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Exploring traditional medicinal plant knowledge of the Nepalese community in Udalguri district of Assam, India

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Udalguri district, situated within the Bodoland Territorial Region (BTR) of Assam, is inhabited by diverse ethnic communities, including Bodos, Assamese, Adivasis, Bengali Hindus, and Nepalese and others. The ethnic people of Udalguri district use first hand traditional knowledge to utilize plant resources for their daily needs. The everyday life of people living in rural areas heavily depends on the use of locally available medicinal plants. The current study aims to collect data on medicinal plants used by the Nepalese community in the Udalguri district and determine which medicinal plants are necessary for long-term scientific study and preservation. The information was collected through semi-structured ethnobotanical interviews with 55 people, including 15 farmers, 18 house wives, 3 healers, students, working adults, and a few village elders, who were enumerated as knowledge informants. Also, quantitative data like use value (UV), informant consensus factor (ICF), and family importance value (FIV) were analyzed. As a result, 54 plant species belonging to 34 families used for the treatment of different human ailments were documented. Fabaceae (7 species) was the most dominant family followed by Apocynaceae (4 species). Different parts of the plant like flowers, fruits, leaves, stems, bark, rhizome, tubers, and roots were used to treat various diseases such as gastritis, diarrhea, ulcers, piles, tumor, indigestion, vomiting, headache, tonsil, skin infection, chickenpox, ringworm infection, eye problem, irregular menstruation, urine infection, white discharge, heart diseases, asthma, diabetes, blood pressure, sinus, nose bleeding, jaundice etc. The present study reveals that the understanding of the cultural history of the Nepalese community as well as their knowledge of indigenous medicinal plants.

Keywords: Assam, Ethnobotany, Nepalese·Quantitative, Traditional knowledge, Udalguri District

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Ethnobotany has evolved since the dawn of civilization, and the ethnic people who reside in rural areas have primarily relied on nature to fulfil their daily needs[1]. Medico-ethno-botany specifically studies how prehistoric and indigenous people used plants or parts for their therapeutic purposes[2]. Ethnobotany is the study of plants that native people use for clothing, food, and medicine, emphasizing the interactions between these people and theenvironment[3]. In many developing regions, 70-80% of people receive primary medical care from plants. The use of medicinal plants is steadily increasing in developed countries also due to their minimal side effects, and therefore play an important role in healthcare and wellness[4].

A significant portion of the village population relies on plants to treat various illnesses. Both indigenous medicine and economic development in the isolated villages are deeply rooted in the stages of plant resources. The indigenous population primarily depends on traditional medical practices because they have limited access to modern healthcare facilities and other socioeconomic and cultural issues[5-8]. The earliest record of Indian medicine dates back 5,000 years, indicating a very long history. The classical texts such as the Rigveda, Atharvaveda, Charaka Samhita, and Sushruta samhita have demonstrated that India has long practiced traditional herbal treatment[9]. India is a home to over 15,000 medicinal plants, of which 7,000-7,500 are used by indigenous populations to treat a range ailments[10,11]. Urbanization has led to change in the lifestyles of elderly and knowledgeable indigenous peoples. Due to preventing them from accessing sustainable bioresources, many plant collectors overuse important medicinal plants due to poor collection and preservation practices, as well as a lack of regard for long-term consequences. Therefore, preserving

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natural resources is thus essential to safeguarding traditional knowledge among ethnic communities.

Assam, one of the eight states of Northeast India, is renowned for its rich plant diversity and forms part of the Eastern Himalaya and Indo-Burma global biodiversity hotspots. The state harbours a wide range of plant species due to its diverse climate, varied topography, and altitudinal gradients[12]. The Udalguri district, located within the Bodoland Territorial Region, is characterized by a multi-ethnic population. According to district administrative records, the Bodo community constitutes approximately 33.76% of the total population, followed by Assamese, Adivasi, and Bengali Hindu communities. In addition, a sizeable Nepalese, accounting for around 5% of the district's population, is thinly distributed across the district. The ethnic communities of Udalguri district possess rich traditional knowledge and utilize plant resources for their daily healthcare and livelihood needs. The previous ethnobotanical studies in the district have primarily focused on the Bodo community[13-15].

The Nepali community in Udalguri possesses rich traditional knowledge of medicinal plants, which has largely remained undocumented in scientific literature. Despite their extensive cultural practices, this community has often been overlooked in ethnobotanical studies in respect to Udalguri district. Their unique traditions and knowledge of plant resources distinguish them from other communities. Therefore, the present study aims to document the locally available medicinal plants used by the Nepali community to treat various diseases, assess their traditional knowledge system, and identify species that require further scientific investigation and conservation for long-term sustainability. Additionally, the study quantifies ethnobotanical indices, including Use Value (UV), Family Importance Value (FIV), and Informant Consensus Factor (ICF), and highlights potential conservation strategies and the pharmacological relevance of these plants, thereby addressing existing knowledge gaps and providing a foundation for future research.

