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Determining endangered medicinal species of family Fabaceae of Bangladesh and their updated enumeration

Ishrath Jahan**Abstract**

A rich family Fabaceae with high number of medicinal species, has been shown severe threat in context to Bangladesh as assessed in this work. Out of 169 total medicinal species, 32 species under 19 genera were identified and documented as endangered (EN) according to the criteria set by International Union for Conservation of Nature and Natural Resources (IUCN). Names of plants were gathered from standard medicinal and floristic research articles. Assessment was made by long term field investigation, collection and identification; examination of herbarium specimens and survey of relevant literature. Enumeration of these threatened taxa is provided with updated nomenclature and short annotation with data on medicinal value, recorded locality, global distribution, first and last authentic record and list of specimens available at different herbaria. Finally it has been suggested that the threatened medicinal plants are need to be proper conservation and management plans before it lost forever.

Keywords: Endangered species, conservation management, medicinal species, re-determination

Introduction

Medicinal plants are those that are commonly used in treating and preventing specific ailments and diseases, and that are generally considered to play a beneficial role in health care. The use of plants as medicine predates written human history. The World Health Organization (WHO) estimates that 80% of the population of some Asian and African countries presently using herbal medicine for some aspect of primary health care (Wikipedia.org) [23]. An annual global export value of pharmaceutical plants in 2011 accounted for over 2.2 billion US\$ (Wikipedia.org) [23].

The family Fabaceae consists of about 483 genera and 12,000 species (Lewis *et al.*, 2005) [34]. The family is important in a diversity of ecosystems, members of it present and often dominant in nearly every vegetation type on earth from tropical rain forests to deserts and alpine tundra. In Bangladesh, it is represented by 69 genera and 254 species (Ahmed *et al.*, 2009) [1]. With regard to medicinal uses, it has been pointed out that, Fabaceae are found amongst the five botanical families richest in therapeutic properties. In particular, it has been found that the family Fabaceae is second in importance to Asteraceae in terms of richness of medicinal taxa.

A taxon is Endangered (EN) when taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating (IUCN, 2012) [25]. Taxa with few individuals because of unfavorable environment or human factors and that its natural regeneration is not able to keep pace with exploitation or destruction by nature and unnatural means are also categorized as endangered. Bangladesh forests are highly vulnerable to anthropogenic disturbances and climate change. Though once the country was rich in biodiversity, Bangladesh is now facing an imminent extinction of many native floras due to rapid alteration of their environment. Out of 169 medicinal species of the family Fabaceae, 77 *i.e.*, 46% are threatened (Jahan, 2016) [26]. The conservation of endangered medicinal species of the Fabaceae has become a part of challenges of biodiversity conservation in the wild to meet the demand of human civilization. The present investigation was carried out to explore the distribution and status of threatened medicinal species of Fabaceae in Bangladesh. This kind of plant families are in need of proper conservation and management plans before they lost forever.

Materials and Methods

Determination of the recorded species as medicinal have been made by consulting medicinal books and published articles, *e.g.*, Dunn (1912) [14], Gillett (1958) [17], De Kort and Thijsse (1984) [12], Ambasta (1986) [4], Kaur and Kapoor (1990) [28], Jain (1991) [27], Etkin (1998) [15], Ghani (2003) [16], Yusuf *et al.* (2009) [60], Kim *et al.* (2010) [32], Quattrocchi (2012) [38].

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Species growing in wild conditions were only considered in this study. The places of occurrence of the recorded taxa has been documented by consulting Roxburgh (1814, 1824, 1832)^[50-52], Wallich (1828-49)^[59], Hook.f. (1872-1897)^[20], Kurz (1877)^[33], Prain (1903, 1903a)^[36, 37], Heinig (1925)^[18], Cowan (1926, 1929)^[8, 9], Raizada (1941)^[47], Datta and Mitra (1953)^[11] and Sinclair (1956)^[53].

The previously collected specimens of Fabaceae preserved in different herbaria of Bangladesh, viz., BNH (Bangladesh National Herbarium), DUSH (Dhaka University Salar Khan Herbarium), BFRIH (Bangladesh Forest Research Institute Herbarium), BCSIRH (Herbarium, Bangladesh Council of Scientific and Industrial Research), HCU (Herbarium of Chittagong University) and in international herbaria, viz., Herbaria of Aberdeen University (ABD), Royal Botanic Gardens, Kew (K), British Museum (BM) and Edinburgh (E), have been examined critically to record the data of each species.

The relevant and up to date floristic literature published since Sinclair (1956)^[53], such as, Khan and Banu (1972)^[30], Alam (1988)^[2], Khan *et al.* (1996)^[31], Huq and Begum (1984)^[22], Naderuzzaman and Islam (1984)^[35], Huq (1988)^[21], Rahman and Hassan (1995)^[45], Rahman and Uddin (1997)^[42], Yusuf *et al.* (1997)^[61], Dey *et al.* (1998)^[13], Uddin *et al.* (2002, 2003, 2013)^[55-57], Uddin and Rahman (1999)^[58], Das and Alam (2001)^[10], Khan and Huq (2001)^[29], Rashid and Mia (2001)^[48], Uddin and Hassan (2010)^[54], Hossain *et al.* (2005)^[19], Alam *et al.* (2006)^[3], Islam *et al.* (2009)^[24], Rahman and Rashid (2009)^[41], Barbhuiya and Gogoi (2010)^[7], Rahman *et al.* (2010, 2012, 2015)^[43]^[44]^[46], Rahman and Jahan (2016)^[40], Rashid *et al.* (2014)^[49], Arefin *et al.* (2011)^[5] have been surveyed to trace the report of collection/occurrence of the taxa of the Fabaceae. The assessment and recognition of the taxa as threatened is based on the criteria of IUCN (IUCN 2012)^[25].

