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Journal of Chemical and Pharmaceutical Research, 2015, 7(8):220-225

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Ethnomedicinal plants of three folk medicinal practitioners in two villages of Khulna district, Bangladesh

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ABSTRACT

Folk medicinal practice is a common feature of traditional medicinal systems in Bangladesh. Folk medicinal practitioners (FMPs) mainly deal with medicinal plants to cure diseases. Since the plants selected by FMPs vary widely, it was the objective of the present study to document the plants used by three FMPs in two villages of Khulna district, Bangladesh. It was observed that the FMPs used a total of 41 plants distributed into 27 families. The various diseases treated by the FMPs included gastrointestinal disorders, liver disorders including hepatitis B, diabetes, allergy, respiratory tract disorders, cuts, wounds and infection, memory loss, pain of various sorts, skin disorders, helminthiasis, heart disorders, leucorrhea, physical weakness, fever, irregular menstruation, chicken pox, tooth and gum diseases, piles, appendicitis, vomiting, jaundice, hair loss, and sexual weakness. The plants used for treatment of these ailments merit scientific attention for such scientific validation can prove a useful means to provide affordable and easily available means of treatment for the common people of the country, who in general lack access to allopathic medicines.

Key words: Folk medicine, Khulna, medicinal plants, Bangladesh

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INTRODUCTION

Bangladesh is a country known for its diverse form of traditional medicinal practices, which includes Ayurveda, Unani, homeopathy, folk medicine, and tribal medicine among the major forms of traditional medicinal practices. Folk medicine possibly is the most common form of these traditional medicinal practices, and folk medicinal practitioners (FMPs) can be found practically in every village, towns and cities within the country. Such FMPs depend mainly on medicinal plants for treatment with occasional use of animal parts or minerals.

The medicinal plants used and the diseases selected for treatment by FMPs varies considerably between FMPs. As such it is of interest to document the practices of as many FMPs as possible to get a comprehensive overview of medicinal plants and their uses in Bangladesh. We had been conducting ethnomedicinal surveys among various FMPs and tribal medicinal practitioners of Bangladesh for the last few years, which surveys have also included collecting information on home remedies for home remedies also constitute a vital form of traditional medicinal practices and mainly use medicinal plants [1-25]. The objective of the present study was to document the medicinal plants used by three FMPs in two villages of Khulna district, Bangladesh.

EXPERIMENTAL SECTION

The three FMPs surveyed belonged to the villages of Gilatola and Shiramoni in Khulna district, Bangladesh. The FMPs were Sheikh Abul Hossain, male, age 89 years, Gilatala, Khulna district; Syed Abu jafar, male, age 50 years, Gilatala, Khulna district; and Asma Khatun, female, age 45 years, Shiramoni, Khulna district. Prior Informed Consent was obtained from the FMPs for the survey. Actual interviews were carried out with the help of a semi-structured questionnaire and the guided field-walk method of Martin [26] and Maundu [27]. In this method, the FMPs took the interviewers on guided field-walks through areas from where they collected their medicinal plants, pointed out the plants, and described their uses. Interviews were carried out in the Bengali language, which was spoken alike by the FMPs and the interviewers. Plant specimens were photographed, collected, pressed and dried and brought back to Dhaka for identification at the Bangladesh National Herbarium.

RESULTS AND DISCUSSION

It was observed that the three FMPs between themselves used a total of 41 plants distributed into 27 families in their treatment of various diseases. The various diseases treated included gastrointestinal disorders, liver disorders including hepatitis B, diabetes, allergy, respiratory tract disorders, cuts, wounds and infection, memory loss, pain of various sorts, skin disorders, helminthiasis, heart disorders, leucorrhea, physical weakness, fever, irregular menstruation, chicken pox, tooth and gum diseases, piles, appendicitis, vomiting, jaundice, hair loss, and sexual weakness. The results are shown in Table 1.

