



Research Article

Ethnobotanical Knowledge of Traditional Healers in Two Villages of Madhupur Upzila of Tangail District

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ARTICLE INFO	ABSTRACT
Article history Received: 28 May 2026 Accepted: 24 September 2026 Published: 30 September 2026 Keywords Ethnobotany, Madhupur, Medicinal Plant, Traditional Healer, Ethnomedicine Correspondence M. Ashrafuzzaman ✉: ashrafcbot@bau.edu.bd OPEN ACCESS	Traditional healers are key healthcare service providers for ethnic communities in Bangladesh. Most experienced healers are elderly, and unfortunately, much of their knowledge remains undocumented, putting centuries of ethnobotanical expertise at risk of being lost. The study aimed to identify and record the medicinal plants and associated knowledge possessed by traditional healers in Pargacha Chunia and Botia villages of Madhupur Upzila, Tangail district, Bangladesh. A total of six traditional healers were purposefully selected for this study, representing two distinct ethnic groups: the Garo and the Koch. The ethnobotanical survey employed a semi-structured questionnaire with open-ended questions to gather field information. The interviews covered their training, the ailments treated, treatment techniques, and preparation methods. The healers reported 104 medicinal plant species across 93 genera and 52 families. This study documented their botanical and local names, family, habit, parts used, and traditional application. The dominant families are Leguminosae (nine species), Compositae and Zingiberaceae (six species each), Rutaceae (five species), and Lamiaceae and Myrtaceae (four species each). Leaves were the most commonly used plant part (47%), and juice was the primary preparation method (28%). Gastrointestinal disorders were treated with the most significant number of plant species (27), followed by dermatological problems (19). The findings highlight a rich yet vulnerable body of traditional knowledge, emphasizing the need for urgent documentation and preservation efforts.
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Introduction

Plant-based traditional medicines are utilized by millions worldwide to treat a variety of ailments. Rural populations are particularly dependent on these remedies due to limited access to modern healthcare facilities and socioeconomic constraints. In fact, approximately 70–80% of the global population relies on traditional herbal therapies for their primary healthcare needs (Uddin et al., 2018). This ethnobotanical knowledge remains a critical healthcare resource and is highly valued for its contributions to biocultural conservation and modern drug discovery. Furthermore, the medicinal use of plants remains highly relevant today, continuing to serve as the primary healthcare source for a significant portion of the global population (Kunwar et al., 2006). Beyond direct health outcomes, traditional medicine plays a central role in supporting the socioeconomic well-being of rural communities in developing countries (Kumar et al., 2021). Reflecting this global reliance, ethnobotanical

studies in Bangladesh have extensively documented indigenous medicinal plants, their preparation methods, and their therapeutic applications among local populations (Islam & Sarwar, 2020).

Madhupur, an upazila in Bangladesh's Tangail District, is known for its Sal forests and diverse ethnic communities. Residents in these remote areas rely heavily on medicinal plants for primary healthcare. This traditional knowledge, passed down through generations, is essential for investigating the therapeutic properties of these plants (Jamshidi-Kia et al., 2017). However, the use of traditional remedies is steadily declining due to deforestation, which reduces plant availability, and a growing reliance on modern medicine among the younger generation. Therefore, this ethnomedicinal survey was conducted to document the medicinal plants used by traditional healers, locally known as *Kobirajs*, from the Garo and Koch tribes in the Pargacha Chunia and Botia villages of Madhupur. The

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primary objectives of this study were to record the traditional knowledge of local healers regarding commonly used medicinal plants, to identify the various ailments treated with these plants, and to preserve this valuable knowledge for future pharmacological research and drug development.

Materials and Methods

Study Area

The present study was conducted among the folk and tribal medicinal practitioners of two villages, namely Botia and Pargacha Chunia, adjacent to Madhupur Forest Area, which lie in the Madhupur Upazila of

Tangail district in Dhaka division, Bangladesh (Fig. 1). The study area is located in the northernmost part of Madhupur, having the coordinates of 24.75°N and 90.083°E. The area has a monsoon climate typical of the Indian subcontinent. Average annual rainfall is approximately 2,174 mm, with regional variation ranging from 1,500 mm to 3,200 mm. Maximum and minimum annual temperatures range from 15°C to 34°C seasonally, with a mean annual temperature of 25.71°C. Annual relative humidity ranges from approximately 57% to 98% (Annon., 2021).

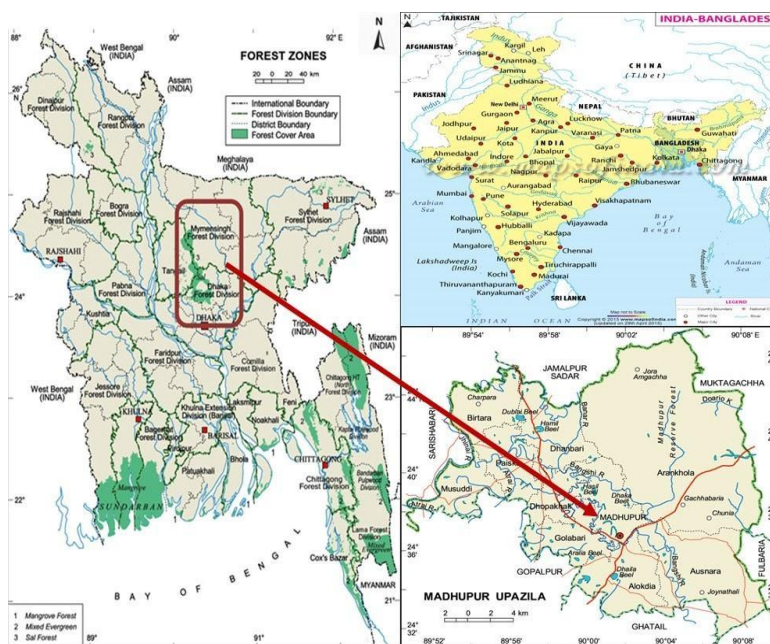


Fig.1: Geographical location of Madhupur Forest Area in Tangail District, Bangladesh

Ethnobotanical Survey

A field survey was conducted using a semi-structured questionnaire that explored various aspects in an open-ended format to collect data from 10th October, 2020, to 7th May, 2021 following the methodology of Martin (2004). A total of six traditional healers (locally known as *Kobirajs*) were selected to provide ethnomedicinal information through direct interviews. These healers practice traditional medicine within their communities and possess a deep understanding of local medicinal plants. *Kobirajes* were selected based on their knowledge and experiences and willingness to share their medicinal plant knowledge. Demographic details of the *Kobirajs*, including gender, age, ethnicity, occupation, and education level, were also documented (Table 1).

