

Ethnobotanical survey of medicinal plants used by traditional health practitioners and indigenous people in different districts of Chittagong division, Bangladesh

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ABSTRACT : *There is very limited information regarding plants used by traditional healers and general people in Chittagong division, for treating general ailments and common diseases. Current study provides significant ethnopharmacological information, both qualitative and quantitative on medical plants of this region used for the treatment of gastrointestinal disorders, skin diseases and sexual dysfunction. The survey was carried out in a period of almost 8 months. This survey is conducted among 80 people of three districts of Chittagong division of Bangladesh on various sectors to estimate the knowledge of medicinal plants used in Gastrointestinal tract (GIT) disorder, skin diseases and sexual dysfunction. Open-ended and semi structured questionnaire were used to interview people including traditional healers, Ayurvedic/Unani drug manufacturers and local people. The collected data were analyzed qualitatively and quantitatively. A total of 40 plant species of 20 families were listed for the treatment of gastrointestinal disorders, skin diseases and sexual dysfunction. Leaves were the most cited plant part used against these diseases. Most of the plant species were very common and were cultivated or planted in homestead or roadsides. From the study, we found medicinal plant family Apiaceae 15.79%; Meliaceae, Zingiberaceae and Poaceae 18.18% each; Myrtaceae and Fabaceae 20% each are widely used for GIT disorder, skin diseases and sexual dysfunction respectively. Folklore and tradition medicinal plants are important contributor for various ailments of local communities. It is urgent need for documenting these before such valuable knowledge becomes inaccessible and extinct. Moreover, this study could play an important role for the conservation of these plants and represent the preliminary information required for future phytochemical investigation.*

KEYWORDS: *Gastrointestinal tract (GIT) disorder, Skin diseases, Sexual dysfunction, Frequency of citation (FC value), Ethnobotanical data.*

I. INTRODUCTION

Traditional medicine still remains the main resource for majority (80%) of people in developing countries for treating health problems, particularly because medicinal plants are accessible and cheap [1,2]. Ethnobotany may be defined as an anthropocentric approach to botany and is essentially concerned with gathering information on plants and their use [3]. Ethnomedicinal survey is one of the reliable sources to natural and synthetic drug discovery [4]. The work on ethnobotany in Bangladesh is very recent. But, Hutchinson first worked on CHT (Chittagong Hill Tract) in 1909. The most recent work has done by Rahman *et al.*, 2003 [5]; Millat-e-Mustafa *et al.*, 2001 [6]; Pavel *et al.*, 2007 [7]; Anisuzzaman *et al.*, 2007 [8] and Kadir *et al.*, 2012 [9]. Chittagong Division is geographically the largest among the divisions of Bangladesh. There are so many geographical varieties like– costal area, islands, river, small hills, low lands etc. are present in this region. Here the concerned districts Noakhali, Feni and Chittagong (without hilly tract) are island rich coastal areas where some indigenous medicinal plants species are used for the treatment of ailments. Before this survey a few endeavor was conducted in Noakhali and Feni districts. Although, some sort of surveys were conducted in Chittagong district. Most of them were done in small scale survey works. The knowledge on medicinal plants usage is very often passed on from one generation to the next only verbally [10] and most of this knowledge has not been documented [11,12]. Moreover due to deforestation, environmental degradation, migrations of traditional medicinal healers to other jobs cause rapid erosion of this rich knowledge. Chittagong division is prone to several diseases. Due to being coastal area here skin disease, gastrointestinal disease etc. diseases are very dominating. So, this survey conducts the information about these diseases. The objective of this study was to preserve the knowledge of these three diseases in this region and also find the newer treatment of these diseases.

II. MATERIALS AND METHODS

2.1 Site selection

Three districts of Chittagong division are selected for the study. Information about these districts are- Noakhali is a district in South-eastern Bangladesh. It is located (22.83°N 91.10°E) in the Chittagong Division. The district has an area of 3601 km² and is bordered by Comilla district to the north, the Meghna estuary and the Bay of Bengal to the south, Feni and Chittagong districts to the east and Lakshmipur and Bhola district to the west. Feni is a small southeastern district of Bangladesh bordering (clockwise from the north) Tripura in India, Chittagong district, the Bay of Bengal, Noakhali district and Comilla district. Area 928.34 km² and location (23.0167°N and 91.3917°E). Chittagong District is a district located in the south-eastern region of Bangladesh. It is a part of the Chittagong Division. Area 5,282.98 km² and location (22.3375°N and 91.8389°E).

