

Phytotherapeutic practices of a folk medicinal practitioner in Dinajpur district, Bangladesh

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ABSTRACT

The phytotherapeutic practices of a folk medicinal practitioner (FMP), practicing in Kaliaganj village of Dinajpur district, Bangladesh, was documented. Interviews of the FMP were carried out with the help of a semi-structured questionnaire and guided field-walk method. The FMP was observed to use a total of 48 plants distributed into 36 families for treatment of diverse diseases, which included respiratory tract disorders, gastrointestinal disorders, skin disorders, leucorrhea, urinary disorders, menstrual disorders, physical weakness, edema, Parkinson's disease (body tremors), piles, bleeding through anus or penis, stone in urinary tract, and bone fracture. Most of the formulations used to treat diseases consisted of more than one plant species. Taken together, most of the formulations appeared to be quite different from plant formulations used by other FMPs in Dinajpur district as well as other places of Bangladesh (as observed in our previous field observations) and as such merit further research towards discovery of new drugs.

INTRODUCTION

Bangladesh is a country of diverse traditional medicinal systems. The more established ones are Ayurveda, Unani and homeopathy. However, besides the above three, there are other forms of traditional medicines, the major two being folk medicine and tribal medicine. The latter can be considered also as a variation of folk medicine, being practiced by various tribes instead of mainstream Bengali-speaking practitioners, who practice folk medicine. Folk medicinal practitioners (FMPs) possibly constitute the largest group of medicinal practitioners and can be found in every village, town and city of the country. Anybody (both male and female and of any occupation and age) can practice folk medicine, for the practitioners do not need to attend any learning institutions or be registered with the Government. While this has given rise among FMPs of quacks and charlatans, surprisingly many FMPs can be found with a

large clientele, established practices, and a good knowledge of medicinal properties of plants.

Considerable knowledge can be obtained from systematic surveys conducted among FMPs on medicinal plants of the country. Plants have always formed an excellent source for medicines since ancient times, and FMPs usually use plants for therapeutic purposes. This traditional knowledge, in turn, can form the basis for further research leading to new drug discoveries. The discovery of new drugs is a necessity because of the emergence of new diseases and existing drug-resistant vectors. We had been conducting ethnomedicinal surveys among different FMPs and tribal medicinal practitioners of the country (Rahmatullah and Biswas, 2012; Rahmatullah *et al.*, 2012a-c; Zaman *et al.*, 2015; Kundu *et al.*, 2016). During our surveys, it was observed that considerable variation exists among the FMPs on diseases treated and the plants used for treating even the same disease. These variations can be observed within FMPs of the same village and which pointed out the necessity of documenting the practices of as many FMPs as possible from all parts of the country to obtain a comprehensive idea of the medicinal plants of the country.

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More surprisingly, it was observed that many of the plants used by the FMPs can be validated in their uses based on their reported pharmacological properties in the existing scientific literature. The objective of the present study was to document the phytotherapeutic practices of a FMP practicing in Kaliaganj village in Dinajpur district, Bangladesh.

MATERIALS AND METHODS

The FMP who was interviewed was named Abdul Bareque (male, age 70 years, practicing folk medicine for 40 years), and resided in the village of Kaliaganj in Dinajpur district, Bangladesh. Prior informed consent was initially obtained from the FMP. The FMP was informed as to the nature of our visit and consent obtained to disseminate any information provided including his name both nationally and internationally.

Actual interviews were conducted in the Bengali language, which was spoken fluently by the FMP 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 (1995) and Maundu (1995). In this method the FMP took the interviewers on guided field-walks through areas from where he collected his medicinal plants or plant parts, pointed out the plants, and described their uses. All plant specimens were photographed and collected on the spot, pressed, dried and brought back to be identified by a competent botanist at the University of Development Alternative. Some specimens were also identified at the Bangladesh National Herbarium. Voucher specimens were deposited with the Medicinal Plant Collection Wing of the University of Development Alternative. The authors are grateful to the Ethics and Publication Committee, University of Development Alternative for approval of the survey.

RESULTS AND DISCUSSION

The FMP was observed to use a total of 48 plants distributed into 36 families for treatment of diverse diseases, which included respiratory tract disorders, gastrointestinal disorders, skin disorders, leucorrhea, urinary disorders, menstrual disorders, physical weakness, edema, Parkinson's disease (body tremors), piles, bleeding through anus or penis, stone in urinary tract, and bone fracture. Most of the formulations used to treat diseases consisted of more than one plant species. The results are shown in Table 1. Most of the formulations appeared to be quite

distinct from formulations obtained in our previous ethnobotanical surveys. Some of the plants and formulations used by the FMP merits attention and discussion. *Justicia adhatoda* was used with *Ocimum tenuiflorum* and *Zingiber officinale* by the FMP to treat coughs. The anti-tussive action of a polyherbal formulation containing *J. adhatoda* has been described (Gupta et al., 2009). Interestingly, the formulation also contained *Ocimum sanctum* (synonym of *Ocimum tenuiflorum*). *Z. officinale* is used in Ayurveda to treat coughs and as such has a long history of use for cough treatment (Malhotra and Singh 2003). Thus the three plant species used by the FMP to treat coughs are valid in their uses. In fact, the three plant species can give potentially a powerful synergistic action in cough treatment.

