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**Sumaiya Alam Titly**  
Department of Pharmacy,  
University of Development  
Alternative, Lalmatia, Dhaka-  
1207, Bangladesh

**Faozia Abida Islam**  
Department of Pharmacy,  
University of Development  
Alternative, Lalmatia, Dhaka-  
1207, Bangladesh

**SM Anwer Majid Tareq**  
Department of Pharmacy,  
University of Development  
Alternative, Lalmatia, Dhaka-  
1207, Bangladesh

**Nusratun Nahar**  
Department of Pharmacy,  
Southeast University, Banani,  
Dhaka-1203, Bangladesh

**Mohammed Rahmatullah**  
Professor, Department of  
Biotechnology & Genetic  
Engineering, University of  
Development Alternative,  
Lalmatia, Dhaka-1207,  
Bangladesh

**Corresponding Author:**  
**Mohammed Rahmatullah**  
Professor, Department of  
Biotechnology & Genetic  
Engineering, University of  
Development Alternative,  
Lalmatia, Dhaka-1207,  
Bangladesh

## Folk medicinal practice in Noakhali district, Bangladesh: A scientific appraisal

**Sumaiya Alam Titly, Faozia Abida Islam, SM Anwer Majid Tareq,  
Nusratun Nahar and Mohammed Rahmatullah**

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### Abstract

Folk medicine is an important part of the traditional health-care system in Bangladesh. The objective of the present study was to document the phytotherapeutic practices of a folk medicinal practitioner (FMP) in Noakhali district, who used some unique formulations to treat some diseases difficult to cure with allopathic medicine. Interviews of the FMP regarding his phytotherapeutic practices were carried out with the help of a semi-structured questionnaire and the guided field-walk method. The FMP used a total of 19 plants distributed into 15 families in his 10 formulations. The diseases treated included leech bite, external cuts and wounds, piles, poisoning, kidney stone diabetes, paralysis, erectile dysfunction, bone fracture, and pain. The FMP used plant-based formulations to cure several diseases, which either need surgical treatment or cannot be cured with existing allopathic medicine(s). As such, the formulations of the FMP merit further scientific studies toward discovery of lead compounds and new drugs.

**Keywords:** Phytotherapy, folk medicine, Noakhali, Bangladesh

### Introduction

Plants have always proved useful to human beings through provision of food, shelter, and possibly clothing and even defense against predators. Additionally, plants produce secondary metabolites, which are not directly involved in the growth, development, or reproduction of plants. These secondary metabolites have traditionally been and also serve even in modern times as arrow poisons, hallucinogenic agents, stimulants, and what is most important, as medicines against various human and animal diseases <sup>[1]</sup>. Various metabolites (phytochemicals) isolated from plants, which are still serving as therapeutic agents in allopathic medicine include atropine, caffeine, morphine, codeine, quinine and artemisinin, to name only a few <sup>[2]</sup>.

Recent years have seen emergence of new diseases like Ebola, bird flu, Hanta, SARS and MERS, all of which diseases needing affordable medicines for cure <sup>[3]</sup>. Moreover, various disease-carrying vectors and microorganisms have developed resistance to existing drugs <sup>[4, 5]</sup>. These factors necessitate discovery of new medicines, and plant kingdoms can be good source for such new medicines. However, to research on appropriate plants which can lead to new drug discoveries, it is essential to gather information on as much traditional medicinal uses of plants as possible. As such, ethnomedicinal surveys are a vital necessity for not only getting an idea on the therapeutic properties of any given plant, but also to document the medicinal plant resources of a country or region.

Although Bangladesh is a small country, from time immemorial there has existed several traditional medicinal systems in this region. These systems have included Ayurveda, Unani, folk and tribal medicine. Folk medicinal practitioners (FMPs) practice among the mainstream Bengali-speaking population and are possibly the most numerous among the various medical practitioners of Bangladesh including allopathic doctors. Tribal medicinal practitioners (TMPs) practice among the various tribes with each tribe having their own practitioner(s).

We had been documenting the various types of practices of FMPs and TMPs of Bangladesh for a number of years <sup>[6-15]</sup>. FMPs mainly use plants for therapeutic purposes, although other materials may be also used. The objective of the present survey was to document the phytotherapeutic purposes of a FMP, who practices in Noakhali district, Bangladesh and whose practice included treatment of several diseases which are difficult to cure. A secondary objective was to scan the scientific literature to find out whether any reported pharmacological activities of the plant are in agreement with the FMP's uses.

## Materials and Methods

Noakhali district is located in the Chittagong Division (Figure 1). The area of the district is 4202 sq km. It is bounded by Comilla and Chandpur districts on the north, the Meghna River estuary and the Bay of Bengal on the south, Feni and Chittagong districts on the east, and Lakshmipur and Bhola districts on the west. The present survey was carried out in Datter Hat town in Noakhali district.

