

Conservation of Indigenous Herbaceous and Semi-Woody Medicinal Plant and Their uses

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Abstract

Medicinal plant genetic resources are one of the most important elements of biodiversity which support life system on earth. Under this research One hundred and fifty six (156) medicinal plants have been conserved with their uses for the cure of more than 100 diseases, and some of these are abscess, asthma, abortion, cough, cold, chicken pox, constipation, dysentery, diarrhea, diabetes, eczema, fever, and fracture of bone, headache, heart disease, itches, jaundice, menstrual disease, paralysis, piles, skin diseases, snake-bite, sex problems, toothache, vomiting, worm, wound and others. In majority cases, leaves of the medicinal plants were found leading in terms of their use followed by whole plant, stem, vine, bark, fruits, rhizome, seed, root and flower. The intensive cultivation by unplanned industrialization, urbanization and housing are responsible for destroying medicinal plants. For protecting our health and biodiversity it's needed to protect our traditional medicinal plants by ex-situ and in-situ conservation, saving homestead gardens of the farmers and community plantation both Government and NGO level. Therefore, proper attention should be given to conserve these medicinal plant genetic resources of Barishal for the welfare of human being and animal health.

Keywords: Biodiversity, Conservation, Indigenous, Medicinal plant

INTRODUCTION

Bangladesh is the largest deltaic region of the world, and it lies in the northeastern part of South Asia between 20 034/ and 26 038/ N latitude and 88 001/ and 92 041/ E longitude. The sub-tropical monsoon climate prevails throughout the country with high relative humidity and heavy rainfall during the rainy season. Bangladesh, although occupies relatively small geographical area, is rich in both floral and faunal diversities evident in a varied range of ecosystems starting from the northern and eastern hills to the southern seas; most deciduous forests to the mangroves, and different agro-ecosystems spread over the wetlands, flood plains as well as the hills [11]. A medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes, or which are precursors for chemo-pharmaceutical semi synthesis. When a plant is designated as 'medicinal', it is implied that the said plant is useful as a drug or therapeutic agent or an active ingredient of a medicinal preparation[14]. Medicinal plants may, therefore, be defined as a group of plants that

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possess some special properties or virtues that qualify them as articles of drugs and therapeutic agents, and are used for medicinal purposes [8]. Over 50% of prescription drugs are derived from chemicals those first identified in plants. The Botanic Gardens Conservation International identified 400 medicinal plants at risk of extinction from over-collection and deforestation, threatening the discovery of future cures for disease. For this review, six volumes of “Encyclopedia of Flora and Fauna of Bangladesh” [1, 2, 3, 4, 5, 6, 13] and the subsequent publications have been taken into account [7, 10, 12]. A list of the medicinal plants genera of angiosperms (hereafter only medicinal plant) represented by single species in Bangladesh territory was prepared with their uses and present conservation status.

Bangladesh has very rich in Bio-diversity. It has more than 500 medicinal plants species [15]. An alarmingly populous, but size-wise a very small country is rather unique in having diversified genetic resources in a wide range of habitats. Increasing population pressure and multifarious anthropogenic activities on the natural ecosystems are posing severe and serious threats to once dense and rich genetically diversified plant communities of this country. Traditional medicine as an alternative form of health care and the development of microbial resistance to the available antibiotics has led to investigate the antimicrobial activity of medicinal plants. In Bangladesh there are about 297 Unani, 204 Ayurvedic and 77 Homeopathic drug manufacturing industries where the medicinal plants are extensively used in both raw and semi-processed forms of medicine in various pharmaceutical dose formulations. These plants also serve as important raw materials for many modern medicinal preparations. The market value of drugs produced by these industries from medicinal plants is about Tk. 300 crores. Besides, village Kobiraj, street Vendors and Tribal people also use a large number of medicinal plants for the treatment of various diseases. There is no actual figure how many medicinal plants are used in Bangladesh. Chowdhury at SAARC workshop (held on 16-18 June, 2002) gave a brief idea about the amount of medicinal plants used annually in Bangladesh. A few of them are mentioned here: Ashwagondha (*Withaniasomnifera*)-56,000 kg, Anantamul (*Hemidesmusindicus*) 50,000 kg, Kurchi (*Holarrhenaantidysenterica*)-1,00,000 kg, Gulancha (*Tinosporacordifolia*)-127,000 kg. According to Hamdard Laboratories (WAQF), in Bangladesh the annual demand for a few medicinal plants are- Satomuli (*Asparagusracemosus*)-800 tons, Sarpagondha (*Rawolfiaserpentina*)-1,000 tons, Ghritokumari (*Aloe vera*)-24,000 tons, Kalomegh (*Andrographispaniculata*)-1,000 tons (Hassan, 2003). Every year Bangladesh imports a large quantity raw materials belonging to of medicinal plants mostly under the banner of spices and spends more than 64 crores Taka annually for this purpose. Ironically,70% of this imported raw material can be met from the indigenous sources from Bangladesh[9]. For protecting our health and biodiversity it's needed to protect our traditional medicinal plants by ex-situ and in-situ conservation, saving homestead gardens of the farmers and community plantation both Government and NGO level. Therefore, proper attention should be given to conserve these medicinal plant genetic resources of Barishal division for the welfare of human being and animal health.

