



# Quantitative ethnobotanical assessment of medicinal plants used in traditional healthcare practices of Dibrugarh and Majuli Districts, Assam

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## Research

### Abstract

**Background:** Northeastern Indian indigenous communities possess diverse ethnobotanical knowledge, as the Northeast Indian states are extremely rich in biodiversity and plant-based medicine is predominant here. The various communities have ancient herbal medicinal systems. The present study aimed to document the ethnobotanical knowledge of local communities in Dibrugarh district and Majuli district of Assam, Northeast India, by recording medicinal plant species and their therapeutic uses, and to evaluate patterns of plant use using quantitative ethnobotanical indices.

**Methods:** The study sites were the Majuli district and Dibrugarh district of Assam. Semi-structured interviews and participant observation were used to collect field data, and medicinal plant usage was documented through use reports categorised by disease conditions and plant species FL, FUV. Pearson correlation analysis was performed to assess the relationship between UV and RFC.

**Results:** A total of 129 plant species were documented as medicinal in the present study. The traditional use of *Zanthoxylum nitidum*, *Stixis suaveolens*, *Piper betle*, *Caesalpinia bonduc*, and *Rubus alceifolia* was reported for Thyroid-related ailments. *Leucas aspera*, *Caesalpinia bonduc*, and *Rubus alceifolia* were also reported for use in relation to Bone cancer and Nerve-related problems, respectively. To the best of our knowledge, these medicinal applications have not been previously documented in the literature reviewed.

**Conclusions:** The highest number of medicinal plant species belonged to the family Fabaceae. Given that several of the documented medicinal plant species are threatened, prioritising their conservation is important for promoting their sustainable use and long-term conservation.

**Keywords:** Ethnomedicine, Indigenous, Traditional knowledge, Dibrugarh, Majuli, Herbal healers.

### Background

Since ancient times, plants have played an essential role in human life, serving as sources of food, medicine, shelter, clothing, and other necessities. Historically, plants were the primary source of healthcare, and traditional practitioners relied on medicinal species to prepare remedies for a wide range of ailments. However, rapid urbanization and modernization have gradually contributed to the decline of traditional plant-based healthcare practices, with increasing reliance on allopathic

medicines, which may be costly and associated with various adverse effects. In recent years, renewed interest in herbal and plant-based remedies has emerged because of their accessibility, affordability, and natural origin. Nevertheless, increasing demand and unsustainable harvesting of medicinal plants have placed numerous species under severe pressure, threatening biodiversity and long-term ecological sustainability. Therefore, conservation efforts must focus not only on plant species and their natural habitats but also on safeguarding indigenous traditional knowledge (ITK), which has been transmitted across generations and remains an important component of cultural and biological heritage. Plants contain a wide range of bioactive compounds that serve as the basis for many modern pharmaceuticals. Herbal medicinal practices have emerged across different cultures worldwide, rooted in local plant resources and sustained through generations of shared knowledge (Tunny *et al.* 2025). As a result, ethnomedical research has gained the attention of pharmaceutical industries worldwide. According to the World Health Organization (WHO), around 70,000 plant species are used globally in traditional and folk medicine, and WHO has shown strong interest in documenting the use of medicinal plants by tribal communities across different regions of the world (Buragohain 2011). India is among the countries with the richest diversity of medicinal plants, and its northeastern region contributes significantly to this wealth.

The present study aimed to document the ethnobotanical knowledge of local communities in Dibrugarh district and Majuli district of Assam, Northeast India, by recording medicinal plant species and their therapeutic uses, and to evaluate patterns of plant use using quantitative ethnobotanical indices. A state known for its high biodiversity and rich cultural heritage. Despite its biological wealth, Assam faces a growing threat of species extinction caused by overexploitation and mismanagement of its natural resources. The state is home to several indigenous tribes, including the Bodo, Mishing, Rabha, Dimasa, Karbi, Ahom, and others—each with unique ethnobotanical traditions (Culture of Assam, Assam State Portal 2025). These societies rely largely on wild and cultivated plants for food, medicine, spirituality, and daily sustenance.

The Dibrugarh district of Upper Assam is predominantly inhabited by Assamese-speaking ethnic groups such as Mishing, Karbi, Dimasha, Rabha, Tiwa, Sonowal Kachari, Ahom, Tai Turung, Tai Khamyang, Deori, Chutia, Koch, Motok and Moran (Konwar *et al.* 2020), with the Ahom being the largest group. They make significant use of conventional medicine. Their methods demonstrate the close relationship that exists between humans, plants, and the environment. The custom of eating 101 leafy vegetables during Bohag Bihu, the main festival of Assam, is passed down from generation to generation because the indigenous group rely on plants for 90% of their diet. They believe that eating 101 Leafy vegetables can cure illness, and the scientific explanation for this is that Leafy vegetables are digested by our digestive system, remove toxins from our bodies, and contain medicinal values (Gogoi & Zaman, 2013).

Majuli is not only known for its unique biodiversity but also for its rich cultural heritage. The population of Majuli is composed of both non-tribal castes and scheduled tribes. Indigenous populations include members of the Mishing (the majority), Deori, Kaibarta, and Sonowal Kachari tribes. The non-tribal Hindu Assamese communities of Koch, Kalita, Ahom, Sutiya, and Jogi are non-tribal castes (Gogoi *et al.*, 2024). Natural resources like bamboo, cane, and other plant-based materials are widely used in local handicrafts, including the Mukha Shilpa (mask-making) tradition, which has even been granted a Geographical Indication (GI) tag. This art form is an illustration of how cultural practices are closely linked to biodiversity and resource utilisation. When it comes to medical procedures, the local population still favours using traditional or folk medicine (gaoliya aushadhi) to cure common illnesses before utilising contemporary healthcare facilities. Such generation-to-generation transmission of ethnomedical knowledge is a fundamental component of the community's identity and way of life.

In many remote areas, people depend on this herbal medicine, as they still don't have the proper allopathic medical system and financial constraints. Without proper road transport to the hospitals, especially at night, and even during the daytime, modern scientific medicine is very limited in these areas. For primary healthcare, they are dependent on traditional medicine administered by the herbal healers. Often, multiple plants are used together to treat a single ailment, and healers, known locally as *Kobirajs*, diagnose illnesses by observing symptoms and prescribing herbal formulations based on generations of knowledge. However, these practitioners usually keep their medicinal formulas secret, believing that disclosure would reduce their effectiveness. Each remedy also comes with specific rules or rituals for consumption, which must be strictly followed to achieve the desired result. Some medicines are not consumed orally but are tied or worn on the body as part of spiritual healing practices. At the basic level of healthcare, ethnomedicine remains an important choice for many people (Bhuyan 2015). Herbal medicine can cure many diseases, such as malaria, different types of Cancer, Diabetes, Skin diseases, Fever, Jaundice, Asthma, chickenpox, and Fungal infections. Mental disorders and also Chronic diseases, such as Anxiety, Depression, etc., are also treated, but there is no scientific evidence to prove their efficacy (Pote *et al.* 2018). Although several traditional practices indicate that *Bacopa monnieri* improves memory, there is no scientific proof to support this claim.

Therefore, this survey focuses on documenting the traditional knowledge of indigenous communities in the Dibrugarh district and Majuli district regarding the ethnomedicinal use of plants and on conserving both medicinal plant species and indigenous wisdom. Such documentation is essential for supporting ecological balance, cultural continuity, and sustainable development for future generations (Nigam 2025).

## Materials and Methods

### Study area

The survey was conducted in Dibrugarh district and Majuli district of Assam, where biodiversity is highly diverse and culturally significant.

### Brief Description of Dibrugarh District

Dibrugarh district has a diverse community that has extensive knowledge of traditional medicine used by the local people. Dibrugarh district falls under Upper Assam. Dibrugarh district is situated in the eastern part of Assam. The district lies between 27° C and the district extends from 27°5'38"N to 27°42'30"N latitude and 94°33'46"E to 95°29'8"E longitude. The district covers an area of 3381 sq. Kms. (Dibrugarh district 2025).

### Brief Description of Majuli District

Majuli, the world's largest river island, is in the Brahmaputra River in Northeastern Assam. It is the country's first river island district. (Majuli district 2025). The district covers an area of approximately 483 square kilometres. It is situated between 26°45' N-27°12' N latitude and 93°39' E and 94°35' E longitude. The island covers a total area of 487.55 km<sup>2</sup> with a population of 167,304 according to the 2011 Census of India (Roy *et al.* 2020).

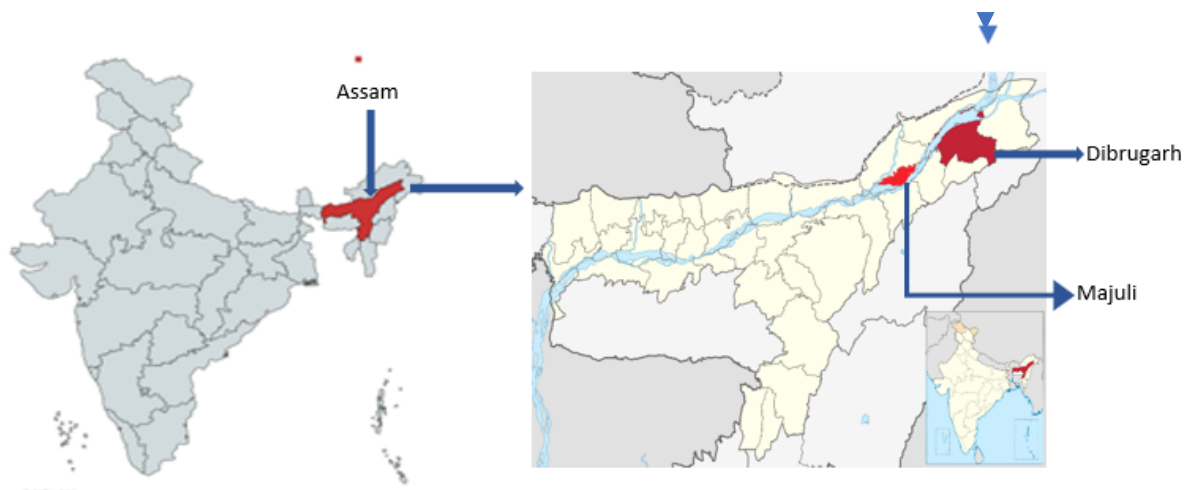


Figure 1. Map of Assam, India, showing the study areas of Dibrugarh District and Majuli District.