Interestingly, although some of the diseases treated were simple like gastrointestinal disorders or respiratory tract disorders, the FMPs treated more complicated diseases like hepatitis B, heart disorders and diabetes. Diabetes is rapidly becoming endemic in Bangladesh possibly because of changes in lifestyle and food habits of the population. The disease also cannot be cured with allopathic medicines; such medicines can only be helpful in reducing diabetes-associated symptoms like hyperglycemia and slow down progression to diabetic neuropathy, nephropathy and retinopathy. The rural people lack access to hyperglycemic drugs like insulin and so any plant that can reduce blood glucose levels will prove a boon to the rural people. Diabetes was treated by the FMPs with *Andrographis paniculata*, *Mangifera indica*, *Coccinia grandis*, *Momordica charantia*, or *Azadirachta indica*.

The obvious questions that can be raised as to whether these plants used by the FMPs have scientific validation, or do the plants really have no effect on reducing blood glucose levels. If there is scientific validation, a conclusion can be reached that the FMPs used the plants with proper knowledge of the blood glucose lowering properties of these plants and not through mere superstitious beliefs or quackery. A perusal of the scientific literature points out that all the plants used by the FMPs have reported antihyperglycemic properties. The antidiabetic property of *Andrographis paniculata* has been demonstrated in streptozotocin-induced diabetic rats [28]. The antihyperglycemic potential of *Mangifera indica* seeds, stem bark and leaves has been reported [29-31]. The blood sugar lowering effect of *Coccinia grandis* has been observed in human clinical trials [32]. *Momordica charantia* reportedly can lower blood glucose level in diabetic patients [33]. *Azadirachta indica* leaf extract and seed oil has been shown to have hypoglycemic effect in normal and alloxan diabetic rabbits [34].

Andrographis paniculata was used by the FMPs to treat hepatitis B. Aqueous extract of the plant has been shown to give a hepatoprotective and antioxidative effect against hexachloro cyclohexane induced liver damage in mice [35]. Thus the plant can conceivably be a potential agent for treatment of hepatitis. The cardioprotective effect of *Terminalia arjuna* has also been established [36, 37]; notably, the plant was used by the FMPs to treat heart disorders. Available scientific literature thus clearly demonstrates that the plants used by the FMPs against diabetes, hepatitis, and heart disorders can be validated in their uses based on scientific evidence. Although not discussed, the same is true for a number of the other plants used by the FMPs.

