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Ethnomedicinal plants used by traditional healers of North Tripura district, Tripura, North East India

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ABSTRACT

Ethnopharmacological relevance: Information about ethnomedicinal plants used by traditional healers in Tripura, India is very much limited. As there is rapid erosion of traditional knowledge in the state, needs has arisen to document the diversity of medicinal plants, their preparation and associated diseases.
Aim of the study: Attempts have been made to explore the herbal medicines used by the traditional healers belonging to the various communities in North Tripura district of Tripura, India and document the associated traditional knowledge on the utilisation of medicinal plants.
Materials and methods: The study was based on ethnomedicinal field survey covering a period of 1 year from February 2012 to February 2013. The ethnomedicinal information was collected by using semi-structured questionnaires from different healers and knowledge holders. Collected data were analysed through informant consensus factor, Index of Specialisation and Relative frequency of citation to determine culturally significant plants.
Results: A total of 75 species of plants under 68 genera belonging to 43 families were collected during the study for the treatment of 15 disease categories. Leaves were the most frequently used plant parts and most of the medicines were prepared in the form of extract and administered orally. F_{IC} values of the present study indicated that there was a high agreement in the use of plants in the treatment of digestive system disorders and respiratory system disorders among the healers. Plants having high ISu are *Justicia adhatoda*, *Pajanelia longifolia*, *Catharanthus roseus* etc.
Conclusion: The present study highlighted certain species having higher priority indices for further phytochemical investigation. Counselling of traditional health practitioners should be taken into consideration in order to smooth continuation and extension of traditional medical knowledge and practice for ensuring safe and effective therapy.

1. Introduction

Ethnomedicinal plants contribute a significant role in accomplishing the primary health care needs of the population in developing countries (Rai et al., 2000), particularly as alternative and complementary *materia medica*. According to World Health Organisation (WHO), 80% of world's population in developing countries rely on herbal medicines, traditional treatments, and traditional practitioners for the main source of health care, and sometimes the only source of care as because it is close to home, accessible and affordable (Akerele, 1984; Shil et al., 2014). In many societies, traditional medicine systems are culturally acceptable with high acceptance level among the concerned people. The affordability of most traditional medicines makes them attractive at a time of soaring health-care costs and nearly universal austerity (Calixto, 2005). A number of people with diverse cultural backgrounds reside in India and practice their own system of traditional medicine for primary healthcare through generations. Reportedly, 70–80% of the rural Indians use non-allopathic (Ayurveda, Siddha, Unani and Homoeopathy) medicines for their healthcare and herbs constitute a major ingredient of these alternative systems of medicine (Gogtay et al., 2002).

The North East (NE) India, one of the richest reservoirs of plant diversity in India (Mao et al., 2009), encompasses a sizeable ethnic population of about 8 million (Sharma et al., 2014) with its contermino us eight sister states. The state Tripura, one of the states of NE India, with a total geographical area of 10491.69 km^2 is located between 22° 56′ and 24° 32′ N latitude and 90° 09′ to 92° 20′ E longitude. The state

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is the home for various ethnic groups namely Tripuri, Bengali, Debbarma, Reang, Naotia, Chakma, Bhil, Bhutia, Chaimal, Garo, Halam, Khasia, Kuki, Lepcha, Lushai, Mog, Munda, Orang, Santhal, Uchoi, Koloi and many other smaller groups. Every community in the state have a rich heritage of medicinal plants and their usage along with their own system of preserving this tradition (Deb et al., 2013). These knowledge ranges from the therapeutic treatment of commonly occurring household remedies to specialized treatment unique to certain traditional healers. Traditional healers following Ayurvedic system of medicine are locally called *Kaviraja* while those following community-specific folk medicine are known as *Ojhas* respectively. Although there are rapid erosion of ethnomedicinal knowledge among these communities, with urbanisation and introduction of western medicine system, many of them in different pockets of the state are still practicing the traditional health practices. It has been felt that documentation of the traditional knowledge from different communities would help in conserving these rich heritages of knowledge and also in incorporating scientific knowledge to the practices and validation of such therapies.

Different research workers in different time periods have put tremendous efforts for investigating the ethnobotanical aspects of Tripura's diverse vegetation. Mention may be made of pioneering works such as Deb (1968, 1975a, 1975b, 1975c, 1976, 1978a, 1978b, 1981a, 1981b, 1983), Singh et al. (1997), Devbarma (1976), Majumdar et al. (2006), Shil and Choudhury (2009), Das et al. (2009), Das and Choudhury (2010), Sen et al. (2011), Sharma et al. (2013); Sharma et al. (2014), Shil et al. (2014) among others. In spite of such efforts, considerably less attention has been paid to the North Tripura District of Tripura by these ethnobotanists for exploring the ethnomedicinal resources.

Considering these limitations in exploring the diversity of medicinal plants vis-à-vis to the traditional medicine, the present study was attempted to document the ethnomedicinal plant wealth of North Tripura district of Tripura and their use by different communities inhabiting in the district.

2. Materials and methods

2.1. Study area

The study was conducted in North Tripura district of Tripua (Fig. 1) which has a geographical area of 1422.19 km^2 and located at latitude of 24° 36′ and at longitude of 92° 19′. The district is divided into three sub-divisions, namely, Dharmanagar, Kanchanpur and Panisagar and has a total population of 422,370 (approx). Main ethnic communities of the districts are Bengali, Tripuri, Halam, Reang, Chakma, Manipuri and Debbarma following Hinduism, Christianity and Buddhism.

2.2. Questionnaire survey and ethnobotanical data collection

The ethnomedicinal field survey was carried out over a period of one year in three sub-divisions of North Tripura district, Tripura during February 2012 to February 2013. Semi-structured questionnaires were administered to collect ethnobotanical data from the informants (Ningthoujam et al., 2013). During the survey, 30 informants were interacted out of which 20 are professional. Most of our information were provided by these 20 informants (male: 13; female: 7), out of which 12 were non-healers (they are having the knowledge of medicinal plant but do not practicing it) and rests are *Kavirajas* and *Ojhas*. All the informants belonged to the 7 different communities and were born and reared in their respective villages. Traditional healers were practicing for years and derived their knowledge from their ancestry or learnt through traditional institutions. Documentation about the informants' community, age, experience, occupation (apart from practicing traditional healing), literacy and social acceptability of their healing ability were also done. Most of the informants were found to be illiterate and school dropouts. Prior informed consent was obtained before collecting the information.

On the basis of information provided by the informants, plant samples were collected from fields and photographs of the plants in flowering/fruiting conditions were taken. Some specimens were collected from the healers' private collections and home gardens as these plants are no more found in the wild condition during the survey. Plants collected from the fields were cross-checked with the healers. The plants were initially identified at Department of Life Science and Bioinformatics, Assam University by discussing mainly from the "Flora of Tripura State" (Deb, 1981a, 1983) and books covering nearby regions namely Flora of British India (Hooker, 1872–1897) and Flora of Assam (Kanjilal et al., 1934, 1936, 1938, 1940). Plants were again verified with the records of the Botanical Survey of India (BSI), North Eastern Circle, Shillong. The herbarium specimens were deposited at the Department of Life Science and Bioinformatics, Assam University, Silchar. Scientific names were standardised by cross-checking with the IPNI (www.ipni.org) and the Plant List (www.theplantlist.org) databases.

