

Ethnomedicinal wisdom of Garo community from erstwhile Sonitpur District of Assam, Northeast India

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Abstract

Assam is the home of a mammoth number of tribal groups, representing cultural heritage of North Eastern part of India. Sonitpur is the second largest district of Assam having 'Garo', a matrilineal tribe, as one of the prominent tribal communities with their strong ethnic cultural heritage. To understand the ethnobotanical knowledge of Garo people, an ethnomedicinal study was undertaken in five selected villages, viz. Senglimari, Doangbari, Phulaguri, Smarna and Rongagora, of Sonitpur district of Assam during 2015 – 2016. These villages are completely occupied by Garo people. The Prior Informed Consent (PIC) was obtained from the respondents and the survey was conducted door to door using structured questionnaire. A total of 51 species of angiosperms representing 48 genera and 34 families of ethnomedicinal plants were recorded. Among these 43 % trees, 25 % herbs, 18 % shrubs and 14 % were climbers. During the field survey vernacular name (*Garo*) of the recorded medicinal plants, their uses, part used, diseases treated, mode of administrations, doses, methods of preparations were also recorded. During the study a total number of 127 individuals (87 males and 40 females) were interviewed and it was witnessed that the Garos has a very strong enduring ethnomedicinal history. Hence, it is very essential to explore and document the strong ethnomedicinal traditional knowledge of the Garo community for the benefit of the society.

Key words: Ethnobotany, Medicinal plants, Garo, Assam, North East India

INTRODUCTION

India hosts 10.05 crore tribal population, which consists 8.6 % of country's total population (Anonymous 2011). It has been estimated that India encompasses approximately 250 tribal groups, having 105 languages and 225 secondary languages. About 70 % of Indian population dwells in rural areas and many of them reside in the neighbourhood of forest and use various plant parts as food, medicines, and in many other purposes for their daily livelihood (Datta *et al.* 2014). The peoples of India are using medicinal plants since prehistoric period. Medicinal plants have a long-standing history among indigenous communities, and are an integral part for treating various diseases, particularly to cure day-to-day ailments and this practice of traditional medicine is based on hundreds of years of belief and observations. With enormously diversified ethnic groups and rich biological resources, India represents one of the great emporia of ethnobotanical wealth (Kala 2005). The use of herbal treatment is now immensely increasing globally and many modern researchers are involved to explore the potential of ethnobotanical information for treating various diseases as well as to recognise usefulness of wild plants (Dutta & Dutta 2005; Kala 2005; Ali-Shtayeh *et al.* 2008; Jain *et al.* 2010; Tiwari *et al.* 2010; Jeyaprakash *et al.* 2011; Paul *et al.* 2011; Ong *et al.* 2012; Bikarma *et al.* 2012; Menendez-

Baceta *et al.* 2012; Mehra *et al.* 2014; Bajpai *et al.* 2016; Ngbolua *et al.* 2016). Reports estimated that traditional medicine accounts for about 40 % of all health care (WHO 2013). It has been projected that about 85 % of traditional medicines used globally are derived from plants (Fransworth 1988). A series of ethnobotanical studies with reference to the uses of medicinal plants by different tribal groups was carried out in North Eastern part of India including Assam (Jain & Borthakur 1980; Jain 1987; Jain 1989; Das 2008; Saikia *et al.* 2010; Rout 2012; Teron & Borthakur 2014; Borgohain *et al.* 2016; Singh *et al.* 2015; Ghosh 2015; Gogoi & Das 2015). However, the ethnobotanical work on Garo community is very limited (Rao & Shanpru 1981; Singh & Mudgal 2000; Singh & Debnath 2008; Singh & Shanpru 2010; Singh *et al.* 2012). To understand the ethnomedicinal knowledge of Garo community the present study was designed, so that the proper scientific documentation could be made for further relevant use.