Materials and Methods

Study area

Udalguri district, also spelled Odalguri, is located in the Bodoland Territorial Region (BTR) of Assam, northeastern India, with its headquarters at Udalguri town. It shares an international boundary with Arunachal Pradesh in the north, and is bordered by Sonitpur to the east, Baksa to the west, and Darang to the south[16]. The district lies at 26.7452°N, 92.0962°E, with an average elevation of 180 meters (590 feet). Udalguri has a literacy rate of 88.33%, the highest in the region. The local population of approximately 831,668 (2011 census) predominantly resides in rural areas (794,094), with 37,574 living in urban centers. The major languages spoken include Assamese, Bodo, Nepali, Adivasi, and others. The district experiences two main seasons: a hot and partly cloudy wet season, and a pleasant, clear dry season, with temperatures generally ranging between 52°F and 94°F.

Selected survey area

The villagers of Fulbari, Kalajhar, Gerenchigaon, Khoirabari, and Bandargudi in the Udalguri district were purposively selected for the surveybased on the presence of sizeable Nepalese populations, representation of diverse ethnic communities, dependence on traditional plant-based healthcare practices, and proximity to varied habitat types such as forest fringes and agricultural landscapes. The Nepalese in these villagers primarily belong to groups such as Chhetri, Limbu, Tamang, and Rai, who possess rich traditional knowledge of medicinal plant use. The community was selected since the residents mostly rely on medicinal plants to treat various ailments. When visiting communities, only reliable information was gathered from the groups of farmers, housewives, students, healers, and some elderly and knowledgeable people, as well as from renowned herbalists and local healers known by the names ojha, dhami, and bej. Survey participants included at least 55 informants. The focus of the interaction was on the part utilized, dosage, common name in the community, and diseases cured. The data was gathered and summarized according to the scientific name, family name, part used, and diseases treated.

Collection, identification and preservation of plants

Between March 2023 and June 2024, field surveys were conducted in the selected study area. Different parts of locally available medicinal plants were collected, and their ethnomedicinal uses were documented with the help of local informants (Fig. 1). The collected specimens were critically identified through detailed morphological comparison with authenticated herbarium specimens and by consulting standard regional floras[17-18]. The scientific names, author citations, and current nomenclature were

Fig. 1 — (a-c) Photographs of interacting local informants during the survey

subsequently verified using online taxonomic databases such as Plants of the World Online[19] and Global Biodiversity Information Facility[20]. Voucher specimens were prepared following standard herbarium techniques and deposited in the Bodoland University Botanical Herbarium (BUBH) for future reference.

Quantitative analysis of data

The information analyzed contains the scientific name, family, local name, portion used, preparation method, and ethno-medicinal uses of the collected plant species. The ethnomedicinal uses were analyzed by using Use value (UV), Informant Consensus Factor (ICF), and Family Importance Value (FIV).

Results

Demographic data of the participants

A total of 55 people, comprising 15 farmers, 18 housewives, 3 healers, students, working adults, and a few village elders, were enumerated as the knowledge informants. Of them, 25 male and 30 female informants were present; 8 were under 25 years old, 12 were between 26 and 40 years old, 31 were between 41 and 60 years old, and 4 were between 61 and 75 years old. The daily lives of people living in rural areas are heavily dependent on the use of medicinal plants. The details demographic data of the participants were presented in (Fig. 2).

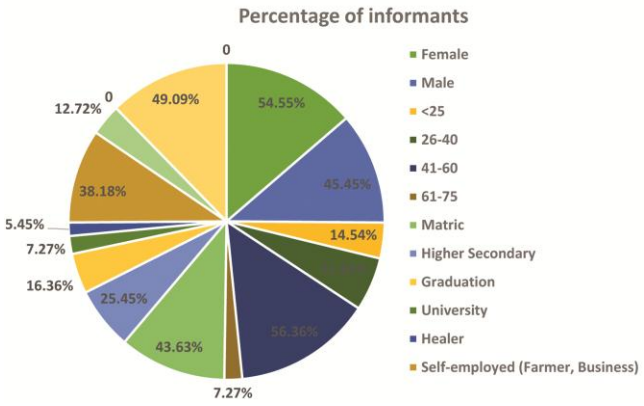

Fig. 2 — Percentage information of demographic data of the participants

Cultural identity and food habit

The Gorkhas is a common term for the Nepali people, who are thought tobe extremely brave, and wear traditional dresses during important occasions. Female wears Guniucholi, Patuli, the man wears Daura suruwal, Dhaka topi, Patuki, and carries the dragger called khukuri. The Tillhori, Bulaki, and Dhungri are the jewelry worn by the Nepali ladies. Nepalese folktales are known as Lokgith and are likewise quite melodic. Traditional dances include Balan, Chabrung, Saungininach, Khukrinach, and Maruni.

Nepali cuisine symbolizes cultural identity, with staples such as rice, lentil soup, curry, and pickles (Dal, Bhat, Takari, Achar). Traditional practices include serving elderly male members first, followed by women. Along with common staples, different groups consume a variety of fermented and non-fermented foods such as Gundruk, Sinki, Kinema,

Churppi, Sukuti, and Roksi. Among these, Gundruk and Sinki fermented products of leafy vegetables like mustard are most traditional, valued for their distinct acidic flavor, nutritional benefits, and use as remedies, especially in soups.