2.3. Analysis

2.3.1. F_{IC} (Informant consensus factor)

Informant Consensus Index was one of popular quantitative approaches for identifying the relative importance of medicinal plants with the ailment categories in a particular culture. The present index was initially developed by Trotter and Logan (1986) and later on modified by Heinrich et al. (1998). The present index calculated on the basis of the following equation:

$$F_{IC} = N_{ur} - N_t/(N_{ur} - 1),$$

where N_{ur} stands for the number of use reports for a particular use category and N_t stands for the number of taxa used for a particular ailment category by all informants. The indices could reflect the homogeneity in the use of plants in the ailment categories among the informants of the study area. As many species may be associated with the same disease, this factor becomes significant tool for determining the most used plant species for treating a particular ailment. A higher F_{IC} value indicates the use of relatively few plants by the informants in the treatment of a particular ailment category whereas a lower F_{IC} value indicates that there are disagreement among the informants with regard to use of a particular plant for treating a particular ailment category.

2.3.2. IS_u (Index of Specialisation unit)

In the present work, evaluation of the ethnobotanical data was performed with modified fidelity level index (Friedman et al., 1986; Bruni et al., 1997) which have been applied in determing the importance of medicinal recipes (Ningthoujam et al., 2013). The primary use of the recipe was used as a fidelity index which is expressed as a percentage of the citation for that recipe (%C_m). The modified index called the "Index of Specialisation by the main use" (IS_u) was used to determine the consensus for the specific medical uses along with type of preparation and application. This index was calculated with the following formula:

$$IS_u = (\%C_m \times \%C_t)/100$$

where IS_u is the Index of Specialisation by the main use, %C_m is the percentage of citation for a particular drug, and %C_t is the percentage of the total citations.

2.3.3. Relative frequency of citation (RFC)

The RFC is obtained by the equation RFC = FC/N where, FC is the frequency of citation i.e., the number of informants who mention

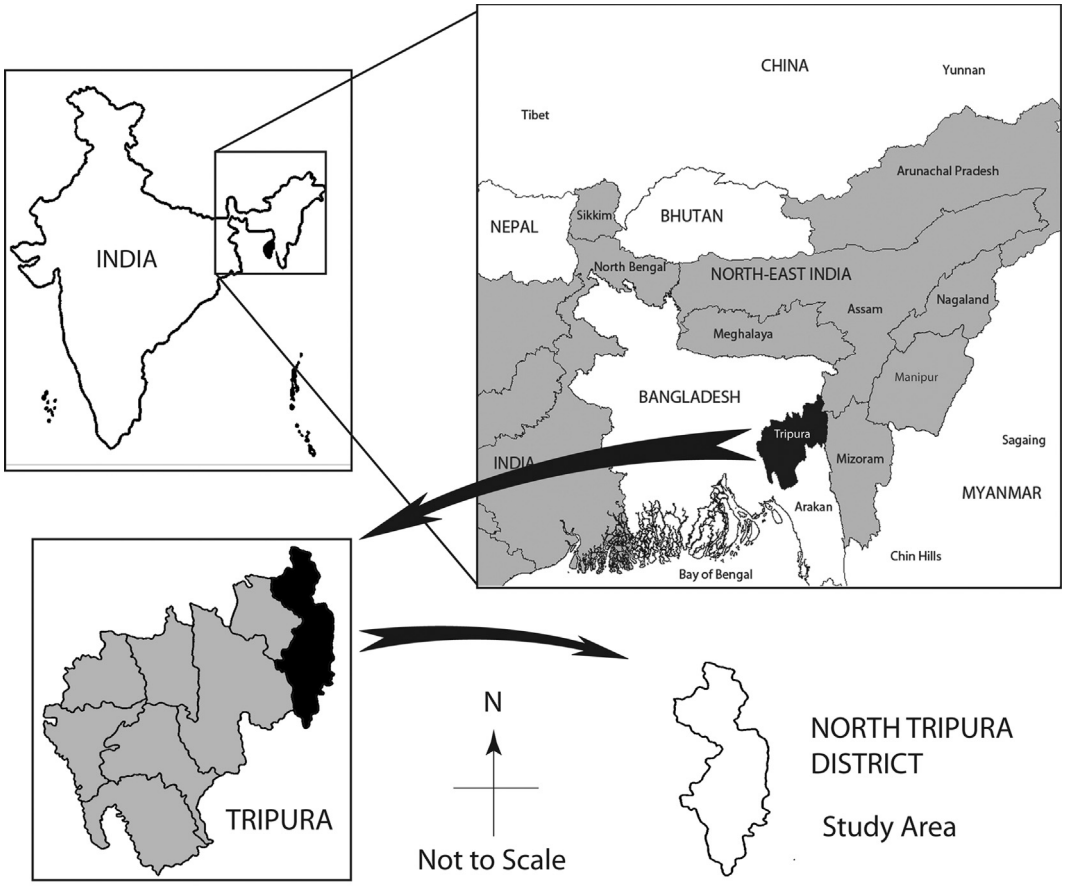

Fig. 1. Map showing the study area.

the use of the species and *N* is the total number of informants interviewed in the survey (Tardío and Pardo-de-Santayana, 2008).

3. Results

In the survey, a total of 75 plant species have been reported by 20 traditional healers for treatment of 15 different of disease categories. Herbal recipes of these medicinal plants are tabulated with scientific name and family followed by vernacular name, RFC, disease, parts used, preparation, application, number of citation, number of use types, Ct, %Ct, Cm, %Cm, IS*u*, other uses and similar use (Table 1).

Among the 20 interviewees, 08 people are traditional health practitioners (THPs) and rests are indigenous non-healers. Major informants were male (65%). There were a high percentage of interviewees who were around 60–70 years (35%) old followed by informants who were more than 70 years (20%) old. The majority of interviewees were illiterate (70%). Experience wise most of the interviewees had 10–20 years of experience (45%) of traditional healing practices (Fig. 2).

In the present study a total of 75 plant species belonging to 43 plant families are identified as having medicinal values used by THPs of North Tripura district. The family Asteraceae and Rutaceae (6 species each) represents the highest number of species, followed by Lamiaceae and Lauraceae (5 species each), Euphorbiaceae (4 species) and Apocynaceae (3 species).

In terms of percentage of plant parts used by the informants, the percentages are as follows, leaf 70.65%, bark 7.6%, fruit 5.43%, root 4.89%, stem 4.34%, whole plant 3.26%, seed 1.63%, latex 1.08%, rhizome and milky juice 0.54% each.

Respiratory system disorders had the highest F_{IC} of 0.85 followed by digestive system disorders (0.84), endocrine system disorders and infection (0.82) (Table 2).

Relative frequency of citation (RFC) of each species has been evaluated from the available information. In the present study RFC of plant species varied between 1 and 0.1. *Litsea glutinosa* of family Lauraceae has shown the highest RFC of 1.0 followed by *Pajanelia longifolia* (0.95), *Catharanthus roseus* (0.9), *Justicia adhatoda* (0.9), and *Ocimum tenuiflorum* (0.9).

