

An Ethnomedicinal Survey of Vitbilia Village in Sujanagar Sub-District of Pabna District, Bangladesh

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Abstract: An ethnomedicinal survey was carried out in the village of Vitbilia situated in Sujanagar sub-district of Pabna district, Bangladesh. Informed consent was obtained from the folk medicinal practitioners (Kavirajes) and interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method, where the Kavirajes took the interviewers to areas from where they collected their plants and pointed out their uses. Plant specimens were collected, pressed and dried in the field and later identified at the Bangladesh National Herbarium. It was observed that the Kavirajes used 48 plants distributed into 30 families for treatment of various ailments. The Fabaceae family formed the largest family contributing six plants followed by the Acanthaceae, Asteraceae and Lamiaceae families contributing three plants each. Leaves constituted the major plant part used (41.2%) followed by roots (27.9%) and stems (13.2%). Other plant parts used included whole plants, flowers, seeds, fruits and plant sap. The various ailments treated included hepatic disorders, gastrointestinal disorders, skin disorders, snake bites, cuts and wounds, sexually transmitted diseases, pain, fever, respiratory tract disorders, paralysis, diabetes, rheumatoid arthritis, impotency and bone fractures. The folk medicinal uses of a number of plants are validated by available scientific studies on those plant species. Cumulatively, the plant species reported in the present survey can form an important source of lead compounds and more efficacious drugs through further scientific studies.

Key words: Folk medicine • Vitbilia • Pabna • Bangladesh

INTRODUCTION

From their very advent, human beings have suffered from various ailments. Lacking any other means, they have very possibly relied on medicinal plants for treatment of ailments. In fact, it has been reported that using of medicinal plants goes back thousands of years ago and is common in all indigenous people throughout the world [1, 2]. A number of modern drugs currently in use have been obtained through further experimentation of medicinal plants used by indigenous people [3]. It has been estimated that about 64% of the total global population still remain dependent on traditional medicine for their healthcare needs [4].

The population of Bangladesh is predominantly rural and generally lack access to or cannot afford

modern medical services. This population also includes tribes, who have their own folk medicinal practitioners. For centuries, they have relied on folk medicinal practitioners (known otherwise as Kavirajes or Vaidyas) for their primary health-care needs. Unlike other traditional systems of medicine practiced in Bangladesh (Ayurvedic, Unani), the Kavirajes rely mostly on simple preparations of medicinal plants for treatment and have developed considerable knowledge and expertise in the uses of medicinal plants. This knowledge is confined by an individual Kaviraj to himself and only passed to an immediate member of the family in the successive generation or to disciples, who are very carefully selected so that the knowledge unique to any particular Kaviraj is not disclosed to others.

The folk medicinal uses of medicinal plants are not well-known outside Bangladesh. For the last few years, we had been conducting extensive ethnomedicinal surveys at the village level in different areas and among different tribes of Bangladesh to obtain a comprehensive view of the plants used in folk medicine. Our surveys indicate that the selection of medicinal plants for treatment of any specific ailment or symptom varies widely between Kavirajes of different areas including adjoining areas or even villages and sometimes may be unique to a particular Kaviraj [5-8]. The objective of the present study was to conduct an ethnomedicinal survey in the village of Vitbilia, which is situated in Sujanagar sub-district of Pabna district, Bangladesh. Since villages form the primary units of habitation in Bangladesh (over 86,000 villages are present within the country), to get a first-hand picture of the folk medicinal practices of the country, one has to interview Kavirajes of different villages. This particular village was chosen for one Kaviraj present in the village was well-known for his practices and extensive knowledge of medicinal plants, as well as spoken well off by the people of Vitbilia as well as adjoining villages. Other Kavirajes practicing in the general area have obtained their training from this Kaviraj and one Kaviraj both obtained his training as well as a close family member.

MATERIALS AND METHODS

Site: Pabna district with an area of 2372.5 square kilometers falls within Rajshahi division of Bangladesh. The yearly temperature falls within a minimum of 9.6°C to a maximum of 33.9°C; the average rainfall is 1872 mm. The district is roughly located between 88°55' - 89°42' E and 23°48' - 24°22' N. The main occupation is agriculture and the major crops are paddy, jute, wheat, sugarcane, oil seeds, onion, garlic, betel leaf and pulses. Sujanagar sub-district (Upazila) with an area of 334.4 square kilometers is a part of Pabna district and is located between about 89°23' - 89°38' E and 23°48' - 24°00' N. Agriculture and agricultural laborer comprises the chief occupations of the population. The village of Vitbilia lies within Sujanagar district. There is a single health complex within the entire sub-district.

