

Ethnomedicinal Practices of the Lepcha Community in Ilam, East Nepal

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Abstract

Lepcha is an ethnic community living in Ilam and Jhapa districts of Nepal. An ethnobotanical survey was carried out on the utilization of plants by *Lepcha* communities in Phikal, Sri Antu and Samalbung VDCs of Ilam by interviewing traditional herbalists and various men and women in June and July 2015. The Indigenous knowledge of herbal medicine remains an integral part of the health care system among *Lepcha* community. 90 plant species were recorded for their uses for curing various ailments of 12 categories. The highest number of plants were used for gastrointestinal disorders and least number for dental problems and nervous disorders. In addition to medicinal use, the collected plant species were used for multiple purposes. These species, belonging to 53 families and 84 genera are listed in alphabetical order, each with common names, parts used, methods of preparation and route of administration. The ethnomedicinal knowledge on this community found to be endangered due to migration, habitat loss and globalization.

Keywords: Benefit sharing, Biodiversity, Endangered, Ethnobotany, Indigenous

Introduction

The use of plant resources as medicine is a part of traditional heritage and has long been practiced by indigenous population of both developed (Tomlinson & Akerele, 2015) and developing countries (Chaudhary, 1998; Luitel et al., 2014; Rokaya et al., 2010). Indigenous people living in certain locality have developed their own type of knowledge and experience on medication by using different kinds of plant species (Rai & Pokhrel, 2006). Plants contain a large number of pharmacologically active compounds, which can be directly used as healing agent or their phytochemicals serve as important compound for developing potential drugs to various ailments (Malla et al., 2015). It is a well-known fact that many modern medicines have been formulated from the herbal plants through an ethnobotanical approach (Cox & Balick, 1994). Thus, bioprospecting of traditional medicinal plants leads for discovery of new drugs to cure for many diseases (Rahmatullah et al., 2012). Therefore, it is quite important to explore and document ethnomedicinal knowledge of different indigenous communities, before it diminishes with the demise of knowledgeable persons, or biodiversity loss, and

socio economic transformation (Kunwar et al., 2016; Singh et al., 2012; Vandebroek & Balick, 2012).

Nepal is considered to be a treasure-trove of cultural plurality and globally significant biological diversity. Of the 59 communities officially recognized as indigenous people of Nepal, almost all live close with nature and depend on natural resource for their survival. These indigenous nationalities have classified into five major categories i.e. endangered, highly marginalized, marginalized, disadvantaged and advanced groups. One of the endangered ethnic groups is Lepcha living mostly in the hilly region of eastern Nepal (mainly in Ilam and Jhapa districts), in west Bengal of India (Sikkim, Darjeeling districts) and several villages of Samtse district of Bhutan (Pradhan & Badola, 2008). They speak Tibeto-Burman language with their origins in a legendary kingdom on the foothills of Mount Kanchanjunga (Roy et al., 2004). They were nomadic and their annual routine for subsistence activities can be divided into four parts viz. the collection of roots, tubers, and fruits (for three months), fishing (for three months), hunting (for three months) and a primitive shifting cultivation (for three months). Since later phase of last century, they involved in terrace farming

and adopted the system of cash crop plantation like cardamom, ginger and tea. Their main religion is Buddhism.

In Nepal, the population of Lepcha declined from 4826 in 1991 to 3445 in 2011 (CBS, 2003; 2013). This is only 0.01 percent out of total population of Nepal. Their main occupation is agriculture and very few people are involved in driving, business, teaching and foreign employment. As Lepcha people live in places with less modern facilities, they are adapted to survive in difficult conditions. This is the main reason to have good experimental knowledge for the ethnomedicinal use of plants in this community. However, the Lepcha healer, locally called *bongthing* (*Guruwa*)/*mun-bongthing* (*Bijuwa/Jhakri*), is known to restrict his medicinal practices and prescriptions only within their community and does not share their knowledge in detail with outsiders. This non-sharing attitude must have been one of the strongest reasons for the decline of indigenous knowledge of ethnomedicine (Pradhan & Badola, 2008).

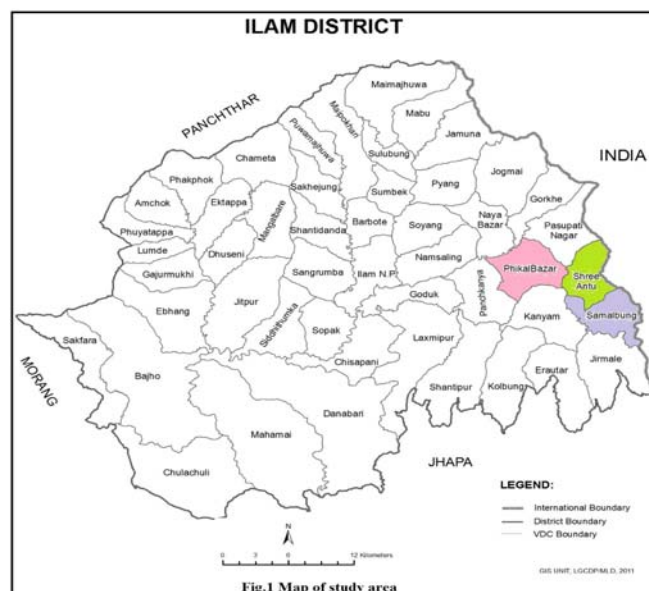
There are many studies related to medicinal plants and associated indigenous knowledge in Nepal (Baral & Kurmi, 2006; Manandhar, 1993; Rajbhandari, 2001) but these studies have not emphasized ethnic groups including Lepcha communities. Till the date, there are only two studies related to Lepcha communities in Nepal (Roy et al., 2004; Tamang & Singh, 2014) and few for India (Kumar et al., 2012; Pal & Palit, 2011; Palit & Banerjee, 2016; Pradhan & Badola, 2008). In Nepal, Roy et al. (2004) studied most aspect of Lepcha community while Tamang & Singh (2014) focused on the uses of both animals and plants. Thus, the present study enlists the medicinal plants used by least studied Lepcha community in Ilam district of Nepal. The study focused on the use of plants to cure various human ailments including veterinary uses.

