

**Medicinal plants used for preventive medicinal purposes:
An Ethnomedicinal survey of Plants Used by the Folk Practitioner
at Inderjani Village in Tangail District, Bangladesh**



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ABSTRACT

Ethnopharmacology involves the investigation of the plants used by the traditional communities and further understand the pharmacological basis of these culturally important medicinal plants. Plants are an integral part of life in many indigenous communities. In modern science, new drug design and for vaccination gradually depends on natural ayurvedic formulation of medicinal treatment by treating folk practitioners in the rural area. In Bangladesh, there are various rich sources of natural medicinal plants which are so much



effective various ailments. Folk medicine forms the primary tier of health-care practices in Bangladesh. Tangail is one of early human settlements in Bangladesh. Due to the rapid deforestation during the last few decades, many plants have already disappeared or are facing extinction. Thus we attempted to document the medicinal plant use of Tangail area with a view to preserve the ethnobotanical knowledge and in order to protect the biodiversity of this area. The objective of this study was to document the medicinal uses of plants by a folk medicinal practitioner (Kaviraj) at ShakhipurUpazila in Tangail district, Bangladesh. The Kaviraj (folk practitioner) used 10 plants distributed into 10 families in his formulations. The formulations were used to treat diverse diseases like gastrointestinal disorders, skin disorders, pain, fever, burns, infertility, diabetes, jaundice, diarrhea, stomach pain, inflammation, dysentery, tuberculosis, asthma and cuts and wounds. Leaves were found to be the most frequently used plant part while decoction is the major form of preparation. In most cases preparations are either administered orally or applied topically. The present study revealed that some of the well-known medicinal plants are used extensively demonstrating an effective ethnobotanical practice in the study area. Moreover medicinal plants used by the Kaviraj of Tangail district needs to be scientifically studied towards discovery of useful

drugs.

KEYWORDS: Ethnopharmacology, Folk practitioner, Drug design, use value, Ethnobotany, Bangladesh

INTRODUCTION

Ethnobotany is the traditional knowledge of utilizing indigenous plants, such as for food, medicine and tools, that local people have been practicing for a long time [1]. Ethnomedicine refers to the study of ayurvedic plants by traditional practitioners for the treatment of various ailments and throughout the world and still continue their traditional medicinal practices. Medicinal plants are always playing a beneficial function in health care. It is reported that 80% of the peoples in the developing countries strongly depend on ayurvedic practitioners used. In the new era of Biological science, modern medicinal treatment is so advanced but still now, some of the common diseases are successfully treated with the ayurvedic or herbal medicinal treatment by folk traditional practitioners. Traditional medicinal Plants have been used for thousands of years to flavor and conserve food, to treat health disorders and to prevent diseases [4-12, 54]. Various types of medicinal practitioners exist in Bangladesh. Besides allopathic medicinal practitioners, there are numerous forms of traditional medicinal practices in the country, which includes Ayurveda, Unani, folk medicine, folk herbalists, home remedies, acupuncture and spiritual practices. Folk medicine practitioners known as Kavirajes possibly form the largest group. Kavirajes are not certified practitioners, but who have picked up some or considerable knowledge on disease treatment with natural medicinal plants from personal experiences or knowledge gathered from a close member of an earlier generation of the family for a long time. Traditional practitioners are part-time folk medicinal practitioners. They are usually engaged in some other type of work and practice folk medicine in their personal experiences or knowledge gained from earlier generation of the family. They use medicinal plants in their formulations but also may include animal parts, insects and minerals. Medicinal plants has always formed a valuable source for discovery of modern drugs and their formulation with vaccination [2]. Traditional medicinal plants form the basic cure for numerous diseases in traditional medicinal systems. It has been reported that 422,000 flowering plant species of the world, at least 50,000 are used for medicinal purposes [3]. Natural medicinal Plants produce secondary metabolites with diverse ethno pharmacological activities and which activities are utilized by both traditional health practitioners as well as modern researchers for disease treatment. The objective of the present study was not only to obtain knowledge on medicinal plants used by Kaviraj at Inderjani village in Tangail district, Bangladesh but also to find out whether differences exist even within village level among practicing Kavirajes as to ailment(s) treated and the medicinal plants selected for treatment of any particular ailment.

