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RESEARCH PAPER

Quantitative approach to unveiling indigenous knowledge on medicinal plants of tea tribes of Dhubri district, Assam, India

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Abstract
The tea communities are one of the largest ethnic groups called *Tea-tribes*. They mainly live in the village areas outside the tea gardens and prefer to refer to themselves as "Adivasis" in Assam. The Tea tribe communities have long used traditional herbal remedies for their health practices. However, until recently, the traditional knowledge of tea tribes from the Assam, state of India, had not been extensively documented. The present study dealt with the ethnobotanical customs of tea tribes or tea garden communities in Dhubri district, Assam. The ethnobotanical data was collected through semi-structured interviews. The data was analyzed with the help of quantitative indices like Use value and comparison of the present work, with the available information. Ethnobotanical uses of documented plant species and comparison with earlier studies are also provided. Quantitative indices such as informant consensus factor (ICF), use value (UV), and family importance value (FIV) were used for quantification. The study recorded 70 plant species belonging to 65 genera of 45 families. Overall, the present work highlights, the documentation and use value of various plant species used as medicine representing the people of tea tribes in the Dhubri district who have extensive knowledge about using plants to cure various diseases. All documented plant species are mainly used as medicine to treat various disorders such as colds, cough, fever, diabetes, toothache, bleeding, amenorrhea, oligomenorrhea, dysmenorrhoea, prostatorrhoea, diarrhoea, hookworm, etc. *Zingiber officinale* Roscoe (1.08) had the highest use value (UV), which shows that this species is the most utilized plant species in the present study.

Keywords Ethnobiology · India · Indo Burma biodiversity · Quantitative · Tea tribes

Introduction

Quantitative ethnobotany or quantification in ethnobotany involves the statistical analysis of folk knowledge about the use of local plant resources. Ethnobotany has become an important field of research for the documentation and preservation of traditional historical knowledge, the development of resource management, and the conservation of biodiversity at the level of species, ecosystems, forest types and regions (Pei et al. 2020; Panigrahi et al. 2021). Ethnobotany refers to all aspects of the direct relationship between plants and humans. Ethnobotany has also addressed the cultural value in societies and the impact on the environment. Traditional medicine today includes several well-organized, distinct diagnostic and healing systems for plants and animals (McClatchey et al. 2009).

Ethnobotanical work has increased greatly in the last hundred years, but ethnobotany has attracted the attention of human society since prehistoric times. It is estimated that in India, more than 1200 plant species are mentioned in classical Indian literature (Jain and Mudgal 1999). The earliest records of the use of plants to treat diseases in humans and their domestic animals in India can be traced back to the earliest records (4500–1600 BC), the Hindu texts such as the Rig Veda, Ayurveda, etc. (Lalrinkima 2013).

The Rigveda identifies 99 medicinal plants, Ayurveda references 82, and Atharva Veda mentions 28 medicinal plants, all used for curing various life-threatening diseases. These ancient claims were later codified in classical texts like the Charaka Samhita (1000–800 BC) and the Sushruta Samhita (800–700 BC) (Bhattacharjya and Borah 2008). From

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ancient times to the present, a significant portion of India's population continues to rely on traditional medicinal plants for healthcare, particularly among various tribes in Assam who depend on forest resources. Ethnomedicinal knowledge serves as a foundation for numerous studies on bioactive compounds. These investigations significantly contribute to the discovery of novel drugs (Baruah et al. 2018). The traditional medicinal plants present in Western Assam's rural areas are extremely important to the healthcare practices of the ethnic communities (Baruah et al. 2013, 2021; Daimari et al. 2019). Tea tribes are one of the communities in Assam and their primary means of subsistence are doing labour in the tea gardens. They are also known as different medicinal plant practitioners used to treat various ailments (Bhattacharyya et al. 2016, 2020). The traditional plant-based knowledge of the tea tribes is gradually declining due to the expansion of modern medical facilities, leading to a significant reduction in the use of these plants. Additionally, the transformation of forests and cultivable land into commercial tea gardens poses a serious threat to the survival of valuable medicinal plants in their natural habitats. Therefore, it is crucial to document and preserve this ethnomedicinal knowledge before it disappears and is completely replaced by contemporary healthcare practices.

Therefore, the present study aimed to study the indigenous knowledge on medicinal plants including quantitative data used by tea tribes of the Dhubri district of Assam. As indigenous knowledge systems are essential to the conservation of medicinal plants, the study also emphasizes the significance of protecting and advancing these systems.

Materials and methods

Study area

The present study was conducted in the tea gardens of Dhubri District (Fig. 1), namely Choibari Tea Estate, Krishnakali Tea Estate, and Chapar Tea Estate, as well as some rural markets of tea tribes in Dhubri District, namely Gudri Bazar (Choibari) and Hatkhola Bazar. The study also covered several villages, including Nizeporty Line, Kher Line, Tali Line, Gudam Line, Staff Line, Hatkhola, Amguri L.P. school, Gunha Line, New Line, Siv Mandir (Majergaon), Chasla Para (Majergaon), Chapar Bagan, and Krishnakali Bagan.

Field survey, data collection and identification of specimens

Field surveys as well as market surveys have been conducted in the studied area from January 2019 to May 2022. The surveys were conducted using the standard ethnobotanical method (Jain 1987). Information on the medicinal plants used by the tea tribes of Dhubri District for different purposes was obtained during the ethnobotanical surveys. Through a non-probability sampling technique, i.e. using a purposive sampling technique, a semi-structured interview was done with a standard questionnaire (Sulaiman et al. 2020). The information was collected from knowledgeable persons of all the village heads, ojhas, kobiraj, and village elders and recorded in primary data sheets. Identification of each specimen was done by consulting Assam flora i.e. Flora of Assam (Kanjilal et al. 1940) and the scientific name was authenticated using online taxonomic tools i.e., Plants of the World Online (https://powo.science.kew.org/) and World Flora Online (https://www.worldfloraonline.org/). The identified specimens were deposited in Bodoland University Botanical Herbarium (BUBH), Department of Botany, Kokrajhar, Assam.

Demographic data of the participants

In the present ethnobotanical study, 68 informants were interviewed by using a purposive sampling method to obtain information about the uses of different plant species, whether they are medicinally important or not, and if they are used as medicine then which particular disease can be treated. The majority of the informants were male and the minority were female, including 6 healers, 4 farmers, and 16 housewives. All the people belonged to rural areas and they are mainly dependent on agricultural practices. Demographic details of the participants, i.e., the number of informants with their age categories, their educational backgrounds, and percentages were considered in this study and shown in Table 1.

Data analysis

Quantitative data were analyzed by using the following ethnobotanical indices-

Use value (UV)

Use value is the relative importance of plant species, that determines the number of use reports mentioned by indigenous informants of the study area. It was calculated using the following formula (Usman et al. 2021):

$$\mathrm{UV} = \frac{\sum Ui}{N}$$

$\sum \mathrm{Ui}$ = total number of citations by informants for particular species.