Collection, Identification, and Deposition of Medicinal Plants:

Guided by traditional healers, we conducted field walks to identify medicinal plants in their natural habitats, collecting photographs and samples to prepare herbarium voucher specimens. Ethnobotanical data including local names, plant parts used, preparation methods, modes of application, and habitat details were recorded through interviews with these healers.

Scientific and family names were determined using relevant literature and consultations with plant taxonomists. These identifications were further authenticated by experts and cross-referenced with standard references, including the *Encyclopedia of Flora*

and Fauna of Bangladesh (Ahmed et al., 2008–2009; Siddiqui et al., 2007) and *Medicinal Plants of Bangladesh* (Yusuf et al., 2009). All accepted nomenclature was verified and updated using the Plants of the World Online (POWO) database (<https://powo.science.kew.org/>). Finally, the taxonomically verified voucher specimens were deposited at the Prof. Dr. Arshad Ali Herbarium, Bangladesh Agricultural University Botanical Garden (BAUBG). Additionally, selected rare and highly valuable medicinal plants were transplanted into the BAU Botanical Garden to support conservation and future research.

Ailment categories:

Based on information obtained from traditional healers in the study area, all reported ailments were categorized into 16 categories. These categories are gastrointestinal disorders, fever, respiratory complaints, diabetes, liver disorders, dermatological problems, urinary and rectal diseases, inflammation and pain, hematological disorders, sexual stimulants, hair growth, general health, nervous system, helminthiasis, female sexual disorders, and heart problems.

Data analysis

Following data collection, the survey responses were analyzed. The data was organized in an Excel spreadsheet to generate various charts and tables.

Results and Discussion

Demographic Data

A total of six traditional healers from two villages participated in the study. Four Garo Kobirajs named Surjo Nokrek, Ashotosh Nokrek, Biplob Nokrek, and Nogendra Dibra are from one village, while two Koch Kobirajs, Polok Bormon and Dipa Bormon, are from another village. (Table 1). Most of the healers were over 40 years old. Regarding their education, three had only completed primary school, and one had completed Secondary School Certificate (SSC) level. Only one traditional healer was female, while the remaining five were male. These practitioners typically pass their knowledge orally to family members or apprentices. Because these villages are remote and have limited access to modern healthcare, local residents rely heavily on traditional medicinal practices for their daily health needs.

Table 1. Demographic data of traditional healer practitioners

SL No	Name	Gender	Category	Age (yrs)	Experience	Education
1	Polok Bormon	Male	Koch	40	15y	Class Eight
2	Dipa Bormon	Female	Koch	27	<5y	Class Five
3	Surjo Nokrek	Male	Garo	85	>40y	Class Five
4	Nogendra Dibra	Male	Garo	80	35 y	Class Eight
5	Ashotosh Nokrek	Male	Garo	60	>25y	Class Five
6	Biplob Nokrek	Male	Garo	30	<10y	SSC Passed

Major Ailment Categories

Table 2 shows the number of medicinal plants used for different illnesses. Digestive problems used the most plants (27 species), likely because stomach issues are common and people rely on easy, homemade remedies. Skin problems ranked second (19 species), probably because skin treatments are easy to apply and farming communities often get minor injuries. Finally, pain/inflammation (8 species) and breathing problems (7 species) had fewer plants. This makes sense because these conditions are usually long-lasting and require ongoing herbal treatment. Conversely, illness categories with very few medicinal plants such as hair growth (1), nervous system (2), and heart problems (2) may indicate that these conditions are less common, people prefer modern medicine for them, or the traditional knowledge is restricted to specialists. These findings align with studies by Amir et al. (2025) and Sadia et al. (2025), which also identified digestive issues as the

most commonly treated ailments in rural Bangladesh. Ultimately, this confirms that digestive disorders remain a major health burden across the country.

Ethnobotanical Data

The study reveals that Garo and Koch communities use 104 plant species from 52 families as traditional medicine (Table 3). The most dominant families are Leguminosae (9 species), Compositae and Zingiberaceae (6 species each), and Rutaceae (5 species). Lamiaceae and Myrtaceae each have four species. Seven families have three species each (Acanthaceae, Anacardiaceae, Apocynaceae, Combretaceae, Convolvulaceae, Lauraceae, and Solanaceae), while ten families have two species each (Amaranthaceae, Araceae, Arecaceae, Menispermaceae, Moraceae, Poaceae, and Rubiaceae, Euphorbiaceae, Lythraceae, and Malvaceae). The remaining families contain one species each (Fig. 2). These findings align with previous research.

Leguminosae consistently emerges as the most dominant family in regional surveys, followed by Compositae, Zingiberaceae, and Rutaceae (Ope et al. 2026; Amir et al. 2025; Derebe 2021; Sutjaritjai et al.

2019). Several of these dominant families are also reported as prominent in the nearby Madhupur Forest (Islam et al. 2014).