MATERIAL AND METHODS

Study area

ShakhipurUpazila is a part of Tangail district, which falls in the central part of Bangladesh (Figure 1). The main occupation of the people of this sub-district is agriculture. However, to a certain extent the area is also noted for its local handicrafts. The present survey was conducted in the village of Inderjani in the sub-district of Shakhipur in Tangail district.

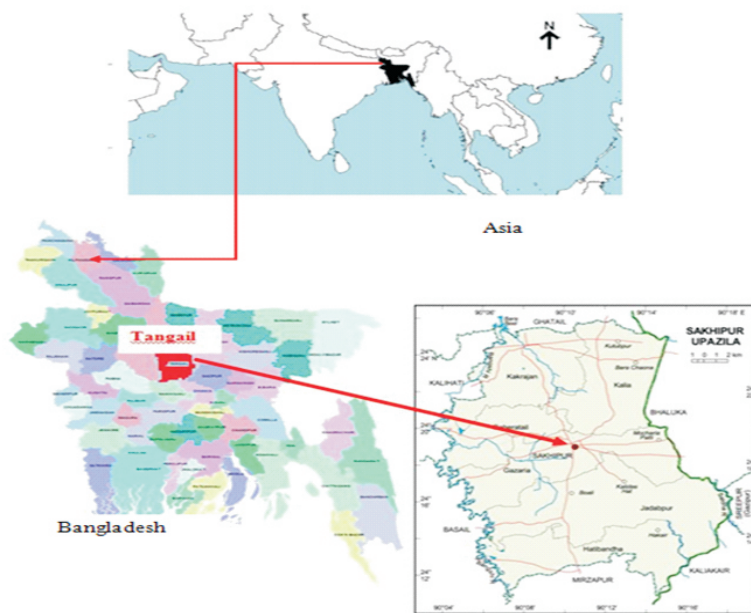


Figure 1: Survey area

Medicinal plant survey and data collection

A systematic and extensive ethnobotanical survey was carried out in Inderjani villages of the Tangail district during Jan 2015 to June 2015 for collection of information on ethnomedicinal plant species being used by the locals in the study area. Information was gathered by conducting interviews and group discussions on the indigenous uses of plant species as medicine. After selecting the people, knowledge about their interests and skills in identification and utilization were obtained through in formal interviews and discussion was made with the informants in their local language for their ease. The objectives of study were elaborated to the informants. A total of 95 informants (55 males and 40 females) between the age group 27–86 years were interviewed with a questionnaire.

Prior Informed Consent was first obtained from the Kaviraj, Shahab Uddin, age 55 years, practicing in Inderjani village of ShakhipurUpazila in Tangail district, Bangladesh. The Kaviraj was apprised as to the nature of our visit and consent obtained to disseminate any information both nationally and internationally. Actual interviews were conducted in the Bengali language, which was spoken fluently by the Kaviraj as well as the interviewers. The interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method of Martin [13] and Maundu [14]. In this method the Kaviraj took the interviewers on guided field-walks through areas from where he collected his medicinal plants, pointed out the plants, and described their uses. All plant specimens were photographed and collected on the spot, pressed, dried and brought back to Bangladesh National Herbarium at Dhaka for identification.

DATA ANALYSIS

Use value (UV)

The relative importance was calculated employing the use-value, a quantitative measure for the relative importance of species known locally:

$$UV = \sum U/n$$

Where U is the number of use reports cited by each informant for a given species and n refers to the total number of informants. Use values are high when there are many use-reports for a plant, implying that the plant is important, and approach zero (0) when there are few reports related to its use (figure 2). The use value, however, does not distinguish whether a plant is used for single or multiple purposes [15-16]. *Averrhoa carambola* (0.03) performs high uses value and others plants uses value are reported as *Mimosa pudica*(0.01), *Streblus asper* (0.02), *Terminalia chebula*(0.01) , *Kalanchoepinnata*(0.01),*Dilleniaindica*(0.02),*Clerodendrumviscosum*(0.02),*Cinnamomumverum*(0.01),*Azadirachtaindica*(0.02) and*Anthocephaluschinensis*(0.02).