Materials and Methods

Study area

Ilam is a hilly district situated in the eastern region of Nepal in Mechi Zone. Spatially it is located

between latitudes 26° 40' N - 27° 08' N and longitudes 87° 40' E - 88° 10' E with area of 1,703 sq. km. The district stretches from lower belt of terai and chure to the upper hilly belt of the Himalayan region with altitude ranging from 140 m to 3636 m above sea level. The average annual temperature is 20.5°C and the average annual rainfall is 2500 mm. The tropical to alpine vegetation is found in the district with forest coverage of about 47 percent (DDC, 2015). The 2011 census counted 64,502 households with 290,254 people living in Ilam (CBS, 2013).



This study has been conducted for the study of traditional knowledge on plants by Lepcha community in the Phikal (Now Suryodaya municipality), Sri Antu and Samalbung VDCs of Ilam districts (Figure 1). The total population of Lepcha in these VDCs is 815. In Ilam, Lepcha reside in 15 VDCs with total population of 2819. Along with Lepcha community, different other ethnic/caste groups like Rai, Chhetri, Brahman, Newars, Tamang, Limbu, Sunuwar, Hyolmo etc. also live there (CBS, 2014).

Plant collection, identification and ethnobotanical information collection

Prior to documentation of ethnobotanical information, different areas were visited to collect plant specimens. The plant specimens were photographed, pressed in between newspapers and dried in the field using a natural drying technique in

sunlight (Forman & Bridson, 1989). Scientific names were determined by using different books (Baral & Kurmi, 2006; Lama et al., 2001; Manandhar, 2002; Polunin & Stainton, 1984; Shrestha, 1998; Stainton, 1988). The nomenclature of Press et al. (2000) was followed. Voucher specimens were deposited at the herbarium of District Plant Resources Office, Ilam. The details of all the specimens collected is published as Plants of Ilam (Bhattarai, 2016).

The ethnobotanical data was collected in June and July 2015. 73 men, 12 women and five traditional healers were interviewed by showing the herbarium specimen collected prior to the interview. The age of the people involved in our interview ranged from around 20 to 70 years. During the interview, we collected the information on vernacular names of the plant, parts used, method of preparation and administration process. Due to devaluation of the occupation of traditional herbal practitioner by new generations, the modern development projects and migration Lepcha community seriously face the degradation of their language, culture and tradition.

Results and Discussion

Plant diversity and uses

In total, there were 90 plant species belonging to 83 genera and 53 families were recorded (Table 1). The

recorded plant species comprised of angiosperms (67 dicots and 18 monocots), gymnosperm (n=1) and some Pteridophytes (n=4). According to the study, the most dominant family was Zingiberaceae (n=6). Herbs were dominant species (n=40), followed by trees (n=26), climbers (n=15) and shrubs (n=10). Similar findings were reported in the study of Lepcha in North Sikkim India (Pradhan & Badola, 2008), where Zingiberaceae was the most dominant family and herbs were the primary source of medicine. The number of plant species in this study was higher than previous studies (Roy et al., 2004; Tamang & Singh, 2014) in Nepal but less than the study in India (Pradhan & Badola, 2008).

Apart from the plants being used in medicine in human beings some of the species had multiple uses. There were seven plant species as condiment or spices (*Amomum aromaticum*, *Cinnamomum tamala*, *Heracleum nepalense*, *Lindera neesiana*, *Piper longum*, *Zanthoxylum oxyphyllum* and *Zingiber officinale*), seven as food/vegetables (*Angiopteris evecta*, *Asparagus racemosus*, *Dioscorea deltoidea*, *Musa paradisiaca*, *Psidium guajava*, *Sechium edule* and *Utrica ardens*), five species used for cultural and religious purposes (*Bambusa nutans*, *Euphorbia royleana*, *Mentha arvensis*, *Thysanolaena maxima*, *Oroxylum indicum*), one as dye yielding species (*Rubia*

Table 2: Ailment categories

S.N.	Ailment categories	Ailments
1	Gastro-intestinal disorders	Food poison, indigestion , diarrhoea, dysentery, cholera, gastritis, nausea, vomiting, stomach disorder
2	ENT problems and ophthalmological uses	Cough, cold, sinusitis, throat pain, diphtheria, tonsillitis, ear-ache, opacity in cornea
3	Hepato-Circulatory disorders	Diabetes, high blood pressure, jaundice, Malaria
4	Fever and headache	Fever, headache and dizziness
5	Skeleto-muscular problems	Body ache, swelling, sprain, fracture, joint pain, rheumatism
6	Dermatological disorders	Scabies, skin diseases, burns, boils, infection of caterpillar hairs, measles, cracks on skin
7	Cut and wounds	Cut, wounds, control haemorrhage, internal blood clot due to accident, swelling-nag lageko
8	Respiratory disorders	Asthma, Pneumonia, dry-cough
9	Genito-urinary problems	Dysuria, bed-wetting, post-partum recovery, syphilis, cancer
10	Dental problems	Tooth ache, pyorrhea
11	Nervous disorders	Rabies, memory loss, epilepsy
12	Veterinary uses	Diphtheria, foot and mouth disease, cut and wound, dysuria, increase lactation, stomach problem, cholera, dysuria, increase weight, bird flu, sprain

manjith) and one used to make broom (*Thysanolaena maxima*). In addition to this, nine species (*Alstonia scholaris*, *Angiopteris evecta*, *Asparagus racemosus* var. *subacerosus*, *Euodia fraxinifolia*, *Lindera neesiana*, *Prunus persica*, *Rhaphidophora decursiva*, *Tinospora sinensis* and *Urtica ardens*) were used against cattle and one species against chicken (*Stephania glandulifera*) (Table 1).

