

## Some Plants Used against Gastrointestinal Disorders in Gopalganj District, Bangladesh

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### Abstract

Living under non-hygienic conditions, lacking access to quality water for cooking and drinking, and presence of a variety of enteric pathogens contribute to a large number of gastrointestinal tract (GI-tract) disorders and death, particularly among children of rural and urban slum areas of Bangladesh. On average, a rural child suffers from 4.6 episodes of diarrhea per year, from which about 230,000 children die every year. Besides diarrhea, other gastrointestinal disorders are also common like dysentery, constipation, acidity, and ulcers. Since the poverty stricken population cannot afford visits to doctors and clinics, which may not also be available in rural and remote areas, people often rely on folk medicinal practitioners (FMPs) for treatment. In a random survey conducted in a village in Gopalganj district of Bangladesh, the village FMP was found to use three plants, namely *Centella asiatica* for treatment of gastric ulcer, *Syzygium samarangense* for treatment of diarrhea, and *Aegle marmelos* for treatment of dysentery. The scientific efficacies of the phytotherapeutic treatments are discussed on the basis of available scientific reports on pharmacological activities and phytochemicals present in the plants.

**Keywords:** GI-Tract Disorders; Phytotherapy; *Centella asiatica*; *Syzygium samarangense*; *Aegle marmelos*; Bangladesh

### Abbreviations

FMP: Folk Medicinal Practitioner; FM: Folk Medicine; TMP: Tribal Medicinal Practitioner; TM: Tribal Medicine

### Introduction

Various sort of gastrointestinal tract (GI-tract) disorders like diarrhea, dysentery, constipation, acidity, and ulcers are common in Bangladesh. The rural people lack access to quality water for cooking and drinking and have to depend on pond, river, or underground water (obtained through tube wells) for their daily needs. Due to lack of modern toilet facilities, the same water source (like a pond) may be used as the source of water for drinking, bathing, washing clothes, and dipping cattle. These conditions lead to a huge numbers of diarrheal cases particularly in children every year. On average, a rural child suffers from 4.6 episodes of diarrhea per year, from which about 230,000 children die every year [1]. Dysentery is also common among children under 5 years of age, with *Shigella* spp. accounting for 32% of the cases [2]. *Helicobacter pylori* is responsible for causing dyspepsia and peptic ulcer; 92% of the adult population and 80 percent of children in Bangladesh are infected with this microorganism [3].

Needless to say, this situation causes a major health concern for the people. Approximately a third of the population lives below the poverty level and rural and remote area population lack proper access to modern doctors and health facilities. The urban slum population is increasing rapidly, which by itself is causing problems in adequate sanitary facilities. The poorer sections of the mainstream population as a necessity, therefore to some extent depends on folk medicine (FM) and folk medicinal practitioners (FMPs). The country also has

