

Review

Not peer-reviewed version

Present Status of Endemic Plants of Bangladesh

[Md. Salah Uddin](#)*, [Abdullah Al Masud Mazumder](#), Sang Woo Lee, [Shaikh Bokhtear Uddin](#)

Posted Date: 27 November 2023

doi: 10.20944/preprints202311.1674.v1

Keywords: endemic plants; updated list; bangladesh flora



Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Article

Present Status of Endemic Plants of Bangladesh

MD. SALAH UDDIN ¹, ABDULLAH AL MASUD MAZUMDER ², SANG WOO LEE and SHAIKH BOKHTEAR UDDIN ^{4,*}

¹ Department of Biology, Kyungpook National University, Daegu 41566, Korea Republic

² Silviculture Research Division, Bangladesh Forest Research Institute, Sholashahar, Chattogram 4000, Bangladesh

³ International Biological Material Research Center, Korea Research Institute of Bioscience and Biotechnology, Daejeon 34141, Korea Republic

⁴ Ethnobotany and Pharmacognosy Lab., Department of Botany, University of Chittagong, Chattogram 4331, Bangladesh

Abstract: The study of angiosperm flora, endemic plants in the literature, and investigations of 'POWO Build a checklist' were used to compile an updated list of Bangladesh's endemic plants. According to the study, at least 49 (1.24%) of Bangladesh's 3,956 plant species are endemic to the country including 5 varieties, belonging to 41 genera in 26 families. Magnoliopsida account for thirty of them, Liliopsida for the remaining sixteen, and Pteridophytes for the final three. The four families Zingiberaceae (9 taxa), Araceae (6 taxa), Rubiaceae (4 taxa), and Euphorbiaceae (3 taxa), include the most endemic taxa. The five most numerous endemic taxa belong to the *Curcuma* genus. The endemic flora, which is mostly found in the districts of Chattogram, Moulvibazar, and Rangamati, consists of 13 tree species, 4 shrubs, 5 climbers, and 27 herbaceous plant species.

Keywords: endemic plants; updated list; Bangladesh flora

Introduction

Endemism refers to species that are confined in their distribution to a specific or well-defined small or large area. These taxa can be continental, national, regional, local, or provincial. Endemism results from a species' incapacity to spread its offspring due to environmental or geographic limitations (Pasha, 2011). Understanding the concept of endemism requires familiarity with the geographic range of a species. Until it is found again in another country or region, a newly discovered species is often only found in a small area and is assumed to be endemic to that location (Rahman and Rashid, 2013).

Bangladesh is a country known for its rich biodiversity, with a vast array of plant species growing in its varied geographical regions. Among these plant species, there are many that are endemic to the country, meaning that they are found only in Bangladesh and nowhere else in the world. These endemic plants of Bangladesh are an important part of the country's natural heritage, and they play a vital role in the ecological balance of the region. Bangladesh is located in the delta region of the Ganges, Brahmaputra and Meghna rivers. It is a relatively flat and low-lying country, with a tropical monsoon climate. These factors make it a highly dynamic and constantly changing environment, which may not be conducive to the evolution and persistence of many endemic plant species. Bangladesh has one of the highest population densities in the world, and much of its natural habitats have been destroyed or altered due to human activities such as deforestation, agriculture, and urbanization. This has led to the loss of many plant species and their habitats, and may have also prevented the development of many endemic species. Endemic species often develop in isolation, which allows them to evolve unique characteristics that distinguish them from other species. However, Bangladesh is not geographically isolated from other countries, and its flora has been influenced by species from neighboring regions such as India and Southeast Asia. This may have prevented the development of many endemic species. Finally, it is possible that many endemic plant

species in Bangladesh have yet to be discovered or properly documented due to limited scientific exploration and research (Pasha, 2011; Rahman and Rashid, 2013). As more information becomes available, it may be possible to identify more endemic species in the country.

Compared to main lands, islands have greater rates of endemism and endemic taxa (New Caledonia and Hawaii have almost 95% each) (Takhtajan 1986). Most countries have evaluated their own endemic plants. Numerous Asian countries, including China, India, and Malaysia, have released the updated list of their endemic taxa (Ahmedullah and Nayar, 1986). Around 33% of India's plants are endemic, according to Ahmedullah and Nayar (1986), although little is known about endemic plant species in the current Bangladesh region.

Khan *et al* (2001) made the initial attempt, listing 14 species as being endemic to Bangladesh. Then Hassan & Ahmed (2008) increased the endemic plants number to 16 though they gave a only list of six endemic plants. Pasha (2011) mentioned 25 endemic taxa from Bangladesh. Finally, Rahman and Rashid (2013) identified the 28 endemic plants that are unique to Bangladesh. Yet, no attempt has been made to discuss or assess the endemism and endemic flora of the country since that time. In an effort to the greatest extent possible, an evaluation of Bangladesh's flora and updated list of endemic plants has been made.

Materials and Methods

Early authentic literature (Roxburgh 1820-24; Hooker 1872-1894; Prain 1903; Heinig 1925; Kanjilal *et al.* 1934-1940; Sinclair 1955) was sought for the most current update of Bangladesh's list of endemic taxa. A very new and thorough compilation called the Encyclopedia of Flora and Fauna of Bangladesh (Siddiqui *et al.*, 2007; Ahmed *et al.*, 2008-2009) was also consulted. A thorough cross-checking of the relevant articles (Khan *et al.*, 2001; Siddiqui *et al.*, 2007; Ahmed *et al.*, 2008-2009; Pasha, 2011; Rahman and Rashid, 2013) as well as the 'POWO Build a checklist' (Kew, 2023) was done in order to generate the updated list of endemic plants of Bangladesh.

