i>Telosma cordata</i> L.	Unknown	Herb,vi;w	O	Ashraf 443
Solanaceae Juss.					
155	<i>Datura stramonium</i> L.	Datura	Shrub,sc;w	M	Ashraf 563
156	<i>Physalis angulata</i> L.	Futka	Herb,er;w	Fo	Ashraf 117
157	<i>Solanum Americanum</i> Mill.	Tit Begun	Herb,er;w	Fo	Ashraf 218

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
158	<i>S. sisymbriifolium</i> L.	Kata Begun	Shrub,er;w	Vg	Ashraf 120
159	<i>S. torvum</i> Sw.	Gota Begun	Shrub,er;w	Vg	Ashraf 352
160	<i>S. xanthocarpum</i> L.	Buti Begun	Shrub,er;w	M	Ashraf 352
Convolvulaceae Juss.					
161	<i>Evolvulus nummularia</i> (L.) L.	Bhui Okra	Herb,cr;w	Fb	Ashraf 414
162	<i>Ipomoea aquatica</i> Forssk.	Kalmishak	Herb,cr;w	Vg	Ashraf 250
163	<i>I. fistulosa</i> Mart. ex choisy	Dhol Kalmi	Shrub,cr;w	Fo	Ashraf 251
164	<i>I. quamoclit</i> L.	Kunja lata	Herb,vi;w	O	Ashraf 151
165	<i>Merremia hederaceae</i> L.	Holud bokful	Herb,vi;w	Fo	Ashraf 321
166	<i>M. vitifolia</i> G. Don.	Unknown	Herb,vi;w	Fo	Ashraf 443
Menyanthaceae Dumort.					
167	<i>Nymphoides indica</i> Burm. f.	Chadmala	Herb,fr;w	O	Ashraf 254
Boraginaceae Juss.					
168	<i>Ehretia acuminata</i> L.	Unknown	Shrub,s;w	Fo	Ashraf 544
169	<i>Heliotropium strigosum</i> L.	Hatisur	Herb,er;w	M	Ashraf 564
170	<i>Rotala indica</i> (Willd.) Koehne	Ghurni	Herb,er;w	Fo	Ashraf 323
171	<i>R. rotundifolia</i> (Buch. Ham. ex Roxb.) Koehne	Dim Ghurni	Herb,er;w	Fo	Ashraf 549
172	<i>Tournefortia roxburghii</i> Roxb.	Unknown	Shrub,s;w	M	Ashraf 446
Verbenaceae J. St. Hill.					
173	<i>Duranta repens</i> L.	Kata mehedi	Shrub,s;pl	O	Ashraf 517
174	<i>Lantana camara</i> L.	Kutus kata	Shrub,s;w	Fo	Ashraf 565
175	<i>Lippia alba</i> (Mill.) N.E. Br. ex Britton & P. wilson	Pichas-lakri	Shrub,s;w	Fu	Ashraf 416
176	<i>Phyla nodiflora</i> (L.) Greene	Vuiokra	Herb,er;w	Fb	Ashraf 333
Lamiaceae Martinov					
177	<i>Anisomeles indica</i> (L.) Kuntze	Gobura	Herb,er;w	M	Ashraf 254
178	<i>Clerodendrum infortunatum</i> L.	Bhat	Shrub,ty;w	Fu	Ashraf 125
179	<i>Gmelina arborea</i> Roxb.	Gamari	Tree,l;pl	T	Ashraf 518
180	<i>Hyptis capitata</i> Jacq.	Tata tokma	Herb,er;w	Fo	Ashraf 105
181	<i>H. suaveolens</i> (L.) Poit	Tokma	Herb,er;w	M	Ashraf 106
182	<i>Leucas aspera</i> (L.)	Chutra	Herb,er;w	Fo	Ashraf 217
183	<i>L. zeylanica</i> (L.) W. T. Aiton	Dondokalosh	Herb,er;w	Fo	Ashraf 218
184	<i>Leonurus sibiricus</i> L.	Rokto-dron	Herb,er;w	M	Ashraf 546
Plantaginaceae Juss.					
185	<i>Mecardonia procumbens</i> (Mill.) Small.	Mecardonia	Herb,pr;w	Fo	Ashraf 108
186	<i>Scoparia dulcis</i> L.	Bondhone	Herb,er;w	M	Ashraf 236
Linderniaceae Borseh.					
187	<i>Lindernia crustaceae</i> (L.) F. Muell.	Chapra ghas	Herb,pr;w	Fo	Ashraf 307
188	<i>L. procumbens</i> (Krock.) Borbas	Bakpuspa	Herb,pr;w	M	Ashraf 308
Mazaceae Reveal					
189	<i>Mazus pumilus</i> (Burm.) f. Steenis	Tutra	Herb,pr;w	M	Ashraf 408
Acanthaceae Juss.					
190	<i>Dipterocanthus prostrates</i> (Vahl.) Vollesen	Filareck	Shrub,s;w	O	Ashraf 547
191	<i>Hygrophila phomoides</i> (Burm. f.) Hochr	Jongli basak	Shrub,s;w	Fo	Ashraf 418
192	<i>Justicia procumbens</i> L.	Unknown	Herb,er;w	Fo	Ashraf 554
193	<i>J. scarabaeoides</i> Burm. f.	Unknown	Herb,er;w	Fo	Ashraf 553
194	<i>Rungia pectinata</i> L. Nees.	Pindi	Herb,pr;w	O	Ashraf 131
Lentibulariaceae Rich.					
195	<i>Utricularia aurea</i> Lour.	Patajhajhi	Herb,cr;w	M	Ashraf 238
Rubiaceae Juss.					
196	<i>Gardenia jasminoides</i> J. Ellis.	Ghondoraj	Shrub,ty;pl	O	Ashraf 415
197	<i>Hedyotis corymbosa</i> L.	Unknown	Shrub,s;w	O	Ashraf 243
198	<i>Neolamarckia cadamba</i> (Roxb.) Basser	Kadam	Tree,l;pl	O	Ashraf 515
199	<i>Richardia scabra</i> L.	Nakli ipecac	Herb,pr;w	Fo	Ashraf 212
200	<i>Spermacoce alata</i> L.	Bahos	Herb,pr;w	M	Ashraf 207
201	<i>S. aspera</i> L. f.	Unknown	Herb,pr;w	Fo	Ashraf 318
Asteraceae Bercht & J. Presl					
202	<i>Acmella paniculata</i> (wall.ex DC.) R.K. Jansen	Mahatitinga	Herb,pr;w	M	Ashraf 211