### Data Collection and Study Population

The ethnobotanical survey was conducted in 2024 in the Dibrugarh and Majuli districts of Assam, Northeast India. Data were collected through a semi-structured questionnaire (S. Format 1) and face-to-face, in-depth interviews. A total of 82 interviews were conducted with 82 participants. While conducting interviews with locals on a field tour, some photos were taken (S. Figure 7). The participants were selected based on their knowledge and experience of traditional medicinal plant use. The questionnaire comprised questions related to local plant names, plant parts used, therapeutic applications, and perceived conservation status of medicinal plants. The interviews also allowed participants to provide additional information beyond the predefined questions.

The participants included recognised herbal healers as well as other knowledgeable community members, including farmers, housewives, teachers, businesspeople, and day labourers. Thus, the 82 participants were not restricted to formally recognised herbal healers; rather, all participants were included based on their relevant ethnomedicinal knowledge. Informants were selected using purposive sampling to identify individuals with relevant knowledge of medicinal plants, followed by snowball sampling, in which knowledgeable participants recommended other potential informants. Prior Informed Consent (PIC) was obtained from all participants before conducting the interviews.

Interviews were conducted in the Assamese language to facilitate communication and allow informants to describe their traditional knowledge accurately. Each interview lasted approximately 45 minutes to 1 hour, depending on the knowledge and availability of the informant. A total of 121 field visits were conducted during the study period. Where clarification was required, information was revisited with the respective informants during subsequent interactions. Participant observation was used to document relevant aspects of medicinal plant use where applicable.

Table 1. Socio-Demographic Data of the Informants.

| Informants | Demographic Information | Total Informants | Percentage (%) |
|------------|-------------------------|------------------|----------------|
| Gender     | Male                    | 39               | 47.56          |
|            | Female                  | 43               | 52.44          |
| Age Group  | 40-50                   | 12               | 14.63          |
|            | 51-60                   | 20               | 24.39          |
|            | 61-70                   | 22               | 26.83          |
|            | 71-80+                  | 28               | 34.15          |
| Occupation | Housewife               | 28               | 34.15          |
|            | Day Labour              | 21               | 25.61          |
|            | Farmer                  | 25               | 30.49          |
|            | Teacher                 | 3                | 3.66           |
|            | Business                | 5                | 6.10           |
| Education  | Illiterate              | 9                | 10.98          |
|            | Primary                 | 30               | 36.59          |
|            | Middle                  | 25               | 30.49          |
|            | Secondary               | 15               | 18.29          |
|            | Bachelor Degree         | 3                | 3.66           |

#### Plant collection and identification

A total of 129 medicinal plant species belonging to 61 families were documented from the ethnobotanical information provided by the 82 informants. Informants assisted in the field collection of the reported medicinal plants, where permitted. During field surveys, the collected plants were documented through field notes and photographs, and information on their local names, plant parts used, and reported therapeutic applications was recorded. Voucher specimens were prepared following standard herbarium procedures and deposited at the School of Life Sciences, University of Hyderabad, for future reference. The collected specimens were identified using relevant regional floras and standard taxonomic literature and were further verified through consultation with taxonomic experts. The accepted scientific names, family assignments, and taxonomic nomenclature of the documented species were cross-checked using authoritative taxonomic resources, particularly Plants of the World Online (POWO). Plant-use information was also cross-checked among informants to identify consistent reports and clarify discrepancies in local names, plant identification, and reported medicinal uses.

#### Data Analysis

The ethnopharmacological data collected through in-depth interviews were organised and collated using MS-Excel. We considered each usage report (UR) as a single record, as it was provided by a single source describing the medicinal use of a specific plant species. To analyse the interview data quantitatively, we used tools such as Use Value (UV), Fidelity Value (FL), Relative Frequency of Citation (RFC), Frequency of Citation (FC), Informant Consensus Factor (ICF), Family Use Value (FUV). To facilitate comparison and evaluation of informant agreement, use reports were categorised into key disease groups. Based on the quantity of use reports and the proportion of informants mentioning each species, the relative significance of plant species and therapeutic categories was assessed.

First, we sum the UR of all the informants within each use-category for that species (s); i.e., the number of informants who mention each use-category for the species. Second, we sum all the UR of each use-category. (Tardío & Pardo-de-Santayana 2008).

#### Use value (UV)

Use Value (UV) was calculated to assess the relative importance of each medicinal plant species based on the number of use reports provided by the informants (Phillips and Gentry 1993). The Use Value was calculated using the formula:

$$UV_i = U_i/N$$

where  $U_i$  represents the total number of use reports (UR) recorded for species  $i$ , and  $N$  represents the total number of informants ( $N = 82$ ). Higher UV values indicate a greater number of reported medicinal uses for a species within the study population.

#### **Relative Frequency of Citation (RFC)**

Relative Frequency of Citation (RFC) was calculated to determine the relative frequency with which each medicinal plant species was cited by the informants (Chaachouay *et al.* 2020). The RFC was calculated using the formula:

$$RFC = \frac{FC}{N}$$

where **FC** represents the number of informants who cited or reported a particular plant species, and **N** represents the total number of informants participating in the study (**N = 82**). The RFC values range from 0 to 1, with higher values indicating that a greater proportion of informants cited the particular plant species.

#### **Fidelity Level (FL)**

Fidelity Level (FL) was calculated to determine the percentage of informants who reported a particular medicinal plant species for a specific ailment. The FL was calculated using the following formula (Chaachouay *et al.* 2020).

$$FL\% = \frac{L_p}{L_u} \times 100\%$$

where  $L_p$  represents the number of informants who reported a particular plant species for a specific ailment, and  $L_u$  represents the total number of informants who reported that plant species for any medicinal use. A higher FL value indicates that a greater proportion of informants associated a particular plant species with the same specific ailment.

#### **Informant Consensus Factor (ICF)**

Consensus among informants across different disease categories was examined using the Informant Consensus Factor (ICF) following Trotter and Logan (1986). Reported ailments were classified according to their primary affected body system and clinical nature. Closely related gastrointestinal and hepatobiliary conditions were grouped, whereas urogenital and gynaecological, dermatological, toxicological, haematological, respiratory, neurological, musculoskeletal, cardiovascular, endocrine and metabolic, infectious and parasitic, and neoplastic conditions were classified separately. ENT, ophthalmological, and oral/dental conditions were grouped into a single category due to the limited number of reported ailments in each group. Cancer-related conditions were grouped under neoplastic disorders irrespective of their anatomical site. General health and wellness uses were retained as a separate category when no specific disease condition was reported. This classification was applied consistently to all reported ailments before calculating the ICF.

$$ICF = \frac{N_{ur} - N1}{N_{ur} - 1}$$

where  $N_{ur}$  represents the total number of use reports for all ailments within a particular disease category, and  $N1$  represents the number of different plant taxa used for that disease category. Higher ICF values indicate greater agreement among informants regarding the use of medicinal plants for ailments within a particular disease category. Conversely, lower ICF values indicate greater variation in plant selection among informants. Thus, the ICF reflects the degree of informant consensus regarding plant use for specific disease categories.

#### **Family Use Value (FUV)**

Family Use Value (FUV) was calculated to assess the relative importance of each plant family based on the use values of medicinal species within that family. The FUV for each family was calculated as the sum of the Use Values (UV) of all species recorded within the family divided by the total number of species belonging to that family:

$$FUV = \frac{\sum UVs}{N_s}$$

where  $\sum UV_i$  denotes the sum of the Use Values of all medicinal plant species in a particular family, and  $N_i$  denotes the total number of medicinal plant species recorded in that family. Higher FUV values indicate a greater overall use value of the medicinal species represented within a plant family (Bhattacharyya *et al.* 2020).

Ethnopharmacological significance at the family level was evaluated descriptively using the number of medicinal plant species recorded per family and the total number of usage reports assigned to each family. This method enables the identification of plant groups that contribute the most to local medicinal practices without the use of composite indices. (Bhattacharyya *et al.* 2020).

The ethnomedicinal information obtained from all 82 informants was compiled and subjected to quantitative analysis. Pearson's correlation analysis was performed using IBM SPSS Statistics version 25 (SPSS 2025) to assess the relationship between Use Value (UV) and Relative Frequency of Citation (RFC) among the documented medicinal plant species. Specifically, the analysis examined whether plant species cited by a greater proportion of informants also tended to have higher Use Values. This analysis was intended to assess the relationship between the two quantitative ethnobotanical measures within the dataset rather than to infer ecological distribution or the depth of traditional knowledge.

## Results

### Demographic data of the survey

A survey of 82 herbal healers revealed that women (43) outnumbered men (39) (Table 1). This may be because men often work outside the home, leaving women to manage household health issues and gain greater herbal knowledge. The healers' ages ranged from 40 to over 80, with no young practitioners, as younger generations leave villages for education or better opportunities. Among the healers were three teachers, five businesspeople, twenty-eight housewives, twenty-five farmers, and twenty-one day labourers. Educationally, one held a bachelor's degree, three had higher secondary, twenty-five had middle school, thirty had primary school, and nine were illiterate, reflecting diverse backgrounds and experiences.

