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Journal of Chemical and Pharmaceutical Research, 2015, 7(8):414-420

Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

Ethnomedicinal practices of an urban folk medicinal practitioner of Dhaka city, Bangladesh

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ABSTRACT

Although folk medicinal practitioners are common in rural areas, urban practitioners are a comparative rarity. It was thus of interest to document the ethnomedicinal practices of a folk medicinal practitioner of Dhaka city, which is the capital of Bangladesh and has a population nearing 20 million. The practitioner was observed to use a total of 30 plants distributed into 20 families in his formulations. The practitioner treated a number of difficult to cure diseases as well as common diseases. Cumulatively, the diseases that he treated included cancer, leukemia, diabetes, gastrointestinal disorders, various types of pain, poisoning of various organs of the body due to accumulation of toxins, heart disorders, vomiting, passing of blood with urine, hypertension, weakness, excessive excitement of nervous system, helminthiasis, rheumatism, urinary disorders, blood disorders, fever, respiratory tract disorders, insomnia, piles, kidney stones, skin disorders, heart disorders, menstrual disorders, cholera, malaria, cataract, hair loss, obesity, chicken pox, and weakness. The practitioner also used various plants or plant parts to maintain or improve functions of several major organs of the body. Taken together, the medicinal plants used for diseases treated by the practitioner can prove highly important for further scientific research towards curative as well as preventive purposes.

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

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INTRODUCTION

Folk medicinal practitioners (FMPs) are a common feature of the Bangladesh rural scenario but also can be seen practicing less commonly in urban areas. The practitioners mostly rely on decoctions, juice, or paste of medicinal plants or plant parts for treatment, which formulations are administered orally or topically. It is the view point of some that folk medicine is a 'corrupted' or simplistic form of the more established Ayurvedic or Unani medicinal systems, although our various studies on FMPs suggest that folk medicine has evolved and is still evolving in an independent manner. This is because the knowledge of FMPs are derived independently through trials and errors as well as obtained from friends, relatives or FMPs from an earlier generation. This gain of knowledge from diverse sources is of interest for no two FMPs use the same medicinal plants or treat the same diseases with similar formulations. It is thus of interest to document the medicinal plant uses of the FMPs because such documentation can lead to a better understanding of the medicinal plants and their uses in the country.

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].

Our studies have mainly concentrated on folk medicinal practitioners of rural areas, although we have conducted such surveys in several relatively small cities like Barisal and Khulna [26, 27]. Unlike small cities or towns, Dhaka city, which is the capital of Bangladesh with around 20 million people, is of special interest because of the scarcity of suitable areas from where a FMP can collect his or her medicinal plants and because of possible interaction between FMPs and allopathic doctors. The objective of the present study was to document the medicinal plants used by a FMP of Dhaka city in Dhaka district, Bangladesh.

EXPERIMENTAL SECTION

Prior Informed Consent was obtained from the FMP (Sanjay Kumar Das, male, Mirpur, Dhaka) for the survey. Actual interviews were carried out with the help of a semi-structured questionnaire and the guided field-walk method of Martin [28] and Maundu [29]. In this method, the FMP took the interviewers on guided field-walks through areas from where he collected his medicinal plants, pointed out the plants, and described their uses. Interviews were carried out in the Bengali language, which was spoken alike by the FMP and the interviewers. Plant specimens were photographed, collected, pressed and dried and identified at the Bangladesh National Herbarium. The Bangladesh National Herbarium is also located in Mirpur as well as the Botanical Garden, and it appeared that the FMP collected a number of his plants from the Botanical Garden. The rest of his plants were collected from areas adjoining Dhaka city, which were rural and contained fallow lands and forest areas.

RESULTS AND DISCUSSION

The FMP used a total of 30 plants distributed into 20 families in his various formulations. The results are shown in Table 1. The various diseases that he treated included cancer, leukemia, diabetes, gastrointestinal disorders, various types of pain, poisoning of various organs of the body due to accumulation of toxins, heart disorders, vomiting, passing of blood with urine, hypertension, weakness, excessive excitement of nervous system, helminthiasis, rheumatism, urinary disorders, blood disorders, fever, respiratory tract disorders, insomnia, piles, kidney stones, skin disorders, heart disorders, menstrual disorders, cholera, malaria, cataract, hair loss, obesity, chicken pox, and weakness. The practitioner also used various plants or plant parts to maintain or improve functions of several major organs of the body. Thus a particular point of interest was that at least this urban FMP used plants or plant parts for both therapeutic and preventive purposes.

