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ORIGINAL ARTICLES

Medicinal Plants Used for Preventive Medicinal Purposes: a Survey in Muktipara Village, Chuadanga District, Bangladesh

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ABSTRACT

Bangladesh has over 5,000 floral species, approximately a fifth of which are considered as medicinal plants. Such plants form the major base of formulations prescribed by folk medicinal practitioners, otherwise known as Kavirajes, for treatment of diverse ailments. Kavirajes are present in almost every villages of the around 86,000 villages of the country and play a major role in providing primary health care to the rural residents. In our various ethnomedicinal surveys, we noticed that Kavirajes prescribe plants for not only curative but also for preventive purposes. Since such plants can play a major role in avoidance of diseases and so save health-care costs, the objective of the present survey was to document the various plants that were advised by the practicing Kaviraj of Muktipara village in Chuadanga district of Bangladesh. A total of 11 plants distributed into 11 families were found to be advised by the Kaviraj to village residents to be taken at different times of the year towards prevention of several common ailments. The various ailments against which the plants were prescribed included respiratory tract infections like coughs, colds and mucus, syndromes produced by excessive exposure to sun's heat, hemorrhoids, skin disorders, chicken pox, and flatulency or bloating, i.e. formation of excessive gas in the stomach. Interviews with the rural households of the village indicated that the plants do give positive effects for which the plants are advised to be taken, indicating that these plants can form as good sources of preventive medicine. Since prevention of disease is much more desirable than occurrence of a disease followed by its cure, the plants merit considerable potential for studies to establish them as functional foods.

Key words: Medicinal plants, preventive medicine, Muktipara, Bangladesh.

Introduction

Folk medicine is a particular form of traditional medicine practiced in Bangladesh by the folk medicinal practitioners, who are known as Kavirajes. Such medicinal practitioners rely almost solely on various medicinal plants for treatment of diverse ailments. Bangladesh has around 86,000 villages, and almost every village has one or two practicing Kavirajes, depending on the village population. In absence of modern clinics or hospitals in the villages, the Kavirajes form the first tier of primary health-care providers to the rural population of the country. Additionally, such Kavirajes also administer primary health-care to a substantial segment of the urban population of the country. The notable feature of treatment by the Kavirajes is that they rely almost exclusively on formulations based on medicinal plants in their treatment. Such formulations are easy to prepare and considering the patient satisfaction and long history of practice by the Kavirajes in the country, appears to be effective.

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We have been documenting the usage of medicinal plants by the Kavirajes of the mainstream population of various villages along with the usage of medicinal plants by the tribal medicinal practitioners for quite some time (Nawaz *et al*., 2009; Rahmatullah *et al*., 2009a-c; Hasan *et al*., 2010; Hossan *et al*., 2010; Mollik *et al*., 2010a,b; Rahmatullah *et al*., 2010a-g; Jahan *et al*., 2011). Notably, both sorts of practitioners use medicinal plants in their treatment of ailments. During the course of our various surveys, we noticed that Kavirajes and tribal medicinal practitioners not only prescribe medicinal plants as curative elements for diseases, but also prescribe them for preventive purposes. We have documented such preventive uses of medicinal plants before among the Chakma tribe residing in Hatimara village of Rangamati district, Bangladesh (Rahmatullah *et al*., 2011). The objective of the present survey was to document the use of medicinal plants for preventive purposes by the Kaviraj practicing in Muktipara village of Chuadanga district, Bangladesh.

Materials and methods

The survey was conducted in Muktipara village, which falls within Chuadanga district of Bangladesh. Sri Gokul Sarkar (48 years old, practicing for 25-26 years) was the practicing Kaviraj in this village. During our interviews with him, it came out that he also advised village residents to partake of several plant preparations, which according to him, have the ability to prevent certain diseases from occurring. With the help of a semi-structured questionnaire, the Kaviraj was queried as to the names and formulations of the plants, along with the names of diseases that according to him, can be prevented with the medicinal plants. The various plant species were shown by him to the interviewers during walks through the village and adjoining areas. Plant specimens were collected and identified by Mr. Manjur-ul-Kadir Mia, ex-Curator and Principal Scientific Officer of the Bangladesh National Herbarium at Dhaka. At the same time, randomly selected village residents were queried as to the preventive efficacy of the plants mentioned by the Kaviraj, and their responses noted.