Data Collection and Mode of Survey: Folk medicinal health-care in Vitbilia and adjoining villages is mainly provided by one folk medicinal practitioner (name withheld), who along with his disciples and one close family member catered to the patient's needs. The Kaviraj,

by religion a Muslim, also served as a 'pir' (i.e. a religious person who also conducts various religious functions as well as treats sick persons by reciting the Koran) and was locally known as the Khalifa of Furfura Sharif. The purpose of our visit and the survey was explained to him and he agreed to provide information on medicinal plants used by him and his helpers. Informed consent was obtained from him that the information may be disseminated both nationally and internationally. Interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method as described by Martin [9] and Maundu [10]. In this method, the Kaviraj or one or more of his disciples took the interviewers to locations from where they collected their medicinal plants, pointed out the plants and described their uses along with providing the local names. All information was cross-checked with the Kaviraj in later sessions. Plant specimens were collected, pressed and dried in the field and later identified at the Bangladesh National Herbarium at Dhaka.

RESULTS

The Kavirajes of Vitbilia village used 48 plants distributed into 30 families for treatment of various ailments. The Fabaceae family was the largest family contributing 6 plants followed by the Acanthaceae, Asteraceae and Lamiaceae families with three plants per family. The results are summarized in Table 1.

Leaves constituted the major plant part used. Of the 68 uses of whole plant or plant parts shown in Table 1, leaves formed 41.2% of total uses. Roots were used 27.9% of the time, followed by stems at 13.2%. The bark of any plant was not used specifically by the Kavirajes of Vitbilia. The results are shown in Table 2 indicated that both oral and topical applications, a paste of the plant part was used generally. Other modes of use included juice extracted from plant part and use of crushed plant part. It was observed that a single plant part or a combination of plant parts may be both used at Vitbilia to treat a single ailment or a diverse group of ailments. For instance, the leaves of *Justicia adhatoda* were used for treatment of a single disease, whooping cough. A single plant part may also be used to treat diverse ailments; the roots of *Amaranthus spinosus* were used to treat diarrhea, heat stroke and leucorrhea in women. A combination of leaves and stems of *Coccinia grandis* was used for treatment of diabetes and jaundice. Occasionally, different parts from the same plant were used for treatment of different ailments.

Table 1: Medicinal plants used by folk medicinal practitioners of Vitbilia village, Pabna district, Bangladesh

