Original Research Article

An ethnobotanical study on common plants with medicinal properties and ITK used by the tea garden tribes of eastern Upper Brahmaputra Valley Zone (UBVZ) of Assam

ABSTRACT

In Assam, ninety-six numbers of different tea and ex-tea garden tribes are residing mainly in the "Labour Lines" within the Tea Estates (TE) and neighbouring villages of TEs. Like other communities of Assam, raising plants as bio fencing as well as in the backyard garden is a traditional practice among tea garden tribes (TGT). A significantly large section of TGT relies on age old traditional system of healing by collecting herbs from their backyard and nearby forest. An ethno-botanical study was carried out through personal and group interviews with the tribal practioners in order to document the indigenous traditional knowledge (ITK) about these plants. Fifty-five (55) numbers of plant species distributed over 32 families have been documented that included almost all types of plants from trees to herbs. Highest number of plant species were found under the family Leguminaceae followed by Euphorbiaceae which were utilized for preparation of the medicine. Among all, leaves were the most frequently used plant part followed by bark and flower belonging to perennial, annual, bi perennial and semi-annual type. The study also underlines the potentials need for the documentation of traditional ecological knowledge pertaining to the medicinal plant utilization for the greater benefit of mankind.

Keywords: *Ethno-botanical, indigenous traditional knowledge, Medicinal plant, Tea estate, Tea Garden Tribes.*

INTRODUCTION

Wild plants are an important part of tribal existence on earth as they largely rely upon the vegetation from food to fire, shelter to furniture, medicines to intoxicants, oils to beverages. India has a wealthy history of medicinal flora. Assam, the second largest state of northeast region, situated between 26.20° N latitude and 92.93° E longitude is by default a hub for medicinal plants because of its favorable climate. With an erratic distribution of periodic rainfall, nearly 65% rainfall occurs during the monsoon *i.e.* between June to September with maximum temperature varies between 31°- 37°C and minimum temperature varies from 6°-8° C. The state is divided into six agro-climatic zones and the two distinct river valleys (Brahmaputra and Barak) are separated by a hill zone. Apart from monocropping of rice in Assam, the hills and forests of the valley is endowed with plants with high nutritional value and medicinal properties [1][2][3].

A number of wild relatives of vegetables like *Solanum spp.*, ginger, turmeric, *Colocasia, Dioscorea, Momordica spp.*, etc are reported from the region. The indigenous people of Assam use various plants like *Alternanthera sessilis, Amaranthus sp., Enhydra fluctuans, Houttuynia cordata, Centella asiatica, Ipomoea aquatica,* etc. as vegetables as well as medicine [4][5][6].

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•You can also spread references among the lines.
•Add more references almost at the end of each sentence.
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The various wild or semi wild relative of the plants are also being used widely as ethnomedicines as well as worshipping purpose.

About 96 different kinds of tea and ex-tea garden tribes are residing in the tea gardens and their peripheral villages of both the Brahmaputra and Barak valley of the state of Assam. They were brought to the state as contract labourer in the 19th century by the British to work in the tea gardens. These tribes migrated mostly from poverty and natural calamity-stricken areas of Bengal, Orissa, Madhya Pradesh, Tamil Nadu and Uttar Pradesh and mostly belong to Kolarian and Dravidian tribes. Therefore, TGT and ex-TGT are as a whole, multi-ethnic in nature. They are mostly inhibiting in "Labour Lines" within the Tea Estate (TE) and in the peripheral villages of TEs. 60 % of the TGT prefer herbal drugs and remedies as food and medicine in their day-to-day life.

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There is a need to collect, conserve and document these species as threat of extinction is looming over with the increasing population, shifting of area to small tea gardens, ignorance by the new generation and influence of floods and erosion resulting in depletion of the plant biodiversity. However, recently great interest in study of traditional system of cure is gaining momentum worldwide. Therefore, collection of wild and domesticated edible and non edible plants with medicinal value was undertaken in order to assess the local crop diversity and ITK for benefit of humankind in many ways.