Results and Discussion

The study revealed that out of 3,956 plant species of Bangladesh (Uddin *et al.*, 2023), 49 are endemic is about 1.24% of the total species.

Here, the disparate data and research are compiled to provide all the elements needed for an evaluation of each endemic taxon. The identified endemic taxa are then listed alphabetically with the accepted scientific name, family, habit, type and available herbarium specimens.

An updated list for endemic plants of Bangladesh are following:

1. *Abrus precatorius* L. var. *albo-spermum* Hassan, Rahman et Afroz, Bangladesh J. Pl. Taxon. 28(2): 289 (2021). FABACEAE. Habit: Climber. Type: Bangladesh, Dhaka, Dhaka University Botanical Garden, M.A. Hassan 6001, 24 October 2021 (Holotype: DUSH) (Hassan *et al.*, 2021).
2. *Alocasia hararganjensis* H. Ara & M.A. Hassan, Bangladesh J. Pl. Taxon. 25(2): 228 (2018). ARACEAE. Habit: Herb. Type: Bangladesh, Moulvibazar district, Gazipur beat, Hararganj reserve forest, 21.05.2005, Hosne Ara HA 1740 (DACB). Herbarium specimens: HA 1468 (DACB); HA 2885 (DACB) (Ara & Hassan, 2018).
3. *Alocasia salarkhanii* H. Ara & M.A. Hassan, Bangladesh J. Pl. Taxon. 25(2): 231 (2018). ARACEAE. Habit: Herb. Type: Bangladesh, Moulvibazar district, Lawachara reserve forest, 15.05.2005, Hosne Ara HA 1467 (DACB). Herbarium specimens: HA 2630 (DACB), HA 2651 (DACB) (Ara & Hassan, 2018).
4. *Ampelgynum salarkhanii* Hassan, Bangladesh J. Bot. 20(2): 245 (1991). POLYGONACEAE. Habit: Herb. Type: Bangladesh, Bandarban, Chimbuk hill, 1990, Hassan s.n. (DACB DUSH). Herbarium specimens: Rahman *et al.* 7954 (HCU) (Rahman & Rashid, 2013), Anwar-0686 (Islam *et al.*, 2016).

5. *Bambusa comillensis* Alam, Bangladesh J. Pl. Taxon. 3(2): 41 (1996). POACEAE. Habit: Herb (Kew, 2023; POWO, 2023).
6. *Boesenbergia islamii* Yusof & M.A.Rahman, Saudi J. Biol. Sci. 10(1): 51-55 (2003). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Chittagong, Chunati, Near forest beat office, 02.10.1997, Yusuf & Rahman, 1019 (BCSIRH: holo., HCU: iso.). Herbarium specimen: Chittagong, Sitakunda, Chandranath hill, 31.08.2009, Rahman s.n. (HCU) (Rahman & Rashid, 2013).
7. *Colocasia hassanii* H. Ara, Bangladesh J. Pl. Taxon. 25(1): 102 (2018). ARACEAE. Habit: Herb. Type: Bangladesh, Bandarban district, on the way to Betchari, 22.9.2004, Hosne Ara HA 1215, 1216 (DACB). Herbarium specimens: HA 1291, 1292 (DACB) (Ara, 2018).
8. *Croton chittagongensis* Chakrab. & N.P. Balakr, Proc. Indian Acad. Sci., Pl. Sci. 92: 365 (1983). EUPHORBIACEAE. Habit: Tree. Type: Chittagong Hill Tracts, Rangamati, Mainamukh, 09-05-1939, Dent 72 (CAL) (Rahman & Rashid, 2013).
9. *Croton chlorocalyx* Müll.Arg., Linnaea 34: 109 (1865). EUPHORBIACEAE. Habit: Shrub. (Kew, 2023; POWO, 2023).
10. *Curcuma bakerii* Rahman & Yusuf, Plantae Discoverie 1: 21 (2012). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Tangail, Madhupur Sal forest, 14.05.1996, Rahman & Yusuf 938 (BCSIRH: holo, HCU: iso) (Rahman & Rashid, 2013).
11. *Curcuma hookerii* Rahman & Yusuf, Plantae Discoveries 1: 23 (2012). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Chittagong, Barakundu, 18.04.1994, Rahman & Yusuf 867 (BCSIRH: holo.; HCU: iso.). Herbarium specimens: Rahman *et al.* 2773, 2774 (HCU) (Rahman & Rashid, 2013).
12. *Curcuma roxburghii* Rahman & Yusuf, Bangladesh J. Plant Taxon. 19(1): 80 (2012). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Rangamati, Rangapani, 08.07.1993, Rahman & Yusuf 803 (BCSIRH: holo.; HCU: iso.). Herbarium specimen: Rahman *et al.* 3248 (HCU) (Rahman & Rashid, 2013).
13. *Curcuma wallichii* Rahman & Yusuf, Bangladesh J. Plant Taxon. 19(1): 82 (2012). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Moulvi Bazar, Srimangal, Lawachara forest, 16.07.1993, Rahman & Yusuf 813 (BCSIRH, HCU) (Rahman & Rashid, 2013).
14. *Curcuma wilcockii* Rahman & Yusuf, Bangladesh J. Plant Taxon. 19(1): 83 (2012). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Tangail, Madhupursal forest, Rasulpur, 21.08.1993, Yusuf & Rahman 838 (BCSIRH, HCU) (Rahman & Rashid, 2013).
15. *Cuscuta chittagongensis* Sengupta, M.S.Khan & Huq, Bangladesh J. Bot. 12(1): 33-36 (1983). CUSCUTACEAE. Habit: Parasite. Type: Rangamati, Myanimukh, 24.12.1956, Khan 234A (DACB). Herbarium specimen: Bandarban: Chimbuk hill, 27.11.1983, Khan *et al.*, K.6518 (DACB) (Rahman & Rashid, 2013).
16. *Dehaasia rangamattiensis* M.Gangop., Bull. Bot. Surv. India 48: 127 (2006). LAURACEAE. Habit: Tree (Kew, 2023; POWO, 2023).
17. *Diospyros stricta* Roxb., Fl. Ind. ed. 1832. 2: 539 (1832). EBENACEAE. Habit: Tree (Kew, 2023).
18. *Diplazium banglum* Fraser-Jenk. & Pasha, Annot. Checkl. Ind. Pterid. 2: 102 (2018). ASPLENIACEAE. Habit: Herb (Kew, 2023; POWO, 2023).
19. *Dipterocarpus scaber* Buch.-Ham., Mem. Wern. Nat. Hist. Soc. 6: 300 (1826) DIPTEROCARPACEAE. Habit: Tree (Kew, 2023; POWO, 2023).

