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Therapeutic effects of ethnomedicinal plants used against various diseases in Bangladesh

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ABSTRACT

Ethnomedicinal plants are traditionally used against different diseases in the different regions across Bangladesh. People of different communities in Bangladesh use medicinal plants and rely on ethnomedicine because of cost-effectiveness, acceptability, biomedical benefits and less or no side-effects. A comprehensive list of the important medicinal plants from different villages of Bangladesh was prepared by investigating the plants commonly used by Bangladeshi people. A total of 100 medicinal plant species were collected and recorded for their different ailment. All these folk medicinal plants were mostly used for treatment and prevention of ring worm, diarrhea, abscess, abortion, cold, pox, constipation, dysentery, diabetes, tumor, cancer, heart disease, blood pressure, etc. In most cases, leaves of the medicinal plants were showed leading parts followed by whole plants, rhizome, fruits, seed, roots, bark, stem and flower. For each species scientific name, local name, family, diseases to be treated, part(s) and therapeutic purpose are provided. The study will help to further investigate the effect of these medicinal plants by identifying the active compound of the plants and the mode of action in order to develop drugs against the diseases.

INTRODUCTION

Bangladesh is a densely populated Agricultural Country with a 11.2 percent of forest areas of the total area of the country. Due to high population, deforestation, changes the pattern of land use, many species of medicinal plants become extinct and endangered. Considering this situation and our better future, it is necessary to conserve the natural resources of medicinal plants (Motaleb, 2010). From the very beginning of human civilization, medicinal plants have been played a pathfinder role for the well-being of human health. A little while back, marked changes have taken place in the primary health supervision of world population, recently it also unveilings its effects on both human and animal health care system through the expansion of medical science and technology.

The study of medical application and utilization of medicinal herbs by the rural people create an interdisciplinary science called "Ethnobotany" (Hershberger, 1895). It includes total natural and traditional interrelationships of human being and plants and different animal species (Jain, 2001).The knowledge of herbal medicine transferred from generation to generation through folklore or sign language (Anonymous, 1984). Day by day demand of medicinal plants based raw materials are increased in international market (Begum, 2004), (Bangladesh foreign trade institute, 2016). These folk herbal medicines can be used for alternative patent medicine, which is very essential for our modern situation (Ashraf, 2014).

The present study is aimed to gather the information on medicinal plants that are commonly used in Bangladesh. The findings of this study may help the scientists to get a comprehensive view of the folk medicinal practices in Bangladesh and can use the results to identify medicinal plants of therapeutic interests

MATERIALS AND METHODS

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Study area

Sample were collected from different villages of different districts of Bangladesh such as Chuadanga, Jessore, Jhenaidah, Khulna, Kushtia, Magura, Meherpur, Narail, Satkhira, Chittagong, Mymensingh, Sherpur, Bogra, Joypurhat, Pabna, Rajshahi, Sirajgonj, Dinajpur, Gaibandha, Lalmonirhat, Rangpur, Thakurgaon.

Characterization of plants

A total of 100 medicinal plant species were collected and recorded for their use in different diseases. During the survey collection and documentation of plants specimen were performed. In the field interview the information was noted in data sheet. All the information about plant species, local name, habitat, uses was documented. Moreover, medicinal information was obtained from informal interviews especially from local herbalists, elder people. The specimen were identified by consulting with plants experts and also from secondary source such as books (Abdul Ghani, 1998), available herbarium, literature (Hooker JD, 1961). The specimens are stored in Jhenaidah Government Veterinary College, Jhenaidah for future reference.

RESULTS AND DISCUSSION

Data revealed that rural people in this study are poor and illiterate. These people are out of the reach of the modern medicine. Moreover, market prices of modern patent medicines are expensive. Therefore these medicinal plants are used by them to cure and prevent of different diseases (Table1).Various parts of plant of different species used for treating different ailments are illustrated in figure1.

The work also suggested that the present information on herbal medicine used by rural people of Bangladesh may be used for Pharmacological research in future for discovery of new sources for drugs (A.H.M. MahbuburRahman, 2015).

Table 1
List of 100 Medicinal plants, their scientific name, local name, family, Part(s) for use, therapeutic use by local people of Bangladesh.