The plant *Amaranthus blitum* was used by the FMP to treat cancer, diabetes, leukemia, and to maintain normal blood flow. The FMP also used the plants *Catharanthus roseus*, *Basella alba*, *Lilium candidum*, *Delonix regia*, *Swietenia mahagoni*, and *Solanum melongena* to treat cancer. There are several interesting questions here. How did the FMP diagnose diabetes, cancer and leukemia? The FMP admitted that he neither possessed the appropriate diagnostic tools nor had the knowledge to interpret the clinical test results. He depended on allopathic diagnosis. Apparently patients, who have visited allopathic doctor(s) before and have undergone diagnostic procedures for the disease and then have found out that they are not able to afford the allopathic treatment or have been told by the doctor that their condition is terminal comes to him to try alternative treatment. But then what made him choose these plants and not others? This happened, according to the FMP, through trial and errors and knowledge obtained from previous generations.

The obvious question then arises as to whether the plants used by the FMP really have any values in treating cancer, diabetes, or leukemia, the latter being cancer of the bone marrow and blood? Interestingly, although *Amaranthus blitum* is yet to be studied for anticancer effects, several related *Amaranthus* species have reportedly anticancer properties. For instance, ethanol extract of *Amaranthus spinosus* have been shown to have antitumor activity against Ehrlich's ascites carcinoma bearing mice [30]. Tumor cell proliferation inhibitory compounds have been isolated from leaves and stems of *Amaranthus tricolor* [31]. Aqueous extract of *Amaranthus gangeticus* reportedly inhibited the proliferation of liver cancer cell line (HepG2) and breast cancer cell line (MCF-7) [32]. A novel antiproliferative and antifungal lectin has been isolated from *Amaranthus viridis* seeds [33]. This it seems highly probable that possible anticancer compounds and even compounds against leukemia can be found in *Amaranthus blitum*.

Regarding the other plants used by the FMP to treat cancer, various alkaloids isolated from *Catharanthus roseus* like vincristine and vinblastine have already found use in allopathic medicine as anticancer agents [34]. Cytotoxic activity of *Basella alba* has been shown against Jurkat and lung cancer cell lines [35]. Extract of *Lilium candidum* has been shown to modulate the xenotoxicity of the antibiotic zeocin [36]. Cytotoxic activity has been observed with

Delonix regia flower extracts [37]. Although the anticancer potential of *Swietenia mahagoni* (a plant used by the FMP against cancer) is yet to be reported, a related species *Swietenia macrophylla* reportedly possess anticancer activities [38]. Fruit peels of *Solanum melongena* have been shown to be active against hepatocellular carcinoma [39]. Thus it comes as surprising, but it remains a fact that the plants used by this illiterate FMP against cancer all have scientifically reported anticancer activity by themselves or in a closely related species. This suggests that probably through trials and errors conducted over generations, FMPs have gained considerable knowledge of medicinal plants and their properties, which they have learned to use against various diseases, even though they are not in a situation to diagnose the disease(s) themselves.

The use of *Amaranthus blitum* by the FMP to treat diabetes is new. However, other *Amaranthus* species reportedly have antidiabetic effect. Leaf extract of *Amaranthus spinosus* has been shown to attenuate streptozotocin-nicotinamide-induced diabetes and oxidative stress in albino rats [40]. Leaf extract of *Amaranthus tricolor* has been shown to exert a hypoglycemic activity when administered to rats [41]. Antidiabetic activity has been reported for *Amaranthus caudatus*, *Amaranthus spinosus*, and *Amaranthus viridis* [42].

Catharanthus roseus, *Cocos nucifera*, *Basella alba*, *Coccinia indica*, *Artocarpus heterophyllus*, and *Citrus paradisi* were other plants used by the FMP to treat diabetes. Dichloromethane-methanol extract of *Catharanthus roseus* has been observed to produce an antihyperglycemic effect in alloxan diabetic rats [43]. Antidiabetic effect of *Cocos nucifera* husk extract has been reported in alloxan diabetic rats [44]. Aqueous extract of *Basella alba* leaves reportedly showed antidiabetic effect in alloxan induced diabetic albino rats [45]. *Coccinia indica* has been mentioned as a plant for treatment of diabetes in human beings [46]. The antidiabetic and antioxidant activity of fruit extract of *Artocarpus heterophyllus* has been reported [47]. Juice from *Citrus paradisi* caused fall in blood glucose levels and rise in plasma insulin levels in both normal and alloxan diabetic rats [48]. Thus all the plants used by the FMP for diabetes treatment can be seen to be scientifically validated in their uses.

