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## Research

### Medical ethnobotany of the Marma community of Rangamati district of Bangladesh

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The ethnomedicinal practices of Marma indigenous community of Bangladesh is considered rich. This study aimed to compile their medicinal plant usage to get fresh insights into newer ethnobotanical uses. Ethnomedicinal information was collected through open-ended/semi structured techniques following field interview, plant interview and market survey from key informants. Documented data was further analyzed using different quantitative indices. The Jaccard index was also calculated to show the degree of similarity with previous studies conducted in Bangladesh and abroad. A total of 196 plants from 75 families belonging to 164 genera were documented in the survey. Gastrointestinal disorders epitomized the foremost complaints sort with the use of 72 plant species, followed by pain and inflammation (63 species). Leaves (42.8%) were the principal source of medication while trees were the major plant type used in the ethnobotanical practice. The original application of ethnomedicinal plants within our study was compared with 44 previous ethnomedicinal research studies and the Jaccard index (JI) ranged from 0.78 to 46.78. The highest similarity within the country was recorded with studies from the Bandarban district while the lowest was from the northern region. Similarly, the highest similarity with reports from neighboring countries was with Chanduali district of UP, India and the lowest with FATA, Pakistan. Importantly, our literature study exhibited that this study recorded 23 species with new ethnomedicinal uses. The Marma community still depends on plants to treat different complaints/diseases. This compilation may provide a future resource for further phytochemical and pharmacological studies.

Keywords: ethnobotany, herbal medicine, indigenous community, medicinal plant, Bilaichari

## Introduction

Many traditional healing herbs and their parts have been shown to have medicinal value and can be used to prevent, alleviate or cure various human diseases. Due to this, the World Health Organization (WHO) has a keen interest in recording the use of medicinal plants by indigenous peoples from around the world (Buragohain 2011).



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Medicinal plants are the ‘backbone’ of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize ethnomedicinal plants on a regular basis (Davidson-Hunt 2000). Ethnomedicinal knowledge is valuable in searching new medicine for human welfare. To develop drugs with lesser side effects than synthetic drugs, the knowledge of medicinal plants from the indigenous communities will play a great role. In recent years, interest in herbal medicines has increased considerably both at home and abroad as they are believed to be comparatively less toxic than the synthetics (Bandaranayake 2006).

Depending on the rich local plant diversity, which is due to its environment and availability of raw materials for making ethnomedicine, a long traditional system of medicine has developed among the indigenous communities of Bangladesh, which is considered a very important constituent of the primary health care system, who are inaccessible to the modern system of medical facilities. Furthermore, one study reported that more than 80% of the Bangladeshi use herbal medicines for their primary healthcare, of which ethnomedicinal plants constitute a major component (Yusuf et al. 1994). Bangladesh is home to 35 indigenous communities, which shelter about 2% of the total inhabitants, whom populate various hilly and inaccessible areas (Uddin et al. 2010). These communities have varied cultural backgrounds and practice traditional treatment systems by using ethnomedicinal plants along with various types of ingredients with often anecdotal results (Khan et al. 2015). However, indigenous knowledge of using medicinal plants is in risk due to increasing extinction rate and passing these knowledge on orally from generation to generation without the aid of a writing system (Asase et al. 2008, Nadembega et al. 2011). One such community is Marma, the second largest indigenous community in Bangladesh, mostly living in the Chittagong Hill Tract disticts including Bilaichari Upazila. Belaichhari is an upazila of Rangamati district of Bangladesh, home of nine indigenous communities viz, Chakma, Marma, Tripura, Tanchayanga, Bawm, pankhua, Chak, Khumi and Mro (Islam 2003), among which the Marma community was selected for this study. A clan of Marma abide in the studied area (Nokhattachora, Mopoffochora, Kutubdia) which is about 25 km away from the Rangamati district. In the rainy season, the only way to reach to the studied area is by motor-boat, taking 7–8 h, while in dry season it takes more than 8–9 h on foot.

The foremost obstacle in the hunt for modern care by rural indigenous members are absence of doctors, high consultancy fees, low domestic income, costs of medicines, distances, transportation costs, travel time and regular transport facilities. In fact, the Bilaichari Upazila has only one government health complex with basic conventional medicine facilities, which is nearly 18 km away from the studied area. The inhabitants thus have no frequent access to modern health care system. Most of the people of this area hinge on traditional health system as first and last source of treatment because of low cost. To mitigate these obstacle, indigenous communities established their own health care system led by

their own traditional healers. Likewise, Marma indigenous communities have their unique system of traditional health-care and their ethnomedicinal practice is considered rich, however their traditional knowledge remain fully unexplored and unknown for other parts of the country, especially the Bilaichari Upazila. Despite of the existence of rich traditional ethnomedicinal practices in the Rangamati district, only a few devoted plant based ethnomedicinal studies have been conducted so far (Kadir et al. 2012, Uddin et al. 2014). These studies have been conducted in a few areas of Rangamati and only limited to qualitative analysis in small extent and did not analyze the data quantitatively. However, there is one other study published by us from the same studied area on another Pankhua indigenous community (Faruque et al. 2019). Considering this, the present study aimed to document the ethnomedicinal plant using information from the Marma community of Bangladesh and compare the presently recorded ethnomedicinal information with previously published ethnomedicinal information of Bangladeshi plants with the aim of getting fresh insights into newer ethnobotanical uses of the plants.

## Methodology

### Study area

Rangamati, the largest district of the country, which is part of Chittagong division and Chittagong hill tracts, is located at 22°00'27" to 23°00'44"N and 91°00'56" to 92°00'33"E. The Marma live in the three hill districts of Rangamati, Bandarban and Khagrachhari. Some Marma, however, live in the coastal districts of Cox's Bazar and Pathuakhali. They speak an Arakanese dialect. Agriculture is the main occupation of Marma. There are ten Upazilas (sub-districts) in the Rangamati district. Of them, Belaichhari Upazila was selected for the present study. It is situated approximately between 20°50' to 22°35'N latitude and between 90°38' to 92°17'E longitude. It is bounded by Juraichhari and Rangamati sadar upazila on the north, Ruma and Thanchi upazila on the south, Mizoram (India) and Myanmar on the east, Kaptai, Rajasthali and Rowangchhari upazila on the west (Fig. 1). Belaichhari upazila was established in 1976. It consists of 3 Union parishads, 9 mouzas and 59 villages. The average literacy rate of this area is 26.7%. The temperatures are highest on average in May, at around 28.7°C, January has the lowest average temperature (20.6°C) of the year. The people drink water mainly from natural jhorna (waterfalls) and sanitation facilities are very poor in the studied area (Islam 2003).

### Method of study

Data collection by using appropriate methodology or techniques is an essential part of any research. Successful ethnobotanical documentation depends on application of appropriate methods. It is very important to locate knowledgeable informants for the documentation of medicinal plants (Given

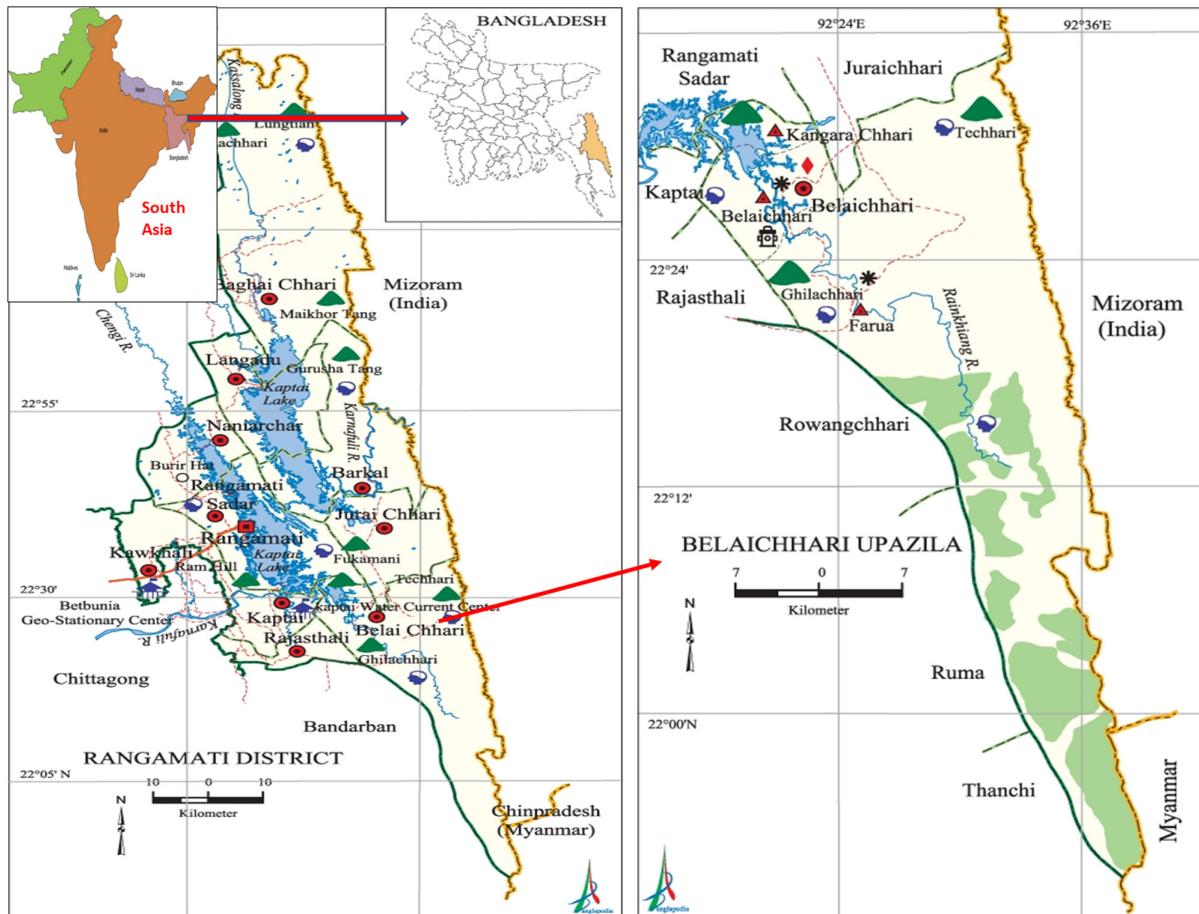


Figure 1. Map of study area.

and Harris 1994). Informants (Supporting information) were selected before going to the studied area with the help of colleagues, students and their relatives who have knowledge about medicinal plants, occupation, age etc. The interview is a dynamic process involving spoken interactions between two or more people (Faruque et al. 2019). The recommended techniques for ethnobotanical documentation are direct or participant observation, checklist interview, group interview, field interview, plant interview and market survey (Martin 1995b, Alexiades and Sheldon 1996). The present study utilized all these technique except check list interview (Supporting information). Documentation was done by open ended and semi-structured questionnaires. Information was noted on data documentation sheets (Supporting information) which were prepared based on previously published research works (Alcorn 1984, Jain 1989, Martin 1995a, Cotton and Wilkie 1996, Alam 1998). Interviews was conducted in chittagonian (local) language and help was taken from a local student named Uthoy Marma for the interpretations.

No clear rules or regulations pertain to the practice of traditional ethnomedicinal research in Bangladesh. However, permission was taken orally from the head (*karbari*) of the

community and local administration before taking interview. The purpose of the research project was explained to selected informants before they gave oral informed consent. Each participant of the present study agreed to participate voluntarily. Participants were allowed to discontinue the interviews at any time. Upon completion of the study, all documented data will be included online at <[www.ebbd.info](http://www.ebbd.info)> and <[www.mpbd.cu.ac.bd](http://www.mpbd.cu.ac.bd)>. During the collection of ethnomedicinal plants/parts for the voucher specimen, permission was taken from the appropriate authority, owner of the plants and the local government.

## Quantitative ethnobotany

### **Informant consensus factor (ICF)**

Informant consensus factor (ICF) is used to determine the level of homogeneity of information between the different informants (Heinrich et al. 1998 {Trotter, 1986 #235}). It was calculated using the following formula:  $FIC = \frac{Nur - Nt}{(Nur - 1)}$ . Where, 'Nur' denotes the total number of use reports for each disease group and 'Nt' refers the total number of species used for that group.

### **Use value (UV)**

Use value (UV) is an index widely used to enumerate the relative importance of beneficial plant. The UV was calculated using the following formula modified by Phillips et al. (1994).

$$UV = \sum UV / N$$

where, 'UV' refers to the number of uses mentioned by the informants for a given species and 'N' refers to the total number of informants interviewed.

### **Frequency of citation (FC) and relative frequency of citation (RFC)**

The FC was calculated using the following formula:  $FC = (\text{number of times a particular species was mentioned}) / (\text{total number of times that all species were mentioned}) \times 100$ .

$RFC = FC/N$ . Where, FC=frequency of citations, N=total number of informants (Tardío and Pardo-de-Santayana 2008).

### **Relative importance index (RI)**

Relative importance index was calculated with the following equation (Tardío and Pardo-de-Santayana 2008):

$$RI = \{RFC_{s(\max)} + RNU_{s(\max)}\} / 2$$

where,  $RFC_{s(\max)} = FC_s / \max(FC)$  and  $RNU_{s(\max)} = NU_s / \max(NU)$ . The RI index theoretically varies from 0 to 1, when nobody mentioned any use of the plant then RI is 0, and when the plant was most frequently mentioned as useful in the maximum number of use categories its RI index is 1.

### **Jaccard index (JI)**

The Jaccard index is used to understand the similarities between the data, i.e. similarities between the ethnobotanical studies conducted in other parts of Bangladesh as well as other countries in the world, and also among the indigenous communities in the studied areas. The formula to evaluate the JI index (González-Tejero et al. 2008) is:

$$JI = cx100 / a + b - c$$

where, 'a' is the recorded number of species of the study area 'A,' 'b' is the documented number of species of the area 'B' and 'c' is the common number of species in both area 'A' and 'B'.

### **Relative popularity level (RPL)**

Relative popularity level (RPL)=Percentage of  $I_u / 30$ , where,  $I_u$ =number of informants for any medicinal effect (Friedman et al. 1986).

### **Rank order priority (ROP)**

Rank order priority (ROP)=FL  $\times$  RPL (here, FL=fidelity level, RPL=relative popularity level), ROP value represents

the high popularity of the medicinal plants (Friedman et al. 1986).

### **Demographics of informants**

A total of 65 informants (Supporting information), including traditional healers and elderly men and women, with ages ranging from 20 to 90 years were interviewed, but the majority (47.69%) belonged to the age group of 31–50. Demographic information is presented in Table 1.

### **Enumeration of taxa**

The ethnobotanical survey was carried out three times in summer, winter and rainy seasons from March 2018 to August 2019. All plant material collected was identified through expert consultation and by comparison with herbarium specimens. Voucher specimen were deposited in the Chittagong university herbarium with accession numbers. Descriptions and current nomenclature were compared with the recent 'Dictionary of Plant Names of Bangladesh-Vascular Plants' (Pasha and Uddin 2013) and with The Plant List (<www.theplantlist.org>). Recorded ethnomedicinal plant species along with their corresponding taxonomical and ecological information were summarized in Table 2.

## **Results**

### **Ethnomedicinal plants/part(s)**

In the present study, a total of 196 species of medicinal plants were recorded from the Marma indigenous community, belonging in 167 genera in 75 families. (Table 2). Of them, the most used families in terms of number of species was Fabaceae (16) followed by Euphorbiaceae and Asteraceae (11 species each), Lamiaceae (10), Apocynaceae (9), Mimosaceae (7), Caesalpiniaceae, Orchidaceae, Solanaceae (6 species each), Malvaceae and Moraceae (5 species each), Acanthaceae, Poaceae, Rubiaceae, Zingiberaceae (4 species each) and Araceae, Combretaceae, Myrtaceae Verbenaceae

Table 1. Demography of informants.

Variables	Categories	Percentage %
Gender	Male	73.84
	Female	26.16
Age group	< 30	6.15
	31–50	47.69
	51–70	33.84
	71 >	12.30
Education	Illiterate	47.73
	Primary	27.66
	High school	21.54
	University	3.07
Profession	Daily laborer	23.08
	Farmer	40.00
	Professional healer	16.92
	Others	20.00

Table 2. Ethnomedicinal plants used by Marma community and their quantitative analysis.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LC <sup>a</sup> status	RI	RPL	ROP	RFC	UV	FC	UR
1. <i>Abelmoschus moschatus</i> (L.) Medik. TL06092019-21	Fiuma wai	Mushakdina	Malvaceae	Sh	Sd	Fever, nervous disorder, mental problem of children	Decotion of seed is useful in nervous disorder. It is also used as drink to treat fever and mental problem in children.	LC	0.25	0.47	10.07	0.22	0.21	14	3
2. <i>Abronia augusta</i> L. TL06092019-16	Tolosmalla	Ulokombhol	Sterculiaceae	Sh	Rt	Severe pain, Dysmenorrhoea	Juice prepared from root through rubbing on stone is taken twice a day to treat pain and dysmenorrhoea until cure.	LC	0.21	0.43	6.61	0.2	0.15	13	2
3. <i>Abrus precatorius</i> L. TL06092019-09	Kunch, ratti, chanti	Sarakao	Fabaceae	Cl	Lf, Rt	Cold, sore throat, diabetic, erectile dysfunction,	Juice prepared from the roots of the plant is taken two tea spoons twice a day to treat cold and sore throat. Leaves are also taken to treat diabetes and erectile dysfunction.	EN	0.44	1	14.28	0.430	0.14	28	4
4. <i>Acacia farnesiana</i> (L.) Willd. TL06092019-11	Murimotto	Belatibhaba	Mimosaceae	Tr	Lf, Bk	Severe pain, arthritis	Leaves boiled in water and the extract is taken as sedative.	VU	0.19	0.37	6.727	0.169	0.18	11	2
5. <i>Acacia rugata</i> (Lam.) Mar TL06092019-10	Kanpor	Bannitha	Mimosaceae	Sh	Wpt	Madness	Extract of bark is taken for the treatment of arthritis. Whole plant is boiled in water and used to take bath as a treatment of madness (psychological disorders).	VU	0.11	0.23	3.285	0.107	0.14	7	1
6. <i>Acampe paeonora</i> (Roxb.) Blatt & McCann TL06092019-05	Soitalammoy	Mar	Orchidaceae	Ep	Lf	Paralysis, Rheumatism impotence	Power prepared from leaf is taken with honey twice a day for the treatment of paralysis and rheumatism. Extract of leaf is also taken in impotence.	LC	0.24	0.43	9.923	0.20	0.23	13	3
7. <i>Acanthus ilicifolius</i> L. TL06092019-13	Tangtilaoa	Hargjha	Acanthaceae	Sh	Lf	Headache	Leaf extract is taken with honey which helps to decrease headache.	LC	0.13	0.3	3.33	0.13	0.11	9	1
8. <i>Acanthus mollis</i> L. TL15102019-118	Tangtilaoa	Dhakhara	Acanthaceae	Sh	Lf	Headache	Extract prepared from leaves is taken with honey to reduce headache.	EN	0.09	0.2	3.33	0.09	0.17	6	1
9. <i>Acacia nilotica</i> (L.) Willd. ex Del TL15102019-107	Dopang	Babla	Mimosaceae	Tr	Bk, Lf	Diarrhea, dysentery, cough, crying childthen.	Juice of bark is taken a day to treat diarrhea and dysentery. Leaf juice is taken once daily in order to stop baby's over crying and cough in adult.	LC	0.32	1	22.22	0.27	0.22	18	4
10. <i>Achyranthes aspera</i> L. TL06092019-90	Chai chi	Apang	Amaranthaceae	H	Rt	Leucorrhoea, hysteria, toothache.	Extract prepared from root by rubbing it, stone is taken twice a day for a month to treat leucorrhoea, in addition root chewed daily to relief toothache. Leaf is given as eye drops in hysteria.	C	0.39	1	11.54	0.4	0.11	26	3
11. <i>Acorus calamus</i> L. TL06092019-105	Lanki	Bach	Araceae	H	Rh, Lf	Severe pain, fever, laxative, spiritual use.	Rhizome extract is taken to treat pain and fever and as laxative. Flower is used as a spiritual belief. Root extract prepared by rubbing on stone is taken twice a day to treat dysentery and also taken for seven days to treat fever.	LC	0.36	1	26.31	0.29	0.26	19	5
12. <i>Adiantum lunulatum</i> Burm f. TL06092019-02	Unknown	Goyalilata	Adiantaceae	H	Rt	Dysentery, fever	Root extract prepared by rubbing on stone is taken twice a day to treat dysentery. It is also taken to treat fever for seven days.	VU	0.14	0.23	6.571	0.107	0.28	7	2
13. <i>Agile mermelos</i> (L.) Corr TL06092019-04	War-e-si apang	Bel	Rutaceae	Tr	Lf, Fr	Stimulants, evacuation of stomach	Leaf extract is said to important tonic for pregnancy and fruit juice is helpful in curing leprosy. Juice prepared from the leaves is taken to treat dysentery.	C	0.27	1	11.11	0.27	0.11	18	2
14. <i>Ageraatum conyzoides</i> (L.) L. TL06092019-07	Manipuri patra	Fulkori	Asteraceae	H	Wpt	Fever, after delivery, headache.	Plant juice is used to treat fever and given mother after delivery as tonic. Paste prepared from boiled leaf is used to treat headache.	C	0.33	1	14.28	0.32	0.14	21	3
15. <i>Albizia odoratissima</i> (L.f.) Benth. TL06092019-03	Khima moi jhiri	Tetura, chirkunda.	Mimosaceae	Tr	Lf, Bk	Leprosy, cough	Extract prepared from the bark is applied to the affected area for curing leprosy. Juice prepared from the leaves is taken to treat cough.	LC	0.16	0.3	6.67	0.13	0.22	9	2
16. <i>Albizia procera</i> (Roxb.) Benth. TL06092019-07	Chapao	Koroi shil koroi	Mimosaceae	Tr	Lf, Bk	Insecticides	As insecticides, leaves and barks are kept in the corner of the room.	C	0.09	0.2	3.33	0.09	0.17	6	1
17. <i>Allamanda cathartica</i> (L.) L. TL06092019-25	Anu choi loi	Malalilata	Apocynaceae	Sh	Rt & Bk	Liver problem	Paste prepared from root and bark of this plant is taken with sugar to treat liver problem when liver becomes large.	C	0.12	0.27	3.37	0.12	0.12	8	1
18. <i>Allium cepa</i> L. TL06092019-22	Crasoing	Praj	Amaryllidaceae	H	Bulb	Weakness, tonsillitis	Bulb extract helps to increase energy and also cure tonsillitis.	C	0.33	1	8.69	0.35	0.09	23	2
19. <i>Allium sativum</i> L. TL06092019-23	Krasojipru	Rasun	Amaryllidaceae	H	Bulb	Cough, tonsillitis, stomach problem	Juice of bulb is taken to treat cough, tonsillitis and helps to evacuate of stomach.	C	0.34	1	13.63	0.33	0.14	22	3
20. <i>Alcea racemosa</i> (L.) G. Don TL06092019-01	Unknown	Mankhadu	Araceae	H	Wpt	Headache, easy delivery weakness	Plant extract is taken to treat headache and for easy delivery.	C	0.17	0.27	10.12	0.12	0.37	8	3
21. <i>Aloe vera</i> (L.) Burm.f. TL06092019-27	Saiyong lakpai	Chritokurnati	Xanthorrhoeaceae	H	Lf	Burn, asthma, menstrual problem, piles	Extract is taken with milk as tonic. Leaf juice is applied to burn. It is also valuable for asthma, piles and dysmenorrhea.	C	0.42	1	15.38	0.4	0.15	26	4
22. <i>Alpinia conchigera</i> Griff. TL15102019-112	Padagah	Konchi elachi	Zingiberaceae	H	Rh	Throat infection	Rhizome decoction is used to treat throat infection.	LC	0.06	0.1	3.33	0.05	0.33	3	1
23. <i>Alpinia nigra</i> (Guent.) Burtt. TL15102019-115	Keyeia	Jonglida	Zingiberaceae	H	St	Vernex	Young stem has deworming properties which helps to alleviate vermes.	C	0.08	0.16	3.2	0.08	0.2	5	1
24. <i>Aleurotricha sessilis</i> (L.) R. Br. TL16102019-138	Segraobang	Haicha	Amaranthaceae	H	Wpt	Boils	Whole plant is boiled in water and used to take bath for seven days to alleviate boils.	C	0.07	0.13	3.25	0.06	0.25	4	1
25. <i>Amaranthus spinosus</i> L. TL15102019-123	Hanuhuya	Kantadenga	Amaranthaceae	H	Wpt	Abortion, dysuria, dysentery, constipation, laxative, metraena	Whole plant extract is taken with candy after abortion. Root extract is taken with sugar to treat dysentery. Boiled leaf and root are given as a laxative.	C	0.44	1	26.08	0.35	0.26	23	6