METHODOLOGY

Description of study site

The survey was conducted in the eastern most part of Upper Brahmaputra Valley (UBV) zone of Assam. This part is located in between 27.4705° N to 27.4886° N latitude and 94.9125° E to 95.3558° E longitude encompassing two districts *viz.* Dibrugarh and Tinsukia (Fig 1 and Fig 2). The region is bounded by Dhemaji district in the north; Arunachal Pradesh in the east west; Sibsagar district in the south-west and by North Lakhimpur in the north-west. The mighty Brahmaputra is flowing from east to west direction at the northern border of the districts. Both the districts are predominated by tea gardens. The demographic composition of this area is quite interesting with indigenous population of Moran, Muttuck, Kachari, Sonowal-kachari, Mishing, Ahom to the tea garden tribes (TGT) who were the tea garden and ex-tea garden labourers.

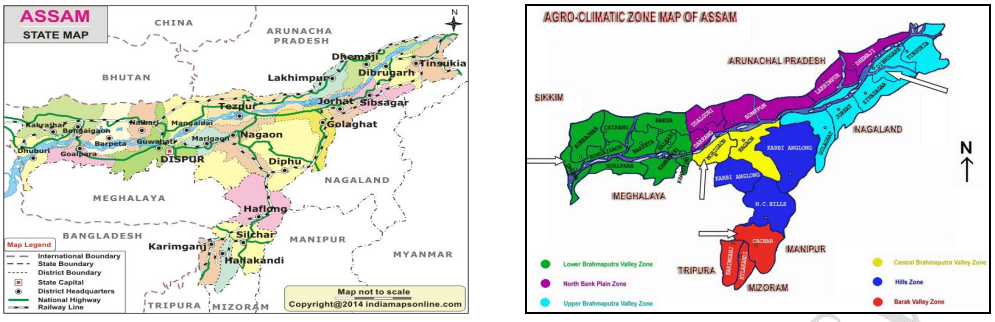

Fig 1. State map of Assam with different agroclimatic zones

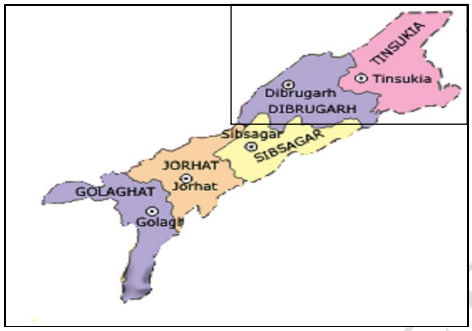

Fig 2. Map of upper brahmaputra valley zone (UBVZ) of Assam highlighting the site of research

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Interviews

Intensive field survey was carried out during 2017-18 in tea community inhabiting areas, mainly, the "Labour Lines" within the TEs and the neighbouring villages of TEs. The information was collected on the basis of interviews with local practitioners (popularly known as *Vaidya* or *Kabiraaj*); elderly persons and *Sardars* (chief of a labour line). Information on different use of plant parts for varies purposes were documented. Local people also helped in collecting and gathering the samples. Women were also interviewed, because they play a major role in nursing and feeding the family.

Some important Indian medicinal plant literatures [7][8][9][10][11] were consulted for ensuring authentic identification and usages of the collected plant species. During the survey and collection, information on 55 plants were collected and recorded.

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Table 1: List of common plants having medicinal properties used by tea tribes of Assam