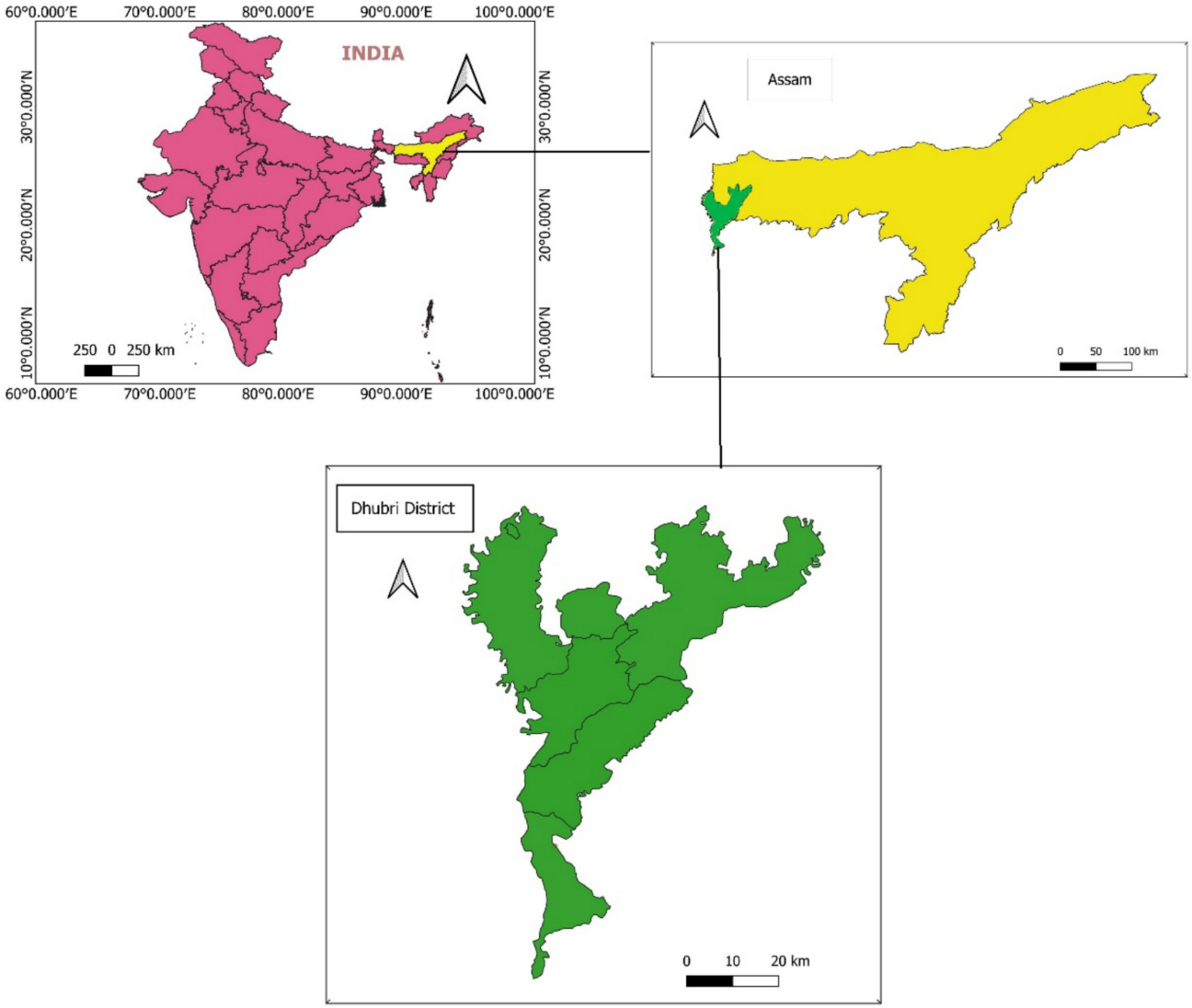

Fig. 1 District map of the study area

Table 1 Demographic data of the participants

Variables	Categories	Number of informants	Percentage
Gender ratio	Female	25	36.76
	Male	43	63.23
Age	< 20	6	8.82
	21–40	17	25
	41–60	30	44.11
	61–80	15	22.05
Educational background	Matric (10 standard)	22	32.35
	Higher Secondary (10 + 2)	13	19.11
	Degree	7	10.29
	Housewives	16	23.52
	Farmers	4	5.88
	Healers	6	8.82
Life type	Rural area		100

Table 2 List of documented ethnobotanical plant species used by the tea tribes of Dhubri District of Assam

Scientific name	Family	Vernacular name	Used parts	Uses
Abroma augustum (L.) L.f Coll. no. 30	Sterculiaceae	Ultakambal (A, AS, B)	Root, Stem, Leaf and Bark	Amenorrhea, dysmenorrhea
Acorus calamus L Coll. no. 37	Acoraceae	Boch Patai (A), Boch (AS, B)	Leaf and Rhizome	Snakebite, cough
Aegle marmelos (L.) Correa Coll. no. 43	Rutaceae	Bel (A, AS, B)	Leaf, Fruit	Amenorrhea, edible
Aloe vera (L.) Burm.f Coll. no. 04	Xanthorrhoeaceae	Ghittokanchan (A), Ghittokumari (B)	Leaf	Fire burn, stomach disorders
Allium sativum L Coll. no.03	Amaryllidaceae	Rosun (A), Nohru (AS), Resun (B)	Whole plant	Dog bite, night blind, fever, cough
Alstonia scholaris (L.) R.Br Coll. no. 31	Apocynaceae	Chatiyan (A), Chaitan (AS)	Bark	Cough, cold, malaria
Alternanthera bettzickiana (Regel) G.Nicholson Coll. no. 38	Amaranthaceae	Lal Patai (A), Bisholyakoroni (AS)	Leaf	Stop bleeding, wound
Alternanthera sessilis (L.) DC Coll. no. 39	Amaranthaceae	Silver Sak (A), Kulekhara (B)	Entire plant except root	Anemia, edible
Amaranthus spinosus L. Coll. no. 17	Amaranthaceae	Kata Gach (A)	Young twig	Edible, carbuncle
Andrographis paniculata (Burm.f.) Wall. ex Nees Coll. no. 32	Acanthaceae	Chirota (A, B), Kalmegh (AS)	Leaf	Hookworm, diarrhea, fever
Annona squamosa L. Coll. no. 40	Annonaceae	Newa (A), Atafol (AS)	Fruit	Diabetes
Argemone mexicana L. Coll. no. 16	Papaveraceae	Kata Gach (A), Kuhumkata (AS), Siyal Kata (B)	Fruit, Seed	Itching
Azadirachta indica A.Juss Coll. no. 02	Meliaceae	Neem (A, AS, B)	Whole plant	Stop vomiting, hookworm, skin disease, jaundice, blood purifier
Bombax ceiba L. Coll. no. 41	Malvaceae	Simlu Gach (A, AS)	Bark	Toothache
Cajanus cajan (L.) Huth Coll. no. 59	Fabaceae	Rohor (A)	Leaf	Jaundice, diabetes
Camellia sinensis (L.) Kuntze Coll. no. 44	Theaceae	Cha (A, AS, B)	Leaf, Flower	Beverage, edible
Carica papaya L. Coll. no. 62	Caricaceae	Pepe (A), Modhufol (AS)	Fruit	Gastric, edible
Cascabela thevetia (L.) Lippold Coll. no. 58	Apocynaceae	Koriful (A), Korobiful (AS)	Fruit, Flower, Root, Seed	Stomach problem, eye infection, cough, piles, ritual
Cassia fistula L. Coll. no. 23	Fabaceae	Sonalu (A)	Fruit	Tongue wounds
Catharanthus roseus (L.) G.Don Coll. no. 42	Apocynaceae	Chandan ful (A), Nayontora (AS)	Roots, Stem, Leaf	High blood pressure, cuts and wounds
Centella asiatica (L.) Urb Coll. no. 01	Apiaceae	Bengpata (A), Manimuni (AS), Thankuni (B)	Leaf	Diarrhea, stomach pain
Cissus quadrangularis L. Coll. no. 56	Vitaceae	Harjora (A)	Leaf, Stem	Bone fracture
Clerodendrum infortunatum L. Coll. no. 57	Lamiaceae	Ghatopatai (A), Bhataitita (AS), Vetomali (B)	Leaf	Dysentery, ritual, alcohol preparation
Clitoria ternatea L. Coll. no. 45	Fabaceae	Nilkontoful (A), Oporajita (AS)	Roots	Snakebite
Curcuma caesia Roxb Coll. no. 22	Zingiberaceae	Kariyahardi (A), Kalaholdi (AS), Kalo Holud (B)	Rhizome	Stomach pain

