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Research Article

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A randomized survey of ethnomedicinal plants used in Patuakhali district, Bangladesh

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ABSTRACT

An ethnomedicinal survey was conducted among three randomly chosen folk medicinal practitioners (Kavirajes) of Patuakhali district to document the folkloric use of medicinal plants. Interviews of the Kavirajes were carried out with the help of a semi-structured questionnaire and the guided field-walk method. The three Kavirajes (two males and one female) were observed to use a total of 23 plants distributed into 16 families. The Fabaceae family contributed the most plants with 4 plants followed by the Euphorbiaceae family with 3 plants. The various plants were used for treatment of respiratory tract disorders, jaundice, blood disorder, wounds, burning sensations in hand or foot, diabetes, inflammation, skin disorders, gastrointestinal disorders, dental caries, pain, weakness, and arthritis. A noteworthy feature was that four plants were used separately to treat diabetes, which opens up a promising aspect of further research on these plants towards discovery and development of possibly novel antidiabetic drugs.

Key words: Folk medicine, ethnomedicine, medicinal plants, Kavirajes, Patuakhali, Bangladesh

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INTRODUCTION

Folk medicine practice is conducted by folk medicinal practitioners in Bangladesh, who are otherwise known as Kavirajes or Vaidyas. Kavirajes do not have any formal education, i.e. they are not qualified graduates from any Government-recognized institutions. Instead, they usually obtain their knowledge generation-wise, i.e. from a close member of the family from an earlier generation. As such, folk medicinal practices can take a variety of forms including treatment with plant or animal parts, minerals, incantations, worships, amulets, sacrifices or a combination of multiple such practices. However, as a general rule, medicinal plants constitute the primary ingredient in their formulations, which are usually simple and taken orally or applied topically depending on the disease.

According to the World Health Organization (WHO), folk medicine is mostly practiced by indigenous or native populations and as much as 80% of the population in certain countries within Asia and Africa rely on it for primary health care [1]. Not only under-developed countries, but also developed countries can have their folk medicinal practitioners. For instance, folk medicines for treatment of malaria have been described for Calabria in southern Italy [2]. In the Indian sub-continent countries like India, Pakistan or Bangladesh, folk medicine is widely practiced in a variety of forms [3, 4]. We have also conducted a number of surveys among folk medicinal practitioners and

tribal medicinal practitioners; the latter can be considered as folk medicine of tribal people versus the folk medicinal practitioners, who practice among the mainstream population [5-19].

Since adequate documentation of traditional medicinal practices can lead to discovery of new and more efficacious drugs [20], the objective of this study was to conduct an ethnomedicinal survey among three folk medicinal practitioners, who were randomly chosen in Patuakahli district in the southern part of Bangladesh.

EXPERIMENTAL SECTION

The present survey was carried out in Kuakata, Bipinpur, and Mishripara areas of Patuakhali district, Bangladesh during 2014. The Kaviraj at Kuakata was Nuru Majhi, male, and of 55 years of age. The Kaviraj at Bipinpur was Rahima Khatun, female and of age 52 years. The Kaviraj at Mishripara was Shahadat Kaviraj, male and 42 years in age. Prior Informed Consent was first obtained from all three Kavirajes. They were explained as to the nature of our visit and consent obtained to disseminate any information obtained both nationally and internationally. Actual interviews were conducted with the help of a semi-structured questionnaire and the guided filed-walk method of Martin [21] and Maundu [22]. In this method, the Kavirajes took the interviewers on guided field-walks through areas from where they collected their medicinal plants, pointed out the plants, and described their uses. Plant specimens were photographed, collected, pressed and dried and brought to Dhaka, where they were identified at the Bangladesh National Herbarium.