Table 2: Ailments grouped by major ailment categories

No	Category	Common diseases/Medical terms	No. of species
1	Gastrointestinal disorders	Constipation, peptic ulcer, stomach disorders, ulcer, appeal for food stomach ulcer, dysentery, increase appetite, diarrhea, flatulence, intestinal disorders, cholera, acidity, dyspepsia, gastrointestinal disorders, vomiting chronic dysentery, burning sensations, gastric troubles, chronic indigestion	27
2	Fever	Fever, malaria fever	4
3	Respiratory complaints	Pneumonia, cough, respiratory disorders, long-term cough, asthma tuberculosis, chronic cold	7
4	Diabetes	Diabetes, fat control	5
5	Liver disorders	Jaundice, biliary disorders	5
6	Dermatological problems	Dandruff, burns, boil, wounds, skin diseases, allergy, eczema, itch, scabies skin lesion, pimples, bone fracture, facial scars, spots, bleeding from cuts and wounds, chicken pox	19
7	Urinary and rectal diseases	Blood or pus coming out with urine, gonorrhea, urinary problems, fistula piles, edema	6
8	Inflammation and pain	Headache, rheumatic pain, bone pain, body pain, leg pain, sinusitis, stomach pain	8
9	Hematological disorders	Anemia, hemorrhage	2
10	Sexual stimulant	Arouse sexual desire, sexual disorders	3
11	Hair growth	Prevent graying of hair, loss of hair	1
12	General health	Tonic, increasing energy, physical weakness in male, debility	4
13	Nervous system	Epilepsy, nervous weakness	2
14	Helminthiasis	Helminthiasis, ringworm, intestinal worms	4
15	Female sexual disorders	Menstrual disorders, gynecological disorders, excessive bleeding during menstruation	5
16	Heart problems	Heart diseases	2

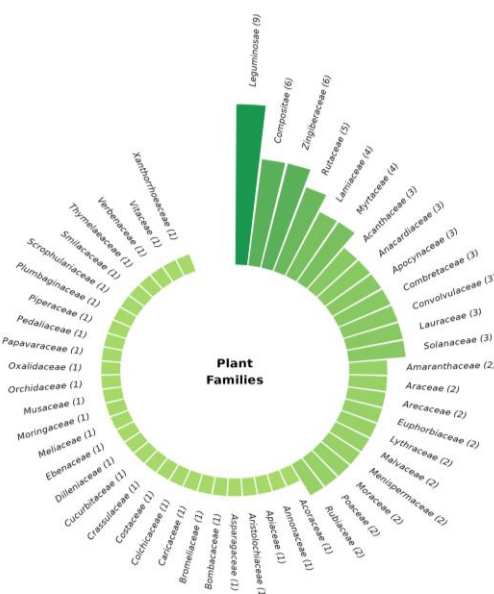


Fig. 2: Distribution of Medicinal plants by family

Habit and habitat

Among the medicinal plants, herbs were the most common, accounting for 45 species (43%). This was followed by trees with 34 species (32%), shrubs with 16 (15%), climbers with 6 (5%), and others with 5 (5%) (Fig. 3). Most of the plant species (73%) were found in wild habitats, growing naturally near ponds, roadsides, riverbanks, and hills. The remaining 27% were

cultivated in homestead gardens, around houses, or on fallow land (Fig. 4). Local healers primarily used herbs and trees because the study area is located close to forested regions where these plants grow naturally. These findings align with previous research (Uniyal et al., 2006), which noted that herbs and trees are the most frequently used in ethnomedicinal practices due to their high availability.

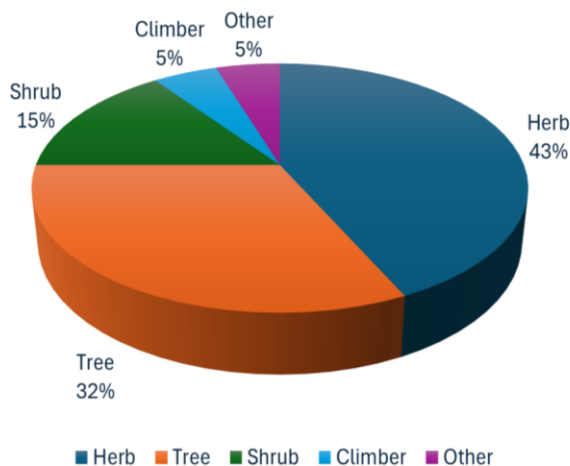


Fig. 3: Percent distribution of medicinal plant species by life form in the study area

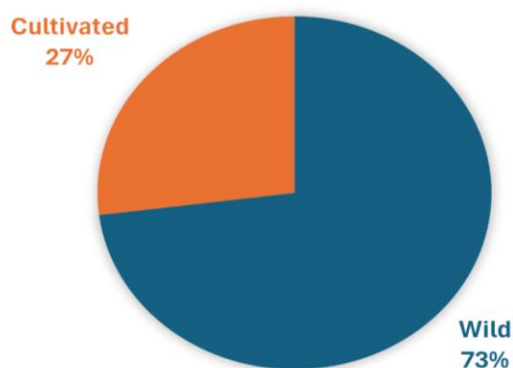


Fig. 4: Percentage of medicinal plants by habitat in the study area

Table 3: List of medicinal plants of the two villages of Madhupur Upzilla, Tangail reported by Kobirajs of two communities