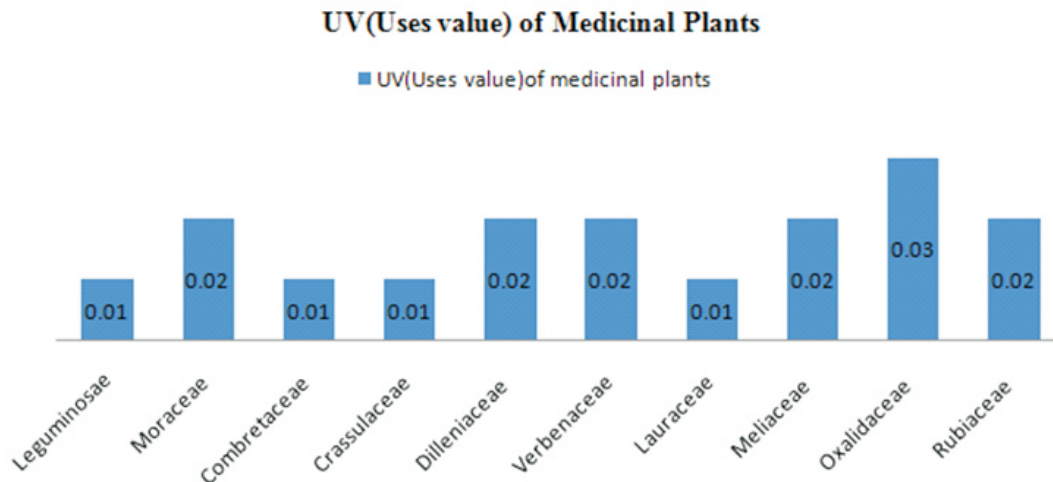


Figure 2: uses value of Medicinal plants in Inderjani village at ShakhipurUpazila by kabiraj.

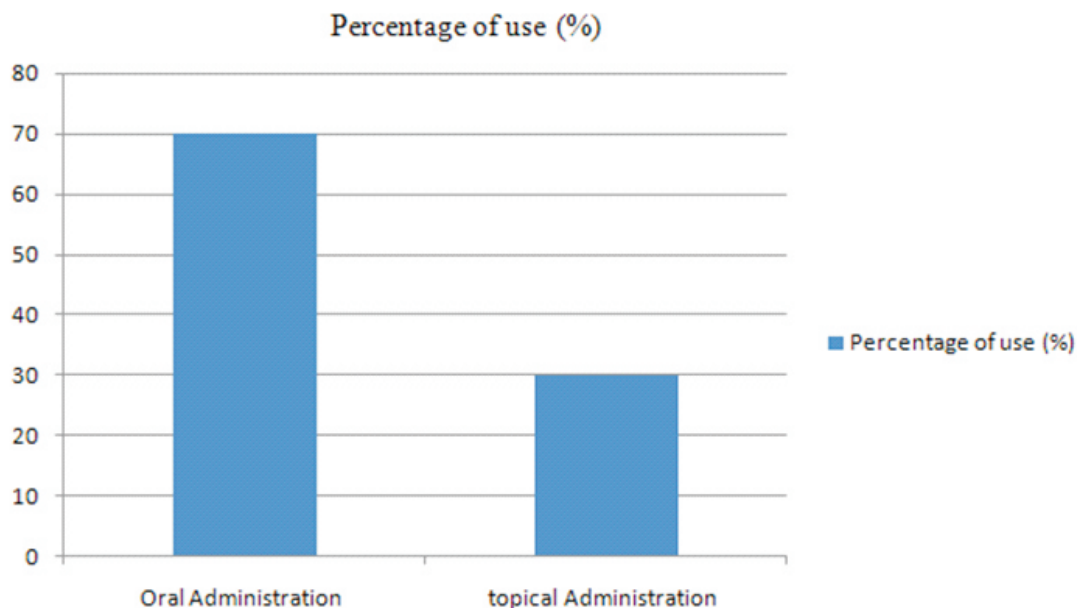


Figure 3: percentage of use in medicinal plants formulation by kabiraj in inderjani village.

