WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 6, Issue 14, 1267-1283. Research Article ISSN 2277– 7105

ETHNOMEDICINES USED BY KOCHILA THARU TRIBES LIVING NEAR BARA DISTRICT OF NEPAL

***Shila Singh**

Assistant Professor, Botany Department, Amrit Campus, Kathmandu, Nepal.

Article Received on
21 Sept. 2017,

Revised on 10 October 2017,
Accepted on 31 October 2017

DOI: 10.20959/wjpr201714-13732

***Corresponding Author**
Shila Singh
Assistant Professor, Botany Department, Amrit Campus, Kathmandu, Nepal.
singhshila@hotmail.com

ABSTRACT

Ethnobotany is the study of how people of a particular culture and region make use of indigenous plants. Since their earliest origins, humans have depended on plants for their primary needs and existence. Plants provide food, medicine, shelter, dyes, fibers, oils, resins, gums, soaps, waxes, latex, tannins, and even contribute to the air we breathe. Many native peoples also used plants in ceremonial or spiritual rituals. Examining human life on earth requires understanding the role of plants in historical and current day cultures. It is estimated that 80% of the world's population lives in developing countries and over 80% of the world's population rely on plant-derived medicines for their primary health care needs. Based on the personal experience, people knew therapeutic potential of the medicinal plants without rationale of their efficacy. Because of advancement, we have a better understanding of the healing powers of plants due to presence of multifunctional chemical entities for treating complicated health conditions. Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of a local culture and people. Bara District lies in Province No. 2. It is one of the seventy-seven districts of Nepal. The district, with Kalaiya as its district headquarters, covers an area of 1,190 km² and has a population of 687,708. Main residents of this district are Tharu, Musalman, Bramhin, Yadav, Kano etc. Thus the present paper describes some important ethno medicinal plants used by Kochila Tharu tribes living near/around Bara district of Nepal. A total of 99medicinal plant species used by Tharus as ethnomedicine for the treatment of various ailments are documented and enumerated in Table 1. The plants in this study represent 50 families with the most prominent family being Asteraceae (12 species), followed by Fabaceae (8 species) and Lamiaceae (8 species). The 49 different ailments reported were grouped into 14 broad categories.

KEYWORDS: Tharu, Bara District, Ethnobotany, Ethnomedicine, diseases etc.

1. INTRODUCTION

Nepal's diverse linguistic heritage evolved from three major language groups: Indo-Aryan, Tibeto-Burman and various indigenous language isolates. According to the 2001 national census, ninety two different living languages are spoken in Nepal.[1] Based upon the 2011 census, the major languages spoken in Nepal are Nepali and Nepal Bhasa. Nepali is considered to be a member of Indo-European language and is written in Devanagari script.[2] Nepali was the language of the house of Gorkhas in the late 18th century and became the official, national language that serves as the lingua franca among Nepalese of different ethnolinguistic groups. Maithili along with regional dialects Awadhi and Bhojpuri are Indian languages and are spoken in the southern Terai Region. Tharu people are an ethnic group indigenous to the southern foothills of the Himalayas; most of the Tharu people live in the Nepal Terai.[3] The Tharu people are an ethnic group indigenous to the southern foothills of the Himalayas; most of the Tharu people live in the Nepal Terai.

Figure 1: A Tharu women in the Bara district, Nepal.

In Nepal, there are about 8.4 million indigenous people of different groups inhabiting various terrains. They possess their own culture, religious rites and rich traditional medicine practices. 6653 species of Angiospermic plants were documented among which 1792 to 2331 were recorded as potential medicinal and aromatic plants.[4] Despite having immense

potentialities to promote medicinal plants at national as well as international markets, the country is still far behind to utilize available resources to generate revenue. Traditional herbal medicine in Nepal has strong cultural and religious foundation. It exists in different ways among ethnic groups in their ritual or ceremonial practices, spiritual practices and self-healing practices. Indigenous and local communities have been using traditional and indigenous knowledge for centuries under local laws, customs and traditions to cure different diseases. Indigenous knowledge not only identifies but also provides the system of management of natural resources.[5]

