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Ethnomedicinal Plants Used by the ethnic Communities of Tinsukia District of Assam, India

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Abstract

An ethnobotanical study focused on medicinal utility of plants was carried out among the ethnic communities of Tinsukia district of upper Assam with aims to document the traditional knowledge of the medicinal plants used in various ailments. The information was based on normal conversation, interview and discussion with local herbal practitioners, elderly men and women of different tribal communities. In this study, a total of 175 plant species belonging to 76 families were described which have been used in the treatment of around 56 diseases. Herbs, shrubs and trees were the dominant category of the plants. Most frequently medicated claims were stomach ailments, gynaecological problems, lung and respiratory diseases, cuts and wounds, skin diseases, urinary troubles and as well as their use as blood purifier. The most cited family was Euphorbiaceae, the most widely used plant part was the leaf and the most common mode of administration was decoction. All these claims need to be subjected to both phyto- and pharmaco-chemical investigations to discover the potentiality of these plants and plant parts as drugs.

Key Words: Ethnomedical knowledge; Traditional herbal medicine; Ethnic communities; Tinsukia district; Assam

Introduction

The use of traditional herbal medicine for the treatment of common ailments has great relevance today because of high cost of modern medical care, which is beyond the reach of poor, side effects of synthetic drugs and development of resistance to currently used drugs for infectious diseases. Contrary to this, plants used for medicinal purpose have been found to have little or no side effects. Since times immemorial, plant based drugs have been in use in the amelioration of various ailments ranging from common cold to cancer [1]. Primitive people have used plants to cure a variety of ailments but they keep no records and the information is mainly passed on verbally from generation to generation [2]. The traditional ethnomedical knowledge has been descending from generation to generation with constant updating through trial and error method. World Health Organization (WHO) has shown great interest in documenting the use of medicinal plants from tribes in different parts of the world [3]. In current world order, an unexplored reservoir of phytochemical information hidden in nature is rapidly destroyed by deforestation and habitat loses. Traditional herbal medicine is an important component of primary health care system in developing countries like India. They are considered to be safe, effective and inexpensive, for which there is a global trend for the revival of traditional herbal medicine. Screening of medicinal herbs used by different ethnic groups or communities has now become a potential source for isolation of bioactive compound. Assam is a botanically rich state in North East India, which is situated in between 24º2' - 27º6' N latitudes and 88º8' - 96º E longitudes (Fig. 1) and covers an area of 78,523 sq. km. The total number of districts in Assam is 23 and the total population as per 2001 census is 26,638,407. The state extends between foothills of eastern Himalayas and the Patkai and Naga Hills and is bordered by the nations such as Bhutan to the northwest, Bangladesh to the south west and Myanmar to the south. Assam has a humid tropical and subtropical climate as it receives heavy rainfall during monsoon. A sizeable area of the state is covered with dense tropical semi-evergreen to evergreen forests with mix crop composition including bamboo. Assam is inhabited by a number of ethnic tribes belonging to the Indo-Mongoloid races which includes Bodo, Mishing, Karbi, Dimasha, Rabha, Tiwa, Sonowal Kachari, Ahom, Tai Turung, Tai Khamyang, Deori, Chutia, Koch, Motok and Moran [4].

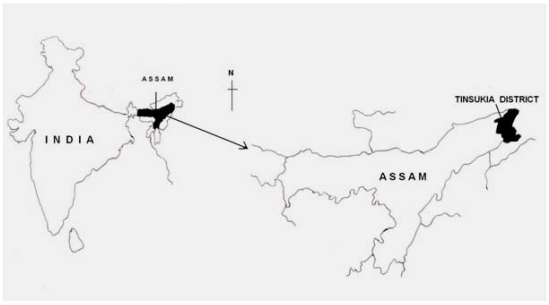

Fig. 1 Location Map of Tinsukia District, Assam (India)

Plants form an integral part of their culture, which is evident from their food habit, customs, marriage system and household practices. The people of this region have developed a rich ethnomedical tradition [5] and have an abundance of medicinal plants known to the native people [6].

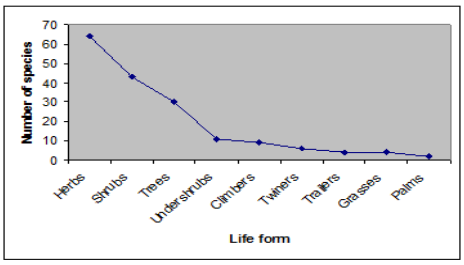

Fig. 2 Category of recorded ethnomedicinal plants

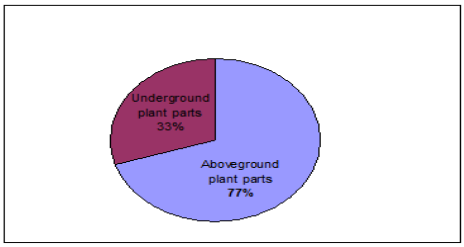

Fig. 3 Underground and aboveground plant parts used against ailments

Methodology

Study area

The Tinsukia district is located in the eastern most part of Assam, India (Fig. 1). Earlier the district was a sub-division of un-divided Dibrugarh District of Assam, which was declared as the 23rd district of Assam on 1st October, 1989. The district covers an area of 3790 sq km, 27°23' to 27°48' N latitude, 95°22' to 95°38' E longitude. The annual rainfall ranges from 2300 - 3800 mm and rainy season extends from the month of June to September. The annual temperature ranges from 7^0C - 34^0C. The average elevation of the district is about 148 m above the sea level. The total population of the district according to 2001 census is 1,150,146 inhabitants with 63.28% literacy rate. Majority of the rural people in the district are cultivators and agricultural workers. Although paddy cultivation occupies major chunk of traditional agricultural system, the inhabitants of the district also produce a sizeable amount of orange, tea and ginger. Majority of the rural population belongs to Indo-Mongoloid communities and comprise Motok, Moran, Sonowal Kachari Deori, Mishing and Ahom [7]. Although the semi-urban people have adopted modern health care facilities, the majority of rural folk are still prefer traditional herbal medication as best alternative to cope with tropical borne diseases. Plants form an integral part of their culture, which is evident from their food habit, customs, marriage system and household activities. The people of these communities more particularly the rural folk have long history of using plants for their various ailments. Till date, only few literatures on the traditional uses of medicinal plants of Tinsukia district are available but disease specific ethnomedicinal investigation are still lacking. A few workers have conducted a survey on ethnobotany of the Dibru-Saikhova Natiional Park [8] and ethnomedicinal plants used in gynecolgical disorders of the said district [7]. In view of the above, present study was conducted with aims to document ethnobotanical plants used by the ethnic communities of the region for medicinal purposes, and it is expected that such key ethnobotanical findings would serve as baseline data for future phytochemical research.

