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Research Article

Ethnomedicinal survey in two villages of Cumilla district, Bangladesh

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Abstract

Introduction: Folk medicines play an important part among the village people in Bangladesh. The main objective of the present study was to carry out a randomized ethnomedicinal survey among the folk medicine practitioners (Kavirajes) of two villages, Parati and Panjab, located in Cumilla Sadar south sub-district of Cumilla district in Bangladesh.

Methods: Informed consent was obtained from the Kavirajes and surveys were conducted with the help of a semi-structured questionnaire and the guided field-walk method. Interviews were carried on in the Kaviraje's native language – Bengali. After completing the survey, voucher specimens were deposited into the Bangladesh National Herbarium for complete identification.

Results: It was observed that the Kavirajes of the two villages used 16 plant species which were distributed into 16 distinct families. Plants belonging to these 16 families were used for the treatment of various ailments such as jaundice, blood dysentery, asthma in infants, leukorrhea, dysentery, abdominal pain, lower abdominal fat, lower back pain, tachycardia, and painful abscess. The major plant part used were leaves (50%), followed by bark and gum (13.2% each), and young shoot, whole plant, pith, and bulb (6% each). Kavirajes, once plentiful are becoming scarce both as to numbers and to their medicinal knowledge. The present survey points to possible plants that need to be pharmacologically assessed as to their traditional uses.

Conclusion: The plant information collected in the present survey is suggestive of significant prospects for further scientific research towards discovery of lead compounds and possibly better drugs.

Keywords: Bangladesh; Drug discovery; Folk medicines; Kavirajes; Medicinal plants

Introduction

Folk medicines, independent of more established traditional medicines like Ayurveda and Unani system have existed as a substantial part of primary health care services since time immemorial in Indian sub-continent countries. In developing countries like Bangladesh, folk medicine practiced by folk medicine practitioners, locally known as 'Kavirajes' are largely considered among rural communities as well as remote areas due to their availability, cost-effectiveness, and traditional belief in the positive outcome of the medicine (WHO 2013; Haque et al. 2018). Folk medicine is not only practiced by regular rural people but also

elderly men and women, irrespectively. Folk medicine varies on historical, ecological, ethnic and social background to a great extent (Payyappallimana 2010). Our ethnomedicinal surveys conducted in different districts in Bangladesh reported the variation in the formulations prepared by folk medicine practitioners (Kavirajes) based on the personal experiences or knowledge on medicinal plants by individual Kavirajes. These practitioners are unique owing to their simple preparation of medicine with the combination of different plant parts for various ailments with practically every Kaviraj having his or her individual formulations and preparation methods for treatment (Rahmatullah et al., 2010a,b; Sarker et al., 2011; Mawla et al., 2012; Das et al., 2012; Khatun et al., 2013; Kabir, 2014; Hossan et al., 2014; Biswas et al., 2014; Mahnoor, 2015; Shakera et al., 2019). The use of these medicinal plants can

be an important resource for scientists to identify potential drug component(s); therefore proper documentation of this knowledge is imperative to protect the medicinal plants from extinction, more so, because Kavirajes with every passing year are noticeably getting rarer in Bangladesh. Therefore, the present study was aimed to carry out a randomized survey among folk medicine practitioners in two villages, 'Parati' and 'Panjab' of Cumilla district in Bangladesh.

Methods

Study area

The present study was conducted in the two villages namely 'Parati' and 'Panjab' within Cumilla Sadar south sub-district of Cumilla district in the division of Chittagong, Bangladesh. Cumilla district covers the south-eastern region of Bangladesh. Its area is 3,087.33 km² (1,192.02 sq mi), and is situated roughly in between 23°02' and 24°47' north latitudes and in between 92°39' and 91°22' east longitudes. It is surrounded by Tripura state of India on the east, Munshiganj and Chandpur districts on the west, Noakhali and Feni districts on the south, and Brahmanbaria and Narayanganj districts on the north. Cumilla Sadar south sub-district has 10 union councils, and 459 villages. The present study area 'Parati' and 'Panjab' villages are under Bholain south union council of Cumilla Sadar south sub-district (Figure 1). The total population of Parati and Panjab villages is 3088 and 954, respectively according to information in the Bangladesh Statistics Bureau.