MATERIALS AND METHODS

Study area

Erstwhile Sonitpur (now it is separated in to two political districts viz. Sonitpur and Biswanath) is the second largest district of state Assam after Karbi Anglong, spread over an area of 5324 km² situated on the north bank of the River Brahmaputra with a population about 1.926 million (Anonymous 2011). The district lies between 26° 40' 25.9860" N and 92° 51' 27.7560" E and is bounded by Arunachal Pradesh in north, River Brahmaputra in south; Lakhimpur district in east and Darrang in the west (Figure 1). As per Census of India (Anonymous 2011) the tribal population of Sonitpur is about 2,32,000 which comprises of different tribal groups, among them Garo, Mishing, Bodo, Rabhas, Mechs, Nyishi, Adi, Munda, Apatani, Lama etc. are some important tribal communities. The present study was conducted in five selected Garo villages (locally known as *Garo Gaon*) viz. Senglimari [26°54'33.53" N & 92°45'4.23" E with 117 households], Doangbari [26°54'48.06" N & 92°44'38.11" E with 160 households], Phulaguri [26°54'27.73" N & 92°44'12.80" E with 110 households], Smarna [26°55'04.87" N & 92°44'14.99" E with 256 households] and Rongagora [26°55'18.37" N & 92°43'45.74" E with 120 households]. The numbers of households mentioned against villages are as per our survey during the study period i.e. 2015 – 2016.

Methodology

Extensive field survey was conducted throughout the year during 2015 – 2016 in order to document ethnobotanical knowledge associated with Garo community. A series of informal meeting was conducted with the village heads (*Nokma's*), family heads (*Nokni Skotong*) of each villages and villagers with the age group of 25 – 85. A standard semi-structured questionnaire was set to conduct the survey which was prepared following the guideline of Convention on Biological Diversity (CBD) (Cheikhyoussef *et al.* 2011). The voucher specimens of recognized plants were collected through repeated field survey in different seasons. Vernacular names (in *Garo*) of medicinal plants were recorded during the field work with the help of villagers. All other associated ethnomedicinal information related to the community like plant part used, mode of administration, dose recommended for human care, nature and name of diseases were properly recorded through personal interaction with medicine men (*Kobiraz, Bez*) using the questionnaire. The plant materials collected from the field were processed and made into mounted herbarium sheets following Jain & Rao (1977) and species were identified consulting the GUBH at Gauhati University, Assam and finally at ASSAM including '*The Flora of British India*' (Hooker 1872 – 1894) and '*Flora of Assam*' (Kanjilal *et al.* 1934 – 1940). In some cases the experts in local flora were also consulted. For updated nomenclature and family delimitation www.theplantlist.org was largely consulted. The herbarium-specimens are housed at the Tezpur University Herbarium (TUH), Department of Environmental Science,