Methods

Regular field trips were conducted during the year 2009 to 2011 in the Tinsukia district of upper Assam. The study was carried out in the areas, where the population distribution of the communities is dense. In each field trip, rapports were established with elderly people or village heads or herbal practitioners of the respective communities. Information was gathered from the local herbal practitioners, and the elderly men and women of the respective communities through normal conversation, interview and discussion. The information was also gathered from some village markets, where some plants of therapeutic value were sold. During the field works, repeated cross verification of data from the informants located in different places were made. Only the specific and reliable information crosschecked with different informants and at different places were incorporated in the present study. The information gathered was also cross verified with available local literature [9, 10]. The collected plant species were identified with the help of local floras, (11-13) and Botanical Survey of India, Shillong. Herbarium specimen of each plant was prepared and deposited to the Department of Botany, Namrup College, Assam, India. Key morphological characters and phenological cycle of the each plant species were recorded. The plants were alphabetically arranged in Table 1 along with their local names, English names, families, parts used, medicinal uses and the mode of administration.

Table1 Checklist of ethnomedicinal plants used by the ethnic communities of Tinsukia District, Assam

Sl. No	Botanical Name	Family	Local name	English name	Phenology	Part used	Medicinal Use
1.	*Abroma augusta* L. JB/NC 004	Sterculiaceae	Ulot kambal, gorokhia korai	Devil's cotton, Cotton abroma	April-Aug	Root	Root juice is considered as uterine tonic
2.	*Abrus precatorius* L JB/NC 001	Fabaceae	Latumoni	Crab's eye vine	July-Nov	Root	Root decoction is given as diuretic
3.	*Abutilon indicum* (L.) Sweet JB/NC 003	Malvaceae	Jopa, junuka goch	Indian mallow	April-Oct	Leaf	Leaf decoction is useful as mouthwash in toothache. Infusion is given in fever.

4.	*Acacia fernesiana* (L.) Willd. JB / NC 002	Mimosaceae	Tarua kadam	—	Sept-March	Stem bark,	Bark decoction is given in malaria.
5.	*Achyranthes aspera* L. JB/NC 005	Amaranthaceae	Bioni-hakuta, Ubhuta bonsoth	Prickly chaff flower	Oct-April	Leaf, root	Root decoction is applied as a poultice to swellings and wounds of nipples. Leaf decoction is used in the treatment of cough and sore throat.
6.	*Acorus calamus* L. JB/NC 006	Araceae	Bosh	Sweet flag	Nov-Jan	Rhizome	Decoction of rhizome given in dyspepsia and flatulence.
7.	*Agerartum conyzoides* L. JB/NC 007	Asteraceae	Gendhela bon	Goat weed	Jan-Dec	leaf	Bruised leaves are applied to cuts and wounds as antiseptic.
8.	*Alangium chinese* (Lour.) Harms. JB/NC 008	Alangiaceae	Sika morolia, maroli goch	—	May-Sept	Leaf, stem bark	Decoction of leaves and stem bark is said to cure malaria.
9.#	*Alocasia indica* (Roxb.) Schott. JB/NC 009	Araceae	Man kachu	—	Jan-Jun	Rhizome	Boiled rhizome is given in abdominal pain.
10.#	*Alocasia macrorriza* (L.) G.Don	Araceae	Bor kochu	—	Jan-March	Rhizome, tender leaf	Rhizome paste is applied on abscesses to expel pus. Boiled tender leaf is said to prevent tonsillitis.
11.	*Alpinia nigra* (Gaertn.) Burtt. JB/NC 010	Zingiberaceae	Tora	—	May-Aug	Rhizome	Rhizome paste is used in bronchitis.
12.	*Alstonia scholaris* (L.) R. Br. JB/NC 011	Apocynacceae	Chatiana	—	Oct-March	Latex, Stem bark	Latex is applied on scabies and some skin diseases. Decoction of stem bark is given in chronic diarrhoea, dysentery and malaria fever
13.#	*Alternanthera sessilis* (L.) R.Br. ex DC JB/NC 012	Amaranthaceae	Mati - kanduri	—	Jan-Dec	Tender shoot	Boiled and given in dysentery
14.#	*Amaranthus spinosus* L. JB/NC 013	Amaranthaceae	Hati-khutura	Spiny amaranth	Jan-Dec	Root, tender shoot	Root juice is given in diarrhoea. Taking as vegetable of tender shoot is useful as galactogue to nursing mothers
15.	*Amaranthus tricolor* L. var. *tristis*(Prain) Nayar JB/NC 014	Amaranthaceae	Bishalya karani	—	Jun-Nov	Leaf	Leaf paste is applied to cuts and wounds for quick healing.
16.#	*Amaranthus viridis* L. JB/NC 015	Amaranthaceae	Khutura	—	Jan-Dec	Tender shoot	Taking as vegetable is said to improve eyesight.
17.#	*Amorphophalus paeoniifolius* (Dennst.) Nicolson JB/NC 016	Araceae	Ol-kochu	—	July-Oct	Tender shoot, corm	Tender shoots are used as vegetables, which is said to cure sinusitis. Boiled corm is used in the treatment of piles, dysentery and rheumatism.
18.	*Aquillaria malaccensis* Lamk. JB/NC 017	Thymeliaceae	Sachi goch	Agarwood, Aloe wood	May-Aug	Root	Root decoction is given in abdominal pain.
19.	*Artocarpus lacucha* Hom. JB/NC 019	Moraceae	Bohot	—	April-Aug	Fruit	Fruit juice is given in dysentery
20.	*Baccaurea ramiflora* Lour. JB/NC 018	Euphorbiaceae	Leteku	—	April-Aug	Stem bark	Decoction of bark is useful in constipation. Powdered dry bark is applied on infected umbilicus of newly born baby.
21.	*Bambusa balcooa* Roxb. JB/NC 017	Poaceae	Bholuka-banh	Plain bamboo	Feb-May	Culm	The outer green layer is scrapped off, powdered and applied on fresh wound for quick healing.
22	*Bixa orellana* L.	Bixaceae	Jorot goch	Arnetto	March-Aug	Stem	Juice of the bark is