Table 2 (continued)

Scientific name	Family	Vernacular name	Used parts	Uses
Curcuma longa L. Coll. no. 21	Zingiberaceae	Hardi (A), Holdi, (AS), Holud (B)	Rhizome	Hookworm, stop bleeding, wound, pain
Cuscuta reflexa Roxb Coll. no. 55	Convolvulaceae	Gachmaragach (A), Akasi lota (AS)	Stem	Excess abdominal fluid
Cynodon dactylon (L.) Pers Coll. no. 06	Poaceae	Dubba Ghas (A, B), Dubari bon (AS)	Leaf	Stop bleeding
Cyperus rotundus L. Coll. no. 05	Cyperaceae	Mutha ghass (B)	Rhizome	Diarrhea, recovery from hangover
Datura stramonium L. Coll. no. 54	Solanaceae	Datura(A)	Leaf, Fruit	Asthma, boils, wounds
Dracaena trifasciata (Prain) Mabb Coll. no. 69	Asparagaceae	Dries lewa (A)	Leaf	Waist pain
Euphorbia neriifolia L. Coll. no. 63	Euphorbiaceae	Kata gach (A), Siju (AS)	Leaf latex	Jaundice, cough
Gmelina arborea Roxb. ex Sm Coll. no. 64	Lamiaceae	Gamari (A, AS, B)	Flower	Edible, skin disease
Hibiscus × *rosa-sinensis* L. Coll. no. 60	Malvaceae	Boga joba (A)	Flower	Tuberculosis
Justicia adhatoda L. Coll. no. 08	Acanthaceae	Baskatita (A, B), Bahoktita (AS)	Leaf	Fever, hookworm, asthma
Justicia gendarussa Burm.f Coll. no. 07	Acanthaceae	Pata bahar (A)	Leaf	Muscles pain
Kalanchoe pinnata (Lam.) Pers Coll. no. 46	Crassulaceae	Pategaja (A, AS), Patarkuchi (B)	Leaf	Fire burn, piles, stomach disorders, epilepsy
Lantana camara L. Coll. no. 61	Verbenaceae	Putus (A)	Leaf, Root	Fever, stop bleeding, edible
Lawsonia inermis L. Coll. no. 66	Lythraceae	Mehendi (A, B), Jetuka (AS)	Leaf	Ear wound, silky hair
Leucas aspera (Willd.) Link Coll. no. 10	Lamiaceae	Goma sak (A), Drun bon/ Kansisa sak (AS), Dondocolos (B)	Leaf, Twig	Fever, cough, cold, asthma, edible
Mangifera indica L. Coll. no. 09	Anacardiaceae	Amba(A), Aam (AS, B)	Tender leaf	Epilepsy, fruit edible
Melia azedarach L. Coll. no. 65	Meliaceae	Bokon (A), Ghora neem (AS, B)	Leaf	Hookworm, stop vomiting
Mikania micrantha Kunth Coll. no. 47	Asteraceae	Jangli Lewa (A)	Leaf	Stop bleeding, wound
Mimosa pudica L. Coll. no. 11	Fabaceae	Lajbanti (A), Lajukibon (AS), Lojjyabonti (B)	Leaf, Root	Diarrhea, piles
Mirabilis jalapa L. Coll. no. 68	Nyctaginaceae	Jahajuhi (A), Sondhaya maloti (AS, B)	Root	Amenorrhea
Moringa oleifera Lam Coll. no. 67	Moringaceae	Munga/Joki (A), Sojna (AS, B)	Leaf, Bark, Fruit, Flower	High blood pressure, liver problem, edible
Mucuna pruriens (L.) DC Coll. no. 53	Fabaceae	Alkusi (A), Bichuti (B)	Fruit, Seed	Gastric, boils
Murraya koenigii (L.) Spreng Coll. no. 36	Rutaceae	Carypata (A, B), Narsingha Pata (AS)	Leaf	Gastric
Musa balbisiana Colla Coll. no. 12	Musaceae	Athiyakola (A), Athiya Kol (AS)	Pseudostem, Fruit	Diarrhea, liver problem
Nelumbo nucifera Gaertn Coll. no. 48	Nelumbonaceae	Podum Ful (A, AS), Pordo Ful (B)	Flower	Weakness
Nigella sativa L. Coll. no. 52	Ranunculaceae	Kariya jira (A), Kala jira (AS), Kalo Jira (B)	Seed	Impotence, fever, spices

Table 2 (continued)

Scientific name	Family	Vernacular name	Used parts	Uses
Nyctanthes arbor-tristis L. Coll. no. 35	Oleaceae	Sefali Ful (A), Sewali Ful (AS, B)	Leaf, Seed, Flower	Anti-dandruff, waist pain, edible
Ocimum gratissimum L. Coll. no. 29	Lamiaceae	Ram Tulsi (A, AS, B)	Leaf	Cough, bees bite
Ocimum tenuiflorum L. Coll. no. 28	Lamiaceae	Tulsi (A, AS, B)	Leaf	Cough, fever, malaria, ringworm, ritual
Oroxylum indicum (L.) Kurz Coll. no. 18	Bignoniaceae	Dingdingiya (A)	Bark, Flower	Jaundice, diabetes, liver problem, edible
Oxalis corniculata L. Coll. no. 13	Oxalidaceae	Amsuritenga (A), Tengechitenga (AS)	Leaf	Diarrhea, mouth wounds, edible
Paederia foetida L. Coll. no.19	Rubiaceae	Padripatai (A), Vedailota (A)	Leaf	Gastric, ulcer, diarrhea, edible
Phlogacanthus thyrsiformis (Roxb. ex Hardw.) Mabb Coll. no. 33	Acanthaceae	Lal baskatita (A), Lal Bahok (AS)	Leaf, Stem, Flower	Cough, cold, edible
Phyllanthus emblica L. Coll. no. 49	Phyllanthaceae	Aamlokhi (A, AS, B)	Fruit, Seed	Stop hair fall, eye infection
Piper betle L. Coll. no. 14	Piperaceae	Pan patai (A), Pan (AS, B)	Leaf	Stop bleeding, night blind, toothache, cough, cold
Piper longum L. Coll. no. 15	Piperaceae	Pipul (A), Shut (B)	Fruit	Hookworm, cough, cold
Pontederia hastata L. Coll. no. 70	Pontederiaceae	Ijnai (A), Meteka (AS)	Flower/Inflorescence	Digestion, edible
Psidium guajava L. Coll. no. 27	Myrtaceae	Temros/Peyara (A), Modhuriaa (AS), Supari (B)	Leaf, Fruit	Dysentery, edible
Ricinus communis L. Coll. no. 50	Euphorbiaceae	Anda (A), Era-Gach (AS)	Leaf, Seed	Wounds, boils, headache
Senna occidentalis (L.) Link Coll. no. 24	Fabaceae	Kalkasunda (B)	Leaf	Blood purifies, cough
Sesbania sesban (L.) Merr Coll. no. 34	Fabaceae	Jayanti Tita (A, AS, B)	Leaf	Hookworm
Smilax ovalifolia Roxb. ex D.Don Coll. no. 25	Smilacaceae	Kumarilota (B)	Stem	Gonorrhea
Tabernaemontana divaricata (L.) R.Br. ex Roem. & Schult Coll. no. 51	Apocynaceae	Boga Ful (A), Kathanda Ful (AS), Toko Ful (B)	Flower	Eye infection
Terminalia arjuna (Roxb. ex DC.) Wight & Arn Coll. no. 26	Combretaceae	Arjun (A, AS, B)	Bark	Heart problem, gastric, amenorrhea
Zingiber officinale Roscoe Coll. no. 20	Zingiberaceae	Adi (A), Ada (AS, B)	Rhizome	Easy digestion, measles, cough, cold, spice