S/N	Scientific name	Local name	Family	Part(s) for uses	Therapeutic uses
1	*Allium sativum L.*	Roshun	*Amaryllidaceae*	Bulb	Heart diseases, inflammation, fever etc.
2	*Allium cepa L.*	Piaj	*Amaryllidaceae*	Bulb	Insect bites, asthma, rheumatism.
3	*Achyranthes aspera Linn.*	Apang	*Amaranthaceae*	Root, leaves, fruits, seeds.	Purgative, diuretic.
4	*Annona squamosa Linn.*	Ata	*Annonaceae*	Leaves, fruits, seeds, roots.	Tumors.
5	*Azadirachta indica.*	Neem	*Meliaceae*	Leaves, fruits, seeds, roots.	Inflammation sores.
6	*Abelmoschus esculentus (l.) moench.*	Dheros	*Malvaceae*	Fruits	Chronic dysentery, urinary discharges, gonorrhoea.
7	*Asparagus racemosus Wild.*	Shatamuli	*Asparagaceae*	Leaves,fruits, barks, roots.	Urinary problems.
8	*Aloe barbadensis Mill.*	Ghritakumari	*Asphodelaceae*	Rhizome	Tonic, expectorants.
9	*Aegle marmelos (L.) Correa.*	Bael	*Rutaceae*	Leaves, fruits, barks, seeds.	Stomachic, laxative.
10	*Alocasia macrorrhizos(L.) G.Don*	Mankachu	*Araceae*	Leaves, tubers, petioles.	Stings of insects, tumors.
11	*Abroma augustum.*	Ulatkambal	*Sterculiaceae*	Leaves, roots,	Irregular menses, pain.

				barks, stalks.	
12	*Alstonia scholaris (L.) R.Br.*	Chatim	*Apocynaceae*	Roots, sap, gum.	Cancer.
13	*Artocarpus lacucha.*	Bonkathal/ Daua	*Moraceae*	Leaves, seed.	Dermatitis, Constipation.
14	*Averrhoa carambola*	Kamranga	*Oxalidaceae*	Fruits.	Fever.
15	*Andrographi spaniculata (Burm.f.) Wall. ex. Nees.*	Kalmegh/ chirota	*Acanthaceae*	Leaves, roots.	Liver and spleen disease.
16	*Albizia chinensis Linn.*	Koroi	*Fabaceae*	Leaves, barks, roots, pods.	Scabies.
17	*Argemone mexicana L.*	Shialkanta	*Papaveraceae*	Leaves, fruits, Seeds, roots.	Antifungal properties.
18	*Amaranthus spinosus L.*	Katanote	*Amaaranthaceae*	Whole plant	Leprosy, piles, leucorrhoea.
19	*Adhatoda vasica Nees.*	Bashak	*Acanthaceae*	Leaves, roots.	Bronchodilator, expectorant.
20	*Acalypha indica L.*	Muktajhuri	*Euphorbiaceae*	Whole plants	Vermifuge, scabicide.
21	*Areca catechu L.*	Shupari	*Arecaceae*	Fruits	Heart disease.
22	*Bacopa monnieri (L.) Pennell.*	Brahmishak	*Plantaginaceae*	Leaves, fruits, seeds, roots.	Diuretic, laxative.
23	*Benincasa hispida (Thunb) Cogn.*	Chalkumra	*Cucurbitaceae*	Leaves, fruits, seeds.	Laxative, demulcent, diuretic, hemorrhage.
24	*Barringtonia acutangula (Linn.) Gaertn.*	Hijal	*Lecythidaceae*	Leaves, roots, barks.	Diarrhea, dysentery.
25	*Bryophyllum pinnatum (Lam.) Oken.*	Patharkuchi	*Crassulaceae*	Leaves.	Dysentery with blood.
26	*Brassica nigra Linn.*	Kalosharisha	*Brassicaceae*	Leaves, seeds.	Stomachic.
27	*Blumea balsamifera (L.) DC.*	Kukursunga	*Asteraceae*	Leaves, roots.	Antispasmodic, astringent, stomachic.
28	*Butea monosperma (Lam.) Taub.*	Polash	*Fabaceae*	Gums, flowers.	Birth control, fever.
29	*Boerhavia diffusa L. nom. cons.*	Punarnava/ hogweed	*Nyctaginaceae*	Leaves, roots, fruits, seeds.	Laxative, stomachic.
30	*Bauhinia acuminita L.*	Shetokanchon	*Fabaceae*	Leaves, barks, fruits, seeds	Baldder stone.
31	*Borassus flabellifer L.*	Tal	*Arecaceae*	Fruit, root	Neoplastic diseases.
32	*Catharanthus roseus (L.) G. Don.*	Nayantara	*Apocynaceae*	Whole plant.	Diabetes.
33	*Caesalpinia pulcherrima (L.) Sw.*	Radhachura	*Fabaceae*	Leaves, flowers, barks.	Tonic, purgative.
34	*Cajanus cajan*	Arhar	*Fabaceae*	Leaves	Jaundice, Pneumonia
35	*Commelina benghalensis L.*	Kanshira	*Commelinaceae*	Leaves, seeds, fruits	Otitis, snake bite.
36	*Clerodendrum viscosum Vent.*	Ghetu	*Lamiaceae*	Leaves, roots	Skin disease, tumor.
37	*Carissa carandas L.*	Karamcha	*Apocynaceae*	Fruits.	Diabetes.
38	*Capsicum frutescens L.*	Morich	*Solanaceae*	Leaves.	Dysuria, headache.
39	*Colocasia esculenta (L.) Schott.*	Mukhikochu	*Araceae*	Leaves, rhizome.	Emaciation, atrophy.
40	*Celosia cristata L.*	Morogful	*Amaranthaceae*	Whole plant	Diarrhea, dysentery.