	JB/NC 020			dye tree		bark	prescribed for dysentery and kidney trouble.
23.	*Butea monosporma* (Lamk.) Taub. JB/NC 027	Fabaceae	Polash	Flame of the forest	April-Sept	Flower, Seed	Flower paste is given in urinary trouble. Powdered dry seeds are given as anthelmintic.
24.	*Caesalpinia bonduc* (L.) Roxb. JB/NC 021	Caesalpiniaceae	Letaguti	—	Aug-Dec	Seed	Decoction of seed is given in pneumonia
25.#	*Calamus tenuis* Roxb. JB/NC 026	Arecaeae	Jati-bet	—	May-Nov	Tender shoot	Used as vegetables which is said to act as blood purifier.
26.	*Calotropis procera* (Ait.) R. Br. JB/NC 025	Asclepiadaceae	Akon	—	April-Sept	Latex, Leaf	Latex is applied as liniment in rheumatic pain and the leaf is used as message in chest pain.
27. #	*Carica papaya* L. JB/NC 022	Caricaceae	Amita	Papaya	April-Oct	Fruit	Latex of tender fruit is applied to burn injury, snake bite, jaundice and as antifertility agent. Unripe fruit is useful in liver disorder and constipation. Ripe fruit helps in digestion.
28.	*Carissa carandus* L. JB/NC 023	Apocynacceae	Korja tenga	Christ's thorn,	April-Aug	Stem bark, fruit	Decoction of stem bark is used in chest pain. Ripe fruit is said to cure stomach problems.
29.	*Caryota urens* L. JB/NC 024	Arecaceae	Sewza	Toddy palm wine palm, jaggery palm	Feb-July	Root	Decoction of root is as galactogue to nursing mothers.
30.	*Cascabela thevetia* (L.) Lipp. JB/NC 028	Apocynaceae	Korobiphul	Trumpet flower	April-Nov	Stem bark, seed	Latex of stem bark is applied on boils. Infusion of the bark is used in malaria. Seeds are used as antifertility agent.
31.	*Cassia alata* L. JB/NC 029	Caesalpiniaceae	Khorpat	Ringworm bush	April-Oct	Leaf	Leaf paste is applied on scabies and ringworm.
32.	*Cassia fistula* L. JB/NC 030	Caesalpiniaceae	Sonaru	Golden flower, Indian laburnum	April-Sept	Root, fruit	Burning root is inhaled to relief common cold. Poultice of unripe fruit is applied on tongue of children in fungal infection. Fruit pulp is eaten in constipation and also act as liver tonic.
33.	*Cassia occidentalis* L. JB/NC 031	Caesalpiniaceae	Medeluwa	Cofea senna	April-Sept	Leaf	Leaf decoction is applied on ringworm and itches.
34.	*Cassia sophera* L. JB/NC 032	Caesalpiniaceae	Medeliwa	—	Jun-Nov	Leaf	Leaf decoction is applied on ringworm, scabies and insect bite.
35.	*Cassia tora* L. JB/NC 033	Casalpiniaceae	Dadigdiga, bilokhoni	—	July-Nov	Leaf	Leaf decoction is applied on ringworm and given in asthma.
36.	*Catimbium malaccense* (Burm.f.) Holttum JB/NC 034	Zingiberaceae	Bor tora	—	Jun-Sept	Rhizome	Rhizome paste is used as remedy for sore.
37.	*Celtis tetrandra* Roxb. JB/NC 035	Ulmaceae	Sukuta	—	Jan-Aug	Tender leaf	Taking as vegetable is said to be useful to relieve pain after childbirth.
38.#	*Centalla asiatica* (L.) Urban JB/NC 036	Apiaceae	Bor-manimuni	Asiatic pennywort, Indian pennywort	April-Sept	Whole plant	Paste is applied on cuts and wounds for quick healing. Juice of the plant is applied on forehead in headache.