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
203	<i>Ageratum conyzoides</i> (L.) L.	Fulkuri	Herb,er;w	M	Ashraf 104
204	<i>Blumea lacera</i> (Burn.f.) DC.	Barokuksim	Herb,er;w	Sb	Ashraf 128
205	<i>B. densiflora</i> DC.	Nagorfoli	Herb,er;w	M	Ashraf 513
206	<i>Caesulia axillaris</i> Roxb.	Caesula	Herb,pr;w	O	Ashraf 318
207	<i>Chromolaena odorata</i> (L.) R. M. King & H. Rob	Motmotia	Herb,er;w	Fu	Ashraf 101
208	<i>Conyza aegyptica</i> (L.) Aiton	Unknown	Herb,er;w	O	Ashraf 404
209	<i>C. semipinnatifolia</i> (L.) Aiton	Conyza	Herb,er;w	O	Ashraf 210
210	<i>Cyanthillium cinereum</i> (L.) H. Rob.	Shialmutra	Herb,er;w	M	Ashraf 316
211	<i>Eclipta alba</i> (L.) L.	Kalokeshi	Herb,pr;w	Fo	Ashraf 515
212	<i>E. prostrata</i> (L.) L.	Sadakheshi	Herb,pr;w	M	Ashraf 304
213	<i>Emilia sonchifolia</i> (L.) DC.	Mechitraa	Herb,er;w	Fo	Ashraf 423
214	<i>Gnaphalium luteo-album</i> Pers.	Bara kamra	Herb,s;w	O	Ashraf 502
215	<i>Launaea asplenifolia</i> Hook. f.	Tik-chana	Herb,er;w	M	Ashraf 447
216	<i>Mikania cordata</i> (Burm. f.) B. L. Rob.	Assam lata	Herb,vi;w	Fd	Ashraf 206
217	<i>M. micrantha</i> (Burm. f.)	Assami lata	Herb,vi;w	Fd	Ashraf 315
218	<i>Parthenium hysterophorus</i> L.	Parthenum	Herb,er;w	Fu	Ashraf 448
219	<i>Pseudelephantopus spicatus</i> Roxb.	Unknown	Herb,s;w	Fo	Ashraf 551
220	<i>Synedrella nodiflora</i> (L.) Gaertn	Nak phul	Hern,s;w	O	Ashraf 437
221	<i>Tridax procumbens</i> (L.) L.	Tridhara	Herb,er;w	O	Ashraf 343
222	<i>Xanthium strumarium</i> L.	Ghagra	Herb,er;w	M	Ashraf 253
LILIOPSIDA Batsch					
Arecaceae Bercht & J. Presl.					
223	<i>Calamus tenuis</i> Roxb.	Bet	Shrub,sc;w	Cc	Ashraf 139
224	<i>Chamaedorea elegans</i> Mart.	Supari palm	Shrub,s;pl	O	Ashraf 512
225	<i>Phoenix sylvestris</i> L. Roxb.	Khejur	Tree,s;pl	Fr	Ashraf 451
226	<i>Roystonea regia</i> (Kunth.) O. F. Cook.	Botol Palm	Tree,l;pl	O	Ashraf 514
Araceae Juss.					
227	<i>Alocasia fornicate</i> (Roxb.) Schott	Bish kachu	Herb,er;w	M	Ashraf 455
228	<i>A. macrorrhizos</i> (L.) G. Don	Man kachu	Herb,er;w	Vg	Ashraf 423
229	<i>Alocasia acuminata</i> (L.)	Jongli kachu	Herb,er;w	Vg	Ashraf 348