41	*Cinnamomum tamala*	Tejpata	*Lauraceae*	Leaves.	Cough.
42	*Citrus aurantiifolia (christm.) Swingle.*	Lebu	*Rutaceae*	Fruits.	Stomachic, antiseptic, anthelmintic.
43	*Centella asiatica L.*	Thankuni	*Apiaceae*	Leaves, fruits, seeds, roots.	Digestive disorder.
44	*Coccinia grandis (L.) Voigt.*	Telakucha	*Cucurbitaceae*	Leaves, flowers.	Diabetes.
45	*Cassia fistula L.*	Sonalu/ banorlathi	*Fabaceae*	Leaves, roots, barks, flowers.	Hypoglycemic, anticancer.
46	*Citrus maxima Merr.*	Jambura	*Rutaceae*	Fruits.	Cough influenza.
47	*Cissus quadrangularis L.*	Hadjoralata	*Vitaceae*	Leaves, young shoots, stem.	Injured ligament, fractures.
48	*Clitoria ternatea L.*	Aparajita	*Fabaceae*	Roots.	Tonic for brain, tranquilizer, sedative.
49	*Curcuma longa L.*	Holud	*Zingiberaceae*	Rhizome	Scabies, liver ailments.
50	*Coriandrum sativum L.*	Dhonia	*Apiaceae*	Leaves, fruits.	Appetizer.
51	*Cucurbita maxima.*	Mishtikumra	*Cucurbitaceae*	Pulp	Inflammation, migrane, neuralgia.
52	*Cucumis sativus L.*	Shosha	*Cucurbitaceae*	Fruits.	Sunburn, inflammation.
53	*Calotropis procera (Aiton) W.T. Aiton.*	Akanda	*Apocynaceae*	Bark, roots.	Constipation, indigestion, dyspepsia.
54	*Carica papaya L.*	Papea	*Caricaceae*	Fruits, seeds.	Dyspepsia.
55	*Carthamus tinctorius L.*	Kishum/ safflower	*Asteraceae*	Leaves, fruits, seeds, roots.	Paralysis.
56	*Camellia sinensis (L.) Kuntze.*	Tea/ cha	*Theaceae*	Leaves, stems.	Diuretic, astringent, CNS stimulant.
57	*Caesalpinia pulcherrima (L.) Sw.*	Krishnachura	*Fabaceae*	Leaves, flowers, barks.	Purgative, tonic.
58	*Clerodendrum infortunatum L.*	Vant	*lamiaceae*	Leaves, roots.	Tumor, asthma.
59	*Corchorus capsularis L.*	Pat/ white jute	*Malvaceae*	Leaves.	Dysentery.
60	*Chenopodium ambrosioides.*	Banbatua	*Chenopodiaceae*	Leaves.	Eczema.
61	*Dalbergia sissoo Roxb.*	Shishugach	*Fabaceae*	Leaves, barks, seeds, roots.	Astringent.
62	*Datura metel L.*	Dhutura	*Solanaceae*	Leaves, fruits, seeds, roots.	Rheumatic swellings.
63	*Dillenia indica L.*	Chalta	*Dilleniaceae*	Leaves, fruits.	Laxative, tonic.
64	*Desmodium gangeticum (L.) DC.*	Chalani	*Fabaceae*	Leaves, roots.	Anthelmintic.
65	*Dioscorea alata L.*	Chuprialu	*Dioscoreaceae*	Tuber	Constipation.
66	*Elaeocarpus robustus*	Jolpai	*Elaeocarpaceae*	Leaves, barks, fruits.	Diarrhea, dysentery, mouth-wash.
67	*Euphorbia hirta L.*	Dudhiya	*Euphorbiaceae*	Whole plant	Ulcer, edema.
68	*Eclipta alba (Linn.) Hassk.*	Keshraj	*Asteraceae*	Leaves, flowers.	Stomachic, antipyretic.
69	*Enhydra fluctuans*	Helencha	*Asteraceae*	Leaves stem.	Dropsy, anasarca, ascites.
70	*Erythrina variegata L.*	Madar	*Fabaceae*	Leaves	Inflammation, pain of joint.
71	*Emilia sonchifolia (L.) DC. ex Wight*	Mechitra	*Asteraceae*	Leaves, flowers.	Stomachic, antipyretic.