Serial No.	Scientific name	Local name	Plant Parts type* used**	Ailments	Ailment category
Acanthaceae					
1.	<i>Andrographis paniculata</i> Nees	Kalomegh	W, H WP	Juice of whole plant for the treatment of fever, boil, ulcer and to enhance appeal for food [O].	3
2.	<i>Justicia adhatoda</i> L.	Bashok	W, H WP, L	Decoction of whole plant for intestinal disorders. Leaf juice to treat pneumonia and cough [O]. Decoction of leaf for scabies and other skin diseases [T].	3
3.	<i>Justicia gendarussa</i> Burm.f.	Jogot Madon	W, H R, WP, L	The leaf juice is applied topically in the treatment of earache. The fresh leaves are applied topically as a treatment for oedema and swellings due to beriberi and rheumatism; to relieve headaches and pains. A decoction is used for bathing during and after childbirth.	4
Acoraceae					
4.	<i>Acorus calamus</i> L.	Boch	C, H R	Traditionally, <i>Acorus calamus</i> has been used for the treatment and management of headache, migraine, body ache and severe inflammatory pain in the Unani, Ayurveda and Indian system of medicine.	2
Amaranthaceae					
5.	<i>Achyranthes aspera</i> L.	Ubuth langra	W, H R	Root is tied to head to treat headache [T]. Root paste for hemorrhage, eczema, diarrhea and constipation [O].	4
6.	<i>Amaranthus spinosus</i> L.	katanotey	W, H L, S	Hot extraction for the treatment of rheumatic pain, pain in the bones, blood or pus coming out with urine [O].	2
Anacardiaceae					
7.	<i>Lannea coromandelica</i> (Houtt.)	Jiga	W, S L	Leaf paste for urinary problems, diabetes [O].	2
8.	<i>Mangifera indica</i> L.	Aam	C, T B, Fr	Ripe and unripe fruits used to treat dysentery [O]. Decoction of bark and flower to prevent graying of hair [T].	2
9.	<i>Spondias pinnata</i> (L.f.) Kurz	Amra	W, T B, Fr	Unripe fruits are eaten for dyspepsia [O]. Bark juice to treat dysentery [O].	1
Annonaceae					
10.	<i>Artabotrys hexapetalus</i> (L.f.) Bhandar	Kanthalichapa	C, T R, Fl, Fr	Leaves are mainly used against cholera and as antifungal. In Chinese traditional medicine the roots are used for treating malaria. Flowers yield essential oil which has antifungal activity. The use of flowers is mentioned in the perfume industry also used for preparing tea like beverage. Fruits are eaten by tribal and rural folk and have cardiac depressant activities.	3
Apiaceae					
11.	<i>Centella asiatica</i> (L.) Urb.	Thankuni	W, H L	Leaf juice for dysentery [O]. Leaf paste applied on wounds, burns, and skin lesion [T].	2
Apocynaceae					
12.	<i>Calotropis gigantea</i> (L.) Dryand	Akanda	W, S L	Fungicidal which is far effective than ointment and insecticidal properties of <i>Calotropis</i> have been reported	1

Serial No.	Scientific name	Local name	Plant type*	Parts used**	Ailments	Ailment category
13.	<i>Catharanthus roseus</i> (L.) G. Don	Nayantara (pink)	C, H	L	In traditional medicine, the periwinkle has been used for relieving muscle pain, depression of the central nervous system, also used for applying to wasp stings and to heal wounds. Its application ranges widely from the prevention of diabetes to treatment of stomach ache.	4
14.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Sarpogodha	W, H	R	The root has been used for the treatment of snake and scorpion bites, insect stings, nervous disorders, mania and epilepsy for thousands of years. It is also used as a vermifuge and for the treatment of colic, diarrhea, dysentery, cholera, dysmenorrhea, fever, and to facilitate childbirth.	4
Araceae						
15.	<i>Amorphophallus bulbifer</i> (Roxb.) Blume	Ol (Black stem)	W, H	Rh	Used for the treatment of asthma, cough, hernia, breast pain, burns as well as hematological and skin disorders.	1
16.	<i>Colocasia esculenta</i> (L.) Schott	Kochu	C, H	S	Stem paste to stop bleeding from cuts and wounds [T].	1
Arecaceae						
17.	<i>Cocos nucifera</i> L.	Narikel	C, T	Fr	The inner portion of unripe fruit is used to treat skin disease and to remove skin spots [T]. Coconut water for diarrhea [O].	2
18.	<i>Phoenix sylvestris</i> (L.) Roxb.	Khejur	W, V, T	R, Fr	Root juice for treatment of nervousness, cough and fever [O].	3
Aristolachiaceae						
19.	<i>Aristolochia indica</i> L.	Iswarmul	W, S		The plant is used to treat cholera, fever, bowel troubles, ulcers, leprosy, poisonous bites (Krishnaraju <i>et al.</i> , 2005; Kanjilal <i>et al.</i> , 2009). It is also used as emmenagogue, abortifacient, antineoplastic, antiseptic, anti-inflammatory, antibacterial and phospholipase A ₂ inhibitor (Achari <i>et al.</i> , 1981; Das <i>et al.</i> , 2010).	4
Asparagaceae						
20.	<i>Asparagus racemosus</i> Willd.	Shotomuli	W, H	L, R	Decoction of leaf for epilepsy and stomach ulcers. Root extract with milk for physical weakness in male [O].	3
Bombacaceae						
21.	<i>Bombax ceiba</i> L.	Shimul	W, T	R, Se	Root juice of young plants for sexual disorders. Decoction of root to arouse sexual desire. Seed oil for gonorrhea [O].	2
Bromeliaceae						
22.	<i>Ananas sativus</i> Schult.f.	Anarosh	C, H	L, Fr	Fruit juice is taken for fever. Young leaf is chewed for helminthiasis and jaundice [O].	3
Caricaceae						
23.	<i>Carica papaya</i> L.	Pepe/Pabda	C, S	L, La, Fr	Ripe and unripe fruits are eaten to treat dysentery, diabetes, constipation and chronic indigestion. Latex for the treatment of peptic ulcer. Leaf paste for ringworm [O].	3
Colchicaceae						
24.	<i>Gloriosa superba</i> L.	Ulotchandal	W, S	T, Fl	The tuber has commonly been used as a suicidal agent among women in rural areas and it has also been used for homicide. The flowers are used in religious ceremonies.	2
Combretaceae						
25.	<i>Terminalia arjuna</i> (Roxb. ex DC.). Wight & Arn	Arjun	W, T	L, B	Soaked water of bark for the treatment of heart problem and burning sensations. Leaf juice to treat jaundice, dysentery [O].	4
26.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Bohera	W, T	Fr	Fruits are eaten for helminthiasis [O] and loss of hair [T].	2