N = total number of informants.

Informant consensus factor (ICF)

The informant consensus factor was used to evaluate respondents' consent to use plant species to cure various ailment categories.

$$\mathrm{ICF} = \frac{Nur - Nt}{Nur - 1}$$

Nur = total number of use reports from informers for each disease category.

Nt = total number of plant taxa used for a specific disease category.

The ICF value ranges from 0 to 1. Where 1 represents the highest value of respondents and 0 indicates the lowest value (Heinrich et al. 1998).

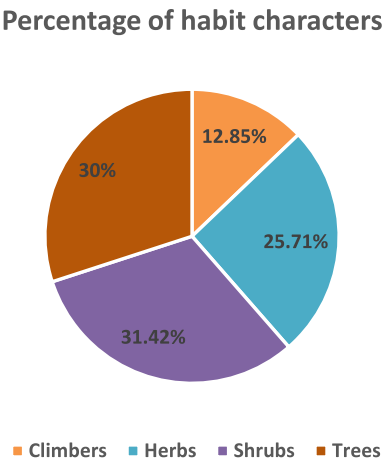

Fig. 2 Categories of plants with their percentage (%)

Family Use Value (FUV)

The Family Use Value (FUV) is used to identify the significance value and cultural importance of plant families (Sreekeesoon and Mahomoodally 2014). It can be calculated as:

$$\text{FUV} = \frac{\sum UVs}{Ns}$$

UVs = the sum of use values for all species belonging to a particular family.

Ns = the total number of species within that family.

Results

The present study revealed that the tea tribe of Dhubri District, Assam is still highly dependent on plants in their daily life. The study recorded 70 plant species belonging to 65 genera and 45 families. In this ethnobotanical enumeration for each plant species, the scientific name, family, vernacular name, parts used, and their uses are provided (Table 2).

A Adivasi, *AS* Assamese, *B* Bengali

Discussion

In the present study, ethnomedicinal knowledge practice by tea tribes i.e. Adivasi community was provided. The study provided a total of 70 plant species, of which 56 (80%) plant species were dicots and 14 (20%) plant species were monocots. In the study, it has been recorded that the maximum number of species used by the tea tribes were shrubs with 22 (31.42%) plant species, followed by trees with 21 plant species (30%), 18 plant species of herbs (25.71%), and the rest 9 plants species were climbers (12.85%) (Fig. 2). Fabaceae were the most dominating family consisting of 7 species, followed by Lamiaceae with 5 species, Acanthaceae and Apocynaceae with 4 species each, Amaranthaceae and Zingiberaceae with 3 species each, Euphorbiaceae, Malvaceae, Meliaceae, Piperaceae and Rutaceae with 2 species each and remaining 34 plant species belong to different plants families with one species in each i.e., Acoraceae, Amaryllidaceae, Anacardiaceae, Asparagaceae, Asteraceae, Amaryllidaceae, Annonaceae, Bignoniaceae, Caricaceae, Combretaceae, Convolvulaceae, Crassulaceae, Cyperaceae, Lythraceae,