Ethnomedicine is a study or comparison of the traditional medicine practiced by various ethnic groups, and especially by indigenous peoples. The word Ethnomedicine is sometimes used as a synonym for traditional medicine. Ethno medicines play an important role in the healthcare practices of the Tharu tribes of Indo-Nepal Boarder.[6] The Terai region of the southern foothills of the Himalayas along the Indo-Nepal border is home to the Tharu tribes. More than 90% of the Tharu population is engaged in agriculture.[7] There are many researches related to ethnobotany carried out in Dang district (Manandhar,[8]; Acharya,[9]; Adhikari,[10]; Adhikari,[11]; Panthi and Chaudhary,[12]). Such researches are found to be focused mainly on uses of the plants for medicinal purpose only. However, a study related to uses of plants for various purposes (including medicinal) would also be of great importance in the field of ethnobotany. Furthermore, use of analytical tools to prioritize certain species for conservation is instrumental in ethnobotanical studies (Anonymous,[13]; Rokaya,[14]; Wagner et al.,[15]; Bhattarai,[16]). Such tools play important role in setting conservation goals. Keeping this in mind, it has been investigated the ethnomedicines of Tharu tribes using quantitative statistical techniques. The aim of this study was: (1) to document the knowledge on ethnomedicines of Tharu tribes and (2) to identify potential plants for phytochemical studies.

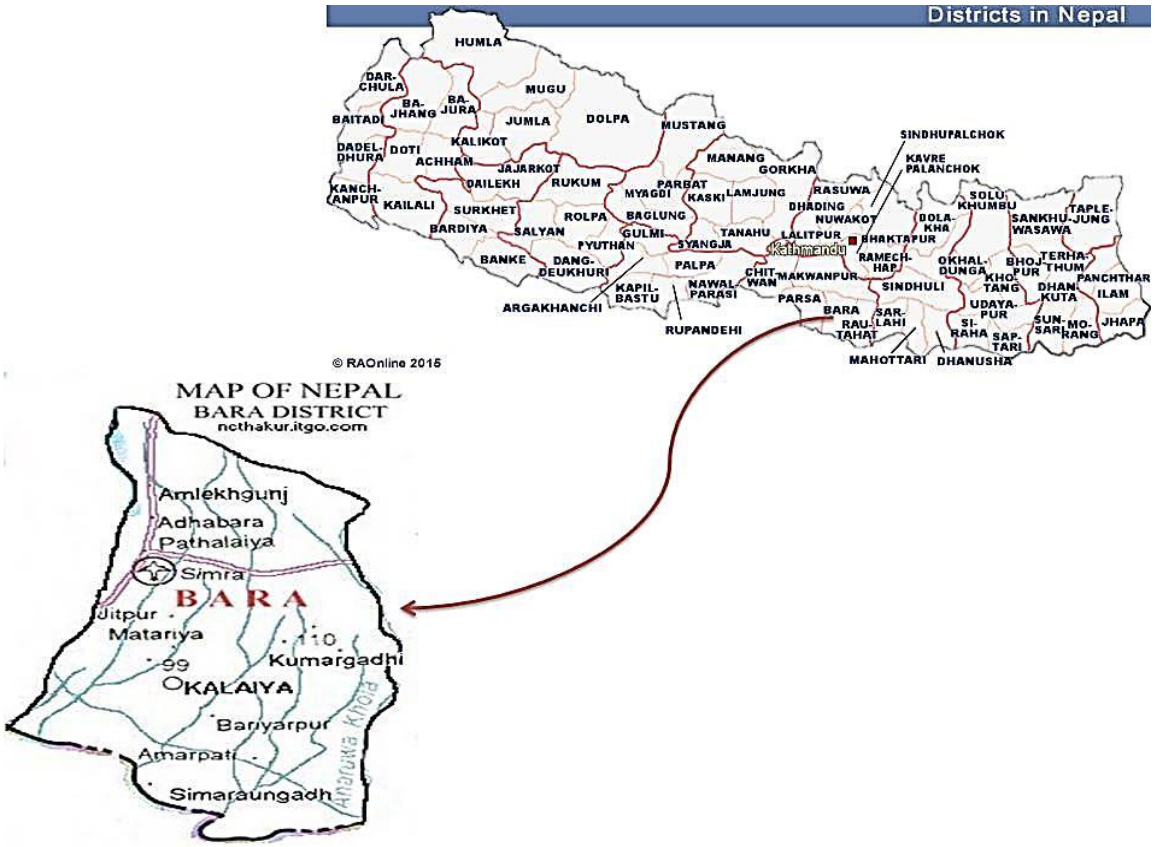

Figure 1: Map showing Bara district of Nepal which was the study area for this research.