Enumeration of the threatened taxa with detailed data on conservation status is prepared and described in the result and discussion part.

Result and Discussions

Research has been revealed that 32 recorded species belonging to 19 genera are recognized as endangered according to IUCN criteria. Each species, as cited in the enumeration, revealed that threat to individual species is mostly habitat loss. All these species, recognized as threatened to Bangladesh, are found to be widely distributed in many countries and highly potential for their medicinal properties and uses.

Enumeration of the threatened taxa of Fabaceae:

Enumeration of threatened taxa is prepared where each species is cited with current nomenclature, synonym(s), medicinal use, status of occurrence, probable threat, first and last authentic record, occurrence in Bangladesh, global distribution and list of examined herbarium specimens. The species are arranged alphabetically.

1. *Aeschynomene americana* L., *Sp. Pl.*:713 (1753). Naderuzzaman (2009)^[35].

Aeschynomene americana L. var. *depila* Millsp., *A. javanica* Miq. var. *luxurians* Miq., *A. Mexicana* Colla.

Medicinal uses: Skin complaints, Rheumatism.

Status of occurrence: Endangered (EN).

First and last authentic record: Its occurrence in Bangladesh has been recorded only by Ahmed *et al.* (2009)^[11]

Chittagong Hill Tracts (*Inc*). No other published report of its occurrence from elsewhere in Bangladesh is available but one collection from Chittagong (BCSIR campus) made by Yusuf in 2004 is available at BCSIRH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (BCSIR campus), Chittagong Hill Tracts (*Inc*). **Global distribution:** Native to America, distributed in tropical Africa and Asia.

Herbarium specimen: Chittagong: BCSIR campus, 06.07.2004, Yusuf 1614 (BCSIRH).

2. *Aganope heptaphylla* (L.) Polhill, *Kew Bull.* 25(2):268 (1971). Naderuzzaman (2009)^[35].

Sophora heptaphylla L. (1753), *Derris sinuata* Benth. *ex Thw.* (1859).

Medicinal uses: Bacterial infection, Used for poisoning.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded from Sundarban (*Inc*) by Prain (1903)^[36] and thereafter by Khan *et al.* (1996)^[31] and Rahman *et al.* (2015)^[46]. One collection from Sundarban made by Das in 1963 is available at BFRIH. No other locality is yet known.

Threat to the species: Restricted occurrence.

Occurrence in Bangladesh: Sundarbans. **Global distribution:** Bangladesh, India, Myanmar, Malaysia, Sri Lanka, China, Thailand, Indonesia, the Philippines and New Guinea.

Specimen examined: Khulna: Sundarban, 09.03.1963, Das SN (BFRIH).

3. *Alysicarpus rugosus* (Willd.) DC., *Prodr.* 2:353 (1825). Naderuzzaman (2009)^[35].

Hedysarum rogosum Willd. (1802), *Alysicarpus wallichii* Wight & Arn. (1834).

Medicinal uses: Cough, Dracunculiasis, Dropsy, Edema, Fever, Guinea worm, Headache Indigestion, Pulmonary troubles, Swelling.

Status of occurrence: Endangered (EN).

First and last authentic record: Khan *et al.* (1996)^[31] first recorded it from Mymensingh (*Inc*) and Tangail (*Inc*). No other published report of its occurrence in Bangladesh is available. There are some collections from Borguna (Amtoli), Patuakhali (Ulnia, Galachipa), Rajshahi (Dariapur, Premtoli) and Tangail (*Inc*) available at BNH and DUSH.

Threat to the species: Loss of habitat.

Occurrence in Bangladesh: Borguna (Amtoli), Patuakhali (Ulnia, Galachipa), Rajshahi (Dariapur, Premtoli) and Tangail (*Inc*).

Global distribution: Bangladesh, India, Myanmar, Pakistan, Cambodia, Vietnam, tropical Africa and Madagascar

Specimen examined: Borguna: Amtoli, 19.03.1989, Huq *et al.* H.9125 (BNH); **Patuakhali:** Galachipa, Ulnia, 13.03.1982, Rahman & Mia R. 1321 (BNH); **Rajshahi:** Dariapur, 14.12.1972, Huq 751 (BNH), Premtoli, 09.12.1979, Zaman UG. 52 (BNH); **Tangail:** *Inc.*, 21.10.1963, Malek 9 (DUSH).

4. *Cajanus crassa* (Prain & King) van der Maesen, *Agric. Univ. Wasgeningen Pap.*:85-105 (1958).

Atylosia mollis Benth. (1852), *A. crassus* Prain & King (1897), *A. volubilis* (Blanco) Gamble (1918).