Results and discussion

A total of 11 plant species distributed into 11 families was advised by the Kaviraj to the village residents to be taken at certain times of the year or for prolonged periods (depending on the usual season for occurrence of the ailment or susceptibility of a person to the ailment). The results are shown in Table 1. Four plant species were advised to be taken for avoidance of skin diseases like scabies or eczema, two plant species for avoidance of chicken pox, two plant species for avoidance of coughs, colds or mucus formation, and one plant species each for prevention of hemorrhoids, flatulency, and for avoidance of various symptoms caused through prolonged exposure to heat by working on hot and sunny days in the open fields.

The rural people of Bangladesh are mostly dependent on cultivating cash crops for their livelihood and food. A small percent are also engaged in catching fish from local water bodies, which they either consume directly, or sell to raise cash incomes. As such, the people are highly dependent on weather conditions. For cultivation of crops, particularly during summer, the cultivators or agricultural laborers have to work for prolonged periods manually under the sun, when the outside conditions are hot and humid. These conditions lead often to heat stroke, or causes symptoms like headache, dizziness, physical weaknesses, vomiting tendency, loss of appetite, and a general feeling of hotness in the body. These are common symptoms for agricultural laborers working manually under the sun for times, which may stretch for a period of several hours without any breaks. The Kaviraj advised such people of consuming the soft pulp within the fleshy leaves of *Aloe vera* by itself or with sugar or molasses. Notably, this preparation was advised to be taken in the morning, i.e. prior to the workers commencing any work.

Because of the poor maintenance of personal hygiene, lack of good quality water, and working with bare hands with soil and other agricultural necessities like fertilizer (which may include cow dung), the agricultural laborers often suffer from skin diseases like scabies or eczema. A number of households have small ditches or ponds within their homes, which ponds are filled with stagnant water. Bathing and washing are done in these ditches, which again is a cause for skin diseases like scabies or eczema. These two skin diseases are a common feature of the rural population, and both adults and children are affected by them. The Kaviraj advised four plants for prevention of skin disorders, namely, *Ipomoea aquatica*, *Azadirachta indica*, *Tinospora cordifolia*, and *Clerodendrum viscosum*. Interestingly, all four plants were to be orally taken and not topically applied. Also two plants among the afore-mentioned four plants, namely *Azadirachta indica* and *Clerodendrum viscosum* are to be taken in combination, suggesting a synergistic effect of both plants. Notably, the plant, *Tinospora cordifolia*, has been previously documented by us to be used by the Chakma tribal medicinal practitioners of Hatimara village in Rangamati district, Bangladesh to be consumed for prevention of scabies (Rahmatullah *et al*., 2011).

Table 1: Medicinal plants advised by the Kaviraj of Muktipara village, Chuadanga district, Bangladesh to be taken as preventive medicine.