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Mama name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	ICo* status	R1	RPL	ROP	RFC	UV	FC	UR
26. <i>Amaranthus viridis</i> L. TI-09092019-102	Ahu mihin ga.	Noye shak.	Anthractaceae	H	Lf	Leprosy	Extract prepared from leaves is taken for the treatment of leprosy.	C	0.08	0.16	3.2	0.07	0.2	5	1
27. <i>Ananas comosus</i> (L.) Merr TI-09092019-91	Nedhebang	Ananas	Bromeliaceae	H	Rt & Fr	Jaundice	Root and fruit extract are taken twice a day as a treatment of jaundice until cure.	C	0.15	0.37	3.36	0.16	0.09	11	1
28. <i>Andrographis paniculata</i> (Burm.f.) Wall. ex Ness TI-07092019-41	Chirota	Kalomegh	Acanthaceae	H	Lf	Fever	Extract of leaf is eaten twice a day for seven days to treat fever.	EN	0.18	0.43	3.30	0.2	0.07	13	1
29. <i>Anisomeles indica</i> (L.) Kunze. TI-06092019-30	Lan da jang	Gobura	Lamiaceae	Sh	Lf	Skin infection, boils, snake bites	Leaf is boiled in water and used to take bath to treat skin infection and boils. This plant is also used as antiseptic in snake bites.	LC	0.21	0.37	10.09	0.17	0.27	11	3
30. <i>Annona reticulata</i> L. TI-06092019-28	Nu nacchi	Nona, nona ata.	Annonaceae	Tr	Lf, Sd, Fr	Insect, repellent, diarrhea, dysentery, intestinal worm	As insect repellents, leaves and seeds are kept in the corner of the room, extract prepared from fruits is taken to treat diarrhea, dysentery and intestinal worm.	C	0.28	1	26.67	0.230	0.26	15	4
31. <i>Antidesma velutinum</i> Blume TI-06092019-29	Sui mong	Shaibuka	Euphorbiaceae	Sh	Lf and Rt	Internal burn	Extraction of root and leaf is taken in burning sensation.	VU	0.08	0.16	3.2	0.07	0.2	5	1
32. <i>Artisia solanacea</i> (Poir.) Rosb. TI-09092019-106	So kra pong.	Ban jam	Myrsinaceae	Sh	Rt	Diarrhea	Juice prepared from root is taken to treat diarrhea.	LC	0.09	0.2	3.33	0.09	0.16	6	1
33. <i>Areca catechu</i> L. TI-09092019-68	Khuaisri	Supari	Arecaceae	Tr	Sd	Pain	Seed is crushed by stone and the extract is taken to reduce pain.	C	0.07	0.13	3.25	0.06	0.25	4	1
34. <i>Argemone mexicana</i> L. TI-15102019-126	Unknown	Shialkanta	Papaveraceae	H	Sd	Constipation, cough	Seed is laxative and also used to treat cough.	LC	0.16	0.3	6.66	0.13	0.22	9	2
35. <i>Argyreia capitiformis</i> (Poir.) Oostr. TI-06092019-24	Anuway-khujeya	Vogatata	Convolvulaceae	Cl	WPr	Bone fracture, cow eyes infection	Plant paste is applied to affected areas as a poultice for the treatment of fracture. Leaf extract is applied to eyes to cure infection in cattle.	LC	0.16	0.3	6.66	0.13	0.22	9	2
36. <i>Artoxanthus heterophyllus</i> Lamk. TI-15102019-133 in	Pennesi	Kadhal	Moraceae	Tr	Lf	Eye infection of cow	Leaf extract is applied to eyes to cure infection in cattle.	C	0.09	0.2	3.33	0.09	0.16	6	1
37. <i>Asphodelus tenuifolius</i> Cav. TI-06092019-08	Shisong	Astdofel	Liliaceae	H	WPr	Orhoreg's epistaxis, intestinal worm	Extract prepared from whole plant is taken one or two spoonfuls twice daily for three days for the treatment of bleeding from nostril (epistaxis), ear (otorregis) and applied to anus for intestinal worm.	EN	0.21	0.37	10.09	0.169	0.27	11	3
38. <i>Athylos scarabaeoides</i> (L.) Benth. TI-16102019-140	Sai-rang	Banr krai	Fabaceae	H	Lf	Anemia	Extract prepared from the leaves is taken for the treatment of anemia.	EN	0.11	0.23	3.28	0.11	0.14	7	1
39. <i>Azadirachta indica</i> A. Juss. TI-06092019-26	Tamakha	Nim	Meliaceae	Tr	Lf	Boils, skin disease	Leaf extract or fried leaf is taken which helps to alleviate boils and skin diseases.	C	0.55	1	4.76	0.65	0.05	42	2
40. <i>Bacopa monnier</i> (L.) Wettst TI-06092019-06	Tong kang mi	Brahmishak	Plantaginaceae	H	WPr	Complication after delivery	Whole plant boiled in water and used to take bath in combination after delivery.	VU	0.07	0.13	3.25	0.06	0.25	4	1
41. <i>Balsamopanax montanum</i> (Willd.) Muell.-Arg TI-06092019-15	Naicro.	Danti	Euphorbiaceae	Sh	Lf	Scabies	Leaf boiled in water is used to take bath or applied to affected areas to treat scabies.	EN	0.13	0.3	3.33	0.138	0.11	9	1
42. <i>Basella rubra</i> L. TI-16102019-130	Cumbishi	Puiskhak	Basellaceae	Cl	Lf	Burning, headache, insomnia	Paste prepared from leaves is applied to affected areas to treat burn, to reduce headache, as tonic in general weakness and to treat insomnia twice daily for three days.	C	0.34	1	13.63	0.33	0.14	22	3
43. <i>Bauhinia acuminata</i> L. TI-16102019-132	Thangba pang.	Sada kanchan	caesalpiniaceae	Tr	Lf	Stone bladder	Decotion prepared from the leaves is taken to treat stone in bladder.	LC	0.11	0.23	3.28	0.107	0.14	7	1
44. <i>Begonia roxburghii</i> DC. TI-06092019-14	Kah khaiung	Coniraka	Begoniaceae	H	Lf	Pain in gout	Paste prepared from boiled leaf is applied as a poultice to cure pain in gout.	LC	0.07	0.13	3.25	0.06	0.25	4	1
45. <i>Blumea lacerá</i> (Burm.f.) DC TI-03112019-141	Towna.	Kukursunga	Asteraceae	H	Lf	Evil spirit, skin disease	Inhale smoke from burn leaf is used to eradicate evil spirit.	C	0.22	0.47	6.714	0.215	0.14	14	2
46. <i>Boehmeria macrophylla</i> var. scabrella (Roxb.) D.G.Long TI-16102019-37	Mtanga	Kankura	Urticaceae	Sh	Lf	Piles, anus problem	Leaf paste is applied to skin disease.	LC	0.11	0.17	6.8	0.07	0.4	5	2
47. <i>Breynia chinensis</i> (Lam.) Capuron TI-16102019-34	Rang khi	Kadam	Rubiaceae	Tr	Fl	Stomach problem	Extract prepared from leaf is taken twice daily for two-three days to treat piles. In addition, warmed water with the leaf extract is used to wash anus.	VU	0.06	0.1	3.33	0.04	0.33	3	1
48. <i>Breynia retusa</i> (Dennst.) Alston TI-06092019-13	Fai-nong.	Chitki akdana	Euphorbiaceae	Tr	St	Conjunctivitis	Pills prepared from flower is taken with honey to cure stomach problem.	LC	0.07	0.13	3.25	0.06	0.25	4	1
49. <i>Bridelia montana</i> (Roxb.) Willd TI-06092019-12	Chichalai	Unknown	Euphorbiaceae	Tr	WPr	Eye problem, weakness, stomach problem	Fresh juice extracted from the stem is applied to affected eye three times a day (one drops each time) until the conjunctivitis is cured.	C	0.32	1	8.69	0.35	0.08	23	2
50. <i>Bryophyllum pinnatum</i> (Lam.) Oken TI-16102019-35	Roikka pambu	Pathor kuchi	Crassulaceae	H	Lf	Cough, gastritis	Whole plant boiled in water and used to take bath twice or thrice daily as a remedy for weak eye sight of old women and in general weakness. Pills prepared from flower is taken with honey to treat stomach problem.	LC	0.19	0.4	6.66	0.18	0.16	12	2
51. <i>Bulbophyllum liliacnum</i> Ridl. TI-16102019-128	Unknown	Bulbosio	Orchidaceae	Ep	WPr	Anemia, jaundice	Paste of leaf extract is taken until cure for the treatment of anemia and jaundice.	C	0.18	0.27	10.12	0.12	0.37	8	3
52. <i>Butea monosperma</i> (Lam.) Taub TI-15102019-121	Puichowan	Polash	Fabaceae	Tr	Lf	Eczema, ring worm, contagious disease	Paste of leaf is applied to affected areas and after 24 hours the skin is removed from the affected areas as a treatment of eczema, ring worm and contagious diseases.								

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LCo* status	R1	RPL	ROP	RFC	UV	FC	IR
53. <i>Cajanus cajan</i> (L.) Huth TL-06092019-20	Pang kong	Ahar	Fabaceae	Sh	Sd, Rt	Bronchitis, heart disease, Rheumatism, swelling of body, vomiting	Seed juice is prescribed in bronchitis and heart diseases, Root is also used to treat heart disease.	C	0.16	0.3	6.66	0.13	0.22	9	2
54. <i>Calotropis gigantea</i> (L.) R. Br. TL-06092019-17	Su gru ba	Baro akanda	Apocynaceae	Sh	Lf	Boils, asthma	Formation of hot leaf is useful in rheumatism and swelling of body, leaf extract with honey is taken to reduce vomiting.	C	0.36	1	13.04	0.35	0.13	23	3
55. <i>Cardiospermum halicacabum</i> L. TL-15102019-108	Nala mariachi.	Phutka, lataphutki	Sapindaceae	Cl	Lf, Rt		Fresh juice extracted from the leaves of the plant is taken twice a day (three spoonfuls each time) or applied to the affected area to treat boils. Pea-sized pills prepared from the roots are taken to treat asthma.	LC	0.10	0.13	6.5	0.06	0.5	4	2
56. <i>Carica papaya</i> L. TL-06092019-19	Pedagasi	Papeya	Caricaceae	Ir	Lf, Fr	Stomachache, constipation	Leaf extract is taken thrice daily until cure of stomachache. Fruit is said to be a valuable source to treat constipation.	C	0.19	0.4	6.66	0.184	0.16	12	2
57. <i>Cascabela thevetia</i> (L.) Lippold TL-09092019-98	Unknown	Holdekorobi	Apocynaceae	Sh	Sd	Boils	Seed extract is taken to reduce pain in boils.	C	0.06	0.1	3.33	0.04	0.33	3	1
58. <i>Cassia fistula</i> L. TL-06092019-18	Mung ri	Badaradhi	Caecalpiniaeae	Ir	Bk, Fr	Weakness, stomach clearance	Paste of bark is taken with honey to increase energy and ripened fruit is valuable to clear stomach.	LC	0.17	0.33	6.6	0.15	0.2	10	2
59. <i>Catharanthus roseus</i> (L.) G. Don. TL-07092019-31	Tesenoatope	Navan tara	Apocynaceae	Sh	Lf	Jawdisease	Juice of leaf is taken to treat jaundice until cured.	C	0.13	0.3	3.33	0.138	0.11	9	1
60. <i>Celosia argentea</i> L. TL-09092019-89	Kasopai	Morogphul	Amaranthaceae	H	Lf, Bk	Blood disease, menstrual problem	Extract prepared from leaves is taken to treat blood diseases. Decotion prepared from the bark is taken to treat menstrual disorder.	C	0.14	0.23	6.57	0.10	0.28	7	2
61. <i>Centella asiatica</i> (L.) Urban TL-07092019-50	Mrang khua	Thankuni	Apiaceae	H	Lf	Energetic, digestive	Leaf extract is taken as energetic and digestive	LC	0.32	1	9.09	0.34	0.09	22	2
62. <i>Cheilocostus speciosus</i> (J. Koenig) C.I.D.Specht	Premdaba	Tara	Costaceae	H	Lf and Fl	Pain in sexual organ of men	Paste prepared from leaf and fruit is used to massage in pantries to reduce pain.	LC	0.06	0.1	3.33	0.04	0.33	3	1
63. <i>Chenopodium album</i> L. TL-15102019-109	Aangpadi	Betoshak	Chenopodiaceae	H	WPt	Weakness	The plant extract is taken to treat weakness and as tonic.	LC	0.09	0.17	3.4	0.07	0.2	5	1
64. <i>Cinnamomum tamala</i> (Buch-Ham., Nees & Ehrm., TL-07092019-38	Shifruu	Teipata	Lauraceae	Ir	Lf	Breathing problem, chest pain	Extract prepared form leaf mixed with mildly hot water is taken two or three tea spoonfuls twice daily for two-three days to treat difficulty of breath in chest pain.	C	0.11	0.17	6.8	0.07	0.4	5	2
65. <i>Cissus quadrangularis</i> L. TL-07092019-51	Pyandhum	Harjhura	Vitaceae	Cl	Lf	Removal of thorn	Latex of leaf is applied to affected areas to remove the thorn within a few minutes.	LC	0.09	0.17	3.4	0.07	0.2	5	1
66. <i>Cissus sicyoides</i> Lamk. TL-16102019-146	Rimi-ova-rih	Anguri	Vitaceae	Cl	Lf	Snake bites	Leaf extract is taken to reduce pain in snake bites.	LC	0.06	0.1	3.33	0.04	0.33	3	1
67. <i>Citrus aurantiifolia</i> (Christm.) Swingle TL-07092019-33	Tha rock pa	Lebu	Rutaceae	Sh	Hr, Lf	Catarrhal fever, filariasis	A glass of warm water with two tea spoonfuls of honey and juice of the fruit is taken as a remedy or catarrhal fever. Paste prepared from the leaves is applied to affected areas for the treatment of filariasis.	C	0.22	0.47	6.71	0.21	0.14	14	2
68. <i>Citrus maxima</i> (Burm.f.) Merr. TL-09092019-100	Dopashe.	Jambura	Rutaceae	Ir	Hr, Lf	Headache, influenza	The fruit of the plant is eaten. Leaves boiled in water and the vapor inhaled for the treatment of headache and influenza.	C	0.18	0.37	6.72	0.16	0.18	11	2
69. <i>Clerodendrum cordatum</i> Vent. TL-09092019-104	Kho pa che	Bhat	Lamiaceae	Sh	Lf	Pain and piles	Leaf juice is taken with honey to alleviate pain and to treat piles.	LC	0.16	0.3	6.66	0.13	0.22	9	2
70. <i>Clerodendrum indicum</i> (L.) Kunze TL-09092019-34	Narayanbaing, narayambule.	Bamanhati	Verbenaceae	Sh	Lf	Menstrual problem, hematuria, jaundice	Extract prepared from leaves added in water found during washing of rice for cooking is taken one or two cupful three times daily until cured to treat irregular menstruation. Extract prepared from leaf mixed with ginger and red sandal, taken one spoonful twice daily for seven days for the treatment of jaundice and hematuria.	C	0.25	0.47	10.07	0.21	0.21	14	3
71. <i>Clerodendrum viscosum</i> Vent. TL-07092019-35	Khunka	Baint	Verbenaceae	Sh	Lf	Toothache	Leaf is used as a mastatory to treat toothache.	C	0.08	0.17	3.4	0.07	0.2	5	1
72. <i>Coccinea grandis</i> (L.) Voigt TL-09092019-92	Unknown	Telakochu	Cucurbitaceae	Cl	WPt	Jaundice	Decotion prepared from the whole plant is taken twice a day to treat jaundice until cure.	C	0.11	0.23	3.28	0.10	0.14	7	1
73. <i>Croton pallidus</i> Aiton TL-09092019-94	Rati aapa	Jhunjhuni	Fabaceae	under	Lf	Gastritis, abdominal disorder	Juice prepared from leaves is taken twice a day (two spoonful each time) to treat gastritis and abdominal disorder.	LC	0.11	0.17	6.8	0.07	0.4	5	2
74. <i>Croton caudatus</i> Geiseker TL-07092019-36	Nin nojja	Nardhantui.	Euphorbiaceae	Sh	Hr, Rt	Liver disease	Extract prepared from the leaves and roots is taken to treat liver diseases.	VU	0.07	0.13	3.25	0.061	0.25	4	1
75. <i>Cucumis melo</i> L. TL-07092019-59	Chwo-khoya-shic	Bang	Cucurbitaceae	H	Hr, Sd	Liver, kidney disease	The pulp of the ripe fruit is eaten. Extract prepared from seeds is taken for the treatment of liver and kidney diseases.	C	0.13	0.23	6.57	0.10	0.28	7	2
76. <i>Curculigo orchoides</i> Gaertn. TL-07092019-62	Unknown	Talamuli	Hypoxidaceae	H	Rh	Skin infection	Rhizome is rubbed in stone and the paste is applied to skin to treat infection.	EN	0.06	0.1	3.33	0.046	0.33	3	1
77. <i>Curcuma longa</i> L. TL-09092019-93	Chih no	Holud	Zingiberaceae	H	Rh	Ulcer, swelling of body.	Extract prepared through boiled the leaf in water is taken three times/day which helps to reduce pain.	VU	0.08	0.17	3.4	0.07	0.2	5	1
78. <i>Cyanotis axillaris</i> (L.) D. Don ex Sweet TL-07092019-31	Unknown	Kanainala	Commelinaceae	H	Lf	Severe pain	Plant extract is taken as a treatment of rheumatism.	C	0.11	0.23	3.28	0.10	0.14	7	1
79. <i>Cymbidium aloifolium</i> (L.) Sw. TL-07092019-32	Laohi	Churi	Orchidaceae	Ep	WPt	Rheumatism	Extract prepared from root is applied to whole abdomen (externally) to treat abdominal pain.	LC	0.07	0.13	3.25	0.06	0.25	4	1
80. <i>Cymbopogon flexuosus</i> (Nees ex Steud.) W. Watson TL-16102019-128	Chalaban apan	Gandhatma	Poaceae	H	Rt	Abdominal pain	Extract prepared from root is taken twice a day for seven days to treat piles and bleeding from anus.	LC	0.06	0.1	3.33	0.04	0.33	3	1
81. <i>Cynodon dactylon</i> (L.) Pers. TL-16102019-190	Dhurba	Dhurba ghass	Poaceae	H	Rt	Piles, stop bleeding	Juice prepared from the root is taken to treat gonorrhea.	C	0.24	1	12.5	0.24	0.12	16	2
82. <i>Daibergia volubilis</i> Roxb. TL-16102019-131	Tha su noya.	Aanklata	Fabaceae	Cl	Rt	Gonorrhea									

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Mama name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LCo* status	R1	RPL	ROP	RFC	UV	FC	IR
83. <i>Datura metel</i> L. TI-16102019-139	Unknown	Datura	Solanaceae	Sh	WPt	Headache, vomiting	Whole plant is cooked with water and then taken with honey for seven days to treat headache and vomiting.	LC	0.16	0.3	6.66	0.138	0.22	9	2
84. <i>Dendrobium aphyllosum</i> (Roxb.) Fischer TI-07092019-52	Unknown	Unknown	Orchidaceae	Ep	Lf	Rheumatism	Plant paste is mixed with jinger to make tablet is taken as rheumatic medicine.	LC	0.08	0.13	3.25	0.06	0.25	4	1
85. <i>Derris robusta</i> (DC.) Benth TI-07092019-54	Gung ba	Koroi	Fabaceae	Tr	Rt	Sore throat	Juice prepared from the root is mixed with the juice of <i>sida acuta</i> and taken for the treatment of sore throat.	VU	0.06	0.1	3.33	0.046	0.33	3	1
86. <i>Desmodium gangeticum</i> (L.) DC. TI-07092019-53	Chungmue.	Chalani	Fabaceae	USh	Rt	High blood pressure	Extract prepared from the root is taken one or two cupsful twice a day to reduce high blood pressure.	LC	0.07	0.13	3.25	0.06	0.25	4	1
87. <i>Desmodium trifoliatum</i> (L.) DC. TI-09092019-97	Bornajai.	Kalalia	Fabaceae	H	Lf, Rt	Tuberculosis	Cottonseed-sized pills made with the leaves and roots of the plant are taken thrice a day (one pill each time) until the tuberculosis is cured.	LC	0.08	0.17	3.4	0.07	0.2	5	1
88. <i>Dillenia indica</i> L. TI-07092019-39	Kra-aning	Chalta	Dilleniaceae	Tr	Ff	Diarrhea, dysentery	Fruits are eaten by cooking and the juice of the green fruit is taken for the treatment of diarrhea and dysentery.	C	0.19	0.4	6.66	0.18	0.16	12	2
89. <i>Dillenia pentagyna</i> Roxb. TI-07092019-37	Harhola	Banchala	Dilleniaceae	Tr	Bk	Neuralgia, pneumonia	Decotion prepared from the bark of the plant is taken for the treatment of neuralgia and pneumonia.	VU	0.12	0.2	6.66	0.09	0.33	6	2
90. <i>Drimia indica</i> (Roxb.) lessop TI-07092019-46	Crasong	Jungil paj	Asparagaceae	H	Bullb	Gastritis	Pills prepared from bulb of wild onion, ginger and garlic is taken to reduce acidity of human and cattle.	VU	0.087	0.17	3.4	0.076	0.2	5	1
91. <i>Drymaria querifulia</i> (L.) J. Sm. TI-09092019-103	Folo ree	Drymariaceae	Fern	Lf		Paralysis	Hot massage of the leaf paste is applied thrice a day until cure to treat paralysis.	C	0.09	0.2	3.33	0.09	0.16	6	1
92. <i>Eclipta prostrata</i> (L.). TI-16102019-152	Bahushi.	Keshraj	Asteraceae	H	Sd	Piles	Extract of seeds is taken twice a day with honey to treat piles.	C	0.09	0.17	3.4	0.07	0.2	5	1
93. <i>Erythrina flactans</i> Lour TI-16102019-136	Rohakhone	Halancha	Asteraceae	H	WPt	Liver blister	Extract prepared from whole plant and filtered extract is taken for the treatment of liver blister. In addition, paste prepared from leaf applied to affected areas.	LC	0.09	0.17	3.4	0.07	0.2	5	1
94. <i>Enada phaeocoleodes</i> (L.) Merr. TI-09092019-101	Gilanoi.	Mug ghila	Mimosaceae	Cl	Lf, Sd	Pain, infantile tympanites	Decotion prepared from the leaves is taken for the treatment of infantile tympanites. Roasted seeds are eaten and its paste is applied to affected area to treat joint pain.	EN	0.17	0.23	9.85	0.11	0.42	7	3
95. <i>Era tomentosa</i> (Koen.) Hook.f TI-07092019-58	Unknown	Unknown	Orchidaceae	Ep	WPt	Rheumatism	Whole plant is crushed in stone to make paste and mixed with garlic and mustard oil is taken twice a day to treat rheumatism.	VU	0.13	0.3	3.33	0.13	0.11	9	1
96. <i>Erythrina variegata</i> L. TI-07092019-42	Thai po	Mandar	Fabaceae	Tr	Lf, Bk	Earache, intestinal worm	Juice prepared from the leaves is applied to ear to treat earache. Extract prepared from bark is taken to treat intestinal worm.	C	0.21	0.43	6.61	0.2	0.15	13	2
97. <i>Euphorbia hirta</i> L. TI-07092019-43	Sai ma munye	Dudhiya	Euphorbiaceae	H	WPt	Bone fracture	Whole poultice is used as a poultice until cure to treat fractures.	C	0.09	0.2	3.33	0.092	0.16	6	1
98. <i>Ficus benghalensis</i> L. TI-09092019-99	Bot gaith,	Bot,bangla bot	Moraceae	Tr	Lf, RT, Bk	Abscesses, bald head	Warm leaves are applied to affected area to treat abscesses. Powder prepared from the root bark is mixed with coconut oil and rubbed to scalp to reduce hair falling.	C	0.16	0.3	6.67	0.13	0.22	9	2
99. <i>Ficus hispida</i> L.f. TI-16102019-129	Fah sal ba	Kak dumur	Moraceae	Tr	WPt	Hysteria	Powder prepared from the plant is mixed with honey and taken thrice a day in hysteria.	C	0.08	0.17	3.4	0.07	0.2	5	1
100. <i>Ficus scandens</i> Roxb. TI-16102019-144	Shefung	Lata dumur	Moraceae	H	St	Fracture	Stem used as a thread to tie the affected area in fracture.	LC	0.11	0.23	3.285	0.107	0.14	7	1
101. <i>Fimbrina colorata</i> (Roxb.) R.Br. TI-16102019-151	Kra-san-baing	Huri	Sterculiaceae	Tr	Rt, Bk	Jaundice	Juice prepared from the bark and root of the plant is mixed with goat milk and taken for the treatment of jaundice.	VU	0.08	0.17	3.4	0.07	0.2	5	1
102. <i>Flacourzia fargomias</i> (Lour.) Rawusch TI-16102019-147	Ne-re-shi	Paniala	Flacourtiaceae	Tr	Lf, RT	Tetanus, bone swelling	Cottonseed-sized pills prepared from the leaves of the plant are taken with honey thrice a day (one pill each time) for two weeks to treat tetanus. Extract prepared from the root is taken one or two cups full twice a day for three days for the treatment of bone swelling.	LC	0.17	0.33	6.6	0.15	0.2	10	2
103. <i>Flenningia stricta</i> Roxb. TI-07092019-48	Prungchum	Charchara	Fabaceae	Sh	Lf	Tooth ache, bad smell of mouth	Ash prepared from leaf is used as tooth powder for two-three days for the treatment of toothache and pyorrhea.	C	0.11	0.17	6.8	0.07	0.4	5	2
104. <i>Flemingia strobilifera</i> (L.) W.L.Aiton TI-07092019-49	Eyami mana	Simbusak phan	Fabaceae	Sh	Lf	Urticaria	Paste prepared with the leaves of the plant is applied to affected parts of the body twice a day for two weeks to treat urticaria.	C	0.06	0.1	3.33	0.04	0.33	3	1
105. <i>Garcinia cowa</i> Roxb, ex DC. TI-16102019-142	Tah-gao	Kao cowা	Clusiaceae	Tr	Lf	Urinary tract infection	Fresh juice extracted from the leaves is taken twice a day (10 ml amount each time) for seven days to treat urinary tract infection.	VU	0.07	0.13	3.25	0.06	0.25	4	1
106. <i>Garuga pinnata</i> Roxb. TI-07092019-61	Ghogar, nilbhadi	Khatring	Burseraceae	Tr	Rt	Pulmonary, blood affections, blood pressure	Decotion prepared from the root is taken for the treatment of pulmonary affections and to control high blood pressure.	VU	0.15	0.27	6.75	0.12	0.25	8	2
107. <i>Comphreja globosa</i> L. TI-07092019-60	Unknown	Batan phul	Amaranthaceae	H	Lf	Fever, rashes	Crushed leaf extract is taken with sugar twice a day to reduce fever and paste of leaf is applied to rashes until cure.	LC	0.15	0.27	6.75	0.123	0.25	8	2
108. <i>Crewia nervosa</i> (Lour.) Panigah TI-16102019-149	Tarani,	Phichard	Tiliaceae	Tr	Lf, Bk	Dandūfi, chronic respiratory disease	Extract prepared from the leaves of the plant is used to wash the head once a day until the dandūfi is cured. Juice extracted from the bark of the plant is taken to treat chronic respiratory diseases.	C	0.11	0.17	6.8	0.07	0.4	5	2
109. <i>Heliotropium indicum</i> L. TI-16102019-150	Chaonamo ban	Haisuru	Boraginaceae	H	Fl	Boils	Paste prepared form flowers mixed with black piper is applied to boils.	C	0.07	0.13	3.25	0.06	0.25	4	1

