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ORIGINAL ARTICLE

Ethnomedicinal Practices among a Minority Group of Christians Residing in Mirzapur Village of Dinajpur District, Bangladesh

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ABSTRACT

Christians form a minority group within the overall Muslim population of Bangladesh and comprises less than 0.5% of the total population. The majority of Christians belong to the various tribes, while non-tribal pockets of Christian population, who have converted to Christianity from Hinduism or Islam are spread around the country. The objective of the present survey was to conduct an ethnomedicinal survey among one such pocket of Christianity in Mirzapur village of Dinajpur district of Bangladesh. It was observed that the group depends on their own folk medicinal healers or Kavirajes for their primary health-care needs. After obtaining informed consent of the Kavirajes, interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method. Data was obtained on the medicinal plants or plant parts used, ailments treated, formulations and administration. All plant specimens as pointed out by the Kavirajes were collected, dried and identified at the Bangladesh National Herbarium. It was observed that 41 medicinal plant species distributed into 28 families were used by the Christian Kavirajes for treatment of various ailments. The ailments treated included pain, gastrointestinal disorders, urinary tract infections, hepatic problems, cuts and wounds, sexual disorders, kidney and gall bladder stones, diabetes, heart disorders, tumor, elephantiasis, rheumatism, edema, epilepsy, nerve weakness, respiratory tract disorders, paralysis, fever, helminthiasis, and debility. Overall, it may be concluded that the medicinal plants used by the Kavirajes can be of excellent potential for further scientific studies and discovery of newer and effective drugs. At the same time, the importance of conservation of these medicinal plants must be emphasized for it was observed that a considerable number of the plants are fast disappearing from the wild because of over-exploitation and lack of conservation measures.

Key words: Christians, Mirzapur, medicinal plants, Bangladesh

Introduction

Bangladesh has a long history of usage of medicinal plants for treatment of various ailments. The traditional medicinal healers can be divided into three mainstreams, namely the Ayurvedic, Unani, and folk medicinal systems. The folk medicinal healers generally use medicinal plants or plant parts for treatment, and since the practice is usually confined to the immediate family and passed on from generation to generation, the folk medicinal healers over the years have acquired considerable knowledge of medicinal plants. In our earlier surveys (Hanif *et al.*, 2009: Shahidullah *et al.*, 2009; Nawaz *et al.*, 2009: Nawaz *et al.*, 2009: Hossan

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et al., 2009; Mia *et al.,* 2009), we have observed that the medicinal plants administered for treatment of various ailments vary considerably from region to region or even between individual Kavirajes. We are now conducting an extensive survey among the various regions and tribes of Bangladesh as to the type of medicinal plants used, ailments treated, formulations, and dosages.

Bangladesh is primarily a Muslim country (over 90% of the population being Muslims). The Hindus form the second largest group. The Christians form less than 0.5% of the population, with several tribal groups having converted to Christianity in recent times. However, the advent of Christianity goes back about four hundred years back, so that there are pockets of Christians spread around various regions of Bangladesh. One such area is the Christian para of Mirzapur village in Dinajpur district in the northern part of Bangladesh (note that para is a Bangla word denoting an area). In a preliminary survey, it was observed that the Christians residing in Mirzapur village are administered to by their own folk medicinal practitioners, who use medicinal plants for treatment of various ailments. The objective of this study was to conduct an ethnomedicinal survey among the Christian Kavirajes of Mirzapur village.

Materials and Methods

2.1 Area of survey

Dinajpur district is one of the northern-most districts of Bangladesh and lies roughly between 88º20 - 89º20 E and 25º10 - 26º05 N. There are thirteen sub-districts within Dinajpur district with the present study being conducted among the Christian community at the village of Mirzapur in Dinajpur Sadar sub-district. Unlike other villages of Dinajpur Sadar with a predominantly Muslim population, Mirzapur is distinguished through having a sizeable Christian community residing within the village. Agriculture is the main occupation of the Christian community residing at Mirzapur.