Serial Number	Scientific Name	Family Name	Local Name	Utilize Part	Ailment(s) prevented
1	*Justicia adhatoda* L.	Acanthaceae	Bashok	Leaf	Prevention of coughs, colds, and mucus formation. 10-12 leaves of *Justicia adhatoda* are combined with 10-12 leaves of *Ocimum tenuiflorum*, macerated, and ½ cup juice obtained from the macerated mix is taken in the morning on a daily basis. Since the above ailments usually occur at the change of seasons, the formulation is to be taken regularly for a few days before change of season occurs. During winter, the above formulation is advised to be taken on a regular basis throughout the winter months.
2	*Aloe vera* (L.) Burm.f.	Aloaceae	Ghritokumari	Soft pulp within leaf	Syndromes produced during excess exposure to sun's heat like headache, dizziness, physical weakness, vomiting tendency, loss of appetite, hotness of body. The soft pulp within the fleshy leaves is taken out after removing the outer layer. 2-3 spoonfuls of the jelly-like pulp are then taken in the morning on an empty stomach. Alternately, 2-3 spoonfuls of the jelly-like pulp is mixed in 1 glass of water along with 2-3 spoonfuls of sugar or molasses and taken every morning on an empty stomach. It is believed that such taking of the pulp in the morning will keep the body free from any conditions arising out from working later in the day under the hot sun. Note that this preventive remedy is mostly used during summer, when the temperature is high outside and the sun shines throughout the day. The remedy is most used by farmers, who by necessity have to work in the fields all day.
3	*Chenopodium album* L.	Chenopodiaceae	Bhaetae, Botua shak	Whole plant apart from root	Prevention of hemorrhoids. Persons who are considered to possess a good probability for developing hemorrhoids or persons who already have had one bout of hemorrhoids are given ½ cup amount juice obtained from macerated plant (without roots), which is taken with 1-2 powdered seeds of black pepper. This is to be taken once daily. Alternately, the whole plant (without roots) is slightly boiled in water and taken regularly as a vegetable.
4	*Ipomoea aquatica* Forssk.	Convolvulaceae	Kolmi	Leaf, top of stem	Skin disorders like scabies or eczema. Skin disorders occur more in the rural population at certain periods of the year. During these periods, ½ cup amount of juice obtained from macerated leaves is taken daily as a preventive measure. Alternately, leaves and top of stems are boiled in water and consumed. This measure is also advised for people who are susceptible to skin disorders like scabies or eczema.
5	*Cuscuta reflexa* Roxb.	Cuscutaceae	Shorno lota	Whole plant	Chicken pox. ½ tola (local measure approximating 12.5g) obtained from macerated whole plant is taken every morning for 7 days. This is done prior to the advent of spring when chicken pox usually occurs.
6	*Ocimum tenuiflorum* L.	Lamiaceae	Tulshi	Leaf	Prevention of coughs, colds, and mucus formation. 10-12 leaves of *Justicia adhatoda* are combined with 10-12 leaves of *Ocimum tenuiflorum*, macerated, and ½ cup juice obtained from the macerated mix is taken in the morning on a daily basis. Since the above ailments usually occur at the change of seasons, the formulation is to be taken regularly for a few days before change of season occurs. During winter, the above formulation is advised to be taken on a regular basis throughout the winter months.
7	*Allium sativum* L.	Liliaceae	Roshun	Bulb	Flatulency or bloating (formation of gas in stomach). 3-4 medium-sized cloves from bulb of the plant are warmed over low heat and taken at least once daily. The warmed cloves are to chewed by adults. Children are given warm macerated cloves.
8	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Leaf	Skin diseases. Equal amounts of leaves from *Clerodendrum viscosum* and *Azadirachta indica* are taken, crushed thoroughly, and 21 pills prepared from the mixture. The pills are thoroughly dried in the sun and kept in air-tight container. One pill is taken daily with water on an empty stomach.
9	*Tinospora cordifolia* (Willd) Hook.f. & Thoms.	Menispermaceae	Guloncho	Top of stem	Skin disorders like scabies or eczema. About 1 inch portion from the top of stem is chewed and eaten.
10	*Moringa oleifera* Lam.	Moringaceae	Sojina	Leaf, fruit	Chicken pox. This disease usually occurs in Bangladesh during the spring and summer months, i.e. roughly from March till August, but mostly occurs during spring. During this time, the Sojina tree also bears flowers and fruits. As a preventive measure against chicken pox, ½ cup juice obtained from macerated leaves is taken once daily. Leaves are also consumed in the fried form, or boiled in water and taken in the mashed form. The fruits are cooked and eaten as vegetable. When small pox used to be present, the above preventive measures used to also taken against small pox.
11	*Clerodendrum viscosum* Vent.	Verbenaceae	Bhati	Leaf	Skin diseases. Equal amounts of leaves from *Clerodendrum viscosum* and *Azadirachta indica* are taken, crushed thoroughly, and 21 pills prepared from the mixture. The pills are thoroughly dried in the sun and kept in air-tight container. One pill is taken daily with water on an empty stomach.