In Table 2, you can see the 129 medicinal plant species that were reported in the ethnobotanical survey. Along with their scientific and local names, the number of use value (UV), Relative Frequency of Citation (RFC), plant parts used, therapeutic indications, Conservation Categories and family affiliation, you can also see the plant parts that were used. Traditional medical knowledge in the research area was extensive, as the recorded species were used to cure a variety of diseases. The most commonly used plant components were Leaves, Roots, Bark, Fruits, and Whole plants. The Use Value (UV) of the documented medicinal plants ranged from 0.012 to 0.097. *Piper nigrum* recorded the highest UV (0.097), followed by *Terminalia arjuna*, *Caesalpinia bonduc*, and *Azadirachta indica*, each with a UV of 0.085. *Zanthoxylum nitidum* also showed a relatively high UV of 0.075.

The Relative Frequency of Citation (RFC) ranged from 0.012 to 0.292. *Azadirachta indica* recorded the highest RFC (0.292), followed by *Caesalpinia bonduc* (0.207). *Citrus aurantiifolia* and *Piper nigrum* had an RFC of 0.182 each. An RFC of 0.170 was recorded for *Curcuma longa*, *Myristica fragrans*, *Terminalia arjuna*, *Zanthoxylum nitidum*, and *Zingiber officinale*.

Among the 129 medicinal plant species documented, two species (1.55%) were classified under threatened IUCN categories (Vulnerable, Endangered, or Critically Endangered). The remaining 127 species were either classified as Least Concern (LC), Near Threatened (NT), or Data Deficient (DD), or had no formal IUCN assessment available and were therefore recorded as Not Assessed (NA). The scientific names of all documented species were checked and standardised using the Plants of the World Online (POWO) database.

The field investigation documented 129 plant species belonging to 61 families that were traditionally reported for use in managing various ailments. The Fabaceae family was the most dominant, followed by Lamiaceae, Zingiberaceae, Asteraceae, Piperaceae, and Rutaceae. Many of these plants grow naturally in rainforests, while others are cultivated in local kitchen gardens. Different plant parts are used for different ailments, with knowledge passed down through generations. Local healers helped identify species and their native names.

Table 2. Detailed List of Number of Plants Used in This Study. (Ass- Assamese)

| Scientific Name                                            | Family         | Local Name (Ass) | Parts Used                        | Ailments                                            | Conservation Categories | Use Value | RFC   |
|------------------------------------------------------------|----------------|------------------|-----------------------------------|-----------------------------------------------------|-------------------------|-----------|-------|
| <i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees     | Acanthaceae    | Kalmegh          | Whole Plant                       | Malaria, Fever, Snake Bite, Dysentery, Haemorrhoids | Not Assessed (NA)       | 0.060     | 0.060 |
| <i>Phlogacanthus thyrsoiflorus</i> Nees.                   | Acanthaceae    | Tita phul        | Flower, Leaves                    | Malaria, Bone Fracture                              | Not Assessed (NA)       | 0.024     | 0.073 |
| <i>Phlogacanthus thyrsoiformis</i> (Roxb. ex Hardw.) Mabb. | Acanthaceae    | Tita bahok       | Leaves                            | Periods, Cramps, Cough                              | Not Assessed (NA)       | 0.036     | 0.085 |
| <i>Alternanthera sessilis</i> (L.)DC.                      | Amaranthaceae  | Matikanduri      | Leaves                            | Jaundice                                            | Least concern (LC)      | 0.012     | 0.024 |
| <i>Amaranthus spinosus</i> L.                              | Amaranthaceae  | Hati khutura     | Aerial Part                       | Increase Lactation in Nursing Mothers               | Not Assessed (NA)       | 0.012     | 0.012 |
| <i>Chenopodium album</i> L.                                | Amaranthaceae  | Jilmil sak       | Aerial Part                       | Constipation                                        | Not Assessed (NA)       | 0.012     | 0.012 |
| <i>Allium cepa</i> L.                                      | Amaryllitaceae | Axomiya piyaz    | Fruit                             | Haemorrhoids,                                       | Not Assessed (NA)       | 0.012     | 0.012 |
| <i>Acorus calamus</i> L.                                   | Anacardiaceae  | Boss             | Root                              | Pneumonia                                           | Not Assessed (NA)       | 0.012     | 0.012 |
| <i>Mangifera indica</i> L.                                 | Anacardiaceae  | Amm              | Seed, Bark                        | Blood Dysentery, Snake Bite, Jaundice               | Not Assessed (NA)       | 0.036     | 0.073 |
| <i>Spondias pinnata</i> (L.f.) Kurz                        | Anacardiaceae  | Amora            | Fruit                             | Blood Dysentery                                     | Least concern (LC)      | 0.012     | 0.048 |
| <i>Annona reticulata</i> Sieber ex A.DC.                   | Annonaceae     | Atlas            | Leaves, Bark                      | Wound, Diarrhoea                                    | Not Assessed (NA)       | 0.024     | 0.024 |
| <i>Ferula assa-foetida</i> L.                              | Apiaceae       | Hinga            | Leaves                            | Wound                                               | Not Assessed (NA)       | 0.012     | 0.024 |
| <i>Centella asiatica</i> (L.) Urban                        | Apiaceae,      | Bor manimuni     | Leaves                            | Diarrhoea, Tonsil                                   | Least concern (LC)      | 0.024     | 0.060 |
| <i>Alstonia scholaris</i> (L.) R.Br.                       | Apocynaceae    | Sotiyana         | Bark, Milky Juice Extract, Leaves | Pneumonia, Toothache, Ulcer, Snake Bite             | Not Assessed (NA)       | 0.048     | 0.097 |
| <i>Catharanthus roseus</i> (L.) G.Don                      | Apocynaceae    | Boga nayantora   | Leaves                            | Diabetes                                            | Not Assessed (NA)       | 0.012     | 0.036 |
| <i>Cryptolepis dubia</i> Burm F.                           | Apocynaceae    | Nahor lota       | Stem, Whole Plant                 | Bone Fracture                                       | Not Assessed (NA)       | 0.012     | 0.024 |
| <i>Alocasia indica</i> (Lour.) Spach                       | Araceae        | Man kosu         | Rhizome                           | Jaundice                                            | Least concern (LC)      | 0.012     | 0.012 |
| <i>Alocasia odora</i> (G.Lodd.) Spach                      | Araceae        | Dohi kosu        | Root                              | Kills Intestinal Worms                              | Least concern (LC)      | 0.012     | 0.012 |
| <i>Areca catechu</i> L.                                    | Araceae        | Tamul            | Fruit                             | Tonsil                                              | Not Assessed (NA)       | 0.012     | 0.012 |
| <i>Colocasia esculenta</i> L.                              | Araceae        | Kola kosu        | Leaves, Stem                      | Cancer, Toothache                                   | Not Assessed (NA)       | 0.024     | 0.036 |
| <i>Lasia spinosa</i> (L.) Thwaites                         | Araceae        | Sengmora         | Leaves, Corm                      | Haemorrhoids, Fever                                 | Least concern (LC)      | 0.024     | 0.036 |

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|                                                      |                 |                      |              |                                                                                 |                    |       |       |
|------------------------------------------------------|-----------------|----------------------|--------------|---------------------------------------------------------------------------------|--------------------|-------|-------|
| <i>Heteropanax fragrans</i> (Roxb.) Seem.            | Araliaceae      | <b>Keseru</b>        | Bark         | Haemorrhoids                                                                    | Least concern (LC) | 0.012 | 0.012 |
| <i>Hydrocotyle sibthorpioides</i> Lam.               | Araliaceae      | <b>Horu manimuni</b> | Leaves       | Jaundice                                                                        | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Calamus tenuis</i> Roxb.                          | Arecaceae       | <b>Bet gaz</b>       | Tender Shoot | Cancer                                                                          | Least concern (LC) | 0.012 | 0.012 |
| <i>Calotropis procera</i> (Aiton) W.T.Aiton          | Asclepiadaceae  | <b>Akon pat</b>      | Leaves       | Haemorrhoids, Spondylitis                                                       | Least concern (LC) | 0.024 | 0.097 |
| <i>Asparagus officinalis</i> L.                      | Asparagaceae    | <b>Satmul</b>        | Root, Stem   | Urolithiasis. Urine Infection                                                   | Not Assessed (NA)  | 0.036 | 0.036 |
| <i>Ageratum houstonianum</i> Mill.                   | Asteraceae      | <b>Gundhuabon</b>    | Root         | Pneumonia                                                                       | Not Assessed (NA)  | 0.012 | 0.024 |
| <i>Eclipta prostrata</i> L.                          | Asteraceae      | <b>Kehraj</b>        | Leaves       | Burn                                                                            | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Grewia multiflora</i> Blanco                      | Asteraceae      | <b>Kukurheta</b>     | Bark         | Leukorrhea                                                                      | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Mikania micrantha</i> Kunth                       | Asteraceae      | <b>Prem lota</b>     | Leaves       | Bone Fracture, Wound                                                            | Not Assessed (NA)  | 0.024 | 0.048 |
| <i>Tagetes erecta</i> L.                             | Asteraceae      | <b>Narji</b>         | Leaves       | Wound, Eye Diseases                                                             | Not Assessed (NA)  | 0.024 | 0.048 |
| <i>Oroxylum indicum</i> (L.) Kurz                    | Bignoniaceae    | <b>Bhatgilla</b>     | Bark         | Haemorrhoids                                                                    | Least concern (LC) | 0.012 | 0.012 |
| <i>Mesua ferrea</i> L.                               | Calophyllaceae  | <b>Jati nahor</b>    | Leaves       | Haemorrhoids                                                                    | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Crateva religiosa</i> G.Forst.                    | Capparaceae     | <b>Borun</b>         | Bark         | Boil                                                                            | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Carica papaya</i> Linn                            | Caricaceae      | <b>Amita</b>         | Gum, Fruit   | Mumms, Constipation                                                             | Not Assessed (NA)  | 0.024 | 0.024 |
| <i>Drymaria cordata</i> (L.) Wild. ex Schult.        | Caryophyllaceae | <b>Laijobori</b>     | Leaves       | Sinus, Jaundice                                                                 | Not Assessed (NA)  | 0.024 | 0.024 |
| <i>Garcinia cowa</i> Roxb. ex Choisy                 | Clusiaceae      | <b>Kuji theka</b>    | Fruit        | Blood Dysentery, Diarrhoea                                                      | Least concern (LC) | 0.024 | 0.060 |
| <i>Garcinia pedunculata</i> Roxb. ex Buch.-Ham.      | Clusiaceae      | <b>Meseki</b>        | Leaves       | T.B                                                                             | Least Concern (LC) | 0.012 | 0.024 |
| <i>Garcinia xanthochymus</i> Hook.f. ex T.Anderson   | Clusiaceae      | <b>Tepor tenga</b>   | Fruit        | Dysentery, Urolithiasis,                                                        | Least concern (LC) | 0.024 | 0.048 |
| <i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. | Combretaceae    | <b>Arjun</b>         | Bark, Leaves | Paralysis, Ulcer, Asthma, Diabetes, High Blood Pressure, Pneumonia, Fatty Liver | Least concern (LC) | 0.085 | 0.170 |
| <i>Terminalia bellirica</i> (Gaertn.) Roxb.          | Combretaceae    | <b>Bhumura</b>       | Bark, Fruit  | Ulcer, Stomach Pain, Diabetes                                                   | Least concern (LC) | 0.036 | 0.048 |
| <i>Terminalia chebula</i> Retz.                      | Combretaceae    | <b>Hilikha</b>       | Bark, Fruit  | Stomach Pain, Diabetes, Constipation                                            | Least concern (LC) | 0.036 | 0.048 |