Fig. 3 Percentage (%) of the plant parts used

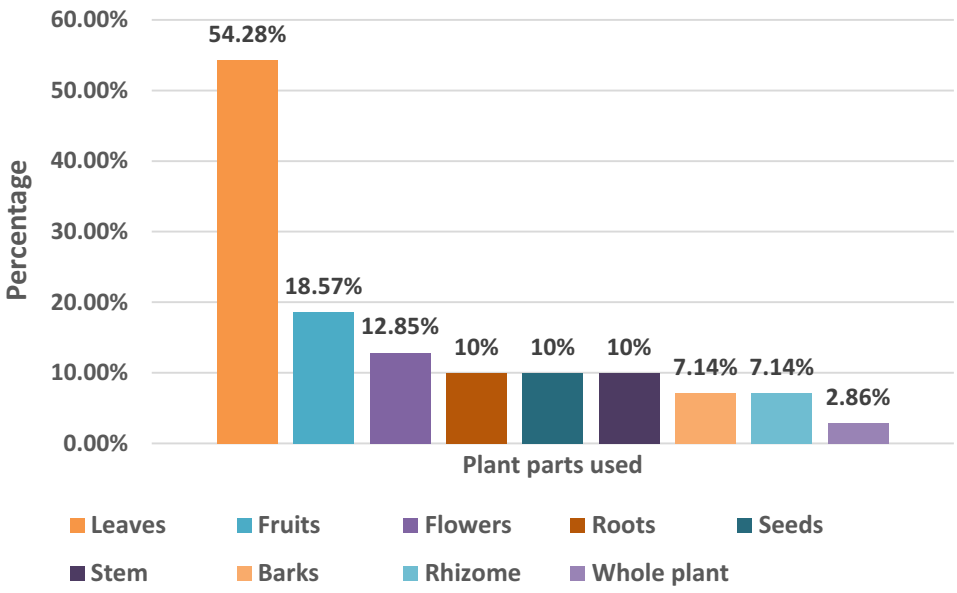

Table 3 Use value (UV) of the medicinal flora

Scientific name	Total no. of informants (N)	Total number of citations for species (ΣUi)	Use value (UV)
Abroma augustum (L.) L.f	68	22	0.32
Acorus calamus L	68	16	0.23
Aegle marmelos (L.) Correa	68	36	0.52
Aloe vera (L.) Burm.f	68	12	0.17
Allium sativum L.	68	32	0.47
Alstonia scholaris (L.) R.Br	68	4	0.05
Alternanthera bettzickiana (Regel) G.Nicholson	68	6	0.08
Alternanthera sessilis (L.) DC	68	11	0.16
Amaranthus spinosus L.	68	4	0.05
Andrographis paniculata (Burm.f.) Wall. ex Nees	68	5	0.07
Annona squamosa L.	68	42	0.61
Argemone mexicana L.	68	41	0.60
Azadirachta indica A.Juss	68	41	0.60
Bombax ceiba L.	68	10	0.14
Cajanus cajan (L.) Huth	68	15	0.22
Camellia sinensis (L.) Kuntze	68	33	0.48
Carica papaya L.	68	41	0.60
Cascabela thevetia (L.) Lippold	68	26	0.38
Cassia fistula L.	68	41	0.60
Catharanthus roseus (L.) G.Don	68	40	0.58
Centella asiatica (L.) Urb	68	25	0.36
Cissus quadrangularis L.	68	30	0.44
Clerodendrum infortunatum L.	68	25	0.36
Clitoria ternatea L.	68	40	0.58
Curcuma caesia Roxb	68	11	0.79
Curcuma longa L.	68	9	0.16
Cuscuta reflexa Roxb	68	38	0.55
Cynodon dactylon (L.) Pers	68	41	0.60
Cyperus rotundus L.	68	11	0.16
Datura stramonium L.	68	35	0.51
Dracaena trifasciata (Prain) Mabb	68	4	0.05
Euphorbia neriifolia L.	68	27	0.39
Gmelina arborea Roxb. ex Sm	68	11	0.16
Hibiscus×*rosa-sinensis* L.	68	21	0.30
Justicia adhatoda L.	68	36	0.52
Justicia gendarussa Burm.f	68	23	0.33
Kalanchoe pinnata (Lam.) Pers	68	40	0.58
Lantana camara L.	68	31	0.45
Lawsonia inermis L.	68	18	0.26
Leucas aspera (Willd.) Link	68	18	0.26
Mangifera indica L.	68	20	0.29
Melia azedarach L.	68	32	0.47
Mikania micrantha Kunth	68	36	0.52
Mimosa pudica L.	68	27	0.39
Mirabilis jalapa L.	68	21	0.30
Moringa oleifera Lam	68	31	0.45
Mucuna pruriens (L.) DC	68	35	0.51
Murraya koenigii (L.) Spreng	68	39	0.57

Table 3 (continued)

Scientific name	Total no. of informants (N)	Total number of citations for species (ΣUi)	Use value (UV)
Musa balbisiana Colla	68	35	0.51
Nelumbo nucifera Gaertn	68	36	0.52
Nigella sativa L.	68	36	0.52
Nyctanthes arbor-tristis L.	68	42	0.61
Ocimum gratissimum L.	68	3	0.04
Ocimum tenuiflorum L.	68	31	0.45
Oroxylum indicum (L.) Kurz	68	7	0.10
Oxalis corniculata L.	68	22	0.32
Paederia foetida L.	68	43	0.63
Phlogacanthus thyrsiformis (Roxb. ex Hardw.) Mabb	68	17	0.25
Phyllanthus emblica L.	68	17	0.25
Piper betle L.	68	38	0.55
Piper longum L.	68	19	0.27
Pontederia hastata L.	68	42	0.61
Psidium guajava L.	68	25	0.36
Ricinus communis L.	68	18	0.26
Senna occidentalis (L.) Link	68	9	0.13
Sesbania sesban (L.) Merr	68	9	0.13
Smilax ovalifolia Roxb. ex D.Don	68	6	0.08
Tabernaemontana divaricata (L.) R.Br. ex Roem. & Schult	68	19	0.27
Terminalia arjuna (Roxb. ex DC.) Wight & Arn	68	33	0.48
Zingiber officinale Roscoe	68	26	0.38

Table 4 Informant Consensus Factor (ICF) value of medicinal plants used for the treatment of various diseases

Category of ailment	No. of use reports (Nur)	No. of species (Nt)	ICF
Digestive system disorder: diarrhea, gastric, piles, ulcer	42	13	0.70
Blood system disorder: anemia, high blood pressure	11	3	0.8
Snakebite, bees bite, dog bite	12	4	0.72
Cardiovascular disease: heart disease	22	2	0.95
Liver disease: excess abdominal fluid, liver problem	35	5	0.88
Dermatological: itching, ringworm, skin disease	47	4	0.93
Sexual related disorders: Amenorrhea, dysmenorrhea, impotence, gonorrhea	14	6	0.61
Eye infection, night blind	8	5	0.42
Boils, carbuncles, cuts and wounds, stop bleeding	53	12	0.78
Fever, cough, cold	65	15	0.78
Parasitic infection: malaria, hookworm	21	8	0.65
Diabetes	16	3	0.86
Microbial infection: measles, jaundice, dysentery, tuberculosis	29	8	0.75
General disorder: Vomiting, tongue wounds, mouth wounds, weakness	35	5	0.88
Pain: stomach pain, toothache, waist pain, headache, muscle pain	28	11	0.62
Bone fracture	13	2	0.91
Respiratory disorder: Asthma	9	3	0.75
Neurological disorder: epilepsy	7	2	0.83

Moringaceae, Musaceae, Myrtaceae, Nelumbonaceae, Nyctaginaceae, Oleaceae, Oxalidaceae, Papaveraceae, Phyllanthaceae, Poaceae, Pontederiaceae, Ranunculaceae, Rubiaceae, Smilacaeae, Solanaceae, Sterculiaceae, Theaceae, Verbenaceae, Vitaceae, and Xanthorrhoeaceae (Table 5). These species were used for curing different types of disease such as colds, cough, fever, diabetes, toothache, bleeding, amenorrhea, oligomenorrhea, dysmenorrhoea, prostatorrhoea, diarrhea, hookworm, etc., and other purposes such as fire burns, dog bite, snake bite and also some species were used as vegetable, food value, and religious value. In the study, among 70 plant species, 68 plant species (97.14%) were used as medicine, 11 plant species (15.71%) were used as food value, and 12 species (17.14%) were used as rituals. Leaves were mostly used parts i.e. 38 (54.28%) in numbers, followed by fruits i.e. 13 (18.57%) in numbers, flowers i.e. 9 (12.85%) in numbers, stem, roots, and seeds in 7 each (10%), rhizome and bark in 5 each (7.14%), and whole plants i.e. 2 (2.86%) in numbers were used for medicinal purposes (Fig. 3).

The present study carried out three different ethnobotanical indices, i.e., Use Value (UV), Informant Consensus Factor (ICF) and Family Use value (FUV). The use value ranged from 0.04 to 0.79 (Table 3). The highest use value (UV) has been observed in *Curcuma caesia* (0.79) which belongs to the Zingiberaceae family. This was due to the large number of used reports in the study area. The use value with greater than 0.50 was observed in the species viz., *Datura stramonium* (0.51), *Mucuna pruriens* (0.51), *Musa balbisiana* (0.51), *Aegle marmelos* (0.52), *Justicia adhatoda* (0.52), *Mikania micrantha* (0.52), *Nelumbo nucifera* (0.52), *Nigella sativa* (0.52), *Cuscuta reflexa* (0.55), *Piper betle* (0.55), *Murraya koenigii* (0.57), *Catharanthus roseus* (0.58), *Clitoria ternatea* (0.58), *Kalanchoe pinnata* (0.58), *Argemone mexicana* (0.60), *Cassia fistula* (0.60), *Carica papaya* (0.60), *Cynodon dactylon* (0.60), *Annona squamosa* (0.61), *Nyctanthes arbor-tristis* (0.61), *Pontederia hastata* (0.61), *Phlogacanthus thyrsiformis* (0.63).