39.#	*Chenopodium album* L. JB/NC 037	Chenopodiaceae	Jilmil sak	Lamb's quarters	Nov-March	Tender shoot	Boiled tender shoot is used in constipation and cough.
40.	*Chromolina odorata* (L.) King et Robin. JB/NC 038	Asteraceae	Bagh dhoka, Jarmani bon.	__	Dec-March	Leaf	Leaf paste is applied as antiseptic to cuts and wounds.
41.	*Cissamperos pareira* L. JB/NC 039	Menispermaceae	Tubuki lota	__	Dec-May	Root, leaf	Powdered dried root is given in dropsy. Leaf paste is applied on forehead in fever.
42.	*Cissus quadriangularis* Wall.ex.Wt & Arn JB/NC 040	Vitaceae	Harjura lota	__	April-Aug	Stem	Stem paste is applied on wounds and bone fracture for quick healing.
43.	*Cissus repens* Lamk. JB/NC 041	Vitaceae	Noltenga	__	April-Jun	Tender leaf	Taking as vegetable is said to relieve stomach ailments.
44.#	*Citrus aurantifolia* (Christm.) Swingle JB/NC 042	Rutaceae	Gol-nemu	Common lime	July-Dec	Fruit	Ripe fruits in common salt are used in dysentery.
45.#	*Citrus grandis* (L.) Osb. JB/NC 043	Rutaceae	Robab tenga, Bor tenga	Shadoock	July-Dec	Fruit	Fruit juice is given to expel worm. The juice also acts as blood purifier.
46.#	*Citrus limon* (L.) Burm. JB/NC 044	Rutaceae	Kaji nemu	Lemon	March-July	Fruit	Fruit juice is given in flatulence, dysentery and diarrhoea.
47.#	*Clerodendron colebrookianum* Walp. JB/NC 045	Verbenaceae	Nephaphu	__	Aug-Nov	Tender leaf	Decoction of tender leaf is given to cure hypertension.
48.	*Clerodendron serrartum* (L.) Moon JB/NC 046	Verbanaceae	Nangal-bhanga	___	Aug-Oct	Root, leaf	Root decoction is given in dysentery. Crushed leaves are applied to cuts and wounds.
49.	*Clerodendron viscosum* Vent. JB/NC 047	Verbenaceae	Dhopat tita	___	March-July	Leaf	Infusion of leaves is said to cure malaria.
50.#	*Coccinia grandis* (L.) Voigt. JB/NC 048	Cucurbitaceae	Kunduli	___	May-Aug	Root	Root juice is given in diabetes.
51.	*Coix lachrya-jobi* L. JB/NC 049	Poacceae	Kawri-moni	Job's tear	July-Sept	Root	Root juice is good for menstrual trouble.
52.	*Commelina benghalensis* L. JB/NC 050	Commelinaceae	Kona-simolu	__	July-Nov	Stem	Stem juice is applied on sore eyes.
53.	*Cordia dichotoma* Forst.f. JB/NC 059	Cordiaceae	Bowal	__	Aug-Dec	Stem bark, Leaf, Seed	Paste of bark and leaf is applied to swelling and inflammation. Powdered dry seeds are applied on skin eruptions.
54.	*Costus speciosus* (Koen.ex.Retz.) J.E. Smith DHC 01	Costaceae	Jam lakhuti	__	Jun-Sept	Rhizome	Rhizome paste is given in jaundice
55.	*Croton caudatus* Geisel. JB/NC 051	Euphorbiaceae	Lota mahudui	__	April-Oct	Leaf	Leaf decoction is given in kidney trouble.
56.	*Croton joufra* Roxb. JB/NC 052	Euphorbiaceae	Goch-mahudi	__	Feb-Jun	Leaf	Leaf decoction is used in the treatment of dysmenorrhea.
57.	*Croton tiglium* L. JB/NC 053	Euphorbiaceae	Konibih	Purging cotton, croton oil tree	Jun-Dec	Tender shoot,	Juice of young shoot is given in constipation. Paste of shoots is applied on carbuncles.
58.#	*Cucurbita maxima* Duch. ex. Lamic JB/NC 054	Cucurbitaceae	Ronga-lao	Red gourd squash	Nov-March	Seed	Regular taking of fried seeds is said to increase the sexual vigour.
59.	*Curanga amada* Juss. JB/NC 055	Scrophulariaceae	Bhui-tita	__	May-Aug	Leaf	Eaten as vegetable is said to be useful as appetizer and in fever.
60.	*Curculigo orchioides* Gaertn. DHC 02	Hypoxidaceae	Nagini	__	April-Aug	Tuber	Powdered dry rhizome is applied to wounds and cuts for quick healing.

							Rhizome paste is given in impotency.
61.#	*Curcuma amada* Roxb. DHC 03	Zingiberaceae	Amada	Mango ginger	May-Jun	Rhizome	Extract of rhizome decoction is given in diarrhea
62.	*Curcuma aromatica* Salisb. DHC 04	Zingiberaceae	Bon-halodhi, keturi, ketkuri	Wild temeric, yellow zedoary	April-Jun	Rhizome	Rhizome paste is applied to sprains.
63.	*Curcuma caesia* Roxb. DHC 05.	Zingiberaceae	Kola-halodhi	Black zedoary	May-Jun	Rhizome	Rhizome paste is applied to sprain and bruises.
64.	*Curcuma zedoaria* Rosc. DHC 06	Zingiberaceae	Borahu	Zedoaaria	May-Jun	Rhizome	Juice of the rhizome is given to women after child birth to remove weakness and is said to act as blood purifier
65.	*Cuscuta reflexa* Roxb. JB/NC 056	Cuscutaceae	Akashi-lota	Dodder	Nov-March	Stem	Paste is applied on wounds and decoction is given in jaundice.
66.	*Cynodon dactylon* (L.) Pers. JB/NC 057	Poaceae	Dubori-bon	Dhub grass, Bewrmuda grass	Jan-Dec	Whole plant	Paste of whole plant is applied to cuts and wounds to stop bleeding. Decoction is given in piles and leucorrhea.
67.	*Cypeerus rotundus* L. JB/NC 058	Cyperaceae	Keya-bon	Nut grass	July-Dec	Tuber	The extract of boiled and pounded tuber is given in stomach discomfort
68.	*Dactylotenium aegypticum* (L.) P. Beauv. JB/NC 059	Poaceae	Bobosa-bon	__	Jun-Nov	Culm	Decoction of culm is given in asthma
69.	*Desmodium caudatum* (Thunb.) DC. JB/NC 060	Fabaceae	Bor bioni-hakuta	__	Jun-Nov	Root	Decoction is given in haemospermia.
70.#	*Dillenia indica* L. DHC 07	Dilleniaceae	Ou-tenga	Elephant apple	July-Dec	Fruit	Decoction is given in dysentery, flatulence and constipation.
71.#	*Dioscorea bulbifera* L. DHC 08	Dioscoreaceae	Gothia alu	Air yam, potato yam	Jun-Oct	Tuber	Eaten boiled or roasted is useful in piles.
72.#	*Dioscorea esculenta* (Lour.) Burk DHC 09	Dioscoreaceae	Mua alu	Lesser yam	July-Oct	Tuber	Poultice is applied on swellings
73.	*Diospyros malaberica* (Desv.) Kost. JB/NC 061	Ebenaceae	Kendu	__	May-Sept	Seed	Pounded seeds are mixed with water and the filtrate is given in dysentery.
74.	*Dracena angustifolia* Roxb. DHC 10	Agavaceae	Jam lakhuti, Hati kuhiar	__	Sept-Nov	Root,	Root decoction is given in jaundice.
75.	*Drymaria cordata* (L.) Willd. ex Roem. et Schult. JB/NC 062	Caryophyllaceae	Lai-jabori	__	March-Sept	Whole plant	Paste of whole plant is applied on tongue in fungal infection. Juice is given as a drop in sinusitis.
76.	*Duchesnea indica* (Andr.) Focke. JB/NC 062	Rosaceae	Goru khis,	Indian strawberry	Aug-Dec	Fruit	Eaten fresh in dysentery.
77.	*Entada scandens* Benth JB/NC 063	Fbabaceae	Ghila	Nicker bean, Mackay bean, sea bean	April-Aug	Seed	Seed powder is used as shampoo.
78.#	*Enhydra fluctuans* Lour. JB/NC 064	Asteraceae	Helonchi sak	__	Nov-Jan	Tender shoot	Taking as vegetable is said to be useful as laxative.
79.	*Erecthites valerianaefolia* (Wolf.) DC JB/NC 065	Asteraceae	Bon kopah	Fireweed. Pile weed	Jan-Dec	Leaf	Leaf paste is applied to cuts and wounds for quick healing.
80.#	*Eryngium foetidum* L. JB/NC 065	Apiaceae	Man dhania	__	May-Oct	Leaf	Leaf juice is given in flatulence and stomach trouble.