|                                                    |                |                     |                   |                                                                                          |                    |       |       |
|----------------------------------------------------|----------------|---------------------|-------------------|------------------------------------------------------------------------------------------|--------------------|-------|-------|
| <i>Cuscuta reflexa</i> Roxb.                       | Convolvulaceae | <b>Akakhi lota</b>  | Stem, Whole Plant | Bone Fracture                                                                            | Not Assessed (NA)  | 0.012 | 0.024 |
| <i>Ipomea aquatica</i> Forssk.                     | Convolvulaceae | <b>Kol mou</b>      | Whole Plant       | Increase Lactation in Nursing Mothers                                                    | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Cheilocostus speciosus</i> (J.Konig) C.D.Specht | Costaceae      | <b>Jomlakhuti</b>   | Rhizome           | Urolithiasis, Jaundice                                                                   | Least Concern (LC) | 0.024 | 0.048 |
| <i>Kalanchoe pinnata</i> (Lam.) Pers.              | Crassulaceae   | <b>Dupor tenga</b>  | Leaves            | Gallbladder, Jaundice, Urolithiasis                                                      | Not Assessed (NA)  | 0.036 | 0.060 |
| <i>Coccinia grandis</i> L.                         | Cucurbitaceae  | <b>Belipoka</b>     | Root              | Pneumonia                                                                                | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Cyperus rotundus</i> L.                         | Cyperaceae     | <b>Keyabon</b>      | Corm              | Pneumonia, Period Cramp                                                                  | Least concern (LC) | 0.024 | 0.073 |
| <i>Dillenia Indica</i> L.                          | Dilleniaceae   | <b>Outenga</b>      | Fruit             | Jaundice                                                                                 | Least concern (LC) | 0.012 | 0.024 |
| <i>Equisetum diffusum</i> D.Don                    | Equisetaceae   | <b>Horsetails</b>   | Whole Plant       | Bone Fracture                                                                            | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Croton caudatus</i> Geiseler                    | Euphorbiaceae  | <b>Lota mahuti</b>  | Bark              | Liver Cancer, Pneumonia                                                                  | Least concern (LC) | 0.024 | 0.036 |
| <i>Jatropha curcas</i> L.                          | Euphorbiaceae  | <b>Bongali ara</b>  | Bark, Leaves      | Haemorrhoids, Diarrhoea, And Skin Diseases                                               | Not Assessed (NA)  | 0.036 | 0.121 |
| <i>Ricinus communis</i> L.                         | Euphorbiaceae  | <b>Ara</b>          | Leaves            | Any Pain, Swelling                                                                       | Least concern (LC) | 0.024 | 0.036 |
| <i>Acacia farnesiana</i> L.                        | Fabaceae       | <b>Toruakodom</b>   | Leaves            | Bone Fracture                                                                            | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Caesalpinia bonduc</i> (L.) Roxb.               | Fabaceae       | <b>Leta guti</b>    | Root, Seed        | Thyroid, Stomach Pain, Nerve Issues, Liver Cancer, Pneumonia, Period Cramps. Bone Cancer | Least concern (LC) | 0.085 | 0.207 |
| <i>Chamaecrista absus</i> (L.) H.S.Irwin & Barneby | Fabaceae       | <b>Latumoni</b>     | Root, Leaves      | Fever, Cough, Tonsil                                                                     | Not Assessed (NA)  | 0.036 | 0.036 |
| <i>Entada phaseoloides</i> L.                      | Fabaceae       | <b>Makorighilla</b> | Bark              | Blood Dysentery                                                                          | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Erythrina variegata</i> L.                      | Fabaceae       | <b>Boga modar</b>   | Bark              | Snake Bite                                                                               | Least concern (LC) | 0.012 | 0.012 |
| <i>Erythrina variegata</i> L.                      | Fabaceae       | <b>Modar</b>        | Bark              | Period Cramps                                                                            | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Mimosa pudica</i> L.                            | Fabaceae       | <b>Nilaji bon</b>   | Leaves            | Haemorrhoids, Nose Bleeding, Toothache, Fatty Liver                                      | Not Assessed (NA)  | 0.048 | 0.085 |
| <i>Tamarindus indica</i> L.                        | Fabaceae       | <b>Teteli</b>       | Leaves            | High Blood Pressure, Jaundice                                                            | Not Assessed (NA)  | 0.024 | 0.024 |
| <i>Cynodon dactylon</i> (L.) Pers.                 | Gramineae      | <b>Dubori bon</b>   | Leaves            | Urine Infection, Bone Fracture, Jaundice                                                 | Not Assessed (NA)  | 0.036 | 0.158 |

|                                                        |                 |                     |               |                                                                                       |                    |       |       |
|--------------------------------------------------------|-----------------|---------------------|---------------|---------------------------------------------------------------------------------------|--------------------|-------|-------|
| <i>Clerodendrum colebrookianum</i> Walp                | Lamiaceae       | <b>Nefafu</b>       | Leaves        | High Blood Pressure                                                                   | Not Assessed (NA)  | 0.012 | 0.048 |
| <i>Clerodendrum infortunatum</i> L.                    | Lamiaceae       | <b>Dhopat tita</b>  | Leaves        | Asthma                                                                                | Not Assessed (NA)  | 0.012 | 0.036 |
| <i>Leucas aspera</i> (Willd.) Link                     | Lamiaceae       | <b>Durun</b>        | Root, Leaves  | Pneumonia, Sinus, Tonsil, Jaundice, Bone Cancer, Snake Bite                           | Not Assessed (NA)  | 0.073 | 0.109 |
| <i>Mentha spicata</i> L.                               | Lamiaceae       | <b>Pudina</b>       | Aerial Part   | Jaundice                                                                              | Least concern (LC) | 0.012 | 0.012 |
| <i>Ocimum tenuiflorum</i> L.                           | Lamiaceae       | <b>Kola tulokhi</b> | Leaves        | Fever, Cough, Skin Diseases                                                           | Not Assessed (NA)  | 0.036 | 0.109 |
| <i>Pogostemon heyneanus</i> Benth                      | Lamiaceae       | <b>Xukloti</b>      | Leaves        | Postpartum Haemorrhages                                                               | Not Assessed (NA)  | 0.012 | 0.024 |
| <i>Vitex negundo</i> L.                                | Lamiaceae       | <b>Posotia</b>      | Leaves        | Bone Pain, Anorexia, Bone Fracture                                                    | Not Assessed (NA)  | 0.036 | 0.048 |
| <i>Cinnamomum zeylanicum</i>                           | Lauraceae       | <b>Dalseni</b>      | Bark          | Pharyngitis                                                                           | Endangered (EN)    | 0.012 | 0.024 |
| <i>Litsea salicifolia</i> (Roxb. ex Nees) Hook.f.      | Lauraceae       | <b>Dhighloti</b>    | Leaves        | Skin Cancer                                                                           | Least concern (LC) | 0.012 | 0.036 |
| <i>Aloe vera</i> (L.) Burm.f.                          | Liliaceae       | <b>Sal kuwari</b>   | Leaves        | Asthma, Hair fall, Skin Diseases, Jaundice                                            | Not Assessed (NA)  | 0.048 | 0.158 |
| <i>Bonnaya ruellioides</i> (Colsm.) Spreng.            | Linderniaceae   | <b>Kasidoya</b>     | Leaves, Stem  | Urine Infection, Tonsil Infection                                                     | Not Assessed (NA)  | 0.024 | 0.036 |
| <i>Punica granatum</i> L.                              | Lythraceae      | <b>Dalim</b>        | Leaves, Fruit | Dysentery                                                                             | Least concern (LC) | 0.012 | 0.024 |
| <i>Hibiscus rosa-sinensis</i> L.                       | Malvaceae       | <b>Jobab phul</b>   | Leaves        | Leukorrhea. Boil                                                                      | Not Assessed (NA)  | 0.012 | 0.024 |
| <i>Hibiscus sabdariffa</i> L.                          | Malvaceae       | <b>Tengamora</b>    | Leaves        | Diarrhoea                                                                             | Not Assessed (NA)  | 0.012 | 0.012 |
| <i>Melastoma malabathricum</i> L.                      | Melastomataceae | <b>Futokola</b>     | Leaves        | Mouth Ulcer                                                                           | Not Assessed (NA)  | 0.012 | 0.073 |
| <i>Azadirachta indica</i> A. Juss.                     | Meliaceae       | <b>Moha neem</b>    | Leaves        | Diabetes, Kills Intestinal Worms, Skin Diseases, Fever, Jaundice, Chicken Pox, Asthma | Least concern (LC) | 0.085 | 0.292 |
| <i>Stephania japonica</i> (Thunb.) Miers               | Menispermaceae  | <b>Tubuki lota</b>  | Leaves        | Jaundice, Stomach Pain, And Flatulence.                                               | Not Assessed (NA)  | 0.036 | 0.048 |
| <i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson | Menispermaceae  | <b>Giloy</b>        | Stem          | Haemorrhoids, Bone Fracture                                                           | Not Assessed (NA)  | 0.024 | 0.073 |
| <i>Tinospora sinensis</i> (Lour.) Merr.                | Menispermaceae  | <b>Hoguni lota</b>  | Stem          | Diabetes, Bone Fracture, Jaundice                                                     | Not Assessed (NA)  | 0.036 | 0.036 |
| <i>Artocarpus heterophyllus</i> Lam.                   | Moraceae        | <b>Kothal</b>       | Rind          | Paralysis                                                                             | Not Assessed (NA)  | 0.012 | 0.024 |