MATERIALS AND METHODS

Conservation of herbaceous and semi-woody medicinal plants at BIRTAN regional station of Barishal division and their management was carried out from July 2018 to June 2019. In the present study of medicinal plants, a total of 156 plant species were

collected and recorded for their use in various ailments. A total of 200 local people having an age range 30-70 years were interviewed using semi structured interview method. Professionally they were peasant, day labor, farmer, betel leaf cultivators, boat men, house wives, medicine men, small shop keepers etc. Among them 92 were female and rest 108 were male. Regular field studies were made in the study area during the period. The information about the plants used for various diseases was gathered through interviews and discussion with the elderly people, medicine men and traditional medical practitioners were also consulted. Triangulation methods have been followed for data validation in the field. Plant samples are conserved under pot (Ex-situ) in BIRTAN regional station, Barishal.

RESULTS AND DISCUSSION

In the present medicinal plants and their use in different ailments by the local people at the Barishal division survey, a total of 156 species were recorded. For each species scientific name, mode of use and part(s) used are provided (Table 1). Analysis of the data based on habits showed that leading medicinal plant species 8.33% belonged to Semi woody trees, 45.51% herbs, 29.49% shrubs and 16.67% climbers.

Table 1. List of medicinal plants and their use in different ailments by the local people at Barishal division