Medicinal uses: Jaundice, Piles, Mumps.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Khan *et al.* (1996)^[31] from Chittagong (*Inc*), Chittagong Hill

Tracts (*Inc*) and Jamalpur (*Inc*). No other published report of its occurrence in Bangladesh is available. Collections from Bandarban (Rumachar), Chittagong (Raozan), Jamlpur (Gajni forest) and Rangamati (Kaptai) are available at BFRIH and BNH.

Threat to the species: Cleaning of forest floor and rapid deforestation.

Occurrence in Bangladesh: Bandarban (Rumachara), Chittagong (Raozan), Jamlpur (Gajni forest) and Rangamati (Kaptai). **Global distribution:** Bangladesh, India, Myanmar, Indonesia, Nepal, Malay Peninsula, Papua New Guinea, Pakistan, the Philippines, Thailand, Singapore, Cambodia and Vietnam.

Specimen examined: Bandarban: Ruma, Rumachara, 27.02.1988, *Alam* EB-88 (BFRIH); **Chittagong:** Raozan, Near Rubber plantation, 31.01.1971, *Khan & Huq* K. 2439 (BNH); **Jamalpur:** Gajni Forest, 16.02.1979, *Huq* 4300 (BNH); **Rangamati:** Kaptai, 22.03.1987, *Das* 5753 (BFRIH).

5. *Cajanus goensis* Dalz. in Hook., *Kew Journ.* 2: 264 (1850). Naderuzzaman (2009) [35].

Dolichos barbatus Wall. (1831-1832), *Dunbaria barbata* Benth. (1852), *Atylosia barbata* (Benth.) Baker (1879), *Cantharospermum barbatum* (Benth.) Koord. ex Kewchen. (1924).

Medicinal uses: Rheumatism, Impure blood, Biliousness, Fever, Swellings.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Prain (1903) [36] from Chittagong (*Inc*) and thereafter by Heinig (1925) [18] from Chittagong Hill Tracts (*Inc*). No other record of its occurrence in Bangladesh is yet recorded although a specimen from Chandra forest collected by some Poritosh in 1967 is available at DUSH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (*Inc*), Chittagong Hill Tracts (*Inc*), Dhaka (Chandra forest). **Global distribution:** Bangladesh, India, Myanmar, China, Indonesia, Laos, Malaysia, Thailand and Vietnam.

Specimen examined: Dhaka: Chandra forest, 26.11.1967, Poritosh 10 (DUSH).

6. *Crotalaria albida* Heyne ex Roth, *Nov. Pl. Sp.*:333 (1821). Yusuf (2009) [60].

Crotalaria formosana Matsum. (1899), *C. albida* Heyne var. *gracilis* Hosok. (1932), *C. albida* Heyne var. *membranacea* Hosok. (1932).

Medicinal uses: Chronic back pain, Indigestion, Wart on the sole.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Prain (1903) [36] from Bengal (*Inc*). Thereafter it was reported by Khan & Huq (2001) [29] from Chunati (Cox's Bazar) and Rahman *et al.* (2015) [46] from Baraiyadhala (Chittagong). Few collections from Chittagong (Sitakundu, Cantonment area) and Cox's Bazar (Chunati) are available at BNH, BFRIH and BCSIRH.

Threat to the species: Deforestation.

Occurrence in Bangladesh: Chittagong (Sitakund, Baraiyadhala, Cantonment area), Cox's Bazar (Chunati). **Global distribution:** Bangladesh, India, the Philippines, New Guinea, China and Taiwan.

Specimen examined: Chittagong: Sitakunda, 18.11.1986, *Huq & Mia* H. 8019 (BNH), Baraiyadhala, 19.11.1986, *Huq & Mia* H. 8078 (BNH), Cantonment area, 27.12.1980, *Yusuf*

294 (BCSIRH), **Cox's Bazar:** Chunati Beat, 27.12.1988, *Khan et al.* K. 8006 (BNH, BFRIH, BCSIRH).

7. *Crotalaria bracteata* Roxb. ex DC., *Prodr.* 2:130 (1825). Yusuf (2009) [60].

Medicinal uses: Used for medicinal purposes in Comboa.

Status of occurrence: Endangered (EN).

First and last authentic record: It was recorded by Roxburgh (1814) [50], Baker (1879) [6], Prain (1903) [36] and Heinig (1925) [18] from Chittagong (*Inc*). Thereafter it was recorded from Sitakundu (Chittagong) by Rahman & Uddin (1997) [42], Rahman *et al.* (2015) [46]. No other locality of its occurrence is yet known. No collection of the species is available at BNH, BFRIH, DUSH, BCSIRH and HCU.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (Sitakund). **Global distribution:** Bangladesh, India, Indo-China, the Philippines and China.

Specimen examined: No specimen available in BNH, BFRIH, DUSH, HCU & BCSIRH.

8. *Crotalaria cytisoides* Roxb. ex DC., *Prodr.* 2:131 (1825). Yusuf (2009) [60].

Crotalaria psoralioides D. Don (1825), *Priotropis cytisoides* (Roxb. ex DC.) Wight & Arn. (1834).

Medicinal uses: Cut and wounds.

Status of occurrence: Endangered (EN).

First and last authentic record: Cowan & Cowan (1929) [9] mentioned its occurrence from North Bengal without citing any locality. Thereafter Khan *et al.* (1996) [31] recorded its occurrence from Sylhet (*Inc*). A specimen of it collected from Sylhet (*Inc*) by Yusuf in 1993 is available at BCSIRH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: North Bengal (*Inc*), Sylhet (*Inc*).