Sl No.	Local Name	Assamese Name	Other Names	Scientific Name	Family	Habit	Parts used	Used Against
1	Aahat, Pipal	Aahat Gach	Pipal, Aswastha (H); Pippala, Aswastha, Bodhidruma (S); Peepal Tree (E)	*Ficus religiosa*	Moraceae	P Tree	Bark	Gonorrhea
2	Am	Aam	Aam (H); Amra (S); Mango (E)	*Mangifera indica*	Anacardiaceae	P Tree	Bark	Jaundice
3	Amlokhi	Amlakhi	Aamla (H); Amrita Phala, Dhatri Phala, Aadi Phala, Amalaka (S); Aonla (E)	*Emblica officinalis*	Euphorbiaceae	P Tree	Fruits	Jaundice, stomach problem, cough
4	Arjun	Arjun	Arjun (H); Arjuna (S); The Arjun Tree (E)	*Terminalia arjuna*	Combritaceae	P Tree	Bark	Various stomach ailments like Dysentery and Diarrhea
5	Beng pata	Bor Manimuni	Brahma manduki, Brahma mandi (H); Mandukarpani (S); Indian Pennywort (E)	*Centella asiatica*	Umbelliferae	A Small Creeping Herb	Leaves	Indigestion, bowel problem and various stomach ailments, Leucorrhoea
6	Bonpuru	Gondhuwa Bon	Ajgondha (H); Goat's Weed (E)	*Ageratum haustonianum*	Compositae	A Small Herb	Leaves	Pneumonia
7	Bubul gos, Torua kadam	Torua kadam	Gandh babul, Bilayti Babul (H); Arimaeda (S); Cassie Oil Tree, sweet Acacia (E)	*Acacia farnesiana*	Leguminoceae	P Tree	Bark, Flowers	Worm infection
8	But, Chana	But Maah	But, Chana (H); Chanaka (S); Gram, Chickpea (E)	*Cicer arietinum*	Leguminoceae	A Herb	Seeds	Jaundice
9	Chakunda	Medeluwa	Chakunda, Kachunda (H); Kasamarda (S); Foetid Cassia, Sickle Cassia (E)	*Cassia sophera*	Leguminoceae	P Shrub	Yellow Flowers	Skin infection

10	Chota Beng Paataa	Xharu Mani-muni	Brahmamandi, Khulkhuri (H)	*Hydrocotyle rotundifolia (Centella rotundifolia)*	Umbelliferae	A Small Herb	Leaves	Head ache, Stomach trouble
11	Dhapor Tita	Dhaapar Tita, Tita Baahek, Baahek Tita	Basaka, Adulsa (H); Vasaka (S); Basaka (E)	*Adhatoda vasica*	Acantheceae	P Shrub	Roots, Flowers	Malaria, Worm Infection
12	Doron Paataa	Dron Xhak	Chota Halkusa (H); Dronapushpi (S); Sweet Mother Wort (E)	*Leucas linifolia*	Labiatae	A Small Herb	Leaves	Head ache, Sinusitis problem, Worm Infection
13	Dub Ghaas	Dubori Bon, Durori	Hariali, Duba, Ram Ghas (H); Durba, Haritali (S); Dub Grass (E)	*Cynodon dactylon*	Poaceae	P Prostrate Herb	Leaves	Cuts & wounds, Jaundice
14	Gol morish*	Jaluk	Golmarish, Kalimarich (H); Krishnamaricha, Maricha (S); Black pepper (E)	*Piper longum*	Piperaceae	P Climber	Fruits	Tuberculosis
15	Gulanch	Boga Gulanchi	Sada Gulanchi (H); Kanakakaravi (S); White Frengipani (E)	*Plumeria alba*	Apocynaceae	P Tree	Succulent branch	Skin infection, Tuberculosis
16	Haldi, Halud*	Halodhi	Haldi (H); Haridra (S); Turmeric (E)	*Curcuma longa*	Zingiberaceae	B Small Herb	Rhizome	Tuberculosis, Cuts & Wounds
17	Hiju Gosh	Xhiju Gosh	Sij, Sehund, Thohar (H); Snuhi (S); Thorny Cactus (E)	*Euphorbia neriifolia*	Euphorbiaceae	P Cacti	Leaves	Cuts & Wounds
18	Hortoki	Xhilikha	Haritaki, Harda, Harir, Harra (H); Haritaki, Himaja (S); Chebulic Myrobalans (E)	*Terminalia chebula*	Combretaceae	P Tree	Bark	Dysentery
19	Jera paataa	Era Gosh, Eree Gosh	Arand, Erandi (H); Eranda (S); Castor (E)	*Ricinus communis*	Euphorbiaceae	P Small Softwood Tree	Bark	Dog bite
20	Jetuka Paat, Mehendi Paat	Jetuka	Mehendi, Henna (H); Mendika (S); The Henna Plant, Egyptian	*Lawsonia inermis*	Lythreceae	P Small	Leaves	Jaundice, cuts & wounds, skin infection, hair fall