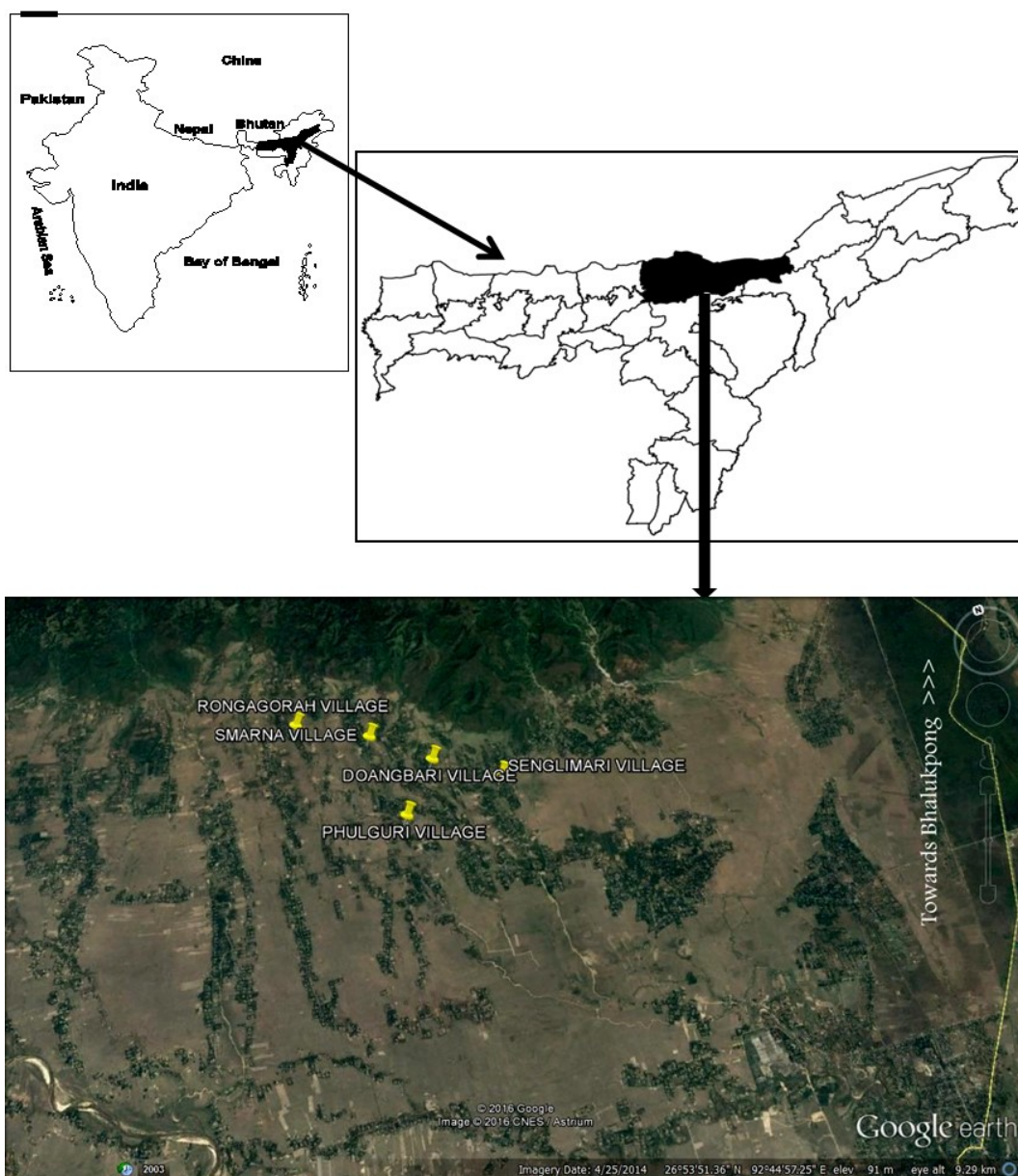


Figure 1. Google Earth Map of the study area indicating the locations of surveyed villages Ecology and Biodiversity laboratory for preservation and record keeping. Prior Informed Consent (PIC) from the respondents was obtained before the informal meeting for field survey as per the CBD guidelines (CBD, UNEP 2007) to collect the associated knowledge related to ethnomedicinal wisdom held by Garo community living in the locality.

RESULTS

During the present survey a total number of 127 individuals (87 males and 40 females) belonging to different age groups (25 – 85 years) were questioned. As recorded, 32 respondents in the interview process were belonging to age group of 25 – 45 years; 27 individuals in 46 – 55 years; 22 individuals were 56 – 65 years; 34 individuals in 66 – 75

years and only 12 individuals in 76 – 85 years. Analysing the semi structured questionnaires and response sheets, a total number of 51 medicinal plant species were documented systematically which belong to 48 genera under 34 families (Table 1; Figure 2). Trees contributed highest proportion with 43 % (23 spp., 22 genera); herbs with 25 % (13 spp., 13 genera); shrubs having 18 % (9 spp., 8 genera) and climbers represented lowest with