Global distribution: Bangladesh, India, Myanmar, China, Nepal and Thailand.

Specimen examined: Sylhet: Inc, 08.05.1993, *Yusuf* 797 (BCSIRH).

9. *Crotalaria laburnifolia* L., *Sp. Pl.*:715 (1753). Yusuf (2009) [60].

Clavulium pedunculosum (Desv.) Desv., *Crotalaria pedunculosa* Desv., *Crotalaria pendula* DC.

Medicinal uses: Helminthiasis, Skin fungus.

Status of occurrence: Endangered (EN).

First and last authentic record: Prain (1903) [36] recorded its distribution from East Bengal (*Inc*). Thereafter Khan *et al.* (1996) [31] recorded its occurrence in Sylhet (*Inc*) but no specimen could be available in BNH or DUSH. Two specimens, collected from Moulvi Bazar in 1979 and 1995 are available at BCSIRH.

Threat to the species: Restricted distribution.

Occurrence in Bangladesh: Moulvi Bazar (Bhunobir, Srimongal). **Global distribution:** Bangladesh, Tropical Asia, North East Australia and tropical Africa.

Specimen examined: Moulvi Bazar: Vonobir [Bhunobir], 17.01.1979, *Alam* 3357 (BFRIH, BCSIRH); Srimongal, Near BTRI, 21.11.1995, *Yusuf* 926 (BCSIRH).

10. *Crotalaria nana* Burm.f., *Fl. Ind.*:156, t. 48 (1768). Yusuf (2009) [60].

Crotalaria umbellata Wight ex wight & Arn. (1832).

Medicinal uses: Diarrhoea.

Status of occurrence: Endangered (EN).

First and last authentic record: Sinclair (1956)^[53] first recorded it from Cox's Bazar (*Inc*). Since then there is no other published report of its occurrence from elsewhere in Bangladesh is available but two collections made by Khan *et al.* from Cox's Bazar (Moheshkhali) in 1978 and Yusuf from St. Martin's Island in 1999 are available at BCSIRH.

Threat to the species: Habitat destruction.

Occurrence in Bangladesh: Cox's Bazar (Moheshkhali, St. Martin's Island). **Global distribution:** Bangladesh, India, Sri Lanka, Nepal through South East Asia to the Phillipines and New Guinea and northwards to China.

Specimen examined: Cox's Bazar: Moheshkhali, 06.03.1978, Khan *et al.* 4825 (BCSIRH), St. Martin's Island, 28.01.1999, Yusuf 1078 (BCSIRH).

11. *Crotalaria quinquefolia* L., *Sp. Pl.*: 716 (1753). Yusuf (2009)^[60].

Medicinal uses: Fever, Impetigo, Lung diseases, Scabies.

Status of occurrence: Endangered (EN).

First and last authentic record: Prain (1903)^[36] first recorded it from North Bengal (*Inc*). Thereafter it was recorded from Himchari (Cox's Bazar) by Uddin & Rahman (1999)^[58]. There is no other published report of its occurrence in Bangladesh but collections from Chittagong (BCSIR campus, Natunpara) and Cox's Bazar (Himchari, Moheshkhali Island) are available at BCSIRH and BFRH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (BCSIR campus, Natunpara), Cox's Bazar (Himchari, Moheshkhali Island).

Global distribution: Bangladesh, India through South East Asia, the Phillipines and New Guinea.

Specimen examined: Chittagong: BCSIR campus, 24.08.2002, Yusuf 1524 (BCSIRH), Natunpara, 16.10.1978, Yusuf 191 (BCSIRH), **Cox's Bazar:** Moheshkhali Island, 10.09.1992, Yusuf 765 (BCSIRH).

12. *Cullen corylifolium* (L.) Medic., *Vorles. Churpf. Phys. Ges.* 2:381 (1787). Naderuzzaman (2009)^[35].

Psoralea corylifolia L. (1753).

Medicinal uses: Caries, Cough, Cold, Conception, Deafness, Diarrhoea, Filariasis, Itch, Impotence, Leprosy, Lumbago, Poisoning, Psoriasis, Skin diseases, Vitiligo, Wounds.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Datta and Mitra (1953)^[11] from Dhaka (*Inc*). Since then no record of its occurrence from elsewhere in Bangladesh is available. But only one specimen of it collected by Yusuf in 1993 from Rajshahi (*Inc*) is available at BCSIRH.

Threat to the species: Over-exploitation.

Occurrence in Bangladesh: Chittagong (BCSIR campus), Dhaka (*Inc*), Rajshahi (*Inc*). **Global distribution:** Bangladesh, Indian sub-continent.

Specimen examined: Chittagong: BCSIR campus (introduced from Rajshahi), 05.03.1993, Yusuf 781 (BCSIRH).

13. *Dalbergia latifolia* Roxb., *Pl. Corom.* 2: 7, t. 113 (1798). Naderuzzaman (2009)^[35].

Dalbergia emarginata Roxb. (1814).

Medicinal uses: Dyspepsia, Diarrhoea, Leprosy, Obesity, Worms.

Status of occurrence: Endangered (EN).