			Pivet, Camphire, Mehendi (E)			Tree		and related ailments
21	Kagzi Nimbu	Kazi Nemu	Kaghji (H); Assam Lemon (E)	*Citrus acida*	Rutaceae	P Tree	Leaves, Roots	Malaria, Jaundice
22	Kala Haldhj	Kola Haladhj	Kali Halud, Narkachur (H); Krishna Haridra (S); Black Zedoary, Grey Turmeric (E)	*Curcuma caesia*	Zingiberaceae	B Small Herb	Rhizome	Indigestion
23	Kala Jamun	Kola Jamu	Jambu, Jaman, Jambava (H); Jambu (S); Black Plum, Jambolana, Java Plum (E)	*Eugenia jambolana*	Myrtaceae	P Tree	Seed, bark, leaves	Irregular Menstrual Cycle & Urinary Problem, Dysentery, Jaundice
24	Kamrenga Tenga	Kordoi	Kamranga, Kamrak, Karmal (H); Carambola (E)	*Averrhoa carambola*	Oxalidaceae	P Tree	Fruits	Jaundice
25	Kerela	Tita Kerela, Kerela	Kerela, Karel (H); Sushavi (S); Bitter Gourd (E)	*Momordica charantia*	Cucurbitaceae	A Climber	Flowers	Worm infestation
26	Kolmoi/ Kolmi Saah, Tita Saah	Kolmou Xhaak	Karmi Sag, Kalmi Sag (H); Kalambi (S); Water Bind Weed, Swamp Cabbage (E)	*Ipomoea aquatica*	Convolvulaceae	A Small Herb	Leafy Parts	Diabetes, Jaundice
27	Kopita	Omita	Papita (H); Papaya (E)	*Carica papaya*	Caricaceae	P Small Soft Tree	Male flowers	Indigestion, Acidity, Bowel Problem
28	Koroin	Kothia Koroi	Sirin, Sirisha, Sirika (H); Sirisha, Kapitana, Pitsirisha (S); Silk flowered Sau, Koko Siris, East Indian Walnut (E)	*Albizia lebbeck*	Leguminoceae	P Tree	Bark	Joint Pain, Arthritis
29	Kumari, Salkumari	Chalkuwari, Pirali Kuwari	Ghee Kanwar, Ghee Guvara (H); Gritakumari (S); Barbados Aloe, Medicine Aloe, True Aloe (E)	*Aloe vera*	Liliaceae	P Small Succulent Plant	Leaves	High Pressure, Paralysis
30	Kundree	Kunduli	Kanduri ki ber, Kundra (H); Bimba (S); Scarlet gourd, Kavai fruit (E)	*Cephalandra indica*	Cucurbitaceae	Semi P Climber	Succulent leaves	Ear Pain