The informants of the study area used different plant species to treat various ailments. To calculate informant consensus factor (ICF), the reported disorders were classified into 18 disease categories (Table 4). The largest ICF value was observed in cardiovascular disease (0.95) followed by some major disorders like dermatological disease (0.93), bone fracture (0.91), liver disease and some general disorders (0.88).

The family use value (FUV) was obtained to identify the cultural significance of each plant family. The study recorded

Table 5 Family use value (FUV) of the medicinal flora

Family name	No. of species (N)	ΣUV	FUV (Family Use Value)
Acanthaceae	4	1.17	0.29
Acoraceae	1	0.23	0.23
Amaranthaceae	3	0.29	0.09
Amaryllidaceae	1	0.47	0.47
Anacardiaceae	1	0.29	0.29
Annonaceae	1	0.61	0.61
Apiaceae	1	0.36	0.36
Apocynaceae	4	0.27	0.27
Asparagaceae	1	0.05	0.05
Asteraceae	1	0.52	0.52
Bignoniaceae	1	0.10	0.10
Caricaceae	1	0.60	0.60
Combretaceae	1	0.48	0.48
Convolvulaceae	1	0.55	0.55
Crassulaceae	1	0.58	0.58
Cyperaceae	1	0.16	0.16
Euphorbiaceae	2	0.65	0.32
Fabaceae	7	2.56	0.36
Lamiaceae	5	1.27	0.25
Lythraceae	1	0.26	0.26
Malvaceae	2	0.44	0.22
Meliaceae	2	1.07	0.53
Moringaceae	1	0.45	0.45
Musaceae	1	0.51	0.51
Myrtaceae	1	0.36	0.36
Nelumbonaceae	1	0.52	0.52
Nyctaginaceae	1	0.30	0.30
Oleaceae	1	0.61	0.61
Oxalidaceae	1	0.32	0.32
Papaveraceae	1	0.60	0.60
Phyllanthaceae	1	0.25	0.25
Piperaceae	2	0.82	0.41
Poaceae	1	0.60	0.60
Pontederiaceae	1	0.61	0.61
Ranunculaceae	1	0.52	0.52
Rubiaceae	1	0.63	0.63
Rutaceae	2	1.09	0.54
Smilacaceae	1	0.08	0.08
Solanaceae	1	0.51	0.51
Sterculiaceae	1	0.32	0.32
Theaceae	1	0.48	0.48
Verbenaceae	1	0.45	0.45
Vitaceae	1	0.44	0.44
Xanthorrhoeaceae	1	0.17	0.17
Zingiberaceae	3	1.33	0.44

Table 6 Ethnobotanical uses of documented plant species and comparison with earlier studies

Name of the species	Present study	Earlier studies
Abroma augustum (L.) L.f	Amenorrhea, dysmenorrhea	Diabetes, inflammation, rheumatic pain of joints, uterine disorders, headache, amenorrhea, dysmenorrhea, antifertility (Khanra et al. 2015; Miah et al. 2020)
Acorus calamus L.	Snakebite, cough	Epilepsy, schizophrenia, memory disorders, chronic diarrhea, dysentery, bronchitis, fevers, cough, asthma, epithelial and abdominal tumors, kidney and liver troubles, rheumatism, eczema, analgesic (Kirtikar and Basu 1998; Mukherjee et al. 2008a, b; Sharma et al. 2020)
Aegle marmelos (L.) Correa	Amenorrhea, edible	Fever, urinary disease, diarrhea, dysentery, diabetes, constipation, eye diseases, gastrointestinal, cough (Singh et al. 2019)
Aloe vera (L.) Burm.f	Fire burn, stomach disorders	Wounds, skin disease, insect bites, eczemas (Sanchez et al. 2020)
Allium sativum L.	Dog bite, night blind, fever, cough	High blood pressure, cold, cough (Tudu et al. 2022)
Alstonia scholaris (L.) R.Br	Cough, cold, malaria	Increase lactation, malarial fevers, abdominal disorders, dyspepsia, skin diseases (Kanase and Mane 2018)
Alternanthera bettzickiana (Regel) G. Nicholson	Stop bleeding, wound	Cuts and wounds, blood purifying (Pamila and Karpagam 2017)
Alternanthera sessilis (L.) DC	Anemia, edible	Wound healing, fevers, burning sensations, diarrhea, skin diseases, dyspepsia, hemorrhoids, liver and spleen diseases, hepatitis, chest tightness, asthma, hepatitis (Agyare et al. 2016; Shehzad et al. 2019)
Amaranthus spinosus L.	Edible, carbuncle	Boils, eczema, abscesses, stomach-ache, gastroenteritis, gallbladder inflammation, rheumatic pain, arthritis (Basu et al. 2019)
Andrographis paniculata (Burm. f.) Nees	Hookworm, diarrhea, fever	Malaria, stomach pain, fever, typhoid, snakebite, whooping cough, asthma, kidney stone, bronchitis, dysentery (Kumar et al. 2021)
Annona squamosa L.	Diabetes	Wounds, ulcers, tumors (Al Kazman et al. 2022)
Argemone mexicana L.	Itching	Tongue disorder, leukoderma, relieve toothache, antidote for snake poisoning (Sharanappa and Vidyasagar 2014; More and Kharat 2016)
Azadirachta indica A.Juss	Stop vomiting, jaundice, hookworm, skin disease, blood purifier	Allergy, skin disease, boils, fever (Sujarwo et al. 2016)
Bombax ceiba L.	Toothache	Cholera, pleurisy, diuretic (Rajput and Rekha 2022)
Cajanus cajan (L.) Huth	Jaundice, diabetes	Diabetes, laxative, genital inflammations, malaria, ulcers, induce lactation (Gargi et al. 2022)
Camellia sinensis (L.) Kuntze	Beverage, edible	Heart disease, controlling blood sugar levels (Chopade et al. 2008)
Carica papaya L.	Gastric, edible	Digestion, jaundice, dysentery, wound healing, heart disease (Kong et al. 2021)
Cascabela thevetia (L.) Lippold	Stomach problem, eye infection, cough, piles, ritual	Wounds, infected areas, ringworms, tumors (Rahman et al. 2017)
Cassia fistula L.	Tongue wounds	Throat disorders, inflammation, liver complications, chest problems, asthma, rheumatism (Mwangi et al. 2021)
Catharanthus roseus (L.) G.Don	High blood pressure, cuts and wounds	Cancer, diabetes, wound, fever, dysentery, digestive, hypotensive, laxative, sedative, stomachic, toothache (Kumar et al. 2022)

Table 6 (continued)