Sl	Scientific name	Parts used	Medicinal value and uses
1	<i>Abroma augusta</i>	Whole plant	Vomiting, Skin problem, Diabetics and pain, dysentery, weakness, sterility and other menstrual disorders
2	<i>Adhatodavassica</i>	Leaf	Fever, cough
3	<i>Achyranthespera</i>	Leaf	Pain, cough heart disease, Jaundice
4	<i>Allium sativum</i>	Bulb	Fever, pain, antiseptic, Heart disease, High blood pressure control, anti-worm and night blind
5	<i>Allium cepa</i>	Bulb	Energy, fever, Eye disease and Skin
6	<i>Argemone mexicana</i>	Stem	Leprosy, blood dysentery, jaundice, skin disease
7	<i>Acalypha indica</i>	Leaf	Cold injury, Bronchitis, Asthma
8	<i>Aloe vera</i>	Leaf	Heart, cholesterol reduce, joint pain, tumor, skin disease
9	<i>Allamandacathartica</i>	Leaf, flower	Malaria, Jaundice
10	<i>Asparagus racemosus</i>	Root	Jaundice, sexual problem
11	<i>Asplenium nidus</i>	Leaf	Labor pain reduce
12	<i>Adiantum capillus-veneris</i>	Leaf	Fever, cough, urinary stone
13	<i>Abelmoschus sp.</i>	Leaf, stem, fruit	Eye and skin infection
14	<i>Aglaonema hybrids</i>	Leaf, stem, root	Biopesticide
15	<i>Alternanthera philoxeroides</i>	Leaf, stem	Constipation
16	<i>Acalypha hispida</i>	Leaf	Infection
17	<i>Andrographis paniculata</i>	Leaf	Anthelmintic, constipation, colic, dysentery and dyspepsia, strangulation of intestine, in spleen complaints and debility.
18	<i>Alternanthera philoxeroides</i>	Whole plant	Blood vomiting, night blindness, malaria, diarrhea, dysentery and puerperal fever.
19	<i>Alternanthera sessilis</i>	Whole plant	Blood vomiting
20	<i>Amaranthus spinosus</i> L.	Whole plant	Appetite, burning sensation, hallucination, leprosy, piles, bronchitis, leucorrhoea, constipation and flatulence
21	<i>Amaranthus viridis</i> L.	Whole plant	Burning sensation, hallucination, leprosy, bronchitis, piles, leucorrhoea and constipation.
22	<i>Anomomum adalatum</i>	Seed	Headache pain, vomiting, gum pain
23	<i>Anomomum adalatum</i>	Seed	Headache pain, vomiting, gum pain
24	<i>Bacopamonniera</i>	Leaf	Blood purification, heart cure Epilepsy
25	<i>Bixa orellana</i>	Fruit	Fever, Jaundice, diabetic, snake bite bit
26	<i>Bauhinia purpurea</i> L.	Leaf, flower, bark	Fever, cough
27	<i>Bauhinia acuminata</i>	Leaf, flower, bark	Throat pain, headache, burn, stop bleeding and leprosy
28	<i>Bombax ceiba</i>	Root	Fever, smallpox, Gonoria, leprosy, dysentery, constipation
29	<i>Blumealacera</i>	Flower	Gum pain
30	<i>Blumealacera</i>	Flower	Gum pain
31	<i>Bacopamonniera</i>	Leaf	Blood purification, heart cure, Epilepsy
32	<i>Cocciniagrandis</i>	Leaf, root	Diabetics, Gonoria, dysentery
33	<i>Centella asiatica</i>	Leaf	Fever, diarrhea and gastric
34	<i>Cyanthillium cinereum</i>	Leaf	Fever, blood purification, cough, blood dysentery