20. *Globba rahmanii* Yusuf, J. Econ. Taxon. Bot. 28(1): 87-90 (2004). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Khagrachari, Dheghinala-Marissha road, Teen tila, 30.08.1997, Rahman & Yusuf 1878 (BCSIRH, HCU). Herbarium specimens: Rahman & Yusuf 1020 (BCSIRH and HCU); Huq *et al.*, H.5751 (DACB) (Rahman & Rashid, 2013).
21. *Globba salarkhanii* (M.A.Rahman & Yusuf) Govaerts, Taiwania 61: 269 (2016)(POWO, 2023). Synonym: *Mantisia salarkhanii* Rahman & Yusuf, Saud. J. Biol. Sci. 9 (2): 105 (2002). ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Bandarban, Alikadam, Guishap Jiri, 3.5.1998, Rahman & Yusuf 2891 (BCSIRH, HCU). Herbarium specimen: Rahman *et al.* 8581 (HCU) (Rahman & Rashid, 2013).
22. *Gomphostemma salarkhaniana* Khanam & Hassan, Bangladesh J. Bot. 32 (1):63-64 (2003). LAMIACEAE. Habit: Herb. Type: Bangladesh, Sylhet, Tamabil, 13.10.1973, Khan *et al.*, K.3296 (DACB). Herbarium specimens: Huq & Mia 7873 and 7887(DACB) (Rahman & Rashid, 2013).
23. *Ipomoea salicifolia* Roxb., Fl. Ind. 2: 88 (1824). CONVOLVULACEAE. Habit: Climber (Kew, 2023; POWO, 2023).
24. *Knema bengalensis* W.J. de Wilde, Blumea 25(2): 413 (1979). MYRISTICACEAE. Habit: Tree. Type: Cox's Bazar, Dulahazra, 31.12.1957, M. S. Khan 511 (DACB). Herbarium Specimen: Khan *et al.* 10210 (DACB) (Rahman & Rashid, 2013).
25. *Lagenandra gomezii* (Schott) Bogner & N. Jacobsen, Aqua Pl. 49 (1987). Synonym: *Cryptocoryne gomezii* Schott, Bonplandia (Hannover) 5: 221 (1857). ARACEAE. Habit: Herb. Type: Sylhet, Panchara, 1828, W. Gomez, Wall. Cat. 8958 (K-W) (Rahman & Rashid, 2013).
26. *Lagerstroemia parviflora* var. *benghalensis* C.B.Clarke in J.D.Hooker, Fl. Brit. India 2: 576 (1879). LYTHRACEAE. Habit: Tree (Kew, 2023).
27. *Litsea clarkei* Prain, Bengal Pl. 2:676 (1903). LAURACEAE. Habit: Tree. Type: Chittagong, Seetakundu, Prain s.n. (CAL) (Rahman & Rashid, 2013).
28. *Maesa bengalensis* Mez, H.G.A.Engler (ed.), Pflanzenr., IV, 236: 30 (1902). PRIMULACEAE. Habit: Tree. (Kew, 2023). Herbarium specimen: Kamrul 1411 (JUH) (Haque *et al.*, 2018).
29. *Mycetia clarkei* (Hook.f.) Razafim. & B.Bremer, Taxon 64: 293 (2015) (POWO, 2023). Synonym: *Myrioneuron clarkei* Hook.f., Fl. Brit. India 3: 96 (1880). RUBIACEAE. Habit: Shrub (Pasha, 2011).
30. *Nothopegia acuminata* J. Sinclair, Bull. Bot. Soc. Bengal 9 (2): 90 (1956). ANACARDIACEAE. Habit: Shrub. Type: Cox's Bazar, Kelatuli chara, 17.03.1945, Sinclair 4039 (E) (Rahman & Rashid, 2013).
31. *Oldenlandia thomsonii* (Hook.f.) Kuntze, Revis. Gen. Pl. 1: 293 (1891)(POWO, 2023). Synonym: *Hedyotis thomsonii* Hook.f., Fl. Brit. India 3:63 (1880). RUBIACEAE. Habit: Herb. Type: East Bengal, loc., 1851, J. D. Hooker s.n. (K). Herbarium specimens: Huq *et al.* H.5082 (DACB), Rahman *et al.* 8639 (HCU) (Rahman & Rashid, 2013).
32. *Persicaria ciliata* Hassan, Bangladesh J. Plant Taxon. 3(2): 87-89 (1996). POLYGONACEAE. Habit: Herb. Type: Bangladesh, Rangamati, Kaptai, 1.11.1988, Hassan 1205 (DACB) (Rahman & Rashid, 2013).
33. *Phyllanthus pendulus* Roxb., Fl. Ind. ed. 1832. 3: 663 (1832). PHYLLANTHACEAE. Habit: Herb (Kew, 2023; POWO, 2023).
34. *Piper carnistigmum* C.DC., Candollea 1: 186 (1923). PIPERACEAE. Habit: Herb (Kew, 2023; POWO, 2023).