Sl. No.	Plant Name	Family	Local name	Utilized part	Ailments and formulations
1	<i>Andrographis paniculata</i> Nees.	Acanthaceae	Kalomegh	Leaf, stem, root	Liver disorders, helminthiasis, acidity. Root paste is taken with sugar for liver disorders. Leaf paste mixed with sugar is taken for helminthic infections. Stem is taken with sugar to reduce acidity
2	<i>Barleria lupulina</i> Lindl.	Acanthaceae	Rahuchondal	Leaf	Eczema, itches, scabies. Paste of leaf is applied to the affected area
3	<i>Justicia adhatoda</i> L.	Acanthaceae	Basok	Leaf	Whooping cough. Tablets made from paste of pills are taken.
4	<i>Aloe barbadensis</i> Mill.	Aloaceae	Ghritakanchan	Leaf	Sexually transmitted diseases in men, skin disorders. Crushed leaf paste is applied to penis for sexually transmitted diseases and to affected areas for skin disorders
5	<i>Aerva sanguinolenta</i> (L.) Blume	Amaranthaceae	Bish korolli	Leaf, root	Body pain. Paste of leaf and root is applied to affected area
6	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Katakure	Root	Diarrhea, heat stroke, leucorrhoea in women. Root paste is applied to head during hot temperatures. Root paste is taken with milk and sugar for diarrhea and leucorrhoea in women
7	<i>Rawolfia canescens</i> L.	Apocynaceae	Boro chanda	Root	Snake bite. Root paste is applied to affected part as well as taken
8	<i>Rawolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Sharpagandha, Choto chanda	Root	Snake bite. Crushed roots are taken
9	<i>Aristolochia indica</i> L.	Aristolochiaceae	Ishwarmul	Root	Snake bite. Crushed roots are taken.
10	<i>Eclipta prostrata</i> L.	Asteraceae	Shonotola	Leaf	To remove any painful object from the body. Leaf paste is taken with salt
11	<i>Mikania cordata</i> (Burm. f.) B.L. Robinson	Asteraceae	Jarmani lata	Leaf	To stop external bleeding. Leaf juice is applied to wounds and cuts where bleeding is occurring
12	<i>Wedelia chinensis</i> (Osbeck) Merr.	Asteraceae	Bhimraj	Leaf, stem, root	To blacken hair, to keep head cool. Paste of leaves is applied to head to keep head cool; paste of stems and roots is applied to hair for blackening
13	<i>Bixa orellana</i> L.	Bixaceae	Deshi jafran	Fruit	Appetite stimulant. Fruits are chewed with salt
14	<i>Heliotropium indicum</i> L.	Boraginaceae	Hatishur	Root	Sexually transmitted diseases. Root paste is taken with sugar
15	<i>Opuntia dillenii</i> (Ker-Gawl) Haw.	Cactaceae	Cactus, Gukkhupot	Sap	Paralysis. Sap is applied to paralyzed area
16	<i>Terminalia belerica</i> Roxb.	Combretaceae	Bohera	Leaf, stem, root	To cure any disease. Juice from leaf, stem and root is taken together.
17	<i>Terminalia chebula</i> Retz.	Combretaceae	Horitoki	Leaf, root	Blackening of hair, acne, acidity. Root paste is taken for acidity. Leaf paste is applied to acnes or to hair for blackening
18	<i>Ipomoea mauritiana</i> Jacq.	Convolvulaceae	Bhui kumra	Root	For blackening hair in men and women as well as sexually transmitted diseases in men. Root paste is applied to hair or penis
19	<i>Costus speciosus</i> (Koen.) Sm.	Costaceae	Kayee mala	Root	Impotency. Root paste along with honey is applied to sex organ.
20	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Patharkuchi	Leaf	Remove gallbladder stones. Leaves are chewed with salt to dissolve gall bladder stones
21	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Telakucha	Leaf, stem	Diabetes, jaundice. Juice extracted from crushed leaves and stems are taken.
22	<i>Ephedra Gerardiana</i> Wallich ex C. A. Meyer	Ephedraceae	Dudhraj	Sap	To increase lactation in mother. Sap is taken with sugar as well as applied to breasts
23	<i>Euphorbia neriifolia</i> L.	Euphorbiaceae	Cactus, Monshasiz	Sap	Rheumatoid arthritis, paralysis. Sap is applied to affected area
24	<i>Abrus precatorius</i> L.	Fabaceae	Deshi jashimodhu	Leaf, stem	Coughs, liver disorders. Leaf juice is taken for coughs. Paste of stem is taken for any type of liver disorders
25	<i>Cassia sophora</i> L.	Fabaceae	Kolkashundia	Whole plant	Eczema. Paste of whole plant is applied to affected area
26	<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae	Shalpan	Root	Tangling of ureters in women. Root paste is taken
27	<i>Mucuna pruriens</i> (L.) DC	Fabaceae	Alkuchi, Torukola	Seed	Sexually transmitted diseases in men. Seed paste is applied to penis
28	<i>Sesbania sesban</i> (L.) Merr.	Fabaceae	Junti	Leaf	Helminthiasis, acidity, liver disorders. Leaf paste is taken with sugar
29	<i>Tephrosia villosa</i> (L.) Pers.	Fabaceae	Shetnil	Leaf, stem	Acne, sinusitis. Leaf paste is applied to acne. Stem juice is taken as remedy for sinusitis
30	<i>Curculigo recurvata</i> Dry.	Hypoxidaceae	Boro talmuli	Root	Sexual diseases. Root juice is taken
31	<i>Ocimum americanum</i> L.	Lamiaceae	Radha tulshi	Leaf	Whooping cough. Leaf juice is taken with sugar
32	<i>Ocimum gratissimum</i> L.	Lamiaceae	Ram tulshi	Leaf	Asthma, bronchitis. Leaf juice is taken
33	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Kalo tulshi	Leaf	Coughs, cold, fever. Juice of leaves is mixed with sugar and taken
34	<i>Dehaasia kurzii</i> King ex Hook.f.	Lauraceae	Modonomoshorok	Leaf	Pain in the neck, heat stroke. Paste of leaf is applied to neck and head
35	<i>Leea macrophylla</i> Roxb. ex Hornem.	Leeaceae	Hishirkorno	Leaf, root, seed	Impotency in men, bone fracture, kidney problems. Paste of leaf is applied to penis as remedy for impotency. Paste of seed is applied to fractures for healing. Paste of root is taken with milk for kidney problems
36	<i>Asparagus racemosus</i> Willd.	Liliaceae	Shotomul	Root	Constipation, impotency in men. Root paste mixed with sugar is taken for constipation; paste is applied to penis as remedy for impotency
37	<i>Hibiscus rosa sinensis</i> L.	Malvaceae	Panchajaba	Flower, leaf	Leucorrhoea and passing of blood in urine of women, infertility in women due to problems in uterus (badhok disease – local name). Paste of flower and leaf is taken with sugar
38	<i>Sida rhombifolia</i> L.	Malvaceae	Peeth berela	Leaf	Sexually transmitted diseases. Leaf paste is taken with sugar
39	<i>Stephania japonica</i> (Thunb.) Miers	Menispermaceae	Akondi	Leaf	Diarrhea, when temperature is hot outside. Leaves are crushed and applied to head to keep body cool during hot weather. Tablets made from leaves are taken for diarrhea
40	<i>Ficus racemosa</i> L.	Moraceae	Dumur, Joggo dumur	Fruit	Diabetes. Paste of fruit is taken with milk
41	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Dubla ghash	Whole plant	Wounds, acne. Two teaspoonful of whole plant juice is taken with a glass of milk
42	<i>Datura metel</i> L.	Solanaceae	Konok dhutura	Leaf, root	Body pain. Paste of leaf and roots is applied to affected area
43	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Ashwagandha	Fruit, leaf, root	Sex stimulant. Mixture of fruit, leaf and stem is taken
44	<i>Abronia augusta</i> L.f.	Sterculiaceae	Ulot kombol	Stem	Debility, infertility in women due to problems in uterus (badhok disease – local name). Crushed stems are taken with sugar
45	<i>Pentapetes phoenicea</i> L.	Sterculiaceae	Godhuli	Flower, root	Severe fever, acidity. Tablets made from flowers are taken for severe fevers. Tablets made from roots are taken for acidity
46	<i>Vitex negundo</i> L.	Verbenaceae	Nishinda	Leaf	Helminthiasis, severe fever. Tablets made from leaf are taken
47	<i>Stachytarpheta indica</i> (L.) Vahl	Verbenaceae	Supang	Leaf, stem	Leucorrhoea in women. Juice extracted from leaves and stems is taken with sugar
48	<i>Cissus quadrangularis</i> L.	Vitaceae	Harjora	Leaf, stem	Bone fractures. Paste of leaf and stem is applied to fractures