Data collection and sampling techniques

To record the practical application of medicinal plants, a survey was carried out among the folk medicine practitioners ('Kavirajes') in Parati and Panjab villages to collect the ethnomedicinal data. The purpose of the survey was made clear to the Kavirajes and permission obtained to present survey results verbally and in writing. The survey was conducted with the help of a semi-structured questionnaire and the guided field-walk method

as described by Martin (1995) and Maundu (1995). A guide was managed initially (Mr. Masud Rana, Age: 26, Student- Cumilla Victoria College) and local people were asked about the details of practicing 'Kavirajes' and three 'Kavirajes' were convened for interviews, namely Mst. Saleha Begum, Mohammed Shahjahan (belong to Panjab village) and Mst. Tahera Begum (belong to Parati village). Interviews were organized after receiving permission from the 'Kavirajes' to initiate the survey and subsequently a focused group discussion was conducted. Interviews were carried on in the native language (Bengali) of Kavirajes and the authors (interviewers). The Kavirajes discussed about medicinal plants and gave explanations of their local names and uses to treat various ailments. All information obtained was cross-checked with the 'Kavirajes' after completion of the day's work, when there was more free time for free discussions. The English names of the plants were obtained by us following identification of plants and conducting Google searches. Details of the plants were later collected from the 'Medicinal Plants Database of Bangladesh'. Data were collected and transferred into the Microsoft Excel Spreadsheet 2010 (Microsoft Corp., USA) and demonstration of the data was performed as table and percentage. Plant specimens were gathered, and photographed serially, and later pressed and dried on site. After completion of the survey dried plant specimens were brought to the Bangladesh National Herbarium for complete identification. The voucher specimens of the plants were deposited at the Medicinal Plant Collection Wing of the University of Development Alternative and accession numbers were obtained from there.

Results

Plants and their distribution into distinct families

The result of the present study showed that 16 species of plants were used for the treatment purposes by three Kavirajes from Parati and Panjab villages of Cumilla district, Bangladesh (Figure 1).