Bara District is a district of Narayani Zone, administrative headquarters of this district is Kalaiya, situated in Central Development Region of Nepal. It is situated in the height of 152 meters to 915 meters from sea level and its area is 1190 square kilometers. Total population of Bara district is 687,708 according to census 2068 B.S. (2011 A.D.). Main profession of the residents in this district are agriculture and business. Its agricultural land is 51303.4 hectare; there are 98 village development committees and a Kalaiya Municipality. The people believe that the district is preserved by Baragadhi since Mithila kingdom to date and it is the reason behind the place being called Bara now.[17] The district is bounded by Rautahat in the east, Parsa in the west, Makawanpur in the north and Bihar (India) in the south. The language and the culture of the place is predominantly Tharu, Abadhi, Nepali, Bhojpuri, Magar, Newari, Gurung, Maihtali, Tamang, Danuwar, Rai, Sherpa, Satar, Santhali and Limbu. The term Tharu sometimes refers to all types of Tharu people living along the Nepal-India border, including Chitwan Tharu, Rana Tharu, Dangaura Tharu, Kochila Tharu, etc.[18]

Figure 2: Author (fourth from left) getting information from the women from ethnic group of Kochila Tharu community in Bara District, Nepal.

Kochila Tharu living in eastern Terai: Saptari, Bara, Parsa, Rautahat, Sarlahi, Mahottari and Udayapur districts. The place is rich in culture and is famous for pilgrimage due to the presence of temples like Kankalini temple of Simrongarh, Jhorahar Pond of Karchorba, Goddess of Bariyapur, Churiyamai of Chure, Sahajnath of Kantghant and the Baragadhi. These cultural and religious heritages also call for major tourism attractions in the district. The major rivers flowing through the district of Bara are Anruwa, Bageri, LalBakaiya, Shati, Mohan and Sirsiya. Beside these, *Amalekhganj*, *Bariyadpur*, *Kalaiya*, *Simara* and *Simraungadh*are the major five tourist attractions in the district.[19]

Studies on ethnomedicinal plants of Nepal have been conducted in the past by the Nepalese and foreign researcher; and comprehensive works have already been published (Rajbhandari,[20]; Manandhar,[21]). However, there are limited studies of this kind with a focus in hilly districts. Plants having medicinal properties have been studied time to time in different parts of Nepal by several researchers (Manandhar,[22]; Bhattarai et al.,[23]; Joshi and Joshi,[24]; Shrestha et al.,[25]; Shrestha and Dhillion,[26]; Mahato and Chaudhary,[27]; Kunwar and Bussmann,[28]; Panthi and Chaudhary,[29]; Sharma et al.,[30]; Bhattarai et al.,[31]; Ghimire and Basakoti,[32]; Kunwar et al.,[33]; Acharya and Acharya,[34]; Uptrei et al.,[35]; Joshi et al.,[36]; Malla et al.,[37]). In Parbat, some of the studies on ethnomedicinal plants have already emphasized on their importance by some researchers (Malla and Chhetri,[38]; Thapa,[39]; Malla et al.,[40]); but not much work on their importance has been done especially with

reference to Tharu tribes. In addition, due to the availability of modern medical facilities, the tradition of using indigenous knowledge for the treatment of common ailments is also rapidly disappearing. Keeping in view the importance of traditional knowledge of ethnic people, the present survey enlists the medicinal plants used by Tharu in Bara district of Nepal.

2. MATERIALS AND METHODS

2.1 Study Area

Bara district is located in the south-central lowland Terai of Nepal which borders India on the south. The district is surrounded by Rautahat in the east, Parsa in the west, Makawanpur in the north and Bihar, India in the south (Figure 1). It is located between the latitudes 26o 61. and 27o 02. N and the longitudes 84o 51. and 85o 16. E. It occupies 0.87% of the 14.7 million hectares area of Nepal.s land surface, includes 1.8% of country.s farmland, and bears 1.9% of Nepal.s 24 million people with an average population of 7.5 per ha (CBS,[41]). This study was conducted during March 2015 to November 2015 in the forest and adjoining five villages, *Amalekhganj*, *Bariyadpur*, *Kalaiya*, *Simara* and *Simraungadh* of Bara District of Nepal. The plants were collected identified on the basis of related flora (HMG Nepal[42]) and verified by cross checking with the authentic voucher specimens presented in the National Herbarium and Plant Laboratory, Godavari, KTM, Nepal. The use of various medicinal plants reported in this study was compared with previously published ethnobotanical literature in Nepal and India.