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LC*	R1	RPL	ROP	RFC	UV	FC	IR
110. <i>Hibiscus rosa-sinensis</i> L. TL-16102019-143	Hindu ma-pangri.	Jhoba	Malvaceae	Sh	Fl, Rt	Piles, cold, cough	Extract prepared from flowers, with leaves of <i>Aduhatoda zeylanica</i> is taken to treat piles. Decoction of roots is taken for the treatment of cold and cough.	C	0.23	0.43	9.92	0.2	0.23	13	3
111. <i>Hodarhena anticyclonica</i> (Robt. ex Fleming) Wall. ex DC. TL-16102019-146	Shinhabapan	Kurchi	Apocynaceae	Tr	St	Uterine prolapse	A piece of stem is tied with a thread round the waist to treat uterine prolapsed.	VU	0.09	0.2	3.33	0.09	0.16	6	1
112. <i>Hodarhena pulcherrima</i> Wall. Ex G. Don TL-07092019-57	Laubang	Lom kuchi	Apocynaceae	Tr	Fl, Sd	Leukoderma, diuresis	Paste prepared from the flowers is applied to affected areas to treat leukoderma. Extract prepared from the seeds is taken for the treatment of cold and cough.	C	0.23	0.23	6.57	0.10	0.28	7	2
113. <i>Hyptis stoechas</i> (L.) Poit TL-07092019-40	Chang kasey	Tokma	Lamiaceae	H	Lf	Loss of appetite, weakness	Leaf extract helps to increase appetite and energy.	C	0.28	1	10.52	0.29	0.10	19	2
114. <i>Impatiens balsamina</i> L. TL-16102019-145	Unknown	Dopati	Balsaminaceae	H	WPt	Arthritis, burns	Plant extract is helpful to reduce joint pain if eaten twice a day and seed extract is applied to burns.	VU	0.22	0.47	6.71	0.21	0.14	14	2
115. <i>Ipomoea aquatica</i> Forsk. TL-17102019-163	Sadi morok	Kalmi	Convolvulaceae	H	Lf	Boils and pain of boils	Paste prepared from leaves is applied to treat boils. In addition, it is useful to reduce pain in boils.	C	0.11	0.23	3.28	0.107	0.14	7	1
116. <i>Iora ingrica</i> R.Br. ex Wight & Arn. TL-09092019-95	Rongma, frareko	Rangon	Rubiaceae	Tr	leaves	Vomiting, excessive bleeding, unconsciousness	Extract prepared from root is taken one cupful four times daily for two days against vomiting and excessive bleeding.	VU	0.21	0.37	10.09	0.169	0.27	11	3
117. <i>Lasianthus sambac</i> L. TL-09092019-96	Chioy.	Beli	Oleaceae	H	St	Asthma	Extract prepared from stem is taken twice a day to treat asthma, unconsciousness of children.	VU	0.07	0.13	3.25	0.06	0.25	4	1
118. <i>Latropha curcas</i> L. TL-17102019-173	Tachia pan	Bagh verenda	Euphorbiaceae	Sh	Lf	Fever, blister, eruption	Hot infusion of the young leaves is drunk to treat fever. Latex of stem is applied to mouth and tongue for the treatment of blisler and eruption in mouth.	VU	0.23	0.43	9.92	0.2	0.23	13	3
119. <i>Litsea adhatoda</i> L. TL-17102019-168	Bombraja	Basok	Acanthaceae	Sh	Lf, Rt	Stomachache, fever, cough	Leaf and root extract are taken with honey which helpful to treat stomachache and fever.	IC	0.23	1	13.33	0.23	0.13	15	2
120. <i>Lawsonia inermis</i> L. TL-17102019-154	Mendi gach	Mehedi	Lythraceae	Sh	Lf	Spematorrhoea	Fresh juice extracted from the leaves of the plant is mixed with some sugar then the mixture is taken twice a day (two tea spoons each time) until the spermatorrhoea is cured.	C	0.08	0.17	3.4	0.08	0.2	5	1
121. <i>Leea indica</i> (Burm.f.) Merr. TL-17102019-158	Si sa kalo, kra	Kurkurjhiba.	Vitaceae	Sh	Lf	diarrhea, dysentery, colic, boils, epilepsy, gastric tumor, goit, itching, rheumatic arthritis	Paste prepared from the leaves is applied to affected area for used in diarrhea and dysentery. A decoction of the root is cooling, relieves thirst, and is given in colic. The roasted leaves are applied to head in vertigo. The juice of the young leaves is digestive.	VU	0.82	1	67	0.41	0.67	27	9
122. <i>Loewisia aspera</i> (Willd.) Link. TL-17102019-170	Pi tung sa	Shedron	Lamiaceae	H	Lf	Skin disease	Leaf paste is applied to skin infection twice a day until cure.	C	0.08	0.17	3.4	0.07	0.2	5	1
123. <i>Ulmus monspeliana</i> (Robt.) Pers. TL-17102019-165	Kukurching gaith.	Bara kurchita	Lauraceae	Tr	Bk	Bruise	Extract prepared from bark is applied to affected area for the treatment of bruises.	VU	0.05	0.07	3.5	0.03	0.5	2	1
124. <i>Ludwigia hyssopifolia</i> (G.Don) Exell. TL-07092019-41	Nalikrang	Zaikura	Onagraceae	H	Lf	Gynecological disorder	Pea-sized pills made from the leaves of the plant are taken with a little amount of honey for the treatment of gynecological disorder.	C	0.06	0.1	3.33	0.04	0.33	3	1
125. <i>Mesa indica</i> (Robt.) A.DC. TL-17102019-167	Mesa dai	Myrsinaceae	Sh	Lf, Rt	Boils, syphilis	Poultice of the leaf is used to expel pus from boils. Extract prepared from the leaves is taken or rubbed in addition root extract is rubbed to the affected area twice daily for the treatment of syphilis.	C	0.22	0.47	6.71	0.215	0.14	14	2	
126. <i>Manihot esculenta</i> Crantz. TL-17102019-155	Asanwak, lapai baou	Kasawa, shimal alu Soleda	Euphorbiaceae	H	Rt	Jarddice	Extract prepared from root is taken for the treatment of jarddice.	C	0.06	0.1	3.3	0.04	0.33	3	1
127. <i>Manilkara zapota</i> (L.) P. Royen TL-17102019-172	Rowaia	Sapotaceae	Tr	WPt	Asthma, cough	Paste prepared from whole plant, mixed with hot water is taken one cupful twice daily for three days for the treatment of asthma and cough.	C	0.11	0.17	6.8	0.07	0.4	5	2	
128. <i>Melastoma malabathricum</i> L. TL-17102019-164	Masmatarum.	Datrange	Melastomaceae	Sh	Lf	Diarrhea, dysentery	Extract prepared from the leaves is taken for the treatment of diarrhea and dysentery.	C	0.15	0.27	6.75	0.12	0.25	8	2
129. <i>Metha anensis</i> L. TL-17102019-157	Kureua	Pudina	Lamiaceae	H	WPt	Boils, headache, pain, weakness	Powder prepared from burned bark is applied to boils three times daily. In addition, sacred texts are read during application. For headache, powder is applied to forehead to relieve pain and taken in general weakness.	IC	0.30	1	25	0.24	0.25	16	4
130. <i>Mezia foetida</i> L. TL-17102019-153	Sipran.	Nagassar	Clusiaceae	Tr	Rt	Diarrhea	Sap prepared from root mixed with green coconut water is taken one or two spoons full thrice daily for two days to cure diarrhea.	VU	0.06	0.1	3.33	0.04	0.33	3	1
131. <i>Mikania micrantha</i> Kunth TL-17102019-171	Woalaban	Topanilata	Asteraceae	H	Lf	Stop bleeding	Crushed fresh leaves is applied to cuts to stop bleeding.	C	0.18	0.43	3.30	0.2	0.09	13	1
132. <i>Mimosa pudica</i> L. TL-08092019-79	Kak pine	Lajaboti	Mimosaceae	Sh	Lf and Rt	Dysentery, piles	Leaf and root extract are taken as a treatment of dysentery and piles.	C	0.16	0.3	6.66	0.13	0.22	9	2
133. <i>Moringa oleifera</i> Lamk. TL-08092019-63	Dan tho rai	Sajna	Moringaceae	Tr	Bk	Pain	Bark paste is applied to fracture to release pain. Pills prepared from seed and ginger is taken to relieve rheumatic pain.	IC	0.12	0.27	3.37	0.12	0.12	8	1
134. <i>Mucuna pruriens</i> (L.) DC TL-08092019-83	Eng thi noi	Alkoshi	Fabaceae	Cl	Sd	Rheumatism	Pills are prepared from seed and ginger is taken to relieve rheumatic pain.	C	0.17	0.14	1.16	0.18	0.08	12	1
135. <i>Mussaenda roxburghii</i> Hook. f. TL-08092019-71	Chung faing la	Silchauri	Rubiaceae	Sh	Rt	Enlarged chest bone (Costochondritis)	Crushed root is taken once a day to decrease enlarged chest bone for a week or ten days.	C	0.07	0.13	3.25	0.06	0.25	4	1
136. <i>Nicotiana tabacum</i> L. TL-07092019-55	Siah	Tamak	Solanaceae	H	Lf	Rheumatism, skin disease	Extract prepared from the leaves is applied to affected area for the treatment of rheumatic swellings and skin diseases	C	0.35	1	8	0.38	0.08	25	2
137. <i>Ocimum sanctum</i> L. TL-17102019-174	Nung na	Tulsi	Lamiaceae	H	Lf	Cold	Leaf extract is taken with Honey to treat cold in children.	C	0.21	1	6.25	0.24	0.06	16	1

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LCo* status	R1	RPL	ROP	RFC	UV	FC	IR
83. <i>Datura metel</i> L. TH-16102019-139	Unknown	Datura	Solanaceae	Sh	Wpt	Headache, vomiting	Whole plant is cooked with water and then taken with honey for seven days to treat headache and vomiting.	LC	0.16	0.3	6.66	0.38	0.22	9	2
84. <i>Dendrobium aphyllum</i> (Roxb.) Fischer	Unknown	Unknown	Orchidaceae	Ep	Lf	Rheumatism	Plant paste is mixed with Zinger to make tablet is taken as rheumatic medicine.	LC	0.08	0.13	3.25	0.06	0.25	4	1
85. <i>Derris robusta</i> (DC.) Bentii	Gung ba	Koroi	Fabaceae	Tr	Rt	Sore throat	Juice prepared from the root is mixed with the juice of <i>sida acuta</i> and taken for the treatment of sore throat.	VU	0.06	0.1	3.33	0.046	0.33	3	1
86. <i>Desmodium gangeticum</i> (L.) DC.	Chungnue.	Chalan	Fabaceae	Ush	Rt	High blood pressure	Extract prepared from the root is taken once or two capsful twice a day to reduce high blood pressure.	LC	0.07	0.13	3.25	0.06	0.25	4	1
87. <i>Desmodium trifoliatum</i> (L.) DC.	Bormajal.	Kalalia	Fabaceae	H	Lf, Rt	Tuberculosis	Cottonseed-sized pills made with the leaves and roots of the plant are taken thrice a day (one pill each time) until the tuberculosis is cured.	LC	0.08	0.17	3.4	0.07	0.2	5	1
88. <i>Dillenia indica</i> L. TH-07092019-39	Kra-aning	Chalta	Dilleniaceae	Tr	Fr	Diarrhea, dysentery	Fruits are eaten by cooking and the juice of the green fruit is taken for the treatment of diarrhea and dysentery.	C	0.19	0.4	6.66	0.18	0.16	12	2
89. <i>Dillenia pentagyna</i> Roxb. TH-07092019-37	Harjhola	Banchalta	Dilleniaceae	Tr	Bk	Neuralgia, pneumonia	Decotion prepared from the bark of the plant is taken for the treatment of neuralgia and pneumonia.	VU	0.12	0.2	6.66	0.09	0.33	6	2
90. <i>Drimia indica</i> (Roxb.) Jessop	Crasoing	Jungil paj	Asparagaceae	H	Bulb	Gastritis	Pills prepared from bulb of wild onion, ginger and garlic is taken to reduce acidity of human and canine.	VU	0.087	0.17	3.4	0.076	0.2	5	1
91. <i>Drymaria guerickiella</i> (L.) Sm. TH-09092019-103	Folo rere	Pankhraj	Drymariaceae	Fern	Lf	Paralysis	Hot massage of the leaf paste is applied thrice a day until cure to treat paralysis.	C	0.09	0.2	3.33	0.09	0.16	6	1
92. <i>Eclipta prostrata</i> (L.) L.	Bahushri	Keshraj	Asteraceae	H	Sd	Piles	Extract of seed is taken twice a day with honey to treat piles.	C	0.09	0.17	3.4	0.07	0.2	5	1
93. <i>Enhydra fluctans</i> Tour TH-16102019-136	Rohakhone	Halancha	Asteraceae	H	Wpt	Liver blister	Extract prepared from whole plant and filtered extract is taken for the treatment of liver blister. In addition, paste prepared from leaf applied to affected areas.	LC	0.09	0.17	3.4	0.07	0.2	5	1
94. <i>Eruca phaeoldoides</i> (L.) Merr. TH-09092019-101	Giharo.	Mug ghila	Mimosaceae	Cl	Lf, Sd	Pain, infantile tympanites	Decotion prepared from the leaves is taken for the treatment of infantile tympanites. Roasted seeds are eaten and its paste is applied to affected area to treat joint pain.	EN	0.17	0.23	9.85	0.11	0.42	7	3
95. <i>Eria compacta</i> (Koen.) Hook.f TH-07092019-58	Unknown	Unknown	Orchidaceae	Ep	Wpt	Rheumatism	Whole plant is crushed in stone to make paste and mixed with garlic and mustard oil is taken twice a day to treat rheumatism.	VU	0.13	0.3	3.33	0.13	0.11	9	1
96. <i>Frieda variegata</i> de L. TH-07092019-42	Thai po	Nandar	Fabaceae	Tr	Lf, Bk	Earache, intestinal worm	Juice prepared from the leaves is applied to ear to treat earache. Extract prepared from bark is taken to treat intestinal worm.	C	0.21	0.43	6.61	0.2	0.15	13	2
97. <i>Euphorbia hirta</i> L. TH-07092019-43	Sai ma munrye	Dudhiya	Euphorbiaceae	H	Wpt	Bone fracture	Whole plant is crushed in stone to make paste is used as a poultice until cure to treat fractures.	C	0.09	0.2	3.33	0.092	0.16	6	1
98. <i>Ficus benghalensis</i> L. TH-09092019-99	Bot gaith,	Bot bangla bot	Moraceae	Tr	Lf, Rt, Bk	Abscesses, bald head	Warm leaves are applied to affected area to treat abscesses. Powder prepared from the root bark is mixed with coconut oil and rubbed to scalp to reduce hair falling.	C	0.16	0.3	6.67	0.13	0.22	9	2
99. <i>Ficus hispida</i> L. f. TH-16102019-129	Fah sai ba	Kak dumur	Moraceae	Tr	Wpt	Hysteria	Powder prepared from the plant is mixed with honey and taken thrice a day in hysteria.	C	0.08	0.17	3.4	0.07	0.2	5	1
100. <i>Ficus scandens</i> Roxb. TH-16102019-144	Shefung	Lata dumur	Moraceae	H	St	Fracture	Stem used as a thread to tie the affected area in fracture.	LC	0.11	0.23	3.285	0.107	0.14	7	1
101. <i>Fimbrina colorata</i> (Roxb.) Br. TH-16102019-151	Kra-sam-baing	Huri	Sterculiaceae	Tr	Rt, Bk	Jaundice	Juice prepared from the bark and root of the plant is mixed with goat milk and taken for the treatment of jaundice.	VU	0.08	0.17	3.4	0.07	0.2	5	1
102. <i>Flacouria jangomas</i> (Lour.) Raeusch. TH-16102019-147	Ne-re-shi	Paniala	Flacourtiaceae	Tr	Lf, Rt	Tetanus, bone swelling	Cottonseed-sized pills made from the leaves of the plant are taken with honey thrice a day (one pill each time) for two weeks to treat tetanus. Extract prepared from the root is taken one or two cups full twice a day for three days for the treatment of bone swelling.	LC	0.17	0.33	6.6	0.15	0.2	10	2
103. <i>Flemingia stricta</i> Roxb. TH-07092019-48	Prungchum	Charchara	Fabaceae	Sh	Lf	Tooth ache, bad smell of mouth	Ash prepared from leaf is used as tooth powder for two-three days for the treatment of toothache and pyorrhea.	C	0.11	0.17	6.8	0.07	0.4	5	2
104. <i>Flemingia strobilifera</i> (L.) W.T.Aiton TH-07092019-49	Eyami mana	Simbusak phan	Fabaceae	Sh	Lf	Urticaria	Paste prepared with the leaves of the plant is applied to affected parts of the body twice a day for two weeks to treat urticaria.	C	0.06	0.1	3.33	0.04	0.33	3	1
105. <i>Garcinia cowa</i> Roxb, ex DC. TH-16102019-142	Tah-gao	Kao cowa	Clusiaceae	Tr	Lf	Urinary tract infection	Fresh juice extracted from the leaves is taken twice a day (10 ml amount each time) for seven days to treat urinary tract infection.	VU	0.07	0.13	3.25	0.06	0.25	4	1
106. <i>Gangia primnatia</i> Roxb. TH-07092019-61	Ghogar nilbhadi	Khatring	Burseraceae	Tr	Rt	Pulmonary affections, blood pressure	Decotion prepared from the root is taken for the treatment of pulmonary affections and to control high blood pressure.	LC	0.15	0.27	6.75	0.12	0.25	8	2
107. <i>Comphaea globosa</i> L. TH-16102019-60	Unknown	Batan phul	Annanthaceae	H	Lf	Fever, rashes	Crushed leaf extract is taken with sugar twice a day to reduce fever and paste of leaf is applied to rashes until cure.	C	0.11	0.17	6.8	0.07	0.4	5	2
108. <i>Grewia nervosa</i> (Lour.) Panigrahi TH-16102019-149	Phichard	Tiliceae	Tiliaceae	Tr	Lf, Bk	Dandruff, chronic respiratory disease	Extract prepared from the leaves of the plant is used to wash the head once a day until the dandruff is cured. Juice extracted from the bark of the plant is taken to treat chronic respiratory diseases.	C	0.07	0.13	3.25	0.06	0.25	4	1
109. <i>Heliotropium indicum</i> L. TH-16102019-150	Chaonamo han	Hatisur	Boraginaceae	H	Fl	Boils	Paste prepared form flowers mixed with black piper is applied to boils.	C	0.07	0.13	3.25	0.06	0.25	4	1