Based on information collected from the informants, all the human ailments were grouped into 12 categories viz. cut and wounds; dental problems; dermatological disorders; ear, nose, throat (ENT) and ophthalmological problems; fever and headache; gastro-intestinal disorders; genito-urinary problems; hepato-circulatory disorders; nervous disorders; respiratory disorders; skeleto-muscular problems; and veterinary uses (Rokaya et al., 2010) (Table 2).

Parts used

The different parts such as whole plant, leaves, flowers, fruits, roots, bark, latex/sap, rhizome, tuber, bulb etc. were used as medicines. As per plant part used by Lepcha community, the maximum number of species are harvested for root and rhizome (n=35), leaves and young shoot (n=30), followed by fruit (n=10), bark (n=8), whole plant (n=7), seed (n=6), stem (n=6), sap/latex (n=4), inflorescence/flower (n=4) and oil (n=2). Similar findings were reported in India (Pradhan & Badola, 2008) where maximum number of species were harvested for root and tuber. The preference for roots and rhizomes to prepare traditional remedies follows the scientific basis that roots generally contain high concentrations of bioactive compounds (Upreti et al., 2016).

Preparation and administration

The different parts of plants such as whole plant, leaves, flowers, fruits, roots, bark, latex, rhizome, tuber, bulb etc. were used as medicines and other purposes. Usually the different parts of plants were made into juice (n=32), paste (n=27), decoction (n=18), powder (n=7), scent/smoke (n=5), cooked and used as curry (n=5) and infusion (n=3) to treat various ailments. Analysis of species level data

discovered the oral (66%), external application (30%), and inhalation (4%) as major administration route of ethnomedicine used. Preparation and administration depends on the type of ailments. Gastro-intestinal problems, hepato-circulatory disorders, cough, cold and fever were treated by oral administration of medicine whereas dermatological problems, cut, wounds and boils were treated by application.

Day of medicinal plant collection

Lepcha people, as well as Thami and other communities in Ilam collect medicinal plants on Tuesday and Saturday only. There is a special occasion of collection of medicinal plant on the first Tuesday after Teej (a Hindu festival), known as *harelo* which generally falls in the month of August-September. It is believed that the plants collected on this day have good effects on the medicine. On this day, traditional healers, *mun-bongthings* and *bongthings* go to collect medicinal plants on high altitude region where there is rich in high value medicinal plants.

Indigenous knowledge on medicinal plants for treatment process of various ailments

Medicinal plants knowledge has been identified as particularly vulnerable to loss worldwide due to increasing dependency towards modern medicine, devaluation of the occupation of traditional herbal practitioner by younger generations, migration, lack of cultural support and push by some governmental programs to modernized medical practices (Vandebroek & Balaick, 2012). Present study documented the use of plants on various ailments grouped into 12 categories, which were as follows:

- 1. Cut and wounds:** In the present study, leaf juice of *Ageratum conyzoides* or *Eupatorium adenophorum* reported to be used most frequently in cut and wounds to control bleeding (Pradhan & Badola, 2008). Rhizome paste of *Kaempferia rotunda* is warmed and used to treat internal blood clot in muscles caused by hit or accident (Pradhan & Badola, 2008; Roy et al., 2004). To remove worms from old wound especially of cattle, leaf

juice of *Prunus persica* was used (Limbu and Rai, 2013; Manandhar, 1993).

2. **Dental problems:** It was reported that chewing the juice from the rhizome of *Acorus calamus* help to relieve toothache. The bark powder of *Betula alnoides* help to strengthen teeth and control pyorrhea (Yonzon et al., 2011). There is a traditional belief that toothache is due to worms and if the smoke of seed of *Datura metel* is allowed to enter in mouth without inhaling, it removes out worms from teeth. Some people use latex of *Euphorbia royleana* on affected teeth to relieve from pain.
3. **Dermatological disorders:** In burn, leaf pulp of *Aloe vera* was applied. This is the most common practice not only among Lepcha but also in other communities (Parajuli, 2012; Rai, 2003; Rai et al., 2013; Tamang & Sedai, 2016). The bark paste of *Alstonia scholaris* or seed oil of *Pyrularia edulis* was reported to cure scabies. Leaf juice of *Artemisia indica*, *Azadirachta indica*, *Mentha arvensis*, and *Plumbago zeylanica* etc. was used to treat skin infections. Root juice of *Datura suaveolens* was used to treat infection of caterpillar hair. The corm paste of *Gonatanthus pumilus* or root paste of *Thysanolenia maxima* was applied around boils to opens it faster (Limbu & Rai, 2013). The root paste of *Thysanolenia maxima* was also applied on affected parts to take out thorns inserted in the hand or foot. In measles fruit paste of *Elaeocarpus sphaericus* and *Terminalia bellirica* was applied. Bark of *Schima wallichii* was rubbed on cracks of legs to heal it.
4. **Ear, nose, throat (ENT) and ophthalmological problems:** In ear-ache, sap of *Musa paradisiacal* was put inside the infected ear. The seed oil of *Pyrularia edulis* or *Ricinus communis* was also reported in the study. In cough, cold, sinusitis, pneumonia, sore throat etc. scent or vapour from steamed leaf of *Drymaria cordata* was inhaled (Bhattarai & Khadka, 2017; Pradhan & Badola, 2008; Roy et al., 2004). *Hemiphragma heterophyllum* are eaten for sore throat said to be highly effective. Root juice of *Acacia pennata* or *Achyranthes aspera* help to cure cough, cold and

pneumonia. To remove opaqueness of cornea of eye, stem sap of *Chilocostus speciosus* or leaf juice of *Colebrookea oppositifolia* was used. The use of *Colebrookea oppositifolia* in ophthalmic problems was also reported in Limbu community in east Nepal (Limbu & Rai, 2013).