Name of the species	Present study	Earlier studies
Centella asiatica (L.) Urb	Diarrhea, stomach pain	Dysentery, stomach problems, diabetes, jaundice, anemia, leprosy, lupus, varicose ulcers, eczema, psoriasis, fever (Gohil et al. 2010; Basumatary et al. 2024)
Cissus quadrangularis L.	Bone fracture	Bone fracture, pain, inflammation, osteoporosis, rheumatoid, swelling, dyspepsia, colic, chronic ulcer, hemoptysis, convulsion, skin diseases, leprosy, helminthiasis (Hamid and Patil 2023)
Clerodendrum infortunatum L.	Dysentery, ritual, alcohol preparation	Headache, toothache, rheumatism, swelling, skin diseases, fever, diabetes, malaria, burns, tumors, epilepsy (Prashith et al. 2019)
Clitoria ternatea L.	Snake bite	Eye infection, indigestion, memory enhancer, nootropic, antistress, anxiolytic, antidepressant (Mukherjee et al. 2008a, b)
Curcuma caesia Roxb	Stomach pain	Piles, tumors, leukoderma, asthma, bronchitis (Devi et al. 2015)
Curcuma longa L.	Hookworm, stop bleeding, wound, pain	Cuts and wounds, skin disease, cough, cold, jaundice, liver disorders, stomach pain, worms, regulating menstruation, dissolving gallstones, relieving arthritis, burns (Prasad and Aggarwal 2011)
Cuscuta reflexa Roxb	Excess abdominal fluid	Diarrhea, constipation, headache, skin rashes, amnesia, epilepsy, cough, fever (Hassan et al. 2020)
Cynodon dactylon (L.) Pers	Stop bleeding	Vomiting, skin disease, leprosy, piles, wounds, cough, cramps, diarrhea, dysentery, epilepsy, headache, hemorrhage, hypertension, measles, rubella, snakebite, sores, stones, tumors, urogenital disorders (Nagori and Solanki 2011)
Cyperus rotundus L.	Diarrhea, recovery from hangover	Diabetes, malaria, stomach disorders, diarrhea, pyresis, inflammation (Pirzada et al. 2015)
Datura stramonium L.	Asthma, boils, wounds	Ulcers, wounds, inflammation, rheumatism and gout, bruises and swellings, fever, asthma, bronchitis, toothache, ear pain, cough, fever, asthma (Srivastava and Srivastava 2020)
Dracaena trifasciata (Prain) Mabb	Waist pain	Allergy, skin disease (Afrasiabian et al. 2017)
Euphorbia neriifolia L.	Jaundice, cough	Skin diseases, digestive issues, wounds, hemorrhages, bronchitis, tumors, leukoderma (Sultana et al. 2022)
Gmelina arborea Roxb	Edible, skin disease	Vomiting, diarrhea, snakebite, Cut and wound, piles (Kumari et al. 2017)
Hibiscus rosa-sinensis L.	Tuberculosis	Dysentery, fever, boils, cough, cold, inflammation, bacterial infections, wound (Missoum 2018)
Justicia adhatoda L.	Fever, hookworm, asthma	Cough, cold, leprosy, bronchitis and asthma (Sobia et al. 2020; Baruah et al. 2024)
Justicia gendarussa Burm.f	Muscles pain	Rheumatism, fever, hemiplegia, arthritis, headache (Paval et al. 2009)
Kalanchoe pinnata (Lam.) Pers	Fire burn, piles, stomach disorders, epilepsy	Kidney stones, gastric ulcers, pulmonary infections, rheumatoid arthritis (Quazi Majaz et al. 2011)

Table 6 (continued)

Name of the species	Present study	Earlier studies
Lantana camara L.	Fever, stop bleeding, edible	Cough, cold, rheumatism, skin rashes, malaria, wound healing, fever treatment, influenza treatment, stomach ache, malaria, cancers, chickenpox, measles, ulcer (Etuh et al. 2021)
Lawsonia inermis L.	Ear wound, silky hair	Headache, jaundice, antidandruff, wounds, ulcer, skin inflammation (Batiha et al. 2024)
Leucus aspera (Wild.) Link	Fever, cough, cold, asthma, edible	Cuts, sores, skin disease, asthma, bronchitis, scabies, psoriasis, snakebite, cough, cold, boils, migraine (Das et al. 2012)
Mangifera indica L.	Epilepsy, fruit edible	Dysentery, cough, cold, digestion diabetes, bronchitis, diarrhea, asthma, kidney, scabies, respiratory problem (Kumar et al. 2021)
Melia azedarach L.	Hookworm, stop vomiting	Anemia, skin disease, headache, fever, diarrhea, malaria (Jafari et al. 2013)
Mikania micrantha Kunth	Stop bleeding, wound	Snakebite, scorpion bite, insect bites, rashes and itches of skin, chicken pox, healing of sores and wounds, colds and fever, nausea, jaundice, rheumatism, respiratory ailments (Ali Khan et al. 2023)
Mimosa pudica L.	Diarrhea, piles	Infertility, toothache, headache, jaundice, piles, diarrhea, dysentery, piles, ulcers, wounds, hemorrhoids and urinary infections, fever, syphilis, leprosy, stomach worms, insect bite, insomnia, nervousness (Ahmad et al. 2012)
Mirabilis jalapa L.	Amenorrhea	Wounds, inflammation, allergic skin disorder, asthma (Innocent et al. 2024)
Moringa oleifera Lam	Hookworm, high blood pressure, liver problem, edible	Tumors, leukoderma, liver disorders, snakebite, piles, diarrhea, wounds, pain, ulcers, heart disease, inflammation (Pareek et al. 2023)
Mucuna pruriens (L.) DC	Gastric, boils	Nervous disorders, male infertility (Lampariello et al. 2012)
Murraya koenigii (L.) Spreng	Gastric	Fever, cough, diarrhea, bone fractures, dog bites, madness, pain, pleuritis, ringworm, scorpion sting, snake-bite, menstruation disorders, constipation, edema, tuberculosis (Thyagaraju 2017)
Musa balbisiana Colla	Diarrhea, liver problem	Liver problems, dysentery, diabetes, diarrhea, scabies, helminthiasis, inflammation (Daimari and Swargiary 2020)
Nelumbo nucifera Gaertn	Weakness	Skin disease, leprosy, vomiting, ringworm (Sheikh 2014)
Nigella sativa L.	Impotence, fever, spices	Diarrhea, inflammation, anemia, indigestion, loss of appetite, dropsy, amenorrhea and dysmenorrhea, skin eruptions (Ahmad et al. 2013)
Nyctanthes arbor-tristis L.	Anti-dandruff, waist pain, edible	Rheumatism, malaria, fever, cough, skin inflammation (Agrawal and Pal 2013)
Ocimum gratissium L.	Cough, bees bite	Diarrhea, fever, cough, skin disease, vomiting, diabetes, cancer, inflammation, anemia, pains, fungal, bacterial infections (Ugbogu et al. 2021)

Table 6 (continued)