For treatment of dysentery, the FMP used another polyherbal formulation where barks of *Holarrhena pubescens* (also known as *Holarrhena antidysenterica*), *Spondias pinnata*, *Alstonia scholaris* and *Syzygium cumini* were soaked together in water overnight followed by drinking the water on an empty stomach the following morning. The antidiarrheal action of *H. antidysenterica* has been shown in rats (Sharma et al., 2015). The bark of *A. scholaris* can reportedly inhibit some enteric pathogens and so can be useful in treating dysentery (Mukherjee et al., 2012). The barks of *S. pinnata* and *S. cumini* merit scientific research regarding their anti-dysentery actions, for although not studied scientifically, indigenous uses of the plants for treatment of diarrhea and dysentery has been reported (Bora et al., 2014; Ayyanar and Subash-Babu, 2012).

The other polyherbal formulations of the FMP deserve scientific research, particularly the formulations for treatment of asthma and Parkinson's disease. Polyherbal formulations are regarded as being more effective in the sense that in some cases the plants can act synergistically and so produce a more powerful effect, and in other cases the toxic effect of any particular plant may be negated through the use of a second plant leaving only the desirable effect of the first plant to have its action. Asthma is difficult to control and Parkinson's disease has no known cure in allopathic medicine. That the FMP was treating Parkinson's disease was confirmed by the patient whose disease was diagnosed in a modern clinic by allopathic doctors, whose medicines, however, did not have any positive effects on the patient leaving him to seek the FMPs cure. As such, a real cure of Parkinson's disease from the FMPs formulation, as validated by modern research, can be of huge benefit to human beings.

Table 1: Plants and formulations of the FMP from Kaliaganj village in Dinajpur district, Bangladesh.

Serial Number	Scientific Name	Family Name	Local Name	Parts used	Ailments and mode of medicinal use
1	<i>Justicia adhatoda</i> (L.) Nees	Acanthaceae	Bashok	Leaf	Coughs. Juice obtained from leaves of <i>Justicia adhatoda</i> and leaves of <i>Ocimum tenuiflorum</i> and rhizomes of <i>Zingiber officinale</i> is mixed with 3 drops of honey and taken orally. See <i>Alocasia indica</i> .
2	<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Seed	See <i>Salmalia malabarica</i> .
3	<i>Spondias pinnata</i> (L.f.) Kurz	Anacardiaceae	Amra	Bark	See <i>Holarrhena pubescens</i> .