31	Kushiyar	Kuhiyaar	Ganna, Kusiyara (H); Ikshu (S); Sugarcane (E)	*Saccharum officinarum*	Poaceae	A/P Grass	Stalk	Jaundice
32	Laher Daal	Rahar Daail	Rahar, Arahar (H); Arhaki, Tubarika (S); Pigeon Pea, Cajan Pea (E)	*Cajanus cajan*	Leguminoceae	B/ P Shrub	Succulent leaves	Jaundice
33	Lajwanti, Lajoni Gos, Nilaji Bon	Nilaaji Bon, Laajuki Bon, Aadori Bon	Lajwanti (H); Lajja, Anjali Karika, Varah-kranti (S); Humble Plant, The Sensitive Plant (E)	*Mimosa pudica*	Leguminoceae	A Small Herb	Leaves, Roots	Piles, Skin Infection
34	Long*	Long	Lavanga (H); Lavang (S); Clove (E)	*Syzygium aromaticum*	Myrtaceae	P Tree	Dried unopened flower buds	Tuberculosis
35	Mikani	Japani lota, Amar lota	Mikania (E)	*Mikania micrantha*	Asteraceae	P Climber	Leaves, succulent twigs	Cuts & wounds
36	Misimi Paataa	Bon Jaluk	Daman Papra (H); Parpata (S); Parpata (E)	*Oldenlandia corymbose*	Rubiaceae	A Herb	Leaves	Leucorrhea
37	Moran Aada	Moran Aada	Jangli Ada (H); Banadraka (S); Wild Ginger (E)	*Zingiber cassumunar*	Zingiberaceae	B Small Herb	Rhizome	Indigestion
38	Motha Ghaas	Mutha	Motha (H); Musta, Mustaka (S); Nut Grass, Coco Grass (E)	*Cyperus rotundas*	Cyperaceae	P Herb	Under-ground bulbs	Tuberculosis
39	Munga	Sojina Goch	Sajna (H); Sobhanjana (S); Drumstick Tree, Bene Oil Tree (E)	*Moringa oleifera*	Moringaceae	P Tree	Roots	Toothache, Joint Pain, Arthritis
40	Naga Dhania	Man Dhania, Bonmemedhu, Jongoli memedhu	Fitweed (E)	*Eryngium foetidum*	Umbelliferae	A Small Aromatic Herb	Leaves	Indigestion and other stomach ailments
41	Paadri Pata	Bhedai lataa,	Gandheli (H); Prasarani,	*Paederia*	Rutaceae	P	Leavea	Indigestion, Dysentery

		Bhebeli Lataa, Paduri Lataa	Gandhavadra (S);	*foetida*		Climber	s, succulent twigs	and other stomach ailments, Liver trouble
42	Piyaj*	Piyaaz, Panaru	Pyaaz (H); Palandu (S); Onion (E)	*Allium cepa*	Liliaceae	A Herb	Bulb	Acidity & other stomach dysfunction
43	Ring Kanda	Kath Aalu	Pindalu (S); White Yam, Water Yam, Greater Yam (E)	*Dioscorea alata*	Diascoreaceae	A Stout Climber	Rhizome	Leucorrhoea
44	Ronga Phul	Jabaa Phul	Jasum, Gurhur (H); Jaba (S); China Rose, Hibiscus (E)	*Hibiscus rosa-sinensis*	Malvaceae	P Shrub	Succulent leaves, Flower	Headache, Sinusitis
45	Rosun, Lohsun*	Naharu	Lasun, Rasun (H); Lasuna, Mahausada (S); Garlic (E)	*Allium sativum*	Liliaceae	A Herb	Bulb	Cough and other Bronchial disorder, Fever, Muscle pain, Rheumatism
46	Rudrakkhya	Rudrakhya, Rudrai	Rudraki (H); Rudrakkhya, Sivapriya (S); Bead Tree, Utrasam (E)	*Elaeocarpus ganitrus*	Elaeocarpaceae	P Tree	Bark	Dysentery
47	Sarsa*	Xhariyoh	Saron (H); Rapeseed (E)	*Brassica campestris*	Cruciferae	A	Oil	Joint & Muscle Pain
48	Sindura	Posotiya	Nirgundu, Shamalu (H); Nirgundi, Indrani (S); Chaste Tree, Indian Privet (E)	*Vitex negundo*	Verbenaceae	P Small tree/ Big shrub	Leaves	Headache, Sinusitis, Jaundice, Menstrual ailments
49	Suhani ban	Xhuhani	Akarakaru (H); Toy Chilli, Para Cress (E)	*Spilanthes acmella*	Compositae	A Prostrate Herb	Yellow Flowers	Toothache, Pharyngitis
50	Surat pata	Choraat Paat, Bor Choraat, Dom Choraat	Utigan (H); Assam Nettle (E)	*Laportea crenulate*	Urticaceae	P Shrub	Roots	Anti-inflammatory
51	Tamul	Tamul, Gua	Supari, Kasaili (H); Poongiphalam (S); Areca Nut	*Areca catechu*	Palmeae	P Palm	Fruits	Headache