Structured questionnaires, interviews and participatory observations were used to elucidate information's of the resource persons. During field stay plants were enumerated and several times interactions were done with the traditional healers, local knowledgeable old persons, and other informants like forest officers and few local old people. Questionnaires include use of the plants for different purposes; including medicinal uses, parts of the plants used detailed information about mode of preparation such as decoction, powder, paste, juice and mixture with other plants used as ingredients.

2.2 Field survey and data collection

An ethnomedicinal survey was conducted during March 2015 to November 2015 in the forest and adjoining five villages, *Amalekhganj*, *Bariyadpur*, *Kalaiya*, *Simara* and *Simraungadh* of Bara District, State No-2 of Nepal inhabited by Tharu tribes (Figure 1). The plants were collected identified on the basis of related flora (HMG Nepal[42]) and verified by cross checking with the authentic voucher specimens presented in the National Herbarium and

Plant Laboratory, Godavari, KTM, Nepal. A transect-walk method of a Participatory Rural Appraisal (PRA) was adopted.[43] This method involves semi-structured interviews and discussion with key-research participants such as community elders, traditional healers, and farmers. The non-medical ethno-botanical results of this study have been published elsewhere Kumar et al.[44] The use of various medicinal plants reported in this study was compared with previously published ethnobotanical literature in Nepal and India.

Structured questionnaires, interviews and participatory observations were used to elucidate information's of the resource persons. During field stay plants were enumerated and several times interactions were done with the traditional healers, local knowledgeable old persons, and other informants like forest officers and few local old people. Questionnaires include use of the plants for different purposes; including medicinal uses, parts of the plants used detailed information about mode of preparation such as decoction, powder, paste, juice and mixture with other plants used as ingredients.

Common ailments, medicinal plants and other raw materials, methods of preparation, and dosage of remedies used were recorded. A comparative assessment in the form of a literature review was also conducted to differentiate between new findings and similarities with past research.

2.3 Analysis of quantitative data

The frequency of citation for each medicine was calculated using the following formula:

Frequency of citation (%) = (N/T) × 100,

Where, N is the number of informants who cited the medicine and T is the total number of informants interviewed. Logically, the most popular or common medicines among community member will get the highest number for the citation frequency. The informant consensus factor (FIC) technique (also known as the informant agreement ratio (IAR)) was used to determine the consensus between informants for the treatment of a certain use category. The FIC value illustrates the cultural coherence of the selection of a set of medicinal plants used in the treatment of a certain illness category. It is calculated as the number of use-reports or mentions in each usage category (nur) minus the number of taxa used in each category (nt), divided by number of mentions in each usage category minus one Collins et al.[45]

$F_{IC} = (n_{ur} - n_t) / (n_{ur}^{-1})$

FIC values range between 0 and 1, with a high FIC value indicating greater agreement among informants for uses of species for certain categories of ailments.

3. RESULTS AND DISCUSSION

A total of 99medicinal plant species used by Tharus as ethnomedicine for the treatment of various ailments are documented and enumerated in Table 1. The plants in this study represent 50 families with the most prominent family being Asteraceae (12 species), followed by Fabaceae (8 species) and Lamiaceae (8 species). The 49 different ailments reported were grouped into 14 broad categories: digestive system, dermatological, skeletomuscular, cold & fever, male reproductive issues, eye & ear troubles, maternity related issues, urinary system, parasitic/viral/bacterial infections, burns, respiratory troubles, circulatory system, teeth & gums, and injury or wound. Over half of all species reported were used for digestive, dermatological, or skeletomuscular ailments. Leaves and roots/ rhizomes were the most commonly used plant parts, with half of all plants reported being used for these parts. Herbs were the primary source of medicinal plants as categorized by plant life form (48%), followed by trees. The most common method of remedy preparation was extraction or juice (31%), followed by paste (20%) and decoction (15%).