The Index of Specialisation (IS*u*) of medicinal plant species in the present study ranged from 0.12 to 1.78. *J. adhatoda* has shown highest IS*u* of 1.78 followed by *P. longifolia* (1.65), *C. roseus* (1.52), *Centella asiatica* (1.39), *Oroxylum indicum* (1.39), *Carica papya* (1.39), *L. glutinosa* (1.14), *Annona reticulata* (1.14), *Citrus lemon* (1.14), *Hyptis suaveolens* (1.14), *Lagerstroemia speciosa* (1.14), *Mimosa pudica* (1.14), *Pandanus foetidus* (1.14), *Justicia gendarussa* (1.01), *Bryophyllum pinnatum* (1.01), *Enhydra fluctuans* (1.01).

4. Discussion

The present study indicated that traditional healers have substantial knowledge on specificities of different medicinal plants according to disease types, which is also corroborated with earlier studies (Das and Choudhury, 2010). Differential values of FIC in different categories reflected the preponderances of the healer's viewpoints as well as common ailments facing the communities covered. Disease categories with highest values of FIC such as Respiratory System Disorders and Digestive System Disorders are associated with common ailments like cough, sinus, indigestion, and stomach ache. Moreover, another category of Infection exhibiting

Table 1
Medicinal plants of North Tripura district of Tripura state against different ailments.

Plant name and family	Vernacular name	Voucher no.	RFC	Main disease	Parts used	Preparation	Application	Number of citations per preparation	No. of uses type	Ct	%Ct	Cm	%Cm	ISu	Other uses and mode of application	Relevant ethnobotanical/ pharmacological citation
Acmella paniculata (Wall. ex DC.) R.K. Jansen	*Ansa* (H)	AUS2507	0.35	Paralysis	Leaf	Crushed	Rubbed	3	2	4	0.50	3	75	0.38	Eczema (rubbed); Headache (drink)	(Hossain et al., 2014)
Asteraceae				Fever	Leaf	Decoction	Drink	2	1	2	0.25	2	100	0.25		
Aegle marmelos (L.) Correa	*Bael* (H, B, M)	AUS2508	0.65	Diarrhoea	Fruit	Decoction	Drink	3	3	5	0.63	3	60	0.38	Indigestion (Decoction, drink); weak heart (Decoction, drink)	(Shoba and Thomas, 2001; Brijesh et al., 2009; Arul et al., 2004, 2005)
Rutaceae				Knee Pain	Fruit	Crushed	Rubbed	2	1	2	0.25	2	100	0.25		
				Fever	Fruit	Crushed	Drink	5	1	5	0.63	5	100	0.63		
				Fever	Leaf	Crushed	Drink	1	1	1	0.12	1	100	0.12		
				Asthma	Fruit	Burnt	Inhale	1	1	1	0.12	1	100	0.12		
Aerva javanica (Burm. F.) Juss. ex Schult.	*Bishalyakarani* (B)	AUS2509	0.40	Joint Pain	Leaf	Crushed	Rubbed	2	2	8	1.01	6	75	0.76		(Qureshi and Bhatti, 2008)
Amaranthaceae				Cut and Wounds	Leaf	Crushed	Rubbed	6								
Ageratum conyzoides (L.) L.	*Bon tulsi* (B),	AUS2510	0.55	High BP	Leaf	Crushed	Drink	5	2	8	1.01	5	62.5	0.63	Angina (Crushed, drink)	(Ming, 1999; Rajendran et al., 2004)
Asteraceae	*Samnama* (R)			Fever	Flower	Crushed	Drink	3	1	3	0.38	3	100	0.38		
Alocasia macrorrhizos (L.) G.Don	*Anman kachu* (B)	AUS2511	0.35	Arthritis	Rhizome	Crushed	Rubbed	7	1	7	0.89	7	100	0.89		(Nadkarni and Basu, 1996; Rahman et al., 2011; Rahmatullah et al., 2010b)
Araceae																
Aloe vera (L.) Burm.f.	*Kumari* (R), *gritkumari* (B)	AUS2512	0.40	Jaundice	Stem	Crushed	Drink	5	1	5	0.63	5	100	0.63		(Vogler and Ernst, 1999; Surjushe et al., 2008)
Liliaceae				Liquiria	Leaf	Decoction	Drink	3	1	3	0.38	3	100	0.38		
Alstonia scholaris (L.) R. Br.	*Lawthong* (H)	AUS2513	0.8	Diarrhoea	Bark	Decoction	Drink	6	2	9	1.14	6	66.6667	0.76		(Shah et al., 2010; Das et al., 2003; Atta-ur-Rahman et al., 1985)
Apocynaceae				Ulcer	Milky Juice	Decoction	Drink	3	1	3	0.38	3	100	0.38		
				Bone Fracture	Leaf	Crushed	Rubbed	4	1	4	0.50	4	100	0.50		
				Snakse Bite	Bark	Decoction	Drink	3								
Amaranthus spinosus L.	*Katadugi* (B)	AUS2514	0.55	Stone	Leaf	Decoction	Drink	7	2	11	1.39	7	63.6364	0.89	Stomachache (Decoction, drink)	(Ballabh et al., 2008)
Amaranthaceae																
Annona reticulata L.	*Atafal* (B)	AUS2515	0.50	Cuts	Leaf	Crushed	Rubbed	9	1	9	1.14	9	100	1.14		(Chavan et al., 2012)
Annonaceae				Infestation of Cattle	Leaf	Decoction	Vapour	1	1	1	0.12	1	100	0.12		
Archidendron clypearia (Jack) I.C. Nielsen[a]	*Loapatto* (C)	AUS2516	0.45	Dysentery	Bark	Decoction	Drink	6	2	9	1.14	6	66.6667	0.76	Stomachache (Decoction, drink)	
Mimosaceae																
Averrhoa carambola L.	*Kapranga* (B)	AUS2517	0.60	Jaundice	Leaf	Crushed	Pellet	7	1	7	0.89	7	100	0.89		(Borah et al., 2006; Mia et al., 2007; Ripunjoy, 2013)
Averrhoaceae				Dysentery	Leaf	Decoction	Drink	5	1	5	0.63	5	100	0.63		
Azadirachta indica A. Juss.	*Neem* (B)	AUS2518	0.65	Indigestion	Leaf	Decoction	Drink	2	3	9	1.14	4	44.4444	0.50	Fever, TB (Decoction, drink)	(Muthu et al., 2006; Khosla et al., 2000; Chattopadhyay et al., 1987; Kar et al., 2003)
Meliaceae				Diabetes	Leaf	Crushed	Drink	3	1	3	0.38	3	100	0.38		
				Allergy	Leaf	Crushed	Rubbed	1	1	1		1	100	0		
	Payan (B)	AUS2519	0.60	Cough	Leaf	Decoction	Drink	3	2	7	0.89	4	57.1429	0.50		