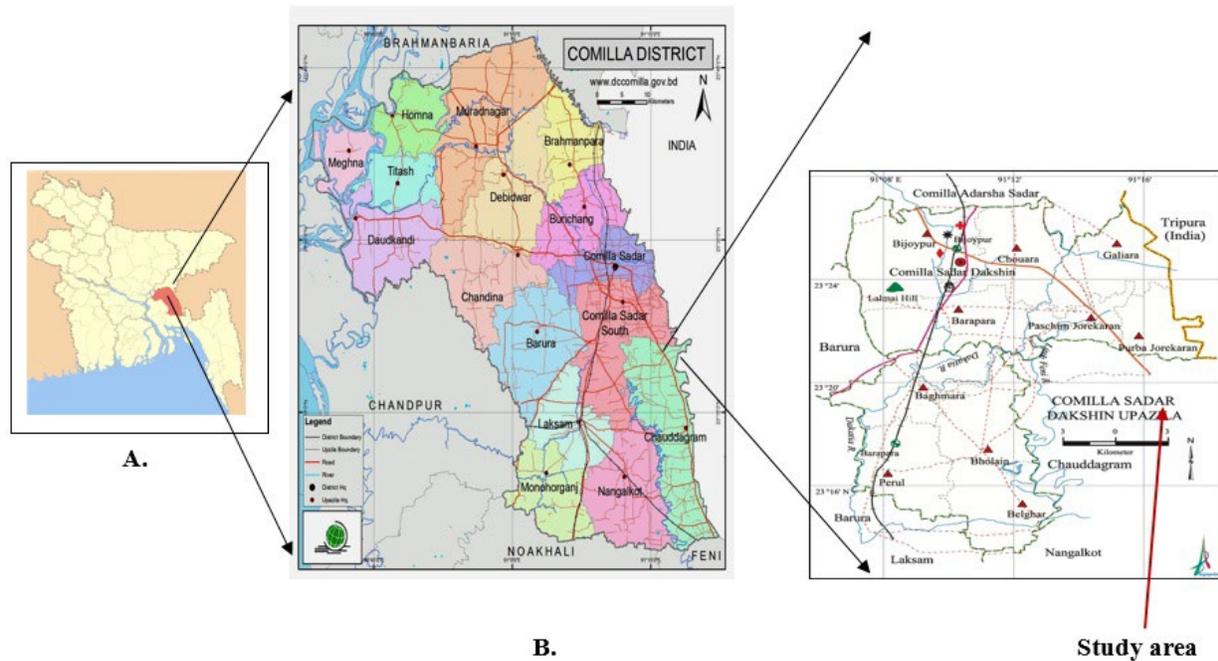


Figure 1: Location of the study area – A. Map of Bangladesh, Red highlight indicates Comilla district; B. Map of Comilla district; C. Map of Comilla Sadar south sub-district; Parati and Panjab villages are under Bholain union council [Comilla has been recently renamed to Cumilla].

These medicinal plants belonged to 16 distinct families, one plant belonging to each family. Families include Menispermaceae, Lauraceae, Bignoniaceae, Asteraceae, Fabaceae, Apocynaceae, Lythraceae, Moraceae, Plantaginaceae, Lamiaceae, Anacardiaceae, Araceae, Rutaceae, Bromeliaceae, Combretaceae and Amaryllidaceae. Kavirajes used these plants for the treatment of various ailments such as jaundice, blood dysentery, asthma in infants, leukorrhea, dysentery, abdominal pain, lower abdominal fat, lower back pain, tachycardia, and painful abscess. Plants used by folk medicine practitioners are shown in Figure 2. The results are summarized in Table 1.



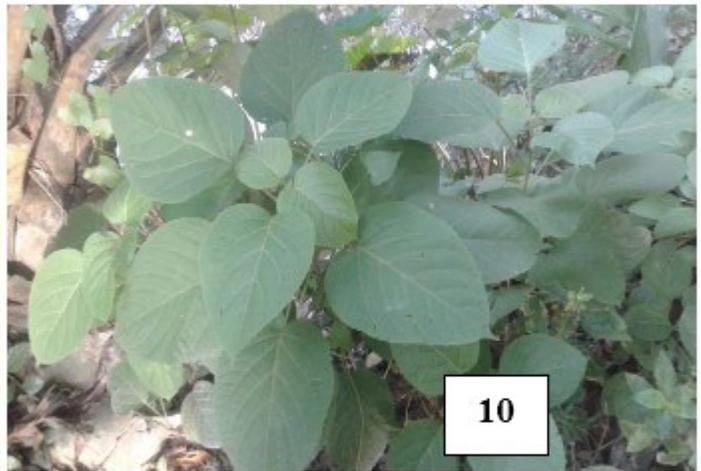




Figure 2: Plants used by folk medicinal practitioners: 1. *Stephania japonica*; 2. *Litsea glutinosa*; 3. *Oroxylum indicum*; 4. *Eclipta prostrata*; 5. *Dalbergia sissoo*; 6. *Alstonia scholaris*; 7. *Lawsonia inermis*; 8. *Streblus asper*; 9. *Scoparia dulcis*; 10. *Clerodendrum viscosum*; 11. *Mangifera indica*; 12. *Pothos scandens*; 13. *Aegle marmelos*; 14. *Ananas comosus*; 15. *Terminalia arjuna*; 16. *Allium cepa*.