The most traditional Nepali festivals are Dashain and Tihar. During Dashain and Tihar, they make traditional sweet which is a ring shape fried made from rice flour. Documented medicinal plant species are identified (at Bodoland University Botanical Herbarium) and arranged alphabetically along with family, local name, parts used, method of preparation, and illness recovery. In the selected study area, 54 plant species representing 34 families were documented and identified to treat various illnesses in the selected study area.The various plant parts utilized in herbal treatments, including leaves, fruits, flowers, roots, bark, seeds, rhizomes, whole plants, vines, tubers, bulbs, and stems, are presented in (Table 1). Representative photographs of the traditionally used plant parts are shown in (Fig. 3). The results of the Use Value (UV), Informant Consensus Factor (ICF), and Family Importance Value (FIV) analyses are presented in (Table 2-4), respectively. In addition, a column chart illustrating the distribution of plant parts used and a pie chart depicting the Family Importance Value (FIV) are presented in (Fig 4 & Fig. 5), respectively.

Table 1 — List of medicinal plants used by the Nepali community (Abbreviation used:'N'-Nepali,'A'- Assamese)

Sl. No.	Scientific Name	Local Name	Family	Parts Used	Method of preparation	Disease cured
1	*Achyranthes aspera* L. (BUBH 0102)	Apamarg (N)	Amaranthaceae	Leaves, Flower,	Flowers and seeds are powdered, and a pinch of the powder is inhaled	Sinusitis, cough
2	*Acmella oleracea* (L.) R.K. Jansen (BUBH 0202)	Pirperrejhar (N)	Asteraceae	Flower	Fresh flowers are chewed 2-4 times daily.	Mouth wound
3	*Acorus calamus* L. (BUBH 0112)	Bojho (N)	Acoraceae	Rhizomes	Rhizomes are dried and consumed	Dry cough, heart diseases
4	*Aegle marmelos* (L.) Correa (BUBH 0203)	Bael (N)	Rutaceae	Fruits, Leaves	Fruits are mixed with water and salt to prepare a sharbat. Leaves are crushed with *Piper* and applied to the affected area.	Stomach problem, piles, boils
5	*Agapetes acuminata* D.Don ex G.Don (BUBH 502)	Laliguras (N)	Ericaceae	Flower, Leaves	Pasteis applied to the affected area	Fever, skin problem
6	*Allium sativum* L. (BUBH 0324)	Rasun (A), Lasun (N)	Amaryllidaceae	Bulb	Bulb paste is cooked with mustard oil until reddish.	Apply on the chest also Reduces cold and cough, itching
7	*Aloe vera* (L.) Burm.f. (BUBH 0302)	Aloevera Ghiukumari (N)	Asphodelaceae	Leaves	Aloe vera gel is mixed with mustard oil and candle wax, boiled, and stored for later use as a topical ointment	Cracked heels, wound healing, skin diseases, and burns.
8	*Alternanthera brasiliana* (L.) Kuntze (BUBH 0242)	Ratopat (N)	Amaranthaceae	Leaves	Leaf juice is extracted by crushing fresh leaves and applied topically.	Cut and wound
9	*Amaranthus spinosus* L. (BUBH 0252)	Kata kutura (A), Ludde (N)	Amaranthaceae	Root	Roots are ground into a paste and administered orally.	Wound
10	*Artocarpus heterophyllus* Lam. (BUBH 0322)	Kathal (A), Kotar (N)	Moraceae	Bark	Bark is ground into a paste and applied to the affected area.	Breast wounds and infections.
11	*Averrhoa carambola* L. (BUBH 0312)	Kordoitenga (A), Charpatte (N)	Oxalidaceae	Fruits	Fruits are consumed raw.	Dysentery, Diarrhoea
12	*Azadirachta indica* A. Juss. (BUBH 0352)	Neem (N/A)	Meliaceae	Leaves	Juice from young leaves is extracted by rubbing and 3–4 drops are instilled into the affected ear.	Redness, pain, watering of eyes, itching body
13	*Bacopa monnieri* (L.) Wettst. (BUBH 0222)	Brahmi (N/A)	Plantaginaceae	Leaves	The plant part is cooked and consumed orally.	Brain enhancer

(*Contd.*)

Table 1 — List of medicinal plants used by the Nepali community (Abbreviation used:'N'-Nepali,'A'- Assamese) (*Contd*.)