230	<i>Caladium bicolor</i> (Aiton) Vent.	Diranga kachu	Herb,er,pl	O	Ashraf 450
231	<i>Colocasia esculenta</i> (L.) Schott	Jangli Kachu	Herb,er;w	Vg	Ashraf 142
232	<i>C. gigantea</i> (L.)	Unknown	Herb,er;w	Vg	Ashraf 144
233	<i>Pistia stratiotes</i> L.	Topapana	Herb,ff;w	M	Ashraf 227
234	<i>Syngonium podophyllum</i> Schott	Podolata kachu	Herb,pr;w	O	Ashraf 204
235	<i>Typhonium flagelliforme</i> (Lodd.) Blume	Ghechu	Herb,er;w	M	Ashraf 453
236	<i>T. trilobatum</i> (L.) Schott	Get kachu	Herb,er;w	Vg	Ashraf 450
Commelinaceae Mirb.					
237	<i>Callisia repens</i> Lam.	Kanshira	Herb,er,w	Wd	Ashraf 224
238	<i>Commelina benghalensis</i> L.	Kanshira	Herb,cr,w	Fo	Ashraf 402
239	<i>C. diffusa</i> Burn. f.	Unknown	Herb,cr,w	Wd	Ashraf 506
240	<i>C. longifolia</i> Lam.	Pani kanshira	Herb,cr,w	Fo	Ashraf 405
241	<i>Cyanotis axillaris</i> (L.) D. Don ex Sweet	Axinot	Herb,er;w	Fo	Ashraf 103
242	<i>Murdannia nudiflora</i> (L.) Brenan	Kureli	Herb,cr;w	Fo	Ashraf 209
Cyperaceae Juss.					
243	<i>Cyperus exaltatus</i> Retz.	Ghasi	Herb,er;w	Wd	Ashraf 223
244	<i>C. difformis</i> L.	Behua	Herb,er;w	Fd	Ashraf 137
245	<i>C. pulchellimus</i> Willd. ex Kunth	Unknown	Herb,er;w	Fd	Ashraf 135
246	<i>C. rotundus</i> L.	Nagarmutha	Herb,er;w	Wd	Ashraf 141
247	<i>Fimbristyllis acuminata</i> (L.) Vahl.	Fimbry	Herb,er;w	Fo	Ashraf 350
248	<i>Kyllina brevifolia</i> Rottb.	Unknown	Herb,er;w	O	Ashraf 136
249	<i>K. nemoralis</i> (J. R. Forst. & G. Forst.)	Unknown	Herb,er;w	O	Ashraf 145
250	<i>Schoenoplectus articulatus</i> (L.) Lye	Chechra	Herb,er;w	Fo	Ashraf 242
Poaceae Barnhart					
251	<i>Arundo longifolia</i> Salisb. ex Hook. f.	Unknown	Herb,cr;w	Fo	Ashraf 159
252	<i>A. donax</i> L. Var. Donax	Donax	Herb,cr;w	Fo	Ashraf 160
253	<i>Bambusa bambos</i> (L.) Voss	Kanta bans	Bamboo;pl	Bc	Ashraf 508
254	<i>Brachiaria kurzii</i> (Trin.) Griseb	Unknown	Herb,cr;w	Fd	Ashraf 138
255	<i>B. reptans</i> (Trin.) Griseb	Unknown	Herb,er;w	Fd	Ashraf 156
256	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Prem kata	Herb,er;w	Hc	Ashraf 226
257	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Kakpaya	Herb,er;w	Wd	Ashraf 303