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35	<i>Calotropis gigantea</i>	Leaf	Leprosy, cough, fever, skin, anti-worm
36	<i>Carica papaya</i>	Fruit , leave, latex	Fever, fistula, anti-worm and ulcer
37	<i>Clerodendron infortunatum</i>	Leaf, stem	Anti-worm and Malaria
38	<i>Cynodon dactylon</i>	Whole Plant	Cuts and wounds, Blood dysentery , irregular manse
39	<i>Clitoria ternate</i>	Leaf, flower, fruit	Pain, infertility, eye disease
40	<i>Catharanthus roseus</i>	Leaf	Anti-worm, leucorrhoea, high blood pressure control, diabetic
41	<i>Cassia alata</i>	Leaf	Skin disease
42	<i>Cullen corylifolia</i>	Seed	Skin disease, leprosy
43	<i>Curcuma zedoaria</i>	Rhizome	cough, urine infection
44	<i>Cassia alata</i>	Leaf	Skin disease
45	<i>Celosia argentea</i>	Flower	High blood pressure, cholesterol control
46	<i>Capsicum annuum</i>	Fruit	High blood pressure, urtary pain
47	<i>Cymbopogon citratus</i>	Leaf	Fever, Headache pain, food poisoning
48	<i>Coix lacryma</i>	Seed	Gonoria, hyper tension, cancer, tumor
49	<i>Curcuma amada</i>	Rhizome	Stomach pain, sexual disease
50	<i>Crinum asiaticum</i>	Bulb, flower	Fever, headache pain, cancer, tumor
51	<i>Cissus quadrangularis</i>	Leaf	Urinary infection
52	<i>Cajanuscajan</i>	Leaf	Fever, Jaundice
53	<i>Cyperus rotundus</i>	Leaf, rhizome	indigestion, diarrhea, dysentery, vomiting, fever
54	<i>Chenopodium album</i>	Leaf, seed	Dysentery, liver infection, anti-worm
55	<i>Citrus aurantifolia</i>	Fruit	Skin irritation and nausea; juice is appetizer, stomachic, antiscorbutic, refrigerant, antiseptic and anthelmintic; used in biliousness, sore throat and eye complaints, relieves vomiting
56	<i>Colocasia esculenta</i>	Whole plant	Tumors, ulcerated polyp, cancer of nose and warts
57	<i>Cucumis melo L.</i>	Pulp of the fruit	Eczema, biliousness, insanity, ascites and allays fatigue.
58	<i>Cucumis sativus L.</i>	Fruit	Relieve inflammation, sunburn and eyestrain. 57
59	<i>Cucurbitalagenaria L.</i>	Pulp of the fruit	Cholera, muscular pain and dry cough.
60	<i>Cucurbita maxima</i>	Pulp of the fruit	Burns, inflammations and boils; migraine and neuralgia.
61	<i>Daturametel</i>	Seed, Leaves, Root	Insanity, fever with catarrh, diarrhea, skin diseases and cerebral complications.
62	<i>Dolichos purpurens</i>	Root, seed	Anti-worm, urinary infection, sperm increase
63	<i>Daturametel(L)</i>	Leaf, fruit	Anti-drug, pain, Asthma, paralysis, tumor
64	<i>Euphorbia hirta</i>	Leaf, stem	Diarrhea, dysentery
65	<i>Eupatorium triplinerve</i>	Root	Anti-germ, ulcer, stimulator
66	<i>Euphorbia tirucalli</i>	Leaf	Dysentery, Diarrhea
67	<i>Epiphyllum hybrid</i>	Stem	Diarrhea, constipation
68	<i>Evolvulus sinoides</i>	Leaf	Fever, dysentery, cough, asthma
69	<i>Euryale ferox</i>	Seed	Epilepsy
70	<i>Entadaphascoloides</i>	Seed	Anti-worm
71	<i>Enhydra fluctuans</i>	Leaf, stem	Indigestion, weakness, diabetic
72	<i>Ficus semicordata</i>	Fruit	Diarrhea, dysentery, high blood pressure
73	<i>Ficus racemosa</i>	Fruit	Skin disease, gum pain and diarrhea
74	<i>Glycosmis pentaphylla</i>	Leaf, Stem	Anti-worm, gum infection free
75	<i>Glycyrrhiza acchinata</i>	Stem	Cough, fever
76	<i>Hordeum vulgare</i>	Seed	Weakness, cough, stimulator
77	<i>Hemidesmus indicus</i>	Leaf, root	Irregular periods, Fistula, kidney stone
78	<i>Heliotropium indicum</i>	Leaf	Ulcers, sores, wounds, gum boils, skin affections, stings of insects and rheumatism.
79	<i>Hibiscus rosa-sinensis</i>	Flower	Hair fall, headache pain, skin disease, Mummies
80	<i>Hyptis suaveolens</i>	Seed	Constipation blood purification, fistula, tumor, anti-cancer
81	<i>Hydnocarpus kurzii</i>	Seed	Leprosy, skin disease
82	<i>Hibiscus rosa-sinensis</i>	Flower	Hair fall, headache pain, skin disease, Mummies
83	<i>Hibiscus mutabilis</i>	Flower, root	fistula, tumor, excess bleeding control during menstrual time
84	<i>Hibiscus tiliaceus</i>	Flower	Fever, birth control, respiratory infection
85	<i>Hiptage benghalensis</i>	Leaf, flower	Skin disease, Asthma, paralysis
86	<i>Hoehenantidysenterica</i>	Leaf, bark, root	Blood dysentery, snake bits
87	<i>Helianthus annuus</i>	Leaf	Lumber pain, malaria.
88	<i>Ipomoea quamoclit</i>	Leaf, vine	Breast cancer, fistula, skin
89	<i>Ipomoea aquatic</i>	Leaf, stem	Leprosy, Bronchitis, cold injury
90	<i>Impatiens balsamina</i>	Leaf, flower	Anti-cancer, cough, uric acid reduce
91	<i>Ipomoea pes-caprae</i>	Leaf, stem	Headache pain , labor pain reduce
92	<i>Imperatya lindrica</i>	Leaf, root	Fever, gonoria, kidney infection, anti-abortion
93	<i>Ipoemapaniculata</i>	Root	Weakness, sexual disorder
94	<i>Ixorachinensis</i>	Leaf, flower	High blood pressure control
95	<i>Ipomoea batatas</i>	Leaf	Digestion and eye disease
96	<i>Ipomoea carnea</i>	Leaf, latex	Asthma, Infection, Paralysis
97	<i>Indigoferalactoria</i>	Leaf	Epilepsy
98	<i>Juniperus chinensis</i>	Leaf	Rheumatic fever, hair fall, skin burn
99	<i>Kaempferia galangal</i>	Rhizome	Fever, cough, Asthma
100	<i>Kopsia fruticosa</i>	Leaf	Sexual disease
101	<i>Linum usitatissimum</i>	Seed	Cough, urinary infection, pain, heart pain
102	<i>Leucoscephalotes</i>	Leaf	Jaundice