Serial No.	Scientific name	Local name	Plant Parts type* used**	Ailments	Ailment category
27.	<i>Terminalia chebula</i> Retz.	Horitoki	W, T Fr	Fruits are soaked in water and then taken for constipation and vomiting [O].	1
Compositae					
28.	<i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen	Surja Kannya	W, S	An herbal remedy for toothache and oral infections	1
29.	<i>Blumea lacera</i> (Burm. f.) DC	Shialmutra	W, H WP	Skin diseases, skin tumor, scabies, blood purification. For skin diseases (acne, eczema) and skin tumor, whole plant is boiled in water and the decoction filtered. Two table spoons of the decoction are taken thrice daily orally. For scabies and blood purification, one table spoon of the decoction is taken daily in the morning on an empty stomach.	1
30.	<i>Calendula officinalis</i> L.	Gada ful	W, H L, Fl	Mashed leaf and flower to treat old wound, menstrual problems and itches [T]. Flowers to treat stomach upset, ulcers and inflammation [O].	4
31.	<i>Eclipta prostrata</i> (L.) L.	Kalokeshi	W, H L	Plays a role in the treatment of several diseases, including infectious hepatitis, snake venom poisoning, gastritis, and respiratory diseases such as a cough and asthma	2
32.	<i>Enydra fluctuans</i> Lour.	Helencha	C, H WP	Fried whole plant for intestinal disorders [O].	1
33.	<i>Mikania cordata</i> (Burm.f.) B.L.	Refugee lota/ jarmani lota	W, H L	Macerated leaf to stop bleeding from external cuts and wounds [T].	1
Convolvulaceae					
34.	<i>Cuscuta reflexa</i> Roxb.	Shorno lota	W, H WP	Juice obtained from macerated whole plant for the treatment of jaundice [O].	1
35.	<i>Ipomoea aquatica</i> Forssk.	Kalmi shak	W, H L	Fried leaf for constipation and piles [O].	2
36.	<i>Ipomoea mauritiana</i> Jacq.	Bhui kumra	W, H L	Fried leaf for constipation and piles [O].	2
Costaceae					
37.	<i>Cheilocostus speciosus</i> (J.Koenig) C.D.Specht	Kusta	W, S Rh	The rhizome has been used to treat fever, rash, asthma, bronchitis, and intestinal worms.	1
Crassulaceae					
38.	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Patharkuchi	W, H L, R	Leaf juice to treat cholera, diarrhea, and dysentery [O].	1
Cucurbitaceae					
39.	<i>Coccinia cordifolia</i> (L.) Cogn.	Telakucha	W, H WP, L	Juice is produced from whole plant to treat diabetes, gonorrhea and constipation [O]. Leaf for wounds [T].	4
Dilleniaceae					
40.	<i>Dillenia indica</i> L.	Chalta	W, T Fr	Fruit juice is taken for fever and cough [O].	2
Ebenaceae					
41.	<i>Diospyros peregrina</i> Gürke	Gab	W, T B, Fr	Bark decoction to treat dysentery and cholera [O].	1
Euphorbiaceae					
42.	<i>Emblica officinalis</i> Gaertn.	Amloki	W, T Fr	Fruits for allergy, as food, and for gastric [O].	2
43.	<i>Ricinus communis</i> L.	Reri/Venda	W, T Fr	Fruits for the treatment of flatulence, acidity, gastric troubles [O].	1
Lamiaceae					
44.	<i>Clerodendrum infortunatum</i> L.	Bhati	W, H L, Fr	Juice from crushed leaf and fruit for helminthiasis and dysentery [O].	2

Serial No.	Scientific name	Local name	Plant type*	Parts used**	Ailments	Ailment category
45.	<i>Hyptis suaveolens</i> (L.) Poit.	Tokma	W, H	Fr	Fruits for the treatment of flatulence, acidity, gastric troubles [O].	1
46.	<i>Ocimum tenuiflorum</i> L.	Tulsi	C, H	L, S	Juice from macerated leaves to treat coughs [O]. Stems are worn as garland around the neck for tuberculosis [T].	2
47.	<i>Vitex negundo</i> L.	Nishinda	W, H	L, S	Juice from crushed leaf and fruit for helminthiasis and dysentery [O].	2
Lauraceae						
48.	<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & C.H.Eberm	Tejpata	W, T	L	Leaf paste to treat headache and pimples [T].	2
49.	<i>Cinnamomum verum</i> J. Presl.	Daruchini	W, T	B	Bark for asthma and coughs [O].	1
50.	<i>Litsea glutinosa</i> (Lour.) C.B.Rob.	Kharajora	C, T	L	Juice of leaf and root for long-term cough, nervous weakness [O]	4
Leguminosae						
51.	<i>Abrus precatorius</i> L.	Kuch/Ratti	W, T	B, W	Decoction of bark for diarrhea [O]. Wood extract for skin diseases [T].	2
52.	<i>Cajanus cajan</i> (L.) Millsp.	Arhar			Cooked or salad to treat tonic, gynecological disorders [O].	2
53.	<i>Cassia fistula</i> L.	Sonalu	W, T	L, R	Fr, Ripe fruits to treat helminthiasis. Juice of leaf and root for long-term cough, nervous weakness [O].	3
54.	<i>Cassia occidentalis</i> L.	Jhi jhi gach	W, H	R	Root paste is massaged on the leg with mustard oil for leg pain [T].	1
55.	<i>Entada rheedii</i> Spreng.	Gilalota	W, V			2
56.	<i>Mimosa pudica</i> L.	Lajjaboti	W, H	R	Decoction of roots for jaundice treatment [O].	1
57.	<i>Senna alata</i> (L.) Roxb.	Dadmardan	W, T	L	Leaf paste is applied to treat skin disease, and scabies [T].	1
58.	<i>Sesbania grandiflora</i> (L.) Poir.	Bakful	W	Fl	The plant used in colic disorder, jaundice, poisoning condition, smallpox, eruptive fever, epilepsy etc., Flower extract used in various diseases like nasal catarrh, headache, laxative, aperitif, gout, ozoena, bronchitis, pain	3
59.	<i>Tamarindus indica</i> L.	Tetul	W, T	L	Decoction of leaf for the treatment of sinusitis and chronic cold [O].	2
Lythraceae						
60.	<i>Lawsonia inermis</i> L.	Mehedi	C, S	L	Scabies, skin infections, wound. Paste prepared from tender leaves is applied topically to affected area one hour before taking a bath. This is continued for 8-10 days. Alternately, leaves are dried and then soaked in water to prepare syrup. Syrups are taken orally thrice daily for 35-40 days. [T]	1
61.	<i>Punica granatum</i> L.	Dalim	C, S	Fr	Ripe fruit and leaf juice to treat diabetes, intestinal worms [O].	2
Malvaceae						
62.	<i>Abroma augusta</i> (L.) L.f.	Ulot-kombol	W, T	L, B, R	Juice of the leaf and root for treatment of diabetes. Decoction of bark for female sexual disorders. Sap juice to treat menstrual disorders [O].	2
63.	<i>Hibiscus sinensis</i> L.	Jaba	G, S	WP, L	Whole plant for dysentery. Leaf juice is taken to treat debility [O].	2
Meliaceae						
64.	<i>Azadirachta indica</i> A. Juss.	Neem	W, T	L	Leaves are dried and powdered and taken every morning for allergy, eczema, skin diseases and diabetes [O].	2