			(E)					
52	Tengesi Saag	Xaru Tengeshi	Ambooti, Amrool (H); Amlalonika, Amalika (S); Indian Sorrel, Creeping Sorrel (E)	*Oxalis corniculata*	Oxalidaceae	A Herb	Succulent aerial parts	Dysentery, Diarrhea and various stomach ailments
53	Tetli	Teteli	Imli, Amli (H); Jamdutika, Tintrini, Amlika (S); Tamarind (E)	*Tamarindus indica*	Leguminosae	P Tree	Leaves	Dog's bite
54	Tulsi	Tuloxhi	Tulshi (H); Tulasi (S); Sacred Basil (E)	*Ocimum sanctum*	Labiatae	P Shrub	Leaves	Asthma, Cough, Ear Pain
55	Uriyam Gos	Uriyam Goch	Pankain, Kain, Kot, Bhillar, Senda (H); West Indian Cedar, Red Cedar, Bishop Wood Tree (E)	*Bischofia javanica*	Euphorbiaceae	P Tree	Bark	Tuberculosis

[*] *also used as common spice*

H=Hindi; S=Sanskrit; E=English

Table 2. Traditional remedy used for different ailments

Sl No	Disease/Ailments/ Disorder	Remedy
1	Cough / Asthma	1. Regular intake of tea prepared from *Ocimum sanctum*. Intake of leaf juice of *Ocimum sanctum* or *Adhatoda vasica* or mixture of these two. 2. Regular intake of curry prepared from the dried flowers of *Adhatoda vasica.*
2	Cuts & wounds	1. A paste is prepared from a mixture of equal quantity of leaves of *Mikania micrantha* and *Euphorbia neriifolia* and applied on the affected part. 2. Rhizome of *Curcuma longa* in the form of a paste is applied on the affected part. 3. Application of paste or juice prepared from fresh leaves of *Lawsonia inermis* onto the affected parts. 4. Local application of paste or juice prepared from fresh leaves of *Cynodon dactylon.*
3	Diabetes	1. Regular intake of *Ipomoea aquatica* as vegetable.
4	Different Arthritis/ Joint pain/ Muscle Pain	1. A medicinal oil is prepared by adding roots of *Laportea crenulata* in 200ml of hot *Brassica campestris* oil. The oil is then strained and given a hot massage on the affected part. 2. A paste is prepared from the bark of *Moringa oleifera* and applied to the affected part. 3. Few bulbs of *Allium sativum* fried in hot raw *Brassica campestris* oil and massaged on the affected part. 4. A mixture of crushed *Moringa oleifera* root, bark of *Albizia lebbeck* and *Allium sativum* is made and heated in *Brassica campestris* oil and applied on the affected joints.
5	Dog's bite	1. Fourteen (14) no. of pills are prepared from *Tamarindus indica* leaves (50g) and 21 numbers of *Piper longum*. Administered in empty stomach every day. 2. A paste of the bark of *Ricinus communis* is prepared and mixed with jaggery and water. Administered 3 times per day.
6	Dysentery	1. A five litre mixture solution of equal quantities of barks of *Elaeocarpus ganitrus, Terminalia chebula and Eugenia jambolana* is made and

		boiled till the volume of the solution reduced to about 1 L. The red decoction obtained thereby is then administered 2 times in empty stomach daily. 2. Intake of decoction of *Paederia foetida* leaves as raw or curry. 3. Intake of decoction of fruit of *Emblica officinalis* as raw or curry.
7	Ear pain	1. Succulent leaves of *Cephalandra indica* and *Ocimum sanctum* is mixed in equal proportion and juice is extracted. Two drops of this juice should be allowed to trickle down into the ear.
8	Gonorrhea	1. A paste is prepared from stem bark of *Ficus religiosa* and applied locally.
9	Head ache	1. A paste of succulent leaves of *Leucas linifolia* is applied on forehead or is inhaled. 2. Application of paste of *Areca catechu* nuts on forehead. 3. A poultice made from leafy portion of *Hydrocotyle rotundifolia* is applied on forehead. 4. Inhalation of smoke of *Vitex negundo* leaves. 5. Application of a paste made up of leaves of *Hibiscus rosa-sinensis* on forehead.
10	High Pressure	1. Application of *Aloe vera* paste on forehead. 2. Juice of *Aloe vera* be taken along with milk
11	Irregular Menstrual Cycle & Urinary Problem	1. Pellets are made from seeds and bark of *Eugenia jambolana* and administered 2 times daily in empty stomach. 2. Intake of decoction of *Vitex negundo* leaves.
12	Jaundice	1. Crushed bark of *Mangifera indica* is soaked in water for a night. Next day the solution is applied onto the whole body. It is practiced consecutively for 3 days without taking bath. 2. Intake of juice of young leaves and twigs of *Cajanus cajan.* 3. A paste made up of a mixture of the bark of *Mangifera indica* and *Citrus acida* along with the leaves of *Cynodon dactylon* is applied on hands and kept for 15-20 min. 4. A juice is prepared of 12 numbers of *Averrhoa carambola* and equal volume of *Saccharum officinarum* juice. One packet of glucose may also be added and drink 4 times a day.