Table 1: Distribution of medicinal plant species of Inderjani village according to their Family

Family	Number of species
Leguminosae	1
Moraceae	1
Combretaceae	1
Crassulaceae	1
Dilleniaceae	1
Verbenaceae	1
Lauraceae	1
Meliaceae	1
Oxalidaceae	1
Rubiaceae	1

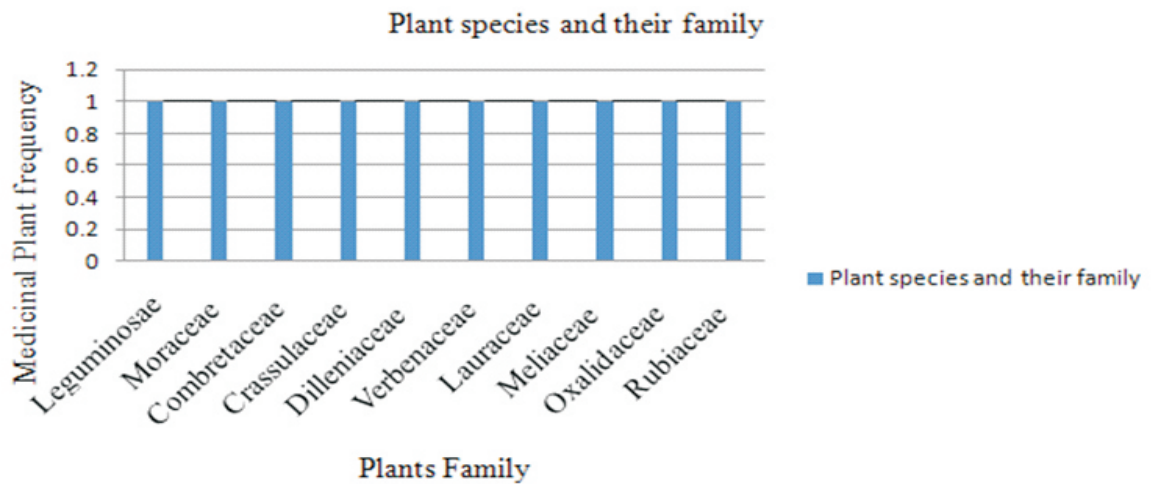


Figure 3: plant species use and their respective family

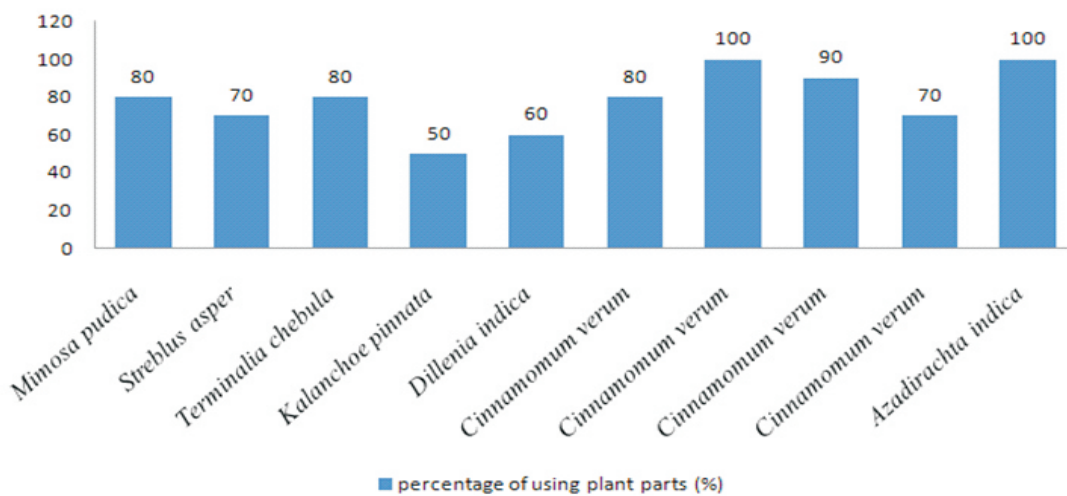


Figure 4: percentage of using plant parts

Medicinal plants parts distribution in various ailments in Inderjani Village

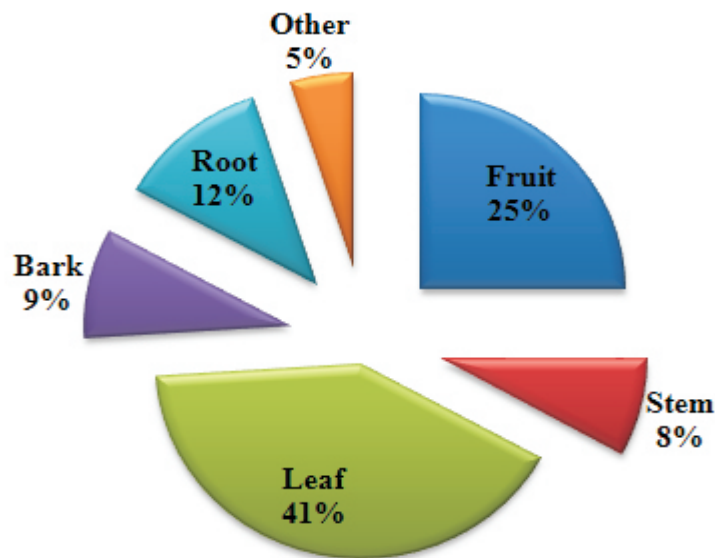


Figure 5: pie chart of medicinal plants parts distribution in disease treatment and formulation by kabiraj.

Table 2: Medicinal plants and formulations of the Kaviraj from Tangail District of Inderjani Village

Serial No.	Botanical name	Accession Number	Family	Local Name	Plant Type	Parts used	Medicinal uses with possible formulation	No. of ailment reports	Uses value (UV)
1	<i>Mimosa pudica</i> L.	DACB-41740/2015	Leguminosae	SadaLajjaboti	W, H	Root	Inflammation, diarrhea, root extract is useful for dysentery, leaf extract is also used for insect bites, extract prepared from root is taken twice a day for one month to treat piles. Useful for jaundice and skin diseases.	1	0.01
2	<i>Streblus asper</i> Lour.	DACB-41693/2015	Moraceae	Sheora	W, T	Leaf, Root	Stomach pain, ear ache, very effective in bone disease of cattle, blood dysentery, coughs, tuberculosis, constipation, leaf extract is useful for gastrointestinal disorders.	2	0.02

3	<i>Terminalia chebula</i>	DACB-41718/2015	Combretaceae	Hortoki	W,T	Fruit	Useful for piles, asthmatic problems, coughs, diabetes, osteoporosis, Fruits are soaked in water and then taken for constipation and Vomiting. Powdered fruits are soaked in water overnight followed by drinking the water in the morning. This is continued for 2-3 days.	1	0.01
4	<i>Kalanchoe pinnata</i> Lam.	DACB-41734/2015	Crassulaceae	Patharkuchi	W,H	Leaf, Root	Leaf extract is useful for cholera, diarrhea, Gall bladder stones, bloating, to stop bleeding from cuts and wounds, constipation, diabetes, stomach or kidney stones, effective for sexual disorders. 2-4 drops of leaf juice is Taken with sugar for stomach pain. Paste of leaves is applied to forehead for headache.	1	0.01