Sl. no.	Scientific Name	Bengali Name	Habit	Use	Acc. No.
258	<i>Digitaria sanguinalis</i> (L.) Scop.	Mukurjoli	Herb,er;w	Fo	Ashraf 349
259	<i>Echinochloa cruss-galli</i> (L.) P. Beauv	Unknown	Herb,er;w	Fo	Ashraf 337
260	<i>Eleusine indica</i> (L.) Gaertn.	Malankuri	Herb,er;w	Sb	Ashraf 158
261	<i>Eragrostis amabilis</i> (Retz.) Nees.	Koni ghas	Herb,er;w	Fo	Ashraf 341
262	<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arn.	Jongli dhan	Herb,er;w	Fo	Ashraf 452
263	<i>Imperata cylindrica</i> (L.) Raeusch	Chann	Herb,er;w	Fo	Ashraf 501
264	<i>Oplismenus burmanni</i> (Retz.) P. Beauv.	Jhabri durba	Herb,er;w	Wd	Ashraf 202
265	<i>O. compositus</i> (L.) P. Beauv.	Gohur	Herb,er;w	Wd	Ashraf 403
266	<i>Panicum brevifolium</i> L.	Bashpatigas	Herb,er;w	Fo	Ashraf 242
267	<i>Paspalum conjugatum</i> P.J. Bergius	Moishsha ghas	Herb,er;w	Wd	Ashraf 447
268	<i>Phragmites karka</i> L.	Nolkhagra	Herb,l;w	Fo	Ashraf 140
269	<i>Saccharum spontaneum</i> L.	Kash	Herb,er;w	Fo	Ashraf 461
270	<i>Sporobolus spicatus</i> (L.) R. Br.	Benajhoni	Herb,er;w	Wd	Ashraf 460
Pontederiaceae Kunth.					
271	<i>Eichhornia crassipes</i> (Mart.) Solms	Kachuripana	Herb,ff;w	Fo, Gm	Ashraf 243
Amaryllidaceae J. St. Hill					
272	<i>Crinum asiaticum</i> L.	Shukdarsan	Herb, pr;pl	O	Ashraf 503
Asparagaceae Juss.					
273	<i>Agave americana</i>	Shatavdi udvid	Herb,er;pl	M	Ashraf 542
274	<i>Sensevieria roxburghiana</i> L.	Naglota	Herb,cr;w	O	Ashraf 305
Hypoxidaceae R. Br.					
275	<i>Curculigo orchioides</i> Gaertn.	Talmuli	Herb,er;w	M	Ashraf 505
Dioscoreaceae R. Br.					
276	<i>Dioscorea alata</i> L.	Chupri alo	Herb,tw;w	Vg	Ashraf 201
277	<i>D. bulbifera</i> L.	Shora alo	Herb,tw;w	M	Ashraf 504
278	<i>D. pentaphylla</i> L.	Jhum alo	Herb,tw;w	Vg	Ashraf 211
Orchidaceae Juss.					
279	<i>Geodorum densiflorum</i> (Lam.) Schltr.	Sankhamul	Herb,er;w	M	Ashraf 401