Begonia roxburghii A. DC.															Fever (Decoction, drink)	(Yogendra Kumar, 2008; Gupta, 2006; Srivastava 2010a)
Begoniaceae				Allergy	Leaf	Crushed	Rubbed	5	1	5	0.63	5	100	0.63		
Bryophyllum pinnatum (Lamk.) Oken	*Gorol* (B)	AUS2520	0.60	Dysentery	Leaf	Crushed	Drink	4	1	4	0.50	4	100	0.50		(Dalziel, 1937; Kamboj and Saluja, 2009)
Crassulaceae				Stone	Leaf	Decoction	Drink	8	1	8	1.01	8	100	1.01		
Cajanus cajan (L.) Millsp.	*Arhar* (B), *domurshumi* (C)	AUS2521	0.50	Jaundice	Leaf	Crushed	Pellet	7	1	7	0.89	7	100	0.89		(Kong et al., 2009; Morton, 1976; Akinloye and Olaniyi, 2011)
Papilionaceae				Allergy	Leaf	Crushed	Rubbed	3	1	3	0.38	3	100	0.38		
Calotropis gigantea (L.) Dryand.	*Akanda* (B)	AUS2522	0.20	Urinary Troubles	Leaf	Decoction	Drink	4	1	4	0.50	4	100	0.50		(Misra et al., 1993)
Apocynanceae																
Carica papya L.	*Koiphol* (B, DB, H)	AUS2523	0.60	Teeth Infection	Leaf	Crushed	Rubbed	9	2	11	1.39	9	81.81	1.14		(Rahmatullah et al., 2010b)
Caricaceae				Bone Fracture	Leaf	Crushed	Rubbed	2						0		
				Arthritis	Root	Crushed	Rubbed	1								
Catharanthus roseus (L.) G. Don.	*Nayantara* (B)	AUS2524	0.9	Diabetes	Leaf	Decoction	Drink	12	1	12	1.52	12	100	1.52		(Ghosh and Gupta, 1980; Banerjee and Basu, 1991; Singh et al., 2001; Kirtikar and Basu, 1933; Nammi et al., 2003; Rasineni et al., 2010)
Apocynaceae				Cut and Wounds	Leaf	Crushed	Rubbed	6	1	6	0.76	6	100	0.76		
Centella asiatica (L.) Urb.	*Thunimankuni* (B, M)	AUS2525	0.85	Gastric	Leaf	Crushed	Drink	11	1	11	1.39	11	100	1.39		(Cheng and Koo, 2000; Sairam et al., 2001; Chatterjee et al., 1992; Guo et al., 2004)
Apiaceae				Eye Infection	Leaf	Decoction	Drink	6	1	6	0.76	6	100	0.76		
Cinnamomum verum J. Presl	*Dalchini* (B, H)	AUS2526	0.15	Asthma	Bark	Crushed	Rubbed	1	1	1	0.12	1	100	0.12		(Khare, 2007; Mukti et al., 2012)
Lauraceae				Asthma	Bark	Decoction	Drink	2	1	2	0.25	2	100	0.25		
Cissus quadrangularis L.	*Harkuchla* (B)	AUS2527	0.10	Bone Fracture	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100	0.25		(Shirwaikar et al., 2003)
Vitaceae																
Citrus limon (L.) Osbeck	*Lebu* (B, H)	AUS2528	0.60	Diabetes	Leaf	Decoction	Drink	9	1	9	1.14	9	100	1.14		(Wagh et al., 2011; Naim et al., 2012)
Rutaceae				Dysentery	Fruit	Crushed	Drink	3	1	3	0.38	3	100	0.38		
Citrus maxima (Burm.) Merr.	*Jambura* (B, H)	AUS2529	0.60	Indigestion	Fruit	Crushed	Drink	3	2	10	1.27	7	70	0.89		(Bhandurge et al., 2010; Kundusen et al., 2011)
Rutaceae				Diabetes	Leaf	Crushed	Drink	7								
				Allergy	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100	0.25		
Clausena heptaphylla (Roxb.) Wight and Arn	*Kukra* (B)	AUS2530	0.35	Indigestion	Leaf	Crushed	Pellet	5	1	5	0.63	5	100	0.63		(Nath and Choudhury, 2010)
Rutaceae				Stone	Leaf	Decoction	Drink	2	1	2	0.25	2	100	0.25		
Clerodendrum cordatum D.Don	*Bhati* (B)	AUS2531	0.45	Jaundice	Leaf	Crushed	Rubbed	4	2	5	0.63	4	80	0.50		(Shukla et al., 2013)
Lamiaceae				Gastric	Leaf	Decoction	Drink	3	2	4	0.50	3	75	0.38		
				Inflammation	Leaf	Decoction	Drink	1								
				Inflammation	Leaf	Crushed	Rubbed	1								
Coccinia grandis (L.) Voigt	*Telakuchi* (B)	AUS2532	0.40	Diabetes	Leaf	Decoction	Drink	6	1	6	0.76	6	100	0.76		(Venkateswaran and Pari, 2003; Shibib et al., 1993; Umamaheswari and Chatterjee, 2008)
Cucurbitacea				Cut and Wounds	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100			
Cocos nucifera L.	*Narikul* (B)	AUS2533	0.55	Teeth Infection	Leaf	Crushed	Rubbed	6	2	11	1.39	6	54.54	0.76		(Rahmatullah et al., 2010a; Yong et al., 2009)
Arecaceae				Inflammation	Leaf	Crushed	Rubbed	5								
Connarus paniculatus Roxb. [a]	*Uroshichak* (C)	AUS2534	0.30	Diarrhoea	Leaf	Decoction	Drink	5	1	5	0.63	5	100	0.63		

Table 1 (*continued*)