Sl. No.	Scientific Name	Local Name	Family	Parts Used	Method of preparation	Disease cured
14	*Bombax ceiba* L. (BUBH 0432)	Simal (N), Simalu (A)	Malvaceae	Leaves, Fruits, Seed	Leaf juice is consumed orally, and the seeds are chewed.	Diarrhoea, worm, weakness, stomach problem
15	*Bauhinia variegata* L. (BUBH 0341)	Rato Koirala (N)	Fabaceae	Bark	The plant material is dried, powdered, and 1 teaspoon is taken orally twice daily.	Tumor, ulcer
16	*Calotropis gigantea* (L.) Dryand. (BUBH 0547)	Ankh (N)	Apocynaceae	Leaves, Flower	Leaves are warmed with mustard oil over hot coal and applied topically.	Leg pain, swelling and continuous cough
17	*Carica papaya* L. (BUBH 0602)	Meuwa (N)	Caricaceae	Ripe fruit, latex	Ripe papaya is applied to the face	Remove acne, wrinkles, softening of skin
18	*Catharanthus roseus* (L.) G.Don (BUBH 0472)	Nayanatora(A)	Apocynaceae	Leaves, Flower	Leaf and flower paste is applied to the affected area	Skin infection, headache
19	*Centella asiatica* (L) Urb. (BUBH 0402)	Manamuni(N)	Apiaceae	Leaves	Leaves are either boiled or consumed raw.	Stomach problem, acidity
20	*Cinnamomum tamala* (Buch.-Ham.) T. Nees & C.H. Eberm. (BUBH 0572)	Tejpat (N)	Lauraceae	Leaves	Used as a spice in tea.	Stress and headache
21	*Cissus quadrangularis* L. (BUBH 0409)	Hadjor (A/N)	Vitaceae	Whole plant	Whole plant crushed and consumed orally.	Leucorrhoea
22	*Citrus limon* (L.) Osbeck (BUBH 0462)	Golnemu (N)	Rutaceae	Fruits	Juice extract is applied to the affected area.	Pimples and weight loss.
23	*Clitoria ternatea* L. (BUBH 0408)	Aparagita (A/N)	Fabaceae	Roots, Flower	A small portion of the root is crushed, and the juice is consumed orally. The flowers are dipped in hot water and consumed in the morning.	Headache and Stress
24	*Colocasia esculenta* (L). Schott (BUBH 0505)	Kachhu (N)	Araceae	Tubers	Paste is applied to the scalp.	Hair growth
25	*Curcuma longa* L. (BUBH 0482)	Haldi (N)	Zingiberaceae	Rhizomes	Crushed rhizomes are boiled with milk and consumed.	Vitamin source and wound healing.
26	*Datura metel* L. (BUBH 0512)	Datura (N)	Solanaceae	Seed	Paste or fresh plant material is applied directly to the injured area.	Wound
27	*Euphorbia royleana* Boiss. (BUBH 0612)	Seudi(N)	Euphorbiaceae	Leaves	Crushed leaves are applied topically.	Earache and diarrhoea.
28	*Hibiscus rosa- sinensis* L. (BUBH 0522)	Ghantiphool (N)	Malvaceae	Leaves, Flower	Flowers are dipped in hot water and consumed; leaves are made into a paste and applied to the affected area.	Urinary tract infection and hair loss.
29	*Justicia adhatoda* L. (BUBH 0598)	Asuro (N)	Acanthaceae	Leaves	Leaves are consumed as juice	Asthma and skin diseases
30	*Kalanchoe pinnata* (Lam.) Pers. (BUBH 0599)	Bidyapat (N)	Crassulaceae	Leaves	Fresh leaves are consumed every morning for one week, increasing the dose by one leaf daily.	Kidney stones.

(*Contd*.)

Table 1 — List of medicinal plants used by the Nepali community (Abbreviation used:'N'-Nepali,'A'- Assamese) (*Contd.*)

Sl. No.	Scientific Name	Local Name	Family	Parts Used	Method of preparation	Disease cured
31	*Leucas aspera* (Willd.) Link (BUBH 0617)	Tirfullejhar(N)	Lamiaceae	Leaves	Leaves are crushed to extract the juice, and 2 drops are applied.	Sinusitis.
32	*Mangifera indica* L. (BUBH 0744)	Mango	Anacardiaceae	Leaves	The plant material is dried, powdered, and the smoke is inhaled. Young leaves are made into a paste, mixed with curd and olive oil, and applied to the affected area.	Tonsillitis, neck pain, and hair loss.
33	*Mentha spicata* L. (BUBH 0702)	Pudina (A/N)	Lamiaceae	Leaves, Stem	Fresh or dried leaves and stems are consumed.	Acidity and stomach pain
34	*Mimosa pudica* L. (BUBH 0704)	Lajakilata (A)	Fabaceae	Leaves, Root	Applied as a paste	Wound healing and intestinal worms
35	*Momordica charantia* L. (BUBH 0706)	Bittergourd Titta karela (N)	Cucurbitaceae	Leaves	One teaspoon of leaf juice is mixed with a small piece of wild turmeric and taken orally.	Chickenpox
36	*Moringa oleifera* Lam. (BUBH 0711)	Sojina (N)	Moringaceae	Leaves	Leaves are consumed raw or cooked.	Menstrual pain.
37	*Murraya koenigii* (L.) Spreng. (BUBH 0716)	Narsingha (N)	Rutaceae	Leaves	Leaves are consumed raw or cooked.	Indigestion
38	*Myrica esculenta* Buch.-Ham. ex D. Don (BUBH 0734)	Kafal (N)	Myricaceae	Bark, Flower, Fruits	Dried powder is inhaled twice daily; bark is boiled in water, and the decoction is consumed.	Sinusitis, diarrhoea, and throat disorders.
39	*Oxalis corniculata* L. (BUBH 0823)	Chari Amilo (N)	Oxalidaceae	Leaves	Leaf paste mixed with alum (fitkari) and applied topically.	Cut and wound
40	*Paederia foetida* L. (BUBH 0825)	Padde lahara (N)	Rubiaceae	Leaves	Leaves are ground to extract the juice.	Dysentery, diarrhea
41	*Periploca calophylla* (Wight) Falc. (BUBH 0828)	Shikari lahara (N)	Apocynaceae	Vines	Vine paste is mixed with Hadjhor/Hadchur and applied topically.	Cracks on hands and legs
42	*Phyllanthus emblica* L. (BUBH 0846)	Gooseberry kassiaamala (N)	Phyllanthaceae	Fruits	Juice is consumed or one fruit is eaten daily; the paste is applied to the affected area.	Weight loss, hair growth
43	*Plumbago zeylanica* L. (BUBH 0849)	Chitu (N)	Plumbaginaceae	Roots, Leaves	Roots are crushed with mango leaves, and the juice is consumed with water in the morning.	Jaundice and urine infection
44	*Psidium guajava* L. (BUBH 0854)	Ambak (N)	Myrtaceae	Leaves	Juice extracted from crushed young leaves is consumed orally.	Lose motion
45	*Senna alata* (L.) Roxb. (BUBH 0856)	Chakramandi (N)	Fabaceae	Leaves, Roots	Pasteis applied to the affected area	Ringworm, itching
46	*Sida acuta* Burm.f. (BUBH 0859)	Khareto (N)	Malvaceae	Leaves	Leaves are extracted as juice, mixed with talmisri, and consumed.	Leucorrhoea