First and last authentic record: It was recorded from North Bengal (*Inc*) by Prain (1903)^[36] and Cowan & Cowan (1929)^[9]. Thereafter Khan *et al.* (1996)^[31] reported its occurrence in

Sylhet (*Inc*). Two collections, one from Chittagong (Sitakund) and another from Sylhet (Near TB Hospital) are available at BNH and DUSH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (Sitakund), Sylhet (Near T. B. Hospital area), North Bengal (*Inc*). **Global distribution:** Bangladesh, India, Pakistan and Nepal.

Specimen examined: Chittagong: Near Chandranath Hill, Sitakund, 13.04.1994, Huq & Mia 10261 (BNH); **Sylhet:** Near T. B. Hospital, Hamid 130 (DUSH).

14. *Dalhousiea bracteata* (Roxb.) Grah. ex.Benth., *Ann. Wein. Mus. Nat.* 2:65 (1838). Naderuzzaman (2009)^[35].

Podalysaria bracteata Roxb. (1820).

Medicinal uses: Fresh cuts.

Status of occurrence: Endangered (EN).

First and last authentic record: It has been recorded from Chittagong (*Inc*) and Sylhet (*Inc*) by Baker (1878)^[6] and thereafter by Heinig (1925)^[18] from Chittagong (*Inc*) as well. There is no other published report of its occurrence in Bangladesh. But collections from Moulvi Bazar (Adampur) and Sylhet (Debpur, Jafflong) are available at BNH and DUSH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (*Inc*), Moulavibazar (Adampur), Sylhet (Debpur, Jafflong). **Global distribution:** Bangladesh, India.

Specimen examined: Moulavibazar: Adampur, Kamalgonj, 19.05.2014, Bushra *et al.* B. 3090 (BNH); **Sylhet:** Deppur, 26.04.1968, Sudhangshu 56 (DUSH), T. B. Hospital area, 21.05.1968, Hamid 129 (DUSH), Cattle Farm Forest, 24.04.1968, Amalendu 170 (DUSH), Jafflong, 30.04.1981, Huq *et al.* H. 5100 (BNH).

15. *Dendrolobium triangulare* (Retz.) Merr., *J. Arn. Arb.* 23:170 (1942). Naderuzzaman (2009)^[35].

Hedysarum triangulare Retz. (1786), *Desmodium cephalotes* (Roxb.) Wall. ex Weight & Arn. (1834), *Dendrolobium triangulare* (Retz.) Schind. (1924).

Medicinal uses: Snakebite, Strengthening bones and building muscles, Poisonous.

Status of occurrence: Endangered (EN).

First and last authentic record: This species was first recorded from Bengal (*Inc*) by Baker (1878)^[6] and thereafter by Kurz (1877)^[33] and Prain (1903)^[36]. Heinig (1925)^[18] recorded it from Chittagong (*Inc*) and Cowan & Cowan (1929)^[9] from North Bengal (*Inc*). Khan *et al.* (1996)^[31] reported its occurrence in Chittagong (*Inc*), Mymensingh (*Inc*) and Dhaka (*Inc*). Only 2 specimens collected from Chittagong (Sitakund and Baraiyadha) are available at BCSIRH.

Threat to the species: Habitat degradation. Probably restricted to some habitats.

Occurrence in Bangladesh: Chittagong (Sitakund), Dhaka (*Inc*), Mymensingh (*Inc*). **Global distribution:** Bangladesh, Myanmar, Sri Lanka, Bhutan, Thailand, China, Malaysia, Cambodia, Australia and New Guinea.

Specimen examined: Chittagong: Chandranath Hill, Sitakund, 21.08.1987, Yusuf 714 (BCSIRH), Hazarikhil-

Baraiyadhala, 02.11.1983, Yusuf 444 (BCSIRH).

16. *Dendrolobium umbellatum* (L.) Benth. in Miq., *Pl. Jungh.* : 218 (1852). Naderuzzaman (2009)^[35].

Hedysarum umbellatum L. (1753), *Desmodium umbellatum* (L.) DC. (1825).

Medicinal uses: Enlarged spleen, Fever, Headache, Malaria.

Status of occurrence: Endangered (EN).

First and last authentic record: Prain (1903)^[36] first recorded its occurrence from Sundarban (*Inc*). Although Khan *et al.* (1996)^[31] reported its distribution in Chittagong, Sylhet, Cox's Bazar and Bhola without citing any locality, no specimen except one collection from Cox's Bazar (Teknaf) made by Khan in 1963, available at DUSH, could be found BNH or any other herbaria.

Threat to the species: Restricted occurrence.

Occurrence in Bangladesh: Bhola (*Inc*), Sundarban (*Inc*), Cox's Bazar (Teknaf) and Sylhet (*Inc*). **Global distribution:** Bangladesh, Myanmar, Malaysia.

Specimen examined: Cox's Bazar: Teknaf, 24.10.1963, Khan 735 (DUSH).

17. *Derris cuneifolia* Benth. in Miq., *Pl. Jungh.* 1:253 (1852).

Derris discolor Benth. (1859)

Medicinal uses: Poisonous to fish.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Baker (1878)^[6] from Sylhet (*Inc*). Prain (1903)^[36] recorded from East Bengal (*Inc*) and Chittagong (*Inc*). Heinig (1925)^[18] also recorded it from Chittagong (*Inc*) and Cowan & Cowan (1929)^[9] from North Bengal (*Inc*). It was recorded from Sitakund (Chittagong) by Rahman & Uddin (1997)^[42]. Collections from relevant areas are available at BNH and HCU.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Chittagong (Sitakund), Rangamati (Kaptai), Sylhet (Salotikar). **Global distribution:** Bangladesh, India, Myanmar and Nepal.