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103	<i>Lawsoniainermis</i>	Leave, bark	Fever, jaundice, anti-dandruff, skin disease
104	<i>Lantana camara</i>	Leave	Fever, Chicken pox, Leprosy, fistula, tumor
105	<i>Lens esculenta</i>	Seed	Foul and indolent ulcers.
106	<i>Menthaspicata</i>	Leave	Asthma, anti-cancer and active digestive system
107	<i>Mirabilis jalapa</i>	Leave, root	Fever, diabetic, infection
108	<i>Mimosa pudica</i>	Stem, root	dysentery , fistula, gum pain
109	<i>Murraya exotica</i>	Leave	Blood dysentery , fever
110	<i>Manihotesculenta</i>	Root	Diabetic, heart disease, anti-cancer
111	<i>Moringaoleifera</i>	Leave, flower, fruit	Anti-cancer, ulcer, diabetic, tumor, wound
112	<i>Morusnigra</i>	Leave	Fever, anti-worm
113	<i>Nyctanthesarbortristis</i>	Leave, flower, seed	Fever, cool injury, anti-worm, and anti-dandruff
114	<i>Nigella Sativa</i>	Seed	Cold injury, fever, headache pain, milk increase lactating mothers
115	<i>Nerium oleander</i>	Leave	Chicken pox, paralysis, diabetic
116	<i>Naraveliazeylanica</i>	Leave	wound
117	<i>Ocimumtenuiflorum</i>	Leave	Cool , fever and cough
118	<i>Oxalis corniculata</i>	Leave	Heart, cholesterol reduce
119	<i>Portulacaoleracea</i>	Leave, stem	Liver, heart cure
120	<i>Polygonumhydropiper</i>	Leave	Control unrest bleeding, blood dysentery, skin disease
121	<i>Piper lingum</i>	Seed	Asthma, fever, cough, food poison, liver active
122	<i>Piper nigrum</i>	Seed	Fever, cool injury, malaria, gonoria, mal-digestion
123	<i>Phyllanthushsirur</i>	Leave	Fever, stomach, liver and kidney problem
124	<i>Piper betel</i>	Leave	food poisoning, cancer
125	<i>Pandanusodoratissimus</i>	Leave	Digestion
126	<i>Paederiafoetida</i>	Leave	Stomach pain, Gum pain, paralysis
127	<i>Pentapetesphoenicea</i>	Leave, flower	Fever, wound
128	<i>Piper chaba</i>	Stem	High blood pressure control
129	<i>Physalisisixocarpa</i>	Fruit	Cancer, diarrhea, constipation, cholesterol reduce
130	<i>Ricinuscommunis</i>	Seed	Hair fall, headache , urinary infection, paralysis
131	<i>Rhocopathacea</i>	Leave	Dysentery, stop bleeding
132	<i>Raulwolfia serpentine</i>	Leave	high blood pressure, irregular sleep
133	<i>Solanumnigrum</i>	Leave, fruit	Tumor, anti-cancer, skin disease, ulcer, dysentery, cough
134	<i>Sesamumindicum</i>	Seed	Piles.
135	<i>Sesbaniagrandiflora</i>	Leave, flower	Fever, cough, liver infection
136	<i>Saccharumofficinatum</i>	Stem	Brain development, gastric, Ulcer
137	<i>Stevia rebaudiana</i>	Leave	Diabetic and cholesterol level balance
138	<i>Scopariadulcis</i>	Leave	Diabetic, hyper tension, sex stimulator
139	<i>Solanumsuratense</i>	Leave	Cough, Asthma
140	<i>Salvia columbaiae</i>	Seed	Diabetic and blood cholesterol control
141	<i>Sidacordifolia</i>	Leave	Fever, infertility, Gonoria, injury
142	<i>Sonchusarvensis</i>	Leave , root	Jaundice, asthma
143	<i>Tagetesrecta</i>	Leave	Anti-worm, control unrest bleeding
144	<i>Trachyspermum Ammi</i>	Seed	Indigestion, skin disease, cough, paralysis
145	<i>Trigonellofoenum-graecum</i>	Seed	Diabetics, irregular periods, high blood pressure
146	<i>Tinosporacrispa</i>	Vine/ stem	Diarrhea, diabetic, malaria, high blood pressure
147	<i>Tropaeolummajus</i>	Leave	Infection, fever, cough
148	<i>Urgineeindica</i>	Leave , bulb	Cough, digestion, respiratory infection
149	<i>Vignasinensis L.</i>	Seed	Jaundice, strengthen the stomach and to destroy worms.
150	<i>Vitexnegundo</i>	Leave	Fever, cough, pain, anti-worm
151	<i>Vangueriaaspinosa</i>	Leave, fruit	Liver infection, fever
152	<i>Withaniasomnifera</i>	Leave	Infertility, rekates, pain, irregular sleep, Leocoderma, constipation, insomnia, tissue-building, nervous breakdown, fever, painful swelling and ophthalmitis
153	<i>Xanthium indicum</i>	Whole plant	Urinary and renal complaints in gleet, leucorrhoea and menorrhagia.
154	<i>Zingiberofficinale</i>	Rhizome	Fever, cough, cold injury, uric acid reduce
155	<i>Zephyranthesminuta</i>	Bulb	Cancer, Diabetic
156	<i>Zea mays L.</i>	Seed	Piles; lessens pain.