(*Contd.*)

Table 1 — List of medicinal plants used by the Nepali community (Abbreviation used:'N'-Nepali,'A'- Assamese) (*Contd*.)

Sl. No.	Scientific Name	Local Name	Family	Parts Used	Method of preparation	Disease cured
47	*Syzygium aromaticum* (L.) Merr. & L.M. Perry (BUBH 0888)	Long (N)	Myrtaceae	Fruits	Oil extract is applied to the affected area	Teeth pain, Mouth wound
48	*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult. (BUBH 0890)	Setophool (N)	Apocynaceae	Flower	Crushed juice (2–3 drops) is applied topically.	Itching, redness of eyes
49	*Tamarindus indica* L. (BUBH 0896)	Titri (N)	Fabaceae	Fruits	Two to three fruits are consumed raw after meals.	Diabetes and hypertension.
50	*Terminalia arjuna* (Roxb.ex DC.) Wight & Arn. (BUBH 0891)	Arjun (A/N)	Combretaceae	Bark	Arjun bark (6 g) is boiled in milk (1 glass) and consumed.	Cardiovascular disorders and general nutritional support
51	*Terminalia bellirica* (Gaertn.) Roxb. (BUBH 0893)	Barro (N)	Combretaceae	Fruits, Leaves	Fruits are dried, powdered, mixed with amla powder, and 1 teaspoon is consumed with water every morning.	Gastritis and respiratory tract infections.
52	*Terminalia chebula* Retz. (BUBH 0895)	Harro (N)	Combretaceae	Fruits	Dried powder is mixed with amla powder, and 1 teaspoon is taken with a glass of water every morning.	Gastric, ulcer, vomiting
53	*Trifolium repens* L. (BUBH 0897)	Abijalo (N)	Fabaceae	Leaves	Leaves are wrapped in banana leaves, warmed over hot coal, and inhaled twice daily.	Sinusitis, common cold, and influenza
54	*Trigonella foenum-graecum* L. (BUBH 0899)	Methi (N)	Fabaceae	Seed	Seeds are ground into a paste and applied to the scalp.	Dandruff

Fig. 3 — Traditionally used plants by the Nepali community of Udalguri district (a) Rhosdhoyero, (b) Nilothutto, (c) Kafal ko bokro, (d) Chousur, Aoukhonbed, (e) Sikari lahara, (f) Hadjorr, (g) Hadhchur, (h) Vuechiple lahara

Table 2 — Use value (UV) of the medicinal plants

Sl. No.	Scientific Name	No. of frequency of citation for species (Uvi)	Total No. of respondents (Ni)	Use value (UV)
1	*Achyranthes aspera* L.	21	55	0.38
2	*Acmella oleracea* (L.) R.K. Jansen	47	55	0.85
3	*Acorus calamus* L.	48	55	0.87
4	*Aegle marmelos* (L.) Correa	20	55	0.36
5	*Agapetes acuminata* D.Don ex G.Don	15	55	0.27
6	*Allium sativum* L.	37	55	0.67
7	*Aloe vera* (L.) Burm.f.	30	55	0.54
8	*Alternanthera brasiliana* (L.) Kuntze	42	55	0.76
9	*Amaranthus spinosus* L.	22	55	0.40
10	*Artocarpus heterophyllus* Lam.	21	55	0.38
11	*Averrhoa carambola* L.	24	55	0.43
12	*Azadirachta indica* A.Juss.	47	55	0.85
13	*Bacopa monnieri* (L.) Wettst.	34	55	0.61
14	*Bombax ceiba* L.	22	55	0.40
15	*Bauhinia variegate* L.	15	55	0.27
16	*Calotropis gigantea* (L.) Dryand.	45	55	0.81
17	*Carica papaya* L.	48	55	0.87
18	*Catharanthus roseus* (L.) G.Don	47	55	0.85
19	*Centella asiatica* (L) Urb.	45	55	0.81
20	*Cinnamomum Tamala* (Buch.-Ham.) T.Nees & C.H. Eberm.	50	55	0.90
21	*Cissus quadrangularis* L.	50	55	0.90
22	*Citrus limon* (L.) Osbeck	42	55	0.76
23	*Clitoria ternatea* L.	36	55	0.65
24	*Colocasia esculenta* (L). Schott	30	55	0.54
25	*Curcuma longa* L.	50	55	0.90
26	*Datura metel* L.	37	55	0.67
27	*Euphorbia royleana* Boiss.	15	55	0.27
28	*Hibiscus rosa- sinensis* L.	42	55	0.76
29	*Justicia adhatoda* L.	20	55	0.36
30	*Kalanchoe pinnata* (Lam.) Pers.	45	55	0.81
31	*Leucas aspera* (Willd.) Link	47	55	0.85
32	*Mangifera indica* L.	40	55	0.72
33	*Mentha spicata* L.	35	55	0.63
34	*Mimosa pudica* L.	20	55	0.36
35	*Momordica charantia* L.	39	55	0.70
36	*Moringa oleifera* Lam.	34	55	0.61
37	*Murraya koenigii* (L.) Spreng.	39	55	0.70
38	*Myrica esculenta* Buch.-Ham. ex D. Don	8	55	0.14
39	*Oxalis corniculata* L.	40	55	0.72
40	*Paederia foetida* L.	21	55	0.38
41	*Periploca calophylla* (Wight) Falc.	10	55	0.18
42	*Phyllanthus emblica* L.	26	55	0.47
43	*Plumbago zeylanica* L.	31	55	0.56
44	*Psidium guajava* L.	31	55	0.56
45	*Senna alata* (L.) Roxb.	40	55	0.72
46	*Sida acuta* Burm.f.	22	55	0.40
47	*Syzygium aromaticum* (L.) Merr. &L.M.Perry	18	55	0.32
48	*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult.	35	55	0.63
49	*Tamarindus indica* L.	51	55	0.92
50	*Terminalia arjuna* (Roxb.ex DC.) Wight & Arn.	40	55	0.72
51	*Terminalia bellirica* (Gaertn.) Roxb.	41	55	0.74
52	*Terminalia chebula* Retz.	32	55	0.58
53	*Trifolium repens* L.	14	55	0.25
54	*Trigonella foenum-graecum* L.	50	55	0.90