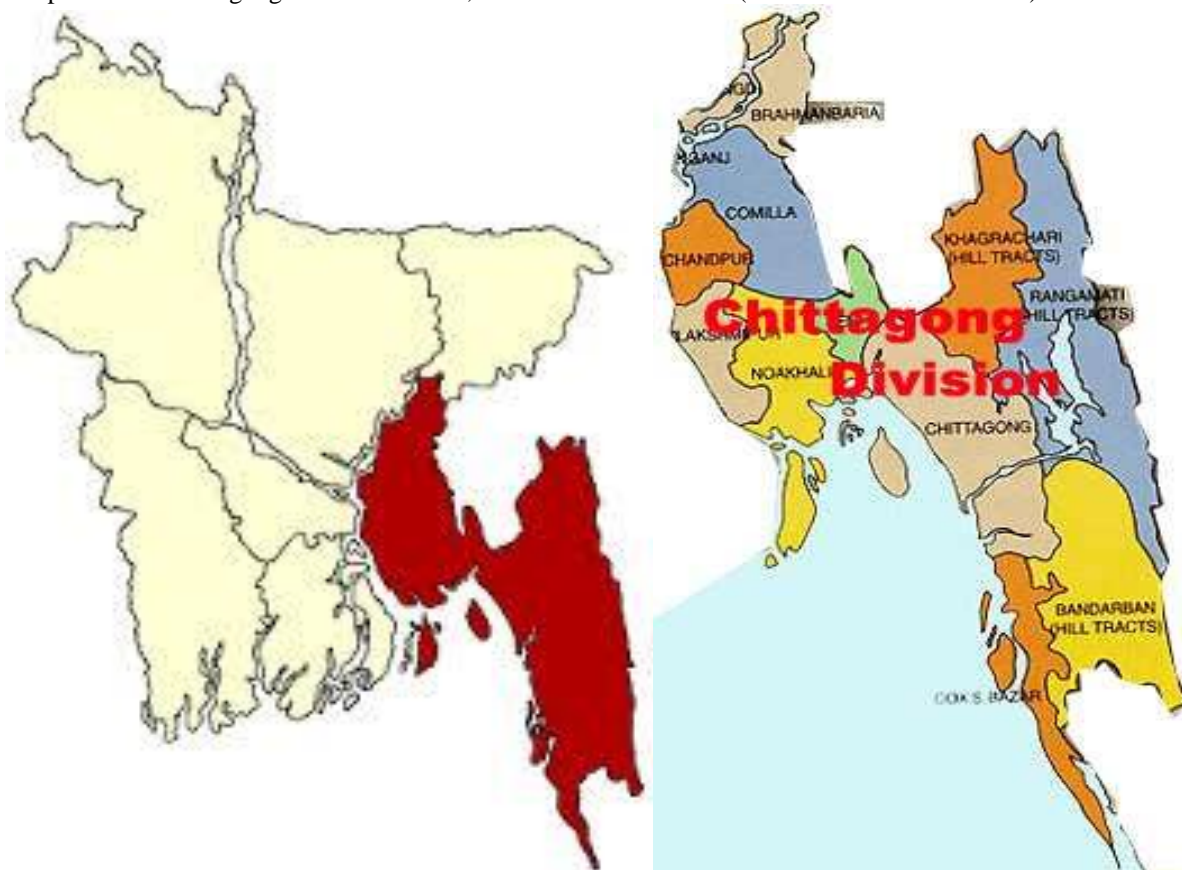


Figure 1. Map of Chittagong division

2.2 Sampling informants

The ethnobotanical survey was conducted between August 2013 to March 2014. It was planned to cover at least five Kabiraj/Ayurved/hakim/Unani practitioners in each area. The experts in Unani and Ayurvedi Board were also consulted and reputed Hakims and Ayurvedi drug manufacturers namely Hamdard, Ayurvedi Pharmacy, Shakti, Sadhana and Kundeshwari played an important role. Besides local people who had practical or empirical knowledge on medicinal plants had been interviewed. A total of 80 people were interviewed for this purpose. However, gender, age, educational background and experience on use of traditional medicinal plants of inter-viewees were taken into consideration.