Table 1: Enumeration of plant species used in Ethnomedicine by Tharu tribes.

S.N.	Species [family]	Tharu name	Citation (%)	Medicinal Uses	Application
1	*Acacia sinuata* [Fabaceae]	Aila	41	Hair tonic	Ointment
2	*Achyranthes aspera* L. [Amaranthaceae]	Chitchitta	19	Contraceptive	Oral
3	*Ageratum conyzoides* (L.) [Asteraceae]	Kukrona	28	Headache	Smell
4	*Alternanthera sessilis* (L.) [Amaranthaceae]	Gidanisag	25	Cataract	Eye drop
5	*Amorphophallus paeoniifolius* [Araceae]	Suran	46	Menstrual cycle	Oral
6	*Andrographis paniculata*[Acanthaceae]	Kalmegh	66	Anorexia	Oral
7	*Azadirachta indica*[Meliaceae]	Neem	55	Skin itching	Oral
8	*Bacopamon nieri* (L.) [Plantaginaceae]	Palanibia	42	Cough	Oral
9	*Blumea lacera* [Asteraceae]	Sabarbarand	61	Wounds	Ointment
10	*Buchanania cochinchinensis* [Anacardiaceae]	Piyal	31	Skin itching	Ointment
11	*Caesalpinia bonduc* (L.) [Fabaceae]	Karang	28	Fever	Oral
12	*Caesulia axillaris*Roxb. [Asteraceae]	Gar gandh	36	Boils/blisters	Ointment
13	*Callicarpa macrophylla* [Lamiaceae]	Daya	39	Boils on tongue	Ointment
14	*Cannabis sativa* L. [Cannabaceae]	Bhang	46	Sore eye	Ointment
15	*Capparis zeylanica* L. [Capparaceae]	Karralura	55	Boil	Ointment
16	*Cardiospermum halicacabum*L. [Sapindaceae]	Kanpool	25	Inflammation	Ointment

17	*Cassia fistula* L. [Fabaceae]	Amaltas	31	loss of appetite	Oral
18	*Centella asiatica* (L.) [Api-aceae]	Brahmi	18	Loose motion	Oral
19	*Centipeda minima* (L.) [Asteraceae]	Nak- chikani	27	Toothache	External
20	*Ceriscoidesturgida* (Roxb.) [Rubiaceae]	Gudgudia	69	Vomiting	Oral
21	*Chlorophytumtuberosum*(Roxb.) [Asparagaceae]	Safedmusali	45	Loose motion	Oral
22	*Cirsium arvense* (L.) [Asteraceae]	Oont-ka- tila	13	Frequent urine	Oral
23	*Cissampelos pareira* L. [Menispermaceae]	Madrachi	66	Stomachache	Oral
24	*Cleome viscosa* L. [Cleomaceae]	Hurhura	72	Boil	Ointment
25	*Cocculus hirsutus* (L.) [Menispermaceae]	Chreta	25	Skin itching	Ointment
26	*Colebrookea oppositifolia* [Lamiaceae]	Daya	34	Cuts, wounds	Ointment
27	*Cordia dichotoma* [Boraginaceae]	Lasoora	61	Cough, cold	Oral
28	*Cryptolepis dubia* (Burmf) [Apocynaceae]	Dudhi	39	Abnormal bone	Oral
29	*Curcuma amada*Roxb. [Zingiberaceae]	Amahaldi	55	Abdominal pain	Oral
30	*Datura innoxia* Mill. [Solanaceae]	Dhatura	21	Boils/blisters	Ointment
31	*Dicliptera paniculata* [Acanthaceae]	Chotihadjor	31	Bone fracture	External
32	*Diospyro sexsculpta*Buch [Ebenaceae]	Tendu	61	Loose motion	Oral
33	*Drimia indica* (Roxb.) [Asparagaceae]	Ban piaj	34	Swelling	External
34	*Dysphania ambrosioides* (L.) [Amaranthaceae]	Kirmani	42	Piles	Ointment
35	*Echinopse chinatus*Roxb. [Asteraceae]	Yokhru	22	Abdominal pain	Oral
36	*Eclipta prostrata* (L.) L. [Asteraceae]	Bhangra	58	Body-swelling	Oral
37	*Elephantopus mollis* [Asteraceae]	Jangaligobi	13	Filariasis	Oral
38	*Enicostema axillare* [Gentianaceae]	Chotachirayata	10	Headache	Oral
39	*Eruca vesicaria* (L.) [Brassicaceae]	Tara-mira	27	Burn injury	Ointment
40	*Erythrina stricta*Roxb. [Faba-ceae]	Nasui	33	Menstrual cycle	Oral
41	*Euphorbia fusiformis*Buch.[Euphorbiaceae]	Banmuli	13	Burn	Ointment; Ointment
42	*Euphorbia hirta* L. [Euphorbiaceae]	Laldudhi	21	tomach worm	Oral
43	*Evolvulus nummularius* (L.) [Convolvulaceae]	Musakan	48	Cough & cold	Oral
44	*Ficus hispida* [Moraceae]	Kalhgular	31	White patches	Oral
45	*Glycosmis mauritiana* (Lam.) [Rutaceae]	Ban nimbu	25	Fever	Oral
46	*Gmelina arborea*Roxb. [Lamiaceae]	Gamhar	43	Fever	Oral
47	*Haldina cordifolia* (Roxb.) [Rubiaceae]	Hardu	36	Body weight	Oral
48	*Helictere sisora* L. [Malvaceae]	Murra	55	Dysentery	Oral
49	*Hibiscus rosa-sinensis* L. [Malvaceae]	Gurhal	58	Urination	Oral
50	*Hygrophila auriculata* [Acanthaceae]	Talmak- hana	16	Skin itching	Ointment
51	*Ipomoea carnea*Jacq. [Convolvulaceae]	Behaya	40	Inflammation	External
52	*Launaea acaulis* (Roxb.) [Asteraceae]	Dudhia	12	Redness in eye	External
53	*Lawsonia inermis* L. [Lythraceae]	Mehndi	69	Frequent motion	Oral
54	*Leeam acrophylla*Roxb. [Vitaceae]	Hathikan	19	Bone fracture	External