Serial No.	Scientific name	Local name	Plant type*	Parts used**	Ailments	Ailment category
Menispermaceae						
65.	<i>Tinospora sinensis</i> (Lour.) Merr.	Padmaguloncha	W, S	WP	Skin diseases (bacterial). Whole plant is cut into small pieces and boiled in water to make syrup. The syrup is taken orally thrice daily on an empty stomach	2
66.	<i>Cyclea barbata</i> Miers	Patalpur	W, C	R	A decoction of the roots is used in local medicine against fever and hemorrhoids, after childbirth and as a vermifuge for children. The bitter decoction of its roots is used against (malarial) fever, in the treatment of lower abdominal pains, eye diseases, jaundice and as a tonic.	2
Moraceae						
67.	<i>Ficus racemosa</i> L.	Jog dumur	W, S	L, Fr	Leaf paste to arouse sexual desire and biliary disorders. Fruits are taken for treatment of diabetes [O].	3
68.	<i>Streblus asper</i> Lour.	Sheora	W, T	L, R	Leaf paste for gastrointestinal disorders. Mashed root for increasing energy [O].	2
Moringaceae						
69.	<i>Moringa oleifera</i> Lam.	Sojina	W, T	L, Fr	Leaf juice for fat control. Fruits for diabetes [O].	2
Musaceae						
70.	<i>Musa paradisiaca</i> L.	Bichi kola	C, S	L, Fr	Leaf juice for anemia. Unripe fruits to treat dysentery [O].	2
Myrtaceae						
71.	<i>Psidium guajava</i> L.	Peyara	C, S	L	Juice from crushed leaves for piles, indigestion, diarrhea, dysentery and menstrual disorders [O].	3
72.	<i>Syzygium aromaticum</i> (L.) Merr. & L.M. Perry	Lobongo	W, T, C	Fl	Flower bud to treat asthma and coughs [O].	1
73.	<i>Syzygium cumini</i> (L.) Skeels	Jaam	C, T	L, Fr	Decoction of leaf to induce vomiting. Ripe fruits to treat diabetes [O]. Bark juice is taken for excessive bleeding during menstruation and chronic dysentery [O].	3
74.	<i>Nyctanthes arbor-tristis</i> L.	Sheuly	W, T	L, Se	Seed and flower paste for constipation. Leaf juice to treat fever [O].	2
Orchidaceae						
75.	<i>Geodorum densiflorum</i> (Lam.) Schltr.	Shonkomul	W	R		1
Oxalidaceae						
76.	<i>Averrhoa carambola</i> L.	Kamranga	W, T	L, Fr	Ripe fruits are eaten for cough, fever, appetite stimulant and jaundice [O]. Leaf juice for ringworm and chickenpox [T].	5
Papaveraceae						
77.	<i>Argemone mexicana</i> L.	Shialkanta	W, H		The yellow sap of <i>A. mexicana</i> and the whole plant may be used as a supposed treatment for <u>jaundice</u> .	2
Pedaliaceae						
78.	<i>Sesamum indicum</i> L.	Tiil	C, S	L, Se	Leaf paste is used in fistula. Seed oil for the treatment of burns associated with infection, pain and blisters [T].	3
Piperaceae						
79.	<i>Piper betel</i> Blanco	Paan	W, V	L	Juice from leaf for diabetes and acidity [O].	2
Plumbaginaceae						