2.3 Ethnobotanical data collection

The objectives of the study were clearly explained and verbal consent was obtained by interviewer from each informant. Most interviews were arranged by local people familiar with traditional healers and who could communicate with native communities. Open-ended and semi structured questionnaire were used for the purpose [13-14]. The record questionnaires used included the following information: (a) the local name; (b) plants part/s used; (c) the method of preparation; (d) source of plant material and (e) relative abundance at the area. Data concerning the social profile of the participants such as gender, age, educational background, experience were also recorded. Interviews were conducted using the Bengali language. Informants were asked to collect the plants they used for the treatment of gastrointestinal disorders, skin diseases and sexual

dysfunction. These specimens were pressed, preserved and later identified by the Bangladesh National Herbarium, Dhaka (Voucher specimens # 39531, Bangladesh National Herbarium).

2.4 Data analysis

The species were listed in alphabetical order by scientific name, family, local name, general name, plants parts used, mode of preparation, habit, habitat, relative abundance, geographical distribution, nature, general name, solvent used and frequency of citation (FC). The FC of the species of plants being utilized was evaluated using the formula: $FC = (\text{Number of times a particular species was mentioned} / \text{Total number of times that all species were mentioned}) \times 100$.

III. RESULTS

3.1 Informants

Among of 80 interviewees, major informants are male. Majority of the interviewees were aged around 50-60 years. Most of the interviewees were completed 5 and 8 years education level. The majority of interviewees were 5-10 years of professional experience, followed by 10-20 years of experience. 23 out of 80 interviewees are Aurvedic practitioner. Along with this figure of professional background, a significant portion of informants were local old people, hakim and other professional (Table 1).

Table 1. Demographic Data of the informants.

Variable	Categories	No. of person
Gender	Male	69
	Female	11
Age	< 30 years	5
	30-40 years	10
	40-50 years	17
	50-60 years	30
	> 60 years	18
Educational background	Illiterate	10
	Completed 5 years education	17
	Completed 8 years education	21
	Completed 10 years education	12
	Completed 12 years education	8
	Graduate (Higher education)	7
Experience	Others	5
	< 2 years	7
	2-5 years	12
	5-10 years	28
	10-20 years	17
Profession	> 20 years	16
	Hakim	18
	Unani	5
	Aurvedic	23
	Local older person	18
Others	16	

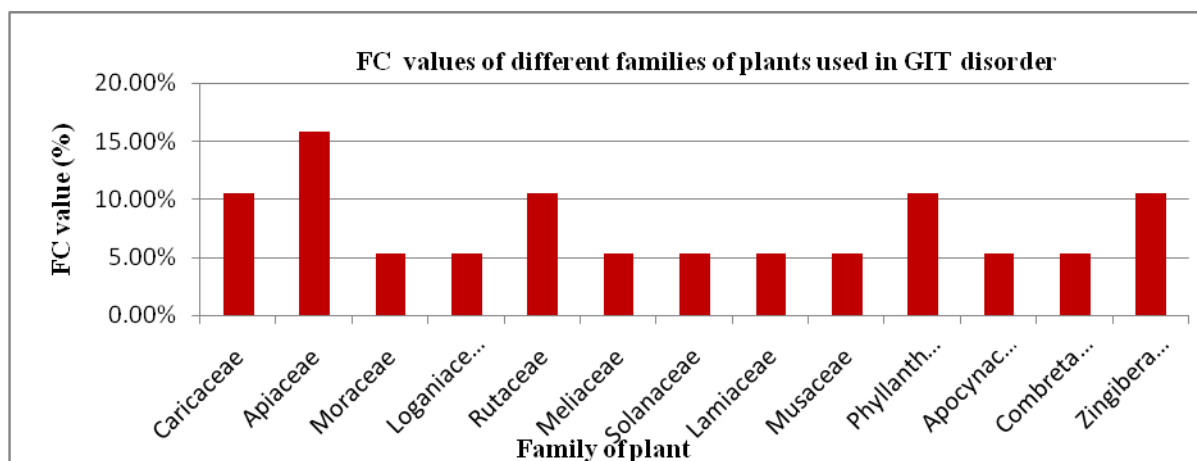


Figure 2. Medicinal plants used for GIT disorder

The no. of indicated medicinal plants and their potential applications in the treatment of GIT disorders reflect the rich ethnomedicinal value [15]. In our study, we found different families of plants are used for the treatment of GIT disorder. From which, Apiaceae is leading 15.79%, which is followed by Zingiberaceae, Phyllanthaceae, Caricaceae, Rutaceae 10.53% each and so on (Fig 2).