2.2 Data collection and mode of survey

Informed consent was obtained of the Kavirajes prior to the survey. The Kavirajes were explained as to the purpose of the visit and it was also mentioned that the survey results may be disseminated both nationally and internationally. The Kavirajes had no objections to disseminate the survey results. Interviews were conducted in the Bangla language (spoken by both interviewers and those who were interviewed) with the help of a semi-structured questionnaire. The basic method employed was that of Martin (Martin, 1995) and Maundu (1995), where the Kavirajes took the interviewers on guided field-walks during day time through the areas from where they collected their medicinal plants, pointed them out, and described their uses. All information was noted down carefully and cross-checked with the Kavirajes in evening sessions. Plant specimens were collected and identification completed at the Bangladesh National Herbarium.

Results and Discussion

Information on 41 medicinal plants distributed into 28 families was obtained in the present survey. The results are presented in Table 1. With eight exceptions, it was observed that a single plant part from a given medicinal plant was generally used for treatment of a single or multiple ailments. For instance, the leaves of *Justicia gendarussa* were used for treatment of back pain, while the bark of *Aloe vera* was used to keep the body cool and also to treat burning sensations during urination. Some of the exceptions to this general mode of treatment included a combination of bark of root along with fruit of *Cassia fistula* being administered for leprosy and tonsillitis, and leaves and stems of *Tinospora cordifolia* being administered by the Kavirajes as treatment for rheumatism. A treatment may simultaneously consist of both oral as well as topical administration; for treatment of abdominal edema, the leaves of *Pteridium aquilinum* are cooked and eaten as vegetable, while the roots are tied to the abdomen. A single instance was observed where four different plant parts of the same plant was used; the leaves, stems, roots and fruits of *Datura metel* were mixed, crushed together and orally administered for treatment of asthma or insanity. It is to be noted that the juice obtained from crushing a mixture of all four plant parts was also applied to eyes for treatment of eye pain.

Two ethnoveterinary applications of medicinal plants were also observed in the present study. The roots of *Synedrella nodiflora* were administered to cattle for swelling of abdomen (they were also used for the same purpose in human beings), and the roots of *Ipomoea fistulosa* were used for treatment of cataract in cattle. One plant (*Opuntia dillenii*) was used to ward off evil spirits (or ghosts) following childbirth. The Kavirajes as well as the general populace of Mirzapur village believed that a child, especially soon after birth, is susceptible to evil spirits (which they termed also as ghosts) or the “evil eye” and it was observed that quite elaborate precautions through use of *Opuntia dillenii* were conducted to ward off this “evil”.

Among the plant parts used for treatment, leaves formed the part of the plant most frequently used (39.2%), closely followed by roots (33.3%). Other plant parts like bark, stem, fruit, and flower were used only occasionally, while there was only a single instance (*Mimosa pudica*), where the whole plant was used for medicinal purposes.

Discussion

A random survey of the medicinal plants described in Table 1 in the available scientific literature demonstrates that a number of these plants have been scientifically studied. Some of the scientific results validate a particular plant's folk medicinal use, while other studies demonstrate properties of the plants, which have not been recognized at least by the Kavirajes of Mirzapur. A few of the scientific findings shall be discussed in this section. However, it may be noted that this is not a comprehensive survey and all reports have not been cited.

The various studies on *Justicia gendarussa* have demonstrated its anti-arthritic potential (Paval *et al.,* 2009), larvicidal and adulticidal activities against the malarial vector, *Anopheles stephensi* (Liston) (Senthilkumar *et al.,* 2009), and HIV type 1 reverse transcriptase inhibitory activity *in vitro* (Woradulayapinij *et al.,* 2005). The hepatoprotective and anti-oxidant activity of *Amaranthus spinosus* against carbon tetrachloride induced toxicity have been reported (Zeashan *et al.,* 2009; 2008). The plant additionally has been shown to have antinociceptive activity (Zeashan *et al.,* 20209), anti-diabetic, anti-hyperlipidemic and spermatogenic effects in streptozotocin-induced diabetic rats (Sangameswaran and Jayakar, 2008), and *in vivo* anti-malarial activities in mice inoculated with red blood cells parasitized with *Plasmodium berghei berghei* (Hilou *et al.,* 2006). The plant is also used in the traditional medicinal system of Thailand for treatment of diarrhea and has been reported to inhibit the *in vitro* growth of the intestinal protozoan parasite, *Blastocystis hominis* (Sawangiaroen, 2005).