Table 2: Percent use of whole plants or plant parts in Vitbilia village for treatment of ailments

Plant part	Percentage of total use (%)
Whole plant	2.9
Leaf	41.2
Stem	13.2
Root	27.9
Bark	0.0
Flower	2.9
Seed	2.9
Fruit	4.4
Sap (gum)	4.4

The roots of *Andrographis paniculata* were used to treat liver disorders, while the leaves and stems were used, respectively, to treat helminthic infections and acidity. Bitter plant parts (e.g. *Andrographis paniculata*) may be taken with sugar. We did not observe a single instance at Vitbilia of combination of plants being used for treatment of any ailment; in all instances, a single plant was used.

If the number of plants used to treat any specific ailment or symptom is any indication of the prevalence of the ailment, then gastrointestinal disorders like acidity, diarrhea, dysentery, or loss of appetite was the foremost health problem of the people of Vitbilia and adjoining areas. Seven plants were used to treat gastrointestinal disorders, six plants each for treatment of skin disorders, respiratory tract disorders, sexually transmitted diseases and sexual dysfunctioning (including impotency and infertility). Three plants were used to treat snake bites by the Kavirajes of Vitbilia. Snake bites are not uncommon in villages of Bangladesh; in fact, during the rainy season people are more often bitten by snakes for the rising water forces snakes to come indoors and seek sheltered spots. It is to be noted that most ailments treated at Vitbilia are common ailments; difficult to treat ailments (at least with modern allopathic medicine) included diabetes, rheumatoid arthritis and paralysis. One plant (*Kalanchoe pinnata*) was used to treat gall bladder stones; the Kavirajes claimed that chewing of leaves of the plant with salt will dissolve the gall bladder stones with time. Another interesting plant observed was *Terminalia bellerica*. According to the Kavirajes, consumption of juice extracted from a combination of leaves, stems and roots will cure any disease.