Serial No.	Scientific name	Local name	Plant type*	Parts used**	Ailments	Ailment category
80.	<i>Plumbago zeylanica</i> L.	Sada chita	W, H		Effective against anemia, rheumatic pain, dysmenorrhea, leprosy, ulcers and elimination of intestinal parasites. The roots are credited with potential therapeutic properties including cardiogenic, neuroprotective and CNS stimulating properties.	4
Poaceae						
81.	<i>Cynodon dactylon</i> (L.) Pers.	Durba gash	W, H	WP, Rh	Macerated whole plant is applied to stop bleeding from cuts and wounds [T]. Rhizome for heart failure. Whole plant extract for diabetes [O].	3
82.	<i>Cyperus rotundus</i>	Mutha	W, H	Rh	Rhizomes are considered astringent, diaphoretic, diuretic, analgesic, antispasmodic, aromatic, carminative, antitussive, emmenagogue, litholytic, sedative, stimulant, stomachic, vermifuge.	
Rubiaceae						
83.	<i>Anthocephalus chinensis</i> Hassk.	Kodom	W, T	L, B	Leaf and bark decoction for ulcers, wounds, pain, constipation, and edema [O].	4
84.	<i>Morinda angustifolia</i> Roxb.	Daruhoridra		L, B	Leaf and bark decoction for ulcers, wounds, pain, constipation, and edema [O].	2
Rutaceae						
85.	<i>Aegle marmelos</i> (L.) Corrêa ex Roxb.	Bel	W, T	L, Fr	Ripe and unripe fruits are eaten for constipation. Decoction of leaves for peptic ulcer. Leaf oil to treat respiratory disorders [O].	2
86.	<i>Citrus acida</i> Pers.	Lebu	C, S	Fr	Fruit juice for facial scars and spots [T]. Fruits increase appetite [O].	2
87.	<i>Citrus grandis</i> Hassk.	Jambura	C, T	Fr	Fruit juice for the treatment of fever [O], scabies, eczema, and itches [T].	2
88.	<i>Feronia limonia</i> Swingle	Kadbael	W, T	Fr	Ripe fruits are eaten for flatulence, and pimple [O].	2
89.	<i>Zanthoxylum rhetsa</i> DC	Bajna	W, T		It has been predominantly used by Indian tribes for the treatment of many infirmities like diabetes, inflammation, rheumatism, toothache and diarrhea.	2
Scrophulariaceae						
90.	<i>Scoparia dulcis</i> L.	Dhonia	C, H	L	Leaf is taken on an empty stomach for fever [O].	1
Smilacaceae						
91.	<i>Smilax ocreata</i> DC.	A. Kumarilata	W, C	R	Used in folk medicine as a tonic, an anti-rheumatic, and an anti-syphilis treatment	3
Solanaceae						
92.	<i>Datura metel</i> L.	Dhutura	W, H	L, Se	Fl, Flower and seed for cold and nervous disorders [O]. Crushed leaf is applied to painful areas [T].	2
93.	<i>Solanum americanum</i> Mill	Tit begun			Flower and seed for cold and nervous disorders [O]. Crushed leaf is applied to painful areas [T].	2
94.	<i>Withania somnifera</i> (L.) Dunal	Aswagandha	W, H		It is widely used as an adaptogen, nerve tonic, anti-stress, memory enhancer and against cognitive deficits, insomnia, anxiety, infectious diseases, infertility, rheumatoid arthritis and gout over thousands of years.	4
Thymelaeaceae						
95.	<i>Aquilaria malaccensis</i> Lamk.	Agar	W, T	W	Wood extract used for body pain, and skin diseases. Wood decoction for ulcer, edema, and jaundice [O].	5
Verbanaceae						

Serial No.	Scientific name	Local name	Plant Parts type* used**	Ailments	Ailment category
96.	<i>Lippia alba</i> (Mill.) N.E.Br. ex Britton & P.Wilson	Motmotia	W, H L, R	Its pharmacological properties include analgesic, anti-inflammatory, antipyretic, sedative, digestive, anti-asthmatic, anti-hypertensive, antispasmodic, emmenagogue and diaphoretic, and it is used in the treatment of syphilis and gonorrhea.	1
Vitaceae					
97.	<i>Cissus quadrangularis</i> L.	Harjora	W, H L, Rh	S, Stem and rhizome paste for pain and bone fracture [T]. Dried leaf and stem for stomach upset, stomach ulcer, and malaria fever [O].	4
Xanthorrhoeaceae					
98.	<i>Aloe vera</i> (L.) Burm.f.	Ghrita-kumari	W, H L, La	Leaf for skin dandruff and burns [T]. Leaf juice for stomach disorders, Leaf-latex for constipation [O].	2
Zingiberaceae					
99.	<i>Curcuma amada</i> Roxb.	Amada	C, H Rh	Used as an appetizer, alexteric, antipyretic, aphrodisiac, diuretic, emollient, expectorant and laxative and to cure biliousness, skin diseases, bronchitis, asthma, hiccup and inflammation due to injuries.	4
100.	<i>Curcuma longa</i> L.	Holud	C, H Rh	Rhizome juice for diarrhea and flatulence [O]. Rhizome paste to remove face spots [T].	2
101.	<i>Curcuma zedoaria</i> (Christm.) Rosc.	Shoti	C, H Rh	Used traditionally for the treatment of menstrual disorders, dyspepsia, vomiting and for cancer. Rural people use the rhizome for its rubefacient, carminative, expectorant, demulcent, diuretic and stimulant properties while the root is used in the treatment of flatulence, dyspepsia, cough and fever.	2
102.	<i>Elettaria cardamomum</i> (L.) Maton	Elach	W, T Fr, Se	Fruit and seed for asthma and coughs [O].	1
103.	<i>Zingiber officinale</i> Roscoe	Ada	C, H Rh	Rhizome is eaten for coughs, stomach pain and gastric [O].	3
104.	<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	Bon Ada	W, H Rh	Rhizome is used in numerous ethnomedicinal applications including antipyretic, anti-inflammatory, antibacterial, anti-diarrheal, antidiabetics, carminative, and diuretic.	2

* W Wild; H Herb; C Cultivated/Climber; S Shrub; T Tree; V Vine;

** WP Whole plant; L Leaf; R Root; T Tuber; S Stem; B Bark; Fl Flower; W Wood; S Stem; La Latex; Fr Fruit; Se Seed; Rh Rhizome

Relative uses of various plant parts

Various plant parts including leaves, roots, stems, fruits, bark, flowers, seeds, whole plants, and rhizomes are used to treat a wide range of ailments. Leaves were the most frequently used part (36%), followed by fruits (20%) and roots (14%) (Fig. 5). Other parts used included whole plants (7%), rhizomes (7%), bark (5%), wood (4%), stems (2%), latex (2%), gum (2%), and flower buds (1%). In this study area, Kabirajs (traditional healers) use these plants to treat coughs and colds, fever, asthma, jaundice, bronchitis, diarrhoea, dysentery, skin conditions, sexually transmitted infections, cuts and wounds, joint pain, headaches, and digestive disorders.