Specimen examined: Rangamati: Kaptai, 17.04.1985, Alam 5389 (BFRIH), Sitapahar, 22.04.1997, Rahman *et al.* 1005 (HCU); **Sylhet:** Salotikar, *dnc.*, Mia *et al.* M. 51 (BNH).

18. *Derris elegans* Benth. var. *vestita* (Baker) Prain, *J. Asiat. Soc. Beng.* 66:103 (1897).

Derris vestita Baker (1878)^[6].

Medicinal uses: Snakebite, Used for poisoning.

Status of occurrence: Endangered (EN).

First and last authentic record: Khan *et al.* (1996)^[31] mentioned its distribution in Sylhet without citing any locality. Thereafter it was recorded from Rancitia (Sylhet) by Tutul and his co-workers in 2010 and from Moulvi Bazar (Lawachara) by Uddin & Hassan (2010)^[54] but no collections are available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Change in the forest ecosystem and degradation.

Occurrence in Bangladesh: Moulvi Bazar (Lawachara), Sylhet (Rancitia). **Global distribution:** Bangladesh, India, Myanmar.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

19. *Desmodium styracifolium* (Osbeck) Merr., *Amer. J. Bot.* 3:580 (1916). Naderuzzaman (2009)^[35].

Hedysarum styracifolium Osbeck (1757), *Nicolsonia styracifolia* (Osbeck) Desv. (1826).

Medicinal uses: Chickenpox, Dropsy, Edema, Irritation from nettle, Kidney stone, Jaundice, Gall bladder, Nephritis, Urethra inflammation.

Status of occurrence: Endangered (EN).

First and last authentic record: Baker (1878)^[6] first recorded it from Sylhet (*Inc*). Thereafter it was recorded by Khan & Huq (2001)^[29] from Chunati (Cox's Bazar) and Uddin *et al.* (2013)^[56] from Tefnaf (Cox's Bazar). Collections from Chittagong and Sylhet are available at HCU and BNH.

Threat to the species: Habitat destruction.

Occurrence in Bangladesh: Chittagong (Fatikchari, Hathazari), Cox's Bazar (Chunati, Teknaf), Sylhet (Shalitkar). **Global distribution:** Bangladesh, India, Myanmar, Sri Lanka, China, Thailand, Malaysia.

Specimen examined: Chittagong: Karnafully Tea Estate area, Fatikchari, 21.01.1989, Huq *et al.* H. 9013 (BNH), Baluchara, Hathazari, 17.03.1999, Rahman 4671 (HCU); **Sylhet:** Shalitkar, 14.10.1973, Khan *et al.* K. 3374 (BNH).

20. *Dunbaria glandulosa* (Dalz.) Prain, *J. Asiat. Soc. Beng.* 66:433 (1897). Naderuzzaman (2009)^[35].

Cajanus glandulosa Dalz. (1861), *Atylosia glandulosa* Dalz. (1873), *A. rostrata* Baker (1876)^[6].

Medicinal uses: Sterility.

Status of occurrence: Endangered (EN).

First and last authentic record: It was first recorded by Prain (1903)^[36] from East Bengal (*Inc*) and Mymensingh (*Inc*). Later on, it was recorded from Dhaka (*Inc*) by Datta & Mitra (1953)^[11] and Huq & Begum (1984)^[22]. Since then there is no other report of its occurrence in Bangladesh.

Threat to the species: Habitat degradation. No locality could be traced yet.

Occurrence in Bangladesh: Dhaka (*Inc*), Mymensingh (*Inc*). **Global distribution:** Bangladesh, India, Myanmar and Thailand.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

21. *Erythrina suberosa* Roxb., *Fl. Ind.* 3:253 (1832). Naderuzzaman (2009)^[35].

Erythrina sublobata Roxb. (1832), *E. glabrescens* (Prain) Parker (1925).

Medicinal uses: Swelling and Boils.

Status of occurrence: Endangered (EN).

First and last authentic record: It has been recorded by Khan *et al.* (1996)^[31] from Chittagong (*Inc*). No other published report of its occurrence from elsewhere in Bangladesh is available. No collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Probably habitat degradation.

Occurrence in Bangladesh: Chittagong (*Inc*). **Global distribution:** Bangladesh, India, Myanmar, Bhutan, Nepal, Pakistan and Sri Lanka.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

22. *Flemingia chappar* Bueh.-Ham. *ex* Benth. in Miq., *Pl. Jungh.*:244 (1852). Naderuzzaman (2009)^[35].

Moghania chapper (Buch.-Ham. *ex* Benth.) Kuntze (1992).

Medicinal uses: Cataract, Diarrhoea, Dysentery, Bodyache, Epilepsy, Eye trouble, Fever, Indigestion, Intestinal worm, Spermatorrhoea.

Status of occurrence: Endangered (EN).

First and last authentic record: Khan *et al.* (1996)^[31] reported its occurrence in Mymensingh (*Inc*). No other

published report of its occurrence from elsewhere in Bangladesh is available. No collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Loss of habitat.

Occurrence in Bangladesh: Mymensingh (*Inc*).