Serial Number	Scientific Name	Family Name	Local Name	Parts used	Ailments treated/Mode of use
1	<i>Allium cepa</i> L.	Amaryllidaceae	Piyaj	Bulb	Painful abscess. Rice is fried till it forms an ash on a metal pot and allowed to cool. Chopped bulb and small amount of table salt are added to rice ash; this mixture is applied on all sides of the abscess. It reduces pain and ripens the abscess quickly.
2	<i>Mangifera indica</i> L.	Anacardiaceae	Aam gach	Leaf	Lower abdominal fat. Leaf mash is mixed with onion and burnt peppers and the mixture is eaten with boiled rice. A visual improvement is observed after a month-long administration. See <i>Aegle marmelos</i> .
3	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	Chatiyani gach	Gum	Asthma in infants. Half teaspoon of gum is mixed properly with breast milk, which causes formation of a fibrous item. After removing the fibrous item, the remaining liquid is given to the infants to drink in three sips. Painful abscess. Gum is heated on a metal spoon and the hot liquid is applied on all sides of the abscess. It reduces pain and ripens the abscess quickly.
4	<i>Pothos scandens</i> L.	Araceae	Hatir lota	Leaf	Lower back pain. Leaves of the plant are taken on the palm of a hand and small amount of kerosene and table salt is added and the mixture is rubbed on the affected area.
5	<i>Eclipta prostrata</i> L.	Asteraceae	Keincha gach	Leaf	See <i>Stephania japonica</i> . See <i>Lawsonia inermis</i> .
6	<i>Oroxylum indicum</i> Vent.	Bignoniaceae	Thona gach	Bark	See <i>Stephania japonica</i> .
7	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Anarosh gach	Pith	See <i>Aegle marmelos</i> .
8	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun gach	Bark	Tachycardia. Bark of the plant is crushed to obtain a juice which is taken with warm milk every morning on an empty stomach for a period of 10 to 15 days. During the treatment sugar and sweet food consumption is prohibited.
9	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Shishu gach	Leaf	Blood dysentery. Leaves are soaked in water for few hours. After removing the leaves, the decoction is taken orally.
10	<i>Clerodendrum viscosum</i> Vent.	Lamiaceae	Bait gach	Young shoot	Abdominal pain. Young shoot is crushed and taken after mixing with lime water.
11	<i>Litsea glutinosa</i> (Lour.) C.B. Rob.	Lauraceae	Meda gach	Leaf	See <i>Stephania japonica</i> . See <i>Lawsonia inermis</i> .

12	<i>Lawsonia inermis</i> L.	Lythraceae	M e h e d i gach	Leaf	Leucorrhoea. After cleaning, the leaves of <i>Lawsonia inermis</i> , <i>Eclipta prostrata</i> and <i>Litsea glutinosa</i> are crushed together to make pills, which are taken orally in the morning with cold water. See <i>Aegle marmelos</i> .
13	<i>Stephania japonica</i> (Thunb. ex Murray) Miers.	Menispermaceae	Muicchani gach	Leaf	Jaundice. Leaves of <i>Stephania japonica</i> , <i>Litsea glutinosa</i> and <i>Eclipta prostrata</i> are mixed with bark of <i>Oroxylum indicum</i> and soaked in water overnight and the decoction is taken orally after mixing with jaggery on an empty stomach every day for a period of seven days.
14	<i>Streblus asper</i> Lour.	Moraceae	Horpa gach	Gum	Leucorrhoea. Gum of the plant is mixed with goat milk to drink in the morning.
15	<i>Scoparia dulcis</i> L.	Plantaginaceae	Dhonica gach	Whole plant	Dysentery. The plant is crushed to obtain juice, which is mixed with jaggery and taken orally.
16	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Bel gach	Leaf	Tachycardia. Leaves of <i>Aegle marmelos</i> , <i>Mangifera indica</i> , and <i>Lawsonia inermis</i> , and young pith of <i>Ananas comosus</i> along with processed rice are washed and soaked overnight in water; the resultant decoction is taken orally every morning on an empty stomach for a period of 10 to 15 days. During the treatment sugar and sweet food consumption is prohibited.

Table 1: List of plants (16 plants, 16 families) along with their medicinal uses obtained from three folk medicine practitioners (Kavirajes) of Parati and Panjab villages, Cumilla district, Bangladesh.

It was reported earlier that the plant parts mostly used by folk medicine practitioners are leaves and roots (Wondimu et al., 2007; Giday et al., 2003). Our ethno-medicinal survey result showed a similar profile of plant parts used in Parati and Panjab villages. Leaves were the major plant parts used solely or mixed with other parts forming 50% of total uses. This was followed by bark and gum (12.5%), and the lowest parts used were young shoot, whole plant, pith, and bulb (6%) (Figure 3). The folk medicine was applied either through oral or topical administration for the treatment of simple to complicated diseases.

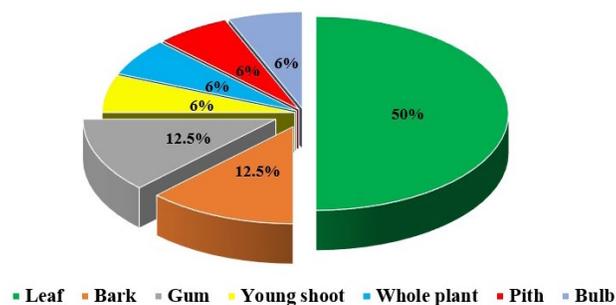


Figure 3: Plant parts used to prepare medicinal remedies.