81.	*Erythrina stricta* Roxb. DHC 11	Fabaceae	Ronga modar	__	March-Jun	Leaf	Leaf juice is used to kill worms in pigs.
82.	*Euphorbia hirta* L. JB/NC 066	Euphorbiaceae	Gakhiroti bon	__	Jan-Dec	Tender shoot	Taking as vegetable by nursing mother helps in the lactation
83.	*Euphorbia ligularia* Roxb. DHC 12	Euphorbiaceae	Siju	__	Dec-May	Latex	Latex is applied to burn injuries, boils and warts.
84.	*Ficus racemosa* L. JB/NC 067	Moraceae	Mau dimoru	__	Feb-Sept	Fruit	Boiled fruits are given in diabetes.
85.	*Flacourtia jangomas* (Lour.) Raeusch. JB/NC 069	Flacourtiaceae	Poniol	Indian plum,	March-Aug	Stem bark, leaf	Decoction of stem bark and leaves are useful in diarrhoea.
86.	*Flemingia srobilifera* (L.) R.Br. JB/NC 068	Fabaceae	Makhioti	__	March-July	Root	Root decoction is given in menstrual irregularities.
87.	*Floscopa scandens* Lour. JB/NC 070	Commelinaceae	Soru konasimolu	__	Aug-Dec	Leaf	Leaf juice is dropped on sore eyes
88.#	*Garcinia cowa* Roxb. ex DC. JB/NC 071	Clusiaceae	Kuji-thekera	__	March-Sept	Fruit	Infusion of dry pericarp is given in diarrhoea, dysentery and flatulence.
89.#	*Garcinia lancifolia* (G.Don.) Roxb JB/NC 072	Clusiaceae	Rupahi thekera	__	April-Oct	Fruit	Same as above
90.#	*Garcinia pedunculata* Roxb. DHC 13	Clusiaceae	Bor thekera	__	Feb-Jun	Fruit	Same as above
91.	*Gmelina arborea* Roxb. JB/NC 073	Verbenaceae	Gomari	__	March-Jun	Leaf	Leaf decoction is given in indigestion and flatulence.
92.#	*Gomphrena celosioides* Mart. JB/NC 074	Amaranthaceae	Leheti	__	Jun-Sept	Tender shoot	Taking regularly as vegetable acts as blood purifier.
93.	*Hedyotis corymbosa* (L.) Lamk. JB/NC 075	Rubiaceae	Bon-jaluk	__	Jun-Dec	Tender shoot	Decoction is given in body ache and peptic ulcer.
94.	*Hedyotis diffusa* L. JB/NC 076	Rubiaceae	Bon-jaluk	__	April-Dec	Tender shoot	Same as above
95.	*Heliotropium indicum* L. JB/NC 077	Boraginaceae	Hatisuriya	__	April-Aug	Leaf	Leaf paste is applied to sprain
96.	*Hibiscus mutabilis* L. JB/NC 078	Malvaceae	Sthala padma	__		Flower bud	Paste is given in menorrhagia.
97.	*Hibiscus rosa-sinensis* L. JB/NC 079	Malvaceae	Jobaphul	China rose	Jan-Dec	Leaf	Leaf paste is used as shampoo to remove dandruff.
98.#	*Hibiscus sabdarifolia* L. JB/NC 080	Malvaceae	Tengamora	__		Tender shoot	Decoction is prescribed in diarrhoea or dysentery
99.	*Homalomena aromatica* (Roxb.) Schott. DHC 14	Araceae	Gondh-kochu	__	Jun-Oct	Rhizome	Rhizome paste is given in stomach ailments.
100.#	*Houttuynia cordata* Thunb. JB/NC 081	Saururaceae	Mosondori	__	Jun-Aug	Leaf	Leaf decoction is given in flatulence, diarrhoea and dysentery
101.	*Hydrocotyl sibthropioides* Lamk. JB/NC 082	Apiaceae	Soru-manimuni	__	May-Nov	Whole plant	Juice of the whole plant is given to kill intestinal worms. Decoction is given in diarrhoea and dysentery. Taken as vegetable is said to be beneficial in improving memory.
102.	*Ichnocarpus frutescens* R.Br. DHC 15	Apocynaceae	Dudhkuri lota	Black creeper	Sept-Dec	Root	Root juice is used in fever and diabetes
103.	*Impatiens balsamina* L. JB/NC 083	Balsaminaceae	Dam-deuka	Garden balsam	Feb-Aug	Stem, leaf	Extract of grounded leaves is given in jaundice. Stem juice is applied on corns. Stem and leaf paste is applied on abdomen to cure urinary trouble.
104.	*Ipomoea aquatica* Forsk.	Convolvulaceae	Pani-	Swamp	Aug-Feb	Tender	Taken as a vegetable is