Global distribution: Bangladesh, India, Myanmar.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

23. *Flemingia stricta* Roxb. *Fl. Ind.* 3: 342 (1832). Naderuzzaman (2009) [35].

Flemingia stricta Roxb. var. *petropus* Baker (1876) [6], *Moghania stricta* (Roxb.) Kuntze (1891).

Medicinal uses: Asthma, Fever, Menstrual irregularities.

Status of occurrence: Endangered (EN).

First and last authentic record: Its occurrence from Bangladesh was recorded by Baker (1878) [6] from Sylhet (*Inc*) thereafter from Chittagong (*Inc*) by Kurz (1877) [33], Prain (1903) [36] (*Inc*) and Heinig (1925) [18], from North Bengal (*Inc*) by Cowan & Cowan (1929) [9]. Arefin *et al.* (2011) [5] recorded its occurrence in Satchari (Sylhet). There is no other published report of its occurrence from elsewhere in Bangladesh but one collection from Rangamati (Kaptai) made by Uddin in 2010 is available at BNH.

Threat to the species: Habitat degradation, only 2 localities are known.

Occurrence in Bangladesh: Chittagong (*Inc*), Rangamati (Kaptai), Sylhet (Satchari). **Global distribution:** Bangladesh, India, Myanmar, Bhutan and China.

Specimen examined: Rangamati: Karnafully forest range, Kaptai, 15.12.2010, Uddin N-4413 (BNH).

24. *Indigofera linnaei* Ali, *Bot. Notis.* 111:549 (1958).

Hedysarum prostratum L. (1767), *Indigofera enneaphyllum* L. (1771).

Medicinal uses: Dandruff, Sprue, Wounds.

Status of occurrence: Endangered (EN).

First and last authentic record: Khan *et al.* (1996) [31] although mentioned its occurring in all districts but no other published report of it's from elsewhere in Bangladesh is yet available except only one collection from Rajshahi (Godabari) made by Huq in 1972 is available at BNH.

Threat to the species: Habitat degradation, only one location is known.

Occurrence in Bangladesh: Rajshahi (Godabari). **Global distribution:** Bangladesh, Australia to India, Myanmar, China, Indonesia, Pakistan, Nepal, Thailand, Vietnam, New Guinea, Sri Lanka.

Specimen examined: Rajshahi: Godabari, 14.12.1972, Huq 738 (BNH).

25. *Indigofera prostrata* Willd., *Sp. Pl.* 3:1226 (1802). Naderuzzaman (2009) [35].

Indigofera trifoliata auct. non L. (1753).

Medicinal uses: Leucorrhoea, Rheumatism.

Status of occurrence: Endangered (EN).

First and last authentic record: It's occurrence in Bangladesh was recorded only by Ahmed *et al.* (2009) [1] from Northern parts of the country. There is no other published report of its occurrence from elsewhere in Bangladesh. No collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Habitat destruction. No locality is known.

Occurrence in Bangladesh: Northern parts of the country. **Global distribution:** Bangladesh, India, Indonesia, the Philippines, Australia.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

26. *Indigofera trita* L.f., *Suppl.:* 335 (1781).

Indigofera hedysaroides Lam. (1789), *I. canescens* Lam. (1789), *I. cinerea* Willd. (1802), *I. leschenaultii* DC. (1825).

Veterinary Medicinal uses: Impaction.

Status of occurrence: Endangered (EN).

First and last authentic record: Khan *et al.* (1996) [31] first recorded it as occurring in all districts of the country. Thereafter no other published report of its occurrence in Bangladesh is available. No collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Sylhet (*Inc*). **Global distribution:** Bangladesh, India, Myanmar, Australia, Pakistan, Indonesia, Malaysia, Sri Lanka.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

27. *Mucuna macrocarpa* Wall., *Pl. As. Rar.* 1: 41, t. 47 (1830).

Mucuna colletii Lace (1986), *M. ferruginea* Matsume (1900), *M. subferruginea* Hayata (1913).

Medicinal uses: Sprains.

Status of occurrence: Endangered (EN).

First and last authentic record: Baker (1878) [6] first recorded its occurrence in Bangladesh from Sylhet (*Inc*). It was recorded by Cowan & Cowan (1929) [9] from North Bengal (*Inc*). There is no other published report of its occurrence in Bangladesh but collections from Chittagong (Hazarikhil) made by Rahman *et al.* in 1995 [45] is available at HCU.

Threat to the species: Deforestation as well as restricted distribution.

Occurrence in Bangladesh: Chittagong (Hazarikhil), Sylhet (*Inc*). **Global distribution:** Bangladesh, India, Myanmar, Bhutan, China, Cambodia, Laos, Malaysia, Nepal, Taiwan, Thailand, Japan and Vietnam.

Specimen examined: Chittagong: Hazarikhil, 02.10.95, Rahman *et al.* 132 (HCU).

28. *Mucuna nigricans* (Lour.) Steud., *Nom. Bot. ed.* 2(2): 163 (1841).

Citta nigricans Lour. (1790), *Mucuna gigantea* DC. var. *nigricans* (Lour.) DC. (1825), *M. membranacea* Hayata (1913).

Medicinal uses: Causes Dermatitis, Itching, Irritation, used for Asthma, Cholera, Cough, Fever, Snakebite, Throat pain, Ulcer of genital organs of both sex.