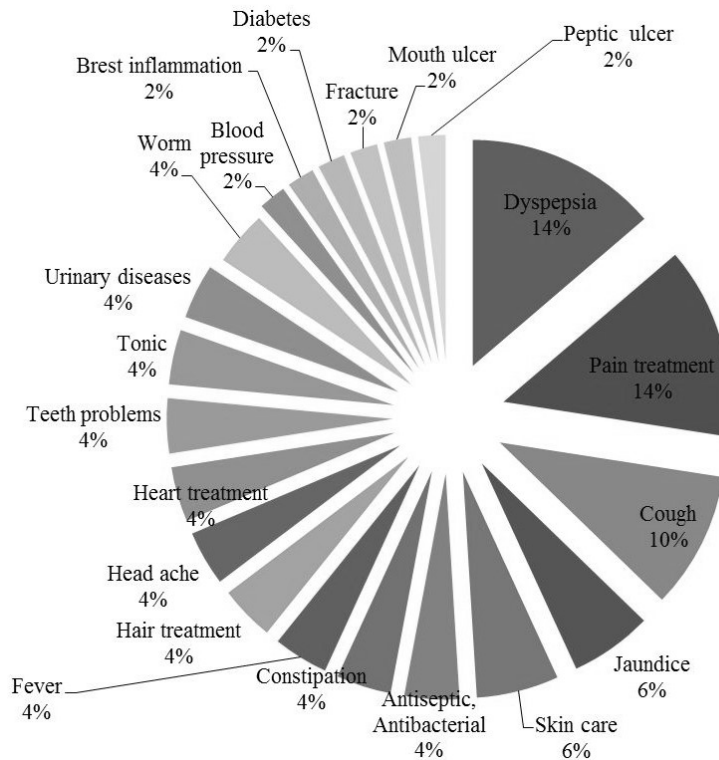


Figure 2. Percentage of species used against different diseases

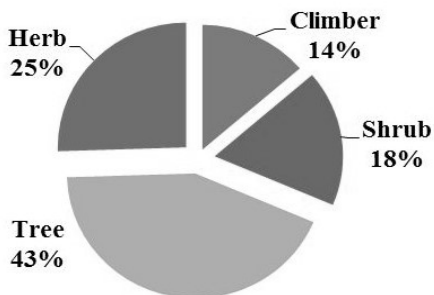


Figure 3. Percentage composition of different life forms of recorded plant species

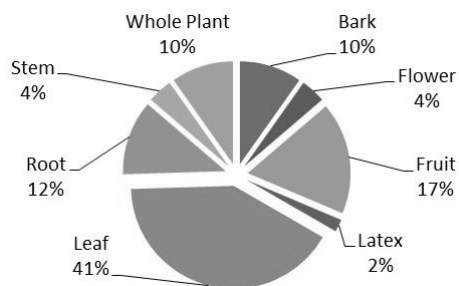


Figure 4. Percentage of plant parts used in treatment of health ailments

only 14 % (7 spp., 7 genera) (Figure 3). As per the interaction with different medicine man (*Bez, Kobiraz viz. Sri Jibon sangma, Sri Bipul Momin, Sri Sitarson Sangma, Sri Mesi Marak, Sri Megam Marak*) different plant parts those have been used for the treatment of various health ailments by the community are also chronicled during the study. It was found that among the plant parts, leaf was extensively used for the preparation of medicines



Table 1. List of recorded plant species (dicots) used by *Garo* peoples for different health ailments [Abbreviations used: E = External; I = Internal; T: Tree; CL: Climber; H: Herb; SH: Shrub; WP: Whole Plant; FR: Fruit; BR: Bark; ST: Stem; LF: Leaf; FL: Flower; SD: Seed]

Sl. No.	Botanical name [Family]; Collection No.	Vern. name (<i>Garo</i>)	Used against	Habit	Part Used	Dose/ Administration (E/I)*
1.	<i>Abrus precatorius</i> L. [Fabaceae]; JS/177	<i>Mengo Micron</i>	Worms	T	RT, SD	I : 2 teaspoon decoction of root and seeds used regularly two times after food.
2.	<i>Abutilon indicum</i> (L.) Sweet [Malvaceae]; JS/228	<i>Bibal Jacksona</i>	Swelling, pain	SH	LF, RT	E: A gentle paste is used on pain-full swelling
3.	<i>Achyranthes aspera</i> L. [Amaranthaceae]; JS/111	<i>Samsengi / Memang</i>	Headache / worms	H	RT, WP	E: A gentle paste is used on forehead against headache I: Purified root-juice is used against worms, mainly children (1 teaspoon daily once after meal)
4.	<i>Aegle marmelos</i> (L.) Corrêa [Rutaceae]; JS /281	<i>Belethi</i>	Dysentery, heart & liver tonic	T	FR, LF, BR	I: Ripe fruit juice used directly as heart and liver tonic. Decoction of tender leaf and bark taken regularly against dysentery (1-2 teaspoon twice daily)
5.	<i>Ageratum conyzoides</i> (L.) L. [Asteraceae]; JS /145	<i>Fulkuri</i>	Wound	H	LF	E: Leaf juice used on the wounds
6.	<i>Albizia procera</i> (Roxb.) Benth. [Fabaceae]; JS/223	<i>Khereri</i>	Muscle pain	T	BR	E: A gentle paste is used as poultice
7.	<i>Alstonia scholaris</i> (L.) R.Br. [Apocynaceae]; JS/117	<i>Soksen</i>	Fever	T	BR	I: Dried bark powder is taken orally with boiled water
8.	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC. [Amaranthaceae]; JS/112	<i>Adaurak</i>	Dysentery, diarrhoea	H	LF	I: Tender leaf extract taken orally
9.	<i>Amaranthus spinosus</i> L. [Amaranthaceae]; JS/123	<i>Khutura</i>	Skin sore	H	LF, ST	E: Paste of leaf and steam used on infected portions for immediate relief
10.	<i>Ananas comosus</i> (L.) Merr. [Bromeliaceae]; JS/166	<i>Anara</i>	Vomiting, worms	H	LF	I: Juice of tender leaf taken orally
11.	<i>Andrographis paniculata</i> (Burm.f.) Nees [Acanthaceae]; JS/120	<i>Kal tita</i>	Worms	H	LF	I: Juice of tender leaf taken orally
12.	<i>Aristolochia indica</i> L. [Aristolochiaceae]; JS/127	<i>Nirkumt</i>	Muscle pain, tonic	CL	RT, LF	I: Root decoction taken orally against pain; Juice of tender leaf mixed with honey taken orally as tonic