		5. *Cicer arietinum* is soaked in water for overnight. The soaked water is collected in the next morning and a drink is prepared by mixing with palm candy. Administered 5-6 times a day. 6. Pills are made from a mixture of the seeds, bark and leaves of *Eugenia jambolana*. Pellets are then taken 2 times daily in empty stomach. 7. Intake of succulent leaves of *Vitex negundo.* 8. Regular intake of *Ipomoea aquatica* as vegetable.
13	Leucorrhoea	1. A paste of *Dioscorea alata* and palm sugar candy is made. Water is added and administered in empty stomach in the morning. 2. Pellets are prepared from a mixture of *Centella asiatica* and *Oldenlandia corymbosa* and administered 2 times daily in empty stomach.
14	Malaria	1. Pellets are made from a mixture of equal quantities of succulent leaves and roots of *Citrus acida* along with roots of *Adhatoda vasica.* Administered 2 times daily in empty stomach
15	Paralysis	1. Intake of juice of *Aloe vera* along with milk.
16	Piles	1. A paste of the leaves of *Mimosa pudica* is prepared and mixed in raw milk. Administered 2 times daily in empty stomach. 2. Regular intake of decoction of leaves of *Leucas linifolia* along with milk.
17	Pneumonia	1. One teaspoon of the leaf juice of *Ageratum houstonianum* with little bit of salt be taken.
18	Post- natal ailments	1. Pills are prepared from a mixture of a few numbers of *Piper longum* and dried meat of 'White breasted Waterhen' and administered to the mother after child birth. 2. Curry/ decoction prepared from succulent leafy parts of *Paederia foetida* along with few numbers of *Piper longum* and administered regularly.
19	Sinusitis problem	1. 1-2 drops of leaf juice of *Leucas linifolia* is administered into the nostrils. 2. Inhalation of smoke of *Vitex negundo* leaves.
20	Skin infection	1. A paste of yellow flowers of *Cassia sophera* is applied on the affected part. 2. Local application of juice extracted from the roots of *Mimosa pudica*