35. *Psychotria bangladeshica* M.Gangop. & Chakrab., J. Econ. Taxon. Bot. 13: 115 (1989). RUBIACEAE. Habit: Shrub (Kew, 2023; POWO, 2023).
36. *Pteris giasii* Fraser-Jenk. & Pasha, Taxon. Revis. Indian Subcontinental Pteridophytes: 119 (2008). PTERIDACEAE. Habit: Herb (Kew, 2023).
37. *Pteris sylhetensis* Fraser-Jenk. & Sushil K.Singh, Annot. Checkl. Ind. Pterid. 2: 424 (2018). PTERIDACEAE. Habit: Herb (Kew, 2023; POWO, 2023).
38. *Rhaphidophora calophyllum* Schott var. *violaceus* H. Ara & M.A. Hassan, Bangladesh J. Pl. Taxon. 26(1): 20 (2019). ARACEAE. Habit: Climber. Type: Bangladesh, Moulvibazar district, Madhabkundo reserve forest, 20.05.2014, Sarder Nasir Uddin N 5242 (DACB). Herbarium specimen: N 5172 (DACB) (Ara & Hassan, 2019).
39. *Rotala tenuis* (Wight) Koehne, Bot. Jahrb. Syst. 1: 177 (1880). LYTHRACEAE. Habit: Aquatic herb (Kew, 2023; POWO, 2023).
40. *Syzygium amplexicaule* (Lindl.) N.P.Balakr., Bull. Bot. Surv. India 22: 173 (1980 publ. 1982). MYRTACEAE. Habit: Tree (Kew, 2023; POWO, 2023).
41. *Syzygium lanceolarium* (Roxb.) N.P.Balakr., Bull. Bot. Surv. India 22: 174 (1980 publ. 1982). MYRTACEAE. Habit: Tree (Kew, 2023; POWO, 2023).
42. *Taxillus thelocarpa* (Hook.f.) M.K.Alam, Bang. J. Bot., 14(1): 32 (1985)(Pasha, 2011) LORANTHACEAE. Habit: Parasite. Type: Chittagong, Kazike hat, 1851, Hook.f & Thom. s.n. (K). Herbarium specimen: Huq *et al.* H.3910 (DACB) (Rahman & Rashid, 2013).
43. *Tournefortia montana* var. *griffithii* (C.B.Clarke) I.M.Johnst., J. Arnold Arbor. 32: 117 (1953). BORAGINACEAE. Habit: Climber (Kew, 2023; POWO, 2023).
44. *Trigonostemon praetervisus* Airy Shaw, Kew Bull. 37: 121 (1982). EUPHORBIACEAE. Habit: Tree. Type: Silhet (Sylhet), Wall. Cat. 8001 (K) (Rahman & Rashid, 2013).
45. *Typhonium elatum* H. Ara & M.A. Hassan, Bangladesh J. Pl. Taxon. 25(2): 234 (2018). ARACEAE. Habit: Herb. Type: Bangladesh, Sherpur district, Samaschura beat, 10.10.2003, Hosne Ara HA 701 (DACB). Herbarium specimens: HA 1060 (DACB); HA 2889 (DACB) (Ara & Hassan, 2018).
46. *Utricularia rosettifolia* Alfasane & Hassan, Bangladesh J. Pl. Taxon. 27(2): 206 (2020). LENTIBULARIACEAE. Habit: Aquatic herb. Type: Bangladesh, Jhenaidah district, Joydia baor, M.A. Alfasane, 1686(PLHL), 19.02.2019, Acc. No. 63594 (DACB). Herbarium specimens: 1688(PLHL), 1689(PLHL), 1690(PLHL) (Alfasane *et al.*, 2020).
47. *Wendlandia amocana* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 277 (1932). RUBIACEAE. Habit: Tree (Kew, 2023; POWO, 2023).
48. *Zingiber salarkhanii* Rahman & Yusuf, Bangladesh J. Plant Taxon. 20(2):2013. ZINGIBERACEAE. Habit: Herb. Type: Bangladesh, Chittagong, Sitakundu, Chandranath hill, 13.08.1993, Rahman & Yusuf 825 (BCSIRH, HCU). Herbarium specimens: Rahman & Yusuf 825 (BCSIRH, HCU) (Rahman & Rashid, 2013).
49. *Ziziphus rugosa* var. *glabrescens* Prain, Bengal Pl.: 334 (1903). RHAMNACEAE. Habit: Climber (Kew, 2023; POWO, 2023).