Sl. No.	Botanical name [Family]; Collection No.	Vern. name (Garo)	Used against	Habit	Part Used	Dose/ Administration (E/I)*
13.	<i>Asparagus racemosus</i> Willd. [Asparagaceae]; JS/222	<i>Sathobari bondu</i>	Urinary trouble, tonic	CL	RT	I: Root juice taken orally against blood in urine; as tonic and in other urinary problems
14.	<i>Averrhoa carambola</i> L. [Oxalidaceae]; JS/268	<i>Khanreng a</i>	Prolonged cough	T	FR	I: Juice of burnt ripe fruit taken orally
15.	<i>Azadirachta indica</i> A.Juss. [Meliaceae]; JS/255	<i>Nim bijok</i>	Antiseptic, pox, worms, diabetes	T	LF	E: Boiled leaf water administrated. I: The fry leaf is taken to control worms and diabetes.
16.	<i>Bacopa monnieri</i> (L.) Wettst. [Scrophulariaceae]; JS/338	<i>Brami</i>	Tonic	H	LF	I: Leaf juice is taken .
17.	<i>Bauhinia purpurea</i> L. [Fabaceae]; JS/224	<i>Migong</i>	Jaundice	T	FL	I: Purified flower juice eaten.
18.	<i>Bixa orellana</i> L. [Bixaceae]; JS/142	<i>Bol – rong</i>	Hair fall	T	FR	E: The paste of ripen fruit used.
19.	<i>Bombax ceiba</i> L. [Malvaceae]; JS/229	<i>Roathi</i>	Jaundice	T	BR	E: The refined decoction of bark used orally (1 teaspoon daily once).
20.	<i>Calotropis gigantea</i> (L.) Dryand. [Apocynaceae]; JS/119	<i>Akanda</i>	Scabies, Muscle pain	SH	LF	E: The leaf paste is used. The mature leaf is heated in the fire and wrapped in the pained portions.
21.	<i>Carica papaya</i> L. [Caricaceae]; JS/159	<i>Modu</i>	Dyspepsia	H	LATE X	I: Leaf latex is taken.
22.	<i>Centella asiatica</i> (L.) Urb. [Apiaceae]; JS /116	<i>Manamun i</i>	Headach, dysentery, boil	H	WP	I: The refined juice is taken. The boil is covered with the leaf to prevent infections.
23.	<i>Cissus quadrangularis</i> L. [Vitaceae]; JS/45	<i>Bol-merang</i>	Fracture	CL	WP	E: The stem is used to bind the fractured.
24.	<i>Dillenia indica</i> L. [Dilleniaceae]; JS/155	<i>Oksi</i>	Hair conditioner , appetizer	T	FR , SD	E: The seeds were grind and used. I: The fruit is boiled and juice is taken.
25.	<i>Erythrina variegata</i> L. [Fabaceae]; JS/244	<i>Modar phang</i>	Toothache	T	FL	I: Leaf juice used as mouth wash.
26.	<i>Euphorbia hirta</i> L. [Euphorbiaceae]; JS/154	<i>Khatri phang</i>	Peptic ulcer	H	WP	I: This paste is used.
27.	<i>Hibiscus rosa-sinensis</i> L. [Malvaceae]; JS/231	<i>Gitsak – jaba bibal</i>	Diarrhoe, hair fall treatment	T	FL	I: Flower juice are taken. E: Flower paste is used in hair.
28.	<i>Houttuynia cordata</i> Thunb. [Saururaceae]; JS/235	<i>Musander i</i>	Joint pain, muscle pain, blood dysentery	H	WP	I: Plant juice is administrated.