4	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Chaitan	Bark	See <i>Holarrhena pubescens</i> .
5	<i>Holarrhena pubescens</i> Wall. ex G. Don	Apocynaceae	Indrajol	Bark	Dysentery. Barks of <i>Holarrhena pubescens</i> , <i>Spondias pinnata</i> , <i>Alstonia scholaris</i> and <i>Syzygium cumini</i> are soaked together in water overnight followed by drinking the water on an empty stomach the following morning.
6	<i>Alocasia indica</i> (Roxb.) Schott	Araceae	Maan kochu	Tuber	Asthma. Tuber of <i>Alocasia indica</i> are powdered with leaves of <i>Justicia adhatoda</i> , whole plants of <i>Plumbago zeylanica</i> , and whole plants of <i>Nicotiana tabacum</i> and mixed with honey. Pills prepared from the mixture are dried under the sun. The pills are then coated with ghee (clarified butter) and taken orally.
7	<i>Colocasia esculenta</i> (L.) Schott	Araceae	Mokoddos	Tuber	See <i>Carthamus tinctorius</i> .
8	<i>Cocos nucifera</i> L.	Arecaceae	Narikel	Oil	See <i>Wedelia chinensis</i> .
9	<i>Sansevieria trifasciata</i> Prain	Asparagaceae	Boro chokkor	Leaf	Skin disease. Leaf paste is mixed with mustard oil (oil obtained from seeds of <i>Brassica nigra</i>) and topically applied.
10	<i>Aloe barbadensis</i> Mill.	Asphodelaceae	Musabbar	Leaf	Bloating. Leaf pulp of <i>Aloe barbadensis</i> is mixed with tuber paste of <i>Ipomoea digitata</i> followed by preparation of pills from the mixture. Pills are taken orally. Note that the pills cannot be taken by anybody under 12 years of age. Pregnant women should take the pills only after a heavy meal.
11	<i>Carthamus tinctorius</i> L.	Asteraceae	Kusum phool	Flower	Leucorrhea, burning sensations during urination, loss of appetite, physical weakness, irregular menstruation, whitish discharge during urination. Flowers of <i>Carthamus tinctorius</i> , fruits of <i>Piper cubeba</i> , flowers of <i>Leea macrophylla</i> , leaves of <i>Piper betle</i> , seeds of <i>Nigella sativa</i> , seed coat of <i>Myristica fragrans</i> , and tubers of <i>Coccolasis esculenta</i> are combined and cooked to make 'halwa' which is taken orally twice daily in the morning and evening.
12	<i>Wedelia chinensis</i> (Osbeck) Merr.	Asteraceae	Bhimraj	Root	Memory enhancer. Paste of root of <i>Wedelia chinensis</i> and tuber of <i>Ipomoea digitata</i> is taken orally with raw cow milk or molasses. Skin infections. A mixture of powdered whole plants of <i>Wedelia chinensis</i> , powdered roots of <i>Leea macrophylla</i> , and powdered roots of <i>Trewia polycarpa</i> are combined with warm coconut oil (oil obtained from fruits of <i>Cocos nucifera</i>) and applied topically to infected area following cleaning the area.
13	<i>Brassica nigra</i> (L.) W.D.J. Koch	Brassicaceae	Shorisha	Seed	See <i>Sansevieria trifasciata</i> .
14	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Bohera	Fruit	See <i>Salmalia malabarica</i> .
15	<i>Terminalia chebula</i> Retz.	Combretaceae	Hortoki	Fruit	See <i>Salmalia malabarica</i> .
16	<i>Ipomoea digitata</i> L.	Convolvulaceae	Bhui kumra	Tuber	See <i>Wedelia chinensis</i> . See <i>Aloe barbadensis</i> . See <i>Salmalia malabarica</i> .
17	<i>Trewia polycarpa</i> Benth.	Euphorbiaceae	Mudda gach	Root	See <i>Wedelia chinensis</i> .
18	<i>Tamarindus indica</i> L.	Fabaceae	Tetul	Leaf	Mucus in children. One handful of leaf of <i>Tamarindus indica</i> and sliced fruits of <i>Citrus aurantium</i> are added to water along with a small amount of sliced rhizome of <i>Zingiber officinale</i> . The water is then boiled till it reaches half the original volume. The water is then strained and sugar dissolved in it and re-boiled till the volume is reduced by half. The decoction is kept in an open jar and taken orally thrice daily.
19	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Tulshi	Leaf	See <i>Justicia adhatoda</i> .
20	<i>Vitex negundo</i> L.	Lamiaceae	Nishinda tita	Leaf	Edema. Leaf paste is applied topically to swollen areas.
21	<i>Cinnamomum camphora</i> (L.) J. Presl.	Lauraceae	Kofur	Wood	See <i>Sterculia urens</i> .
22	<i>Salmalia malabarica</i> (DC.) Schott & Endl.	Malvaceae	Shimul	Root	Leucorrhea, Parkinson's disease (body tremors). Powdered roots of <i>Salmalia malabarica</i> , roots of <i>Abroma augusta</i> , tubers of <i>Ipomoea digitata</i> , leaves of <i>Piper longum</i> , fruits of <i>Terminalia chebula</i> , fruits of <i>Terminalia bellirica</i> , fruits of <i>Phyllanthus emblica</i> , whole plants of <i>Wedelia chinensis</i> , whole plants of <i>Tinospora cordifolia</i> , seeds of <i>Syzygium cumini</i> and seeds of <i>Mangifera indica</i> are mixed with honey. Tablets made from the mixture are dried under the sun and taken orally twice daily.
23	<i>Sida cordifolia</i> L.	Malvaceae	Brela	Whole plant	Stoppage of urination. Juice obtained from crushed whole plant is taken orally with honey. At the same time paste of whole plant of <i>Sida cordifolia</i> and whole plant of <i>Eichhornia crassipes</i> is topically applied to lower abdomen.