LEGEND: BCSIRH = Bangladesh Council of Scientific and Industrial Research Herbarium; CAL = Calcutta Herbarium; DACB = Bangladesh National Herbarium, Herbarium Code; DUSH = Dhaka University Salar Khan Herbarium; HCU = Herbarium of Chittagong University; JUH = Jahangirnagar University Herbarium; K = Kew Herbarium; PLHL = Herbarium of Phycology Limnology and Hydrobiology Laboratory; POWO = Plants of the World Online.

From the critical study on the occurrence and distribution of the angiosperm flora of Bangladesh, there are at least 49 species, including 5 varieties, belonging to 41 genera in 26 families, endemic to Bangladesh. Of these, 3 taxa under Pteridophytes, 16 taxa belong to Liliopsida and the rest 30 species to Magnoliopsida (**Fig. 1**). Four families, Zingiberaceae (9 taxa), Araceae (6 taxa), Rubiaceae (4 taxa), Euphorbiaceae (3 taxa) have the highest taxa representing the endemic flora (**Fig. 2**). There are two endemic taxa in five families (Polygonaceae, Lauraceae, Pteridaceae, Lythraceae, and Myrtaceae), and one endemic taxon in each of the remaining seventeen families. Among these, 13 are tree species, 4 shrubs, 5 climbers and 27 herbs (**Fig. 3**). *Curcuma* genus includes five highest number of endemic taxa (**Fig. 4**). Chattogram, Moulvibazar, and Rangamati district are home to the most endemic taxa (**Fig. 5**).

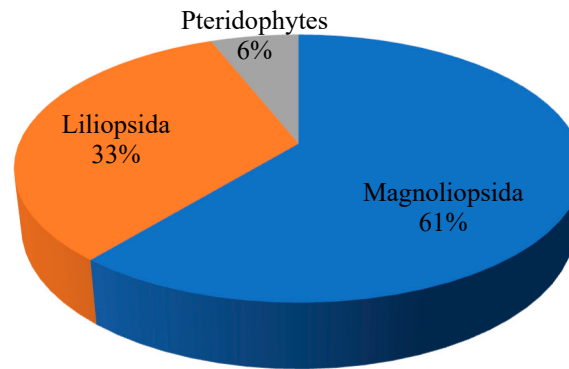


Figure 1. Percentage of endemic taxa of each group.

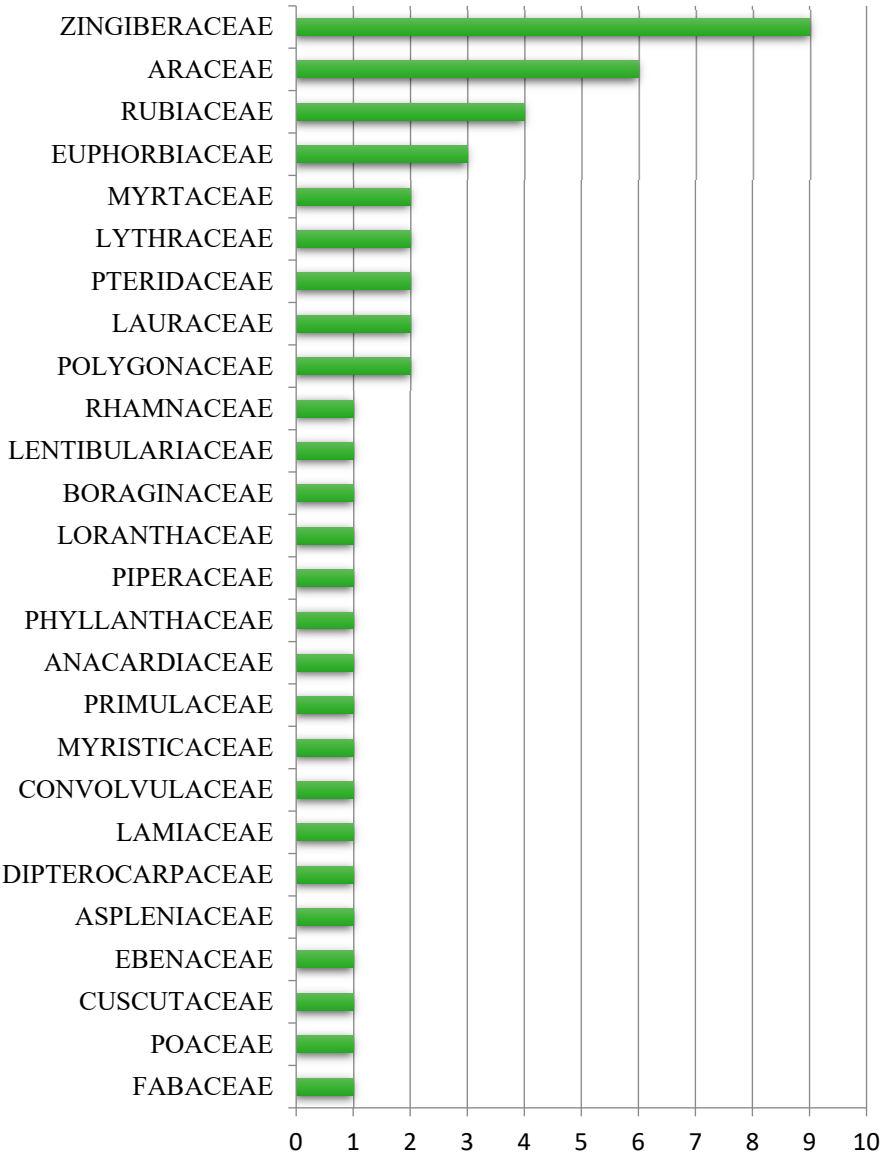


Figure 2. Families with number of endemic taxa.