Use of plant parts as medicine shows variation. Leaves 57.05% are the leading part used in a majority of medicinal plants followed by 8.97% fruits, 10.26% roots, 2.56% bark, 5.13% whole plant, 11.54% stem, 1.28% latex, 2.54% bulb, 3.21% rhizomes, 15.38% seed, 1.92% pulp, 10.26%flower (Table 2).

Table 2. List of plant parts used as medicine

	Use of plant parts	No. of plants	%	Total plants
1	Leave	89	57.05	156
2	Whole plant	8	5.13	156
3	Root	16	10.26	156
4	Stem/vine	18	11.54	156
5	Bark	4	2.56	156
6	Fruit	14	8.97	156
7	Rhizome	5	3.21	156
8	Flower	16	10.26	156
9	Seed	24	15.38	156
10	Bulb	4	2.56	156
11	Latex	2	1.28	156
12	Pulp	3	1.92	156

In Bangladesh, due to population pressure, deforestation and changes in land use patterns, many species of both herbaceous and semi woody medicinal plant (*Leucasephalotes*, *Euphorbia hirta*, *Cyanthilliumcinereum*, *Argemonemexicana*, *Sidacordifolia*, *Dolichospruriens*, *Ipomoea pes-caprae*, *Vangueriaspinosa*, *Hibiscus tiliaceus*, *Tinosporacrispa*, *Coixlacryma*, *Ipoemapaniculata*, *Pentapetesphoenicea* and *Acalyphahispida*) have become extinct and many more are threatened and endangered. In addition, the country will face serious consequences of biodiversity loss from the global climate change. Considering the present situation and future need, the problems of extinction of the native plant resources, conservation and management programmes are necessary.

CONCLUSION

One hundred and fifty six (156) medicinal plants have been conserved with their uses for the cure of more than 100 diseases, like as Abscess, asthma, abortion, cough, cold, chicken pox, constipation, dysentery, diarrhea, diabetes, eczema, fever, and fracture of bone, headache, heart disease, itches, jaundice, menstrual disease, paralysis, piles, skin diseases, snake-bite, sex problems, toothache, vomiting, worm, wound and others. In majority cases, leaves of the medicinal plants were found leading in terms of their use followed by whole plant, stem, bark, fruits, rhizome, seed, root and flower. Therefore, the present study will be useful for researchers in the field of ethno-botany, ethno-medicinal and pharmacology for further studies.

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