Table 3 — Informant Consensus Factor (ICF) value of medicinal plants used for treatment of various diseases

Category of ailment	Number of use report (Nur)	Number of species (Nt)	Informant consensus factor (ICF)
Digestive system, gastritis, diarrhea, dysentery, ulcers, piles, tumors, kidney stones, indigestion, vomiting	57	16	0.73
Leg pain, swelling, earache, headache, tonsil	53	7	0.88
Fever, cold and cough,	44	8	0.83
Skin infection, chickenpox, burn, pimples, hand-feet cracking	48	7	0.87
Ringworm infection, itching	28	3	0.92
Cuts, wounds, boils	63	8	0.88
Redness, itching, watering of eyes	45	3	0.95
Irregular menstrual, cramps, urine infection, Leucorrhoea	40	7	0.84
Hair fall, hair growing, dandruff	35	5	0.88
Heart diseases, asthma	25	4	0.87
Diabetes, blood pressure	20	5	0.78
Tongue wound, toothache	28	6	0.81
Sinusitis, nose bleeding	35	5	0.88
Jaundice	15	2	0.92

Table 4 — Family Importance Value (FIV) of the medicinal flora

Name of the family	No. of Species (N)	FC (Family)	Family Importance Value (FIV)
Acanthaceae	1	25	45.45
Acoraceae	1	12	21.81
Amaranthaceae	3	36	65.45
Amaryllidaceae	1	11	20
Anacardiaceae	1	50	90.90
Apiaceae	1	15	27.27
Apocynaceae	4	42	76.36
Araceae	1	28	50.90
Asphodelaceae	1	39	70.90
Asteraceae	1	15	27.27
Caricaceae	1	45	81.81
Combretaceae	3	43	78.18
Crassulaceae	1	45	81.81
Cucurbitaceae	1	28	50.90
Ericaceae	1	18	32.72
Euphorbiaceae	1	37	67.27
Fabaceae	7	52	94.54
Lamiaceae	3	37	67.27
Lauraceae	1	42	76.36
Malvaceae	3	38	69.09
Meliaceae	1	26	47.27
Moraceae	1	33	60
Moringaceae	1	45	81.81
Myricaceae	1	24	43.63
Myrtaceae	2	49	89.09
Oxalidaceae	2	28	50.90
Phyllanthaceae	1	37	67.27
Plantaginaceae	1	36	65.45
Plumbaginaceae	1	35	63.63
Rubiaceae	1	18	32.72
Rutaceae	3	44	80
Solanaceae	1	27	49.09
Vitaceae	1	14	25.45
Zingiberaceae	1	51	92.72

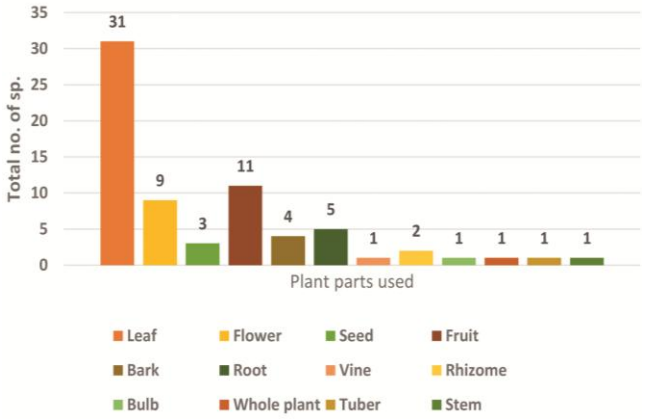

Fig. 4 — Column chart of plant parts used

Ethnobotanical data on documented medicinal plants

Table 1 summarizes the medicinal plants traditionally used by the Nepali community of Udalguri District, Assam. Each species is listed along with its local/vernacular name, plant part used, and therapeutic applications.