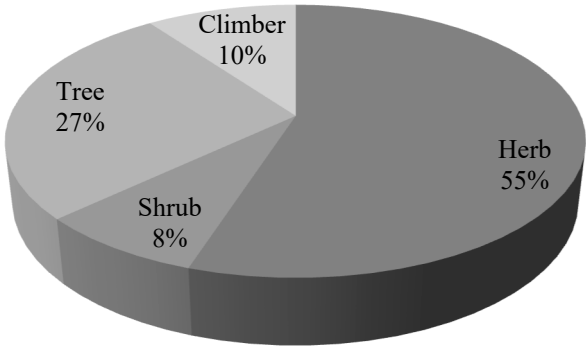


Figure 3. Percentage of endemic taxa of each life form.

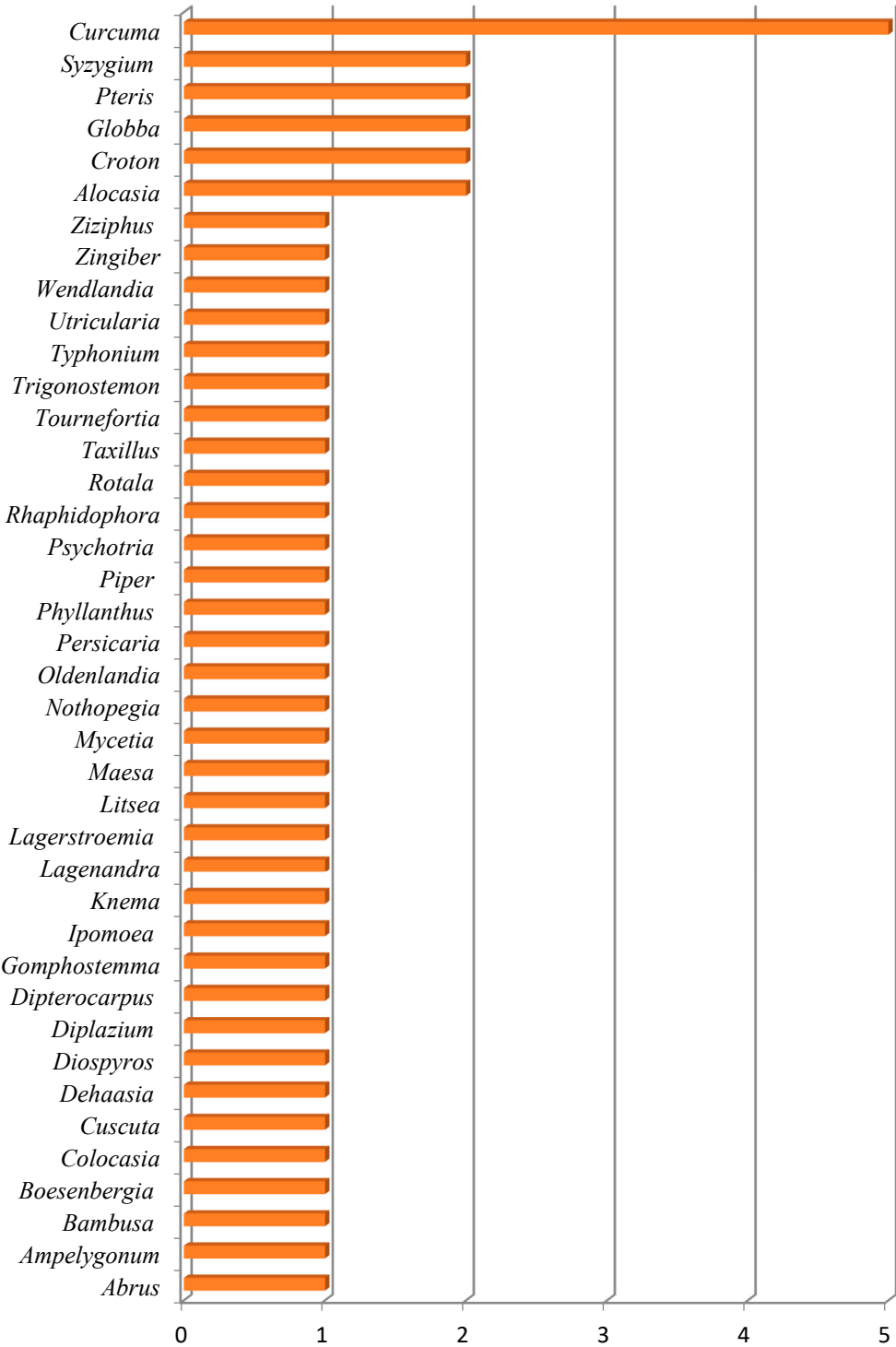


Figure 4. Genera with number of endemic taxa.