5. **Fever and headache:** The decoction of *Swertia chirayita* was the most commonly used medicine for fever and headache (Pradhan & Badola, 2008; Roy et al., 2004). Similarly various parts of *Achyranthes aspera*, *Aconitum spicatum*, *Centella asiatica*, *Euodia fraxinifolia*, *Ocimum tenuiflorum*, *Zingiber cassumunar* etc. were also reported to use in fever and headache.
6. **Gastro-intestinal disorders:** A maximum variety of plants and their parts were used against gastro-intestinal disorders. Similar findings were reported in India (Pradhan & Badola, 2008; Yonzon et al., 2011) as well as in Nepal (Bhattarai & Khadka, 2017; Limbu & Rai, 2013; Malla et al., 2015; Rokaya et al., 2010). The tuberous root of *Aconitum ferox* was used against food poisoning, often called *nas kapat* or *harital* in local language (Bantawa and Rai, 2009). Fresh rhizome juice of *Tectaria cicutaria* is eaten to control diarrhoea and dysentery (Roy et al., 2004). Bark juice of *Psidium guajava* (Oli et al., 2005; Pradhan & Badola, 2008; Roy et al., 2004), root juice of *Bergenia ciliata*, *Euodia fraxinifolia*, *Justicia adhatoda*, *Rubus ellipticus* or honey like latex on seed of *Cassia fistula* was used against diarrhoea, dysentery and other stomach problems. In gastritis, *Phyllanthus emblica*, *Stephania glandulifera*, *Terminalia bellirica*, *Lindera neesiana*, *Zanthoxylum oxyphyllum* etc were used (Oli et al., 2005).
7. **Genito-urinary problems:** *Cassia fistula* was used against dysuria (difficult in urination). Stem juice of *Tinospora sinensis* or *Chilocostus speciosus* was used against burning urination and syphilis which was also reported in Lepcha community in India (Pradhan & Badola, 2008). Root decoction of *Astilbe rivularis* was used for postpartum recovery. In Darjeeling, it is reported to be used in irregular menstrual cycle (Bantawa

& Rai, 2009). Eating the leaf decoction of *Taxus wallichiana* regularly helps to cure old wounds and cancer of breast and ovaries.

8. Hepato-circulatory disorders: In diabetes root tuber of *Aconitum ferox* or bark decoction of *Oroxylum indicum* or infusion of *Swertia chirayita* was eaten. In jaundice stem juice of *Cuscuta reflexa* (Limbu & Rai, 2013; Sharma et al., 2014) or root bulb of *Nephrolepis cordifolia* (Roy et al., 2004) or infusion of the fruit fiber of *Momordica dioica* (Pradhan & Badola, 2008) was eaten. In high blood pressure, curry of *Urtica ardens* was said to be effective (Limbu & Rai, 2013). Commonly, decoction of *Swertia chirayita* was eaten in fever and malaria.

9. Nervous disorders: In rabies, bark of *Betula alnoides* or small quantity of seed of *Datura metal* was eaten, which was also reported in Lepcha community of North Sikkim, India (Pal & Palit, 2011; Pradhan & Badola, 2008). For memory power improvement 3-4 leaves of *Centella asiatica* were eaten daily (Rai et al., 2013). For epilepsy, root juice of *Mimosa pudica* was eaten. Instead, it was reported to use in treatment of Piles in Lepcha of India (Pal & Palit, 2011; Pradhan & Badola, 2008).

10. Respiratory disorders: In asthma, root or leaf piece of *Piper longum* was eaten, which was also reported in Lepcha community of North Sikkim (Pal & Palit, 2011). Root juice of *Acacia pennata* and *Achyranthes aspera* or plant juice of *Centella asiatica*, *Drymaria cordata*, *Ocimum tenuiflorum* was eaten against pneumonia. The use of *Drymaria cordata* against pneumonia was also reported in eastern Nepal (Limbu & Rai, 2013).

11. Skeleto-muscular problems: Stem decoction of *Acacia catechu*, Root juice of *Achyranthes aspera*, stem curry of *Asparagus racemosus*, root powder of *Astilbe rivularis* (Bantawa & Rai, 2009), root decoction of *Potentilla fulgens* were eaten to treat body ache. Rhizome paste of *Kaempferia rotunda*, Leaf paste of *Calotropis gigantea*, plant paste of *Cissus quadrangularis*, *Plumbago zeylanica*, *Urtica dioica*, *Viscum*

album, root paste of *Uncaria sessilifructus*, bark paste of *Persea odoratissima* were reported to be applied on sprain and fracture (Pal & Palit, 2011; Pradhan & Badola, 2008; Roy et al., 2004). Steam bath of *Vitex negundo* was informed to cure body swelling and rheumatism which was also reported in eastern Nepal (Oli et al., 2005) and north-east India (Sharma et al., 2014).

12. Veterinary uses: Bark paste of *Alstonia scholaris* given to eat cattle, especially pigs to make them fat. *Angiopteris evecta* was used to treat foot and mouth disease of cattle, tuber of *Asparagus racemosus* was used to promote lactation in cattle. The paste of tuber of *Dioscorea deltoidea* (Bhyakur) was used to treat diphtheria (Bhyagute disease) of cows. Similar findings and method of application to treat diphtheria was previously reported in the same community in Nepal by Roy et al. (2004). Root paste of *Euodia fraxinifolia*, fruits of *Lindera neesiana* (Pradhan & Badola, 2008), stem of *Tinospora sinensis* were used to treat diarrhoea in cattle. Leaf paste of *Prunus persica* is applied to take out worms (*aunsa*) from the old wound of cattle, which was already reported in other communities of Nepal (Limbu & Rai, 2013; Manandhar, 1993). Stem sap of *Rhaphidophora decursiva* was also used to treat dysuria in cattle. Tuber of *Stephania glandulifera* was used to make water-pot for hens to prevent various diseases including flu. *Urtica dioica* was used to treat fracture which was also reported in India (Pradhan & Badola, 2008) along with other different uses.