RESULTS AND DISCUSSION

The three Kavirajes, in between themselves, were observed to use a total of 23 plants in their formulations. These plants were distributed into 16 families. The Fabaceae family contributed the most plants with 4 plants followed by the Euphorbiaceae family with 3 plants. The various plants were used for treatment of respiratory tract disorders, jaundice, blood disorder, wounds, burning sensations in hand or foot, diabetes, inflammation, skin disorders, gastrointestinal disorders, dental caries, pain, weakness, and arthritis. The results are shown in Table 1. The importance of Fabaceae family plants in ethnomedicine has also been noted previously [23]. The Fabaceae family comprises of about 7,000 species and various species belonging to this family are used as food as well as medicines.

The Kavirajes mainly used a single plant or plant part to treat one or more diseases. The only exception was the use of leaf juice of *Justicia adhatoda* along with rhizome juice of *Zingiber officinale* for treatment of coughs. Formulations were advised to be orally partaken or topically applied depending on the disease. One unusual mode of treatment was the use of *Justicia gendarussa* for treatment of respiratory tract disorders, where leaves and roots of the plant were tied to the waist.

A number of the plants used by the Kavirajes can be shown to be scientifically validated in their uses based on published scientific reports. For instance, *Justicia adhatoda* has been shown to be effective for coughs [24]. The hepatoprotective potency of *Achyranthes aspera* has been reported [25]; the plant was used to treat jaundice by the Kavirajes.

One note worthy feature of the Kavirajes' treatment was the treatment of diabetes. Diabetes is characterized by high blood glucose levels, can lead to other complications, and has no total treatment in allopathic medicine. Four plants were used separately to treat diabetes. It was of interest to find out the scientific validations, if any, behind the use of these plants. The blood sugar lowering effect of *Coccinia grandis* has been reported [26]. Significant blood glucose lowering effect has been observed with aqueous extract of *Phyllanthus emblica* fruits in Type 2 diabetes [27]. Antihyperglycemic activity of *Swietenia macrophylla* seed extract has been reported in normoglycemic rats undergoing glucose tolerance tests [28]. The antihyperglycemic properties of *Tinospora crispa* extract have also been shown [29]. Thus taken together, all four plants used by the Kavirajes against diabetes have been shown to have antihyperglycemic effects when administered to experimental animals, thus validating the Kavirajes' use of the plants.

Table 1. Medicinal plants and formulations of the three Kavirajes of Patuakhali district, Bangladesh