The FMP (initials MU, male) resided in Datter Hat town, which falls in Noakhali Sadar Upazila (sub-district). His patients included town and adjoining village residents. A number of visits were made to the FMP by the authors (but most frequently the first two authors) to interview the FMP and collect plant specimens. Prior Informed Consent was obtained from the FMP to disseminate any information obtained.

Actual interviews of the FMP were conducted with the help of a semi-structured questionnaire and the guided field-walk method of Martin <sup>[16]</sup> and Maundu <sup>[17]</sup>. The FMP was further queried with the help of the semi-structured questionnaire as to plants and formulations used, disease(s) treated, source and mode of collection and preservation of plants, season of collecting, preparation of formulations, mode of administration, and any precautions which needed to be followed during medication period together with any other details which the FMP wanted to provide. In the guided field-walk method, the FMP took the interviewers on guided field-walks through areas from where he collected his medicinal plants, pointed out the plants, and mentioned their use(s). The semi-structured questionnaire and the guided field-walks were augmented with informal conversations between the authors and the FMP, in which conversations the FMP discoursed freely on any topic of his choice but mostly on his treatment methods. To conduct an ethnomedicinal survey successfully, it is necessary to build up a rapport with the FMP or FMPs concerned. Without such rapport, any information is either not given, or given partially, leaving out vital necessities.

All plant specimens collected were verified as to their identities by the plant taxonomist at the Medicinal Plant Collection Wing of the University of Development Alternative with help from Bangladesh National Herbarium (where necessary). Plant or plant part specimens were deposited at the Medicinal Plant Collection Wing of the University of Development Alternative <sup>[9]</sup>.

## Results and Discussion

### *Medicinal plants and diseases treated by the FMP*

The FMP was found to use a total of 19 plants distributed into 15 families in his formulations, which were 10 in number. These formulations were used to treat leech bite, cuts and wounds (to stop bleeding), piles, poisoning, kidney stone,

diabetes, paralysis, erectile dysfunction, bone fracture, and pain. The results are shown in Table 1.

Both monoherbal and polyherbal formulations were used for treatment. Diabetes and piles were treated with two separate formulations involving different plant species. A single plant part was found to be used to treat two different disorders, like the use of *Datura metel* leaves for treatment of both paralysis and erectile dysfunction. Similarly, the aerial parts of *Cissus quadrangularis* were used to treat both bone fracture and pain.

Piles, also known as hemorrhoids, are swollen blood vessels in or around the anus and rectum. Over the counter remedies for piles can treat some symptoms like inflammation and pain, but cannot cure the problem. At least one in ten people having piles may need surgery. From that view point, the two polyherbal formulations used by the FMP to treat piles (both formulations containing in common, fruits of *Terminalia chebula*) merit scientific attention for an easy solution to this problem. Interestingly, fruits of *T. chebula* have been in use in Ayurveda for hundreds of years <sup>[18]</sup>. In one of his formulations, the FMP used rhizome juice of *Curcuma longa* (turmeric) and molasses prepared from the stem juice of *Saccharum officinarum* (sugarcane) to treat piles. Tribal people of Jharkhand, India, use fresh paste prepared from turmeric rhizome and sugar to treat piles <sup>[19]</sup>. Turmeric reportedly possesses analgesic and anti-inflammatory properties <sup>[20]</sup>; both properties can be beneficial in piles. A folk medicinal practitioner in Kushtia district, Bangladesh used whole plants of *Chromolaena odorata* to treat piles <sup>[21]</sup>, which show that different FMPs in different areas of Bangladesh may use different plants to treat the same ailment. Taken together, the components of the first formulation used by the FMP for piles treatment have both traditional precedents as well as scientific validity.

*Kalanchoe pinnata* was used by the FMP for treatment of kidney stone. Such use of this plant has been reported before in folk medicinal studies <sup>[22, 23]</sup>. *In vitro* antiurolithiatic activity has been reported for aqueous extract of leaves of the plant <sup>[24]</sup>. It follows that the use of *K. pinnata* by the FMP to treat kidney stones also has ethnomedicinal precedents as well as scientific validity. A major conclusion that can be drawn is that FMPs through possible use of plants, the knowledge of which has continued generationally, can end up with considerable expertise on the therapeutic uses of plants.

This can also be seen from the FMPs use of *Coccinia cordifolia* leaf and *Syzygium cumini* seed to control diabetes. The antidiabetic properties of both plants have been reported <sup>[25, 26]</sup>. The use of *Cissus quadrangularis* by the FMP to treat bone fracture and pain has also been scientifically validated <sup>[27, 28]</sup>. In Daudkandi sub-district of Comilla district, paste of the plant is used for bone fracture <sup>[29]</sup>.