In the present study, most of the documented medicinal plants being used to treat multiple ailments. Gastro-intestinal disorders; cough, cold and sore throat; fever and headache; skeleto-muscular disorders; dermatological infections; injuries; respiratory disorders were treated with the highest diversity of medicinal plant species (Figure 2). The high diversity of species used in gastro-intestinal disorders could be due to poor sanitation and drinking water quality in the study sites as in the settlements of many developing countries (Rokaya et al., 2014).

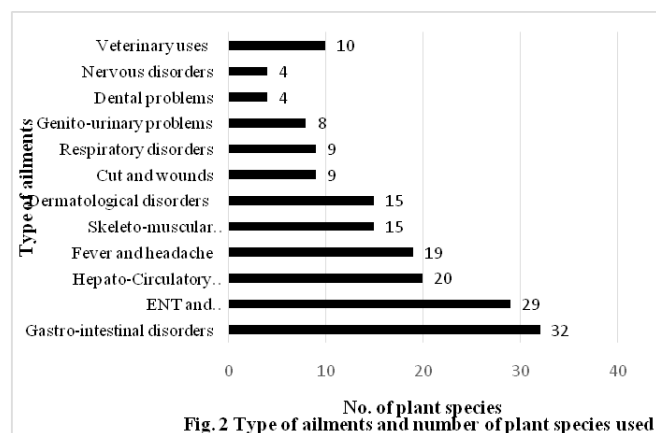


Fig. 2 Type of ailments and number of plant species used

In this study it was noticed that the traditional knowledge on medicinal plants were depleting on younger generation. Most of the informants even not known the name of plants in their own language. Similarly, the older generation hardly shared their knowledge on medicinal use (Tamang & Singh, 2014). Hence, the ethnomedicinal knowledge on this endangered community found to be becoming endangered.

Conclusion

The Lepcha community of the study area had a sound ethnobotanical knowledge for the treatment of various ailments of both human and cattle. This useful knowledge should be further researched and tested scientifically. It is necessary to prepare data of ethnomedicinally important plant and carry out further studies including phytochemical and pharmacological analysis. It is a fact that many modern medicines were formulated from the herbal plants through an ethnobotanical approach. So Department of Plant Resources (DPR) should investigate in verification of the phytochemical content, formulation of modern medicine, establishment of patent rights over their knowledge and benefit sharing to this community. Further, highly potential medicinal plants must be grown commercially and adopted in traditional agro-forestry systems. This will reduce pressure on these species in their natural environments while providing economic benefits to poor and marginalized community.

The erosion of cultural knowledge and traditions as a result of globalization and migration is a commonly

reported phenomenon. The inclination of younger generation towards modern medicine, lack of awareness, modernization and non-sharing attitude of knowledge on medicinal plants by older generation created a great threat to its existence. So, there must have a policy to support this community for preservation of their indigenous knowledge. This knowledge is their natural asset that has to be handed over to the new generation to prevent further degradation for their welfare.

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Table 1: List of ethnomedicinal plant species and their uses in Lepcha community, Ilam