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Made of use	LC <sup>a</sup> status	R1	RPL	ROP	RFC	UV	FC	IR
110. <i>Hibiscus rosa-sinensis</i> L. TI-16102019-143	Hindu ma-pangi.	Jhoba	Malvaceae	Sh	Fl, Rt	Piles, cold, cough	Extract prepared from flowers, with leaves of <i>Athadoda zeylanica</i> is taken to treat piles. Decotion of roots is taken for the treatment of cold and cough.	C	0.23	0.43	9.92	0.2	0.23	13	3
111. <i>Holarthrea antidyserterica</i> (Roxb.) Ex Fleming Wall. ex DC. TI-16102019-146	Shinhapran	Kurchi	Apocynaceae	Tr	St	Uterine prolapse	A piece of stem is tied with a thread round the waist to treat uterine prolapsed.	VU	0.09	0.2	3.33	0.09	0.16	6	1
112. <i>Hodarhena pubescens</i> Wall. Ex G. Don TI-092019-57	Latubang	Lom kuchi	Apocynaceae	Tr	Fl, Sd	Leukoderma, diuresis	Extract prepared from the flowers is applied to affected areas to treat leukoderma. Extract prepared from the seeds is taken for the treatment of diuresis.	VU	0.13	0.23	6.57	0.10	0.28	7	2
113. <i>Hypnis steyermarkii</i> (L.) Poir. TI-07092019-40	Chang kasey	Tokma	Lamiaceae	H	Lf	Loss of appetite, weakness	Leaf extract helps to increase appetite and energy.	C	0.28	1	10.52	0.29	0.10	19	2
114. <i>Impatiens balsamina</i> L. TI-16102019-145	Unknown	Dopati	Balsaminaceae	H	Wpt	Arthritis, burns	Plant extract is helpful to reduce joint pain if eaten twice a day and seed extract is applied to burns.	VU	0.22	0.47	6.71	0.21	0.14	14	2
115. <i>Iponmea acutifolia</i> Forsk. TI-17102019-163	Sadi morok	Kalmi	Convolvulaceae	H	Lf	Boils and pain of boils	Paste prepared from leaves is applied to treat boils. In addition, it is useful to reduce pain in boils.	C	0.11	0.23	3.28	0.107	0.14	7	1
116. <i>Iora nigricans</i> R.Br. ex Wight & Am. TI-09092019-95	Rongma, frareko	Rangon	Rubiaceae	Tr	leaves	Vomiting, excessive bleeding, unconsciousness	Extract prepared from root is taken one cupful four times daily for two days against vomiting and excessive bleeding. Extract prepared from leaves is taken, in addition paste prepared form root applied to whole body as a remedy for unconsciousness of children.	VU	0.21	0.37	10.09	0.169	0.27	11	3
117. <i>Jasminum sambac</i> L. TI-09092019-96	Chioy.	Beli	Oleaceae	H	St	Asthma	Extract from stem is taken twice a day to treat asthma.	VU	0.07	0.13	3.25	0.06	0.25	4	1
118. <i>Latiropha curcas</i> L. TI-17102019-173	Tachia pan	Bagh verenda	Euphorbiaceae	Sh	Lf	Fever, blister, eruption	Hot infusion of the young leaves is drunk to treat fever. Latex of stem is applied to mouth and tongue for the treatment of blister and eruption in mouth.	VU	0.23	0.43	9.92	0.2	0.23	13	3
119. <i>Jussiaea adhatoda</i> L. TI-17102019-168	Bombaraja	Basok	Acanthaceae	Sh	Fl, Rt	Stomachache, fever, cough	Leaf and root extract are taken with honey which helpful to treat stomachache and fever.	IC	0.23	1	13.33	0.23	0.13	15	2
120. <i>Lawsonia inermis</i> L. TI-17102019-154	Mendi gach	Mehedi	Lythraceae	Sh	Lf	Spematorrhoea	Fresh juice extracted from the leaves of the plant is mixed with some sugar then the mixture is taken twice a day (two tea spoons each time) until the spermatorrhoea is cured.	C	0.08	0.17	3.4	0.08	0.2	5	1
121. <i>Leea indica</i> (Burm.f.) Merr. TI-17102019-158	Si sa kalo, kra	Kurkurihibba.	Vitaceae	Sh	Lf	dianhea, dysentery, colic, boils, epilepsy, gastric tumor, goit, itching, gout, rheumatic arthritis.	Paste prepared from the leaves is applied to an affected area for the treatment of rheumatism. The root is a sudorific, and is used in diarrhea and dysentery. A decoction of the root is cooling, relieves thirst, and is given in colic. The roasted leaves are applied to head in vertigo. The juice of the young leaves is digestive.	VU	0.82	1	6.7	0.41	0.67	27	9
122. <i>Leucas aspera</i> (Willd.) Link. TI-17102019-170	Pi tung sa	Shetodhon	Lamiaceae	H	Lf	Skin disease	Leaf paste is applied to skin infection twice a day until cure.	C	0.08	0.17	3.4	0.07	0.2	5	1
123. <i>Litsea monopetala</i> (Roxb.) Pers. TI-17102019-165	Kukurching gaiith.	Bara kurchita	Lauraceae	Tr	Bk	Bruise	Extract prepared from bark is applied to affected area for the treatment of bruises.	VU	0.05	0.07	3.5	0.03	0.5	2	1
124. <i>Ludwigia hyssopifolia</i> (G.Don) Exell. TI-07092019-41	Nalikrang	Zaikura	Onagraceae	H	Lf	Gynecological disorder	Pearlsized pills made from the leaves of the plant are taken with a little amount of honey for the treatment of gynecological disorder.	C	0.06	0.1	3.33	0.04	0.33	3	1
125. <i>Maesia indica</i> (Roxb.) A. DC. TI-17102019-167	Mesa dai	Myrsinaceae	Sh	Fl, Rt	Boils, syphilis	Poultice of the leaf is used to expel pus from boils. Extract prepared from the leaves is taken or rubbed, in addition root extract is rubbed to the affected area twice daily for the treatment of syphilis.	C	0.22	0.47	6.71	0.215	0.14	14	2	
126. <i>Manihot esculenta</i> Crantz. TI-17102019-155	Asanrwak, lapai bau	Kasava, shimal alu	Euphorbiaceae	H	Rt	Jaundice	Extract prepared from root is taken for the treatment of jaundice.	C	0.06	0.1	3.3	0.04	0.33	3	1
127. <i>Manilkara zapota</i> (L.) P. Royen TI-17102019-172	Rowa/ā	Sofeda	Sapotaceae	Tr	Wpt	Asthma, cough	Paste prepared from whole plant, mixed with hot water is taken one cupful twice daily for three days for the treatment of asthma and cough.	C	0.11	0.17	6.8	0.07	0.4	5	2
128. <i>Melastoma malabathricum</i> L. TI-17102019-164	Masnatainam.	Datrange	Melastomaceae	Sh	Lf	Diarhea, dysentery	Extract prepared from the leaves is taken for the treatment of diarrhea and dysentery.	C	0.15	0.27	6.75	0.12	0.25	8	2
129. <i>Mentha arvensis</i> L. TI-17102019-157	Kuruea	Pudina	Lamiaceae	H	Wpt	Boils, headache, pain, weakness	Powder prepared from burned bark is applied to boils three times daily. In addition, sacred texts are read during application. For headache, powder is applied to forehead to relieve pain and taken in general weakness.	IC	0.30	1	25	0.24	0.25	16	4
130. <i>Mesua ferrea</i> L. TI-17102019-153	Siprun.	Nagassar	Clusiaceae	Tr	Rt	Diarhea	Sap prepared from root mixed with green coconut water is taken one or two tea spoons full thrice daily for two days to cure diarrhea.	VU	0.06	0.1	3.33	0.04	0.33	3	1
131. <i>Mikania micrantha</i> Kunth TI-17102019-171	Woalaban	Topamilita	Asteraceae	H	Lf	Stop bleeding	Crushed fresh leaves is applied to cuts to stop bleeding.	C	0.18	0.43	3.30	0.2	0.09	13	1
132. <i>Mimosa pudica</i> L. TI-08092019-79	Kak pine	Lajjaboii	Mimosaceae	Sh	Lf and Rt	Dysentery, piles	Leaf and root extract are taken as a treatment of dysentery and piles.	C	0.16	0.3	6.66	0.13	0.22	9	2
133. <i>Molinia oleifera</i> Lamk. TI-08092019-63	Dan tho tai	Sajna	Moraceae	Tr	Bk	Pain	Bark is applied to fracture to release pain. Pills prepared from seed and ginger is taken to relieve rheumatic pain.	IC	0.12	0.27	3.37	0.12	0.12	8	1
134. <i>Mucuna pruriens</i> (L.) DC TI-08092019-83	Eng thi noi	Alkoshi	Fabaceae	Cl	Sd	Rheumatism	Pills are prepared from seed and ginger is taken to relieve rheumatic pain.	C	0.17	0.14	1.16	0.18	0.08	12	1
135. <i>Mussaenda roxburghii</i> Hook. f. TI-08092019-71	Chung faing la	Silchauri	Rubiaceae	Sh	Rt	Enlarged chest bone (Costochondritis)	Crushed root is taken once a day to decrease enlarged chest bone for a week or ten days.	C	0.07	0.13	3.25	0.06	0.25	4	1
136. <i>Nicotiana tabacum</i> L. TI-07092019-55	Siah	Tamak	Solanaceae	H	Lf	Rheumatism, skin disease	Extract prepared from the leaves is applied to affected area for the treatment of rheumatic swellings and skin diseases.	C	0.35	1	8	0.38	0.08	25	2
137. <i>Ocimum sanctum</i> L. TI-17102019-174	Nung na	Tulsi	Lamiaceae	H	Lf	Cold	Leaf extract is taken with honey to treat cold in children.	C	0.21	1	6.25	0.24	0.06	16	1

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Marma name	Bangla name	Family	Habit	Parts used	Disease treated	Made of use	LCo* status	R1	RPL	ROP	RFC	UV	FC	UR
138. <i>Oroxylum indicum</i> L. TL15102019-120	Krongسامي.	Khona	Bignoniaceae	Tr	Rt	Impotence	Extract prepared from root is mixed with three drops of water from three different ponds and two or three tea spoonful is taken twice a day for three days for the treatment of impotence.	VU	0.08	0.17	3.4	0.07	0.2	5	1
139. <i>Oxalis corniculata</i> L. TL08092019-68	Mring blu	Amul	Oxalidaceae	H	Lf	Weakness	Vegetable prepared from the plant is taken as a tonic for women.	C	0.06	0.1	3.33	0.04	0.33	3	1
140. <i>Papilionacae tenuis</i> (Robb.) Schltr TL08092019-80	Kayalatta	Paphiodi	Orchidaceae	H	Lf	Diabetes	Plant juice with duba grass ( <i>Cynodon dactylon</i> ) is taken to treat diabetes.	VU	0.05	0.07	3.5	0.03	0.5	2	1
141. <i>Pasiflora foetida</i> L. TL17102019-159	Aanu akna	Junkolata	Passifloraceae	Cl	Rt	Snake bite	Root of this plant has anti-venom properties and used in snake bites to alleviate poison.	C	0.05	0.07	3.5	0.03	0.5	2	1
142. <i>Pavetta indica</i> L. TL08092019-77	Sherprang	Fhalda	Rubiaceae	Sh	Wpt	Rheumatic pain	Whole plant boiled in water and used to take bath twice or thrice daily for the treatment of rheumatic pain.	VU	0.07	0.13	3.25	0.06	0.25	4	1
143. <i>Phyllanthus acidus</i> (L.) Skjels. TL17102019-162	Dendalam	Arbori	Euphorbiaceae	Tr	Fr	Jaundice, diabetes	Crushed fruit extract is taken twice a day with honey to treat jaundice until cure. This extract is said to be useful to control diabetes.	VU	0.19	0.4	6.66	0.18	0.16	12	2
144. <i>Phyllanthus emblica</i> L. TL15102019-117	Soi sha	Amloki	Euphorbiaceae	Tr	Fr	Anemia, loss of appetite, stomachache	Fruit is taken to treat anemia and increase appetite. Fruit extract is also used to treat stomachache.	IC	0.39	1	11.53	0.4	0.11	26	3
145. <i>Physalis minima</i> L. TL15102019-116	Fwa-lowk-shi	Phutka	Solanaceae	H	Lf	Dysuria, fever	Extract of leaf is taken by crushing to treat dysuria and fever.	C	0.11	0.17	6.8	0.07	0.4	5	2
146. <i>Piper betel</i> L. TL08092019-72	Khuyarro	Pan	Piperaceae	Cl	Lf, Rt	Pain, gastritis	Leaf and root extract are taken with honey which helpful to eradicate pain and gastritis.	C	0.13	0.23	6.57	0.10	0.28	7	2
147. <i>Plumbago indica</i> L. TL17102019-169	Kaing-kheo.	Raktachita	Plumbaginaceae	H	Rt	Contraceptive	Pea-sized pills prepared from the root are taken as a contraceptive.	VU	0.06	0.1	3.33	0.04	0.33	3	1
148. <i>Plumeria rubra</i> L. TL07092019-56	Sada angara	Golokchapa	Apocynaceae	Tr	Lf	Hemorrhages, for easy delivery	Leaf extract is taken with honey one spoonful thrice a day to treat hemorrhages. In addition, it is used for easy delivery.	C	0.15	0.27	6.75	0.12	0.25	8	2
149. <i>Pogostemon bengalense</i> (Burm.f.) Kunze TL08092019-75	Unknown	Pacholi	Lamiaceae	Sh	Lf	Cold	Leaf extract is taken with milk to relieve cold in children.	EN	0.05	0.07	3.5	0.03	0.5	2	1
150. <i>Polyosma fruticosum</i> (L.) TL08092019-73	Unknown	Tikoyapata	Araliaceae	H	Wpt	Headache, balanitis, loss of appetite	Pills prepared from the powdered plant and honey is taken to treat headache and balanitis. It is also taken to increase appetite.	VU	0.20	0.33	9.9	0.15	0.3	10	3
151. <i>Pongamia pinnata</i> (L.) Pierre. TL08092019-74	Mauprin.	Kelenga	Fabaceae	Tr	Lf	Itch	Leaf boils in water and this water is used to take bath to treat itches.	IC	0.06	0.1	3.33	0.04	0.33	3	1
152. <i>Portulaca oleracea</i> L. TL08092019-69	Lania	Lunia	Portulacaceae	H	Wpt	Neurological disorder, thrombolytic	This plant extract is taken twice a day to control neurological problems and thrombolyisis.	IC	0.09	0.1	6.66	0.04	0.66	3	2
153. <i>Premna esculenta</i> Roxb. TL08092019-86	Kranu-rauh	Lalong	Lamiaceae	Sh	Lf	Diabetes, urinary tract infection	Leaf decoction is taken 3-4 times/day to control diabetes. Extract prepared from leaves is taken until cure to treat urinary tract infection (UTI).	IC	0.15	0.27	6.75	0.12	0.25	8	2
154. <i>Psidium guajava</i> (L.) Bat. TL08092019-84	Goyesi	Peyera	Myrtaceae	Tr	St	Cold	Juice prepared from the apex of the stem is taken to confiscate cold in children.	C	0.11	0.23	3.28	0.10	0.14	7	1
155. <i>Pteris pellucida</i> C. Presl TL08092019-78	Shrikabong.	Luciferis	Peridaceae	H	Wpt	Boils	Whole plant is boiled in water and used to take bath until cured to treat big boils and over the head of children (furuncle).	IC	0.05	0.07	3.5	0.03	0.5	2	1
156. <i>Rawolfia serpentina</i> (L.) Benth. ex Kurz TL08092019-76	Kayamoshiba	Swarpagandha	Apocynaceae	Sh	Rt, Lf	Throat pain, high blood pressure, stomachache, diarrhea	Root is rubbed on stone and paste is taken in throat pain. In high blood pressure root extract is taken twice a day and it is also used to treat stomachache. Extract prepared from leaf is taken two or three tea spoons full twice or three times daily until cured to treat diarrhea.	VU	0.30	1	25	0.24	0.25	16	4
157. <i>Ricinus communis</i> L. TL17102019-160	Krichuban	Verenda	Euphorbiaceae	Sh	Sd	Skin infection	Paste of seed is applied as a poultice to skin infection.	C	0.11	0.23	3.28	0.107	0.14	7	1
158. <i>Saccharum spontaneum</i> L. TL08092019-66	Pefung	Kash	Poaceae	H	St	Diarrhea, dysentery	Pills prepared from tender stem and thankuni ( <i>Centella asiatica</i> ) is taken for the treatment of diarrhea and dysentery.	C	0.11	0.17	6.8	0.07	0.4	5	2
159. <i>Sansevieria rodburgiana</i> Schult. TL17102019-156	Par gaja	Murabha	Asparagaceae	H	Lf	Fracture	Paste of leaf, whole plant of thankuni and ginger is used as a poultice to heal fracture.	IC	0.05	0.07	3.5	0.03	0.5	2	1
160. <i>Sarcaca asoca</i> (Robb.) Willd. TL17102019-161	Prajok	Asok	Fabaceae	Tr	Fl	To get rid of insect	To get rid of small insect from the house flower is kept at the corner of the house.	VU	0.05	0.07	3.5	0.03	0.5	2	1
161. <i>Sauvagea blumioides</i> Steud. TL17102019-166	Fao ma	Barakushina	Asteraeae	H	Lf, Rt	Fever, skin disease	Extract of leaf is taken twice a day for seven days to treat fever.	EN	0.13	0.23	6.57	0.10	0.28	7	2
162. <i>Scoparia dulcis</i> L. TL08092019-81	Du-jhang	Bandhuni	Scrophulariaceae	H	Lf	Dysentery	Leaf extract is mixed with sugar and taken half spoonful for two times/day to cure dysentery.	C	0.07	0.13	3.25	0.06	0.25	4	1
163. <i>Senia alata</i> L. TL17102019-185	Pui chi	Badaradhi	Caecalpiniaceae	Sh	Lf, Fl	Severe pain, piles, itching	Chutney (saucess) prepared from the boiling tender leaves and flower is taken half cup for 2-3 days to cure body pain and piles.	VU	0.24	1	12.5	0.246	0.12	16	2
164. <i>Senia obtusifolia</i> L. TL15102019-125	Dang geya	Chakundo	Caecalpiniaceae	H	Lf	Cough, severe pain	Leaf juice is useful to relief cough and to reduce pain.	C	0.16	0.3	6.66	0.138	0.22	9	2
165. <i>Senia sophera</i> (L.) Roxb. TL08092019-67	Makahaban.	Choto	caesalpiniaceae	sheaub	Lf	Dysuria	Paste prepared from leaves is mixed with sugar candy and taken one or two tea spoons full twice or thrice a day to treat dysuria.	C	0.08	0.17	3.4	0.07	0.2	5	1

(Continued)

Table 2. Continued.

Scientific name (voucher no.)	Mama name	Bangla name	Family	Habit	Parts used	Disease treated	Mode of use	LC*	status	R1	RPL	ROP	RFC	UV	FC	IR
166. <i>Sesbania grandiflora</i> (L.) Pers. TI-17/02/2019-179	Sai sa	Bokhfuli	Fabaceae	Tr	Lf	Night blindness (nyctalopia).	Extract prepared from the leaves is taken for the treatment of night blindness (nyctalopia).	LC	0.06	0.1	3.33	0.04	0.33	3	1	
167. <i>Setaria italica</i> (L.) Beauv. TI-15/02/2019-114	Unknown	Kakon	Poaceae	H	Sd	Urination during sleep	Pills prepared from the seed and ginger is taken to stop urination during sleeping time.	LC	0.06	0.1	3.33	0.04	0.33	3	1	
168. <i>Sida acuta</i> Burm. F. TI-08/09/2019-82	Ban methi	Habhangha	Malvaceae	Sh	Lf	Displace of bone	Leaf extract is mixed with mustard oil is massaged to displaced bone.	C	0.05	0.07	3.5	0.03	0.5	2	1	
169. <i>Sida orientalis</i> Cav. TI-17/02/2019-181	Ohah ki pale	Lal berela	Malvaceae	Sh	Rt	Fever	Pills prepared from root is taken to cure fever. In addition, root is tide in arm.	EN	0.11	0.23	3.28	0.10	0.14	7	1	
170. <i>Solanum americanum</i> Mill. TI-15/02/2019-124	Pokhong thoyesi	Futbegun	Solanaceae	H	Lf, St	Itchiness	Pills prepared from leaf and stem is taken to treat itches.	LC	0.06	0.1	3.33	0.04	0.33	3	1	
171. <i>Solanum torvum</i> Swartz. TI-15/02/2019-113	Khajo ba kaja	Gothbegun	Solanaceae	Sh	Lf, St	Itches	Pills prepared from the leaf, stem, ginger, black pepper are dried. Then it is taken for the treatment of itches.	C	0.05	0.07	3.5	0.030	0.5	2	1	
172. <i>Sphaeranthus indicus</i> L. TI-18/02/2019-186	Unknown	Indisikak	Asteraceae	H	Fl, Lf	Infertility, digestive	Pills prepared from flower is taken in infertility of women. Leaf juice is taken as digestive.	VU	0.10	0.13	6.5	0.06	0.5	4	2	
173. <i>Sphagnicola calendulacea</i> L. Pruski TI-08/09/2019-70	Unknown	Kesraj	Asteraceae	H	Fl	Diarrhea, dysentery	Pills prepared from 5 flowers, ginger and garlic is taken to treat diarrhea. For the treatment of dysentery, pills are prepared from the above ingredients with thanduk and honey.	VU	0.13	0.23	6.57	0.11	0.28	7	2	
174. <i>Splathanea acmena</i> Murtt. TI-18/02/2019-177	Hamfoi	Marhatigga	Asteraceae	H	St, Fl	Infection of mouth, cough, headache	To treat mouth infection stem and leaves are used to be chewed. It is also taken in cough and headache.	C	0.22	0.4	10	0.18	0.25	12	3	
175. <i>Spondias pinnata</i> (L.f.) Kurz TI-18/02/2019-183	Raisongsing	Aama	Anacardiaceae	Tr	Lf	Insomnia, night mare	Leaf is placed under the pillow during sleep for a sound sleep and against insomnia and night mare.	C	0.11	0.17	6.8	0.07	0.4	5	2	
176. <i>Stephania japonica</i> (Thunb.) Miers TI-08/09/2019-87	Tung na way	Akandimank	Menispermaceae	Cl	Lf	Dysentery	Leaf extract is prepared by crushing the leaf is taken to treat dysentery.	EN	0.08	0.17	3.4	0.07	0.2	5	1	
177. <i>Streblus asper</i> Loure. TI-18/02/2019-180	Wainghini	Shaora	Moraceae	Tr	Rt	Extensive thirst (Polydipsia)	Extract prepared from root mixed with cold water is taken to treat in extensive thirst (no satisfaction after drinking water). Five liters of fruit juice is boiled and reduced to two liters and mixed with ginger. This mixture is taken three times/day for the treatment of jaundice, liver disease, anemia and headache.	LC	0.05	0.06	3	0.03	0.5	2	1	
178. <i>Syzygium cumini</i> (L.) Skeel TI-18/02/2019-176	Sochi tebri	Jam	Myrtaceae	Tr	Fr	Jaundice, liver problem, anemia, headache	Extensive thirst (Polydipsia) Jaundice, liver problem, anemia, headache	C	0.37	1	18.18	0.34	0.18	22	4	
179. <i>Syzygium fructicosum</i> (Roxb.) DC. TI-18/02/2019-184	Sabri	Banjam	Myrtaceae	Tr	Sd	Diabetes	Seed extract is eaten with sugar twice a day to control diabetes.	C	0.14	0.33	3.3	0.15	0.1	10	1	
180. <i>Tamarindus indica</i> L. TI-18/02/2019-162	Hao mong	Tetol	Caecalpiniaceae	Tr	Fr	Energetic, fever	Fruit extract is used to increase energy and also helps to treat fever.	C	0.17	0.33	6.6	0.15	0.2	10	2	
181. <i>Terminalia arjuna</i> (Roxb.) W. & A. TI-15/02/2019-110	Unknown	Arijun	Combretaceae	Tr	Bk	Bone fracture	Bark is boiled in water and the extract is taken twice a day to treat fracture.	LC	0.09	0.2	3.33	0.09	0.16	6	1	
182. <i>Terminalia bellifolia</i> (Gaertn.) Roxb. TI-15/02/2019-111	Soi sing sa	Bohera	Combretaceae	Tr	Fr	Blood purifies, stomach problem	Fruit extract is taken twice a day which helps to purify blood and cure stomach problem.	VU	0.19	0.4	6.66	0.18	0.16	12	2	
183. <i>Terminalia chebula</i> (Gaertn.) Retz. TI-18/02/2019-178	Ajubang	Horitoki	Combretaceae	Tr	Fr	Weakness, loss of appetite	Drying fruit with anoloki, bahera and fried rice are powdered to make pills which are used to cure weakness and increase appetite.	EN	0.25	1	12.5	0.24	0.12	16	2	
184. <i>Thospora sinensis</i> (Lour.) Merr TI-18/02/2019-175	Fa bro noy	Guloncho	Menispermaceae	Cl	Lf, St	Fever, gastric, jaundice liver problem	Leaf extract is used for gastritis. Piece of stem is dipped into water for overnight and taken to cure fever, jaundice and liver problem.	VU	0.32	1	22.22	0.27	0.22	18	4	
185. <i>Teucrium palmatum</i> (Roxb. ex Lindl) Vis. TI-20/02/2019-193	To podda ga	Agoya	Araliaceae	Tr	Lf	Severe pain, jaundice	Leaf extract is taken twice a day for seven days to relieve pain and also taken for the treatment of jaundice.	LC	0.15	0.27	6.75	0.12	0.25	8	2	
186. <i>Thysphora indica</i> (Burm.f.) Merr TI-08/09/2019-65	Unknown	Antanul	Apocynaceae	Cl	Lf, Rt	Ulcer, skin disease	Pills prepared from leaf and root extract with rice powder is taken by water or milk to cure ulcer and cough. Paste of leaf is applied to skin infection.	EN	0.12	0.2	6.66	0.092	0.33	6	2	
187. <i>Typhonium trilobatum</i> (L.) Schott. TI-07/09/2019-45	Mowsi	Ghetkul	Araceae	H	Rt	Piles	Root extract is taken with banana to cure piles.	LC	0.07	0.13	3.25	0.06	0.25	4	1	
188. <i>Urena lobata</i> L. TI-20/02/2019-195	Faw ma	Batapuran	Malvaceae	Sh	Lf, Fl	Gastritis, sore throat	Extract prepared from the leaves is taken to treat gastritis, infusion of flowers is used to gargle to treat sore-throat.	C	0.11	0.17	6.8	0.07	0.4	5	2	
189. <i>Vernonia pedunculata</i> (Dryand) Merr. TI-07/09/2019-44	Hungtui	Kukshim	Asteraceae	H	Lf	Ear infection	Leaf extract is applied to ear to treat ear infection.	LC	0.05	0.07	3.5	0.03	0.5	2	1	
190. <i>Vitis pendulifolia</i> Wall. ex Schauer TI-08/09/2019-85	Krakhta	Horina	Verbenaceae	Tr	Rt	Eye problem, paralysis	The extract is applied to affected area for the treatment of abnormality in eyes caused by paralysis.	LC	0.10	0.13	6.5	0.06	0.5	4	2	
191. <i>Vitis negundo</i> L. TI-08/09/2019-64	Salong	Nishinda	Lamiaceae	Sh	Tg	Jaundice, fever, leucorrhoea, Eczema	Twig of plant is boiled to make syrup and eaten twice a day in jaundice until cure.	LC	0.30	1	25	0.24	0.25	16	4	
192. <i>Vites trifolia</i> L. f. TI-15/02/2019-119	Niramizhechi	Nilnoshinda	Lamiaceae	Sh	Lf, Rt	Fever	Leaf and root are boiled in three liters of water and reduced to one liter by boiling which is taken twice a day to treat fever until cure.	LC	0.08	0.17	3.4	0.07	0.2	5	1	
193. <i>Withania somnifera</i> (L.) Donal TI-15/02/2019-122	Unknown	Aswagandha	Solanaceae	Sh	Lf	Leucorrhoea, dysentery after delivery	Leaf extract with ginger is taken to cure leucorrhoea. After delivery it is also used to stop dysentery.	VU	0.11	0.17	6.8	0.07	0.4	5	2	
194. <i>Xanthium strumarium</i> L. TI-20/02/2019-192	Chukhure thipa	Ghagra	Astaceae	Sh	WPt	Snake bite	Paste prepared by crushing whole plant which is used to treat snake bites to subdue poison.	LC	0.11	0.23	3.28	0.11	0.14	7	1	
195. <i>Xylosma longitubum</i> Clos. TI-07/09/2019-47	Udha	Kathari	Salicaceae	Tr	Lf	Gastritis	Extract prepared from leaf is taken one cupful twice daily until cured to treat gastritis.	VU	0.087	0.17	3.4	0.08	0.2	5	1	
196. <i>Zingiber officinale</i> Roscoe TI-20/02/2019-187	Kheyani	Ada	Zingiberaceae	H	Tr	Sore throat, cough, vomiting	Slice prepared from zinger without skin is burnt into fire and taken twice daily until cured to treat sore throat and cough.	C	0.48	1	5.55	0.55	0.05	36	2	