Use value (UV)

The use value (UV) was calculated (Table 2) to determine the relative importance of each medicinal plant species cited by the Nepali community of Udalguri District, Assam.

Informant consensus factor (ICF)

The informant consensus factor (ICF) was calculated (Table 3) to assess the agreement among informants regarding the use of medicinal plants for treating different disease categories.

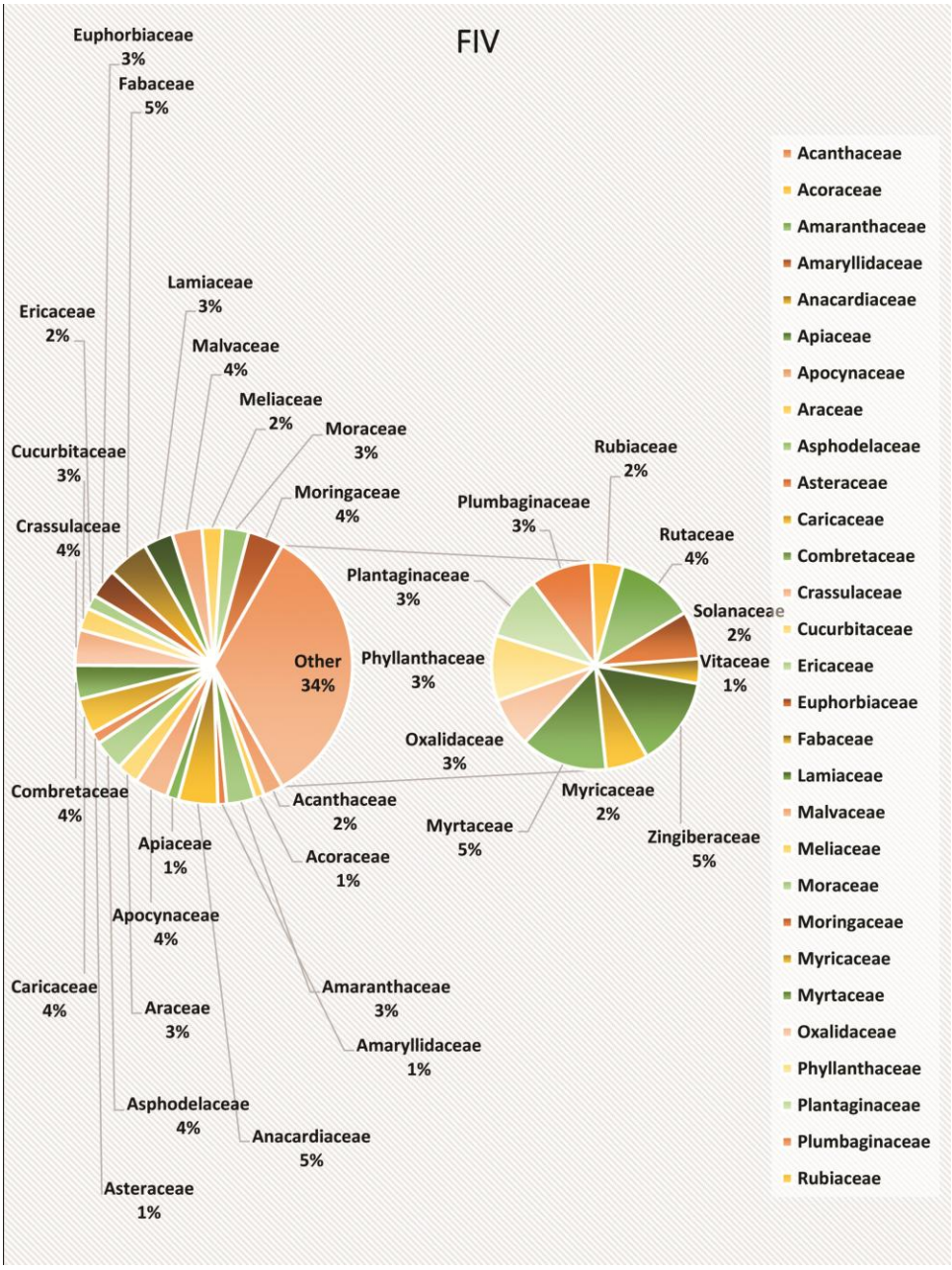

Fig. 5 — Pie chart representation of Family Importance Value (FIV)

Family importance value (FIV)

To assess the relative significance of different plant families in the ethnobotanical repertoire, the family importance value (FIV) was calculated (Table 4)