Status of occurrence: Endangered (EN).

First and last authentic record: It's occurrence in Bangladesh was first recorded by Khan *et al.* (1996) [31] from Sylhet (*Inc*). No other published report of its occurrence from elsewhere in Bangladesh is available. Also no collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Habitat degradation.

Occurrence in Bangladesh: Sylhet (*Inc*). **Global distribution:** Bangladesh, India, Myanmar, Bhutan, Nepal, Laos, Malaysia, Pakistan, the Philippines, Vietnam, Sri Lanka and Thailand.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

29. *Pterocarpus marsupium* Roxb., *Pl. Corom.* 2:9, t. 116 (1799). Naderuzzaman (2009)^[35].

Medicinal uses: Asthma, Cough, Diabetes, Graying hair, Heart disease, Jaundice, Menorrhagia, Skin disease.

Status of occurrence: Endangered (EN).

First and last authentic record: It's occurrence in Bangladesh is recorded only by Ahmed *et al.* (2009)^[1] from Chittagong Hill Tracts (*Inc*). There is no other published report of its occurrence from elsewhere in the country and also no collection is available at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Over exploitation.

Occurrence in Bangladesh: Chittagong Hill Tracts (*Inc*).

Global distribution: Bangladesh, India.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

30. *Pterocarpus santalinus* L. f., *Suppl. Pl.*: 318 (1781). Naderuzzaman (2009)^[35].

Ligonium santalinum (L. f.) Kuntze (1891).

Medicinal uses: Acne, Burning sensation, Bleeding, Blood diseases, Chronic bronchitis, Chronic dysentery, Diabetes, Diarrhoea, Edema, Fracture, Gonorrhoea, Headache, Hemorrhage, Inflammation, Menorrhagia, Mental aberrations, Pimples Skin disorders, Swelling, Ulcers, Vision defects, Vomiting, Wounds, Wrinkles.

Status of occurrence: Endangered (EN).

First and last authentic record: It's occurrence in Bangladesh is recorded only by Ahmed *et al.* (2009)^[1] from Chittagong Hill Tracts (*Inc*). No other published report of its occurrence elsewhere from Bangladesh is available and also no collection at BNH, BFRIH, DUSH, HCU & BCSIRH.

Threat to the species: Over exploitation.

Occurrence in Bangladesh: Chittagong Hill Tracts (*Inc*).

Global distribution: Bangladesh, India.

Specimen examined: No specimen is available in BNH, BFRIH, DUSH, HCU & BCSIRH.

31. *Pueraria peduncularis* (Grah. ex Benth.) Benth., *J. Linn. Soc. Bot.* 9: 124 (1867).

Neustanthus peduncularis Grah. ex Benth. (1852).

Medicinal uses: Used for poisoning.

Status of occurrence: Endangered (EN).

First and last authentic record: It's occurrence in Bangladesh is recorded only in Ahmed *et al.* (2009)^[1] from Chittagong (*Inc*) and Chittagong Hill Tracts (*Inc*). There is no other published report of its occurrence in Bangladesh but one collection of the species from Chittagong (Harbang) made by Huq *et al.* in 1979 is available at BNH.

Threat to the species: Habitat destruction.

Occurrence in Bangladesh: Chittagong (Harbang), Chittagong Hill Tracts (*Inc*).

Global distribution: Bangladesh, India, Myanmar, Bhutan, China, Nepal and Pakistan.

Specimen examined: Chittagong: Harbang, 19.11.1979, Huq *et al.* H. 4477 (BNH).

32. *Trigonella corniculata* (L.) L., *Syst. Nat. ed.* 10(2): 1180 (1759). Naderuzzaman (2009)^[35].

Trifolium corniculatum L. (1753).

Medicinal uses: Bruises, Swelling.

Status of occurrence: Endangered (EN).

First and last authentic record: Baker (1878)^[6] first recorded it from Bengal (*Inc*). Thereafter Prain (1903)^[36] also recorded it from all over the Bengal. Datta & Mitra (1953)^[11] recorded it from Dhaka (*Inc*). There is no other published report of its occurrence in Bangladesh but collection from Bogra (Beltala) made by Khatun in 2000 is available at BNH.

Threat to the species: Habitat loss.

Occurrence in Bangladesh: Bogra (Beltala), Dhaka (*Inc*).

Global distribution: Bangladesh, India, Afghanistan, South Europe, Pakistan and Mediterranean areas.

Specimen examined: Bogra: Beltala, 15.01.2000, Khatun R.K. 2202 (BNH).

Conclusion

From the above result, it can be concluded that, many of our valuable medicinal taxa used to cure a variety of human ailments are at risk of extinction. It's clear that, the flora is depleting at an alarming rate due to several anthropogenic as well as natural causes. According to the demonstrated data, out of 169 medicinal taxa of the family Fabaceae, 32 species are Endangered (EN). These medicinal plants possess a variety of medicinal properties including anti-cancer, anti-microbial, anti-nutritive, anti-proliferative, astringent, hypolipidemic, sedative properties and many species bears toxic properties. The present study is therefore recommends to continue more survey of the flora for re-determining their status and to undertake appropriate conservation management, both in-situ and ex-situ. Conservation of medicinal plants is also necessary to maintain uniform flow of raw materials in the pharmaceutical industries.

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