H=herb, Sh=shrub, Tr=tree, Cl=climber, Ep=epiphyte, Fr=fruit, St=stem, WPt=whole plant, Tg=twig, Rf=root, Bk=bark, Sk=bark, Sd=seed, UTI=urinary tract infection, \*LC=local conservation.

(3 species each). Other families included only one or two species.

According to the documented data, herbs (35.71%) have been found to be used most frequently by the Marma community followed by trees (28.06%), shrubs (25.19%), climbers (5.93%) and epiphytes (0.74%), respectively. The most extensively utilized plant part is leaves (42.80%) followed by roots and whole plants (Fig. 2).

### Formulation types and uses

The present study revealed at least seven methods of preparation of herbal medicine, viz. extract, paste, powder, decoction, juice, ash and tablet. The most common mode of preparations of herbal medicine (38.45%) by Marma was paste, followed by extract (22.75%) and decoction (9.08%).

The most common use was external application (51%) followed by internal application (44%).

### Conservation status

The conservation status of all recorded plant species from the studied area was checked using the international union for conservation of nature (IUCN) red list of threatened species. A total of 16 species, namely *Acorus calamus*, *Alpinia nigra*, *Alternanthera sessilis*, *Bacopa monnieri*, *Celosia argentea*, *Centella asiatica*, *Cheilocostus speciosus*, *Cyanotis axillaris*, *Dendrobium aphyllum*, *Eclipta prostrata*, *Enhydra flactuans*, *Ipomoea aquatica*, *Mentha arvensis*, *Mimosa pudica*, *Saccharum spontaneum* and *Urena lobata* were recorded as 'least concern (LC)' while only one species (*Saraca asoca*) was recorded as 'Vulnerable'. The rest of the species has not been assessed yet. However, our field observation and local knowledge revealed that 85 species are common and abundantly distributed in the study area while 57 species were recorded as least concern (LC), 40 species were vulnerable and 14 species were endangered (Table 2).

### Quantitative analysis

#### Informant consensus factors (FIC)

The documented ethnomedicinal plants were used to treat 90 different ailments which were grouped into 15 different disease categories (Table 3). The ICF values ranged from 0.71 to 0.90 (Table 3). The highest ICF value (0.90) was calculated for gastrointestinal disorders followed by respiratory disorder (0.89), dermatological disorders (0.88) and pain and inflammation (0.87), while the lowest ICF value was 0.71 for snake bite in the studied area. The highest number of ethnomedicinal species were used to treat gastrointestinal disorders (72 species) followed by treatment of respiratory disorder (63) and dermatological disorders (52), while only two species were documented to treat heart disease.

#### Jaccard index

The Jaccard index (JI) (Table 4) was calculated to illustrate the homogeneity of use and to compare the present study

with 44 previous investigations, and values ranged from 0.78 to 44.54. The highest degree of similarities (44.78) was with a study from Bangladesh (Faruque and Uddin 2014) while the lowest was from FATA, Pakistan.

#### New uses

Based on literature survey, the present study recorded 23 new uses of medicinal plants in Bangladesh, comparing with previous published ethnomedicinal reports from Bangladesh. These species were *Abelmoschus moschatus*, *Abrus precatorius*, *Acanthus illicifolius*, *Acorus calamus*, *Alpinia nigra*, *Amaranthus spinosus*, *Artocarpus heterophyllus*, *Cajanus cajan*, *Calotropis gigantea*, *Cassia fistula*, *Cinnamomum tamala*, *Cymbidium aloifolium* (L.) Sw. *Entada phaseoloides*, *Ficus benghalensis*, *Ficus hispida*, *Hyptis suaveolens*, *Lawsonia inermis*, *Oxalis corniculata*, *Psidium guajava*, *Sida acuta*, *Tamarindus indica*, *Trevesia palmata* and *Withania somnifera* (Table 5).

#### Use value (UV)

In the present study, the use value (UV) ranged from 0.047 to 0.67. The highest UV was noted for *Leea indica* (0.67), followed by *Portulaca oleracea* (0.66) and lowest for *Azadirachta indica* (0.04).

#### Relative frequency of citations (RFC)

The highest RFC value was recorded for *Azadirachta indica* (0.65) followed by *Zingiber officinale* (0.55), *Abrus precatorius* (0.43) and *Leea indica* (0.41), while lowest for *Litsea monopetala* (0.03) and *Passiflora foetida* (0.03).

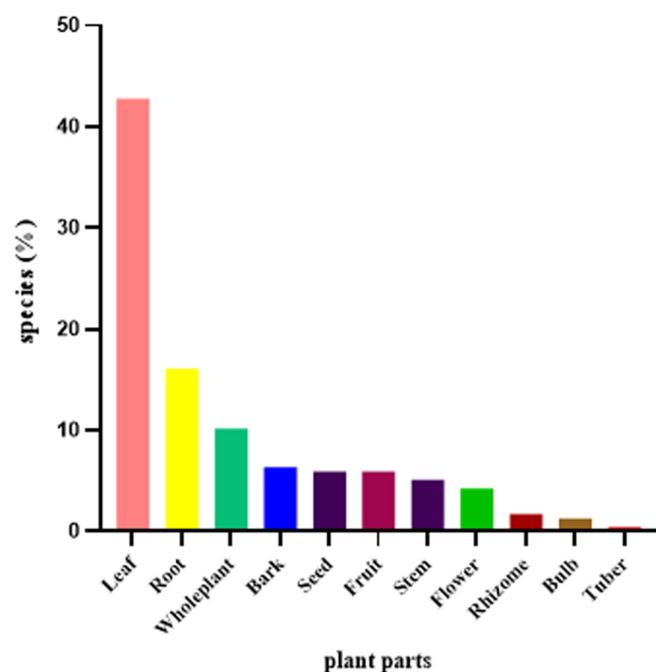


Figure 2. Plant parts used for the preparation of ethnomedicine.

### Relative importance index (RI)

The highest RI was calculated for *Leea indica* (0.82) followed by *Azadirachta indica* (0.55) and *Zingiber officinale* (0.48), whereas the lowest was for *Pogostemon bengalense* and *Pteris pellucida* (0.05).

### Rank order popularity (ROP)

In the present study, ROP ranged from 67 to 3.2. The highest ROP was noted for *Leea indica* (67) followed by *Annona reticulata* (26.67), *Acorus calamus* (26.31) and *Amaranthus spinosus* (26.08) while the lowest was for *Mucuna pruriens* (1.16).

## Discussion

Medicinal plants assist as vital healing agents as well as valuable raw material for manufacturing in both traditional and modern medicines. In addition, medicinal plants provide substitute remedies with marvelous openings to produce

income, employment and earn foreign currencies for developing countries like Bangladesh (Rawat and Uniyal 2003). The knowledge of the traditional plant using information lies in the rural and indigenous communities because they live closer to nature. They have a vast knowledge that passes through generation to generation. Lack of proper documentation of this knowledge may result in that it is lost forever. Keeping this in mind, the present study documented the traditional uses of 196 medicinal plant species in 167 genera in 75 families from 65 informants of the Marma community living in Belaijhari upazila of Rangamati district, which were used to treat 15 categories of complaints.

Out of the 65 informants, 11 were professional traditional healers (10 men and 1 woman), aged from 48 to 82 years. More ethnomedicinal plant using information were documented from illiterate men than women. The present study revealed that the aged and illiterate people have more plant usage information compared to younger generations and literate people. In the community, the traditional healers

Table 3. Categories of ailments and informant consensus factors (FIC).

Category	Common diseases/medical terms	No. of species used (Nt)	% of all species	No. of use report (Nur)	% of all use reports	FIC
Gastrointestinal disorders	Constipation, stomach disorders, dysentery, diarrhea, laxative, intestinal disorders, acidity, dyspepsia, colic, vomiting, gastritis, ulcer, digestive.	72	21.69	713	27.03	0.90
Respiratory disorders	Pneumonia, cough, asthma, tuberculosis, cold, bronchitis, influenza, tonsillitis, breathlessness.	63	18.98	590	22.37	0.89
Endocrine disorder	Diabetes	10	3.01	49	1.86	0.81
Liver disorders	Jaundice, liver blister	19	5.72	115	4.36	0.84
Dermatological problems	Dandruff, burns, boil, wounds, rash, eczema, itch, scabies, skin infection, abscesses, bleeding from cuts and wounds, filariasis, urticaria, sudorific, leprosy.	52	15.66	436	16.53	0.88
Poisoning	Snake bite	3	0.90	8	0.303	0.71
Urinary and rectal diseases	Hematuria, bladder stone, gonorrhoea, urinary problem, edema, diuresis, dysuria, urinary tract infection	9	2.71	56	2.123	0.85
Pain and inflammation	Headache, rheumatic pain, severe pain, sore throat, arthritis, toothache, chest pain, abdominal pain, earache, stomach pain, vertigo, balanitis.	28	8.43	230	7.96	0.87
Hematological disorders	Anemia, hemorrhage	6	1.81	31	1.175	0.83
Somatization and musculoskeletal disorder	Hysteria, bone fracture	5	1.51	17	0.644	0.75
General health disorder	Tonic, physical weakness, unconsciousness, contusion, fever, paratyphoid fever	16	4.82	110	4.17	0.86
Nervous system	Epilepsy, nervous weakness, tetanus	5	1.51	18	0.682	0.76
Helminthiasis	Ringworm, intestinal worms	5	1.51	27	1.024	0.85
Sexual and gynecological diseases	Menstrual disorders, gynecological disorders, excessive bleeding during menstruation, impotence, erectile dysfunction, contraceptive, uterine prolapse, easy delivery, dysmenorrhea, abortion, syphilis, leucorrhea	21	6.33	140	5.307	0.86
Cardiovascular disorder	Heart diseases, high blood pressure	2	0.60	6	0.227	0.80
Total		332 <sup>a</sup>		2638		

<sup>a</sup> Each species listed in several categories.

Table 4. Jaccard similarity index (JI) with previous studies from Bangladesh and neighboring countries.

Area of study	A	B	C	JI	Reference	Distance from study area (km)
Sandwip island, Chittagong	143	58	53	35.81	Sajib and Uddin 2013	80–100
Cox's Bazar district	143	29	53	44.54	Uddin et al. 2013	200
Hathazari	145	24	51	43.22	Sajib and Uddin 2015	50
Rangamati district	177	31	19	10.05	Uddin et al. 2014	30
Six districts of northern region	193	21	3	1.42	Rahman 2013	300–350
Bandarban district	155	41	41	24.45	Uddin et al. 2015	77
Bandarban district	145	15	51	46.78	Faruque and Uddin 2014	77
Feni district	168	18	28	17.72	Chowdhury et al. 2009	160
Dinajpur district	158	33	38	24.83	Khan et al. 2015	530
Chittagong district	172	19	24	14.37	Faruque and Uddin 2011	70
Madhupur	155	37	41	27.15	Islam et al. 2014b	384
Kalenga forest	176	15	20	11.69	Uddin and Hassan 2014	356
Kamalganj	179	15	17	9.60	Rana et al. 2010	252
Moulivibazar district	185	4	11	6.18	Akter et al. 2014	275
Natore district	185	9	11	6.01	Akhter et al. 2016	452
Rangamati district	145	66	51	31.87	Faruque et al. 2019	30
Noakhali district	135	82	61	39.10	Bhowmik et al. 2014	206
Dhaka district	177	18	19	10.79	Ocvirk et al. 2013	219
Sylhet district	155	34	40	26.84	Azam et al. 2013	252
Panchoghar district	141	42	55	42.97	Rahman et al. 2016	600
Pabna district	182	15	14	7.65	Kamal et al. 2014	525
Rangamati district	181	26	15	7.81	Sarker et al. 2013	30
Bandarban district	173	31	23	12.70	Hossan et al. 2012	77
Rangamati district	188	7	8	4.27	Islam et al. 2015	30
Joypurhat district	143	42	53	40.15	Rahman 2015	550
Rangamati district	188	16	8	4.08	Wahab et al. 2013	30
Bandarban district	187	24	9	4.45	Sarker et al. 2012	77
Western Mizoram, India	177	70	19	8.33	Lalfakzuala et al. 2015	700
Wana district, Waziristan, Pakistan	194	48	2	0.83	Ullah et al. 2013	2580
Mohmad agency, FATA, Pakistan	194	62	2	0.78	Aziz et al. 2018	2580
Trashigang, Bhutan	193	65	3	1.18	Dorji et al. 2017	650
Satupda Hill, India	185	41	11	5.11	Kosalge and Fursule 2009	2098
Sarban Hills, Abattobad, Pakistan	190	68	6	2.38	Ijaz et al. 2016	2580
State of Tripura	175	104	21	8.13	Shil et al. 2014	200
Parbat district of western Nepal	190	126	6	1.94	Malla et al. 2015	900
Mizoram, India	194	55	2	0.80	Rai and Lalramnghinglova 2010b	350
Mizoram, India	161	124	35	14.00	Rai and Lalramnghinglova 2010a	350
Manipur, India	175	99	21	8.30	Khumbongmayum et al. 2005	350
Jajarkot district, Nepal	192	56	4	1.64	Manandhar 1995	900
Subansiri District of Arunachal Pradesh, India	175	119	21	7.69	Murtem and Chaudhry 2016	300
Pemathang gewog, Bhutan	172	69	24	11.05	Chetri 2019	800
Chanduali district, UP, India	185	41	11	5.11	Singh and Singh 2009	1000
Chin state, Myanmar	188	50	8	3.47	Ong et al. 2018	270
Assam, India	182	25	14	7.25	Sajem and Gosai 2006	300

are respected and reliable persons, and play numerous roles including headman (*karbari*), counsellors, spiritual guides and healers. Generally, aged persons of each family knows some common traditional uses of plants and they could play a role as a healer for the other members of the family, if needed. In addition, other people could consult with them in their particular local community with little or no charge. Closely 80% of the informants stated that the transfer of traditional practice of plants from one generation to the next generation was not taking place successfully due to shortage of interest by the younger generation.

Documented data revealed that the most dominant family in the studied area is Fabaceae. This might be due to the distribution of this family throughout the world including the study area (Chintamunnee and Mahomoodally 2012, Kadir et al. 2013, Uddin et al. 2013, 2014, Faruque et al. 2019, Aumeeruddy and Mahomoodally 2021). Moreover, this family is the second largest family in Bangladesh (Uddin et al. 2013).

The most common mode of preparations of herbal medicine was paste and external application was most preferred. The Marma people used a mixture of ethnomedicines with