Changes of seasons like from summer to winter or vice versa is accompanied by diseases like flu, coughs, colds, and mucus formation in practically every country of the world. Bangladesh is no exception to this general rule. Additionally, the rainy season (which includes the monsoon months from around June till September) is a period where the population is subject to incessant rainfall, the whole landscape is wet, and people get wet every time they have to go outdoors for field or other works. During these periods, the Kaviraj advised partaking of the juice obtained from the combination of leaves of two plants, namely *Justicia adhatoda* and *Ocimum tenuiflorum*. Incidentally, both plants are also used by Kavirajes for treatment of respiratory tract disorders like coughs, colds, asthma, mucus formation, and bronchitis.

The advent of the spring season in the Bengali month of Baisakh (mid-April till mid-May) brings on attacks of chicken pox. The Kaviraj advised two plants toward prevention of this disease, namely *Cuscuta reflexa* and *Moringa oleifera*. *Moringa oleifera* is also used by Kavirajes in other regions of the country for treatment of chicken pox as well as small pox (when the latter used to be prevalent in past times). However, the use of *Cuscuta reflexa* for prevention of chicken pox has not been observed by us in our previous ethnomedicinal surveys. In a previous survey conducted in Dinajpur district of the country, we have observed the use of *Moringa oleifera* as a preventive measure against chicken pox (rahmatullah *et al*., 2009b).

The plant – *Chenopodium album*, was observed to be advised by the Kaviraj for consumption to prevent hemorrhoids. Only those persons were advised to consume the plant – persons who have a good probability to develop hemorrhoids, and people, who already have had one bout of this ailment.

The rural population, when questioned about the various plants advised by the Kaviraj for prevention of the ailments mentioned, expressed considerable satisfaction and agreed in general that the plants mentioned served the purposes for which they were consumed. A point worth mentioning in this regard is that all 11 plants were advised by the Kaviraj to be orally consumed in the raw or cooked form, even though the ailment may be something like skin disorders, for which topical administration may appear to be the more common choice.

Food items (including plant-derived items), which can maintain healthy body conditions and prevent diseases have attracted the attention of scientific communities throughout the world. Such items are also known by various terms like 'nutraceuticals' and 'functional foods'. Use of medicinal plants for preventing diseases is not something unique to Bangladesh. To cite only a few recent publications, regular consumption of polyphenols – secondary metabolites of plants, has been correlated with reduced risk of cardiovascular diseases, diabetes, arthritis, and cancer in epidemiologic studies. Anthocyanins, another group of plant constituents, have been reported to significantly increase serum antioxidant potential, when consumed in diet and as such, can be beneficial in reduced risks of hypertension, cardiovascular disorders, and diabetes, among other diseases (Saluk-Juszczak, 2010). The flowers of *Hibiscus sabdariffa* have been shown to contain a good percentage of dietary fiber as well as high antioxidant capacity (Sáyago-Ayerdi and Goñi, 2010). The seed coat matter of finger millet (*Eleusine coracana*) has been shown to ameliorate hyperglycemia and its associated complications in streptozotocin-induced diabetic rats (Shobana *et al*., 2010).

The edible fruits of a wild plant, *Rosa canina*, have been suggested to replace synthetic additives in functional foods as a natural antioxidant (Egea *et al*., 2010). The plant, *Aloe vera*, recently is getting increasing prominence as a functional ingredient in foods (Rodríguez-Rodríguez *et al*., 2010). The fruits of bitter melon (*Momordica charantia*) have been for centuries recommended by the Indian traditional medicine system of Ayurveda as a functional food to prevent and treat diabetes and associated complications. The antidiabetic, as well as the anti-tumor potential of the fruits is starting to get validated in scientific literature (Nerurkar and Ray, 2010).