		3. Application of the latex exuded from *Plumeria alba* on the affected part.
21	Stomach complaints like Indigestion, Gastroenteritis, Acidity, Bowel Problem	1. A paste of a mixture of equal quantities of male flowers of *Carica papaya* and leaves of *Eryngium foetidum* and *Centella asiatica* is made. The paste is then boiled in water and administered in empty stomach. 2. Intake of dried rhizome of *Zingiber cassumunar* in the form of slice, powder or bits. 3. Oral administration of decoction of *Paederia foetida* leaves 4. Intake of aerial parts of *Oxalis corniculata* as raw or as curry. 5. Intake of *Emblica officinalis* fruits as raw or in the form of decoction. 6. Crushed bark of *Terminalia arjuna* is soaked in water for overnight. Next morning the solution is administered in empty stomach 7. Intake of *Carica papaya* along with its peel. Salt may be added according to taste. 8. Intake of raw juice of *Allium cepa* along with little salt to taste 9. Juice of *Curcuma caesia* is extracted and administered
22	Tooth ache, Pharyngitis	1. Crushing by teeth few numbers of yellow flowers of *Spilanthes acmella* & gargling for a min. 2. Roots of *Moringa oleifera* in the form of paste is applied to the affected part.
23	Tuberculosis (initial stage)	1. A paste is prepared from a mixture of the bark of *Bischofia javanica* (50g), *Piper longum* (5 no.), *Syzygium aromaticum* (3-5 no.) and underground part of *Cyperus rotundus* (3 nos). One litre of water is added to the paste and boiled. Boiling is continued up to 1/4th of the initial volume. Administered in the morning and evening. 2. Oral administration of *Curcuma longa* soaked water 3. A decoction is prepared by boiling 250g of succulent branches of *Plumeria alba* in 5 L of water. Boiling process is continued until the solution reduces to 1L. Administered 2 times daily in empty stomach.
24	Worm Problem	1. Intake of fried flowers of *Adhatoda vasica* 2. Oral administration of juice extracted from *Momordica charantia* 3. A paste is prepared from the bark and flowers of *Acacia farnesiana* and administered. 4. Regular intake of curry prepared from succulent leaves of *Leucas linifolia*.

RESULTS AND DISCUSSION:

Diseases in modern times sometimes has lifestyle and dietary component to them. In ancient times, different plants and herbs have been an important source of precursors and products in health care sector. Allopathic medications, however, have gradually eclipsed the conventional method. However, because to their low or complete lack of residual toxicity, traditional medicines are currently experiencing a spike in popularity.

All the 55 number of plant species documented were found to be very common in the locality and they were being used in various ailments from jaundice, gonorrhea to minor cuts and wound. These 55 species were distributed over 32 number of botanical families with 53 genus. Highest number of plant species were found under the family Leguminaceae (7) followed by Euphorbiaceae (4). It is interesting to note that highest number of plant species (22) were utilized singly or in combination with others for preparation of the medicine for most predominant ailments of the area like jaundice and stomach ailments and indigestion. Similarly, lifestyle related ailments like hypertension or diabetes are not very common among the population which is reflected that only 2 species were found to be used as medicine for these two ailments. Leaves of 22 plants were used as medicine, ranking it number one as the most frequently used plant part, followed by bark (9) and flower (4). Out of these 55 species, 33 were of perennial type, 16 were of annual type, 5 were bi perennial and 1 was of semi-annual type (Table 1).

It was observed that though almost all the population of TE areas have good access to health care services offered by respective companies as well as the Assam government, yet traditional system is the first choice of majority of tea community for major as well as minor ailments. Precise understanding of plants and knowledge about its medicinal uses were mostly associated with the elderly people (both male and female) however, the case was not similar with the younger generations. They were reluctant to acquire such knowledge.. Most of the plant species were collected from the natural habitats and many were also found to be maintained in the backyards of the *Kabiraaj*. The plants were both herbaceous and perennial tree species. The knowledge has been passed from one generation to next mainly through oral communication. It was observed that jaundice, stomach complaints *viz*. diarrhea, dysentery, worm infestation, gastro-enteritis, tuberculosis, anaemia, joint pain, headache, skin infection is most commonly occurring diseases in this community which was treated by use of single herb or a mixture of herbs as shown in Table 2.

CONCLUSION

The TGT in Tinsukia and Dibrugarh districts of Assam widely used medicinal plants from their backyard and nearby forest to manage various human ailments. Many of the medicinal plants were used for culinary preparations also. However, sometimes due to ignorance, some useful plants were treated as weeds ultimately leading to their extinction from the wild. The identification and conservation of indigenous knowledge are therefore vital as the new generation is showing disinclination towards acquiring these invaluable ITK. Systemic cultivation and ex-situ conservation of medicinal plants has got a tremendously promising approach in pharmacological

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research. The present study therefore highlights useful ethnobotanical information about the plants used by the tribes of Assam. Efforts should be made to conserve the ethnomedicinal plants although further investigations need to be done in these areas.

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Comment [F. Z.17]: In the text, you have 14,15, 16. Where are them?
Add them to bibliography part.
Add new references

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