	JB/NC 084		kolmow	cabage		shoot	said to be useful in diabetes and as galactagogue to nursing mothers.
105.	*Justiicia adhatoda* L. JB/NC 085	Acanthaceae	Boga-bahok	__	Nov-April	Root, leaf	Powder of dry roots is applied on ulcers. Warmed juice is used as message on lower abdomen after childbirth for uterus contraction.
106.	*Kaempferia galanga* L. DHC 16	Zingiberaceae	Gathion	__	March-May	Rhizome	Rhizome paste is applied on skins as emollient and bright Decoction is given in cough and cold
107.	*Kayea assamica* King et Prain DHC 17	Clusiaceae	Sia-nahor	__	April-July	Fruit	Used as fish poison
108. #	*Lagenaria siceraria* (Molina) Standl. JB/NC 086	Cucurbitaceae	Jati-lao	Bottle guard		Flower	Juice is applied to burn injury.
109. #	*Lasia spinosa* (L.) Thw. DHC 18	Araceae	Chengmora	__	Dec-Feb	Rhizome	Boiled rhizome is prescribed for irregular menstruation and juice of the same is given in leucorrhoea.
110.	*Leonurus japnicus* Houtt. JB/NC 087	Lamiaceae	Rong-doron	Siberian mother wort	Feb-May	Leaf	Leaf juice is applied on sore eyes
111. #	*Lepidium sativum* L. JB/NC 088	Brassicaceae	Halim-sak	Garden cress	April-Aug	Tender shoot	Taken as a vegetable is said to be useful for liver.
112. #	*Leucas plukeneti* (Roth.) Spr. JB/NC 089	Lamiaceae	Doron	__	Jan-Dec	Leaf	Leaf juice is given as nasal drops in sinusitis.
113.	*Lindernia pusilla* (Willd.) Bold JB/NC 090	Scrophulariaceae	Gakhiroti-bon	__	Sept-Jan	Whole plant	Decoction is given to women after childbirth to promote milk.
114.	*Lindernia ruellioides* (Colsm.) Pennel. JB/NC 091	Scrophulariaceae	Kasidoria bon	__	Oct-Feb	Whole plant	Paste is applied to tonsillitis.
115.	*Litsea salicifolia* (Roxb. ex Nees.) Hook.f. JB/NC 092	Lauraceae	Dighloti	__	Feb-Jun	Leaf	Leaf decoction is given in dysentery
116.	*Ludwigia octovalvis* (Jacq.) Raven. JB/NC 093	Onagraceae	Pani jolokia	__	Jan-Dec	Whole plant	Paste is applied to fungal infections of toes.
117.	*Machilus bombyciana* King ex Hook.f. JB/NC 094	Lauraceae	Som	__	March-Jun	Fruit	Paste is given as anthelmentic.
118. #	*Malva verticillata* L. Syn. *M. parviflora* L. JB/NC 095	Malvaceae	Lofa	__	Dec-March	Leaf	Taken as vegetable helps in stomach ailments.
119.	*Melastoma malabathricum* L. JB/NC 096	Melastomaceae	Phutuka	Indian rhododendron	Jan-Dec	Leaf	Paste is applied to cuts and wounds
120.	*Melia azedarach* L. JB/NC 097	Meliaceae	Ghora neem	__	March-July	Bark, leaf	Paste of bark and infusion of leaves are applied in skin diseases.
121.	*Melochia corchorifolia* L. JB/NC 098	Sterculiaceae	Bonmora	Wild jute	July-Sept	Root bark	Paste is applied in sore lip
122.	*Meyna spinosa* Link. JB/NC 099	Rubiaceae	Kutkura	__	March-Nov	Leaf, fruit, seed	Leaf paste is used as shampoo. Paste of ripe fruits is applied in cracked heels and used in stomach cancer. Dried fruits are eaten and are said to be useful in piles. Seed paste is used in abortion and applied to pimples.
123.	*Mikania micrantha* Kunth.	Asteraceae	Premlota,	__	Sept-Jan	Leaf	Leaf juice is given in

	JB/NC 100		japanilota				stomach pain and dysentery. Leaf paste is applied to cuts and wounds to stop bleeding.
124.	*Mimosa pudica* L. JB/NC 101	Mimosaceae	Lajuki lota	__	Jan-Dec	Root, leaf	Root paste is given in jaundice. Taking root juice with milk is said to increase the sexual vigour. Leaf paste is applied in skin disease
125.	*Mollugo pentaphylla* L. JB/NC 102	Aizoaceaea	Setkopora	Indian chickweed	Aug-Oct	Leaf	Leaf juice is prescribed to women after childbirth. It is useful for urinary troubles.
126.	*Monochoria hastata* (L.) Solms. JB/NC 103	Pontederiaceae	Bhat meteka	__	Aug-Nov	Leaf	Leaf juice is given as digestive.
127.	*Morus australis* Poir. JB/NC 104	Moraceae	Nuni	Common mulberry	March-Jun	Flower	Paste is given in constipation
128. #	*Murraya koenigii* (L.) Spreng JB/NC 105	Rutaceae	Narasingha	Curry-leaf plant	April-Jun	Leaf	Leaf decoction is given in dyspepsia and dysentery
129. #	*Musa bulbiciana* Colla JB/NC 106	Musaceae	Athia kol	__	July-Sept	fruit	Infusion is given in dysentery, diarrhoea and as anthelmintic.
130. #	*Musa sapientum* L. Collection No. ???	Musaceae	Pura kol, Kach kol	Plantain	Sept-Jan	Fruit	Unripe fruits are boiled and are given in diarrhoea.
131.	*Myrica nagi* Thunb.	Myricacceae	Noga tenga	__	Jan-April	Stem bark	Decoction is prescribed for asthma, cough and diarrhoea.
132.	*Nyctanthes arbor-tristis* L. JB/NC 107	Oleaceae	Sewali phul	Night jasmine	Sept-Jan, April-Jun	Flower	Eaten cooked is useful in malaria, measles, as blood purifier and diabetes.
133.	*Oroxylum indicum* (L.) Vent. JB/NC 108	Bignoniaceae	Bhat-ghila	__	Nov-March	Stem bark	Decoction is given in sour mouth and tongue
134.	*Oxalis corniculata* L. JB/NC 109	Oxalidaceae	Tengeshi, cangeri tenga	Indian sorrel	Jun-Dec	Whole plant	Decoction is given in dysentery and diarrhoea.
135.	*Oxalis corymbosa* DC. JB/NC 110	Oxalidaceae	Bor tengeshi	Wood sorrel	Jan-May	Whole plant	Same as above
136. #	*Paederia scandens* (Lour.) Merr. JB/NC 111	Rubiaceae	Bhedailota	__	Sept-Dec	Tender leaf and shoot	Decoction is given in dysentery, diarrhea, abdominal pains and flatulence.
137.	*Peperomia pellucida* L. JB/NC 112	Peperomiaceae	Ponow-nowa	__	Aug-Jan	Whole plant	Paste is applied on burns for quick relief.
138. #	*Phlogacanthus thyrsiformis* (Hardw.)Mabb. JB/NC 113	Acanthaceae	Ronga bahok, tita phul	__	Jan-May	Flower	Eaten as vegetable is useful in rheumatism, anemia and cough
139.	*Phyllanthes fraternus* Webst. JB/NC 114	Euphorbiaceae	Pani amlakhi,bhui amlakhi	__	July-Dec	Root, tender shoot	Root juice is given in jaundice. Shoot decoction is prescribed for dysentery
140.	*Phyllanthes virgatus* G.Forst. JB/NC 115	Euphorbiaceae	Pani amlakhi	__	Jun-Nov	Root, tender shoot	Same as above
141.	*Physaslis minima* L. JB/NC 116	Solanaceae	Kopalphuta	Sunberry	Oct-March	Leaf	Ripe fruits are considered as diuretic.
142. #	*Piper betle* L. JB/NC 117	Piperacaea	Pan	Betel	March-May	Leaf	Leaf paste is applied on cuts and wounds for quick healing. Petiole paste is applied on piles as well as children to act as laxative.
143.	*Plantago erosa* Wall. JB/NC 118	Plantaginaceae	Singa-pat	__	April-July	Leaf	Leaf paste is applied to cut and wounds.
144.	*Polygonum chinense* L. JB/NC 119	Polygonaceae	Modhu-soleng	__	Sept-March	Tender shoot	Infusion of tender shoots is useful in dysentery.
145.	*Polygonum hydropiper* L. JB/NC 120	Polygonaceae	Pothorua bihoongoni	Water pepper, Pepperwor	Aug-March	Whole plant	Decoction is used as anthelmentic. Whole plant is dried and put in cloth or