DISCUSSION

It is always of interest to determine whether the various medicinal plants used in folk medicinal systems of different countries can really treat the disease or merely substitute as placebos. A perusal of the scientific

literature indicated that the use of a number of medicinal plants used by the Kavirajes at Vitbilia can be validated by available scientific studies on pharmacological activities of the plant or phytochemical constituents present in the plant. *Andrographis paniculata* is used by the Kavirajes of Vitbilia for liver disorders. Andrographolide, a constituent isolated from the plant has been demonstrated to have hepatoprotective activity against carbon tetrachloride- [11], galactosamine- and paracetamol- [12, 13], ethanol- [14] and hexachlorocyclohexane-induced hepatic toxicities [15]. The alcoholic extract of leaves of the plant reportedly demonstrated hepatoprotective effects against carbon tetrachloride-induced [16], while administration of the plant showed hepatoprotective activity against benzene hexachloride-induced liver damages [17]. Andrographolide reportedly further demonstrated choleric effect in rats and guinea pigs, as evidenced by increases in bile flow, bile salt and bile acids [18].

Barleria lupulina (used at Vitbilia for skin disorders like eczema, itches and scabies) has been shown to possess antimicrobial effects against acne-inducing bacteria [19]. A bronchodilator alkaloid (vasicinone) has been isolated from the plant *Justicia adhatoda* (used at Vitbilia for whooping cough) [20]. An extract of the plant has been shown to have anti-tussive effect [21], while the plant has been mentioned as a possible natural agent for treatment of airway inflammation [22]. The plant, *Amaranthus spinosus* is used at Vitbilia for treatment of diarrhea. The plant is also considered anti-diarrheic in traditional Thai medicine; extracts of the plant reportedly inhibited growth of fresh isolates of the intestinal protozoan parasite, *Blastocystis hominis* [23]. *Coccinia grandis*, which is used at Vitbilia to treat diabetes, has been shown to possess anti-oxidant activities in various fractions of the hydromethanolic extract of leaves [24], which can have a beneficial effect on diabetic patients. Furthermore, ethanol extract of the plant showed significant triglyceride and cholesterol-lowering effects in dyslipidemic hamster model [25], which can also contribute to better health in diabetic patients. Both stem bark [26] and fruit [27] of *Ficus racemosa* has been shown to have hypoglycemic activity. Ethanolic extract of the bark of the plant also demonstrated hypolipidemic activities in alloxan-induced diabetic rats [28]. Notably, the plant is used at Vitbilia by the Kavirajes to treat diabetes. The bone fracture healing activity of the plant *Cissus quadrangularis* has also been widely reported [29-32]; the plant is used at Vitbilia for treatment of bone fractures.

Cumulatively speaking, a number of medicinal plants used by the Kavirajes of Vitbilias are validated in their uses through modern scientific studies on pharmacological activities on those plants or phytochemical constituents present. It is an important fact to consider for plants like *Coccinia grandis* or *Ficus racemosa*, which are used by the Kavirajes of Vitbilias against diabetes. Diabetes is a debilitating disease prevalent worldwide against which modern allopathic medicine has no known cure. If the above two plants, through further scientific studies, can prove as a curative agent for diabetes, it would be an important breakthrough in the treatment of this disease. A number of plants are yet to be studied scientifically. It is expected that the medicinal plants reported in the present study can form an important source of lead compounds or phytochemicals, which can prove efficacious against a number of diseases, which cannot currently be treated adequately with allopathic medicine. Such diseases include rheumatoid arthritis and paralysis. Other common diseases like gastrointestinal disorders, if proven to be successfully treated by the plants mentioned, can also be of beneficial effect to the people in reducing health costs and receiving effective treatment on an immediate basis instead of arduous traveling to distant clinics away from the villages.

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