Plant name and family	Vernacular name	Voucher no.	RFC	Main disease	Parts used	Preparation	Application	Number of citations per preparation	No. of uses type	Ct	%Ct	Cm	%Cm	ISu	Other uses and mode of application	Relevant ethnobotanical/ pharmacological citation
Connaraceae				Stomach-Ache	Leaf	Crushed	Drink	1	1	1	0.12	1	100	0.12		
Croton bonplandianum Baill.[a]	*Japur* (T)	AUS2535	0.35	Indigestion	Root	Decoction	Drink	7	1	7	0.89	7	100	0.89		
Euphorbiaceae																
Cynodon dactylon (L.) Pers[a]	*Durba* (B)	AUS2536	0.35	Indigestion	Leaf	Decoction	Drink	4	1	4	0.50	4	100	0.50		
Poaceae				Semen Loss	Leaf	Crushed	Drink	3	1	3	0.38	3	100	0.38		
Cuscuta reflexa Roxb.	*Sunnalata* (H),	AUS2537	0.65	Jaundice	Leaf	Decoction	Drink	2	5	12	1.52	5	41.66	0.63		(Siwakoti and Siwakoti, 2000; Hossan et al., 2009; Patel et al., 2012)
Convolvulaceae	*Kuchilalata* (B)			Jaundice	Stem	Decoction	Drink	2								
				Gastric	Leaf	Decoction	Drink	1								
				Urinary Troubles	Stem	Decoction	Drink	5								
				Ear Pain	Leaf	Decoction	Drink	2								
Datura stramonium L.	*Dhutra* (B)	AUS2538	0.40	Knee Pain	Leaf	Crushed	Rubbed	5	2	8	1.01	5	62.5	0.63		(Gaire and Subedi, 2013)
Solanaceae				Inflammation	Leaf	Crushed	Rubbed	3								
Dendrophthoe falcata (L.f.) Ettingsh.	*Gaschotta* (C), *amburus* (B),	AUS2539	0.45	Cough	Leaf	Decoction	Drink	4	2	7	0.89	4	57.1429	0.50		(Pattanayak and Mazumder, 2010; Rajendran et al., 2004)
Loranthaceae				Cough	Root	Decoction	Drink	3								
				Cut and Wounds	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100	0.25		
Dichrocephala integrifolia (L.f.) Kuntz.[a]	*Bortora* (C)	AUS2540	0.25	Joint Pain	Leaf	Crushed	Rubbed	3	2	4	0.50	3	75	0.38		
Asteraceae				Skull Hardening	Leaf	Crushed	Rubbed	1								
				Piles	Leaf	Crushed	Drink	1	1	1	0.12	1	100			
Diplazium esculentum (Retz.) Sw.	*Bon paloi* (H, B)	AUS2541	0.35	Indigestion	Leaf	Crushed	Drink	1	1	1	0.12	1	100	0.12		(Deb et al., 2009; Angami et al., 2006; Roy et al., 2013)
Athyriaceae				Bone Fracture	Whole Plant	Crushed	Rubbed	2	2	6	0.76	4	66.6667	0.50		
				Arthritis	Leaf	Crushed	Rubbed	4								
Dracaena elliptica Thunb. & Dalm.[a]	*Hodorotengait* (C)	AUS2542	0.45	Small Pox	Stem	Crushed	Rubbed	7	1	7	0.89	7	100	0.89		
Asparagaceae				Body Pain	Stem	Decoction	Drink	2	1	2	0.25	2	100	0.25		
Enhydra fluctuans Lour.	*Helenchak* (C)	AUS2543	0.75	Indigestion	Leaf	Decoction	Drink	8	2	12	1.52	8	66.6667	1.01		(Sannigrahi et al., 2011; Sannigrahi et al., 2010)
Asteraceae				Nervous Disorder	Leaf	Decoction	Drink	4								
				Inflammation	Leaf	Crushed	Rubbed	3	1	3	0.38	3	100	0.38		
Euphorbia neriifolia L.	*Shairapul* (H), *Shibgach* (C)	AUS2544	0.55	Pneumonia	Whole Plant	Decoction	Drink	7	1	7	0.89	7	100	0.89		(Jahan et al., 2011; Pokharen et al., 2011)
Euphorbiaceae				Allergy	Latex	Ointment		4	1	4	0.50	4	100	0.50		
Ficus hirta Vahl[a]	*Tamangaddu* (C)	AUS2545	0.55	Stomach-Ache	Leaf	Decoction	Rubbed	7	1	7	0.89	7	100	0.89		
Moraceae				Snake Bite	Root	Crushed	Rubbed	4	2	9	1.14	5	55.5556	0.63		
Ficus pumila L.	*Ludisharbuho* (C)	AUS2546	0.30	Diabetes	Leaf	Decoction	Drink	1	1	1	0.12	1	100	0.12		(Leong et al., 2008; Liao et al., 2012)
Moraceae				Body Pain	Leaf	Crushed	Rubbed	5								
Floscopa scandens Lour.[a]	*Panneihedugi* (C)	AUS2547	0.6	Indigestion	Leaf	Crushed	Rubbed	7	2	10	1.27	7	70	0.89		

Commelinaceae				Sore Eye	Stem	Crushed	Drop	2	1	2	0.25	100	0.25	
				Bone Fracture	Leaf	Crushed	Rubbed	3						
Hibiscus rosa-sinensis L.	*Jaba* (B)	AUS2548	0.70	Dysentery	Leaf	Decoction	Drink	7	3	14	1.78 7	50		(Ross, 1999; Kim et al., 2003)
Malvaceae				Arthritis	Root	Decoction	Drink	3						
				Liver Troubles	Flower	Decoction	Drink	4						
Houttuynia cordata Thunb.	*Toppaneigkong* (M), *Kokpanikouo* (H)	AUS2549	0.40	Appetite Loss	Leaf	Decoction	Drink	5	2	8	1.01 5	62.5	0.63	(Kumar et al., 2014; Srivastava et al., 2010b)
Saururaceae				Body Pain	Leaf	Decoction	Drink	3						
Hyptis suaveolens Piot.	*Tukma* (B)	AUS2550	0.60	Liver Troubles	Leaf	Decoction	Drink	9	1	9	1.14 9	100	1.14	(Babalola et al., 2011; Ghaffari et al., 2012)
Lamiaceae				Allergy	Leaf	Crushed	Rubbed	3	1	3	0.38 3	100	0.38	
Ipomoea aquatica Forssk.	*Kalmi* (B,H) *Banialochi* (R)	AUS2552	0.45	Jaundice	Leaf	Decoction	Drink	7	1	7	0.89 7	100	0.89	(Prasad et al., 2008)
Convolvulaceae				Cuts and Wounds	Leaf	Crushed	Rubbed	2	1	2	0.25 2	100	0.25	
Jasminum sambac (L.) Aiton	*Beli* (B)	AUS2553	0.60	Bone Fracture	Leaf	Crushed	Rubbed	2	2	5	0.63 3	60	0.38	(Sabharwal et al., 2011; Sengar et al., 2015)
Oleaceae				Arthritis	Leaf	Crushed	Rubbed	3						
				Diarrhoea	Leaf	Decoction	Drink	7	1	7	0.89 7	100	0.89	
Jatropha curcas L.	*Dantigach* (D), *bherenda* (B)	AUS2554	0.40	Eczema	Seed oil	Ointment	Rubbed	2	1	2	0.25 2	100	0.25	(Joshi and Joshi, 2000)
Euphorbiaceae				Cut and Wounds	Leaf	Crushed	Rubbed	6	1	6	0.76 6	100	0.76	
Jatropha gossypifolia L.	*Lal bherenda* (B)	AUS2555	0.40	Teeth Infection	Latex	Ointment	Rubbed	6	1	6	0.76 6	100	0.76	(Panda et al., 2009)
Euphorbiaceae				Snake Bite	Leaf	Crushed	Rubbed	2	1	2	0.25 2	100	0.25	
Justicia gendarussa Burm.f.	*Bishoma* (C)	AUS2556	0.75	Waist Pain	Leaf	Crushed	Rubbed	7	2	15	1.90 8	53.3333	1.01	(Jothimanivannan et al., 2010; Paval et al., 2009)
Acanthaceae				Inflammation	Leaf	Crushed	Rubbed	8						
Justicia adhatoda L.	*Basak* (B)	AUS2557	0.90	Cough	Leaf	Decoction	Drink	4	2	18	2.29 14	77.7778	1.78	(Nath et al., 1992; Singh et al., 2000; Mahato and Chaudhary, 2005; Joshi and Joshi, 2000)
Acanthaceae				Fever	Leaf	Decoction	Drink	14						
Lablab purpureus (L.) Sweet.	*Lalshim* (B)	AUS2551	0.20	Eczema	Leaf	Crushed	Rubbed	4	1	4	0.50 4	100	0.50	(Islam et al., 2011)
Leguminosae														
Lagerstroemia speciosa (L.) Pers.	*Jarulata* (B)	AUS2558	0.55	Teeth Infection	Root	Fresh	Chewed	9	1	9	1.14 9	100	1.14	(Vivek et al., 2013)
Lythraceae				Cut and Wounds	Root	Crushed	Rubbed	2	1	2	0.25 2	100	0.25	
Lawsonia inermis L.	*Mehendi* (B)	AUS2559	0.55	Urinary Troubles	Leaf	Crushed	Drink	4	1	4	0.50 4	100	0.50	(Ali et al., 1996; Chaudhary et al., 2010)
Lythraceae				Catamenia	Leaf	Crushed	Pellet	3	1	3	0.38 3	100	0.38	
				Body Pain	Leaf	Decoction	Drink	4	1	4	0.50 4	100	0.50	
Leucas aspera (Willd.) Link	*Dankalshi* (B)	AUS2560	0.80	Piles	Leaf	Crushed	Rubbed	4	1	4	0.50 4	100	0.50	(Reddy et al., 1986; Srinivas et al., 2000)
Lamiaceae				Inflammation	Whole Plant	Crushed	Drink	7	2	12	1.52 7	58.3333	0.89	
				Dysentery	Leaf	Crushed	Drink	5						
Litsea glutinosa (Lour.) C.B. Rob.	*Chengpisla* (B) *Musafaoma* (R)	AUS2561	1.0	Gastric	Leaf	Crushed	Drink	5	2	14	1.78 9	64.2857	1.14	(Bhowmick et al., 2014; Chowdhury et al., 2008; Ghani, 2003; Bhuinya et al., 2010)
Lauraceae				Dysentery	Leaf	Crushed	Pellet	6	1	6	0.76 6	100	0.76	
				Semen Loss	Bark	Crushed	Drink	9						
Litsea monopetala (Roxb.) Pers.[a]	*Kala deungra* (B)	AUS2562	0.4	Diabetes	Seed	Decoction	Drink	6	2	8	1.01 6	75	0.76	