5	<i>Dilleniain dica</i> L.	DACB-41710/2015	Dilleniaceae	Chalta	W,T	Fruit	Useful for Sex stimulant, enhance digestion, dysentery, edema, diarrhea, leaf extract is so much effective for fever and cough, taken orally. Leaf juice is taken orally on an empty stomach twice daily in the morning and Evening.	2	0.02
6	<i>Clerodendrum viscosum</i> Vent.	DACB-41748/2015	Verbenaceae	Bhat	W,H	Leaf, Fruit	Leaf and fruit of this plant are beneficial for helminthiasis and Dysentery, also useful for gastrointestinal disorders, diabetes, frequent unination, fever sexual weakness, stomach pain, acidity.	2	0.02

7	<i>Cinnamomum verum</i> J.	DACB-41711/2015	Lauraceae	Daruchini	W, T	Bark	Bark of this plant is so much effective for asthma which is taken orally with water bark paste, also effective for bone fracture, diabetes, infertility in woman, urine problems, biliary disorders, coughs, bloating, appetite stimulant	1	0.01
8	<i>Azadirachta indica</i> A.	DACB-41731/2015	Meliaceae	Neem	W, T	Leaf	Used To strengthen base of teeth. Teeth are brushed with Dried bark. Leaves are dried and powdered and taken every morning for	2	0.02
							allergy, eczema, skin diseases and diabetes. Orally taken. Also useful in cancer, skin diseases, helminthiasis, wounds, diabetes, rheumatoid arthritis,		

9	<i>Averrhoa carambola</i> L	DACB-41746/2015	Oxalidaceae	Kamran ga	W,T	Leaf, Fruit	Ripe fruits are eaten for cough, fever, appetite stimulant and Jaundice orally taken. Leaf juice for ringworm and chickenpox which is taken in topically. Also effective for diarrhea, vomiting, influenza, constipation, liver diseases.	3	0.03
10	<i>Anthocephalus chinensis</i>	DACB-41733/2015	Rubiaceae	Kodom	W,T	Leaf, Bark	Leaf and bark decoction for ulcers, wounds, pain, Constipation and edema. Also effective in snakebites patients, elephantiasis, any problem of scrotum, helminthiasis, tumor, headache, bums, eczema, itches. Leaf and bark extract are taken in orally.	2	0.02

*DACB=Dhaka Bangladesh; Accession Number; W=wild; T=Topical; H=Herb; S=Shrub

RESULTS

A total of 10 plant species distributed into 10 families were found to be used by the Kaviraj for treatment of various ailments (table 1& 2). They are including *Averrhoa carambola*, *Mimosa pudica*, *Streblus asper*, *Terminalia chebula*, *Kalanchoepinnata*, *Dilleniaindica*, *Clerodendrum viscosum*, *Cinnamomum verum*, *Azadirachta indica* and *Anthocephalus chinensis*. All parts of the plant were used by the Kaviraj. These included whole plants, leaves, stems, barks, roots, flowers, fruits, seeds, gum, and rhizomes. Leaves constituted the major plant part used (41%), where roots part used (12%), fruits part used (25%). The results are shown in pie chart. The various formulations were used to

treat diseases like urinary disorders, oral lesions, diabetes, leucorrhea, pain, gastrointestinal disorders, cuts and wounds, jaundice, helminthiasis, and coughs. The Kaviraj mainly used simple formulations of plant parts in his treatment. The results are summarized in Table 2 and figure 3, 4, 5 respectively.