|                                                      |                |                     |                        |                                                                                              |                     |       |       |
|------------------------------------------------------|----------------|---------------------|------------------------|----------------------------------------------------------------------------------------------|---------------------|-------|-------|
| <i>Streblus asper</i> Lour.                          | Moraceae       | <b>Xorua</b>        | Bark, Leaves           | Haemorrhoids, Jaundice                                                                       | Least concern (LC)  | 0.024 | 0.036 |
| <i>Musa balbisiana</i> Colla                         | Musaceae       | <b>Bhim kol</b>     | Leaves, Fruit          | Toothache<br>Anaemia, Jaundice                                                               | Not Assessed (NA)   | 0.036 | 0.085 |
| <i>Myristica fragrans</i> Houtt.                     | Myristicaceae  | <b>Jaifol</b>       | Seed                   | Haemorrhoids, Flatulence,<br>Constipation, Paralysis,<br>Pharyngitis, Pneumonia              | Data Deficient (DD) | 0.073 | 0.170 |
| <i>Syzygium cumini</i> (L.) Skeels                   | Myrtaceae      | <b>Kola jamun</b>   | Seed                   | Diabetes                                                                                     | Least concern (LC)  | 0.012 | 0.012 |
| <i>Syzygium jambos</i> (L.) Alston                   | Myrtaceae      | <b>Bogi jamun</b>   | Leaves                 | Jaundice                                                                                     | Least concern (LC)  | 0.012 | 0.012 |
| <i>Nyctanthes arbor-tristis</i> L.                   | Oleaceae       | <b>Hewali</b>       | Leaves                 | Bone Fracture                                                                                | Not Assessed (NA)   | 0.012 | 0.012 |
| <i>Averrhoa carambola</i> L.                         | Oxalidaceae    | <b>Kordoi</b>       | Fruit                  | Jaundice                                                                                     | Not Assessed (NA)   | 0.012 | 0.060 |
| <i>Oxalis debilis</i> Kunth                          | Oxalidaceae    | <b>Bor tengeshi</b> | Leaves,<br>Whole Plant | Any Pain, Diarrhoea,<br>Jaundice                                                             | Not Assessed (NA)   | 0.036 | 0.048 |
| <i>Bischofia javanica</i> Blume                      | Phyllanthaceae | <b>Uiram</b>        | Bark                   | Snake Bite                                                                                   | Least concern (LC)  | 0.012 | 0.012 |
| <i>Phyllanthus emblica</i> L.                        | Phyllanthaceae | <b>Amlokhi</b>      | Root, Fruit            | Asthma,<br>Good for Digestion,<br>Diabetes, Immune Booster.<br>Jaundice                      | Least concern (LC)  | 0.060 | 0.146 |
| <i>Phyllanthus niruri</i> L.                         | Phyllanthaceae | <b>Bon amlokhi</b>  | Root                   | Jaundice, Fever, Diarrhoea                                                                   | Not Assessed (NA)   | 0.036 | 0.060 |
| <i>Peperomia pellucida</i> (L.) Kunth                | Piperaceae     | <b>Pononua</b>      | Stem, Leaves           | Urine Infection                                                                              | Not Assessed (NA)   | 0.012 | 0.048 |
| <i>Piper betle</i> Linn                              | Piperaceae     | <b>Paan</b>         | Stem                   | Thyroid, Stomach Pain,<br>Nerve Issues, Period<br>Cramps, Pneumonia                          | Not Assessed (NA)   | 0.060 | 0.073 |
| <i>Piper longum</i> L.                               | Piperaceae     | <b>Pipoli</b>       | Seed                   | Pharyngitis                                                                                  | Not Assessed (NA)   | 0.012 | 0.012 |
| <i>Piper nigrum</i> L.                               | Piperaceae     | <b>Jaluk</b>        | Seed                   | Pneumonia, Cough, Fever,<br>Jaundice, Period Cramps,<br>Asthma, Fatty Liver, Liver<br>Cancer | Not Assessed (NA)   | 0.097 | 0.182 |
| <i>Syzygium aromaticum</i> (L.)<br>Merr. & L.M.Perry | Piperaceae     | <b>Long</b>         | Fruit                  | Pharyngitis                                                                                  | Not Assessed (NA)   | 0.012 | 0.024 |
| <i>Bacopa monnieri</i> (L.) Wettst                   | Plantaginaceae | <b>Brahmixak</b>    | Leaves Stem            | Memory Increases                                                                             | Endangered (EN)     | 0.012 | 0.012 |
| <i>Scoparia dulcis</i> L.                            | Plantaginaceae | <b>Senibon</b>      | Whole Plant            | Flatulence, Stomach Pain                                                                     | Not Assessed (NA)   | 0.024 | 0.036 |
| <i>Eleusine indica</i> (L.)                          | Poaceae        | <b>Bobosa bon</b>   | Leaves                 | Asthma                                                                                       | Least concern (LC)  | 0.012 | 0.012 |
| <i>Oryza sativa</i> L.                               | Poaceae        | <b>Hali dhan</b>    | Seed                   | Urine Infection                                                                              | Not Assessed (NA)   | 0.012 | 0.012 |

|                                                |              |                        |                     |                                                                                        |                      |       |       |
|------------------------------------------------|--------------|------------------------|---------------------|----------------------------------------------------------------------------------------|----------------------|-------|-------|
| <i>Persicaria decipiens</i> (R.Br.) K.L.Wilson | Polygonaceae | <b>Bixoilokorni</b>    | Leaves              | Any Pain                                                                               | Not Assessed (NA)    | 0.012 | 0.012 |
| <i>Stixis suaveolens</i> (Roxb.) Baill.        | Resedaceae   | <b>Madhoi maloti</b>   | Root                | Thyroid, Stomach Pain, Nerve Issues                                                    | Not Assessed (NA)    | 0.036 | 0.060 |
| <i>Rubus alceifolius</i> Poir.                 | Rosaceae     | <b>Jetulipoka</b>      | Bark, Leaves        | Thyroid, Stomach Pain, Nerve Issues, Asthma, Pneumonia                                 | Not Assessed (NA)    | 0.060 | 0.097 |
| <i>Rubus benguensis</i> Elmer                  | Rosaceae     | <b>Xung xungi</b>      | Leaves              | Asthma                                                                                 | Not Assessed (NA)    | 0.012 | 0.024 |
| <i>Morinda citrifolia</i> L                    | Rubiaceae    | <b>Nuni</b>            | Bark                | Pneumonia                                                                              | Not Assessed (NA)    | 0.012 | 0.012 |
| <i>Mussaenga frondosa</i> L                    | Rubiaceae    | <b>Sobaiatha</b>       | Root                | Haemorrhoids,                                                                          | Not Assessed (NA)    | 0.012 | 0.024 |
| <i>Paederia foetida</i> L.                     | Rubiaceae    | <b>Bhedailota</b>      | Whole Plant         | Dysentery, Anaemia, Constipation                                                       | Not Assessed (NA)    | 0.036 | 0.036 |
| <i>Aegle marmelos</i> (L.) Correa              | Rutaceae     | <b>Bell</b>            | Leaves              | Pneumonia, Haemorrhoids, Blood Dysentery, Fever, Eye Diseases                          | Near Threatened (NT) | 0.060 | 0.146 |
| <i>Citrus aurantiifolia</i> (Christm.) Swingle | Rutaceae     | <b>Gulnemu</b>         | Fruit, Leaves, Seed | Pneumonia, Blood Dysentery, Diarrhoea, Urolithiasis, Haemorrhoids, Skin Cancer, Asthma | Not Assessed (NA)    | 0.048 | 0.182 |
| <i>Citrus limon</i> (L.) Burm. f.              | Rutaceae     | <b>Kaji nemu</b>       | Leaves              | Bone Fracture, Jaundice                                                                | Not Assessed (NA)    | 0.024 | 0.060 |
| <i>Murraya koenigii</i> (L.) Spreng.           | Rutaceae     | <b>Noroxingho</b>      | Leaves              | Period Cramp                                                                           | Least concern (LC)   | 0.012 | 0.036 |
| <i>Zanthoxylum nitidum</i> A.St.-Hil.          | Rutaceae     | <b>Tezmuri</b>         | Bark                | Thyroid, Stomach Pain, Nerve Issues, Cancer, Liver Cancer, Fatty Liver                 | Not Assessed (NA)    | 0.073 | 0.170 |
| <i>Mimusops elengi</i> L                       | Sapotaceae   | <b>Bokul</b>           | Bark                | Toothache, Mouth Ulcer                                                                 | Not Assessed (NA)    | 0.024 | 0.036 |
| <i>Houttuynia cordata</i> Thunb.               | Saururaceae  | <b>Mosundori</b>       | Leaves              | Jaundice                                                                               | Not Assessed (NA)    | 0.012 | 0.012 |
| <i>Smilax perfoliata</i> Lour.                 | Smilacaceae  | <b>Tikoni boruah</b>   | Leaves              | Diabetes                                                                               | Not Assessed (NA)    | 0.012 | 0.012 |
| <i>Capsicum frutescens</i> L.                  | Solanaceae   | <b>Kunkuni jolokia</b> | Fruit               | Period Cramp                                                                           | Not Assessed (NA)    | 0.012 | 0.012 |
| <i>Solanum torvum</i> Sw.                      | Solanaceae   | <b>Hati vekuri</b>     | Root, Fruit         | Allergy, Malaria, Stomach Pain                                                         | Not Assessed (NA)    | 0.036 | 0.048 |
| <i>Solanum violaceum</i> R.Br.                 | Solanaceae   | <b>Tita bhekuri</b>    | Leaves, Seed        | T.B., Kills Intestinal Worms, Blood Purifier                                           | Not Assessed (NA)    | 0.036 | 0.073 |