**Fig 1:** Noakhali district inset: map of Bangladesh showing Noakhali district in yellow). [[http://en.banglapedia.org/index.php/Noakhali\\_District](http://en.banglapedia.org/index.php/Noakhali_District)]

**Table 1:** Medicinal plants and formulations of the FMP from Noakhali district, Bangladesh.

Serial Number	Scientific Name (English name)	Family Name	Local Name	Parts used	Ailments and mode of medicinal use
1	<i>Allium sativum</i> L. (Garlic)	Amaryllidaceae	Roshun	Skin of clove	Leech bite. Paste prepared from skins of cloves is applied to the bitten area.
2	<i>Mikania cordata</i> (Burm.f.) B.L. Rob. (Heartleaf hempvine)	Asteraceae	Assamia lota	Aerial part	External cuts and wounds (to stop bleeding). Paste of aerial parts is topically applied.
3	<i>Mesua nagassarium</i> (Burm.f.) Kostern. (Indian rose chestnut)	Calophyllaceae	Nageshwar	Bark	See <i>Piper peepuloides</i> .
4	<i>Terminalia chebula</i> Retz. (Chebulic Myrobalan)	Combretaceae	Hartaki	Fruit	Piles. Fruits of <i>Terminalia chebula</i> are dried under the sun and powdered. The powder is soaked overnight and taken orally the following day twice on an empty stomach along with rhizome juice of <i>Curcuma longa</i> and molasses prepared from stem juice of <i>Saccharum officinarum</i> . See <i>Piper peepuloides</i> .
5	<i>Ipomoea aquatica</i> Forssk. (Water spinach)	Convolvulaceae	Kolmi shak	Whole plant	Antidote to poison. Juice prepared from crushed whole plant of <i>Ipomoea aquatica</i> and seed of <i>Lathyrus sativus</i> is taken orally.
6	<i>Kalanchoe pinnata</i> (Lam.) Pers. (Air plant)	Crassulaceae	Pathor kuchi	Leaf	Kidney stone. Leaves are sucked daily for two continuous months.
7	<i>Coccinia cordifolia</i> (L.) Cogn. (Scarlet-ivy gourd)	Cucurbitaceae	Telakuchi	Leaf	Diabetes. Leaves are chewed and taken orally.
8	<i>Lathyrus sativus</i> L. (Grass pea)	Fabaceae	Khesari	Seed	See <i>Ipomoea aquatica</i> .
9	<i>Cinnamomum tamala</i> Nees. (Indian bay leaf)	Lauraceae	Tejpata	Leaf	See <i>Piper peepuloides</i> .
10	<i>Cinnamomum verum</i> Presl (True cinnamon tree)	Lauraceae	Darchini	Bark	See <i>Piper peepuloides</i> .
11	<i>Syzygium cumini</i> (L.) Skeels (Jambolan)	Myrtaceae	Jaam	Seed	Diabetes. Powdered seeds are soaked in water overnight and the water taken orally the following morning.
12	<i>Piper nigrum</i> L. (Black pepper)	Piperaceae	Gol morich	Fruit	See <i>Piper peepuloides</i> .
13	<i>Piper peepuloides</i> Roxb. (Wild pepper)	Piperaceae	Pipal	Fruit	Piles. Fruits of <i>Terminalia chebula</i> , fruits of <i>Elettaria cardamomum</i> , bark of <i>Cinnamomum verum</i> , leaves of <i>Cinnamomum tamala</i> , bark of <i>Mesua nagassarium</i> , fruits of <i>Piper peepuloides</i> , fruits of <i>Piper nigrum</i> , rhizomes of <i>Zingiber officinale</i> are dried, powdered and mixed with equal amount of sugar and then again powdered. One spoon of the powder is taken with one spoon of sugar once daily in the morning after breakfast.
14	<i>Saccharum officinarum</i> L. (Sugarcane)	Poaceae	Akh	Stem	See <i>Terminalia chebula</i> .
15	<i>Datura metel</i> L. (Indian thorn apple)	Solanaceae	Dhutra	Leaf	Paralysis, erectile dysfunction. Leaves are boiled in mustard oil and then mixed with powdered camphor. The mixture is massaged over the paralyzed area or male genital organ as appropriate.
16	<i>Cissus quadrangularis</i> L. (Veld grape)	Vitaceae	Har bhanga	Aerial part	Bone fracture, pain. The vinous aerial part is twined around the fractured or painful area.
17	<i>Curcuma longa</i> L. (Turmeric)	Zingiberaceae	Holud	Rhizome	See <i>Terminalia chebula</i> .
18	<i>Elettaria cardamomum</i> (L.) Maton (Cardamom)	Zingiberaceae	Elach	Fruit	See <i>Piper peepuloides</i> .
19	<i>Zingiber officinale</i> Roscoe (Ginger)	Zingiberaceae	Ada	Rhizome	See <i>Piper peepuloides</i> .

### Conclusions

Medicinal plants used by folk medicinal practitioners of Bangladesh possess enormous potential for discovery of lead compounds and novel drugs. As such, documentation of such traditional uses is a necessity and can benefit human beings throughout the world.

### Conflicts of interest

The authors declare that they have no conflicts of interest.

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