DISCUSSION

Recently most allopathic doctors look down on traditional medicinal folk practitioners and describe their treatment as useless but relevant scientific literature points out to the validity of the uses of many plants by the Kavirajes. Traditional folk ayurvedic practitioners treat various ailments including cough, stomach pain, and asthma by using formulation with natural sources medicinal plants. Moreover recent findings proved that medicinal plants perform so much exclusive treatment against cancer, sexual disorders, gastrointestinal irritation, and blood dysentery. They contains various medicinal activities including antiinflammation, antioxidant, anticancer, antidiabetic, antiulcerogenic, antibacterial, antifungul, immunomodulatory and hepatoprotective activities[17- 27]. In this survey kabiraj used some important plant species like as Terminalia chebulawhich is effective for various ailments having some exclusive phytochemical constituents and performs anticancer activity. It has been reported, many of ayurvedic plants are now used for new drug formulations and vaccination. The treatment of the various ailments by kaviraj is quite similar with other reported ethnomedicinal uses of the plants in various districts in Bangladesh like as: Anthocephaluschinensis used by FMPs of Sylhet Division, Bangladesh for snake bite [28]; infertility in men or women, infections in diabetic patients, bloating in cattle by FMPs in villages by the Padma River of Rajshahi district [29]; fever, coughs, eye diseases, labor pain by FMPs of Boalia sub-district, Rajshahi district [30]; tumor by the Santal tribe residing in Thakurgaon district [31], Averrhoa carambola is used by the Garo tribe living in Netrakona district for diarrhea [32]; FMP practicing among tea garden workers in Sreemangal, Maulvibazar district for jaundice [33]; by TMPs of two Marma tribal communities in two villages of Khagrachhari district for constipation [34], Azadirachtaindica is used by by FMPs of a village in Narayanganj district for tooth infection and helminthiasis [35]; by a FMP of Gachabari village in Tangail district for chicken pox [36]; by FMPs of three villages in Kurigram district for rheumatic pain [37]; by TMPs of Goala tribe of Moulvibazar district for stomach disorders [38]; by TMPs of 15 clans of the Garo tribe of Madhupur, Tangail district for diarrhea and blood purifier [39]; by a FMP of Jhalokathi in Barisal district for leprosy and allergy [40], Cinnamomumverum is used by FMPs of Station Purbo Para village, Jamalpur district for diabetes [41]; by FMPs of Chuadanga district for infertility in woman [42]; Clerodendrumviscosum is used by FMPs of Vasu Bihar village, Bogra district for gastrointestinal disorders [43]; by by FMPs of Balidha village, Jessore district for helminthiasis [44], Dilleniaindica is used by FMPs of Daudkandi sub-district of Comilla district for sex stimulator [45]; by FMPs of Dinajpur district for dysentery [46], Kalanchoepinnatais used by FMPs of Bhola district for urinary disorders [47]; by a FMP of Jhalokathi in Barisal district for blood dysentery [48]; by FMPs of Chuadanga district for headache [49], Terminalia chebula is used by TMPs of the Pankho tribe of Bilaichari Union, Rangamati district for anemia [50], Streblus asper is used by by the Tripura tribe residing in Chittagong Hill Tracts, Bangladesh for diarrhea [51]; by FMPs of two villages in Bagerhat district for flatulency and blood purifier [52] and Mimosa pudica is used by by the Garo tribe living in Netrakona district for sex stimulant [53]. As such, any scientific studies carried out with medicinal plants used traditionally and involving pharmacological activity studies, isolation and identification of bioactive components, followed by clinical trials can go a long way in mitigating the sufferings of these poor illiterate communities, for these plants are still to some extent available and easily affordable. From that view point, ethnomedicinal studies like this can spur scientific interest leading to scientific validation of traditional uses of medicinal plants.

CONCLUSION

It is concluded that the practices of traditional medicinal practitioners should not be discarded by modern scientists. In addition to medicinal plant usage, our study provided insight into the transmission of medical plant knowledge. In Bangladesh there is a huge source of medicinal plants for treatment various ailments in rural area by folk practitioners. For future new pharmacological findings, it is important to store this traditional ayurvedic medicinal formulation used for various ailments by folk practitioners. To improve the knowledge of medicinal plants and prevent the knowledge-loss, future work documenting medicinal plant identification, formulation and treatment preparation are needed.

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Competing interests

The authors declare that they have no competing interests.

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