The above discussion clearly indicates that plants used by FMPs in Bangladesh (with the exception of possibly few who are generally quacks) are selected with care and from a good understanding of the medicinal properties of the plants. Moreover, at least the present FMP also used plants to maintain healthy body organs (Table 1). If such plants used to maintain healthy body organs can be found useful in their purposes through scientific studies, it will greatly aid the people, for prevention is always better than cure, and the generally poor people of Bangladesh cannot afford costly allopathic treatments.

Table 1. Medicinal plants and formulations of the folk medicinal practitioner of Dhaka city, Bangladesh

Serial Number	Scientific Name	Family Name	Local Name	Parts used	Ailments and mode of medicinal use
1	*Amaranthus blitum* L.	Amaranthaceae	Lal shak	Leaf	Cancer, diabetes, leukemia, to maintain normal blood flow. Leaf juice obtained from 100-250g leaves is orally taken; alternately, leaves are boiled in water and the water orally taken.
2	*Amaranthus lividus* L.	Amaranthaceae	Data shak	Leaf, stem	To clear bowels, burning sensations in stomach, headache. Leaves and stems are soaked in water following slicing and the water taken orally. Alternately, leaves are boiled in water followed by drinking the water.
3	*Spinacia oleracea* L.	Amaranthaceae	Palong shak	Leaf	Blood purifier, to clear toxins accumulated in stomach and urinary bladder. Leaves are dried and powdered followed by taking the powder orally with water, honey or milk.
4	*Coriandrum sativum* L.	Apiaceae	Dhonae	Leaf, fruit	To strengthen stomach, brain and heart, to increase appetite, abnormal fluttering of heart, vomiting, headache, to remove foul odor from mouth. 3-18g of leaf juice is taken orally; alternately, fruits are dried under the sun and then fried and taken orally.
5	*Catharanthus roseus* L.	Apocynaceae	Nayan tara	Whole plant	Passing of blood with urine, diabetes, hypertension, weakness, excessive excitement of nervous system, helminthiasis, rheumatism, leukemia, cancer. Whole plant juice is orally taken.
6	*Cocos nucifera* L.	Arecaceae	Narikel	Fruit	Bloating, to stimulate secretion of bile, fever due to biliary disorders, burning sensations in body due to heat, urinary disorders, diarrhea, blood dysentery, obesity due to diabetes. Water and pulp from young fruits are taken orally.
7	*Lactuca sativa* L.	Asteraceae	Lettuce	Leaf, seed	Blood purifier, to increase strength, to overcome tiredness, to induce sleep, headache, blood disorders. Leaf juice is orally taken; alternately, leaves and 1-3g seeds are boiled in water followed by drinking the water.
8	*Basella alba* L.	Basellaceae	Puin shak	Leaf	Blood purifier, to increase strength, cancer, diabetes. 115-200g leaves are boiled in water and the water taken orally. Alternately, leaves are dried under the sun, powdered and the powder taken orally with water, honey or rose water.
9	*Brassica nigra* (L.) W.D.J. Koch	Brassicaceae	Shorisha	Leaf, seed	Bloating, pain, loss of appetite, constipation, coughs and mucus. Leaf juice is taken (1-3g) for bloating, loss of appetite and constipation. Seed oil is applied topically to pain affected areas or to nose for coughs and mucus.
10	*Brassica oleracea* var. *botrytis* L.	Brassicaceae	Ful kopi	Inflorescence	To decrease tiredness, to induce sleep, to strengthen heart, stomach and brain functions. Inflorescence is sliced and boiled in water followed by orally taking the whole decoction.
11	*Brassica oleracea* var. *capitata* L.	Brassicaceae	Pata kopi	Leaf	Blood purifier, to increase strength, tiredness, to induce sleep, headache, blood disorder induced diseases. Leaf juice is orally taken; alternately, leaves are boiled in water and the water orally taken.
12	*Raphanus sativus* L.	Brassicaceae	Mula	Leaf, root, flower, seed	To increase urine output, bloating, to aid digestion, piles, mucus, kidney stones, rheumatism, leukoderma, jaundice. 40-60g leaf, root and flower juice is taken orally or 1-6g of seed is boiled in water followed by drinking the water.