Discussion

Rural people, by themselves generally use different parts of plants as medicine (as prescribed by Kavirajes) due to limited access to modern health facilities, poverty, and shyness to urban doctor. Women in rural Bangladesh are reluctant to mention their ailments, particularly gynecological ailments even to a female physician, who is unknown to them because properly trained physicians with a doctor's degree rarely practice in villages. They even practice rarely in the small towns, and to a village woman appear to be totally alien. Therefore, village people visit neighborhood folk medicine practitioners (Kavirajes) who have indigenous knowledge on these medicinal plants, transmitted orally from their ancestors or gained through long time experience (Rahman 2013).

The present survey identified around 10 different individual sicknesses or abnormalities which were asserted to be cured by plants mentioned by the Kavirajes. Four plants used to treat leucorrhoea were *Streblus asper*, *Lawsonia inermis*, *Eclipta prostrata*, and *Litsea glutinosa*. *Lawsonia inermis* was also used to treat tachycardia along with the leaves of *Aegle marmelos*, *Mangifera indica*, young pith of *Ananas comosus*, and bark of

Terminalia arjuna. Lower back pain, lower abdominal fat, asthma, abdominal pain, dysentery were other important diseases, which were also treated by five plants each (Table 1). Kavirajes reported to treat jaundice with the leaves of *Stephania japonica*, *Litsea glutinosa* and *Eclipta prostrata*, and bark of *Oroxylum indicum*. *Allium cepa* and *Alstonia scholaris* were processed and applied in the treatment of abscess.

Reported scientific studies supported the use of these medicinal plants by the Kavirajes. *Lawsonia inermis* commonly known as Henna leaves or mehendi gach, which contain active compounds such as lawsone, gallic acid, glucose, mannitol, fats, resin, mucilage, and alkaloid showed antifungal and antibacterial effect (Dixit, 1980; Rahmoun, 2013; Mohiuddin, 2019). Crude extracts of *Eclipta prostrata* and *Litsea glutinosa* also demonstrated antibacterial activity, and previous ethnomedicinal reports mentioned that the powder of *Eclipta prostrata* was used to cure hepatitis and jaundice (Khan, 2008; Mandal, 2000). Hossan et al., (2010) reported earlier the traditional use of *Streblus asper* Lour. and *Litsea glutinosa* by Kavirajes in the treatment of infectious diseases in reproductive systems such as syphilis, gonorrhea, and painful burning during urination, respectively. Moreover, its leaf extract acted as an anti-inflammatory agent and showed potent antimicrobial activity reducing plaque formation (Sripanidkulchai, 2009; Pradeepa, 2011; Kumar, 2020). Rahmatullah et al., (2010a) in their survey stated the traditional use of the bark of *Terminalia arjuna* by Kavirajes for heart diseases. The bark extracts of *Terminalia arjuna* have been reported to contain major constituents such as flavonoids, polyphenols, saponins, tannins, triterpenoids, sterols and minerals. These phytochemicals were experimentally proved to have antioxidant and antihypertensive effects relevant to the therapeutic potential in cardiovascular diseases (Maulik, 2012; Amalraj, 2017). Furthermore, the leaf and fruit extract of *Mangifera indica*, *Aegle marmelos*, and *Ananus comosus*, respectively showed significant cardioprotective roles (Saxena, 2014; Bhatt, 2017; Vishwakarma, 2018). The leaf extract of *Mangifera indica* was also reported to have potential to reduce serum cholesterol level (Gururaja, 2017).

Conclusion

Overall it can be said from the survey that a large number of medicinal or herbal plants used in Parati and Panjab villages of Cumilla Sadar south sub-district of Cumilla district has been validated by previous as well as current scientific research. Besides, the Kavirajes interviewed or their rural patients did not mention any toxic effects of the medications prepared with the plants. Recently scientists are showing renewed interest in medicinal plants because of the emergence of new diseases. These plants can provide effective roles in new treatments. Therefore, it is important to research more on these medicinal plants to identify potential compounds as therapeutic agents so that the plants may

be validated as remedies against various diseases in a more rational and scientific manner.

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