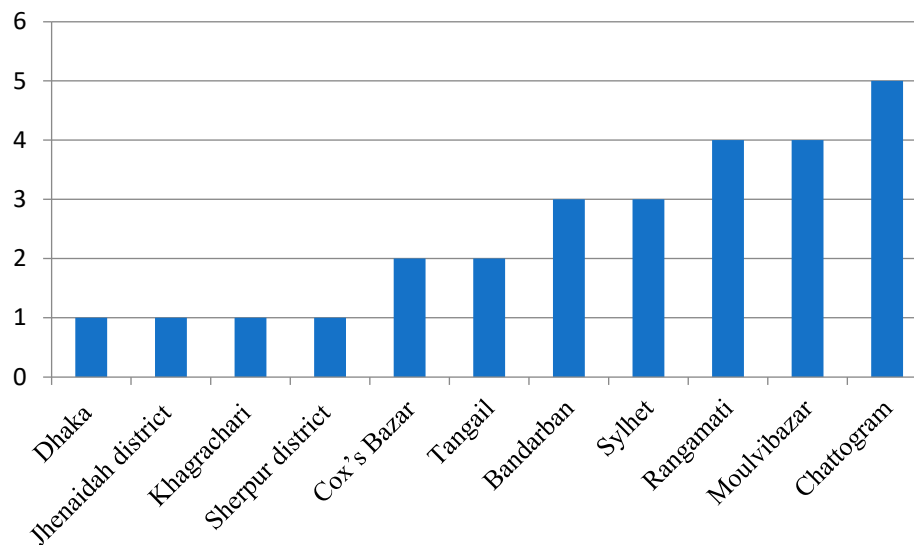


Figure 5. Distribution area with number of endemic taxa.

Khan *et al.* (2001) first listed the 14 endemic plants of Bangladesh. Hasan & Ahmed (2008) increased the number of endemic plants in Bangladesh from 14 to 16 despite only providing a list of six endemic plants, including *Nothopegia acuminata*, *Lagenanda gomezii*, *Taxillus thelocarpa*, *Rotala simpliciuscula*, *Phrymis imbricata*, *Knema bengalensis*. Pasha (2011) identified 16 endemic taxa from the list of Khan *et al.* (2001) and found 25 endemic plant species. Pasha (2011) disqualified three species from being considered endemic to Khan's list: *Bulbophyllum roxburghii* (Lindl.) Reichb.f., *Butea listeri* (Prain) Blatter, and *Hedychium speciosum* Wall. ex Roxb. Though Khan *et al.* (2001) mentioned *Corypha taliera* Roxb. as endemic to Bengal and *Bulbophyllum roxburghii* (Lindl.) Reichb.f. endemic to Sundarban. Besides this, Pasha added 12 more species as endemic taxa. Finally, Rahman & Rashid (2013) recognized 28 endemic plant species' conservation status through their own field research, whether or not it is obvious that the IUCN standard approach was followed. Rahman and Rashid (2013) noted that 11 of the 25 endemic plants (Pasha 2011) and 7 of the 8 endemic plants (Khan *et al.* 2001) are found outside of Bangladesh. We discovered that 7 plants on Rahman and Rashid's (2013) list are present globally (**Table 1**). So, these species ought to be disregarded while compiling the list of endemic plants. In this method, the list of endemic flora was updated.

Table 1. Endemic plants reported by Rahman & Rashid (2013) and their global distribution.

Rahman & Rashid (2013)	Remarks (Distribution)
1. <i>Cyperus pilosus</i> Vahl var. <i>polyantha</i> C.B. Clarke	Synonym of <i>Cyperus pilosus</i> Vahl Asia to E. Australia (POWO, 2023a)
2. <i>Dalbergia confertiflora</i> Benth. var. <i>listeri</i> Thoth	Synonym of <i>Dalbergia confertiflora</i> Benth. Assam to W. Indo-China (POWO, 2023b)
3. <i>Iodes thomsoniana</i> Baill.	Synonym of <i>Mappianthus hookerianus</i> (Baill.) Sleumer, Arunachal Pradesh to W. Malesia (POWO, 2023c)
4. <i>Limnophila cana</i> Griff.	Myanmar (POWO, 2023d)
5. <i>Periploca acuminata</i> Rahman & Wilcock	Synonym of <i>Decalepis khasiana</i> (Kurz) Ionta ex Kambale, Assam to S. China and Indo-China (POWO, 2023e)
6. <i>Rotala simpliciuscula</i> (Kurz) Koehne	Myanmar (POWO, 2023f)
7. <i>Tarenna scandens</i> (Roxb.) Good	Synonym of <i>Tarenna eketensis</i> var. <i>situtela</i> N.Hallé, Nigeria to Cabinda (POWO, 2023g)

Twenty-two plants were identified as being endemic to Bangladesh by comparing Khan *et al* (2001), Pasha (2011), and Rahman & Rashid (2013), whereas other taxa were determined to be spread around the world. Between 1983 and 2021, 26 new species were added to Bangladesh's flora; following a rigorous examination of each species' global range, we discovered an additional 23 species that are exclusive to Bangladesh. However because of habitat loss, climate change, and other human activities, many of these endemic plant species are threatened, which highlights the importance of conservation efforts to save these priceless plant resources. In this regard, it is crucial to comprehend and promote knowledge of Bangladesh's unique flora in order to protect the nation's natural legacy for future generations.

Conclusion

A total of 49 plant species, comprising 22 taxa discovered in earlier research and 27 newly added taxa, have been determined to be endemic to Bangladesh.

Acknowledgement: The authors are thankful to the Nature Conservation Network (NCN).