Table 1 (*continued*)

Plant name and family	Vernacular name	Voucher no.	RFC	Main disease	Parts used	Preparation	Application	Number of citations per preparation	No. of uses type	Ct	%Ct	Cm	%Cm	ISu	Other uses and mode of application	Relevant ethnobotanical/ pharmacological citation
Lauraceae				Fever	Leaf	Decoction	Drink	2								
Litsea semecarpifolia (Wall. Ex. Nees) Hook.f.[a]	*Leichchoshibiang* (C)	AUS2563	0.35	Diabetes	Seed	Crushed	Drink	2	1	2	0.25	2	100	0.25		
Lauraceae				Body Pain	Leaf	Crushed	Rubbed	5	1	5	0.63	5	100	0.63		
Litsea salicifolia (J. Roxb. Ex Nees) Hook.f.[a]	*Shigonjalin odonmointto* (C)	AUS2564	0.35	Arthritis	Leaf	Decoction	Drink	5	2	7	0.89	5	71.4286	0.63		
Lauraceae				Body Pain	Stem	Decoction	Drink	2								
Melastoma malabathricum L.[a]	*Lutki* (B)	AUS2565	0.35	Bone Fracture	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100			
Melastomataceae				Asthma	Leaf	Crushed	Pellet	5	1	5	0.63	5	100	0.63		
Mangifera indica L.	*Aam* (B, H)	AUS2566	0.55	Ulcer	Bark	Crushed	Drink	3	2	5	0.63	3	60	0.38		(Carvalho et al., 2007; Severi et al., 2009)
Anacardiaceae				Gastric	Leaf	Crushed	Drink	2								
				Diabetes	Leaf	Decoction	Drink	6	1	6	0.76	6	100	0.76		
Mentha arvensis L.	*Pudina* (B)	AUS2567	0.40	Indigestion	Leaf	Fresh	Chewed	5	1	5	0.63	5	100	0.63		(Londonkar and Poddar, 2009)
Lamiaceae				Cattle Fever	Whole Plant	Decoction	Drink	3	1	3	0.38	3	100	0.38		
Micromelum integerrimum (Buch.-Ham. ex DC.) Wight & Arn. Ex M. Roem.[a]	*Banjamra* (B)	AUS2568	0.50	Diabetes	Leaf	Crushed	Drink	5	2	8	1.01	5	62.5	0.63		
Rutaceae				Dysentery	Leaf	Crushed	Drink	3								
				Arthritis	Leaf	Crushed	Rubbed	2	1	2	0.25	2	100	0.25		
Mikania cordata (Burm.f.) B.L.Rob.[a]	*Noreshbodug, pikash* (D)	AUS2569	0.60	Diabetes	Leaf	Crushed	Drink	5	1	5	0.63	5	100	0.63		
Asteraceae				Cut and Wounds	Leaf	Crushed	Rubbed	7	1	7	0.89	7	100	0.89		
Mimosa pudica L.	*Lajjaboti* (B, H, M)	AUS2570	0.70	Asthma	Leaf	Crushed	Rubbed	9	1	9	1.14	9	100	1.14		(Girish et al., 2004; Mahanta and Mukherjee, 2001; Yang et al., 2011)
Mimosaceae				Stone	Whole Plant	Crushed	Drink	4	1	4	0.50	4	100	0.50		
				Dog/Snake Bite	Root	Crushed	Pellet	1	1	1	0.12	1	100	0.12		
Momordica charantia L.	*Titkarala* (B)	AUS2571	0.60	Indigestion	Leaf	Decoction	Drink	7	1	7	0.89	7	100	0.89		(Akhtar et al., 1981; Raman and Lau, 1996; Sarkar et al., 1996; Welihinda et al., 1986)
Cucurbitaceae				Diabetes	Leaf	Crushed	Drink	3	2	5	0.63	3	60	0.38		
				Diabetes	Fruit	Crushed	Drink	2								
Morinda angustifolia Roxb.[a]	*Borshoilli* (C)	AUS2572	0.45	Dysentery	Stem	Decoction	Drink	3	1	3	0.38	3	100	0.38		
Rubiaceae				Allergy	Leaf	Crushed	Rubbed	6	1	6	0.76	6	100	0.76		
Moringa oleifera Lam.	*Sajna* (B)	AUS2573	0.45	Jaundice	Bark	Crushed	Pellet	5	1	5	0.63	5	100			(Fakurazi et al., 2008; Pari and Kumar, 2002)
Moringaceae				High B/P	Bark	Crushed	Drink	4	1	4	0.50	4	100	0.50		
Murraya koenigii (L.) Spreng.	*Baupata* (M)	AUS2574	0.35	Stomach Ache	Leaf	Decoction	Drink	6	1	6	0.76	6	100	0.76		(Chakraborty et al., 1965; Shah et al., 2008)
Rutaceae				Piles	Leaf	Crushed	Drink	1	1	1	0.12	1	100	0.12		
Myxopyrum smilacifolium (Wall.) Blume[a]	*Arcid* (B)	AUS2575	0.45	Fever	Leaf	Decoction	Drink	3	1	3	0.38	3	100	0.38		