Name of the species	Present study	Earlier studies
Ocimum tenuiflorum L.	Cough, fever, malaria, ringworm, ritual	Asthma, cough, cold, fever, anxiety/depression, bronchitis, diabetes, diarrhea, eye disorders, insect bites, snakebites, malaria, skin disorders (Bhamra et al. 2022)
Oroxylum indicum (L.) Kurz	Jaundice, diabetes, edible	Diarrhea, jaundice, diabetes, arthritic, rheumatic problems, gastric ulcers, tumors, respiratory diseases (Dinda et al. 2015)
Oxalis corniculata L.	Diarrhea, liver problem, mouth wounds, edible	Scurvy, snakebite, skin disease, liver disorder, indigestion, wounds, conjunctivitis, diarrhea, anemia, dyspepsia, piles, insomnia, insect bites (Sarkar et al. 2020)
Paederia foetida L.	Gastric, ulcer, diarrhea, edible	Vomiting, abdominal pain, stomach disorders, inflammation, diarrhea, dysentery, burns, rheumatism, allergy, diabetes, snakebite, kidney stone (Chanda et al. 2023)
Phlogacanthus thyrsiformis (Roxb. ex Hardw.) Mabb	Cough, cold, edible	Cough, cold, fever, skin disease, wound, blood purification (Koushik et al. 2017)
Phyllanthus emblica L.	Stop hair fall, eye infection	Itching, fever, jaundice, indigestion, cancer, diabetes, liver, cardiac problems, anemia (Prananda et al. 2023)
Piper betle L.	Stop bleeding, night blind, toothache, cough, cold	Antiseptic, malaria, cold, bronchial asthma, cough, rheumatism, oral hygiene, conjunctivitis, wounds (Biswas et al. 2022)
Piper longum L.	Hookworm, cough, cold	Asthma, cough, cold, rheumatism, constipation, gonorrhea, paralysis of the tongue, diarrhea, cholera, chronic malaria, viral hepatitis, respiratory infections, stomachache, bronchitis, diseases of the spleen, tumors (Kumar et al. 2011)
Pontederia hastata L.	Digestion, edible	Boils, gastritis, hepatopathy, laxative (Misra et al. 2018)
Psidium guajava L.	Dysentery, edible	Diarrhea, cuts and wounds, inflammation (Gutierrez-Montiel et al. 2023)
Ricinus communis L.	Wounds, boils, headache	Abdominal disorders, arthritis, backache, muscle aches, bilharziasis, chronic backache, chronic headache, constipation, expulsion of placenta, gallbladder pain, period pain, menstrual cramps, rheumatism, sleeplessness, insomnia (Marwat et al. 2017)
Senna occidentalis (L.) Link	Blood purifies, cough	Jaundice, skin disease, fevers, wounds, anemia, menstrual problems (Manikandaselvi et al. 2016)
Sesbania sesban (L.) Merr	Hookworm	Boils, antibiotic, gonorrhea, breast cancer, edema, malaria (Brahim Mahamat et al. 2024)
Smilax ovalifolia Roxb. ex D.Don	Gonorrhea	Skin disease, anemia, improves sexual vigor (Bhatta et al. 2021)
Tabernaemontana divaricata (L.) R. Br. ex Roem. & Schult	Eye infection	Asthma, diarrhea, epilepsy, abdominal tumors, eye infections, fever, fractures, headache, inflammation, leprosy, edema, paralysis, piles, rabies, rheumatic pain, ulceration, skin diseases (Ghosh et al. 2021)
Terminalia arjuna (Roxb. ex DC.) Wight & Arn	Heart problem, gastric, amenorrhea	Skin disease, leukoderma, tuberculosis, liver Disorders, heart failure, ischemia, blood diseases, anemia, venereal, viral disease, fractures, ulcers (Gaikwad and Jadhav 2018)

Table 6 (continued)

Name of the species	Present study	Earlier studies
Zingiber officinale Roscoe	Easy digestion, measles, cough, cold, spice	Cough, cold, indigestion, fever, blood circulation, kidney function (Bhowmik et al. 2010)

FUV value ranging from 0.05 to 0.63. The highest FUV value was observed in Rubiaceae family (Table 5).

The survey provides comprehensive information on the medicinal plants and traditional practices of the plants used in household remedies. People in these areas use traditional medicine to cure different diseases by using different parts of plants with different ratios. Leaves have always been used for many reasons such as medicine, food value as vegetables, and ritual value. The leaves of *Abroma augustum*, *Acorus calamus*, *Aegle marmelos*, *Aloe vera*, *Alternanthera bettzickiana*, *Alternanthera sessilis, Andrographis paniculata*, *Azadirachta indica*, *Cajanus cajan*, *Camellia sinensis*, *Catharanthus roseus*, *Centella asiatica*, *Cissus quadrangularis*, *Cynodon dactylon*, *Datura stramonium*, *Dracaena trifasciata*, *Euphorbia neriifolia*, *Justicia adhatoda*, *Justicia gendarussa*, *Kalanchoe pinnata*, *Lantana camara*, *Lawsonia inermis*, *Leucus aspera*, *Mangifera indica*, *Melia azedarach*, *Mikania micrantha*, *Mimosa pudica*, *Moringa oleifera*, *Murraya koenigii*, *Nyctanthes arbor-tristis*, *Ocimum gratissimum*, *Ocimum tenuiflorum*, *Oxalis corniculata*, *Paederia foetida*, *Phlogacanthus thyrsiformis*, *Piper betle*, *Psidium guajava*, *Ricinus communis*, *Senna occidentalis, Sesbania sesban* are used for various medicinal purposes.

Leaves of *Alternanthera sessilis, Amaranthus spinosus*, *Centella asiatica*, *Leucus aspera*, *Moringa oleifera*, *Murraya koenigii*, *Paederia foetida*, *Sesbania sesban* are also used as food value or vegetables.

The leaves of *Ocimum tenuiflorum*, *Aegle marmelos*, *Piper betle*, *Clerodendrum infortunatum*, *Cynodon dactylon* are used by the tea tribe of the Dhubri district. *Allium sativum*, *Curcuma longa*, *Zingiber officinale* are used as spices**.** Flowers of *Camellia sinensis*, *Carica papaya*, *Gmelina arborea*, *Justicia adhatoda*, *Leucus aspera*, *Moringa oleifera*, *Nyctanthes arbor-tristis*, *Oroxylum indicum*, *Phlogacanthus thyrsiformis*, *Pontederia hastata* are used as vegetables.

For a better understanding of the medicinal uses of the documented plant species of the study area, ethnobotanical uses of documented plant species and comparison with earlier studies are also provided (Table 6). After comparison, the present study signified the additional uses of some species i.e. *Acorus calamus*, *Aegle marmelos*, *Aloe vera*, *Allium sativum*, *Andrographis paniculata*, *Annona squamosa*, *Bombax ceiba*, *Cascabela thevetia*, *Clitoria ternatea*, *Euphorbia neriifolia*, *Hibiscus rosa-sinensis*, *Kalanchoe pinnata, Mangifera indica*, *Mirabilis jalapa*, *Moringa oleifera*, *Phyllanthus emblica*, *Piper betle* and *Zingiber officinale* as mentioned in Table 6.

Conclusion

Traditional medicine remains an integral part of the health care practice of the tea tribes of Dhubri District, Assam. The study documented a total of 70 species and represented that the tea tribes of Dhubri District people possess very good knowledge about the use of plants for medicinal purposes. This is the first report of quantitative ethnobotanical indices in the study area. The tea tribes of the study area are very much dependent on herbal medicine due to the lack of cost of allopathic. Although they have deep faith in their old methods of treatment and traditions, the tea tribe people have vast knowledge of herbal plants used for treating various diseases, especially ethno-gynecology. The studies of different uses of plant species, the tea tribe make available for documentation of information and some of them new to the societies. This traditional knowledge of herbal medicines needs more scientific research to examine the properties of plant species and phytochemical analysis for the discovery of new drugs and compounds. The active constituents of herbal medicines should be discovered and synthesized by many new medicines of a wider scope. A large number of medicinal plant species are also used in domestic markets in the study area. One common example is that in the study area, the fruits of *Oroxylum indicum* are exported by the employees of domestic markets and brought with 500 rupees/KG.

It is believed that some knowledge about the uses of plant species will stay alive when the elder generation has passed away, due to the lack of well-organized distribution of knowledge regarding these herbal medicines. Several of the medicinal remedial measures are little known to the scientific field. Therefore, through ethnomedicinal studies attention should be paid to the documentation of traditional knowledge for improvement of the healthcare system.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval Not applicable.

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