References

1. Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A.K.A. and Haque, E.U. (Eds) 2008-2009. *Encyclopedia of Flora and Fauna of Bangladesh*, Vols. 6-10 & 12. Asiatic Society of Bangladesh, Dhaka.
2. Ahmedullah, M., and M. P. Nayar. 1986. Endemic plants of the Indian region. I. Bull. Bot.Surv.India, Calcutta. 261pp. *Bulletin of Botanical Surveys in India* I:261.
3. Alfasane, M. A., Hassan, M. A., & Bhuiyan, R. A. 2020. *Utricularia rosettifolia* Alfasane & Hassan sp. Nov. (Lentibulariaceae)—A new species from Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **27(2)**: 205–211. <https://doi.org/10.3329/bjpt.v27i2.50661>
4. Ara, H. 2018. *Colocasia hassanii* (Araceae), A new species of aroid from Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **25(1)**: 101–106. <https://doi.org/10.3329/bjpt.v25i1.37186>
5. Ara, H., & Hassan, Md. A. 2018. Three new species of Araceae from Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **25(2)**: 227–239. <https://doi.org/10.3329/bjpt.v25i2.39529>
6. Ara, H., & Hassan, Md. A. 2019. Four new varieties of the family Araceae from Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **26(1)**: 13–28. <https://doi.org/10.3329/bjpt.v26i1.41913>
7. Haque, A. K. M. K., Khan, S. A., Uddin, S. N., & Shetu, S. S. 2018. An annotated checklist of the angiospermic flora of Rajkandi Reserve Forest of Moulvibazar, Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **25(2)**: 187–207. <https://doi.org/10.3329/bjpt.v25i2.39525>
8. Hassan, M. A., and A. T. A. Ahmed 2008. Threat and extinction: Decline and demise of species from Bangladesh. Pages 188-201. *Encyclopedia of flora and fauna of Bangladesh*. Vol.-I. Bangladesh profile. Asiatic Society of Bangladesh, Dhaka.
9. Hassan, M. A., Rahman, M. O., & Afroz, S. 2021. A New Variety of *Abrus precatorius* L. (Fabaceae) From Bangladesh. *Bangladesh Journal of Plant Taxonomy*, **28(2)**: 289–294. <https://doi.org/10.3329/bjpt.v28i2.57127>
10. Heinig, R. L. 1925. List of plants of the Chittagong Collectorate and Hill Tracts. The Bengal Government Brach Press, Darjeeling, India.
11. Hooker, J. D. 1872-1894. *Flora of British India* (Indian Reproduction (1973). Bishen Singh Mahendra Pal Singh, Dehradun, India). Reeve & Co, Kent, England.
12. Islam, M. A., Rahman, M. M., & Hossain, G. M. 2016. Floristic composition and phytodiversity status of Sitakunda Ecopark, Chittagong, Bangladesh. *Jahangirnagar University Journal of Biological Sciences*, **5(1)**: 29–45. <https://doi.org/10.3329/jujbs.v5i1.29741>
13. Kanjilal, U. N., P. C. Kanjilal, R. N. De, and A. K. Das 1934-1940. *Flora of Assam, Shillong* (Indian Reproduction 1982). Book Company, Dehli, India.
14. Kew. 2023. *World Checklist of Vascular Plants (WCVF)*. Build a checklist. Kew Science. Published on the Internet. <https://checklistbuilder.science.kew.org/reportbuilder.do>
15. Khan, M. S., M. M. Rahman, and M. A. Ali. 2001. Red data book of vascular plants of Bangladesh. Bangladesh National Herbarium, Dhaka.
16. Pasha, M. K. 2011. An evaluation of Endemism and Endemics in Bangladesh Flora. *Proceedings of the International Conference on Biodiversity - Present State, Problems and Prospects of Its Conservation*, 55–77.
17. POWO. 2023. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/>. Accessed at 16.03.2023.
18. POWO. 2023a. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:305553-1>. Accessed at 16.03.2023.

19. POWO. 2023b. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:490144-1>. Accessed at 16.03.2023.
20. POWO. 2023c. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:434428-1>. Accessed at 16.03.2023.
21. POWO. 2023d. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:804296-1>. Accessed at 16.03.2023.
22. POWO. 2023e. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77158677-1>. Accessed at 16.03.2023.
23. POWO. 2023f. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:554230-1>. Accessed at 16.03.2023.
24. POWO. 2023g. Plants of the World Online. Kew Science. Published on the Internet. <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77188800-1>. Accessed at 16.03.2023.
25. Prain, D. 1903. *Bengal plants* [Indian Reproduction] (1963). Vol. 1 & 2. Botanical Survey of India.
26. Rahman, M. A., & Rashid, M. E. 2013. Status of Endemic Plants of Bangladesh and Conservation Management Strategies. *International Journal of Environment*, **2(1)**: 231–249. <https://doi.org/10.3126/ije.v2i1.9224>
27. Roxburgh, W. 1820-1824. *Flora Indica* in W. Carey, editor. Vols. I & II. Mission Press, Serampore, India
28. Siddiqui KU, Islam MA, Ahmed ZU, Begum ZNT, HassanMA, Khondker M, Rahman MM, Kabir SMH, Ahmad M, Ahmed ATA, Rahman AKA, Haque EU. (Eds) 2007. *Encyclopedia of Flora and Fauna of Bangladesh*. Vols. 5 & 11. Asiatic Society of Bangladesh, Dhaka.
29. Sinclair, J. 1955. Flora of Cox's Bazaar, East Pakistan. *Bulletin of the Botanical Society of Bengal* **9**:84-116.
30. Singh, N. P., A. S. Chauhan, and M. S. Mondal 2000. *Flora of Manipur*. Botanical Survey of India.
31. Takhtajan, A. 1986. *Floristic regions of the World*. University of California Press Ltd, London.
32. Uddin, M. S., Mazumder, A.A.M., & Uddin, S. B. 2023. Addition of one hundred and forty-seven new vascular taxa to the flora of Bangladesh. *SPECIES*, **24(73)**: 1–8.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.