Table 5. Comparison of documented ethnomedicinal uses with previous studies from Bangladesh and neighboring countries. Bold and \* marks represent new uses.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Abelmoschus moschatus</i> Medik	<b>Fever, nervous disorder*, mental problem of children*</b>	Dysentery (Uddin et al. 2015)	Syphilis, wounds/ulcers, throat-pain (Rai and Lalramnghinglova 2010a)
<i>Abrus precatorius</i> L.	<b>Cold*, sore throat*, diabetic</b>	Debility, fever, cough (Bhowmik et al. 2014), Paralysis (Rahman 2015), snake bite, poisoning by spine of string fish (Sajib and Uddin 2013)	Dandruff (Singh and Singh 2009), mouth ulcer, to induce abortion (Kosalge and Fursule 2009)
<i>Acanthus illicifolius</i>	<b>Headache*</b>	High blood pressure (Uddin et al. 2013), boils (Sajib and Uddin 2013)	
<i>Achyranthes aspera</i> L.	Leucorrhoea, hysteria, toothache, jaundice	Jaundice (Sajib and Uddin 2015), Cough (Uddin et al. 2014), Dysentery (Uddin et al. 2015), toothache, hysteria (Faruque and Uddin 2014), hemorrhage, eczema, diarrhea, constipation, headache (Khan et al. 2015), diabetes (Ocvirk et al. 2013), fatality (Kamal et al. 2014), Toothache (Rahman et al. 2016), Urinary problems (Sarker et al. 2013), Abortion, diuretic, eczema (Rahman 2015), Having trouble during urination, passing of blood during urination (Wahab et al. 2013), rheumatism (Sajib and Uddin 2013)	Boils (Sajem and Gosai 2006), pneumonia (Chetri 2019), easy delivery, jaundice (Singh and Singh 2009), piles, menstrual disorders, skin sores (Khumbongmayum et al. 2005), dysentery, colic diseases, in boils and cirrhosis (Rai and Lalramnghinglova 2010a), cough, asthma, kidney problem (Ijaz et al. 2016), cough, fever (Kosalge and Fursule 2009)
<i>Acorus calamus</i> L.	<b>Severe pain*, fever*, laxative*, spiritual use*</b>	Hair problem (Uddin et al. 2014), gastritis, vomiting (Uddin et al. 2013), worm, diarrhea, dysentery (Uddin et al. 2015), phobias at night, eczema (Faruque and Uddin 2014), cough (Faruque and Uddin 2011), constipation, oedema, indigestion (Islam et al. 2014b), wound (Azam et al. 2013), cuts, wounds (Rahman et al. 2016), asthma (Sarker et al. 2013), anthelmintic, gastritis (Faruque et al. 2019), Asthma (Wahab et al. 2013)	Diarrhea, dysentery, asthma and bronchitis (Murtem and Chaudhry 2016)
<i>Aegle marmelos</i> (L.) Corr. Serr.	Stimulants, evacuation of stomach	Tonic (Sajib and Uddin 2015), vomiting (Uddin et al. 2013), diarrhea, dysentery (Uddin et al. 2015), insomnia (Faruque and Uddin 2014), ulcer, gastric pain, indigestion, constipation (Chowdhury et al. 2009), constipation, respiratory disorders (Khan et al. 2015), stomach pain, dysentery with blood (Faruque and Uddin 2011), constipation, diarrhoea, dysentery, peptic ulcer, respiratory disorders (Islam et al. 2014b), constipation, dysentery, cancer (Bhowmik et al. 2014), itch (Kamal et al. 2014), digestive, asthma (Faruque et al. 2019), abscess, fever, dysentery, indigestion (Rahman 2015), dysentery (Sajib and Uddin 2013)	Gastritis, dysentery (Chetri 2019), dysentery (Lalfakzuala et al. 2015), digestive (Murtem and Chaudhry 2016), dysentery, stomachache, digestive problems (Rai and Lalramnghinglova 2010a), fever and body pain (Shil et al. 2014), asthma (Kosalge and Fursule 2009)
<i>Ageratum conyzoides</i> (L.) L.	Fever, pain after delivery, headache	Diarrhea, boils, skin diseases, joint pain (Bhowmik et al. 2014), skin disease (Rahman et al. 2016), severe headache (Sarker et al. 2012)	Cuts and wound (Sajem and Gosai 2006), stop bleeding, pneumonia (Chetri 2019), stomach cancer (Lalfakzuala et al. 2015), hair lotion, fresh injuries (Khumbongmayum et al. 2005), stomach cancer, anti-diarrhea, clotting of blood (Rai and Lalramnghinglova 2010a), stomach disorder (Shil et al. 2014)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Albizia odoratissima</i> (L.f.) Benth.	Leprosy, cough		Cough (Lalfakzuala et al. 2015), cough, cutaneous infection, leprosy, invertebrate ulcer (Khumbongmayum et al. 2005), cough (Rai and Lalramnghinglova 2010a)
<i>Albizia procera</i>	Insecticide	Stomach pain, vomiting, headache (Azam et al. 2013), ulcer (Rahman et al. 2016)	Ulcer (Lalfakzuala et al. 2015), stomach, intestinal disease, rheumatism, haemorrhage (Khumbongmayum et al. 2005), ulcers, fish-poisoning (Rai and Lalramnghinglova 2010a)
<i>Allium cepa</i> L.	Weakness, tonsillitis	Cough (Sajib and Uddin 2015), insect bite (Uddin et al. 2015), phlegm congestion in cold (Chowdhury et al. 2009), dandruff, hair loss, insect bite, induces sleep (Bhowmik et al. 2014), gout, asthma, rheumatism (Rahman et al. 2016), cough, headache (Rahman 2015), cough, digestive, ear ache (Sajib and Uddin 2013)	Gastric disorders, expectorant (Aziz et al. 2018)
<i>Allium sativum</i> L.	Cough, tonsillitis, stomach problem	Rheumatism (Sajib and Uddin 2015), cough, high blood pressure, leprosy (Uddin et al. 2013), high blood pressure, cold, cough (Uddin et al. 2015), gastritis (Faruque and Uddin 2014), heart disease, flatulence, troubles in urinating, earache, faintness (Chowdhury et al. 2009), cough (children) (Faruque and Uddin 2011), cold, hair loss, diabetes, helminthiasis (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), wounds, paralysis, erectile dysfunction (Azam et al. 2013), fever, bronchitis, cold, cough (Rahman et al. 2016), piles, rheumatism (Rahman 2015), to kill worm, hair tonic (Sajib and Uddin 2013)	Carminative (Singh and Singh 2009)
<i>Aloe vera</i> (L.) Burm.f.	Burn, asthma, menstrual problem, piles	Tiredness (Sajib and Uddin 2015), burn and skin disease (Uddin et al. 2014), skin care (Uddin et al. 2013), burn, sprains, jaundice, asthma (Rahman et al. 2016), burns (Faruque et al. 2019), piles, menstrual disease, sex problems (Rahman 2015)	Sun burn, burn (Chetri 2019)
<i>Alpinia nigra</i> (Gaertn) Burtt.	<b>Vermes*</b>	Diarrhea (Uddin et al. 2013), cough and colds (Faruque et al. 2019), gastrointestinal disorders (acidity, stomach ache, diarrhea), sudden bouts of faintness, vertigo (Hossan et al. 2012), rheumatism and dysentery (Sajib and Uddin 2013)	Jaundice (Chetri 2019), cut and wounds (Shil et al. 2014)
<i>Amaranthus spinosus</i> L.	<b>Abortion*</b> , dysentery, constipation, <b>laxative*</b> , melaena, dysuria	Tiredness (Sajib and Uddin 2015), dysentery (Uddin et al. 2015), melaena, dysuria (Faruque and Uddin 2014), rheumatic pain, pain in the bones, blood or pus coming out with urine (Khan et al. 2015), dysentery (Faruque and Uddin 2011), headache, frequent urination (Akhter et al. 2016), low semen density (Azam et al. 2013), depression (Kamal et al. 2014), dysentery (Rahman et al. 2016), excessive bleeding during menstruation (Sarker et al. 2013), eczema, dysuria (Faruque et al. 2019), asthma (Rahman 2015), excessive bleeding during menstruation (Wahab et al. 2013), leucorrhoea (Sajib and Uddin 2013)	Boils (Manandhar 1995)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Ananas comosus</i> (L.) Merr	Jaundice	Cough, ear infection (Sajib and Uddin 2015), worm (Uddin et al. 2015), fever, intestinal worm (Chowdhury et al. 2009), fever, helminthiasis and jaundice (Islam et al. 2014b), jaundice, helminthiasis (Bhowmik et al. 2014), helminthiasis (Azam et al. 2013), intestinal disorder (Rahman et al. 2016), anthelmintic (Faruque et al. 2019)	Convulsion (Lalfakzuala et al. 2015)
<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Ness	Fever	Worms (Uddin et al. 2014), fever and intestinal worm (Faruque and Uddin 2014), fever, boil, ulcer and to enhance appeal for food (Khan et al. 2015), fever, intestinal worm, spleenomegaly (Faruque and Uddin 2011), constipation, fever, ulcer, boil, appetizer (Islam et al. 2014b), fever, headache, vertigo (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), liver cirrhosis (Rahman et al. 2016), wound, itches, dysentery, diarrhea, fever, helminthiasis (Rahman 2015)	Malaria, fever (Murtem and Chaudhry 2016), small worms and stomach troubles (Shil et al. 2014)
<i>Areca catechu</i>	Pain	Diarrhea (Uddin et al. 2013), flatulence, vomiting (Chowdhury et al. 2009), diarrhea (Faruque and Uddin 2011), carcinogenic, toothache, addictive (Bhowmik et al. 2014), urinary irritation (Rahman et al. 2016), carminative (Faruque et al. 2019)	
<i>Artocarpus heterophyllus</i> Lam	<b>Eye infection of cow*</b>	Skin disease (Sajib and Uddin 2015), piles (Uddin et al. 2013), apathy to food (Chowdhury et al. 2009), wound, itches and menstrual diseases (Rana et al. 2010), ulcer, constipation, diuretic, carminative, diarrhea (Bhowmik et al. 2014), skin disease (Faruque et al. 2019), asthma, itches, diarrhea, excessive menstrual discharge (Rahman 2015)	
<i>Azadirachta indica</i> A. Juss.	Skin disease, boils	Skin disease (Sajib and Uddin 2015), skin disease (Uddin et al. 2014), chicken pox, high blood pressure, weakness, gastritis, jaundice and malaria (Uddin et al. 2013), worm, skin disease (Uddin et al. 2015), chicken pox and measles (Faruque and Uddin 2014), scabies, eczema, skin disease, diabetes (Chowdhury et al. 2009), allergy, eczema, skin diseases and diabetes (Khan et al. 2015), allergy (Uddin and Hassan 2014), pain, wound healing, small pox, eczema, fever, cough (Islam et al. 2014b), skin diseases and worm (Rana et al. 2010), blood poisoning, itches, eczema (Akter et al. 2014), diabetes, measles, pox, scabies, indigestion, cataract, abscess (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), itch (Azam et al. 2013, Kamal et al. 2014), skin disease (Rahman et al. 2016), diabetes (Sarker et al. 2013), scabies, malaria (Faruque et al. 2019), worm, chicken pox, eczema, itches, helminthiasis (Rahman 2015), scabies, itches (Sarker et al. 2012), toothache, skin disease, insecticide (Sajib and Uddin 2013)	Malarial fever, typhoid (Chetri 2019), skin disease, stomach ache (Murtem and Chaudhry 2016), swelling (Kosalge and Fursule 2009)
<i>Bacopa monnieri</i> (L.) Wettst	Pain after delivery	Boils (Uddin et al. 2013), boils (Faruque and Uddin 2011)	

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Begonia roxburghii</i> DC.	Pain in gout		Thorn infection (Sajem and Gosai 2006)
<i>Blumea lacera</i> (Burm.f.) DC	Evil spirits, skin disease	Hemorrhages (Sajib and Uddin 2015), stomach pain (Uddin et al. 2014), evil spirit (Faruque and Uddin 2014), weakness, edema, piles, cholera, diuretic, microbial infections (Bhowmik et al. 2014), hemorrhages, fever (Sajib and Uddin 2013)	
<i>Butea monosperma</i>	Eczema, ring worm, contagious disease	Toothache (Uddin et al. 2013), cold, cough (Uddin et al. 2015), eczema, ring worm and contagious diseases (Faruque and Uddin 2014), boils, pimples, skin ulcers and piles (Islam et al. 2014b), diarrhea, tumor, hypertension, helminthiasis (Akhter et al. 2016), anthelmintic, dysentery, urinary infections, cough (Faruque et al. 2019), worm (Sajib and Uddin 2013)	Swelling, bone fracture (Kosalge and Fursule 2009)
<i>Cajanus cajan</i> (L.) Millsp.	<b>Bronchitis*, heart disease*</b>	Dog bite (Sajib and Uddin 2015), gout, jaundice, vomiting and stomachache (Uddin et al. 2013), jaundice (Uddin and Hassan 2014), diabetes (Islam et al. 2014b), jaundice, helminthiasis, lower cholesterol level, diabetes (Bhowmik et al. 2014), jaundice (Rahman et al. 2016), gastritis, jaundice (Faruque et al. 2019), diabetes, jaundice (Rahman 2015), jaundice (Sajib and Uddin 2013)	
<i>Calotropis gigantea</i> (L.) Ait.f.	<b>Rheumatism, vomiting*</b>	Rheumatic pain, catarrh, gout, toothache (Uddin et al. 2013), to remove the thorn, pain (Faruque and Uddin 2014), joint ache, rheumatism (Chowdhury et al. 2009), rheumatism (Faruque and Uddin 2011), constipation, fever, stomach disorders (Islam et al. 2014b), pain (Akter et al. 2014), fever, rheumatoid arthritis, asthma, diabetes (Bhowmik et al. 2014), wounds, paralysis, erectile dysfunction (Azam et al. 2013), pain (Kamal et al. 2014), gout, rheumatism (Rahman et al. 2016), rheumatic pain (Faruque et al. 2019), elephantitis, emollient, pain, boils, abscess (Hossan et al. 2012), rheumatism (Sajib and Uddin 2013)	Fracture and sprain (Chetri 2019), dog bites (Murtem and Chaudhry 2016), scabies (Kosalge and Fursule 2009)
<i>Carrica papaya</i>	Stomachache, constipation	Weakness, headache and insomnia (Uddin et al. 2013), diarrhea, worm (Uddin et al. 2015), dysentery, diabetes, constipation, chronic indigestion, peptic ulcer, (Chowdhury et al. 2009), ringworm (Khan et al. 2015), dysentery, peptic ulcer, liver disorders, ringworm (Islam et al. 2014b), indigestion, jaundice, toothache, kidney stones (Bhowmik et al. 2014), jaundice, diabetes (Azam et al. 2013), gastritis (Rahman et al. 2016), digestive and dysentery (Faruque et al. 2019), itches, constipation, indigestion, liver disease, diarrhea (Rahman 2015), worm, digestive (Sajib and Uddin 2013)	Stomach problems (Murtem and Chaudhry 2016), unboil, freckles, blemishes from the skin, anti-helminthic, digestive problems, vermicide (Rai and Lalramnghinglova 2010a)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Cassia fistula</i> L.	<b>Weakness*</b> , stomach clearance	Dysentery, piles (Uddin et al. 2013), diarrhea (Farouque and Uddin 2011), constipation and rheumatism (Rana et al. 2010), ringworms (Rahman et al. 2016), constipation in children (Sarker et al. 2013), jaundice, dysentery (Farouque et al. 2019), coughs, helminthiasis, diabetes, irregular urination, edema, constipation (Hossan et al. 2012), constipation (Sajib and Uddin 2013)	Constipation (Murtem and Chaudhry 2016), tapeworm (Shil et al. 2014), skin disease (Kosalge and Fursule 2009)
<i>Catharanthus roseus</i> (L.) G.Don	Jaundice	High blood pressure (Sajib and Uddin 2015), jaundice and diabetes (Uddin et al. 2013), dengue fever, diabetes, cancer, diarrhea (Islam et al. 2014b), menorrhagia (Rahman et al. 2016), stomachache (Sajib and Uddin 2013)	Diabetes, high blood pressure, nasal bleeding (Sajem and Gosai 2006), high blood pressure (Lalfakzuala et al. 2015), diabetes, diarrhea, dysentery, cholera, anti-cancer, high blood pressure (Rai and Lalramnghinglova 2010a)
<i>Centella asiatica</i> (L.) Urban	Digestive	Dysentery (Sajib and Uddin 2015), fever, pyorrhea, gastritis, jaundice, impotence (Uddin et al. 2013), vomiting, dysentery, diarrhea, dehydration (Farouque and Uddin 2014), dysentery wounds, burns, skin lesion (Khan et al. 2015), diarrhea, flatulence, tuberculosis, pain, dysentery (Farouque and Uddin 2011), dysentery (Uddin and Hassan 2014), hypertension, wounds, burns and skin lesion (Islam et al. 2014b), bleeding of piles, dysentery and flatulence (Rana et al. 2010), spermatorrhea (Akhter et al. 2016), weakness, dysentery, cataract, skin problem, gonorrhea, leucorrhea (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), dysentery, intestinal dysfunction (Azam et al. 2013), dysentery (Kamal et al. 2014), dysentery (Rahman et al. 2016), conjunctivitis, dysentery, impotence, asthma (Farouque et al. 2019), dysentery, eczema, headache (Rahman 2015), dysentery, fever (Sajib and Uddin 2013)	Conjunctivitis, eye injury, stomachic, indigestion, flatulence (Sajem and Gosai 2006), appetizer (Chetri 2019), diuretic, blurry vision, irregular vision (Ong et al. 2018), asthma, eye problems (Lalfakzuala et al. 2015), stomach trouble and as brain tonic (Murtem and Chaudhry 2016), acidity, indigestion (Manandhar 1995), stomach ulcers, urinary troubles, digestive complaint, dysentery, skin disease (Khumbongmayum et al. 2005), memory stimulator, asthma, eye problems, hypertension (Rai and Lalramnghinglova 2010a), muscular swelling, joint pains, eczema and pimples, fever, indigestion, uric acid and dysentery, to enhance memory power (Malla et al. 2015)
<i>Chenopodium album</i> L.	Weakness	Digestive, stomachic, constipation (Rahman 2015)	Jaundice, liver diseases, diuretic, anthelmintic, appetite, tonic, aphrodisiac, biliousness, abdominal pain (Ullah et al. 2013), anthelmintic, jaundice, liver diseases, appetite, diuretic, aphrodisiac, tonic and abdominal pain, Kidney stone (Aziz et al. 2018)
<i>Cinnamomum tamala</i> (Buch-Ham.) Nees & Eberm.	<b>Breathing problem*, chest pain*</b>	Dyspnea (Farouque and Uddin 2014), headache, pimples (Khan et al. 2015), headache and pimples (Islam et al. 2014b), cough and cold (Farouque et al. 2019)	UTI (Chetri 2019), cuts and wounds (Ong et al. 2018), stimulant, carminative, antirheumatic, antidiarrhea, gonorrhea (Rai and Lalramnghinglova 2010a), diarrhea (Dorji et al. 2017)
<i>Cissus quadrangularis</i> L.	Removal of thorn	Fracture (Uddin et al. 2013, 2014, Sajib and Uddin 2015), to remove the thorn (Farouque and Uddin 2014), stomach upset, stomach ulcer, malaria fever, pain, bone fracture (Khan et al. 2015), broken limbs (Rahman et al. 2016), fracture (Sajib and Uddin 2013)	Fracture (Singh and Singh 2009)

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Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Citrus aurantifolia</i> (Christm.)	Catarrhal fever, filariasis	Cough (Sajib and Uddin 2015), baldness, eczema (Uddin et al. 2013), vomiting, headache (Uddin et al. 2015), pyorrhea (Chowdhury et al. 2009), sinusitis, energetic (Rahman et al. 2016), headache, malaria (Faruque et al. 2019), cough (Sajib and Uddin 2013)	Dysentery, diarrhea (Chetri 2019)
<i>Citrus maxima</i> (Burm.f.) Merr.	Headache, influenza	Jaundice (Sajib and Uddin 2015), worm, jaundice, vomiting (Uddin et al. 2015), asthma (Rahman et al. 2016), fever, cough (Faruque et al. 2019)	
<i>Clerodendrum indicum</i> (L.) Kuntze	Menstrual problem, hematuria, jaundice	Cough (Uddin et al. 2014), irregular menstruation, jaundice, hematuria (Faruque and Uddin 2014), asthma (Bhowmik et al. 2014, Rahman et al. 2016), cough and asthma (Faruque et al. 2019), rheumatism (Sajib and Uddin 2013)	
<i>Clerodendrum viscosum</i> Vent.	Toothache	Prevent breast feeding (Sajib and Uddin 2015), swelling leg and blister (Uddin et al. 2013), toothache (Faruque and Uddin 2014), earache (Chowdhury et al. 2009), helminthiasis, dysentery (Khan et al. 2015), fever and malaria, anti-helminthes (Uddin and Hassan 2014), snake bites, asthma, stomach pain, fever, gonorrhea, leucorrhea, skin diseases (Bhowmik et al. 2014), to increase energy (Azam et al. 2013), infertility in women (Kamal et al. 2014), anthelmintic, cough, dysentery (Faruque et al. 2019), vomiting, worm, dyspepsia (Rahman 2015), burning sensations in the chest, salty taste in mouth when burping, flatulence, gastric pain (Sarker et al. 2012)	Diabetes, high blood pressure, asthma (Sajem and Gosai 2006), to purify blood (Murtem and Chaudhry 2016), diabetes, regulation of blood pressure, tumor, ascarids, poisonous bite (Khumbongmayum et al. 2005)
<i>Coccinea grandis</i> (L.) Voigt.	Jaundice	Diabetes, asthma, aphrodisiac, biliousness, disease of the blood, fever, dropsy, epilepsy, gonorrhea, snake-bite (Rahman 2013), diabetes (Uddin et al. 2013), respiratory difficulties with headache, chest pain, bone fracture with swelling and pain, incoherent talking all of a sudden (Kamal et al. 2014), diabetes (Rahman et al. 2016)	
<i>Curcuma longa</i> L.	Ulcer, Swelling of body	Skin disease (Sajib and Uddin 2015), cough, eczema (Uddin et al. 2013), tonsillitis (Uddin et al. 2015), skin dullness, wounds in livestock (Chowdhury et al. 2009), diarrhea, flatulence, face spots (Khan et al. 2015), cough, eczema (Faruque and Uddin 2011), diarrhea, flatulence (Islam et al. 2014b), pain (Akter et al. 2014), allergy, inflammation (Bhowmik et al. 2014), bone fracture, sex stimulant (Azam et al. 2013), blood purifier, diabetes (Rahman et al. 2016), abscess, eczema (Rahman 2015), skin disease (Sajib and Uddin 2013)	Dyspepsia (Sajem and Gosai 2006), antiseptic (Lalfakzuala et al. 2015), fracture and pain relieving (Murtem and Chaudhry 2016)
<i>Cucumis melo</i> L.	Liver, kidney	Kidney diseases, cooling, tonic, laxative, aphrodisiac, biliousness, diuretic, acute eczema, nutritive, beneficial to the enlargement to prostate gland (Rahman 2013)	
<i>Cymbidium aloifolium</i> (L.) Sw.	<b>Rheumatism*</b>	Cut and wounds (Rana et al. 2010)	

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Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Cynodon dactylon</i> (L.) Pers.	Piles, stop bleeding	Hemorrhage (Sajib and Uddin 2015), piles and bleeding from anus (Farouque and Uddin 2014), cuts, wounds (Chowdhury et al. 2009), stop bleeding from cuts and wounds, heart failure, diabetes (Khan et al. 2015), stop bleeding, pain, wound, severe bleeding from vagina, constipation (Islam et al. 2014b), cut and wound, tooth ache (Rana et al. 2010), increase blood, to stop bleeding from external cuts and wounds (Akhter et al. 2016), piles, bronchitis, flatulence, loss of appetite (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), headache, infection (Azam et al. 2013), skin disease, stop bleeding, wound (Rahman 2015), stop bleeding (Sajib and Uddin 2013)	Skin disease (Chetri 2019), fresh cuts, injuries, cough, menstrual disorders (Khumbongmayum et al. 2005)
<i>Datura metel</i> L.	Headache, vomiting	Rheumatism (Sajib and Uddin 2015), leprosy (Uddin et al. 2014), swelling area after injection (Uddin et al. 2013), cold and nervous disorders (Khan et al. 2015), allergy (Uddin and Hassan 2014), mental disorders (Islam et al. 2014b), pain (Akter et al. 2014), insanity, rheumatic swellings, abscess, piles (Bhowmik et al. 2014), intestinal dysfunction (Azam et al. 2013), asthma, rheumatism (Rahman 2015), joint pain (Sarker et al. 2012), fracture, rheumatism (Sajib and Uddin 2013)	Headache, removing worms on cattle wounds (Murtem and Chaudhry 2016), fever in catarrh, cerebral complications, diarrhea, skin diseases, antispasmodic, anesthetic (Ullah et al. 2013)
<i>Desmodium gangeticum</i>	High blood pressure	Fracture (Uddin et al. 2014), high blood pressure (Farouque and Uddin 2014), low semen density (Azam et al. 2013)	Falling of hair (Singh and Singh 2009), mouth ulcer (Kosalge and Fursule 2009)
<i>Dillenia indica</i> L.	Diarrhea, dysentery	Dog bites (Uddin et al. 2013), diarrhea, dysentery (Uddin et al. 2015), fever, cough (Khan et al. 2015), jaundice (Uddin and Hassan 2014), food poisoning, flatulence, boils, fever, cough, to enhance semen production (Islam et al. 2014b), diarrhea, dysentery (Azam et al. 2013), allergy (Rahman et al. 2016), hair tonic (Rahman 2015)	Anti-dandruff (Chetri 2019), stomach problem (Lafakzuala et al. 2015), hair fall (Murtem and Chaudhry 2016), jaundice, diarrhea, dysentery (Rai and Lalramnghinglova 2010a)
<i>Entada phaseoloides</i> (L.) Merr.	Pain, tympanites*		Stomach ulcer, headache, fever (Khumbongmayum et al. 2005)
<i>Eclipta prostrata</i> (L.) L.	Piles	Scuff infection, hair tonic (Sajib and Uddin 2015), excessive menstruation (Farouque and Uddin 2014), jaundice (Rahman et al. 2016)	Cough, fever, toothache (Khumbongmayum et al. 2005), cut and wounds (Shil et al. 2014)
<i>Erythrina variegata</i> L.	Nematode	Nematode (Uddin et al. 2013), dysentery, irregular menstruation (Uddin et al. 2015), killing tapeworm, roundworm, stimulate lactation and menstruation, constipation (Islam et al. 2014b), piles, asthma, epilepsy, astringent (Bhowmik et al. 2014), constipation (Azam et al. 2013), toothache, fever, menstrual disease (Rahman 2015)	
<i>Euphorbia hirta</i> L.	Bone fracture	Diarrhea (Uddin et al. 2013), eye disease (Uddin et al. 2015), dysentery (Farouque and Uddin 2014), oral and anal infections (Sarker et al. 2012)	Appetizer (Chetri 2019), worm disease of children, skin disease, mouth-sores, dysentery, bronchial affections, asthma (Khumbongmayum et al. 2005)
<i>Ficus hispida</i> L. f.	Hysteria*	Diabetes (Akhter et al. 2016)	Cough (Shil et al. 2014)

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Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Ficus benghalensis</i>	Abscesses, <b>bald head*</b>	Piles, astringent, aphrodisiac (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), low semen density (Azam et al. 2013), abscess (Rahman 2015)	Abscesses, dysentery, diarrhea, diabetics, astringent, cooling tonic, gonorrhea, rheumatism, lumbago (Lalfakzuala et al. 2015), obstruction of urine flow, exudation of piles, puss (Khumbongmayum et al. 2005), rheumatism, lumbago, tonic, astringent, dysentery, diarrhea, diabetes, cooling tonic, abscesses, gonorrhea (Rai and Lalramnghinglova 2010a)
<i>Flacourzia jangomas</i> (Lour.) Raeusch.	Tetanus, bone swelling	Diarrhea (Uddin et al. 2015), bone swelling (Faruque and Uddin 2014)	Bleeding gum, toothache, diabetes (Khumbongmayum et al. 2005)
<i>Heliotropium indicum</i> L.	Boils	Infection, blood purification (Akhter et al. 2016)	
<i>Hibiscus rosa-sinensis</i> L.	Piles	Hair tonic (Sajib and Uddin 2015), skin disease (Uddin et al. 2014), boils (Uddin et al. 2013), dysentery, debility (Khan et al. 2015), leucorrhoea (Faruque and Uddin 2011), dysentery, leucorrhea (Bhowmik et al. 2014), premature ejaculation (Azam et al. 2013), piles, leucorrhoea (Faruque et al. 2019), dysentery (Sajib and Uddin 2013)	Jaundice (Lalfakzuala et al. 2015)
<i>Hyptis suaveolens</i> (L.) Poit	<b>Loss of appetite*</b> , weakness	Tiredness, blood purifier (Sajib and Uddin 2015), loose motion, griping (Faruque and Uddin 2014), flatulence, acidity, gastric (Khan et al. 2015), eczema and boils (Islam et al. 2014b), to give strength (Akter et al. 2014), gonorrhea, microbial infections (Bhowmik et al. 2014), low semen density (Azam et al. 2013), stomach ache in children (Sarker et al. 2013), tumor, constipation (Faruque et al. 2019), cooling agent, kidney disease, urinary tract infections, dysuria (painful urination), laxative (Hossan et al. 2012), diuretic (Sajib and Uddin 2013)	
<i>Ixora nigricans</i> R.Br. ex Wight & Arn.	Vomiting, over bleeding, unconsciousness	Vomiting, over bleeding, unconsciousness (Faruque and Uddin 2014)	Dysentery, colic problems (Rai and Lalramnghinglova 2010a)
<i>Ipomoea acutica</i> Forssk.	Boils and pain of boils	Menstrual problem (Sajib and Uddin 2015), UTI (Uddin et al. 2013), constipation, piles (Khan et al. 2015), headache, constipation and piles (Islam et al. 2014b), gastric, intestinal disorders, diabetes (Bhowmik et al. 2014)	Fever and body ache (Shil et al. 2014)
<i>Justicia adhatoda</i> L.	Stomachache, fever, cough	Fever, cough (Sajib and Uddin 2015), cough and fever (Uddin et al. 2014), cough (Uddin et al. 2013), skin cancer, cough (Faruque and Uddin 2014), cough (Faruque and Uddin 2011), cold, cough, fever, malaria, impotence, jaundice (Uddin and Hassan 2014), menstrual problems, asthma, jaundice, hepatitis (Bhowmik et al. 2014), coughs (Azam et al. 2013), coughs with throat pain (Kamal et al. 2014), cough (Rahman et al. 2016), cough (Sarker et al. 2013), bronchitis, high blood pressure (Faruque et al. 2019), malaria, coughs, cold (Hossan et al. 2012), cough (Sajib and Uddin 2013)	Fracture and broken bones (Chetri 2019), scabies, ring worm (Singh and Singh 2009), malaria, fever, chronic malaria (Rai and Lalramnghinglova 2010a), pneumonia and cough (Shil et al. 2014), infectious sores and relieves pain (Dorji et al. 2017)