Table 1. Medicinal plants and formulations of the three FMPs of Khulna district

Serial Number	Scientific Name	Family Name	Local Name	Parts used	Ailments and mode of medicinal use
1	*Andrographis paniculata* Burm.f.	Acanthaceae	Kalomeghi	Leaf	Acidity, diabetes, allergy, liver disorders, hepatitis B. Either leaf or pills made from crushed leaves are taken orally with water.
2	*Justicia adhatoda* L.	Acanthaceae	Bashok gach	Leaf, bark	Respiratory difficulties/asthma, coughs. Dried and powdered leaves and bark are orally taken with honey thrice daily before meals.
3	*Aerva sanguinolenta* (L.) Blume	Amaranthaceae	Rokto chita	Leaf	Cuts, wounds and infections. Leaf juice is topically applied.
4	*Mangifera indica* L.	Anacardiaceae	Aam gach	Seed	Diabetes. Half part seeds of *Mangifera indica*, one part seeds of *Syzygium cumini*, and fruits of *Ficus racemosa* ($1/8^{th}$ part of seeds of *Mangifera indica*) are mixed together. The mixture is taken orally twice daily for 10 days, once in the morning on an empty stomach and the other at night after meals. During this time eating of molasses, sugar, sweets and sour tamarind is forbidden.
5	*Centella asiatica* (L.) Urb.	Apiaceae	Thankuni	Leaf, root, stem	To clean bowels, ulcer, stomach disorders, memory enhancer. Juice of crushed leaves, stems and roots are taken orally. Alternately, leaves are cooked and eaten as vegetable.
6	*Coriandrum sativum* L.	Apiaceae	Dhonae	Fruit	Severe chest pain with constriction. Fruits are washed, dried and partly crushed and boiled with sugar till the decoction forms a gum like substance. It is then taken orally after meals thrice daily.
7	*Calotropis gigantea* R.Br.	Apocynaceae	Akondo	Leaf	Pain. Leaves are rubbed with mustard oil and warmed over a fire and then applied to painful areas. The underside of leaf is applied. Note that plant sap can cause skin infections and so should be avoided when applying leaves.
8	*Areca catechu* L.	Arecaceae	Supari	Root	See *Ananas comosus*.
9	*Cocos nucifera* L.	Arecaceae	Narikel	Inflorescence, oil	Infections due to burns, skin diseases. Inflorescences are rubbed against a hard object and the paste that forms is topically applied. Alternately, coconut oil is topically applied.
10	*Phoenix dactylifera* L.	Arecaceae	Khejur	Pith of stem	Pain due to helminthiasis, dysentery. Pith of stem of *Phoenix dactylifera* is mixed with leaf juice of *Psidium guajava* and stem juice of *Musa paradisiaca* and taken orally 2-3 times. Alternately pith of stem is chewed and taken orally 2-3 times.
11	*Ananas comosus* (L.) Merr.	Bromeliaceae	Anarosh	Fruit, stem, pith	Stomach pain, helminthiasis. Pith of *Ananas comosus* is crushed with roots of *Areca catechu* and the juice orally taken. Blood dysentery. Stem juice is orally taken. Abortifacient. Unripe fruits are crushed and orally taken.
12	*Terminalia arjuna* Wight & Arn.	Combretaceae	Arjun gach	Bark	Constipation, heart disorders, blood purifier. Bark is soaked in water overnight and the water taken orally the following morning on an empty stomach.
13	*Tewrminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Bohera	Fruit	See *Terminalia chebula*.
14	*Terminalia chebula* Retz.	Combretaceae	Hortoki	Fruit	Loss of appetite, to increase digestion. Fruits of *Terminalia chebula* are dried, mixed with dried fruits of *Terminalia bellirica* and *Emblica officinalis* and soaked in water overnight followed by drinking the water the following morning on an empty stomach. This is done once daily. Alternately, unripe fruits are taken orally followed by drinking water.
15	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Telakochu	Leaf	Acidity, diabetes. Leaf juice is orally taken or pills made from leaf paste are orally taken or leaves are cooked and eaten.
16	*Momordica charantia* L.	Cucurbitaceae	Korolla	Fruit	Diabetes, allergy. Fruit juice is orally taken.
17	*Emblica officinalis* Gaertn.	Euphorbiaceae	Amloki	Fruit	See *Terminalia chebula*.
18	*Acacia arabica* Willd.	Fabaceae	Babla gach	Gum	Leucorrhea, physical weakness, excessive body temperature. Gum is soaked in water overnight followed by drinking the water along with sugarcane molasses the following morning once daily on an empty stomach.
19	*Saraca asoca* (Roxb.) Willd.	Fabaceae	Ashok fuli	Bark	Irregular menstruation. Bark is sliced and dried followed by soaking the dry bark in water. The water is taken orally with a little sugar on an empty stomach once daily in the morning.
20	*Ocimum gratissimum* L.	Lamiaceae	Tulshi	Leaf	Coughs, asthma, bronchitis. Leaf juice is taken orally with honey once daily on an empty stomach.
21	*Cinnamomum verum* J. Presl	Lauraceae	Daruchini	Bark	Pain in adults. Powdered bark is taken orally with honey twice daily.
22	*Allium cepa* L.	Liliaceae	Peyaj	Bulb	Dysentery throughout the year, to promote new hair growth. Bulbs are chewed and taken orally with or without a little table salt on an empty stomach 1-2 times daily.
23	*Allium sativum* L.	Liliaceae	Roshun	Clove	See *Vitex negundo*.
24	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Leaf	Helminthiasis, diabetes, chicken pox, tooth and gum diseases. Leaf juice is taken orally with fruits of *Piper nigrum.* Skin infections. Leaves are boiled in water followed by washing the affected areas of the skin with the water.
25	*Tinospora tomentosa* Miers. ex Hook.f.	Menispermaceae	Poddo goroj	Stem	Helminthiasis, piles, itches, appendicitis, chicken pox, allergy, blood purifier. Stems are soaked in water overnight after slicing them into small pieces. The water is taken orally the following morning.
26	*Ficus racemosa* L.	Moraceae	Joggo dumur	Fruit	See *Mangifera indica*.
27	*Musa paradisiaca* L.	Musaceae	Bichi kola, Daya kola	Fruit	Diarrhea. Two ripe fruits are burnt along with their skins or boiled in water, mashed and the ashes or mash is stirred in a glass of water and the water taken orally 1-2 times daily. Diarrhea stops within 15 minutes of taking the medication. See *Phoenix dactylifera*.
28	*Psidium guajava* L.	Myrtaceae	Peyara	Leaf	Stomach pain, helminthiasis. Leaf juice is orally taken; alternately, leaves are chewed and orally taken. See *Phoenix dactylifera*.