Oleaceae				Body Pain	Leaf	Crushed	Rubbed	6	1	6	0.76	6	100	0.76	
Ocimum tenuiflorum L.	*Tulsi* (B, H)	AUS2576	0.90	Cough	Leaf	Decoction	Drink	5	4	18	2.29	7	38.8889	0.89	(Rahmatullah et al., 2009; Sambandan and Dhatchanamoorthy, 2012)
Lamiaceae				Sinus	Whole Plant	Decoction	Drink	7							
				Pneumonia	Leaf	Decoction	Drink	3							
				Fever	Leaf	Decoction	Drink	3							
Oroxylum indicum (L.) Kurz	*Nauka gas* (B)	AUS2577	0.85	Jaundice	Bark	Crushed	Rubbed	11	2	17	2.16	11	64.7059	1.39	(Warrier et al., 1995)
Bignoniaceae	*Thaukharung* (R)			Dysentery	Root Bark	Crushed	Rubbed	6							
Oxalis corniculata L. [a]	*Amrul* (B)	AUS2578	0.55	Catamenia	Leaf	Crushed	Pellet	4	1	4	0.50	4	100	0.50	
Oxalidaceae				Arthritis	Leaf	Crushed	Drink	7	1	7	0.89	7	100	0.89	
Paederia foetida L.	*Badhalipata* (B)	AUS2579	0.75	Indigestion	Leaf	Decoction	Drink	5	2	9	1.14	5	55.5556	0.63	(Chanda et al., 2013)
Rubiaceae				Menopausal pain	Leaf	Decoction	Drink	4							
				Body pain	Leaf	Crushed	Drink	3	1	3	0.38	3	100	0.38	
Pajanelia longifolia (Willd.) K.Schum.[a]	*Nauka* (B)	AUS2580	0.95	Jaundice	Bark	Crushed	Drink	13	1	13	1.65	13	100	1.65	
Bignoniaceae															
Pandanus foetidus Roxb.[a]	*Keyapata* (B)	AUS2581	0.65	Dysentery	Bark	Decoction	Drink	6	1	6	0.76	6	100	0.76	
Pandanaceae				Pox	Leaf	Crushed	Rubbed	9	1	13	1.65	9	69.2308	1.14	
				Allergy	Leaf	Crushed	Rubbed	4							

B=Bengali, T=Tripuri, C=Chakma, D=Debbarma, H=Halam, M=Manipuri, R=Reang, Ct=Citation for a particular recipe, Cm=Highest Citation for a recipe from a plant, %Ct=percentage of citation for a particular recipe, %Cm=percentage of highest Citation for a recipe from a plant, ISu=Index of Specialisation, RFC=Relative Frequency of Citation.

[a] Plants are yet to be studied pharmacologically or chemically.

high values of FIC also consists of ailments such as dysentery and diarrhoea, which are very common to the community. Endocrine System disorders scoring FIC value worth attention as only diabetes is included in this category. High value expressed in this category represents consensus among the informants (Andrade-Cetto and Heinrich, 2011) in the recipes and plants used for the treatment of diabetes.

L. glutinosa along with *P. longifolia* and *C. roseus* has shown high RFC as well as IS*u* value. High RFC value in *L. glutinosa* is due to its wide usage in gastric, dysentery and semen loss. Out of these three ailments, former two cases belonged to digestive and infection categories respectively with high FIC values. This relationship corroborated the higher consensus among the community about the use of this plant in these two categories. Use of this plant in semen loss (genitourinary infection) had lesser value as this ailment is not so common as compared to other two former cases. However, the value should not be reason for preclusion of this plant from genitourinary treatments, as similar use reports are also observed from neighbouring communities. Application of this plant for genitourinary infection was reported among Garo tribes in neighbouring country of Bangladesh (Hossan et al., 2010). Antioxidant properties of this plant collected from the state corroborated its various uses (Kshirsagar and Upadhyay, 2009).

Among those plants cited for diabetes, *C. roseus* has highest RFC value as well as IS*u* index. Practical knowledge about its efficacy in this ailment is encoded in Ayurvedic pharmacopeia. Fresh leaf juice of *C. roseus* has been recommended by Ayurvedic physicians for treatment of diabetes with beneficial action (Nammi et al., 2003). Pharmacological studies of this plant reported its capability of reducing blood glucose level (Banerjee and Basu, 1991; Kirtikar and Basu, 1933).

Species with high RFC values combined with high IS*u* reflect the culturally relevant plants with potential bioactive properties. Prioritisation of such plants for further pharmacological, toxicological and phytochemical analysis are important techniques for the ethnobotanical-directed drug discovery process (Valussi and Scirè, 2012). However, some plants having high IS*u* value such as *Carica papaya* have lower RFC values. It should be noted that the RFC is enumerated on the basis of whole plant without considering the different use types, while IS*u* is counted on the basis of disease or recipe type. There is specialisation among the traditional healers in treating particular ailments with their treatment methods and formulations unique from the remaining healers, as confided by the healers during the present study and also reported by other researchers (Majumdar and Datta, 2007; Sharma, 2010). Presence of such situation also contributed to differential expression of these indices. The majority of THPs, in the current study, confided that they were restricting their knowledge of plants from the public as well as from other healers for professional reasons. Even to the author, most of the healers were reluctant in sharing their knowledge openly in the first case. In most of the instances, knowledge is passed from one generation to the next orally. Transfer of knowledge outside the family could be possible only after paying a substantial amount. Such confidentiality ensures one's unique identity and importance in the local society (Majumdar and Datta, 2007). At the same time, maintaining secrecy is a means of preventing general public to use medicinal plants indiscriminately (Nadembega et al., 2011). While prioritising species from such situation, it needs to take into account such specialties of the healers, whatever, low the citation have as the potential target.

The major plant part used in North Tripura district against different disease categories were leaves. Similar types of observation were also made by Shil et al. (2014) in the state. It shows sharing and transmission of traditional knowledge among the communities within the same region. There are opinions that collection of leaves involved less effort and as such convenience is the major cause of preference of leaf to other parts of plants (Giday et al., 2009; Telefo