				t			under mattresses to drive away moth and other insects.
146.	*Portulaca oleracea* L. JB/NC 121	Portulacaceae	Malbhog saki	Common garden Pursslane.	May-Sept	Whole plant	Decoction is given in dysentery and the paste is applied on wounds and burns.
147.	*Pouzolzia zeylanicca* (L.) Benn. JB/NC 122	Urticaceae	Borali-bokua	—	May-Jan	Whole plant	Paste is applied on sprain and also cut and wounds.
148.	*Psidium guajava* L. JB/NC 123	Myrtaceae	Modhuri am	Guava	April-Nov	Stem bark, Leaf	Bark decoction is given in blood dysentery. The extract of grounded leaves is given in piles and diarrhoea.
149.	*Punica granatum* L. JB/NC 124	Punicaceae	Dalim	Pomegranate	March-Jan	Root, tender shoot and fruit	Root juice is given in urinary trouble. Decoction of tender shoots is given in diarrhoea. Juice of the mature fruit is dropped in conjunctivitis.
150.	*Quisqualis indica* L. JB/NC 125	Combretaceae	Malati phul	Rangoon crceeper	March-Aug	Root	Decoction is given as anthelmintic.
151.	*Rhynchostylis retusa* (L.) Bl. DHC 19	Orchidaceae	Kopou-phul	—	April-Jun	Flower	Paste is applied as emollient on face.
152.	*Rubus alceifolius* Poir JB/NC 125	Rubiaceae	Jetuli-poka, jejeli-poka	—	Aug-Dec	Root, tender shoot, fruit	Root extract is given to relive pain in dysmenorrhea. Decoction of tender shoot is prescribed for cough and pneumonia. Unripe fruit is rubbed over tongue to cure fungal infection.
153.	*Sapindus mukorossi* Gaertn..f. JB/NC 126	Sapindaceae	Moni-chal, ritha	Soap-nut tree	April-Dec	Seed	Seed paste with hot water is used as gargle in tonsillitis and pharyngitis. Seed decoction is also applied on scabies.
154.	*Saraca asoka* (Roxb.) de Wilde. JB/NC 127	Caesalpiniaceae	Ashok goch	—	May-Aug	Seed	Seed paste is given in urinary complaints.
155. #	*Sarcochlamys pulcherima* (Roxb.) Gaud. JB/NC 128	Urticaceae	Mechaki	Dogal tree	Jun-Dec	Tender shoot	Decoction is given in dysentery. Eaten cooked with pork is said to facilitate the digestion of fats by the Mishing people.
156.	*Sauropus androgyns* (L.) Merr. JB/NC 129	Euphorbiaceae	Bari-sundari	Stargoose berry	Jan-Dec	Fruit	Paste is given as anthelmintic.
157.	*Scoparia dulcis* L. JB/NC 130	Scrophulariaceae	Cheni-bon, bon dhania	Sweet broomweed	July-Oct	Stem	Infusion is prescribed for gastritis.
158.	*Sesbania grandiflora* (L.) Pers. JB/NC 131	Fabaceae	Bok-phul	Sesban, Swamp pea	March-Aug	Leaf	Juice is prescribed as gargle in sore throat and mouth.
159.	*Sida acuta* Burm. f. JB/NC 132	Malvaceae	sonborial	Snake's tongue	Sept-Nov	Root	Decoction is given in stomach pain.
160. #	*Smilax perfoliata* Lour. JB/NC 133	Smilaceae	Tikoni-borua	—	March-Aug	Stem, tender shoot	Stem is used as toothbrush to strengthen the gums. Tender shoot is taken in curries and is useful as blood purifier.
161.	*Solanum indicum* L. JB/NC 134	Solanaceae	Tita bhekuri	Indian nightshade	May-Oct	Fruit	Eaten in curries or roasted is useful as blood purifier.
162. #	*Solanum nigrum* L. JB/NC 135	Solanaceae	Loch-kochi, Pokmow	Black nightshade	March-Nov	Tender shoot	Eaten in curries is useful in dysentery. Juice is applied on skin diseases.