Legend: **Habit:** cr-creeper, ep-epiphyte, er-erect, ff-free floating, l-large, m-medium, pl-planted, pr-prostrate, s-small, sc-scandent, ty-typical, tw-twisted, vi-vine, w-wild. **Use:** Bc-Bamboo craft, Cc-Cane craft, Fb-Fiber, Fo-Fodder, Fr-Forage, Fu- Fuel, Fw-Fuel wood, Gu-Gum, Gm-Green manure, Hc-Handcraft, M-Medicinal, O-Ornamental, Oy- Oil yielding, Sb-Soil binder, T-Timber, Vg-Vegetable, Wd-Weed.

Species number under each life-form category can be an effective tool to know the floristic pattern of any ecosystem. Floristic composition of life-form category under different habits of plants has showed variation in respect to species number. The highest 85 species was found as erect herb followed by 39, 31 and 22 as large tree, prostrate herb and small shrub, respectively. Remarkably, 17 vines, 1 epiphyte, 1 bamboo and 1 liana species were also recorded in this park ecosystem (Figure 5). An undisturbed condition of the ecosystem has given a suitable platform for generation of different life-form categories.

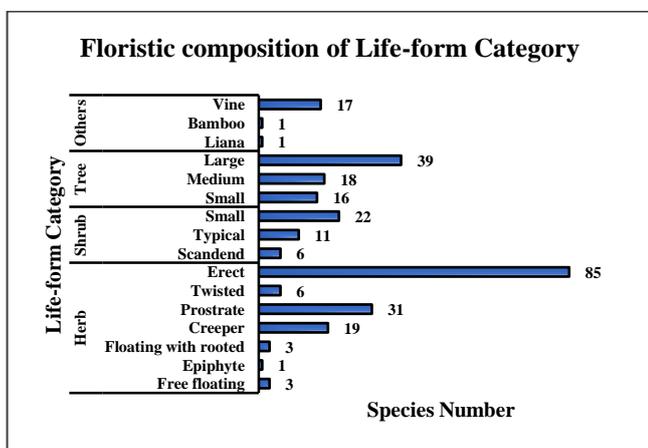


Figure 5: Floristic composition of different life-form category.

To get a complete outline of any ecosystem, a comparative floristic composition of different ecosystems can serve as an effective tool. By knowing the comparative data of different ecosystems, conservationist and ecologist can develop a new conservation strategy. Uddin and Hassan (2010) [30] recorded a total of 374 plant species at Lawachara National Park, Moulvibazar; Arefin *et al.* (2011) [31] recorded a total of 186 plant species at Satchhari National Park, Habiganj; Hadi and Rahman (2013) [12] recorded a total of 203 plant species at Tilagarh Eco-Park, Sylhet; Islam *et al.* (2016) [13] recorded a total of 412 plant species at Sitakunda Eco-Park, Chittagong; Rahman *et al.* (2017) [32] recorded a total of 265 plant species at Kuakata National Park, Patuakhali, (Figure 6).

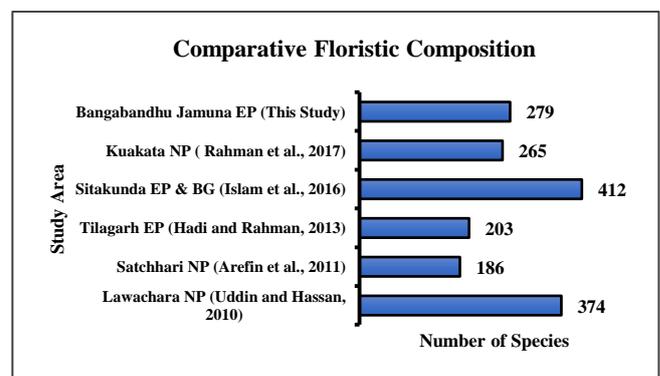


Figure 6: Comparative floristic composition of selected ecosystem. (EP, Eco-Park), (NP, National Park).