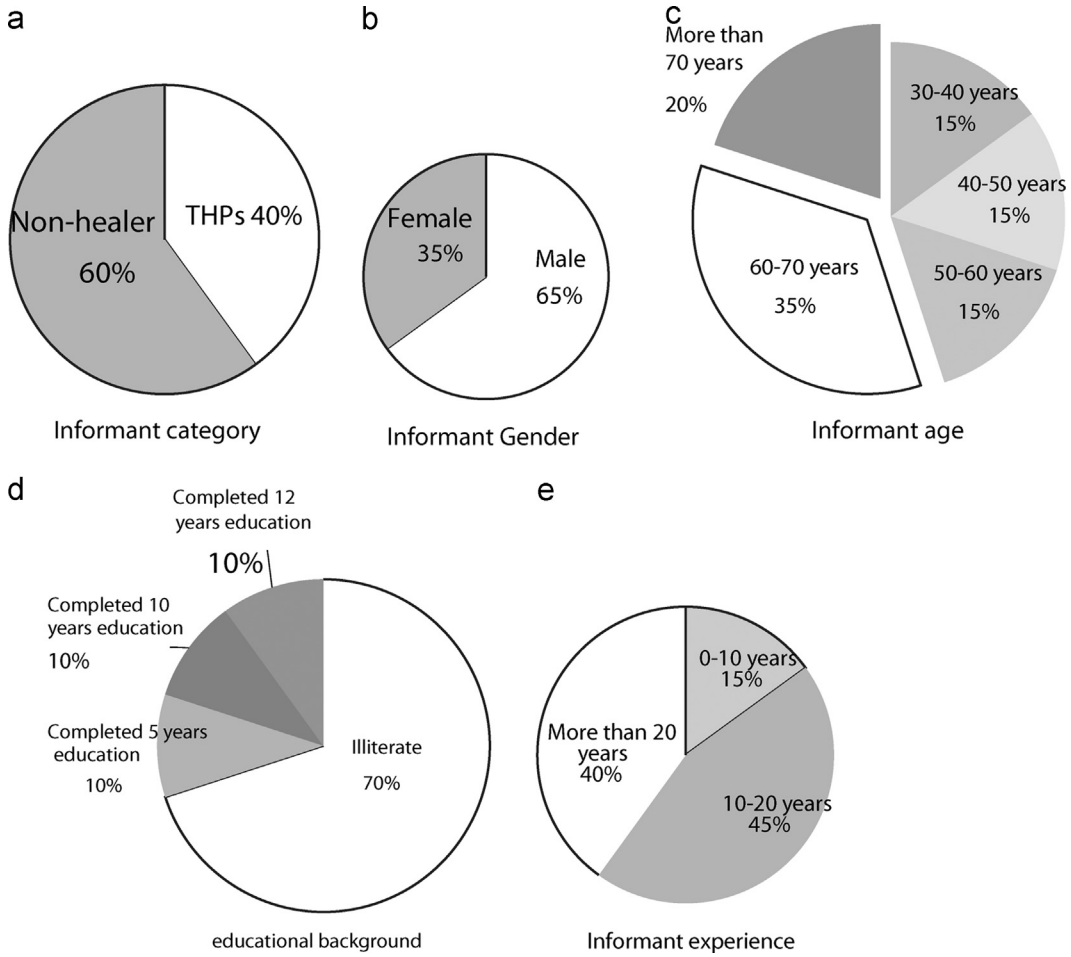

Fig. 2. Percentage distribution of informants category (a); informants gender (b); informants age (c); educational background of informants (d) and informants experience (e).

Table 2
Informant consensus factor for commonly used medicinal plants.

Disease Category	F_{IC}
Respiratory system disorder	0.85
Digestive system disorder	0.84
Endocrine system disorder	0.82
Infection	0.82
Poisoning	0.81
Injuries	0.80
Muscular skeletal disorder	0.78
Genitourinary system disorder	0.78
Mental disorder	0.76
Nervous System Disorders	0.75
Skin/Subcutaneous Cellular Tissue Disorders	0.75
Pain	0.69
Circulatory system disorder	0.69
Veterinary Diseases	0.50
Sensory System Disorders	0.50

et al., 2011). However, this argument might always not be true when traditional healer identified different role of plant parts with a particular disease, as observed in this field study. For instance, in *Alstonia scholaris*, use of bark for diarrhoea have the higher ISu as compared to use of leaves for bone fracture, while in *Jatropha gossypifolia* L., use of latex for teeth infection have more preference over use of leave for snake bites. Knowledge about difference in pharmacological action and concentration of bioactive compounds between different plant parts might be the reason for selectivity of plant parts by the traditional healers (Elisabetsky and Etkin, 2005). Selectivity of the plant parts depend on the nature and type of the disease. When different plant parts have the same effectiveness for a disease, leaves usually became the initial choice. Apart from convenience, healers usually choose leaves as major medicinal source as uprooting usually lead to death of the plant and they had to maintain their continuous supply (Poffenberger et al., 1992; Abebe and Ayehu, 1993; Martínez et al., 2000; Zheng and Xing, 2009; Rehecho et al., 2011). Consciousness for conservation of medicinal plants are there among the traditional healers are there, that can be observed as cultivation of formerly wild-plants in their home gardens (Etkin and Ticktin, 2005). During the field survey, the researchers observed cultivation of many such plants and even collected some plants not available in the wild from their home-gardens.

Preparation of medicine from the raw plant materials was one of the most important processes in herbal therapies. Preference of raw materials over other types of preparation were also observed in other parts of the state (Majumdar and Datta, 2007; Majumdar et al., 2006) and in neighbouring communities of Hmar, Assamese etc., in the state of Assam, (Nath and Choudhury, 2010).

During our survey, some THPs took interest in concept of supernatural power and their role in disease treatment, similar to observation of earlier studies in the state (Majumdar and Datta, 2007). As our study mainly focussed on the use and efficacies of the medicinal plants we have not incorporated par se purely spiritual therapies in the analysis. However, maintenance of strict rules and regulations in collecting and preparation of traditional

recipes have relevancy in the efficacies of these therapies. Collection of the plant at a specific time, the order of mixing of different plants or adjuvant during the concoction, the time of day at which preparations are made or the time of taking the dose might be influenced by how traditional people are giving special treatment for harvesting the associated bioactive compounds (Elisabetsky and Etkin, 2005).

During the survey, it was observed the people in the district are using same vernacular name for *P. longifolia* and *O. indicum.* Fruits of these two plants are similar to each other. Their usage pattern in jaundice was similar but differs in dysentery. Though similar usage pattern with common vernacular name might represent replacement and substitution therapy (Khare, 2004), the healers also acknowledged difference in pharmacological properties by not including *P. longifolia* in the treatment of dysentery.

During the survey, informants without modern education were observed to retain more traditional knowledge about the medicinal plants as compared to those informants with modern education system. It could be attributed to negligence of literate people towards traditional remedy and more proclivities towards modern treatment (Majumdar et al., 2006). Lack of attention among younger generation is one of the reasons for loss of valuable heritage regarding medicinal plant usage in many parts of the world (Kadir et al., 2012). In the existing scenario, ongoing acculturation process remains the major impediment in finding reliable information about restorative properties of medicinal plants. Counselling of traditional health practitioners should be taken into consideration in order to smooth continuation and extension of traditional medical knowledge. At the same time, it is important to integrate and provide awareness about potential toxicological properties of the medicinal recipes for ensuring safe and effective therapy.

Out of the total 75 collected species 49 species have been pharmacologically tested, 7 species studied chemically for isolation of active principles and 19 plants (marked with asterisk in table -1) are yet to be studied either pharmacologically or chemically. Intensive biochemical screening of these plants may provide important leads for treating associated ailments.

Interestingly, it has been observed that none of the plants collected during the present work falls under IUCN threat category. Therefore, the use of enumerated species in herbal formulations creates no ecological problem.

5. Conclusion

The present study could highlight important medicinal plants with their specified disease. Medicinal plants such as *L. glutinosa, P. longifolia, C. roseus, J. adhatoda* etc. are observed to have priority ranking for further experimentation. Healers are observed to acknowledge the differential pharmacological properties of medicinal plants with regard to different diseases, which may be helpful in further bioprospective programmes. Documentation and nurturing of traditional knowledge through various means are required to inculcate the higher value to traditional knowledge among younger generation might help in conserving slowly eroding traditional knowledge and medicinal plants.

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