Amongst the various activities reported for the plant, *Calotropis procera*, are protective effects on experimentally induced gastric ulcers in rats (Bharti *et al.,* 2010), anti-tumor activities as demonstrated against Hep2 cancer cells (Mathur *et al.,* 2009), wound healing activity (Deshmukh *et al.,* 2009), hepatoprotective effects against carbon tetrachloride induced liver injury (lodhi *et al.,* 2009), protective effect in rats against Freund's Complete Adjuvant-induced monoarthritis (Kumar and Roy, 2009), anti-inflammatory activity against carrageenin-and kaolin-induced acute rat paw edema as well as cotton pellet-induced granuloma and adjuvant-induced arthritis (Adak and Gupta, 2006), and analgesic activity (Pathak and Argal, 2007). *Heliotropium indicum*, reportedly possess wound healing effects (Reddy *et al.,* 2002). Extract of *Kalanchoe pinnata* has been reported to be effective against murine visceral leishmaniasis (Gomes *et al.,* 2009). Immunomodulatory pre-treatment with the plant extract and a component (quercitrin flavonoid) has been shown to effectively protect mice against fatal anaphylactic shock (Cruz *et al.,* 2008). The plant reportedly also possesses hepatoprotective activity (Yadav and Dixit, 2003).

Anti-dyslipidemic activity of a polyprenol obtained from *Coccinia grandis* has been reported (Singh *et al.,* 2007). The methanol extract of stems of *Cassia fistula* has been shown to reduce blood glucose levels in streptozotocin-induced diabetic rats. Oral administration of catechin, isolated from the stem extract led to a marked increase in tissue glycogen and ^{14}C-glucose oxidation, thus demonstrating its insulin mimetic effect. Overall, the results pointed to the anti-diabetic efficacy of the plant (Daisy *et al.,* 2010). Other reported activities of the plant include suppression of fertility in male rats (Chauhan and Agarwal, 2009), and larvicidal, ovicidal and repellent effects against the chikungunya vector mosquito, *Aedes aegypti* (Govindarjan, 2009). Wound healing activity has been reported for the plant, *Mimosa pudica* (Kokane *et al.,* 2009). Decoction of leaves of the plant has been shown to protect mice against pentylentetrazol and strychnine-induced seizures (anti-convulsant effect) (Ngo *et al.,* 2004).

Sida cordifolia has been shown to have protective anti-oxidant effects during myocardial injury (Kubavat and Asdaq, 2009); other activities reported of the plant include anti-pyretic and anti-ulcerogenic activity (Philip *et al.,* 2008), anti-inflammatory and analgesic activity of an alkaloid isolated from the plant (Sutradhar *et al.,* 2007), and analgesic, anti-inflammatory and hypoglycemic activities present in aerial and root parts (Kanth and Diwan, 1999). Aqueous extract of the leaves also demonstrated higher liver regeneration indices following partial hepatectomy in rats (Silva *et al.,* 2006). Aqueous extract of *Moringa oleifera* seeds reportedly ameliorated fluoride toxicity in rabbits (Ranjan *et al.,* 2009). Extract of the seeds have also been observed to exert an inhibitory effect on ovalbumin-induced airway inflammation in a guinea pig model of asthma (Mahajan *et al.,* 2009). Seed extract also had ameliorative effects on liver fibrosis in rats (Hamza, 2010). Leaf extract has been shown to have anti-oxidant (Verma *et al.,* 2009) and hypoglycemic (Jaiswal *et al.,* 2009) properties, as well as demonstrated protective effect against isoproterenol-induced myocardial damage in rats (Nandave *et al.,* 2009).