Consistent with our findings, leaves and roots are generally the most commonly used plant parts in traditional medicine globally (Giday et al., 2009; Sadia et al., 2025; Nanyingi et al., 2008; Amir et al., 2025). Leaves are highly favored because they are the primary sites of photosynthesis, making them the most metabolically active components of the plant. This high metabolic activity produces a wide range of secondary metabolites that contribute to therapeutic efficacy (Ghorbani, 2005; Sarwar et al., 2025). Additionally, harvesting and preparing medicines from leaves is significantly easier than using other plant parts (Telefo et al., 2011). While leaves are favored for their accessibility, traditional healers consider roots to be more potent. This is supported by research showing that roots and other underground components contain

high concentrations of bioactive compounds (Kunwar et al., 2006).

Mode of preparation

Ethnomedicines are prepared in various forms, including juices, decoctions, powders, pastes, and oils. In the Madhupur Forest Area, the most common preparation method was juice (28%), followed by fresh fruit and decoction (15% each), and paste (13%) (Fig. 6). Leaf latex, extracts, and mashed preparations were the least used, accounting for only 1–2% each, with other methods falling between these extremes. When

preparing pastes, traditional healers use a mortar and pestle, frequently mixing the ingredients with mustard oil, coconut oil, or ginger. To improve the effectiveness, taste, or overall acceptability of their remedies, healers often add adjuvants such as salt, sugar, banana, milk, or lemon. Furthermore, it is common practice to combine multiple plant species into a single formulation to treat a specific ailment. Because these polyherbal medicines contain a diverse range of bioactive compounds from different plants, they frequently offer greater therapeutic potential (Teklehaymanot et al., 2007).

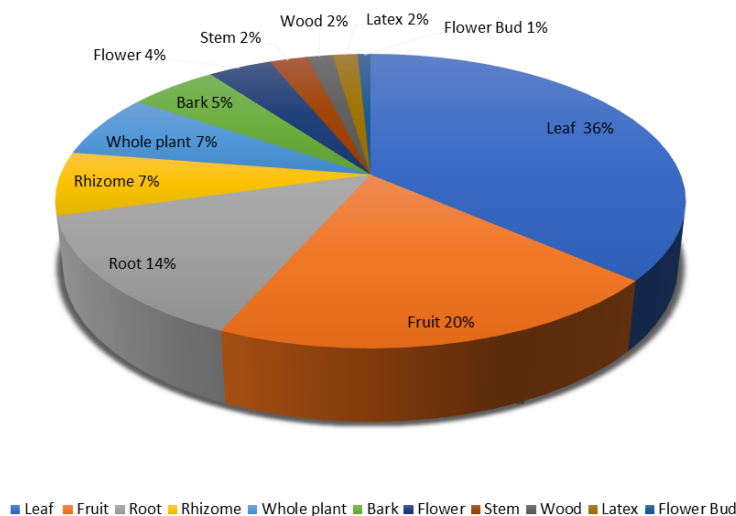


Fig. 5: Percentage of plant parts used in traditional medicine

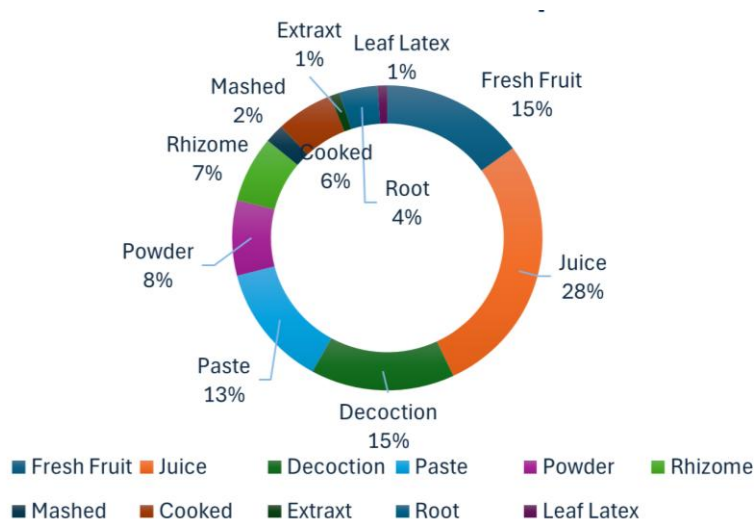


Fig. 6: Percentage of medicinal plant preparation methods used by local healers.

Conclusions

In conclusion, this study highlights the valuable ethnomedicinal knowledge of traditional healers in the two villages of Madhupur upzila and their deep connection to local plant diversity. While these traditional remedies hold great potential for future drug development, their effectiveness and preparation methods must be scientifically verified and standardized. To preserve this rich heritage, awareness campaigns should promote the sustainable cultivation and use of medicinal plants. Ultimately, bridging traditional practices with modern science will support new pharmacological discoveries, conserve local plant resources, and improve the socioeconomic well-being of the community.

Ethical Statement

All participants were informed about the purpose and procedures of the study before the interviews began and provided voluntary consent. They were assured of their right to withdraw from the interview at any stage without consequence. Permission for collecting voucher specimens was obtained from the relevant authorities, landowners, or knowledgeable informants.

Authors' Contribution Statement

M.S.H.: Conceptualization, Methodology, Investigation, Formal Analysis, writing – Original Draft, Writing – Review & Editing. M.J.S.A.: Investigation, Data Curation, Writing – Review & Editing. A.K.M.G.S.: Investigation, Visualization, Writing – Review & Editing. M.A.: Supervision, Project Administration, Funding Acquisition, Writing – Review & Editing. All authors read and approved the final manuscript.

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