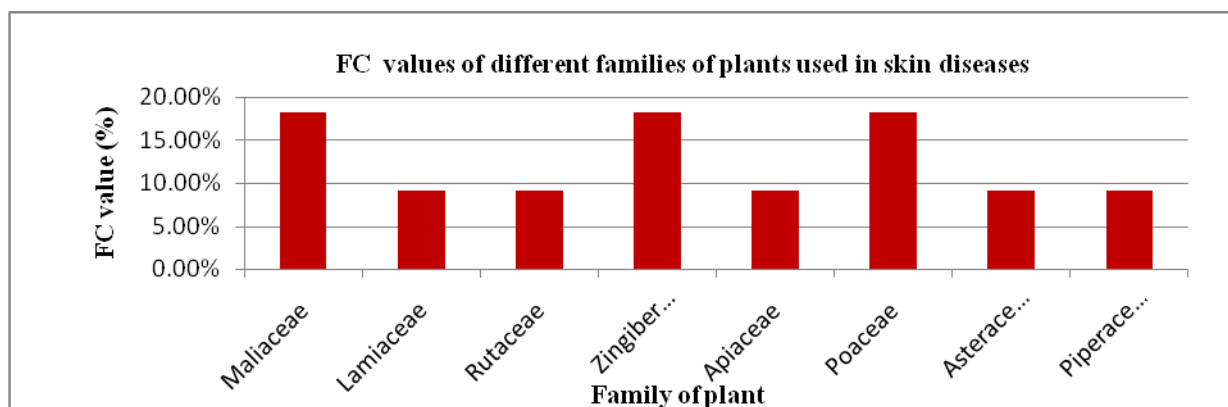


Figure 3. Medicinal plants used for Skin diseases

In this study, we found about 11 medicinal plants of 8 different families are greatly utilized by the people of these districts for skin diseases in which Meliaceae, Zingiberaceae, Poaceae are leading families 18.18% each and which are followed by Lamiaceae, Rutaceae and so on. (Fig 3)

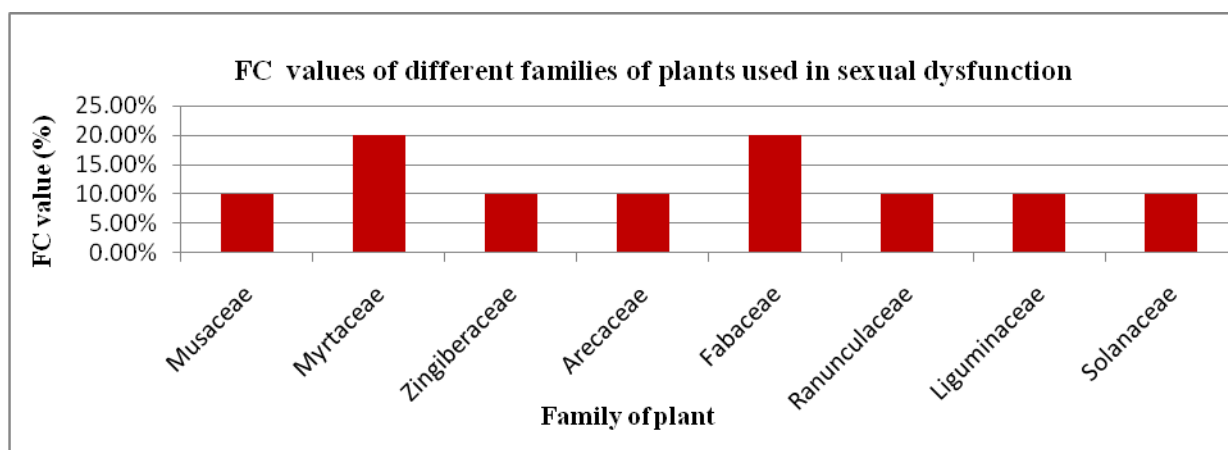


Figure 4. Medicinal plants used for Sexual dysfunction

In this study, about 10 medicinal plants of 8 families both cultivated and wild-harvested generated show that herbal remedies are greatly utilized by men in this area for sexual dysfunction. Different families of plants are commonly used in which of them Myrtaceae and Fabaceae 20% each are leading families, which are followed by Solanaceae, Zingiberaceae, and so on. (Fig 4)

Table 2. Parts of medicinal plants used in different preparations in the study area.