29	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jaam	Bark, fruit	Dysentery, blood dysentery. Bark juice is mixed with goat milk and taken orally. Alternately, bark is soaked in water overnight and the water taken orally the following morning on an empty stomach. Blood purifier. Ripe fruits are taken orally. See *Mangifera indica*.
30	*Nyctanthes arbor-tristis* L.	Oleaceae	Sheuli	Leaf	Chronic fever, coughs, mucus. Leaf juice is taken orally in the morning with honey.
31	*Piper betel* L.	Piperaceae	Paan	Leaf	See *Zingiber officinale*.
32	*Piper nigrum* L.	Piperaceae	Gol morich	Fruit	Coughs which occur suddenly accompanied by inability to talk, a feeling of bones sticking to throat, and having difficulties in respiration, acidity. Powdered fruits are mixed with extra hot cayenne peppers and pills prepared from the mixture are taken once after meals. See *Azadirachta indica*.
33	*Nigella sativa* L.	Ranunculaceae	Kalo jeera	Fruit	Coughs, body pain, to increase lactation in nursing mother. Fruits are taken orally directly or in the fried or mashed form.
34	*Aegle marmelos* (L.) Correa	Rutaceae	Bael	Fruit	Stomach disorders, constipation, to clear bowels, to keep body cool. Ripe fruit pulp is taken with water in the form of a sherbet. Alternately, unripe fruit pulp is dried, powdered and then rubbed between two stone slabs, following which the powder is soaked in water and taken orally.
35	*Citrus aurantifolia* (Christm.) Swingle	Rutaceae	Kagji lebu	Fruit	Fever, fever with mucus, stomach pain. Fruit juice is mixed with water and sugar and taken orally in the form of sherbet. Alternately, fruit juice is taken orally directly. Alternately, fruits are cut into halves and steamed till they are half-boiled. The steamed parts are then put in a bottle with table salt and kept for a few days. When the parts have become totally soft, they are taken orally.
36	*Glycosmis pentaphylla* (Retz.) A. DC.	Rutaceae	Daton	Leaf	To stop vomiting. Leaf juice is taken orally.
37	*Scoparia dulcis* L.	Scrophulariaceae	Chini guri, Mishri dana	Leaf, root	Blood dysentery. Leaf and root juice is taken orally for 2-3 days.
38	*Vitex negundo* L.	Verbenaceae	Shishanda gach	Root, leaf	Jaundice. Root juice is taken orally on an empty stomach. Alternately, roots are chewed and orally taken. Rheumatic pain. Paste of cloves of *Allium sativum* is first applied to affected areas followed by topical application of warm oil obtained from milk fat containing mustard oil, camphor and leaves of *Vitex negundo* followed by massaging the area. This is done twice daily in the morning and night.
39	*Aloe vera* (L.) Burm.f.	Xanthorrheaceae	Ghritokumari	Leaf	To keep body cool, to stop hair loss, to increase sexual ability, to keep skin moist and fresh. The soft pulp inside leaves is mixed with water and taken orally. For hair loss, the mixture is applied to scalp. During medication period eating of tamarind and molasses is forbidden.
40	*Curcuma longa* L.	Zingiberaceae	Holud	Rhizome	To stop bleeding from cuts and wounds. Rhizome paste is topically applied.
41	*Zingiber officinale* Roscoe	Zingiberaceae	Ada	Rhizome	Whooping cough, indigestion, mucus with coughs. Rhizome slices are chewed and taken orally with *Piper betel* leaves. Alternately, sliced rhizomes are chewed with table salt and taken orally. Alternately, sliced rhizomes are soaked in warm tea or water and the tea or water taken orally along with the slices.

CONCLUSION

A number of the plants used by FMPs of Khulna district especially plants used to treat diseases like diabetes, hepatitis and heart disorders deserve scientific attention.

Acknowledgements
The authors are grateful to the FMPs for providing information.

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