72	*Ficus benghalensis*	Bot	*Moraceae*	Whole plant	Diabetes, piles.
73	*Ficus hispida L.f.*	Khokshadumur	*Moraceae*	Leaves, barks	Astringent, cooling.
74	*Ficu sreligiosa L.*	Pakur	*Moraceae*	Fruits	Asthma.
75	*Gmelina arborea Roxb.*	Gamar	*Lamiaceae*	Leaves, flowers	Leprosy, gonorrhea, blood disease.
76	*Gardenia jasminoides*	Gandharaj	*Rubiaceae*	Leaves, fruits, seeds.	Antispasmodic.
77	*Glinus oppositifolius*	Gimhashak	*Molluginaceae*	Whole plant	Skin diseases.
78	*Helianthus annuus L.*	Shurjamukhi	*Asteraceae*	Leaves, flowers, seeds.	Emetic, lumber pain.
79	*Hibiscus rosa-sinensis L.*	Joba	*Malvaceae*	Bud of flowers	Urinary discharges, piles.
80	*Ipomoea batatas (L.) Lam.*	Mishti alu	*Convolvulaceae*	Roots	Skin diseases, diarrhea.
81	*Impatiens balsamina L.*	Dopati	*Balsaminaceae*	Flowers, seeds	Cathartic, diuretic, emetic.
82	*Ixora coccinea L.*	Rongon	*Rubiaceae*	Flowers, roots.	Diarrhea, leucorrhoea.
83	*Ipomoea alba L.*	Kolmilata	*Convolvulaceae*	Leaves	Filariasis, wounds, boils.
84	*Imperata cylindrica (L.) P. Beauv.*	Ulu	*Poaceae*	Roots	Diuretic.
85	*Jasminum grandiflorum L.*	Kathmoni	*Oleaceae*	Roots	Ringworm
86	*Lablab purpureus (L.) Sweet.*	Shim	*Fabaceae*	Seeds	Inflammation.
87	*Litchi chinensis Sonn.*	Lichu	*Sapindaceae*	Fruits, seeds.	Heart disease, orchitis.
88	*Lawsonia inermis L.*	Mehedi	*Lythraceae*	Leaves, stem, root	Heart disease.
89	*Mimosa pudica L.*	Lajjabati	*Fabaceae*	Whole plant	Snake bite.
90	*Musa spientum*	Kola	*Musaceae*	Stem	Source of iron, stop bleeding.
91	*Moringa oleifera Lam.*	Shajna	*Moringaceae*	Leaves	Neoplastic disease.
92	*Nymphaea nouchali Burm. f.*	Shapla	*Nymphaeaceae*	Tuber, root	Neoplastic disease.
93	*Ocimum sanctum*	Tulsi	*Lamiaceae*	Leaves	Gastric disorder, bronchitis, colds.
94	*Psidium guajava L.*	Peyara	*Myrtaceae*	Leaves, fruit	Heart disease.
95	*Piper betle L.*	Pan	*Piperaceae*	Leaves	Indigestion, cough.
96	*Portulaca oleracea L.*	Nuniashak	*Portulacaceae*	Whole plant	Cardiovascular diseases.
97	*Stevia rebaudiana*	sweet leaf	*Asteraceae*	Leaves	Diabetes.
98	*Tectona grandis L.f.*	Segun	*Lamiaceae*	Wood	Piles.
99	*Terminalia chebula Retz.*	Horitaki	*Combretaceae*	Leave, Fruits, barks	Heart disease.
100	*Zingiber officinale Roscoe.*	Adha	*Zingiberaceae*	Rhizome	Sore throats, constipation.