24	<i>Martynia annua</i> L.	Martyniaceae	Bagh thaba	Root	Skin infection. Roots are crushed with fruits of <i>Piper nigrum</i> to obtain juice, which is applied topically to affected areas.
25	<i>Tinospora cordifolia</i> (Willd.) Miers.	Menispermaceae	Gohonchi	Whole plant	See <i>Salmalia malabarica</i> .
26	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Kathal	Fruit	See <i>Musa paradisiaca</i> .
27	<i>Musa paradisiaca</i> L.	Musaceae	Atia kola	Fruit	Flatulence. Pills prepared from paste of fruits of <i>Musa paradisiaca</i> , <i>Artocarpus heterophyllus</i> and <i>Nigella sativa</i> are taken orally, five pills in the morning and five in the evening.
28	<i>Myristica fragrans</i> Houtt.	Myristicaceae	Jayatri	Seed coat	See <i>Carthamus tinctorius</i> .
29	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jaam gach	Bark, seed	See <i>Holarrhena pubescens</i> . See <i>Salmalia malabarica</i> .
30	<i>Helminthostachys zeylanica</i> (L.) Hook.	Ophioglossaceae	Ekbir ektir	Whole plant	Piles. Paste of whole plant is mixed with sesame oil (oil obtained from seeds of <i>Sesamum indicum</i>) and applied to anus.
31	<i>Sesamum indicum</i> L.	Pedaliaceae	Til	Seed	See <i>Helminostachys zeylanica</i> .
32	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Amloki	Fruit	See <i>Salmalia malabarica</i> .
33	<i>Piper betle</i> L.	Piperaceae	Paan	Leaf	See <i>Carthamus tinctorius</i> .
34	<i>Piper cubeba</i> L.	Piperaceae	Kabab chini	Fruit	See <i>Carthamus tinctorius</i> .
35	<i>Piper longum</i> L.	Piperaceae	Pipul	Leaf	See <i>Salmalia malabarica</i> .
36	<i>Piper nigrum</i> L.	Piperaceae	Shada gol morich	Fruit	See <i>Cynodon dactylon</i> . See <i>Celsia coromandeliana</i> . See <i>Martynia annua</i> .
37	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Niltok chita	Whole plant	See <i>Alocasia indica</i> .
38	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Durba	Whole plant	Anal bleeding, bleeding through the penis. Juice obtained from crushed whole plant of <i>Cynodon dactylon</i> , two fruits of <i>Piper nigrum</i> , and whole plants of <i>Withania somnifera</i> and <i>Eichhornia crassipes</i> is taken orally 2-3 times daily.
39	<i>Eichhornia crassipes</i> (Mart.) Solms.	Pontederiaceae	Kochuri pana	Whole plant	See <i>Cynodon dactylon</i> . See <i>Sida cordifolia</i> .
40	<i>Nigella sativa</i> L.	Ranunculaceae	Kalo jira	Seed	See <i>Carthamus tinctorius</i> . See <i>Musa paradisiaca</i> .
41	<i>Citrus aurantium</i> L.	Rutaceae	Kagji lebu	Fruit	See <i>Tamarindus indica</i> .
42	<i>Celsia coromandeliana</i> Vahl	Scrophulariaceae	Kukur muta	Bottom part of plant above ground level	Diarrhea. Bottom part of plant is made into a paste with fruits of <i>Piper nigrum</i> and table salt, lightly warmed over fire and taken orally.
43	<i>Nicotiana tabacum</i> L.	Solanaceae	Tanku	Whole plant	See <i>Alocasia indica</i> .
44	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Ashwagandha	Whole plant	See <i>Cynodon dactylon</i> .
45	<i>Abroma augusta</i> L.	Sterculiaceae	Olot komor	Root	See <i>Leea macrophylla</i> . See <i>Salmalia malabarica</i> .
46	<i>Sterculia urens</i> Roxb.	Sterculiaceae	Katila	Gum	Urinary tract stone. Pills are prepared from a mixture containing 100g gum from <i>Sterculia urens</i> , 25g rhizome of <i>Zingiber officinale</i> , 10g sulfur, and 100g misri (crystalline sugar) and taken orally. Kidney, urinary tract, biliary stone. Gum from <i>Sterculia urens</i> is mixed with camphor (a terpenoid compound found in the wood of the tree <i>Cinnamomum camphora</i>), rhizome of <i>Zingiber officinale</i> and sulfur. Tablets made from the mixture are taken orally.
47	<i>Leea macrophylla</i> Roxb. ex Hornem.	Vitaceae	Hasti polash	Leaf, root, flower	Bone fracture. Paste of leaf and root of <i>Leea macrophylla</i> and root of <i>Abroma augusta</i> is mixed with chicken egg and applied topically on the fractured area. To increase sex ability. 50g of <i>Leea macrophylla</i> powdered flowers and 500g of <i>Abroma augusta</i> powdered roots are mixed together. Pills prepared from the powdered mixture are taken orally. See <i>Wedelia chinensis</i> . See <i>Carthamus tinctorius</i> .
48	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Ada	Rhizome	See <i>Tamarindus indica</i> . See <i>Sterculia urens</i> . See <i>Justicia adhatoda</i> . See <i>Sterculia urens</i> .

CONCLUSION

The plants and formulations used by the FMP merit scientific research towards possible discovery of new drugs.

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