|                                    |               |                      |              |                                                                      |                     |       |       |
|------------------------------------|---------------|----------------------|--------------|----------------------------------------------------------------------|---------------------|-------|-------|
| <i>Abroma augustum</i> (L.) L.f.   | Sterculiaceae | <b>Gorokhiakorai</b> | Leaves, Root | Onychomycosis                                                        | Not Assessed (NA)   | 0.012 | 0.024 |
| <i>Cissus quadrangularis</i> L.    | Vitaceae      | <b>Harjora lota</b>  | Stem         | Bone Fracture                                                        | Not Assessed (NA)   | 0.012 | 0.012 |
| <i>Leea indica</i> (Burm.f.) Merr. | Vitaceae      | <b>Kukurthengia</b>  | Leaves       | Skin Cancer                                                          | Least concern (LC)  | 0.012 | 0.012 |
| <i>Cucurma caesia</i> Roxb.        | Zingiberaceae | <b>Kola haldhi</b>   | Rhizome      | Bone Fracture, Jaundice                                              | Not Assessed (NA)   | 0.024 | 0.097 |
| <i>Curcuma amada</i> Roxb.         | Zingiberaceae | <b>Amm ada</b>       | Rhizome      | Diarrhoea                                                            | Not Assessed (NA)   | 0.012 | 0.012 |
| <i>Curcuma longa</i> L.            | Zingiberaceae | <b>Haldhi</b>        | Rhizome      | Primary Stage of Skin Cancer, Bone Fracture, Any Pain, Skin Diseases | Not Assessed (NA)   | 0.048 | 0.170 |
| <i>Elettaria cardamomum</i> (L.)   | Zingiberaceae | <b>Elachi</b>        | Seed         | Flatulence, Constipation, Paralysis, Pharyngitis, and Haemorrhoids.  | Not Assessed (NA)   | 0.060 | 0.158 |
| <i>Zingiber officinale</i> Roscoe  | Zingiberaceae | <b>Ada</b>           | Root         | Haemorrhoids, Cough, Digestion, Fever, And Bone Fracture             | Data Deficient (DD) | 0.060 | 0.170 |
| <i>Zingiber purpureum</i> Roscoe   | Zingiberaceae | <b>Moran ada</b>     | Rhizome      | Cough, Fever                                                         | Not Assessed (NA)   | 0.024 | 0.048 |

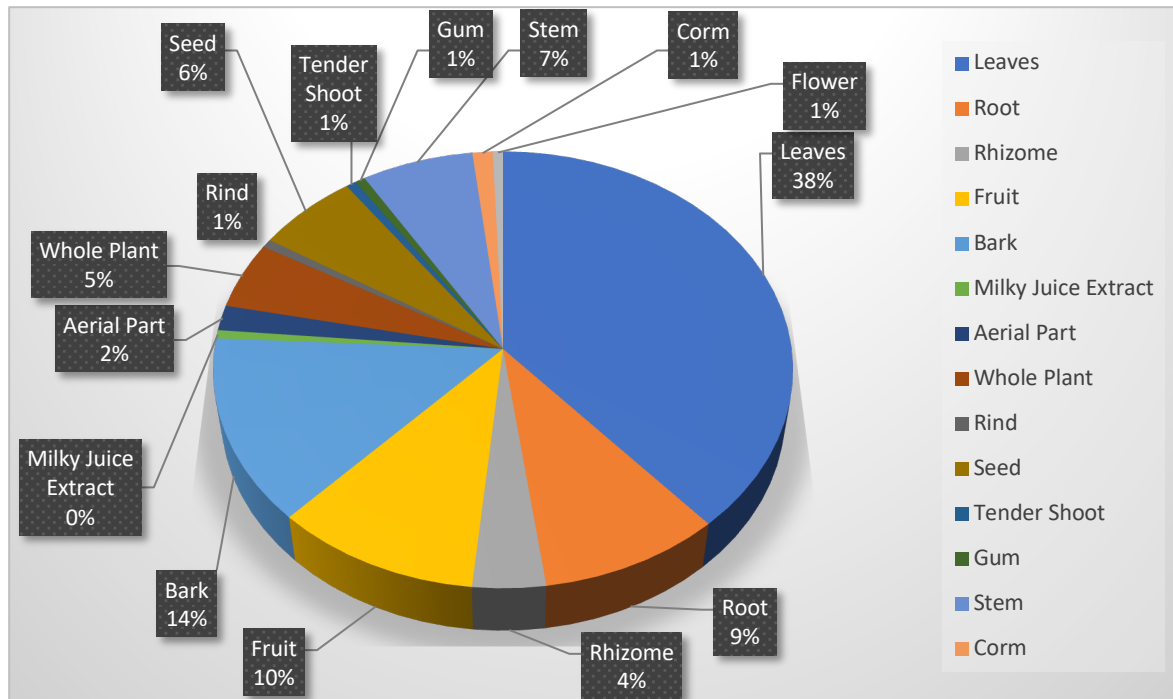


Figure 2. Graph showing percentage of plant parts used for the preparation of herbal formulation for treatment.

Table 3. List of ICF Values According to Different Categories.

| CATEGORIES                                      | DISEASES                                                                                                                                                       | Nur | N1 | ICF   |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-------|
| Gastrointestinal and Hepatobiliary disorders    | Jaundice, Gallbladder, Digestion, Diarrhoea, Constipation, Stomach pain, Fatty liver, Haemorrhoids, Ulcer, Mouth ulcer, Flatulence, Dysentery, Blood dysentery | 95  | 71 | 0.255 |
| Urogenital and Gynaecological disorders         | Urine infection, Urolithiasis, Period cramps, Increased Lactation in a nursing mother, Leukorrhea, Postpartum haemorrhage                                      | 23  | 22 | 0.045 |
| Dermatological disorders                        | Onychomycosis, Hair fall, Skin diseases, Allergy, Burn, Chicken pox, Swelling, Wound                                                                           | 15  | 13 | 0.142 |
| Toxicological conditions                        | Snake bite                                                                                                                                                     | 6   | 6  | 0     |
| Haematological disorders                        | Blood purifiers, Anaemia                                                                                                                                       | 3   | 3  | 0     |
| Respiratory disorders                           | Pneumonia, Sinus, Tonsil, Cough, Asthma, T.B                                                                                                                   | 51  | 36 | 0.300 |
| Neurological disorders                          | Nerve issues, Paralysis                                                                                                                                        | 9   | 9  | 0     |
| Eating disorders                                | Anorexia                                                                                                                                                       | 1   | 1  | 0     |
| ENT, Ophthalmological and Oral/Dental disorders | Pharyngitis, Eye diseases, Toothache, Nose bleeding                                                                                                            | 13  | 12 | 0.083 |
| Infectious and Parasitic diseases               | Kills intestinal worms, Mumps, Malaria, and Boils                                                                                                              | 10  | 10 | 0     |
| Neoplastic disorders                            | Cancer, Bone cancer, Skin cancer, Liver cancer                                                                                                                 | 13  | 11 | 0.167 |
| General health and Wellness                     | Immune booster, Memory increase                                                                                                                                | 2   | 2  | 0     |
| Endocrine and Metabolic disorders               | Diabetes, Thyroid                                                                                                                                              | 14  | 14 | 0     |
| Musculoskeletal Disorders                       | Bone fracture, Bone pain, General pain, Spondylitis                                                                                                            | 21  | 19 | 0.100 |
| Cardiovascular disorders                        | High Blood pressure                                                                                                                                            | 3   | 3  | 0     |

The Informant Consensus Factor (ICF) values ranged from 0.00 to 0.30 across the disease categories (Table 3). The highest ICF value was recorded for respiratory disorders (ICF = 0.30), with 51 use reports involving 36 plant taxa. This was followed by gastrointestinal and hepatobiliary disorders (ICF = 0.255), with 95 use reports involving 71 plant taxa; neoplastic disorders showed an ICF of 0.167, based on 13 use reports involving 11 plant taxa, and dermatological disorders (ICF = 0.142), with 15 use reports involving 13 plant taxa. Musculoskeletal disorders showed an ICF of 0.100 (21 use reports and 19 plant taxa), while ENT, ophthalmological and oral/dental disorders showed an ICF of 0.083 (13 use reports and 12 plant taxa). Urogenital and gynaecological disorders recorded an ICF of 0.045, based on 23 use reports involving 22 plant taxa. Toxicological, haematological, neurological, eating, infectious and parasitic, general health and wellness, endocrine and metabolic, and cardiovascular disorders recorded ICF values of 0.00, as the number of use reports was equal to the number of plant taxa used in these categories. Overall, the relatively low ICF values observed for most disease categories indicate considerable variation in plant selection among informants, reflecting diverse traditional medicinal practices and plant-use preferences within the study communities.