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Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Kalanchoe pinnata</i> (Lam.) Pers.	Cough	Cough (Sajib and Uddin 2015), tumor (Uddin et al. 2014), burn, cough, excessive menstruation, pneumonia, urinary problem in child (Uddin et al. 2013), to reduce pain during delivery, asthma (Faruque and Uddin 2014), cough in babies (Chowdhury et al. 2009), cholera, diarrhea, dysentery (Khan et al. 2015), cholera, diarrhea, dysentery. Ulcer, urinary diseases (Islam et al. 2014b), urinary problems, kidney or gall bladder stones (Bhowmik et al. 2014), stomach pain, headache, malfunctioning of kidneys or stoppage of urination in cholera patients (Kamal et al. 2014), urinary irritations (Rahman et al. 2016), pain, boils, abscess, rheumatism, eczema (Hossan et al. 2012), cough, dysentery, diuretic, diabetes, fracture (Rahman 2015), sedative, carminative (Sajib and Uddin 2013)	Vertigo (Rai and Lalramnghinglova 2010a), gall bladder stone (Shil et al. 2014), kidney stone (Kosalge and Fursule 2009)
<i>Lawsonia inermis</i> L.	<b>Spermatorrhea*</b>	Hair tonic (Sajib and Uddin 2015), hair problem (Uddin et al. 2014), dandruff, grey hair, leg burning in diabetes (Chowdhury et al. 2009), eczema, leprosy, leaf, jaundice (Islam et al. 2014b), dandruff, skin diseases, jaundice and spleen (Rana et al. 2010), hair loss, skin diseases (Akhter et al. 2016), keep head cool, dandruff (Bhowmik et al. 2014), wound, burning sensation (Rahman 2015), skin disease, hair tonic (Sajib and Uddin 2013)	
<i>Leucas aspera</i> (Willd.) Link	Skin disease	Tonsillitis (Sajib and Uddin 2015), high fever, evil spirit, unconsciousness (Faruque and Uddin 2014), allergy, cold, cough (Uddin and Hassan 2014), bloating, indigestion, constipation, blood purifier (Akter et al. 2014), eye inflammation, external bleeding, dysentery (Bhowmik et al. 2014), skin disease (Rahman et al. 2016), excessive menstrual bleeding (Hossan et al. 2012)	
<i>Leea indica</i>	Diarrhea, dysentery, colic, boils, epilepsy, gastric tumor, gout, itching, rheumatic arthritis	Boils, eczema, skin diseases, intestinal, uterus cancer (Bhowmik et al. 2014)	
<i>Litsea monopetala</i> (Roxb.) Pers.	Contusion	Bladder problem (Sajib and Uddin 2015), diarrhea (Rana et al. 2010), gastric ulcer (Azam et al. 2013)	
<i>Maesa indica</i>	Boils, syphilis		Anthelmintic, syphilis (Khumbongmayum et al. 2005)
<i>Manilkara zapota</i> (L.) P. Royen	Asthma, cough	Diarrhea (Uddin et al. 2013), rotten nails (Uddin et al. 2015), asthma and cough (Faruque and Uddin 2014)	
<i>Melastoma malabathricum</i> L.	Diarrhea, dysentery	Dysentery and leucorrhoea (Rana et al. 2010), jaundice (Rahman et al. 2016), urinary tract infection (Hossan et al. 2012), vomiting, stomach pain (Islam et al. 2015)	Dysentery (Sajem and Gosai 2006), skin troubles, diarrhea, dysentery, leucorrhoea (Khumbongmayum et al. 2005), wound healer, antidiarrhea, antiseptic, astringent, antileucorrhoeic (Rai and Lalramnghinglova 2010a)
<i>Mesua ferrea</i> L.	Diarrhea	Coldness (Uddin et al. 2013), diarrhea (Faruque and Uddin 2014), asthma, cough, fever, skin diseases and joint pain (Islam et al. 2014b), fever, arthritis (Azam et al. 2013)	Astringent, stomachic, snake bite, scorpion sting (Lalfakzuula et al. 2015), astringent, stomachache, snakebite, scorpion sting (Rai and Lalramnghinglova 2010a)

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Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Mikania micrantha</i> Kunth	Stop bleeding	Gastritis, hemorrhage (Sajib and Uddin 2015), stop bleeding (Faruque and Uddin 2014)	Diarrhea, dyspepsia (Sajem and Gosai 2006), hemostatic, dysentery (Rai and Lalramnghinglova 2010a)
<i>Mimosa pudica</i> L.	Dysentery, piles	Rheumatism (Sajib and Uddin 2015), jaundice and boils (Uddin et al. 2013), dysentery, jaundice (Uddin et al. 2015), fracture, boils (Faruque and Uddin 2014), jaundice (Khan et al. 2015), diarrhea (Uddin and Hassan 2014), wound, ulcer, piles, swelling (Islam et al. 2014b), piles and dysentery (Rana et al. 2010), piles, wound, dysentery, prevent decaying of gums, urine tract stone, skin diseases (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), impotency, appetizer, spleen enlargement (Azam et al. 2013), toothache (Rahman et al. 2016), piles, dysentery (Faruque et al. 2019), fever, snake-bite (Rahman 2015), swelling due to injury (Sarker et al. 2012), dysentery (Sajib and Uddin 2013)	Piles (Sajem and Gosai 2006), pneumonia (Chetri 2019), cut and wounds, eczema (Singh and Singh 2009), urinary difficulty (Ong et al. 2018), piles, fistula (Lalfakzuala et al. 2015), pile, fistula, gravelliest complaint (Rai and Lalramnghinglova 2010b)
<i>Moringa oleifera</i> Lamk.	Pain	Rheumatism and as anthelmintic (Sajib and Uddin 2015), burning, general weakness, headache, insomnia, high blood pressure, leucorrhoea (Uddin et al. 2013), weakness, blindness and headache (Faruque and Uddin 2014), fat, diabetes (Khan et al. 2015), constipation and diabetes, oedema (Islam et al. 2014b), hypertension, indigestion (Bhowmik et al. 2014), cold, cough (Rahman et al. 2016), chicken pox, diabetes, paralysis, fever (Rahman 2015), ear-ache (Sajib and Uddin 2013)	Kill maggots of cattle wounds (Chetri 2019), cough and cold (Shil et al. 2014)
<i>Nicotiana tabacum</i> L.	Rheumatism, skin disease	Pain (Uddin et al. 2015), toothache, stimulant (Faruque et al. 2019)	
<i>Ocimum sanctum</i> L.	Cold	Cough (Chowdhury et al. 2009), cough (Faruque and Uddin 2011), cold and cough (Uddin and Hassan 2014), cold, cough, fever, bronchitis, asthma (Islam et al. 2014b), asthma, cough, cold ailment, stomachache, dysentery (Rana et al. 2010), mucus, rheumatic pain (Akhter et al. 2016), fever, cough, indigestion (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), cough and colds (Faruque et al. 2019), coughs, cold (Hossan et al. 2012), cough, fever (Rahman 2015), cough, pneumonia (Sajib and Uddin 2013)	Headache, stomachache (Sajem and Gosai 2006), sore throat, cold, head ache (Chetri 2019)
<i>Oroxylum indicum</i> L.	Impotence	Diabetics (Uddin et al. 2014), leucorrhoea, leukemia (Uddin et al. 2013), jaundice (Uddin et al. 2015), impotence (Faruque and Uddin 2014), jaundice (Uddin and Hassan 2014), jaundice, diarrhea, scabies (Bhowmik et al. 2014), jaundice (Azam et al. 2013), jaundice (Sarker et al. 2013), Liver disease, arthritis, diarrhea, cicatrizing (wound healing) (Hossan et al. 2012)	Cuts and wound (Chetri 2019), hyper tension, carminative, spleen inflammation, indigestion (Ong et al. 2018), skin itching, swelling, liver and stomach problem (Murtem and Chaudhry 2016), epilepsy, muscular sprains, general weakness (Khumbongmayum et al. 2005), tonic, antidiarrhea, antirheumatic, carminative stomachache, purgative, scorpion sting (Rai and Lalramnghinglova 2010a), eczema (Shil et al. 2014)

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Scientific name	Ethnomedicinal application(s) among the Marma <b>Weakness*</b>	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Oxalis corniculata</i>		Boils, excessive menstruation (Uddin et al. 2013), anemia, cough (Rahman 2015), mouth taste, indigestion, bladder inflammation (Ijaz et al. 2016)	Remove eye dust (Chetri 2019), fire burn (Murtem and Chaudhry 2016), stomach complaints, dysentery, piles, colic, hair lotion Khumbongmayum et al. 2005
<i>Phyllanthus emblica</i>	Anemia, loss of appetite and Stomachache	Cough, gastritis (Uddin et al. 2013), cough, cold, diarrhea, dysentery, jaundice (Uddin et al. 2015), abdominal gas, fever (Faruque and Uddin 2014), urinary tract infection (UTI), hysteria (Faruque and Uddin 2011), fever and malaria (Uddin and Hassan 2014), oedema, constipation, gonorrhea (Islam et al. 2014b), paralysis (Akhter et al. 2016), diabetes, dysentery, venereal diseases (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), intestinal dysfunction, blood purifier (Azam et al. 2013), blood pressure, liver cirrhosis, sensuality, hair tonic (Rahman et al. 2016), anemia (Sarker et al. 2013), gastritis, high blood pressure (Faruque et al. 2019), aphrodisiac, energizer, fever, body ache (Hossan et al. 2012), burning sensation, vomiting, cough, indigestion, jaundice (Rahman 2015), diuretic, refrigerant, laxative, tonic, gastritis (Sajib and Uddin 2013)	Sore throat (Chetri 2019), carminative, hypertension, cough, blood cleansing, cough, diuretic, menstrual bleeding, ringworm boil, burns, cuts and wounds (Ong et al. 2018), appetizer (Murtem and Chaudhry 2016), dyspepsia, jaundice (Khumbongmayum et al. 2005)
<i>Physalis minima</i> L. <i>Piper betel</i> L.	Dysuria, fever Pain, gastritis	earache, stomach pain, pain (Islam et al. 2014b) Digestive (Sajib and Uddin 2015), fever (Uddin et al. 2013), indigestion (Uddin et al. 2015), flatulence, indigestion, congestion in muscles, cuts and wounds (Chowdhury et al. 2009), diabetes, acidity (Khan et al. 2015), nerve pain, pain, cough, oedema (Islam et al. 2014b), dysentery, loss of appetite, indigestion, belly ache (Rana et al. 2010), spermatorrhea (Akhter et al. 2016), stomach disorders, breast and prostate, cancer (Bhowmik et al. 2014), indigestion, colic, diarrhea, headache, masticatory substance, stimulant (Faruque et al. 2019), cut injury, stomachache (Rahman 2015), rheumatism (Sajib and Uddin 2013)	
<i>Plumbago indica</i> L.	Contraceptive	Delivery (Sajib and Uddin 2015), tumor (Uddin et al. 2014)	
<i>Premna esculenta</i> Roxb.	Diabetes, urinary tract infection	For treatment over bleeding during delivery (Faruque and Uddin 2014)	
<i>Psidium guajava</i> L.	<b>Cold*</b>	Dental pain (Sajib and Uddin 2015), diarrhea (Uddin et al. 2013), diarrhea (Uddin et al. 2015), piles, indigestion, diarrhea, dysentery, menstrual disorders (Khan et al. 2015), dysentery (Faruque and Uddin 2011), diarrhea, menstrual problems, tooth infections (Bhowmik et al. 2014), toothache (Azam et al. 2013), diarrhea and dysentery (Faruque et al. 2019), dysentery, wound, diabetes (Rahman 2015), toothache, dysentery (Sajib and Uddin 2013)	Dysentery (Murtem and Chaudhry 2016)

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Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Throat pain, high blood pressure, stomachache, diarrhea	High blood pressure (Sajib and Uddin 2015), insomnia, high blood pressure (Uddin et al. 2014), insomnia, high blood pressure (Uddin et al. 2013), diarrhea (Faruque and Uddin 2014), fever, cholera, high blood pressure, snake bite (Islam et al. 2014b), diarrhea, fever, blood pressure (Rana et al. 2010), high blood pressure (Sarker et al. 2013), blood pressure, heart disease, dysentery, diarrhea (Rahman 2015), constipation (Sarker et al. 2012), high blood pressure (Wahab et al. 2013), hypertension (Islam et al. 2015), high blood pressure, anxiety (Sajib and Uddin 2013)	Malarial fever (Chetri 2019), labor pain, removal of opacities of the cornea (Singh and Singh 2009), hypertension, stomach problems (Rai and Lalramnghinglova 2010a)
<i>Ricinus communis</i> L.	Skin infection	Rheumatism (Sajib and Uddin 2015), piles (Faruque and Uddin 2014), constipation, fever, cough, gastric disorders, diarrhea, dysentery, constipation, piles (Islam et al. 2014b), gastric distress, liver or gall bladder disorder, constipation, headache, joint pain (Bhowmik et al. 2014), diarrhea in cattle, wound in human (Azam et al. 2013), body pain (Rahman et al. 2016), blood dysentery (Sarker et al. 2013), headache, rheumatism (Rahman 2015), blood dysentery (Wahab et al. 2013), rheumatism (Sajib and Uddin 2013)	Chicken fox, foot infection (Chetri 2019), abortion, stomach ache (Murtem and Chaudhry 2016), ulcer, sciatica, paralysis, urinary problems (Rai and Lalramnghinglova 2010a)
<i>Saraca asoca</i>	To get rid of Insect	Menorrhagia (Uddin et al. 2013), ulcer, piles, dyspepsia, dysentery, stomach pain (Islam et al. 2014b), dysentery, irregular menstruation, piles (Bhowmik et al. 2014), diarrhea, leucorrhoea (Faruque et al. 2019), irregular menstruation (Sajib and Uddin 2013)	Astringent, uterine inflation (Lalfakzuala et al. 2015), astringent, uterine inflation, gonorrhea, scorpion sting (Rai and Lalramnghinglova 2010a)
<i>Scoparia dulcis</i> L.	Dysentery	Dysentery (Sajib and Uddin 2015), evil spirit (Faruque and Uddin 2014), fever (Khan et al. 2015), diarrhea (Uddin and Hassan 2014), stomach pain, lower abdominal pain (Akter et al. 2014), diabetes, wounds, ulcer, weakness, fever, edema, bronchitis, diarrhea, toothache (Bhowmik et al. 2014), spermatorrhea (Sarker et al. 2013), snake bite, insect bite, antidote to poison (Hossan et al. 2012), snake-bite (Rahman 2015), diarrhea (Islam et al. 2015), dysentery Sajib and Uddin 2013)	Cavity formation (Sajem and Gosai 2006), kidney stone (Lalfakzuala et al. 2015), jaundice and blood clotting (Murtem and Chaudhry 2016), kidney stone, jaundice, genitor-urinary troubles (Rai and Lalramnghinglova 2010a)
<i>Senna alata</i> L.	Severe pain, piles, itching	Digestive, skin disease (Sajib and Uddin 2015), eczema, constipation (Uddin et al. 2013), worm (Uddin et al. 2015), eczema (Faruque and Uddin 2014), eczema (Faruque and Uddin 2011), ringworm and eczema (Faruque et al. 2019)	Ring worm. Insect and snake bite (Chetri 2019)
<i>Sida acuta</i> Burm. F.	<b>Displace of bone*</b>		Constipation (Chetri 2019), boils, nervous, urinary, stomach/gastric diseases (Rai and Lalramnghinglova 2010a)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Solanum torvam</i> Swartz.	Itches	Fever, gastritis, flatulence, stomach pain (Uddin et al. 2013), worm (Uddin et al. 2015), fever, pain weakness, diarrhea (Faruque and Uddin 2011), toothache (Azam et al. 2013), gastritis, fever (Faruque et al. 2019)	Toothache, tooth decay (Lalfakzuala et al. 2015), stomach ache and high blood pressure (Murtem and Chaudhry 2016), cough, tonsil complaints (Khumbongmayum et al. 2005), toothache and tooth decay (Rai and Lalramnghinglova 2010a)
<i>Spilanthes acmella</i> Murr.	Infection of mouth, cough, headache	Pain (Sajib and Uddin 2015)	
<i>Stephania japonica</i> (Thunb.) Miers	Dysentery	Pain, eczema (Sajib and Uddin 2015), abdominal pain (Sajib and Uddin 2013)	
<i>Syzygium cumini</i> (L.) Skeel	Jaundice, liver problem anemia, headache	Vomiting, diarrhea, diabetes, urinary disorders (Islam et al. 2014b), diabetes (Ocvirk et al. 2013), anthelmintic, blood dysentery (Faruque et al. 2019), dysentery, wound, diabetes (Rahman 2015), dysentery (Sajib and Uddin 2013)	
<i>Tamarindus indica</i>	<b>Energetic*</b> , fever	Injury (Singh and Singh 2009), conjunctivitis, excessive menstruation (Uddin et al. 2013), dysentery, diarrhea (Uddin et al. 2015), diabetes (Chowdhury et al. 2009), sinusitis and chronic cold (Khan et al. 2015), constipation, jaundice (Islam et al. 2014b), cold, dysentery, rheumatic pain, burning sensations in hands or feet, oral lesions (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), respiratory difficulties with headache, chest pain, bone fracture with swelling and pain, incoherent talking all of a sudden (Kamal et al. 2014), fever (Rahman et al. 2016), cough, dysentery and diarrhea (Faruque et al. 2019), burning sensation, heart disease (Rahman 2015), chicken pox, boils, rheumatism, laxative (Sajib and Uddin 2013)	
<i>Terminalia arjuna</i> (Roxb.) W. & A.	Bone fracture	Heart disease (Sajib and Uddin 2015), scabies and itching (Uddin et al. 2013), hypertension, heart disease (Chowdhury et al. 2009), heart problem and burning sensations, jaundice, dysentery (Khan et al. 2015), scabies, itching (Faruque and Uddin 2011), diabetes (Uddin and Hassan 2014), heart disease, dysentery, diarrhea, Jaundice (Islam et al. 2014b), heart disease (Rana et al. 2010), acidity, stomach pain (Akter et al. 2014), asthma, dysentery, heart disorder, sexual diseases (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), body pain, intestinal dysfunction (Azam et al. 2013), blood pressure (Rahman et al. 2016), burning sensation, blood pressure, heart disease, worm (Rahman 2015), heart disease (Sajib and Uddin 2013)	Abdominal pain (Kosalge and Fursule 2009)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Blood purify, stomach problem	Diarrhea, dysentery (Sajib and Uddin 2015), ulcer (Uddin et al. 2014), cough and diarrhea (Uddin et al. 2013), sore throat and cough (Faruque and Uddin 2014), ulcer, gastric pain, indigestion (Chowdhury et al. 2009), helminthiasis, loss of hair (Khan et al. 2015), urinary tract infection (UTI), hysteria (Faruque and Uddin 2011), fever, malaria (Uddin and Hassan 2014), constipation, hair growth (Islam et al. 2014b), constipation, flatulence, loss of appetite, stomach ache and diarrhea (Rana et al. 2010), acidity, stomach pain, dysentery, stomach pain (Akter et al. 2014), asthma, allergy (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), helminthiasis, loss of hair (Azam et al. 2013), bronchitis, asthma, dyspepsia, scorpion sting (Rahman et al. 2016), aphrodisiac, energizer, fever, body ache (Hossan et al. 2012), burning sensation, rheumatism (Rahman 2015), appetite stimulant (Islam et al. 2015), bronchitis (Sajib and Uddin 2013)	Stomach problem (Lalfakzuala et al. 2015), stomach problem, anti-dropsical, antileprotic, anti-inflammatory, antidiarrheal, anti-bilious, anti-asthmatic, anti-cephalagic, tonic in bronchitis, sore throat and in diseases of eye, nose, piles, diuretic, anemia, leukoderma; kernel narcotic and aphrodisiac (Rai and Lalramnghinglova 2010a)
<i>Terminalia chebula</i> (Gaertn.) Retz.	Weakness, loss of appetite	Pain and fever (Sajib and Uddin 2015), cough (Uddin et al. 2013), sore throat and cough (Faruque and Uddin 2014), ulcer, gastric pain, indigestion (Chowdhury et al. 2009), constipation, vomiting (Khan et al. 2015), urinary tract infection (UTI), hysteria (Faruque and Uddin 2011), fever, malaria (Uddin and Hassan 2014), constipation, ulcer, oedema (Islam et al. 2014b), asthma, anemia, rheumatism, tooth ache (Rana et al. 2010), dysentery, stomach pain, toothache, body pain from skin diseases, acidity, stomach pain (Akter et al. 2014), stomachic, acidity (Bhowmik et al. 2014), diabetes (Ocvirk et al. 2013), indigestion, vomiting, constipation, intestinal dysfunction (Azam et al. 2013), loss of appetite (Kamal et al. 2014), asthma, blood pressure, painful menstruation, indigestion (Rahman et al. 2016), gastritis, pain during menstruation, asthma, bronchitis (Faruque et al. 2019), aphrodisiac, energizer, fever, body ache (Hossan et al. 2012), constipation, indigestion, rheumatism, urinary disease (Rahman 2015), appetite stimulant (Islam et al. 2015), constipation (Sajib and Uddin 2013)	Stomach problem (Lalfakzuala et al. 2015), constipation and gastric (Murtem and Chaudhry 2016), stomach problem, purgative, febrifuge, anti-asthmatic, antidiaryntery, enriches blood, anti-paralytic, in piles, cold, ophthalmia, sore throat, dental caries, bleeding and ulceration of gums, burns, diuretic and cardiotonic (Rai and Lalramnghinglova 2010a)
<i>Trevesia palmata</i>	Severe pain, jaundice*	Snakebite (Faruque et al. 2019)	Colic, high blood pressure, stomachache (Lalfakzuala et al. 2015), colic, stomach ache and high blood pressure (Rai and Lalramnghinglova 2010b)
<i>Urena lobata</i> L.	Gastritis, sore throat	Abdominal pain (Sajib and Uddin 2015, Uddin et al. 2015), malaria, gonorrhea, wound, toothache, ear infections (Bhowmik et al. 2014), cough, fever (Faruque et al. 2019)	Blood pressure, body ache, rheumatism (Sajem and Gosai 2006), boil (Manandhar 1995), aphrodisiac, rheumatism (Rai and Lalramnghinglova 2010a), fever (Shil et al. 2014)

(Continued)

Table 5. Continued.