Serial Number	Scientific Name	Family Name	Local Name	Parts used	Disease, Symptoms, Formulations, and Administration
1	*Justicia adhatoda* L.	Acanthaceae	Bashok	Leaf	Coughs. Leaf juice of *Justicia adhatoda* is mixed with rhizome juice of *Zingiber officinale*, honey and a little salt and taken orally.
2	*Justicia gendarussa* Burm.	Acanthaceae	Bamon hati	Leaf, root	Coughs, asthma, trouble breathing, tight feeling in chest, abnormal sound during breathing. Leaf and root is tied around the waist.
3	*Achyranthes aspera* L.	Amaranthaceae	Apang	Leaf	Jaundice (symptoms: yellowish color of skin, whiteness of eye, pale colored stool, dark urine color, sometimes accompanied with fever and stomach pain). Leaf juice is topically applied to head and also taken orally.
4	*Hemidesmus indicus* R. Br.	Apocynaceae	Krisna anantamul	Bark of root	Blood disorder, meho (endocrinological disorder, symptoms: burning sensations during urination). Bark of root is dried and then boiled and orally taken.
5	*Nerium indicum* Mill.	Apocynaceae	Korobi	Leaf, bark of stem and root	Wound healing. Crushed leaf or bark is directly applied on the wound.
6	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Telakucha	Leaf	Burning sensations in hand or foot. Leaves are rubbed on palms of hands or soles of feet. Diabetes. Juice extracted from 10 leaves is taken orally every morning on an empty stomach.
7	*Croton bonplandianum* Baill.	Euphorbiaceae	Mukjhuri, Bon tulshi	Stem	Cuts and wounds. Stem juice is applied topically.
8	*Phyllanthus emblica* L.	Euphorbiaceae	Gui amla	Leaf, bark	Inflammation. Crushed leaves are topically applied to skin on the inflamed area. Diabetes. Crushed leaf or bark is mixed with water and taken orally twice per day.
9	*Trewia polycarpa* Benth.	Euphorbiaceae	Silani pitali	Leaf, flower, fruit	Dysentery (symptoms: abdominal pain, sudden high fever, flatulence, urgency to pass stool, loss of appetite, weight loss). Leaves, flowers or fruits are crushed to make powder, which is taken orally twice daily.
10	*Caesalpinia bonduc* (L.) Roxb.	Fabaceae	Latta	Fruit	Fever, eczema. Dried fruits are fried and powdered and orally taken (dose one and a half rati; rati is a local measure, 80 ratis equivalent to about 1 kg).
11	*Cassia occidentalis* L.	Fabaceae	Bonnyo dhoincha	Whole plant	Itching, ringworm infection. Whole plant is crushed in coconut oil and topically applied to affected areas of the skin.
12	*Cassia sophera* L.	Fabaceae	Kal kashondi	Whole plant	Asthma, allergy. Any part of the plant or the whole plant is crushed and taken orally.
13	*Glycyrrhiza glabra* L.	Fabaceae	Josti modhu	Leaf, root	Atopic dermatitis (symptoms: dry and scaly skin, redness, usually occurs in the arms, legs, face and neck). Crushed leaves and roots are topically applied on affected areas of skin). Dental caries (symptoms: cavities in the teeth, bad breath, toothache). About 20 leaves are smashed and taken orally.
14	*Barringtonia acutangula* (L.) Gaertn.	Lecythidaceae	Hijol	Leaf, root	Diarrhea, dysentery. Leaves are collected, crushed, mixed with water and taken orally twice daily. Alternately, dried and powdered roots are taken orally once daily.
15	*Sida cordifolia* L.	Malvaceae	Berela, Gulipas	Leaf, root	Weakness. Leaves and roots are boiled in water to produce an oily decoction. The decoction is filtered and the filtrate taken orally.
16	*Swietenia macrophylla* King	Meliaceae	Mahogany	Seed	Diabetes. Seeds are dried and powdered. Pills prepared from the powder are taken orally (one pill once daily).
17	*Tinospora crispa* Miers	Menispermaceae	Aam guruj	Stem	Diabetes (symptoms: frequent urination, excessive thirst, increased hunger, weight loss, fatigue). Stem is crushed and dried and then taken by mouth.
18	*Ludwigia prostrata* Roxb.	Onagraceae	Khet papra	Stem	Asthma, coughs. Stem is dried and powdered. The powder is mixed with warm water and taken orally twice daily.
19	*Rubus fruticosus* L.	Rosaceae	Blackberry	Leaf, bark of root	Diarrhea, dysentery. Paste of leaves and root bark is taken once daily orally.
20	*Aegle marmelos* (L.) Corr.	Rutaceae	Bael	Fruit	Constipation. Fruit juice is taken orally.
21	*Smilax zeylanica* L.	Smilacaceae	Kumar lota	Top part of stem	Indigestion (symptoms: nausea with or without vomiting, abdominal pain, acidic taste in mouth). Top part of stem is dried and taken orally.
22	*Cissus quadrangularis* L.	Vitaceae	Harvanga	Leaf	Body pain, arthritis (symptoms: joint pain, joint swelling, joint redness, hot/warm feeling in joint). Paste of leaf is taken orally. Bone fracture. Paste of leaf and head of climbing perch fish (*Anabas testudineus*, Bengali: Koi) is applied topically over the fractured area.
23	*Zingiber officinale* Roscoe	Zingiberaceae	Ada	Rhizome	See *Justicia adhatoda*.

CONCLUSION

A number of medicinal plants and formulations were obtained from three randomly selected Kavirajes from three areas in Patuakhaliu district, Bangladesh. The medicinal plants and formulations of the Kavirajes can form the basis for further studies and research towards development of possible new drugs. The various plants used by the Kavirajes for treatment of diabetes can be seen to be scientifically validated from scientific reports on their antidiabetic properties.

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