Plant parts	*Percentage (%) of the parts of medicinal plants used in different preparations		
	Plant used in GIT disorder	Plant used in Skin diseases	Plant used in Sexual dysfunction
Bark	11.12%	15.40%	12.85%
Bark, Roots	-	-	5.86%
Bulb	4.50%	-	-
Flowers	7.54%	3.23%	-
Flowers, Leaves	-	-	5.22%
Leaves	34.62%	44.59%	40.66%
Leaves, Roots	11.12%	7.86%	-
Fruits (unripe)	4.09%	-	-
Fruits (ripe)	-	-	5.48%
Leaves, Roots, Fruits	5.46%	5.76%	-
Seeds	-	-	15.62%
Woods	-	18.93%	-
Leaves, Seeds	5.14%	-	7.65%
Rhizomes	4.15%	-	-
Whole plants	12.26%	4.23%	6.66%

*Percentages were calculated as the ratio between the number of plants in which a certain part is used and the total number of plants. Leaves are the major plant parts used for the treatment of GIT disorder, Skin diseases and Sexual dysfunction respectively. Leaves serve almost (34.62%) of the overall surveyed plant parts used for the treatment of GIT disorder. Other notable plant parts are bark (11.12%), Leaves and roots (11.12%), whole plant (12.26%). Leaves serve (44.59%), bark (15.40%), wood (18.93%) for Skin diseases. Again, major plant part used for the treatment of sexual dysfunction is leaves (40.66%). Besides, barks (12.85%), seeds (15.62%) play significant role for treating sexual dysfunction.

IV. DISCUSSION

In our study, we found 69 out of 80 participants are male. According to Ikhtiar Alam SM, in developing countries, society is, in general, male dominated in terms of participation in household decision making [16]. In Bangladesh, the male villagers are more knowledgeable than female in term of medicinal knowledge. Again, aged person are more knowledgeable than younger one. A kind of negligence among younger generations was also observed which is also a cause of rapid loss of valuable information regarding the uses of medicinal plants in this area. As significant amount of informants are hakim, Aurvedic practitioner which are followed by local old people. According to Dr. Abdul Ghani, almost 455 medicinal plants name so far been enlisted as growing or available in Bangladesh [17]. Generally, common medicinal plants are used for the overall treatment of various diseases. As the people of these areas are concerned about various uses of medicinal plants, these are observed with care. In case of GIT disorder, the most cited plants were belonging to the family of Apaceae, Zingiberaceae, Phyllanthaceae, Caricaceae, Rutaceae etc. families are mainly used for GIT disorder. This result supports the previous claim of Mollik *et al.*, 2009 [18]. Similarly, for skin diseases, the most cited plants were belonging to the family of Meliaceae, Zingiberaceae, Poaceae, Lamiaceae, Rutaceae. Again, for sexul dysfunction, the most cited plants were belonging to the family of Myrtaceae, Fabaceae, Solanaceae, Zingiberaceae. It was found that many different parts of the plants were used as GIT disorder, sexual disorder and skin diseases such as leaves, roots, barks, fruits, flowers, wood, seeds etc. Among these, leaves are the most frequently used plant part which is followed by the barks, roots and the whole plant. Similar type of results were also obtained by other researchers [19-22]. The leaves are the main photosynthetic organs containing photosynthates which might be responsible for medicinal values [23,24]. Collection of leaves and then using them as medicine is very easy as compared to roots, flowers and fruits [22, 25]. Another reason of using leaves

could be concerning conservation of the plants as digging out roots might be the cause of death of the plant and putting the species in a vulnerable condition [26-30].

V. CONCLUSION

Our study reveals that plants are still a major source of medicine for the local communities of most of the portions of our surveyed area, as modern health care facilities are still not sufficient. This report may represent a useful and long-lasting document, which can contribute to preserve knowledge on the use of medicinal plants in this region and also stimulate the interest of future generations on traditional healing practices. The information provided in the paper is limited and there is a scope to initiate further ethnobotanical study among the communities to gather information as far as possible. The medicated claims incorporated in the study need to be evaluated through phytochemical and pharmacological investigations to discover their potentiality as drugs. It is an urgent need for documenting these before such valuable knowledge becomes inaccessible and extinct.

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CONFLICTS OF INTEREST : All authors have none to declare.

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