It is an oft repeated phrase that 'prevention is better than cure'. Prevention of diseases from occurring in the first place reduces financial costs and other stresses for both probable patients as well as the Government. The plants reported in this study, from the degree of satisfaction evidenced by the rural population about their disease preventive abilities merit further scientific studies to learn more about their phytochemical constituents and their preventive ability status. Such studies will not only validate the use of the above-mentioned plants for preventive purposes in Bangladesh but throughout the whole world.

References

Egea, I., P. Sánchez-Bel, F. Romojaro and M.T. Pretel, 2010. Six edible wild fruits as potential antioxidant additives or nutritional supplements. Plant Foods for Human Nutrition, 65: 121-129.

Hasan, M.M., M.E.A. Annay, M. Sintaha, H.N. Khaleque, F.A. Noor, A. Nahar, S. Seraj, R. Jahan, M.H. Chowdhury and M. Rahmatullah, 2010. A survey of medicinal plant usage by folk medicinal practitioners in seven villages of Ishwardi Upazilla, Pabna district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 4: 326-333.

Hossan, M.S., A. Hanif, B. Agarwala, M.S. Sarwar, M. Karim, M.T. Rahman, R. Jahan and M. Rahmatullah, 2010. Traditional use of medicinal plants in Bangladesh to treat urinary tract infections and sexually transmitted diseases. Ethnobotany Research and Applications, 8: 61-74.

Jahan, F.I., M.R.U. Hasan, R. Jahan, S. Seraj, A.R. Chowdhury, M.T. Islam, Z. Khatun and M. Rahmatullah, 2011. A Comparison of Medicinal Plant Usage by Folk Medicinal Practitioners of two Adjoining Villages in Lalmonirhat district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 5: 46-66.

Mollik, M.A.H., M.S. Hossan, A.K. Paul, M.T. Rahman, R. Jahan and M. Rahmatullah, 2010a. A comparative analysis of medicinal plants used by folk medicinal healers in three districts of Bangladesh and inquiry as to mode of selection of medicinal plants. Ethnobotany Research and Applications, 8: 195-218.

Mollik, M.A.H., A.I. Hassan, T.K. Paul, M. Sintaha, H.N. Khaleque, F.A. Noor, A. nahar, S. Seraj, R. Jahan, M.H. Chowdhury and M. Rahmatullah, 2010b. A survey of medicinal plant usage by folk medicinal practitioners in two villages by the Rupsha River in Bagerhat district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 4: 349-356.

Nawaz, A.H.M.M., M. Hossain, M. Karim, M. Khan, R. Jahan and M. Rahmatullah, 2009. An ethnobotanical survey of Rajshahi district in Rajshahi division, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 3: 143-150.

Nerurkar, P. and R.B. Ray, 2010. Bitter melon: antagonist to cancer. Pharmaceutical Research, 27: 1049-1053.

Rahmatullah, M., D. Ferdausi, M.A.H. Mollik, M.N.K. Azam, M.T. Rahman and R. Jahan, 2009a. Ethnomedicinal Survey of Bheramara Area in Kushtia District, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 3: 534-541.

Rahmatullah, M., A. Noman, M.S. Hossan, M.H. Rashid, T. Rahman, M.H. Chowdhury and R. Jahan, 2009b. A survey of medicinal plants in two areas of Dinajpur district, Bangladesh including plants which can be used as functional foods. American Eurasian Journal of Sustainable Agriculture, 3: 862-876.

Rahmatullah, M., A.K. Das, M.A.H. Mollik, R. Jahan, M. Khan, T. Rahman and M.H. Chowdhury, 2009c. An Ethnomedicinal Survey of Dhamrai Sub-district in Dhaka District, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 3: 881-888.