13	*Carica papaya* L.	Caricaceae	Pepe	Fruit, seeds	Indigestion, loss of appetite, to induce urination, bloating, burning sensations in heart, stomach or spleen. 2-7g of fruit and seed juice is orally taken daily. Up to 60g of the juice can be taken daily.
14	*Coccinia indica* Wight & Arn.	Cucurbitaceae	Telakucha	Leaf, bark, fruit, seed	Bloating, to clear brain, headache, toothache, helminthiasis, less urination, diabetes. Leaf and bark juice is combined together and taken orally. Alternately, fruit and seed is sliced and taken orally.
15	*Lagenaria vulgaris* Seringe	Cucurbitaceae	Lau	Fruit	Blood purifier, menstrual disorders with pain, to increase milk in nursing mother. Fruits are sliced and orally taken; alternately, fruit juice is orally taken.
16	*Lablab purpureus* (L.) Sweet	Fabaceae	Sim	Leaf	Skin infections. Crushed or powdered or ashes obtained from burning leaves is applied topically.
17	*Mentha spicata* L.	Lamiaceae	Pudina	Leaf	Coughs with mucus, to purify stomach, lungs and urinary bladder from accumulated toxins, to induce urination and sweat, to induce adequate menstruation, pain in ovary, oral lesions, acne, to strengthen gums. 2-7g of leaf juice is orally taken.
18	*Allium cepa* L.	Liliaceae	Peyaj	Bulb	Mucus, loss of appetite, to maintain good urination and good blood flow, bloating, kidney stones. 1-2g (sometimes depending on the disease condition, 25g) of bulb juice is taken orally.
19	*Lilium candidum* L.	Liliaceae	Lily	Root, flower, leaf	Cholera, malaria, cancer, fever, heart disorders. 1-3g roots are boiled in water followed by burning the roots to ashes, which are then taken orally. Alternately, flowers and leaves are soaked in water followed by drinking the water.
20	*Malva verticillata* L.	Malvaceae	Napa shak	Leaf, root	To strengthen heart, liver and stomach functions, helminthiasis, piles. 1-3g leaves and roots are soaked in water overnight followed by drinking the water the following morning with mishri (crystalline sugar) or honey.
21	*Artocarpus heterophyllus* Lam.	Moraceae	Kathal	Fruit	To increase strength, to increase digestion, diabetes, to maintain normal blood flow. Fruits are sliced and taken orally.
22	*Ficus benghalensis* L.	Moraceae	Bot gach	Aerial parts, sap	To increase strength, sex stimulant, bloating, piles, to increase hair growth and strengthen hair base. Juice obtained from 5-10g crushed aerial parts is orally taken with 2-3 drops sap of the plant.
23	*Mirabilis jalapa* L.	Nyctaginaceae	Sandhya maloti	Flower, root	Cataract, blood purifier, skin lesions. Fruits and roots are soaked in water followed by drinking the water.
24	*Jasminum sambac* (L.) Aiton	Oleaceae	Beli	Root	To improve blood circulation, antidote to poisoning, anti-inflammatory. Roots are soaked in water overnight followed by drinking the water the following morning.
25	*Piper betel* L.	Piperaceae	Paan	Leaf	To strengthen teeth and gums, to keep in good condition heart, stomach and brain, jaundice. 4-5g of leaf juice is taken orally daily.
26	*Cymbopogon citratus* (DC. ex Nees) Stapf	Poaceae	Lebu ghas	Leaf, root	Rheumatic pain, joint pain, waist pain, tremors in the body, cholera, dysentery, bloating. 5-7g crushed leaf and root or leaf and root juice is taken orally.
27	*Saccharum barberi* Jeswiet	Poaceae	Aakh	Fruit	Abscess, itch, asthma. 5g fruits are chewed and taken; alternately fruit juice is orally taken.

28	*Ziziphus jujube* L.	Rhamnaceae	Boroi	Fruit	Whooping cough, blood purifier, fever, chicken pox. 5-7 fruits or juice obtained from 5-7 fruits is taken orally daily.
29	*Citrus aurantifolia* (Christm.) Swingle	Rutaceae	Lebu	Fruit	Burning sensations in the stomach, obesity, skin infections. Fruit juice is taken orally.
30	*Citrus paradisi* Macfad.	Rutaceae	Jambura	Fruit	To increase strength, obesity, diabetes, heart disorders. 100g fruit juice is orally taken.

CONCLUSION

The folk medicinal practitioner of the present survey used a number of plants to treat diseases like cancer, diabetes, and rheumatism, which diseases are difficult and costly to treat with allopathic medicine. As such, the plants used for treatment of these diseases merit scientific attention towards discovery of new drugs and providing affordable means of treatment.

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

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