Discussion

The present study documented a total of 54 plant species. For plant parts utilized in herbal treatments, leaves were most frequently used (31), fruits came in second (11), followed by other parts such as flowers (9), roots (5), bark (4), seeds (3), rhizome (2), whole plant (1), vine (1), tuber (1), bulb (1), and stem (1) (Fig. 4). The most of the species were either consumed or applied externally (Table 1).The use value ranged from 0.14 to 0.92. The highest use value has been observed in *Tamarindus indica* L. (0.92). Various studies have demonstrated that the pulp of *Tamarindus indica* L. possesses antipyretic, antiscorbutic, laxative, carminative, digestive, expectorant, and blood-tonic properties, and is also used as a remedy for biliousness and bile disorders. The leaves exhibit anthelmintic and vermifuge

properties, effectively destroying intestinal parasites[21-23]. Other parts of the plant have been reported to show antidiabetic, antioxidant, antihepatotoxic, anti-inflammatory, antimutagenic, and several other pharmacological activities[24]. Out of the 54 medicinal plants, the use value of 22 plants have the highest use value greater than 0.70 and are highly used or mentioned by the majority of informants (Table 2). These plant species are *Acmella oleracea* (L.) R.K. Jansen, *Acorus calamus* L., *Alternanthera brasiliana* (L.) Kuntze, *Azadirachta indica* A. Juss., *Calotropis gigantea* (L.) Dryand, *Carica papaya* L., *Catharanthus roseus* (L.) G.Don, *Centella asiatica* (L) Urb., *Cinnamomum tamala* (Buch.-Ham.) T. Nees & C.H.E berm., *Cissus quadrangularis* L., *Citrus limon* (L.) Osbeck, *Curcuma longa* L., *Hibiscus rosa-sinensis* L., *Kalanchoe pinnata* (Lam.) Pers., *Leucas aspera* (Willd.) Link, *Mangifera indica* L., *Oxalis corniculata* L., *Senna alata* (L.) Roxb., *Terminalia arjuna* (Roxb.ex DC.) Wight & Arn., *Terminalia bellirica* (Gaertn.) Roxb., *Tamarindus indica* L., *Trigonella foenum-graecum* L. And the rest of the 32 plants have the lowest use value ofbelow or <0.70 as compared to other species (Table 2). The other ethnobotanical reports have also highlighted the significant ethnobotanical value of the species[25-31].

The reported plant species were used to cure many different ailments. The informant consensus factor (ICF) values ranged from 0.73 to 0.95 for the different disease categories (Table 3). The disease categories are gastritis, diarrhoea, ulcer, piles, tumor, stone, indigestion, vomiting, leg pain, swelling, neck pain, headache, tonsil, fever, cold and cough, pinus, skin infection, chickenpox, burn, pimples, hand feet cracking, ringworm infection, cuts, wound, eyes problem, irregular menstrual, urine infection, white discharge, hair fall, dandruff, hair growing, heart diseases, asthma, diabetes, blood pressure, tongue, wound, toothache, sinus, nose bleeding, jaundice etc. Finding out ICF value is a significant tool to carry out various ethnobotanical works[32,33]. The highest ICF was observed in Redness, itching, and watering of eyes (0.95). It suggests strong agreement among participants regarding the plants used to treat these conditions, highlighting their reliability and potential effectiveness. This high ICF values indicated reasonable reliability of informants on the use of medicinal plant species[34]. The family importance value (FIV) gives the local importance of the families of wild species.FIV helps determine which plant families are most valued for their medicinal uses[35,36]. The maximum family importance value (FIV)was recorded for the family Fabaceae, *i.e.*, the most dominating family with 7 species, followed by Zingiberaceae, Anacardiaceae, Myrtaceae, Caricaceae, Crassulaceae, Moringaceae, Rutaceae, etc (Table 4).

Conclusion

The current study highlights the continued prevalence of traditional medicinal plant-based treatment systems in the studied locations, underscoring the significance of documenting traditional ethnomedicinal knowledge before this rich resource disappears. The ethnomedicinal investigation of Nepali communities in the Udalguri district incorporates quantitative indices such as use value (UV), informant consensus factor (ICF), and fidelity level (FL) to analyze the relative importance and consensus of medicinal plant use. Due to the accessibility and affordability of therapeutic herbs, the local population primarily relies on them for treating various illnesses. The present study documented 54 plant species belonging to 34 families used to treat different ailments. The documentation of 54 plant species used to treat a wide range of ailments not only highlights the community's extensive botanical expertise but also opens avenues for pharmacological research and sustainable utilization. The conservation efforts, coupled with the promotion of income-generating activities linked to these medicinal plants, will ensure the preservation of this invaluable resource for future generations. From the above discussion, it can be concluded that the Nepali community has a diverse cultural history and the people of the rural villages of Udalguri district have great experience in using traditional medicinal plants.

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Author Contributions

Data collection, data analysis, interpretation and draft of the manuscript were done by PB and ID. Material preparation, data collection, and analysis

were performed by PB, SB and ID. SB contributed to the study conception and design, manuscript editing, and revision. All authors read and approved the final manuscript.

Informed Consent

Informed consent to participate and consent to publish were obtained from all individual participants included in the study. For participants under the age of 18, consent was obtained from a parent and/or legal guardian.

Written informed consent for publication of personal information and photographs was obtained from all individual participants included in the study.

Clinical Trial

Not applicable.

Ethics Statement

Ethics statement in view of International Code of Ethics for Ethnobiology may be declared for this study.

Conflict of Interest

The authors declare that they have no competing interests

Use of Artificial Intelligence (AI)

During the preparation of this manuscript, the authors used Grammarly solely to improve language, grammar, spelling, and readability. All scientific content, including the study design, data analysis, interpretation, and manuscript preparation, was carried out by the authors, who reviewed and approved the final version and take full responsibility for its content.

Data Availability

All the data generated and analyzed during this study are included in this manuscript

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