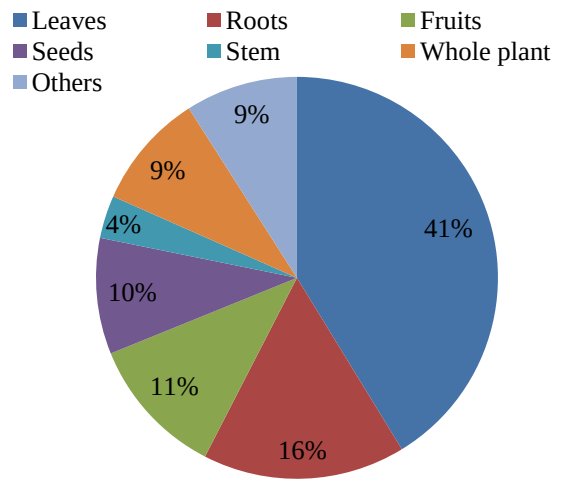

Figure1
Percentage of plant parts used by the rural people for therapeutic uses.

The study demonstrated that the high richness of Bangladesh's medicinal plants and traditional medicine, addressing use of natural resources to treat various diseases and associated problems for a long time. Many of the listed plants or their group members and their extract are being used in different countries of the world against various diseases including antimicrobials, analgesic, anti-inflammatory bowel disease and diabetes etc (Hossain et al., 2016).

Stevia rebaudiana, which is antidiabetic plant, now cultivated in Bangladesh (M.M.Zaman, 2015). On the other hand local plants Harjora, kumra, chalta, shajna, shapla are effective for Neoplastic diseases (Md. NurKabidulAzam, 2016), and Shimul, Arjun, Horitaki, Mehedi, Peyara are effective for heart diseases (Md. NurKabidulAzam, 2014).

Few pharmaceutical industries of Bangladesh are currently producing herbal medicinal those are effective on cold, rhinorrhea (nasal congestion), cough, pain, blood pressure, heart disease and so on, so that they may be able to replace chemical drugs with plant derived ones. Adovas®, Amocid®, AmCivit®, Inacea®, Giloba®, Torel®,Arubin®, Dubarel®, Eyebil®, Jort®, Gintex®, Livolite®, Navit®, Probio® etc. are examples of products from Bangladeshi medicinal plants. However, many of the medicinal plants identified in this study remain to be known and their other medicinal effects have not been yet investigated and confirmed in clinical trials. Therefore, researchers can do complementary studies on the ethnomedicinal plants whose therapeutic effects on different diseases have not been yet investigated, considering the plants used to treat different diseases in country's traditional medicine, and conduct clinical trials to develop the herbal medicines and help to make them commercially available. Furthermore, some ethnomedicinal plants could serve as useful source of new agents against some complex emerging and re emerging diseases in Bangladesh and other countries of the world.

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