Table 1: Medicinal plants used by folk medicinal healers of Mirzapur village of Dinajpur district, Bangladesh

Sl. No.	Plant Name	Family	Local name	Utilized part	Ailments and administration
1	*Justicia gendarussa* L.	Acanthaceae	Biswa-koroli	Leaf	Back pain. Crushed leaves are made into pills, which are taken.
2	*Aloe vera* (L.) Burm.f.	Aloaceae	Ghrito-kumari	Bark	To keep body cool, burning sensations during urination. The bark is crushed and taken as sherbet.
3	*Amaranthus spinosus* L.	Amaranthaceae	Kanta-khuria	Root	Dysentery. Crushed roots are taken.
4	*Curculigo orchioides* Gaertn.	Amaryllidaceae	Talmul	Root	Osteoporosis. Crushed roots are taken. alt. Iridaceae
5	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Chatian	Bark	Gastric problems. Bark is taken.
6	*Tabernaemontana corymbosa* Roxb. ex Wall.	Apocynaceae	Kath-mollicka	Root	Jaundice. Juice from crushed root is taken.
7	*Calotropis procera* (Ait.) Ait.f.	Asclepiadaceae	Akondo gach	Leaf	Pain (analgesic). Warm leaves are applied to part(s) of the body affected by pain.
8	*Blumea lacera* DC	Asteraceae	Kukur-mota	Root	Dog bite. Crushed roots are taken.
9	*Eupatorium odoratum* L.	Asteraceae	Bakjhar	Leaf	Cuts, wounds. Leaf juice is applied.
10	*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	Fotka	Root	Swelling of abdomen in humans or cattle, especially cattle. Juice from crushed root is taken.
11	*Tagetes erecta* L.	Asteraceae	Ganda pata	Leaf	Cuts and wounds (to stop bleeding). Juice from crushed leaves is applied.
12	*Bombax ceiba* L.	Bombacaceae	Shimul gach	Bark	To increase sperm count. Crushed bark is taken.
13	*Heliotropium indicum* L.	Boraginaceae	Hatishura	Leaf	Itches. Juice from crushed leaves is applied to itches.
14	*Opuntia dillenii* (Ker-Gawl.) Haw.	Cactaceae	Phoni-monsha	Stem	To ward off evil spirits (ghosts) after childbirth. Stems containing thorns are placed around the room where the new-born baby is kept.
15	*Ipomoea fistulosa* Mart. ex Choisy	Convolvulaceae	Dhol-kolmi	Root	Cataract in cattle (cows or bulls). Roots are rubbed on the horns.
16	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae	Pathorkuchi	Leaf	Kidney and gall bladder stones. Leaves are taken.
17	*Coccinia grandis* (L.) J. Voigt	Cucurbitaceae	Telakustila	Leaf	Diabetes. Juice from crushed leaf is taken with water.
18	*Cuscuta reflexa* Roxb.	Cuscutaceae	Shorno lota, Alok lota	Stem	Heart disorders. Crushed vines are taken with crushed mushrooms.
19	*Croton bonplandianum* Baill.	Euphorbiaceae	Morich pata	Root	Gastric problems. Crushed roots are taken.
20	*Tragia involucrata* L.	Euphorbiaceae	Bich chatu, Chotta	Root	Tumor, elephantiasis. Juice from crushed roots is taken.
21	*Cassia fistula* L.	Fabaceae	Bandor-lathi	Bark of root, fruit	Leprosy, tonsillitis. Bark of root mixed with fruit is taken.
22	*Cassia occidentalis* L.	Fabaceae	Jhunjhuni, Aerani	Root	Rheumatism. Roots are fried in oil and topically applied to affected areas (claimed by Kavirajes to be an exceptionally powerful medicine).
23	*Erythrina variegata* L.	Fabaceae	Madar gach	Leaf, fruit	Swelling (tumor), cancer. Leaves are taken for cancer and fruits are taken for swellings (tumor).
24	*Mimosa pudica* L.	Fabaceae alt. Mimosaceae	Lojjaboti	Whole plant	Plague, edema, elephantiasis, epilepsy. Crushed whole plant is taken.
25	*Leucas linifolia* (Roth) Spreng	Labiatae	Donto-kolosh	Leaf	Nerve weakness, lung disorders. Leaf juice is taken with honey.
26	*Ocimum basilicum* L.	Labiatae	Babui tulshi, Ched tulshi, Kuddipona	Leaf, root	Coughs, mucus, fever. Crushed leaves and roots are taken with honey.
27	*Hibiscus schizopetalus* (Mast.) Hook. f.	Malvaceae	Shish joba	Fruit	Urinary problem arising from endocrinological disorder or diabetes, referred by the Kavirajes as meho disease. Young fruits are chewed raw.
28	*Sida cordifolia* L.	Malvaceae	Barella	Root	Meho (urinary problems arising from endocrinological disorders or diabetes), dysentery in children. Root juice is taken.
29	*Marsilea minuta* (L.) Mant.	Marsileaceae	Shunshuni	Whole plant	Gastrointestinal disorders. Juice obtained from crushed whole plant is taken.
30	*Tinospora cordifolia* (Willd.) Hook.f. & Thoms.	Menispermaceae	Guloncho	Leaf, stem	Rheumatism (the Kavirajes claim that it can cure 80 types of rheumatism). Crushed leaves and stems are taken.
31	*Moringa oleifera* Lam.	Moringaceae	Sojna gach	Leaf	Paralysis. Leaf juice is taken with water.