163. #	*Solanum torvum* Sw. JB/NC 136	Solanaceae	Hati-bhekuri	—	May-Sept	Fruit	Eaten in curries is useful in stomach problems
164.	*Spilanthes acmella* (auct. non L.) Merr. JB/NC 137	Asteraceae	Bonoria malkthi, Suhuni bon	Para cress	Jan-Dec	Inflorescence	Chewed in sore mouth and tongue and also in the inflammation of the throat.
165. #	*Spondius pinnata* (L.f.) Kurz. Collection No.???	Anacardiaceae	Amora	Hog plum, wild mango	March-Dec	Stem bark, leaf, fruit	Decoction is given in blood dysentery. Leaf juice is dropped in the ear in otalgia. If fruits are taken in curries regularly, it is said to cure chronic dysentery.
166.	*Stellaria media* (L.) Villars. JB/NC 138	Caryophyllaceae	Morolia-sak, thutoni bon	—	March-Sept	Whole plant	Juice is prescribed for piles.
167.	*Streblus asper* Lour. JB/NC 139	Moraceae	Saura	Toothbrush tree, seamese rough bush	Jan-Jun	Stem,	Used as toothbrush to cure toothache.
168.	*Tabernaemontana divaricata* (L.) R.Br. ex Roem.et Schult. JB/NC 140	Apocynaceae	Kothona phul	Crepe jasmine	May-Nov	Root,	Root juice is given in malaria.
169.	*Talauma hodgsonii* Hook.f. et Thomson DHC 20	Magnoliaceae	Borhomothuri	—	April-July	Stipule with bud	Chewed with betel nut and betel leaf is said to strengthen gums and teeth.
170.	*Telanthera ficoidea* Mog. DHC 21	Amaranthaceae	Brindadbon	Joy weed	March-May	Tender shoot	Paste is applied on cuts and wounds.
171.	*Triumfettta rhomboidea* Jacq. JB/NC 141	Tiliaceae	Bon ogora	—	Sept-Nov	Stem bark, Leaf	Bark decoction is given in burning sensation caused by urinary troubles. Leaf decoction is given in diarrhoea.
172.	*Urena lobata* L. JB/NC 142	Malvaceae	Bor-sonbrial	Aramina, Cadilla	July-Dec	Leaf	Leaf paste is given in the treatment of sores.
173.	*Vitex negundo* L. JB/NC 143	Verbenaceae	Pochotia	Chinese chaste tree	April-Aug	Leaf	Paste is applied on scabies and decoction is given in pneumonia.
174.	*Zanthoxylum nitidum* (Roxb.) DC JB/NC 144	Rutaceae	Tezmui, Tezmuri	—	March-May	Root, stem, fruit	Root juice is given in pneumonia, and rubbed on the gums in toothache. Stem is used as toothbrush in pyorrhea. Fruit is chewed as siallagogue and also as fish poison.
175. #	*Zanthoxyllum oxyphyllum* Edgew. JB/NC 145	Rutaceae	Mezenga	—	March-July	Tender shoot, fruit	Tender shoots are taken as vegetable, which are useful in stomach trouble. If taken regularly it is said to cure leucoderma and act as blood purifier. If young shoots are cooked with pork, it is said to reduce the fat content. Fruit is used as spice and helps in digestion.

— not known # sold in the market JB – Jitu Buragohain NC – Namrup College DHC – Digital herbarium collection

Table 2 Number and percentage of plants used against different ailments

Sl. No	Name of diseases	No. of Plant	% of plant
1	Gastrointestinal problems	48	27%
2	Gynecological problems	29	17%
3	Cuts and wounds	17	10%
4	Respiratory ailments	17	10%
5	Skin diseases	15	6%
6	Blood purifier	9	5%
7	Urinary trouble	9	5%
8	Malaria	5	3%

Result and Discussion

In the present investigation, information on 175 plant species belonging to 76 families (Table 1) were collected, verified and authenticated. Among them, 36% were herbs, 24% shrubs and 17% trees (Fig. 2). These plants were used in the treatment of approximately 56 human ailments. Majority of the plants described in the present investigation was used in stomach ailments such as dysentery and diarrhoea, dyspepsia, flatulence, abdominal pain, constipation, removal of intestinal worms etc. Dysentery and diarrhoea alone accounted for 21% plant species. The gastrointestinal problems are the common ailments among the rural people because of poor hygienic condition, sanitation facility along with contaminated food and water. Next to stomach problems, the most frequently claimed uses were for gynecological problems such as menstrual trouble (dysmenorrhoea, menorrhagia), leucorrhoea, abortion, post-natal development, galactogue to nursing mother etc. This could be one of the reasons that a number of rural women were found to have the experience and knowledge in herbal medication. Since the rural people are busy in crop cultivation, building of houses and other household activities, they usually get cuts and bruises and wounds in such activities. Therefore, a number of plant species were prescribed for the purpose of quick healing of such cuts and wounds. A number of uses were attributed to lung and other respiratory ailments viz. pneumonia, asthma, bronchitis, cough etc. Fifteen plant species were claimed to be useful in skin diseases such as scabies, ringworm, boils and sores. Dermatological problems are quite common among the rural mass because of poor hygienic condition. A total of nine plant species were prescribed as blood purifier. Nine other plant species were used in urinary trouble. Piles, jaundice and malaria for which six plant species were used for first two diseases and five species for malaria. Remaining plants were used in the treatment of fever, sore eyes, diabetes, sinusitis, rheumatism, tonsillitis, burn injury, sprain, chest pain etc. For the remedy of these ailments, two to four plant species were used.

The most cited plant family was Euphorbiaceae (10 species) followed by Fabaceae, Malvaceae, Amaranthaceae, Araceae, Caesalpiniaceae (7 species), Zingiberaceae, Rutaceae (6 species), Asteraceae Apocynaceae, Verbenaceae, Rubiaceae (5 species), Moraceae, Poaceae, Scrophulariaceae, Clusiaceae and Solanaceae (4 species). A number of plants were also used in daily life as food, spice and fruit. Leaf was the most widely used part accounting for 30% of plant species in a total of 175 reported medicinal plants. This was followed by tender shoot and fruit (15%), root (14%), bark and whole plant (8%), rhizome (7%), seed (6%), flower and tuber. The most common mode of administrations was decoction, paste and juice for both internal and external applications. Taking as vegetable was also useful in alleviating several ailments. In that case, it improved eyesight, memory; acted as blood purifier and galactogue to nursing mothers. In some cases, the mode of administration was raw which meant direct internal applications. Most of the remedies were taken orally. The herbal practitioners usually collect the plants from wild as and when there is a need. In some cases, a few of them maintained small herbal gardens for the purpose. Almost 26% plant species were observed to have sold in some village markets, which were collected from wild.

Conclusion

The information provided in the paper is limited and there is always a scope to initiate more ethnomedicobotanical study among the ethnic communities of Assam to gather information as far as possible. The knowledge that ethnic people of Assam used for plants gives a clear idea about the crude botanical preparation of traditional sources of medicinal plants. The claims incorporated in present study can be extended for future scientific investigation in the area of core pharmacology and phytochemistry to unveil hidden novel entity for safe therapeutic uses.

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