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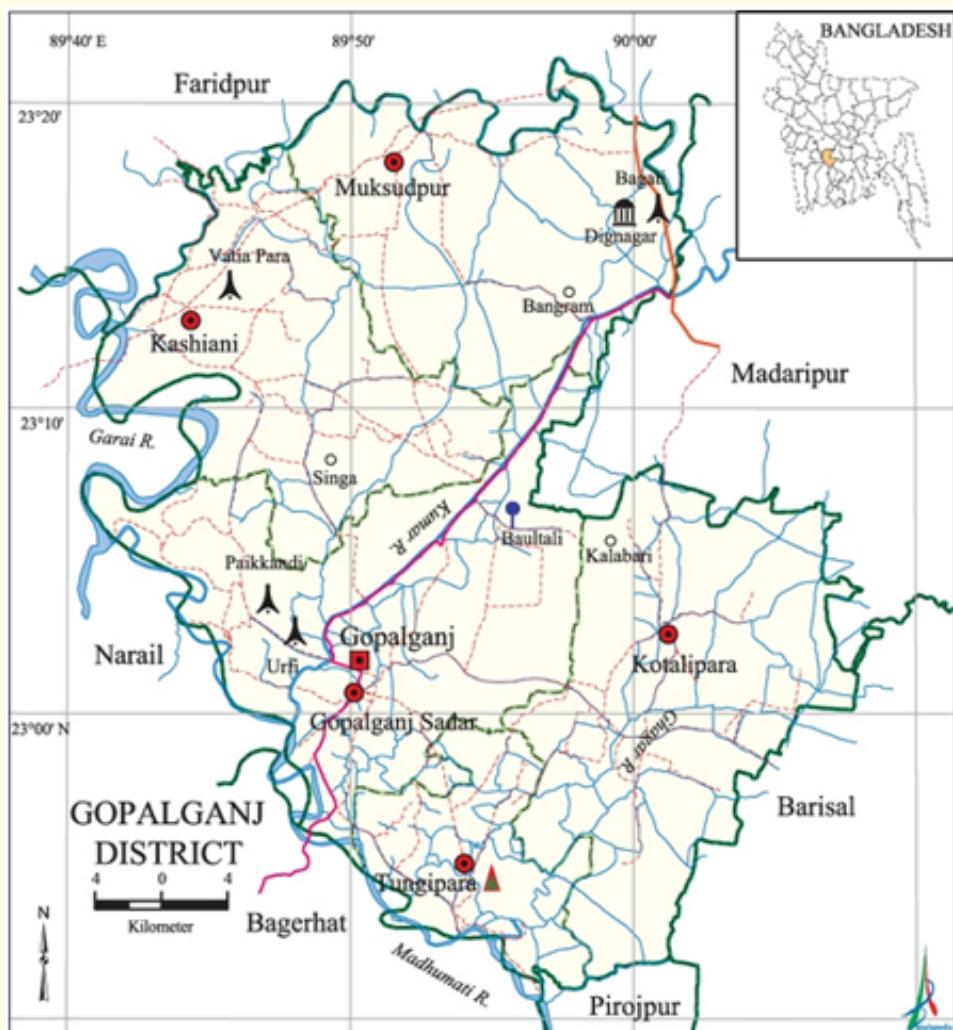
dozens of small and large tribes inhabiting remote areas of the country and they too depend on tribal medicinal practitioners (TMPs) and tribal medicine (TM). FMPs and TMPs depend mainly on plants for treatment, and these phytotherapeutic practices have been going on for time immemorial [4-6].

### Objective of the Study

The objective of this study was to find out plants used by a randomly selected FMP in a village of Gopalganj district, Bangladesh for treatment of gastrointestinal disorders.

### Methods

Prior informed consent was initially obtained from the FMP, named Asutosh Biswas and practicing in Hishur village, Gopalganj district, Bangladesh (Figure 1). Gopalganj district has an area of 1489.92 sq km and is located in between 22°50' and 23°01' north latitudes and in between 89°40' and 90°02' east. Several contacts were made with the FMP to initiate mutual confidence and respect (which is essential in rural Bangladesh). 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



**Figure 1:** Map of Gopalganj district (Inset: map of Bangladesh showing Gopalganj district in yellow).

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 [7] and Maundu [8]. In this method the FMP was asked questions with the help of a semi-structured questionnaire as to the disease(s) he treated, the plants that he used for treatment of those diseases, and the mode of selection of the plants. The FMP took the interviewers to spots from where he collected his medicinal plants during daylight hours, and showed the interviewers the plants that he used for treatment of various gastrointestinal disorders. Later on, in the evening hours, there were open-ended discussions between the FMP and the interviewers with the participation of the village elders and anybody who wished to join the discussions (including past and present patients of the FMP). In these discussions, the topic(s) ranged from various village affairs to traditional treatment methods. The discussions served to establish a bond between the villagers and the authors, which facilitated knowing about the plants from the FMP. It may be mentioned in this context that information gathering from FMP(s) is a time-consuming process in Bangladesh; unless a great deal of mutual trust and friendship is made, FMPs are hesitant to provide information for fear that their information will be used to treat prospective patients and they will lose their incomes or the money earned will be diminished. All plant specimens shown by the FMP were collected on the spot, pressed, dried and brought back to Dhaka for identification by a competent botanist. Voucher specimens were deposited with the Medicinal Plant Collection Wing of the University of Development Alternative. Several patients of the FMP were also interviewed without the FMP being present, and they mentioned that they have obtained satisfactory results following the FMP's treatment.