Table 4. List of Family-Wise Use Value (FUV).

| Family          | No. of Species | ΣUV   | FUV   |
|-----------------|----------------|-------|-------|
| Acanthaceae     | 3              | 0.120 | 0.040 |
| Amaranthaceae   | 3              | 0.036 | 0.012 |
| Amaryllitaceae  | 1              | 0.012 | 0.012 |
| Anacardiaceae   | 3              | 0.060 | 0.020 |
| Annonaceae      | 1              | 0.024 | 0.024 |
| Apiaceae        | 2              | 0.036 | 0.018 |
| Apocynaceae     | 3              | 0.072 | 0.024 |
| Araceae         | 5              | 0.084 | 0.016 |
| Araliaceae      | 2              | 0.024 | 0.012 |
| Arecaceae       | 1              | 0.012 | 0.012 |
| Asclepiadaceae  | 1              | 0.084 | 0.084 |
| Asparagaceae    | 1              | 0.036 | 0.036 |
| Asteraceae      | 5              | 0.084 | 0.016 |
| Bignoniaceae    | 1              | 0.012 | 0.012 |
| Calophyllaceae  | 1              | 0.012 | 0.012 |
| Capparaceae     | 1              | 0.012 | 0.012 |
| Caricaceae      | 1              | 0.024 | 0.024 |
| Caryophyllaceae | 1              | 0.024 | 0.024 |
| Clusiaceae      | 3              | 0.060 | 0.020 |
| Combretaceae    | 3              | 0.157 | 0.052 |
| Convolvulaceae  | 2              | 0.024 | 0.012 |
| Costaceae       | 1              | 0.024 | 0.024 |
| Crassulaceae    | 1              | 0.036 | 0.036 |
| Cucurbitaceae   | 1              | 0.012 | 0.012 |
| Cyperaceae      | 1              | 0.024 | 0.024 |
| Dilleniaceae    | 1              | 0.012 | 0.012 |
| Equisetaceae    | 1              | 0.012 | 0.012 |
| Euphorbiaceae   | 3              | 0.084 | 0.028 |
| Fabaceae        | 8              | 0.241 | 0.030 |
| Gramineae       | 1              | 0.036 | 0.036 |
| Lamiaceae       | 7              | 0.193 | 0.027 |
| Lauraceae       | 2              | 0.024 | 0.012 |
| Liliaceae       | 1              | 0.048 | 0.048 |
| Linderniaceae   | 1              | 0.024 | 0.024 |
| Lythraceae      | 1              | 0.012 | 0.012 |
| Malvaceae       | 2              | 0.024 | 0.012 |
| Melastomataceae | 1              | 0.012 | 0.012 |
| Meliaceae       | 1              | 0.085 | 0.085 |
| Menispermaceae  | 3              | 0.096 | 0.032 |
| Moraceae        | 2              | 0.036 | 0.018 |
| Musaceae        | 1              | 0.036 | 0.036 |
| Myristicaceae   | 1              | 0.073 | 0.073 |
| Myrtaceae       | 2              | 0.024 | 0.012 |
| Oleaceae        | 1              | 0.012 | 0.012 |

|                |   |       |       |
|----------------|---|-------|-------|
| Oxalidaceae    | 2 | 0.048 | 0.024 |
| Phyllanthaceae | 3 | 0.108 | 0.036 |
| Piperaceae     | 5 | 0.193 | 0.038 |
| Plantaginaceae | 2 | 0.036 | 0.018 |
| Poaceae        | 2 | 0.024 | 0.012 |
| Polygonaceae   | 1 | 0.012 | 0.012 |
| Resedaceae     | 1 | 0.036 | 0.036 |
| Rosaceae       | 2 | 0.072 | 0.036 |
| Rubiaceae      | 3 | 0.06  | 0.020 |
| Rutaceae       | 5 | 0.217 | 0.043 |
| Sapotaceae     | 1 | 0.024 | 0.024 |
| Saururaceae    | 1 | 0.012 | 0.012 |
| Smilacaceae    | 1 | 0.012 | 0.012 |
| Solanaceae     | 3 | 0.084 | 0.028 |
| Sterculiaceae  | 1 | 0.012 | 0.012 |
| Vitaceae       | 2 | 0.024 | 0.012 |
| Zingiberaceae  | 6 | 0.228 | 0.038 |

In Table 4, Analysis of the documented medicinal uses revealed that *Azadirachta indica* (Meliaceae) was reported for use against multiple ailments. Additionally, the Fabaceae family has the greatest number of species. The Fabaceae family is one of the largest plant families with species that are used medicinally and therapeutically worldwide (Asfaw and Abebe 2022; Maroyi 2023; Mondal 2013). Family Use Value (FUV) varied among the recorded medicinal plant families, ranging from 0.012 to 0.085. The highest FUV was recorded for Meliaceae (0.085), followed by Asclepiadaceae (0.084) and Myristicaceae (0.073), each represented by a single species. Liliaceae also showed a relatively high FUV (0.048) with one species. Among the families represented by multiple species, Rutaceae (five species) had an FUV of 0.043, followed by Acanthaceae (three species) with 0.040. Fabaceae, despite being represented by eight species, showed an FUV of 0.030, while Lamiaceae, represented by seven species, had an FUV of 0.027. The lowest FUV (0.012) was recorded for several plant families. Overall, the FUV values showed considerable variation among families, reflecting differences in the Use Values of the medicinal species within each family.

The relationship between two quantitative variables can be assessed using Pearson's correlation analysis. In the present study, Pearson's correlation was employed to evaluate the direction and strength of the relationship between Relative Frequency of Citation (RFC) and Use Value (UV) (Ahmad *et al.* 2017). A very strong positive correlation was observed between RFC and UV, with a Pearson correlation coefficient ( $r$ ) of 0.870 (S Table 2), indicating a close association between the two variables. The correlation was statistically significant ( $p < 0.001$ ), demonstrating that plant species with higher citation frequency also tended to have higher use values (Vijayakumar *et al.* 2015). This strong association suggests that frequently cited plant species are generally perceived as important by the local community and are associated with a greater number of reported uses. The findings further indicate that commonly recognised and frequently utilised plant species contribute substantially to the documented traditional ethnomedicinal knowledge of the communities.

## Discussion

The present study provides extensive ethnobotanical information on medicinal plants used for the treatment of various health conditions in Dibrugarh district and Majuli district of Assam. In the present study, *Amaranthus spinosus* L. was reported to be used to promote lactation in breastfeeding mothers, which is consistent with the findings of (Zaman *et al.*, 2017). Jaundice was identified as the most frequently reported ailment category, with 27 medicinal plant species documented for its management. For some recorded plant species, reliable information on their conservation status was unavailable, highlighting the need for further investigation and documentation to support their conservation and sustainable utilisation. Among the species for which conservation information was available, *Aegle marmelos* was categorised as Near Threatened, whereas *Bacopa monnieri* was reported as Endangered. A major challenge associated with traditional herbal medicine is the availability of plant materials, as some species or plant parts may be seasonally unavailable or difficult to obtain in sufficient quantities. Such limitations may affect the preparation and continued use of traditional remedies and further emphasise the importance of sustainable resource management and conservation.

*Citrus aurantiifolia*, *Azadirachta indica*, and *Caesalpinia bonduc* were the most frequently reported medicinal plants in the present study, reflecting their prominent role in the traditional medicinal practices of the study communities. *Azadirachta indica*, commonly known as Neem, has been widely reported in traditional medicine across South and Southeast Asia for various medicinal applications, including microbial infections, inflammatory disorders, metabolic disorders, and

dermatological conditions. Previous phytochemical studies have identified bioactive compounds, including limonoids and flavonoids, in different parts of the plant (Debnath *et al.*, 2025). These findings provide a basis for further investigation of the pharmacological properties of *A. indica*; however, the traditional uses documented in the present study should not be interpreted as evidence of therapeutic efficacy.