Sl. No.	Botanical name [Family]; Collection No.	Vern. name (Garo)	Used against	Habit	Part Used	Dose/ Administration (E/I)*
29.	<i>Melastoma malabathricum</i> L. [Melastomataceae]; JS/232	<i>Kakku phang</i>	Mouth ulcer	SH	LF	I: Leaf juice is used (1 tea spoon daily twice).
30.	<i>Mimosa pudica</i> L. [Fabaceae]; JS/226	<i>Ambi misum</i>	Brest inflammation	H	RT	E: The root paste with <i>Aloe vera</i> is prepared and used.
31.	<i>Moringa oleifera</i> Lam. [Moringaceae]; JS265	<i>Bol sojona</i>	High blood pressure	T	LF	I: Leaf juice is taken orally.
32.	<i>Murraya koenigii</i> (L.) Spreng. [Rutaceae]; JS/282	<i>Sam khatsi</i>	Fever	T	LF	I: Leaf juice is taken orally. 1-2 teaspoonful daily once.
33.	<i>Neolamarckia cadamba</i> (Roxb.) Bosser [Rubiaceae]; JS/279	<i>Mi- bol</i>	Antibacterial	T	FR	E: Paste of fruit used over infected areas
34.	<i>Nyctanthes arbor-tristis</i> L. [Oleaceae]; JS/267	<i>Sephalika</i>	Cough	T	LF,FL	I: Decoction of leaf and flower are used orally.
35.	<i>Ocimum tenuiflorum</i> L. [Lamiaceae]; JS/227	<i>Tulsi</i>	Cough, asthma, wounds	SH	LF	I: Leaf juice with honey is administrated orally (2 teaspoon daily). E: Leaf paste is used over the wounds/cuts.
36.	<i>Oroxylum indicum</i> (L.) Kurz [Bignoniaceae]; JS/141	<i>Khiring</i>	Jaundice	T	BR	I: Decoction of bark is prepared and refined to use orally (1 teaspoon daily twice).
37.	<i>Paederia foetida</i> L. [Rubiaceae]; JS/80	<i>Veda lota</i>	Vomiting, dysentery	CL	LF	I: The tender leaf juice is taken.
38.	<i>Phlogacanthus thyrsoflorus</i> Nees [Acanthaceae]; JS/132	<i>Ellok</i>	Asthma	SH	LF	I: Leaf juice is taken orally.
39.	<i>Physalis minima</i> L. [Solanaceae]; JS/290	<i>Gogipa - bodu</i>	Muscle pain	SH	FR	I: Fruit juice is taken against body pain and muscle pain.
40.	<i>Piper nigrum</i> L. [Piperaceae]; JS/269	<i>Jaluk</i>	Cough	CL	FR	I: Fruit powder is used against cough.
41.	<i>Psidium guajava</i> L. [Myrtaceae]; JS/266	<i>Kamperum</i>	Dysentery	T	LF	I: Leaf juice is prepared and used orally.
42.	<i>Ricinus communis</i> L. [Euphorbiaceae]; JS/153	<i>Khoronda</i>	Muscle pain	SH	LF	E: Gentle paste of tender leaf is used.
43.	<i>Scoparia dulcis</i> L. [Plantaginaceae]; JS/278	<i>Sak kujuk</i>	Diabetes	H	LF	I: The leaf juice is taken orally.
44.	<i>Senna alata</i> (L.) Roxb. [Fabaceae]; JS/225	<i>Dadi - mildang</i>	Scabis	SH	ST, LF	E: Leaf and stem paste is used.
45.	<i>Senna tora</i> (L.) Roxb. [Fabaceae]; JS/245	<i>Jejhe</i>	Urine problem	SH	LF	I: The diluted refined leaf juice is taken orally .