S.N.	Scientific name	Family	Nepali name	Lepcha name	Parts used	Uses	Mode of use	Plant category; Voucher number
1	<i>Acacia catechu</i> (L. f.) Willd.	Fabaceae	Khayer	-	Stem	Body ache	Decoction is taken orally.	Di, T; TKL-039
2	<i>Acacia pennata</i> (L.) Willd.	Fabaceae	Arari	-	Root	Cough-cold, pneumonia	Small piece of root is taken orally.	Di, Sh; TKL-079
3	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apamarga	Muktek	Root	Fever, pneumonia, body ache, rheumatism	Juice is taken orally.	Di, H; TKL-049
4	<i>Aconitum ferox</i> Wall. ex Ser.	Ranunculaceae	Seto bikhma	Nyni	Tuber	Diabetes, food poison, stomach problem	Decoction is taken orally	Di, H; TKL-061
5	<i>Aconitum spicatum</i> (Bruhl) Stapf	Ranunculaceae	Bish	-	Tuber	Stomach problem, fever	Small amount of root paste is taken orally.	Di, H; TKL-078
6	<i>Acorus calamus</i> L.	Acoraceae	Bojho	Roklop	Rhizome	Diarrhoea, cholera, toothache, gastritis, Cough	Juice is taken orally or small piece of rhizome is kept in mouth and suck its juice.	Mo, H; TKL-011
7	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Sitalu(Bel)	-	Root, fruit	Cough-cold, fever, pneumonia, gastritis	Root decoction is taken orally for cough, cold and gastritis. For pneumonia, fruit paste or pulp is taken orally.	Di, T; TKL-015
8	<i>Ageratum conyzoides</i> L.	Asteraceae	Gandhe	-	Leaf	Cut and wounds	Juice is applied externally on the affected parts.	Mo, H; TKL-080
9	<i>Aloe vera</i> (L.) Burm. f.	Asphodelaceae	Ghiu kumari	-	Leaf pulp	Gastritis, burn	Pulp of leaf is taken orally against gastritis and in case of burns applied on affected part.	Mo, H; TKL-016
10	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Chhatium	-	Bark	Tonic, scabies, skin diseases	Bark paste is applied for skin diseases in human. Bark paste mixed with flour is given to eat cattle as tonic to increase weight, wood is used to make <i>madal</i> (a typical Nepali musical instrument).	Di, T; TKL-063
11	<i>Anomum aromaticum</i> Roxb.	Zingiberaceae	Alainchi	Tombhrab	Seed	Gastritis, indigestion	Dried seeds are taken orally. Fresh seeds are not taken as it causes cough and cold. Sometimes seeds are used as condiment.	Mo, H; TKL-053
12	<i>Angiopteris evecta</i> (G. Frost.) Hoffm.	Marattiaceae	Gaikhure uneu	Bigtagrab	Shoot, rhizome	Vegetable, make <i>jad</i> (alcoholic drink), foot and mouth disease of cattle.	Young shoots are cooked and used as vegetable. Rhizome paste is used in foot and mouth disease for cattle. Rhizome is cut into pieces and rinsed in running water to remove poison, dried, powdered and the powder is used to make <i>jad</i> (fermented alcohol).	Pt, Sh.; TKL-066
13	<i>Artemisia indica</i> Willd.	Asteraceae	Titepati	Taknel	Young shoot, leaf	Vomiting, dizziness, high blood pressure, headache, skin diseases	Rubbed on forehead to relieve headache. In case of skin disease, juice is applied on infected areas. For other diseases plant parts are eaten or scent is inhaled.	Di, H; TKL-024
14	<i>Asparagus racemosus</i> var. <i>subacerosus</i> Baker	Asparagaceae	Kurilo	-	Root (Tuber), Stem (shoot)	Body ache, better lactation in cattle and women.	Stem is used as curry or root powder is taken orally. Tubers are cooked and given to cattle to promote lactation.	Mo, H; TKL-010
15	<i>Astilbe rivularis</i> Buch.-Ham. ex D. Don	Saxifragaceae	Budho okhati	-	Root	It is tonic, used in body ache, sprain and post-partum recovery.	Decoction or powder is taken orally.	Di, H; TKL-003
16	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Nem	-	Leaf, stem	Fever, high blood pressure, cough-cold, skin diseases	Leaves decoction is taken orally. For skin diseases, paste is externally applied.	Di, T; TKL-062
17	<i>Bambusa mutans</i> subsp. <i>cupulata</i> Stapleton	Poaceae	Mal Bans	Po	Water inside the hollow stem (sap)	Bed-wetting	Water found inside the hollow stem is taken orally against bed-wetting. It is religious plant and said that Lepcha and <i>Bamboo</i> originated at the same time together. So, in different cultural ceremonies bamboo is used.	Mo, H; TKL-065
18	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Pakhen ved	Senthok	Root	Cut and wound, stomach problems	Paste is applied in cut and wounds while juice is eaten in stomach problems.	Di, H; TKL-036

19	<i>Betula alnoides</i> Buch.-Ham. ex D. Don	Betulaceae	Saur	-	Bark	Tooth ache, pyorrhoea, rabies	Powder is used as tooth paste. Bark is chewed against mad dog bite to avoid rabies.	Di, T; TKL-017
20	<i>Calotropis gigantea</i> (L.) Dryand.	Asclepiadaceae	Aank	-	Leaf	Sprain	Leaves lightly crushed, warmed on fire and kept on sprain parts of the body.	Di, Sh; TKL-006
21	<i>Cassia fistula</i> L.	Fabaceae	Rajbirkchha	-	Fruit, seed	Stomach problems (diarrhoea, cholera), difficult in urination (dysuria)	Seed paste or sweet honey like latex in fruit is taken orally.	Di, T; TKL-038
22	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Ghodtapre	-	Whole plant	Fever, cough-cold, sinusitis, pneumonia, tonic for memory power improvement	The whole plant mixed with <i>Drymaria cordata</i> is crushed and juice is taken orally. In sinusitis leaf is boiled and scent is inhaled. For memory power improvement 3-4 fresh leaves are eaten daily.	Mo, H; TKL-048
23	<i>Chilocostus speciosus</i> (J. Konig) C. Specht	Costaceae	Bedlauri	-	Stem sap	Opacity in cornea of eye, burning urination, syphilis	1-2 drops of stem sap is put in infected eye. About 30 ml. of sap is eaten in urinary problem.	Mo, H; TKL-081
24	<i>Cinnamomum tamala</i> (Buch.-Ham.) Nees & Eberm.	Lauraceae	Tej pat, sinkauli	Naksor	Bark and leaf	Condiments, diabetes	In syphilis, juice is applied on infected areas. Bark decoction is used in diabetes; bark and leaves are also used as condiments.	Di, T; TKL-070
25	<i>Cissus quadrangularis</i> L.	Vitaceae	Hadjor	-	Whole plant	Cut and wounds, fracture	Paste of whole plant is applied as well as eaten.	Di, Cl; TKL-046
26	<i>Cleistanthus operculatus</i> (Roxb.) Merr. & Perry	Myrtaceae	Kyamunaa	-	Bark	Cholera, diarrhoea, dysentery	Juice is taken orally along with the root Juice of <i>Psidium guajava</i> (ambak) and <i>Tectaria cicutaria</i> (Kali Neguro)	Di, T; TKL-073
27	<i>Colebrookea oppositifolia</i> Sm.	Lamiaceae	Dhusure	-	Leaf	Remove opacity in cornea of eye	Leaf juice is kept on clean clothes, warmed with the help of exhaling air from mouth and kept covering the eye.	Di, T; TKL-082
28	<i>Cucumis sativus</i> L.	Cucurbitaceae	Kankro	-	Seed	Malaria, pneumonia	Seeds are eaten raw.	Di, Cl; TKL-084
29	<i>Curcuma caesia</i> Roxb.	Zingiberaceae	Kalo haledo	Gesing nab	Rhizome	Cough-cold	Decoction is taken orally.	Mo, H; TKL-069
30	<i>Curcuma longa</i> L.	Zingiberaceae	Besar, haledo	Gesing pyber	Rhizome	Cough-cold, cholera	Decoction with Zingiber officinale and Zanthoxylum armatum is taken orally in cough and cold; powder is taken orally and rubbed on head and belly in cholera. Used as condiment.	Mo, H; TKL-052
31	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Akash beli, binajari	Lorik	Stem	Jaundice, stomach problems, wound, fracture	Stem juice is taken orally for jaundice and stomach problems. Paste is applied on factured parts and wound.	Di, Cl; TKL-071
32	<i>Cyathea spinulosa</i> Wall. ex Hook.	Cyatheaceae	Rukh uneu	-	Stump (stem)	Burning urination, wound and swelling (nag lageko).	Water kept in stump hole is taken orally for a week to solve urinary problems. Stem paste is applied on wound and swelling. Old stumps are used for making pillars of house.	Pt, T; TKL-066
33	<i>Datura metel</i> L.	Solanaceae	Dhaturo	Khujurip	Seed	Tooth ache, used against rabies, remove evil spirit.	Seeds are burnt and smoke is allowed to enter in mouth for half an hour without inhaling. The saliva collected is spit out removing worms from teeth. To avoid rabies after mad dog bite, few seeds are eaten raw. It is also used as 'buti' to cure various ailments and to remove evil spirits from body in children.	Di, Sh; TKL-029
34	<i>Datura suaveolens</i> Humb. & Bonpl. ex Willd.	Solanaceae	Dhokre phool	-	Root	Against infection of caterpillar hairs.	Juice is applied on infected portion to remove hairs of caterpillar (dhokre kira, takyong).	Di, Sh; TKL-083
35	<i>Dioscorea deltoidea</i> Wall. ex Griseb.	Dioscoreaceae	Vyakur	Kasak	Rhizome, bulb	Fever, sore throat, tonsillitis, diphtheria in cattle.	Crushed and eaten raw; and also rubbed on throat in tonsillitis and sore throat. In diphtheria, the paste of the tuber is administered onto the cattle tongue. Before it, the tongue is cleaned by	Di, Cl; TKL-032