Scientific name	Ethnomedicinal application(s) among the Marma	Previous ethnomedicinal report in Bangladesh	Previous ethnomedicinal report in neighboring countries
<i>Vitex negundo</i> L.	Jaundice, fever, leucorrhoea, eczema	Rheumatism, hair tonic (Sajib and Uddin 2015), toothache, tonsil pain (Chowdhury et al. 2009), flatulence, asthma, cough, fever (Islam et al. 2014b), diabetes (Ocvirk et al. 2013), if infant does not drink milk or cries incessantly (Sarker et al. 2013), evil spirits or ghosts, tranquilizer, headache, allergy (Hossan et al. 2012), fever, rheumatism (Rahman 2015), gas trouble, cholera, rheumatism (Ijaz et al. 2016), boils, hair tonic, dental pain (Sajib and Uddin 2013)	Ringworm (Chetri 2019), cough, cold, fever, gastric troubles, sinusitis (Malla et al. 2015), joint pain (Kosalge and Fursule 2009)
<i>Vitex peduncularis</i> Wall. ex. Schauer	Eye problem, paralysis		Typhoid and malarial fever (Rai and Lalramnghinglova 2010a)
<i>Vitex trifolia</i> L. f.	Fever		Rheumatic swelling, rheumatism, sinus, hydrocele, piles (Khumbongmayum et al. 2005)
<i>Withania somnifera</i> (L.) Donal	<b>Leucorrhoea*, dysentery*</b>	Increase production of breast milk (Sajib and Uddin 2015), diabetes (Ocvirk et al. 2013), erectile dysfunction (Azam et al. 2013)	
<i>Xylosma longifolium</i> Clos.	<b>Gastritis</b>		Piles, killing lice, dizziness, hoarseness, regulation of blood circulation (Khumbongmayum et al. 2005)
<i>Zingiber officinale</i> Roscoe	Sore throat, cough vomiting	Cough (Sajib and Uddin 2015), indigestion and cough (Uddin et al. 2013), cough, cold, dysentery, vomiting, worm (Uddin et al. 2015), sore throat and cough (Faruque and Uddin 2014), cold, cough (Chowdhury et al. 2009), pain in stomach, coughs, gastric disorders, vomiting (Islam et al. 2014b), increase digestion (Bhowmik et al. 2014), depression (Kamal et al. 2014), food additive, stimulant, abdominal problems, laxative, dyspepsia, dysentery and vomiting, coughs, bronchitis, asthma and tuberculosis (Faruque et al. 2019), fever, bronchitis (Rahman 2015), abdominal pain (Sajib and Uddin 2013)	Cough, cold and tonsillitis (Murtem and Chaudhry 2016), cough and bronchitis, throat pain, condiment (Rai and Lalramnghinglova 2010a)

other known and unknown ingredients and they believe that if some plants are used in combination with others, it gives best result to treat different types of disease. For instance, pills prepared from a combination of the three plants *Drimia indica*, *Zingiber officinale* and *Allium sativum* is considered useful to reduce acidity of humans and cattle. Likewise, a paste of *Eria tomentosa* mixed with *Allium sativum* and mustard oil is used to treat rheumatism. Also pills prepared from flowers of *Sphagneticola calendulacea* combined with *Zingiber officinale*, *Allium sativum*, *Centella asiatica* and honey is effective in treating dysentery. A powder of fruits of *Terminalia chebula*, *Phyllanthus emblica*, *Terminalia bellirica* and *Oryza sativa* is used to cure weakness and increase appetite. Herbs were the most frequently used plants since they are naturally occurring in the studied area throughout the year and favorable for their growth because of its hilly nature. Similar results have been observed by different ethnobotanists of Bangladesh (Faruque and Uddin 2011, 2014, Uddin et al. 2013, 2014,

Rahman et al. 2016). The Marma people mainly use leaves to prepare ethnomedicine due to the availability of leaves around the year, easy to collect and preparations for herbal drugs importantly for the preparation of paste.

In the present study, 72 ethnomedicinal plant species were used to treat gastrointestinal disorders and this disorder ranked high in FIC value. This ranking might be due to lack of adequate knowledge about hygiene, favorable environment for pathogens that causes such disease, lack of pure drinking water, especially in the dry season, and cultural tendencies and regional habits. The species with high FIC values need further investigation, and could be a noble source of bioactive compounds. Gastrointestinal disorders or digestive system disorders ranked as the first disease category also in other studies conducted within Belaichhari (Sarker et al. 2013, Faruque et al. 2019) upozila, and it is also supported by published report from the other parts of Bangladesh (Uddin and Hassan 2014, Khan et al. 2015, Faruque et al. 2018).

To search new ethnomedicinal using information of the recorded plant species in Bangladesh, a critical review was performed with previous published reports, which is presented in Table 5. From our literature study, we have recorded 23 plant species with new uses for the first time from Bangladesh. Among them, 4 new uses were documented for 1 species, 2 new uses for 5 species and only one new use for 17 species. For example, *Lawsonia inermis* L. is reported by other studies conducted in Bangladesh for the treatment of hair tonic (Sajib and Uddin 2015), hair problems (Uddin et al. 2014), dandruff, grey hair and leg burning in diabetes (Chowdhury et al. 2009), eczema, leprosy and jaundice (Islam et al. 2014b), dandruff, skin diseases, jaundice and spleen (Rana et al. 2010), hair loss and skin diseases (Akhter et al. 2016), to keep head cool and dandruff (Bhowmik et al. 2014), wound, burning and sensation (Rahman 2015) and skin disease and hair tonic (Sajib and Uddin 2013). However, our study recorded one new use of this species and reported that fresh juice extracted from the leaves of this plant is mixed with some sugar is taken two teaspoons full twice a day until cure from spermatorrhoea. Similarly, the uses of *Withania somnifera* for the treatment of leucorrhoea and dysentery were recorded for the first time in this study. Other novel uses of ethnomedicine include *Xylosma longifolium* to treat Gastritis, *Trevesia palmata* to treat jaundice, *Tamarindus indica* as an energetic, *Ficus hispida* to treat hysteria, *Cymbidium aloifolium* to treat rheumatism and so on (Table 5). Alongside, we also performed another critical review on previous phytochemical and pharmacological studies of these 23 plant species to ascertain whether they possess any biological activity and active chemical constituents. Our study displayed that all of these species exhibited numerous activities along with potential compounds. The detail literature works are summarized in Table 6.

From our field study, we recorded some plant species which are very common and widely used in the indigenous communities of Bangladesh for the treatment of different diseases. One such species is *Acorus calamus* used for severe pain, fever, laxative and spiritual use and also used to treat cough (Faruque and Uddin 2011), gastritis and vomiting (Uddin et al. 2013), worm, diarrhea and dysentery (Uddin et al. 2015), phobias at night and eczema (Faruque and Uddin 2014), hair problems (Uddin et al. 2014), constipation, oedema and indigestion (Islam et al. 2014b), cuts and wounds (Rahman et al. 2016), anthelmintic and gastritis (Faruque et al. 2019).

To compare similarities, JI was calculated with 44 previous studies conducted in home and abroad. The highest degree of similarities was recorded with a study from the Bandarban district (46.78) of Bangladesh conducted by Faruque and Uddin (2014) and the lowest from with the ethno-medicinal investigation of a indigenous community in the northern region of Bangladesh (1.42), conducted by Rahman (2013). On the other hand, the highest JI recorded with studies from neighboring countries was with Mizoram, India (14.00) conducted by Rai and Lalramngsinghlova (2010a) and the lowest with FATA, Pakistan (0.78), conducted by Aziz et al. (2018). The highest degrees of similarity may reflect that the study

area is located in a similar geographical zone with similar socio-economic and cultural characteristics (Faruque et al. 2019).

The indigenous communities still rely on a traditional health care system rather than a modern system of medicine. Nowadays, scientists from different areas and fields have been keen concerned to preserve these valuable knowledges as they have proven a potential source for the discovery of new drugs and safe health care methods with least side effects. Recommended systematic documentation and dissimilation by publication, preparing and publishing databases of this folk knowledge can be the most appropriate way to preserve the knowledge. In addition, by adding valuable scientific findings in support of the folk herbal treasure can popularize the use of traditional medicine. It will also make people concerned to save natural treasures and biodiversity. However, still this valuable knowledge is disappearing in an alarming rate due to many define factors. Educational institutions, research organization, media workers, social and NGO workers can help to popularize the folk medicine among the young generations. Once they understand the values of their cultural treasures, they will be interested to conserve their own unique knowledge and will make them popular and available to the people who need.

This study documented 196 ethnomedicinal plant species and 23 species were recorded with new uses from Bangladesh. All documented data was analyzed qualitatively and quantitatively along with a literature survey on phytochemical and pharmacognostical studies of the recorded plants to generate new insights towards development of the local health care system as well as to provide a basis for future research directions. For example, our documented data can raise the attention of herbal manufacturers to include them in their herbal formularies and produce new alternative medicines. Furthermore, local and national hospitals/health care institutions can establish herbal treatment corners alongside the modern system of medicine. Based on this research, Government and organizations could produce action plans such as medicinal plant conservatory, medicinal plant corner in Botanic gardens and Eco parks, sustainable collection methods, developing cultivation techniques and application of biotechnological techniques in order to conserve them. Thus, these documented data could be inaugurated as a valuable source for both the present and the future.

Assemblage of ethnobotanical data from the indigenous community is mainly field-based. Being field-based research, there are many difficulties to accumulate data from the informants. Our studied area was an hilly areas and faced several problems, viz. security, route access, carrying important instruments, seasonal variation and language barriers. In the rainy season, it is not always possible to collect and dry the voucher specimens. Jhum cultivation in hilly areas is another problem; species are burnt or destroyed which could be medicinally important. Most of the informants show apathy to share information of plant use to outsiders because they do not want to share traditional knowledge outside of their community. After completion of the

Table 6. Review of phytochemical and pharmacological study of 23 plant species.

Species name	Phytochemical studies	Pharmacological activities	Documented phytotoxic compounds
<i>Abelmoschus moschatus</i>	Myricetin (Liu et al. 2005), oleoresin (Cravo et al. 1992)	Antioxidant, antimicrobial, antiproliferative (Gul et al. 2011), antiurolithiatic (Pawar and Vyawahare 2016), anti-inflammatory (Gautam and Agarwal 2017).	
<i>Abrus precatorius</i>	Abruslactone A (Chang et al. 1982), Abrusosides A-D (Choi et al. 1989), Saponin, Abrusoside E (Kennelly et al. 1996), Lectin, Abrin (Roy et al. 1976), 8-C-glucosylscutellarein 6,7-dimethyl ether (Markham et al. 1989).	Antiplatelet, anti-inflammatory, antiallergic (Kuo et al. 1995), antifertility (Agarwal et al. 1970), blood purifiers (van Vuuren and Frank 2020), pancreatic-protective (Boye et al. 2020).	$\beta$ -Amyrin (Dimetry et al. 1990)
<i>Acanthus ilicifolius</i>	5,11-Epoxymegastigmane (Huo et al. 2008), (2R)-2-O- $\beta$ -D-glucopyranosyl-2H-1,4-benzoxazin-3(4H)-one (HBOA-Glc), (2R)-2-O- $\beta$ -D-glucopyranosyl-4-hydroxy-2H-1,4-benzoxazin-3(4H)-one (DIBOA-Glc) (Yin et al. 2008), (Z)-4-Coumaric Acid (Wu et al. 2003), (+)-Iyoniresinol 3a-O- $\alpha$ -D-galactopyranosyl-(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranoside, (+)-Iyoniresinol 2a-O- $\alpha$ -D-galactopyranosyl-3a-O- $\beta$ -D-glucopyranoside (Wu et al. 2004).	Anititumour, anticarcinogenic (Babu et al. 2002), anti-inflammatory (Kumar et al. 2008), antimicrobial (Govindasamy and Arulpriyia 2013), antioxidant, cytotoxic (Firdaus et al. 2013).	
<i>Acorus calamus</i>		Antimicrobial (Devi and Ganjewala 2009), antioxidant (Devi and Ganjewala 2011), anticholinesterase (Ahmed et al. 2009), analgesic, cytotoxic (Khan and Islam 2012).	
<i>Alpinia nigra</i>		Antibacterial (Ghosh et al. 2013), analgesic, cytotoxic (Ahmed et al. 2015), antioxidant (Sahoo et al. 2013), antileishmanial (Ghosh et al. 2017).	
<i>Amaranthus spinosus</i>	Spinoside (Malik et al. 2004), $\alpha$ -spinasterol (Billah et al. 2013).	Antimalarial (Hilou et al. 2006), hepatoprotective (Zeashan et al. 2008), antioxidant, antipyretic (Kumar et al. 2010), antidepressant (Kumar et al. 2014), gut modulatory, bronchodilator (Chaudhary et al. 2012).	
<i>Artocarpus heterophyllus</i>	Jacalin lectin (Kabir 1995), 7-(2,4-dihydroxyphenyl)-4-hydroxy-2-(2-hydroxy propan-2-yl)-2,3-dihydrofuro(3,2-g) chromen-5-one (artocarpifuranol, 1), dihydromorin, steppogenin, norartocarpitin, artocarpanone, artocarpin, artocarpin, cycloartocarpin, cycloartocarpesin, artocarpitin, brosimone I, cudraflavone B, carpachromene, isoartocarpesin, cyanomaclurin (Zheng et al. 2008).	Antimicrobial (Sriratapetawee et al. 2012), antioxidant (Zhu et al. 2017), cytotoxicity (Arung et al. 2010), antidiabetic (Shahin et al. 2012), anti-inflammatory (Fang et al. 2008).	Heterophyllenes A-C, heterophyllene D (Boonyakergson et al. 2017)
<i>Cajanus cajan</i>	Cajachalcone (Ajaiyeoba et al. 2013), pinostrobin, cajanus lactone (Patel and Bhutani 2014), 3-hydroxy-5-methoxystilbene-2-carboxylic acid (Ohwaki et al. 1993).	Antidiabetic (Ezike et al. 2010), antioxidant, anti-inflammatory (Lai et al. 2012), hypoglycemic (Amalraj and Ignacimuthu 1998), antiplasmoidal (Duker-Eshun et al. 2004), cytotoxicity (Ashidi et al. 2010).	Cajanstilbenoids A and B (Zhang et al. 2018b)

(Continued)

Table 6. Continued.

Species name	Phytochemical studies	Pharmacological activities	Documented phytotoxic compounds
<i>Calotropis gigantea</i>	Di-(2-ethylhexyl) phthalate, anhydrosophoradiol-3-acetate (Habib 2011), 19-Nor- and 18,20-Epoxy-cardenolides (Linhhatrakool and Sutthivaiyakit 2006), Pregnanone (Wang et al. 2008), isorhamnetin-3-O-rutinoside, isorhamnetin-3-O-glucopyranoside, taraxasteryl acetate (Sen et al. 1992).	Antivenom (Chacko et al. 2012), anti-tumour (Habib 2011), anti-inflammatory (Awasthi et al. 2009), antifungal (Saratha and Subramanian 2010), antidepressant, analgesic (Pathak and Argal 2007)	Pregnanone, calosides A-F (Nguyen et al. 2020)
<i>Cassia fistula</i>	5,3',4'-Tri-hydroxy-6-methoxy-7-O-f-L-rhamnopyranosyl-(1M 2)-O-g-D-galactopyranoside (Yadava and Verma 2003), Biochanin A (Sartorelli et al. 2007), Rhein (Durai pandiyam et al. 2012).	Anti-yeast (Jothy et al. 2011), hepatoprotective (Pradeep et al. 2007), antioxidant (Luximon-Ramma et al. 2002), antibacterial, antifungal (Durai pandiyam and Ignacimuthu 2007), antileishmanial (Sartorelli et al. 2007).	
<i>Cinnamomum tamala</i>	(3S)-(+)-Linalool (Chamotiya and Yadav 2010)	Gastroprotective (Eswaran et al. 2010), antimicrobial, antioxidant (Heer et al. 2017), anti-tumour, antiangiogenic (Howlader et al. 2011), hypoglycemic, anti-inflammatory (Chaurasia and Tripathi 2011).	
<i>Cymbidium aloifolium</i> (L.) Sw.	Cymbandin-A (Barua et al. 1990), aloifol I, aloifol II, 9,10-dihydrophenanthrene, 6-O-methylcoeloin, batatasin III, coeloin, gigantol (Juneja et al. 1987)	Antinociceptive, anti-inflammatory (Howlader et al. 2011), antidepressant (Howlader and Alam 2011)	
<i>Entada phaseoloides</i>	Phaseoloide E (Mo et al. 2013), 2,5-dihydroxyphenylacetate, butyl 2-O- $\beta$ -D-glucopyranosyloxy-5-dihydroxyphenylacetate, ethyl methyl 2,5-dihydroxyphenylacetate, ethyl 2,5-dihydroxyphenylacetate, 2-O- $\beta$ -D-glucopyranosyloxy-5-hydroxyphenylacetic acid (Chen et al. 2013)	Antidiabetic (Zheng et al. 2012), antimplement, antimicrobial (Li et al. 2012), antiproliferative (Sugimoto et al. 2018), antioxidant (Dong et al. 2012)	
<i>Ficus benghalensis</i>	Pelargonidin (Kundap et al. 2017), carpachromene, alpha amyrene acetate, mucusoside, 2-O- $\alpha$ -l-rhamnopyranosyl-hexacosanoate- $\beta$ -d-glucopyranosyl ester (Hassan et al. 2020)	Antimicrobial (Tkachenko et al. 2017), cytotoxicity (Khanal and Patil 2020), antimutagenic, anti-oxidant (Satish et al. 2013), larvical (Govindarajan et al. 2011)	
<i>Ficus hispida</i>	Hispidacine (Nap et al. 2015), 10-ketotetraacyl arachidate (Wang and Covello 1975), ficushispamines A and B, ficushispamine C, ficushispidine (Shi et al. 2016)	Antulcerogenic (Sivaraman and Muralidharan 2010), antioxidant, antibacterial (Ramesh et al. 2018), anticancer (Zhang et al. 2018a)	
<i>Hyptis suaveolens</i>	Endoperoxide, 13 $\alpha$ -epi-dioxiabiet-8(14)-en-18-ol (Chukwujekwu et al. 2005), suaveolol (Vera-Arzave et al. 2012), suaveolic acid (Islam et al. 2014a)	Antioxidant, antimicrobial (Nantitanon et al. 2007), larvical (Conti et al. 2012), antifungal (Malele et al. 2003), antidiarrheal (Shaikat et al. 2012), gastroprotective (Vera-Arzave et al. 2012)	
<i>Lawsonia inermis</i>	1,2,4-Trihydroxynaphthalene-1-O- $\beta$ -D-glucopyranoside, laliolate, lawsoniaside (Hsouna et al. 2011), lawsonin, lawsonadeem, vomifoliol (Siddiqui et al. 2003), lawsonaphthoate A-C (Liou et al. 2013)	Anti-inflammatory (Alia et al. 1995, Liou et al. 2013), antipyretic, analgesic (Alia et al. 1995), antifungal (Rahmoun et al. 2013), antimicrobial (Yang and Lee 2015)	Bicoumarin A, biflavonoid A, biquinone A (Li et al. 2014)

(Continued)

Table 6. Continued.

Species name	Phytochemical studies	Pharmacological activities	Documented phytotoxic compounds
<i>Oxalis corniculata</i>	5-Hydroxy-6,7,8,4'-tetramethoxyflavone; 5,7,4'-trihydroxy-6,8-dimethoxyflavone (Rehman et al. 2015); Corniculatin A (Ibrahim et al. 2013)	Antihypertensive (Moyeenudin and Vijayakshmi 2019), antibacterial, antifungal, insecticidal (Rehman et al. 2015), antioxidant (Zeb and Imran 2013), nephroprotective (Khan and Zehra 2013), cardioprotective (Abhilash et al. 2011)	
<i>Psidium guajava</i>	Morin-3-O- $\alpha$ -L-lyxopyranoside, morin-3-O- $\alpha$ -L-arabopyranoside (Arima and Danno 2002), guavaonic acid, guavacoumaric acid (Begum et al. 2002), quercetin, quercetin-3-O-glucopyranoside (Tachakittirungrod et al. 2007)	Antidiarrhoeal (Lutterodt 1989), antimicrobial, cytotoxic (Weli et al. 2019), anti-inflammatory (El-Ahmady et al. 2013), antidepressant (Meckes et al. 1996), antibacterial (Mahfuzul Hoque et al. 2007), antioxidant, anti-microbial (Wang et al. 2018)	
<i>Sida acuta</i>	Cryptolepine (Ahmed et al. 2011), cryptolepinone, N-trans-feruloyltyramine, 5,10-dimethylquindolin-11-one (Jang et al. 2003)	Insecticidal (Adeniyi et al. 2010), antimalarial (Karou et al. 2003), analgesic (Konaté et al. 2012), hepatoprotective (Sreedevi et al. 2009), antimicrobial (Ekpo and Etim 2009)	
<i>Tamarindus indica</i>	(+)-pinitol (Jain et al. 2007), procyandin B <sub>2</sub> , (-)-epicatechin, procyandin trimers, procyandin tetramer, procyandin pentamer, procyandin hexamer (Sudjaroen et al. 2005)	Antitumour (Aravind et al. 2012), antioxidant (Siddhuraju 2007), hepatoprotective (Samal and Dangi 2014), antibacterial (Nwodo et al. 2011), hypolipemic (Martinello et al. 2006), antivenom (Ushanandini et al. 2006), anti-inflammatory, analgesic (Komakech et al. 2019)	L-( $\rightarrow$ )-di-n-butyl malate (Kobayashi et al. 1996)
<i>Trevesia palmata</i>	Hederagenin-3-O- $\beta$ -D-glucopyranosyl-(1 → 3)- $\alpha$ -L-rhamnopyranosyl-(1 → 2)- $\alpha$ -L-rhamnopyranosyl-(1 → 2)- $\alpha$ -L-arabinopyranoside, macranthoside A, $\alpha$ -hederin, ilekudinoside D (Kim et al. 2018), acetyltrevesiasaponins A and B (Thao et al. 2018)		
<i>Withania somnifera</i>	Viscosa lactone B, stigmasterol, stigmasteryl glucoside, $\alpha$ + $\beta$ glucose (Misra et al. 2008), Withanone (Pandey et al. 2018), ashwagandhanolide (Subbaraju et al. 2006)	Anxiolytic, antidepressant (Bhattacharya et al. 2000), antioxidant (Dhanani et al. 2017), antistressor (Archana and Namasisivayam 1998), adaptogenic (Bhattacharya and Muruganandam 2003)	

project, documented information from the Marma community of the studied area will be deposited at the e-repository <[www.mpbd.info](http://www.mpbd.info)> for the general people and outcome of the project will be explained to the informants of the studied area.

## Conclusion

In lieu of a bank on trial and error elicited by random screening procedures, properly noted traditional knowledge could help scientists to target those plants whose medicinal properties may find new applications for the benefit of all mankind (Fennell et al. 2004). This study has identified a number of important medicinal plants used by the traditional healers of the Marma community for the treatment of various human ailments and proven that the Marma community still depends on plants for their primary health care needs. Moreover, our documented new uses of 23 species for the first time from Bangladesh would provide a baseline for future phytochemical and pharmacological investigations into their beneficial medicinal properties. However, it is indeed urgent to file traditional knowledge on medicinal plant usage before it is mislaid to future generations.

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## Author contributions

**Taherul Islam:** Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Resources (equal); Software (equal); Visualization (equal); Writing – original draft (equal); Writing – review and editing (equal). **Andrea Pieroni:** Conceptualization (equal); Data curation (equal); Methodology (equal); Resources (equal); Validation (equal); Visualization (equal); Writing – review and editing (equal).

**Saikh Bokhtear Uddin:** Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Project administration (lead); Resources (equal); Software (equal); Supervision (lead); Validation (lead); Visualization (equal); Writing – original draft (lead); Writing – review and editing (equal).

**Mohammad Omar Faruque:** Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (lead); Resources (equal); Software (lead); Supervision (equal); Validation (lead); Visualization (lead); Writing – original draft (lead); Writing – review and editing (lead).

## Data availability statement

All documented data will be deposited to our e-repository at <[www.mpbd.cu.ac.bd](http://www.mpbd.cu.ac.bd)>.

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