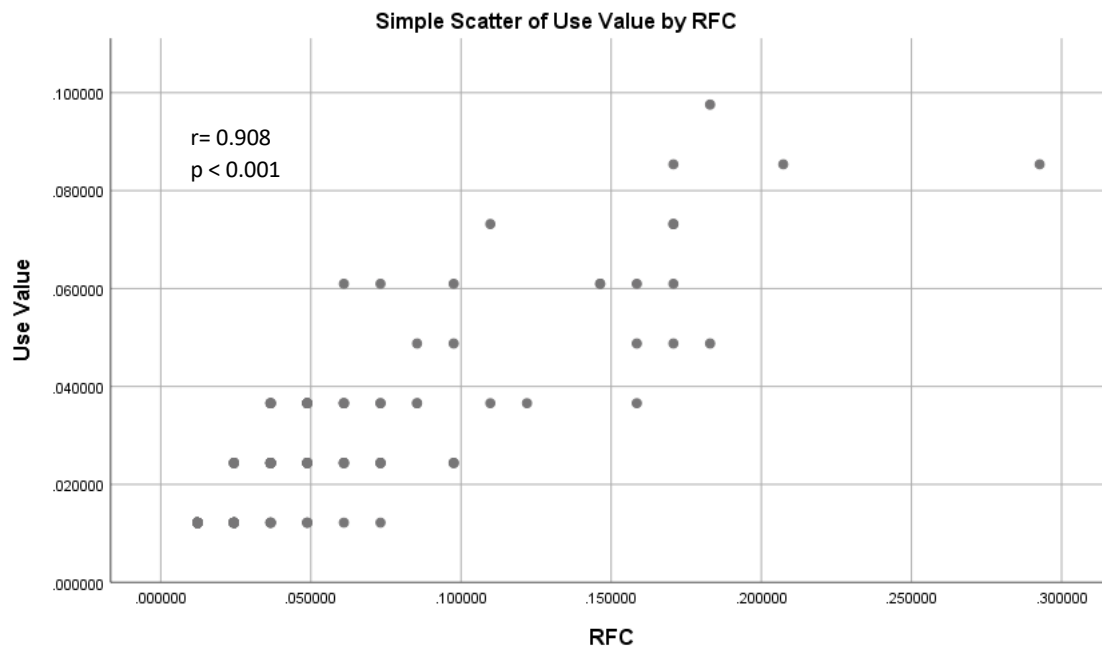


Figure 3. Graphical Representation of the Pearson Correlation Between RFC and UV ( $p < 0.05$ )

In traditional medicine, *Caesalpinia bonduc*, also known as Fever nut or bonduc nut, has been reported for various medicinal uses, including fever, inflammation, and gastrointestinal disorders. Ethnopharmacological studies have reported anti-inflammatory, antidiabetic, antipyretic, and anthelmintic properties associated with different parts of the plant, particularly the seeds. Studies have also reported immunomodulatory and adaptogenic activities of *C. bonduc* in animal models (Shukla *et al.*, 2009). These findings provide a basis for further investigation of the medicinal properties of the species; however, the traditional uses documented in the present study should not be interpreted as evidence of therapeutic efficacy.

Lime, or *Citrus aurantiifolia*, has many nutritional and medicinal uses in both traditional medicine and culinary traditions. The antibacterial, antioxidant, and anti-inflammatory properties of lime are attributed to its abundance of flavonoids, limonoids, and essential oils, as reported in both scientific and traditional literature (Narang and Jiraungkoorskul 2016).

Several factors, including perceived efficacy, cultural importance, and accessibility, may contribute to the high number of reports of use for these species. However, a high frequency of use reports primarily reflects their prominent role in the traditional medicinal practices documented in the study area and does not, by itself, indicate therapeutic efficacy. The frequent reporting of these species may also reflect greater agreement among informants regarding their traditional uses. Previous ethnobotanical studies have highlighted highly reported medicinal species as potential candidates for further phytochemical and experimental investigations. Overall, these findings demonstrate the importance of these species in the traditional medicinal practices of the study area and highlight the need for further research and appropriate conservation measures to support their sustainable use.

Some of the medicinal plant uses that were documented in this study were different from the data that had been previously published, despite the fact that many of the uses that were documented in this study coincide with earlier reports from Northeast India and nearby locations. Notably, *Zanthoxylum nitidum*, a species that has been extensively documented for the treatment of Dental and Inflammatory conditions (Lu *et al.* 2020), was mentioned by informants as a potential treatment for Thyroid-related diseases. To the best of our knowledge, this medicinal application has not been previously documented in the ethnobotanical literature; the current study documented the utilisation of *Stixis suaveolens*, *Piper betle*, *Caesalpinia bonduc*, and *Rubus alceifolia*, which are specifically employed to address thyroid-related ailments. *Rubus alceifolia* is utilised

for neurological conditions. *Caesalpinia bonduc* and *Leucas aspera* are utilised in the treatment of Bone cancer. All of which have not been reported in any earlier research. The significance of ethnopharmacological documentation that is peculiar to a place is brought to light by these findings, which imply the existence of regionally adapted ethnomedicinal knowledge. These potential therapeutic uses may provide useful leads for future study in the field of phytochemistry.

As we can observe in Figure 2, leaves were typically utilised to make medicine. It's important to remember that Leaves are the most readily available and plentiful source of nutrients. All of the photosynthetic processes take place in Leaves, which serve as a powerhouse or a barrier against any infection (Tarak *et al.* 2011). The frequent use of leaves may be related to their accessibility and the presence of diverse bioactive compounds reported in some medicinal plants; however, this explanation requires further phytochemical investigation (Sharafatmandrad & Khosravi Mashizi 2020).

The contrasting FL (S. Table 1) and UV values observed for *Piper nigrum* are noteworthy. Although the species had a high UV, its low FL for its reported use in liver cancer suggests that this particular use was not consistently reported among the informants. This difference may be related to the diverse medicinal applications of *P. nigrum*, where informants may associate the species with several different health conditions rather than with a single specific ailment. Thus, a high overall UV does not necessarily correspond to a high FL for an individual therapeutic use. A similar pattern can be considered when interpreting FUV across plant families. Families represented by a single species may attain relatively high FUV when that species has a comparatively high UV, whereas families containing several species may show lower FUV when the individual species have relatively lower use values. Therefore, FUV should be interpreted in relation to the use values of the constituent species rather than simply the number of species within a family. These patterns highlight the diversity of medicinal applications and the variation in the reporting of plant uses among the local communities.

From the survey, we got to know that the most common medicinal species belong to the eudicots (S. Figure 6). For the future aspect, out of 129 plant species, we found that 57 species are wild, 40 are cultivated, and 32 species are both wild and cultivated. If cultivated, several of these edible wild plants would be a useful source of food and might be used as part of a plan to combat food insecurity (Teklehaymanot & Giday 2010). The very strong positive correlation observed between Use Value (UV) and Relative Frequency of Citation (RFC) indicates that species cited by a greater proportion of informants also tended to have higher use values in the present dataset. However, as both indices are derived from overlapping ethnobotanical citation information, this association should be interpreted as a relationship between the two quantitative measures rather than as evidence of ecological distribution or the depth of traditional knowledge. The economic value of biodiversity and the contribution of traditional knowledge to science and society have been acknowledged by contemporary civilisation (Souza *et al.* 2014). Overall, the present study provides ethnopharmacologically relevant documentation of medicinal plant use in the study area, including several therapeutic applications that have not been previously reported. These findings highlight the value of region-specific traditional knowledge and support its role as a starting point for future phytochemical investigations. While experimental validation is beyond the scope of the present work, the documented use reports offer a meaningful framework for guiding subsequent laboratory-based research. The areas of biomolecular activities, secondary metabolites, and antimicrobial activity have received surprisingly little attention, although research into antioxidant activity has the potential to yield significant results, as the ethnobotanical convergence can play an important role in finding new applications of the used plants. Through research on traditional medicine, medicinal plants have contributed to the development of various plant-based medicines available in the global market (Kunwar *et al.* 2009). However, clinical investigations and appropriate toxicological and safety assessments are necessary to establish the safety and efficacy of both individual medicinal plants and multicomponent herbal preparations (Lee 2000).

## Conclusion

This study contributes to the documentation of ethnomedicinal knowledge and plant-based healthcare practices in the Majuli and Dibrugarh regions of Assam, providing baseline information on the traditional use of medicinal plants in the study area. The reported medicinal uses reflect local traditional knowledge and should not be interpreted as evidence of therapeutic efficacy or safety. Therefore, the findings should be considered as a basis for further scientific investigation rather than as validation of the reported therapeutic effects.

Overall, the study demonstrates the value of quantitative ethnobotanical approaches in documenting and interpreting traditional medicinal plant knowledge in the study area. The observed patterns of Use Value (UV) and Relative Frequency of Citation (RFC) indicate differences in the prominence and reporting of individual medicinal plants within the local healthcare

system. However, these quantitative indices reflect patterns of traditional use and citation and should not be interpreted as evidence of therapeutic efficacy or pharmacological activity.

The documented knowledge provides a useful baseline for future ethnobotanical and phytochemical investigations and highlights the importance of conserving medicinal plant resources and associated traditional knowledge. Sustainable harvesting, cultivation where appropriate, continued monitoring, and regular assessment of conservation status are important for their long-term maintenance, particularly for species with conservation concerns or limited assessment information. Further toxicological and appropriately designed clinical studies are needed to evaluate the safety and therapeutic relevance of the reported medicinal uses.

## Declarations

**List of abbreviations:** UR- Use Report, ICF- Informant Consensus Factor, SPSS - Statistical Package for the Social Sciences, ITK- Indigenous Traditional Knowledge, Ass- Assamese.

**Ethics approval and consent to participate:** All participants were included only after providing informed consent, and no one was forced to respond.

**Consent for publication:** All authors have read and agreed to the publication of the final manuscript.

**Availability of data and materials:** All data generated or analysed during this study are included in this article.

**Competing interests:** Not Applicable.

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**Author contributions:** Chaina Borah (Conceptualisation, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Visualisation, Writing-original draft, writing-review & editing), Trideep Dowarah (Conceptualisation, Formal analysis, Investigation, Methodology, Resources, Software, Supervision, Validation, Writing-review & editing), and Siddharthan Surveswaran (Resources, Supervision, Writing-review & editing).

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