Sl. No.	Botanical name [Family]; Collection No.	Vern. name (Garo)	Used against	Habit	Part Used	Dose/ Administration (E/I)*
46.	<i>Smilax glabra</i> Roxb. [Smilacaceae]; JS/232	<i>Kata lota</i>	Joint pain	CL	RT	I: Refined decoction of roots is used.
47.	<i>Streblus asper</i> Lour. [Moraceae]; JS/264	<i>Bol - Kharaans i</i>	Teeth bleeding	T	ST	E: The stems are used as tooth brass.
48.	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. [Combretaceae]; JS/161	<i>Arjun bol</i>	Heart tonic	T	BR	I: Bark powder juice is taken daily (2 tea spoons daily twice).
49.	<i>Terminalia bellirica</i> (Gaertn.) Roxb. [Combretaceae]; JS/138	<i>Bol badak</i>	Constipation	T	FR	I: Dry fruit powder taken with water during night time.
50.	<i>Terminalia chebula</i> Retz. [Combretaceae]; JS/137	<i>Artak</i>	Digestive / jaundice	T	FR	I: Dry fruit powder taken with water.
51.	<i>Tinospora cordifolia</i> (Willd.) Miers [Menispermaceae]; JS/256	<i>Padma galancha</i>	Constipation	CL	WP	I: Stem juice is taken orally.

contributing 41% followed by fruits (17%), roots (12%); whole plants and bark contributes 10%, stem and flower 4% each and latex contributes 2% as given in Figure 4. It has been estimated that the recorded plants species are widely used for the treatment as many as 21 different health ailments. Among those, dyspepsia, body-ache and cough are commonly treated. About 6% of the total recorded plant species were used against jaundice and skin care. About 4% plant species were strongly used as antiseptic, antibacterial and tonic, and also against constipation, fever, hair-health, headache, heart troubles, teeth problems, worm and urinary diseases. In the treatment of blood pressure, breast inflammation, diabetes, fracture, mouth and peptic ulcers about 2% of total species were used (Figure 2). From the study, it has been seen that the medicine men (*Kobiraz*) are very particular about the mode of administration of herbal medicine. It has been detected that majority of prepared medicine are administered orally (internal) in the form of decoction and few are administered externally in the form of paste. Largely leaves or other parts of the plant species are boiled and the extracted boiled juice is refined with the help of clean muslin clothes and the extracts are used orally for treatment of different health ailments like dyspepsia, body-ache, cough, jaundice, constipation, heart treatment, worm and urinary diseases.

DISCUSSION AND CONCLUSION

The main objective of this study was to trace out different plant species those are exclusively used by the people of *Garo* community of Sonitpur district for the human health care. The outcome of the present study reports the first ever record on ethnobotany of *Garo* tribe of erstwhile Sonitpur district of Assam. From the result it has been realised that the majority of the plant species used for human health care are trees (43%) followed by herbs (25%), shrubs (18%) and climbers (14%). It was recorded that different parts of plants were used for the treatment of various health disorders where majority of diseases were treated with leaves (41%) while latex shows lowest uses (2%). Some major species associated with the healing of stomach problems are *Hibiscus rosa-sinensis*, *Terminalia chebula*, *Psidium*

guajava, *Aegle marmelos*, *Alternanthera sessilis*, *Carica papaya*, *Centella asiatica*, *Houttuynia cordata*, *Paederia foetida*, etc. Species such as *Albizia procera*, *Ricinus communis*, *Physalis minima*, *Smilax glabra*, *Houttuynia cordata*, *Aristolochia indica*, *Calotropis gigantea* and *Abutilon indicum* are extensively used against body pains, while *Dillenia indica* and *Bixa orellana* are used as hair conditioner. *Nyctanthes arbor-tristis*, *Piper nigrum*, *Averrhoa carambola* and *Ocimum tenuiflorum* are used for the treatment of coughs. The leaf juice of *Scoparia dulcis* is taken orally against diabetes (daily twice after the meal), and respondent found very useful. The refined decoction of barks of *Bombax ceiba* and *Oroxylum indicum*, and the juice of flower of *Bauhinia purpurea* is reported to be highly beneficial to control Jaundice. After analysis of the questionnaire, it was found that the majority of the interacted individuals were male. It was also observed that herbal medicine man (*Kobiraz*), specially elders (above 60 years) possess strong background knowledge on medicinal plants and their uses for the treatment of irreverent diseases. Females refuse to interact with the other people. Another observation was that the individuals of lower age groups (25 – 45 years) are not aware about the uses of medicinal plants for different health treatments, and the knowledge they have is not adequate to apply against a disorder. Therefore, the transmissible ethnomedicinal wisdom is eroding day by day.

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