5. Conclusion

The eco-park is developed for protecting the river bank of Jamuna River. Till now this eco-park is strongly fulfilling its prime functions. Besides this function, this eco-park is harbouring its floristic composition and wild lives with a proper care. Present study clearly represents that the eco-park area is floristically quite good and which might serve as an excellent centre for conservation and restoration of biodiversity. A huge number of wild natural plant species have already regenerated here and the number of wild species is also increasing day by day. The present study suggests that a specific area of this eco-park is under construction for Jamuna rail bridge. The plants of this area were cutting down. So, after the inauguration of the Jamuna rail bridge, a lot of plantations must be needed to manage this barren area. An appropriate plantation program should be followed for biodiversity restoration. Dead tree plant species are found scattering inside the eco-park and should be removed from this area. A proper plantation programme in this area is also needed. There is no sign of aquatic body inside the deep region of this eco-park. So, an aquatic body must need to be introduced for betterment of wild life. The eco-park is highly enclosed by barricade, there is no chance of entry of wild life. So, a habitat corridor for entering the wild life from outside is needed for increasing biodiversity. A linear programming model is a powerful tool for forest management [33] which may reduce the overall management cost of this eco-park. Adequate desired protection measures, management, conservation strategy and natural resource development of this park ecosystem will strengthen its sustainable biological, socio-economic, recreational, educational and ecological services besides its river bank management function.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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Authors' Contributions

All the authors have provided their concept for the manuscript. All authors checked the manuscript and approved the final version of the manuscript.

References

[1] BBS (Bangladesh Bureau of Statistics), "Ministry of Planning, Government of the People's Republic of Bangladesh", Dhaka-1000, 2022.

- [2] H. Kargar-Chigani, S.A. Javadi, G. Zahedi-Amiri, M. Jafari, S.J. Khajeddin, "The floristic composition and biological spectrum of vegetation in the Meymeh region of northern Isfahan province, Iran", *Appl. Ecol. Environ. Res.*, Vol.15, Issue.1, pp.415-428, 2016.
- [3] S.K. Mandal, S. Mukherjee, "Exploring the Diversity and Distribution of Macrophytes of Chandanpur Beel and Churamon Beel, North Dinajpur District, West Bengal: Implications for Conservation", *International Journal of Scientific Research in Biological Science*, Vol.11, Issue.2, pp.13-17, 2024.
- [4] D.U. Hooper, P.M. Vitousek, "The effect of plant composition and diversity on ecosystem processes", *Science*, Vol.277, Issue.1, pp.1302-1305, 1997.
- [5] P. Mahdavi, H. Akhiani, E. Van der Maarel, "Species diversity and life-form patterns in steppe vegetation along a 3000 m altitudinal gradient in the Alborz Mountains, Iran", *Folia Geobot.*, Vol.48, Issue.1, pp.7-22, 2013.
- [6] M. Zobel, M.O. pik, M. Moora, M. Partel, "Biodiversity and ecosystem functioning: it is time for dispersal experiments", *J. Veg. Sci.*, Vol.17, Issue.1, pp.543-547, 2006.
- [7] R.A. Mittermeier, N. Myers, J.B. Thomsen, G.A. Da Fonseca, S. Olivieri, "Biodiversity hotspots and major tropical wilderness areas: approaches to setting conservation priorities", *J. Conservation Biology*, Vol.12, pp.516-520, 1998.
- [8] A. Nishat, S.M.I. Huq, S.P. Barua, A.H.M.A. Reza, A.S.M. Khan (eds.), "Bio-ecological zones of Bangladesh", IUCN, Bangladesh country office, Dhaka, Bangladesh, pp.xii + 141, 2002.
- [9] M.K. Hossain, "Overview of the forest biodiversity in Bangladesh", In: Assessment, conservation and sustainable use of forest biodiversity (CBD Technical Series no.3), SCBD, Montreal, Canada, pp.33-35, 2001.
- [10] M.S. Khan, M.M. Rahman, M.A. Ali, "Red data book of vascular plants of Bangladesh", Dhaka: Bangladesh National Herbarium, 2001.
- [11] N. Muhammed, M. Koike, F. Haque, "Forest policy and sustainable forest management in Bangladesh: An analysis from national and international perspective", *New Forest*, Vol.36, pp.201-216, 2008a.
- [12] M.A. Hadi, M.M. Rahman, "Edaphic properties of the soils of Tilagarh Eco-Park in Sylhet, Bangladesh", *Physiol. Ecol. & Environ. Sci.*, Vol.4, Issue.2, pp.37-43, 2013.
- [13] M.A. Islam, M.M. Rahman, G.M. Hossain, "Floristic composition and Phyto-diversity status of Sitakunda Ecopark, Chittagong, Bangladesh", *Jahangirnagar University J. Biol. Sci.* Vol.5 Issue.1, pp.29-45, 2016.
- [14] S.M. Sharif, "Floral Diversity Investigation at Bangabandhu Jamuna Eco Park, Sirajgonj, Bangladesh", *International J. of Science and Research (IJSR)*, Vol.3, Issue.8 pp.2074-2080, 2014.
- [15] J. Braun-Blanquet, "Plant Sociology: The study of plant communities," McGraw-Hill Book Co. Inc., New York, 1932.
- [16] C. Raunkiaer, "The Life form of plant and statistical plant geography", *Claesdon Press*, Oxford, 1934.
- [17] S.A. Cain, "The species-area curve," *American Midland Naturalist*, Vol.19, pp.573-581, 1938.
- [18] B.P.M. Hyland, "A technique for collecting botanical specimens in rain forest", *Flora Malesiana Bulletin*, Vol.26, pp.2038-2040, 1972.
- [19] S.K. Jain, R.R. Raw, "A handbook of field and herbarium methods", pp.157, 1977.
- [20] M.N. Alexiades, "Standard techniques for collecting and preparing herbarium species, A Field Manual", *New York Botanical Garden*, New York, pp.99-126, 1996.
- [21] D. Prain, "Bengal Plants," *Peprint Edition*, Calcutta, Vol.1-2, pp.1-1319, 1903.
- [22] J.D. Hooker, "The Flora of British India, Vol. VII, Second edn.," *Periodical expert book agency*, Delhi, India, pp.10-17, 1872-1897.
- [23] K.U. Siddiqui, M.A. Islam, Z.U. Ahmed, Z.N.T. Begum, M.A. Hassan, M.A.M. Khondker, M.M. Rahman, S.M.H. Kabir, M. Ahmad, A.T.A. Ahmed, A.K.A. Rahman, E.U. Haque (eds.), "Encyclopedia of Flora and Fauna of Bangladesh, Vol.11, Angiosperms: Monocotyledons", *Asiatic Society of Bangladesh*, Dhaka, 2007.