36	<i>Drymaria cordata</i> (L.) Willd. ex Roem. & Schult.	Caryophyllaceae	Abhijalo	Tamjungyo	Leaf	Sore throat, cough-cold, sinusitis, fever, pneumonia, diarrhoea,	rubbing with the maize cob. Used as vegetable. Wrapping in banana-leaves, the leaves of <i>Drymaria</i> is steamed and scent is inhaled to cure cough, cold, sinusitis, pneumonia. Leaf juice is taken orally in sore throat, fever and diarrhoea	Di, H; TKL-007
37	<i>Elaeocarpus sphaericus</i> (Gaertn.) K. Schum.	Elaeocarpaceae	Rudrakchhya	Rakshya	Fruit	Measles, cholera	Fruit paste is eaten orally for cholera and applied on skin for measles.	Di, T; TKL-030
38	<i>Euodia fraxinifolia</i> (D. Don) Hook. f.	Rutaceae	Khanukpa	Kuneu	Root	Cough-cold, fever, cholera both in human and cattle	Roots juice/paste is taken orally. For cattle root paste is mixed with flour and given to promote digestion	Di, T; TKL-059
39	<i>Eupatorium adenophorum</i> Spreng.	Asteraceae	Bannara, kalijhar	Muknab	Young shoot and leaf	Control haemorrhage in cut and wound	Young shoot and leaves are rubbed, squeezed and the juice is applied in affected parts.	Di, H; TKL-026
40	<i>Euphorbia royleana</i> Boiss.	Euphorbiaceae	Sunde	-	Leaf, latex	Fire burn, toothache, headache	Use latex on burnt area. In case of headache leaves are warmed in fire and tied on head for an hour to relieve headache. Latex is applied on tooth to relieve toothache. Wood is light and used to make <i>madal</i> (A typical Nepali musical instrument).	Di, T; TKL-014
41	<i>Gonatanthus pumilus</i> (D. Don) Engler & Krause	Araceae	Ekle mane, Dhunge mane	-	corm	Boils, against infection of caterpillar hairs.	Paste is applied on infected areas.	Mo, H; TKL-085
42	<i>Hemiphysalis heterophyllum</i> Wall.	Scrophulariaceae	Lal gedi	-	Fruit	Sore throat, fever	Fruit is eaten raw.	Di, H; TKL-088
43	<i>Heracleum nepalense</i> D. Don	Apiaceae	Chimphing	Simben	Seed	Cholera, diarrhoea, vomiting, nausea	Paste is taken orally and also applied in belly, hands and legs. Used as condiment.	Di, H; TKL-021
44	<i>Justicia adhatoda</i> L.	Acanthaceae	Asuro	-	Root, leaf, flower	High blood pressure, headache, diarrhoea and stomach problems, cough	Decoction of flower is taken in high blood pressure and headache; Decoction of root is taken in stomach problems and Decoction of leaf is taken in cough.	Di, Sh; TKL-060
45	<i>Kaempferia rotunda</i> L.	Zingiberaceae	Bhuin champa	Ribrik	Rhizome	Swelling, sprain, fracture, internal blood clot due to accident	Paste mixed with red-soil, warmed in fire and applied in affected parts.	Mo, H; TKL-009
46	<i>Lilium nepalense</i> D. Don	Liliaceae	Asare, okhe ali	-	Leaf, bulb	Cut and wound	Paste is applied externally.	Mo, H; TKL-058
47	<i>Lindera neesiana</i> (Wall. ex Nees) Kurz	Lauraceae	Siltimur	Tungrel chok	Fruits	Cholera, indigestion	Powder or paste is taken orally both in cattle and human. Used as condiments.	Di, T; TKL-018
48	<i>Mentha arvensis</i> L.	Lamiaceae	Babari phool	Ripdiyong	Leaf, young shoot	Skin diseases	Leaf is rubbed on the affected parts and juice is used to take bath; whole plant is used for religious purpose.	Di, H; TKL-087
49	<i>Mentha spicata</i> L.	Lamiaceae	Pudina	-	Leaf	Cholera, stomach problems	Paste is eaten as food or smelled; also eaten as pickle.	Di, H; TKL-033
50	<i>Mimosa pudica</i> L.	Fabaceae	Lajawati	Lazime	Root	Epilepsy	Juice/decoction is taken orally.	Di, H; TKL-077
51	<i>Momordica dioica</i> Roxb. Willd.	Cucurbitaceae	Ban karela	-	Fibre inside fruit	Jaundice	Small quantity of fibre found inside the fruit is soaked in water and the water is taken orally. Over dose is poisonous.	Di, Ci; TKL-086
52	<i>Musa paradisiaca</i> L.	Musaceae	Kera	Kurdung	Sap/latex of flower and leaf	Ear ache, cholera, diarrhoea	In stomach problem 10 ml of flower latex is taken orally while in earache, leaf sap in put inside ear. Used as food (fruit).	Mo, H; TKL-090
53	<i>Massaenda macrophylla</i> Wall.	Rubiaceae	Dhobini	Tabaknyom	Root	Pneumonia, cough-cold, fever, jaundice	Juice is taken orally.	Di, Sh; TKL-072
54	<i>Neprolepis cordifolia</i> (L.) K.	Lomariopsidaceae	Pani amala	-	Root bulb	Jaundice, burning urination	Juice is taken orally.	Pt, H; TKL-051