Table 1: Continue

32	*Cymbidium aloifolium* (L.) Sw.	Orchidaceae	Rashna, Auriket	Leaf, root	Asthma, paralysis. Leaves and roots are separately boiled in water and taken.
33	*Saccharum spontaneum* L.	Poaceae	Kashua	Root	Asthma. Roots are crushed, boiled in water and taken.
34	*Persicaria hydropiper* (L.) Delarbre	Polygonaceae	Bish-katali	Leaf	Knee pain. Crushed leaves are applied.
35	*Pteridium aquilinum*	Polypodiaceae	Dhekia shak	Leaf, root	Abdominal edema. Roots are tied to the abdomen in the morning. Note that the patient should not touch water the previous day. Leaves are cooked and eaten as vegetable.
36	*Eichhornia crassipes* (Mart.) Solms	Pontederiaceae	Kochuripana	Root, flower	Hepatic disorders, pandu (swelling on one side of abdomen). Crushed roots are taken with honey for hepatic disorders. Flowers are cooked and eaten as vegetable for pandu.
37	*Datura metel* L.	Solanaceae	Dhutura	Leaf, stem, root, fruit	Asthma, pain in eyes, insanity. Leaves, stems, roots and fruits are mixed together, crushed and taken for asthma or insanity; juice from the mixture of crushed parts is applied to eyes.
38	*Solanum indicum* L.	Solanaceae	Kunthi karika	Leaf	Hoarseness of voice. Leaves are chewed.
39	*Nyctanthes arbor tristis* L.	Verbenaceae	Jui-shefali alt. Oleaceae	Leaf	Migraine. Boiled leaves are taken.
40	*Clerodendrum viscosum* Vent.	Verbenaceae	Vati, Bhat, Vatai	Young leaf	Helminthiasis (hookworm, pinworm), ulcer. Juice from crushed leaves is taken.
41	*Vitex negundo* L.	Verbenaceae	Nishinda	Leaf	Headache, dizziness, debility. Crushed leaves are taken with water.

Anti-oxidant activity has been reported for a water-soluble polysaccharide from *Pteridium aquilinum* (Xu *et al.,* 2009). The plant is used as an anti-fungal agent in the traditional medicinal system of Tanzania; the use has been validated through scientific studies (Hamza *et al.,* 2006). The plant is also used as a folk phytotherapeutic in the Tyrrhenian part of the Basilicata region of southern Italy (Guarrera *et al.,* 2005). Whole plant, plant parts or plant components of *Vitex negundo* has been reported to possess anti-inflammatory activity (Zheng *et al.,* 2010), analgesic properties (Zheng *et al.,* 2009), hepatoprotective activity (Tandon *et al.,* 2008), and anti-microfilarial activity (Sahare *et al.,* 2008).

A random review of the scientific literature clearly indicates that the medicinal plants used by the folk medicinal healers of Mirazapur, Bangladesh have medicinal properties and that a number of folk medicinal uses have been validated through scientific studies. It is apparent that folk medicinal use of plants is an area that cannot be neglected and appropriate importance should be given to the medicinal plants used by the healers for scientific studies towards discovery of newer drugs. At the same time, the conservation needs of these medicinal plants cannot be forgotten for it was observed that even in Mirzapur, a number of medicinal plants that are used are on the verge of extinction and quite difficult to obtain. It is therefore of utmost importance to initiate cultivation and conservation of these medicinal plants as quickly as possible.

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