- [24] Z.U. Ahmed, Z.N.T. Begum, M.A. Hassan, M.M. Khondker, S.M.H. Kabir, M. Ahmad, A.T.A. Ahmed, A.K.A. Rahman, E.U. Haque (eds.), "Encyclopedia of Flora and Fauna of Bangladesh, 6-10, Angiosperms: Dicotyledons", *Asiatic Society of Bangladesh*, Dhaka, **2008-2009**.
- [25] IPNI, "The International Plant Names Index," **2008**, Retrieved on 10 May, **2015**.
- [26] TROPICOS, "Missouri Botanical Garden," *Missouri Botanical Garden*, Saint Louis, Missouri, USA. **2010**, Retrieved on 10 May, **2015**.
- [27] C.F. Shannon, W. Wiener, "The mathematical theory of communication", *University of Illinois Press*, Urbana, **1963**.
- [28] M. Kent, P. Coker, "Vegetation description and analysis- A practical approach", *The CRC Press Inc*, Belhaven Press, London, **1992**.
- [29] E.H. Simpson, "Measurement of diversity", *Nature*, Vol.**163**, pp.**688, 1949**.
- [30] M.Z. Uddin, M.A. Hassan, "Angiosperm diversity of Lawachara National Park, Bangladesh: A Preliminary Assessment", *Bangladesh J. Plant Taxon*, Vol.**17**, Issue.**1**, pp.**9-22, 2010**.
- [31] M. Arefin, M. Rahman, M. Uddin, M. Hassan, "Angiosperm flora of Satchhari National Park, Habiganj, Bangladesh", *Bangladesh J. Plant Taxon*, Vol.**18** Issue.**2**, pp.**117-140, 2011**.
- [32] M.A. Rahaman, M.A. Rahman, M.Z. Uddin, "Diversity of angiosperm flora of Kuakata National Park, Patuakhali District. Bangladesh", *J. Asiat. Soc. Bangladesh*, Vol.**43**, Issue.**2**, pp.**143-159, 2017**.
- [33] T.E. Maadidi, A.E. Aboudi, H.E. Aid, "Using the Linear Programming in Mediterranean Forest Management: A Study Case from the North of Morocco", *Internation Journal of Scientific Research in Biological Science*, Vol.**9**, Issue.**1**, pp.**100-106, 2022**.

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