75	<i>Swertia chirayita</i> (Roxb. ex Fleming) Karsten	Gentianaceae	Chiraito	Rungken	Whole plant	Fever, Malaria, cough-cold, diarrhoea, pneumonia, diabetes.	In diabetes infusion is taken in empty stomach and in other cases decoction is taken.	Di, H; TKL-020
76	<i>Tagetes patula</i> L.	Asteraceae	Sayapatree	Takpurip	Inflorescence	Cold, pneumonia	Juice or infusion about 30-40 ml for an adult and 10 ml. for a child is given orally.	Di, H; TKL-001
77	<i>Taxus wallichiana</i> Zucc.	Taxaceae	Lauth salla	Chenden	Leaf	Cancer (old wounds)	Decoction or used as tea regularly.	Gym, T; TKL-055
78	<i>Tectaria cicutaria</i> (L.) Copel.	Aspidiaceae	Kali Niguro	-	Rhizome	Stomach problem, diarrhoea	Juice is taken orally.	Pt, H; TKL-096
79	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Barro	-	Fruit	Gastritis, stomach problems, tonsillitis, measles	Fruit powder is taken with water to cure stomach problems and tonsillitis; in case of measles it is mixed with fruit paste of <i>Elaeocarpus sphaericus</i> and <i>Terminalia bellirica</i> then applied externally on skin.	Di, T; TKL-041
80	<i>Terminalia chebula</i> Retz.	Combretaceae	Harro	Salem	Fruit	Sore throat, fever, cough, digestive tonic	Dried pulp is eaten raw or juice of pulp is taken orally.	Di, T; TKL-040
81	<i>Thysanolaena maxima</i> (Roxb.) Kuntze	Poaceae	Anriso	-	Root	Chocking needle on foot, boils.	Paste is applied on boils helps it to opening it faster or help to remove needle on foot; inflorescence is used to make broom; religious use.	Mo, H; TKL-075
82	<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Gurjo	-	Stem	Stomach problems of both cattle and human, diabetes, burning urination	Juice or decoction is taken orally.	Di, Cl; TKL-043
83	<i>Uncaria sessilifructus</i> Roxb.	Rubiaceae	Bhamsi kande	Mairong	Root	Sprain	Root is crushed, boiled and taken orally with honey as well as applied on affected parts.	Di, Cl; TKL-008
84	<i>Urtica ardens</i> Link	Urticaceae	Ghariya sisnu	Kultuk	Root, young shoot, leaf	High blood pressure, diabetes, sprain in cattle and human.	Curry of young shoots and leaves is taken with meal; In sprain root paste is applied on affected parts.	Di, H; TKL-044
85	<i>Urtica dioica</i> L.	Urticaceae	Sisnu	Kaiyang	Whole plant	Cut and wounds, fracture	Paste is applied.	Di, H; TKL-098
86	<i>Viscum album</i> L.	Loranthaceae	Hadchur	-	Whole plant	Cut and wounds, fracture	Whole plant paste is applied externally.	Di, Cl; TKL-045
87	<i>Vitex negundo</i> L.	Verbenaceae	Simali	-	Young shoot, leaf	Malaria fever, body swelling	Boiled and scent is inhaled by steam inhalation (steam bath).	Di, Sh; TKL-037
88	<i>Zanthoxylum oxyphyllum</i> Edgew.	Rutaceae	Boke tinmur	-	Fruit	Gastritis, cough-cold	Decoction is taken orally, used as condiment.	Di, T; TKL-019
89	<i>Zingiber cassumunar</i> Roxb.	Zingiberaceae	Phachyang	Salik	Root	Fever, dizziness, high blood pressure	Small piece is eaten raw.	Mo, H; TKL-013
90	<i>Zingiber officinale</i> Rose.	Zingiberaceae	Aduwa	Hing	Rhizome	Dry cough, against infection of caterpillar hairs.	Decoction is taken orally, juice is applied on caterpillar infected portion to remove hairs; used as condiment.	Mo, H; TKL-005

Note: Mo=Mo.; Di=Dicot; Pt=Pteridophyta; Gym=Gymnosperm; H=Herb; Sh=Shrub; T=Tree; Cl=Climber