### Results

The present study represents an ethnobotanical/ethnomedicinal survey of a randomly selected folk medicinal practitioner, who besides treatment of other diseases also treats some gastrointestinal tract disorders like diarrhea, dysentery, and gastric ulcer. According to the FMP, the symptoms of gastric ulcer are pain in the stomach, bloating, vomiting, heartburn and an acid taste in the mouth (known in Bengali as 'tiktota'). Diarrhea was defined by the FMP as passing of frequent watery stool, which leads to weakness and a general inclination of not to eat anything. Dysentery, according to the FMP, was presence of mucus and/or blood with stool; the stool will also have a watery consistency. The FMP was observed to use three plants for treatment of various gastrointestinal disorders. The leaves of *Centella asiatica* (L.) Urb. (Apiaceae family, local name: Thankuni) were used by the FMP to treat gastric ulcers. In his procedure, four spoons of juice obtained from crushed leaves were taken orally for seven consecutive days in the morning on an empty stomach. Leaves of *Syzygium samarangense* (Blume) Merr. and L.M. Perry (Rutaceae family, local name: Jamrul) were used to treat diarrhea. Juice from 3 - 4 crushed leaves was taken orally with a glass of water. The FMP claimed that this would stop diarrheal episodes within 30 minutes. Unripe young fruits of *Aegle marmelos* (L.) Corr. (Rutaceae family, local name: Bael) were used for treatment of dysentery. After the skin was taken off, the fruit pulp was sliced and dried. Dried slices were then soaked in water overnight and the water taken orally in the morning with sugar on an empty stomach. This procedure was done for 2 - 3 consecutive days.

Folk medicine in Bangladesh can be practiced by anybody who claims to know about curing diseases with plants, animals, amulets, and incantations. There are no regulatory agencies for FMPs or presence of any training institutions for them. As such, whether the practice of a FMP is spurious or done with sound phytotherapeutic knowledge is defined by one factor only, namely patient satisfaction. So if a FMP is known to practice at a certain place for a number of years, this indicates that the patient(s) are getting good results or they would have compelled the FMP to leave the area. However, unlike allopathic medicine, no prescriptions are given or any data kept either by the FMP or the patients. In the present instance, several patients mentioned that they have been relieved of their various gastrointestinal disorders with the plant recipes given to them by the FMP. Overall, our impression was that the FMP was well-liked in the village.

### Discussion

Improved healing of gastric epithelium using pentacyclic triterpene-rich *Centella* extract has been reported [9]. Leaf extract of the plant has also been shown to protect against indomethacin-induced gastric mucosal injury in rats [10]. The active component seems to be asiaticoside [9]. As such, the scientific reports indicate that the plant can be both protective and therapeutic against gastric ulcer. The action of asiaticoside has been attributed to attenuation of myeloperoxidase activity at the ulcer tissues with concomitant promotion of epithelial cell proliferation and angiogenesis, thus giving a healing effect in ulcers [11]. *Syzygium samarangense* reportedly is effective against diarrhea, possibly due to presence of calcium antagonists. Also four flavonoids isolated from hexane extract of the

plant and identified as 2'-hydroxy-4',6'-dimethoxy-3'-methylchalcone (SS1), 2',4'-dihydroxy-6'-methoxy-3',5'-dimethylchalcone (SS2), 2',4'-dihydroxy-6'-methoxy-3'-methylchalcone (SS3) and 7-hydroxy-5-methoxy-6,8-dimethylflavanone (SS4), showed dose-dependent spasmolytic activity, which would be beneficial in preventing diarrheal episodes [12]. To be noted is that intestinal spasms are present in diarrhea, and as such, anti-spasmodic or spasmolytic medicines can be helpful in diarrheal episodes. Finally, auraptene - a phytochemical in *Aegle marmelos* has been shown to be effective in dysentery [13]. Auraptene has anti-bacterial and antiprotozoal activities [14], and since bacteria (*Shigella*, *Salmonella*, *Campylobacter*) and protozoans (like *Entamoeba histolytica*) can cause dysentery, auraptene may act through inhibition of these dysentery-causing agents.

### Conclusion

The various scientific reports clearly point out that the FMPs selection of plants for treatment of gastric ulcer, diarrhea and dysentery was correct from the scientific view point. FM has been present in Bangladesh for possibly hundreds of years. Thus this branch of medicine has the advantage of being time-tested and so can be utilized by modern scientists for discovery of new drugs.

### Conflicts of Interest

The authors declare that they have no conflicts of interest.

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