Rahmatullah, M., D. Ferdausi, M.A.H. Mollik, R. Jahan, M.H. Chowdhury and W.M. Haque, 2010a. A Survey of Medicinal Plants used by Kavirajes of Chalna area, Khulna District, Bangladesh. African Journal of Traditional, Complementary and Alternative Medicines, 7: 91-97.

Rahmatullah, M., M.A. Khatun, N. Morshed, P.K. Neogi, S.U.A. Khan, M.S. Hossan, M.J. Mahal and R. Jahan, 2010b. A randomized survey of medicinal plants used by folk medicinal healers of Sylhet Division, Bnagladesh. Advances in Natural and Applied Sciences, 4: 52-62.

Rahmatullah, M., A.A.B.T. Kabir, M.M. Rahman, M.S. Hossan, Z. Khatun, M.A. Khatun and R. Jahan, 2010c. Ethnomedicinal practices among a minority group of Christians residing in Mirzapur village of Dinajpur District, Bangladesh. Advances in Natural and Applied Sciences, 4: 45-51.

Rahmatullah, M., M.A. Momen, M.M. Rahman, D. Nasrin, M.S. Hossain, Z. Khatun, F.I. Jahan, M.A. Khatun, and R. Jahan, 2010d. A randomized survey of medicinal plants used by folk medicinal practitioners in Daudkandi sub-district of Comilla district, Bangladesh. Advances in Natural and Applied Sciences, 4: 99-104.

Rahmatullah, M., M.A.H. Mollik, M.N. Ahmed, M.Z.A. Bhuiyan, M.M. Hossain, M.N.K. Azam, S. Seraj, M.H. Chowdhury, F. Jamal, S. Ahsan and R. Jahan, 2010e. A survey of medicinal plants used by folk medicinal practitioners in two villages of Tangail district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 4: 357-362.

Rahmatullah, M., M.A.H. Mollik, M.K. Islam, M.R. Islam, F.I. Jahan, Z. Khatun, S. Seraj, M.H. Chowdhury, F. Islam, Z.U.M. Miajee and R. Jahan, 2010f. A survey of medicinal and functional food plants used by the folk medicinal practitioners of three villages in Sreepur Upazilla, Magura district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 4: 363-373.

Rahmatullah, M., R. Jahan, M.A. Khatun, F.I. Jahan, A.K. Azad, A.B.M. Bashar, Z.U.M. Miajee, S. Ahsan, N. Nahar, I. Ahmad and M.H. Chowdhury, 2010g. A pharmacological evaluation of medicinal plants used by folk medicinal practitioners of Station Purbo Para Village of Jamalpur Sadar Upazila in Jamalpur district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 4: 170-195.

Rahmatullah, M., P. Chakma, A.K. Paul, D. Nasrin, R. Ahmed, F. Jamal, D. Ferdausi, M. Akber, N. Nahar, S. Ahsan and R. Jahan, 2011. A survey of preventive medicinal plants used by the Chakma residents of Hatimara (south) village of Rangamati district, Bangladesh. American Eurasian Journal of Sustainable Agriculture, 5: 92-96.

Rodríguez-Rodríguez, E., J. Darias Martín and C. Díaz Romero, 2010. *Aloe vera* as a functional ingredient in foods. Critical Reviews in Food Science and Nutrition, 50: 305-326.

Saluk-Juszczak, J., 2010. Anthocyanins as components of functional food for cardiovascular risk prevention. Postępy Higieny I Medycyny Doświadczalnej (Online), 64: 451-458.

Sáyago-Ayerdi, S.G. and I. Goñi, 2010. *Hibiscus sabdariffa* L: source of antioxidant dietary fiber. Archivos Latinoamericanos de Nutrición, 60: 79-84.

Shobana, S., M.R. Harsha, K. Platel, K. Srinivasan and N.G. Malleshi, 2010. Amelioration of hyperglycaemia and its associated complications by finger millet (*Eleusine coracana* L.) seed coat matter in streptozotocin-induced diabetic rats. British Journal of Nutrition, 104: 1787-1795.