55	*Leucas aspera* (Willd.) Link [Lamiaceae]	Gumma	27	Boils/blisters	Ointment
56	*Leucas cephalotes* (Roth) [Lamiaceae]	Goma	54	Impotency	Oral
57	*Litsea glutinosa* (Lour.) [Lauraceae]	Maida	22	Sprain	External
58	*Luffa cylindrica* (L.) [Cucurbitaceae]	Ghiataroi	33	Piles	Oral
59	*Lygodium flexuosum* (L.) [Lygodiaceae]	Bisma	58	Premature ejaculation	Oral
60	*Mallotus philippensis* (Lam.) [Euphorbiaceae]	Rohini	27	Skin itching	Ointment
61	*Melia azedarach* L. [Meliace-ae]	Bakaun	36	Boils/blisters	Ointment
62	*Moringa oleifera* Lam. [Morin-gaceae]	Sanjna	88	Heaviness of head	Oral
63	*Musa acuminata* [Musaceae]	Kera	15	Stomach pain	Oral
64	*Nicotiana tabacum* L. [Solanaceae]	Thambaku	72	Skin itching	Ointment
65	*Oroxylumindicum* (L.) [Bignoniaceae]	Sona	40	Diarrhea	Oral
66	*Persicaria barbata* (L.) [Polygonaceae]	Miriya	22	Contraceptive	Oral
67	*Phragmites karka* (Retz.) [Poaceae]	Narkul	19	Loss of sensation	External
68	*Piper longum* L. [Piperaceae]	Peepramul	84	Cough	Oral
69	*Platycladus orientalis* (L.) [Cupressaceae]	Morpankhi	9	Pain in urination	Oral
70	*Plumbago zeylanica* L. [Plumbaginaceae]	Chita	42	Fever	Oral
71	*Pogostemon benghalensis*(Burm.f.)[Lamiaceae]	Kali bhant	34	Maggots	External
72	*Pterocarpus marsupium*Roxb. [Fabaceae]	Bijasal	46	Chest pain	Oral
73	*Rotheca serrata* (L.) [Lamiaceae]	Bhant	55	Inflammation of eye-lids	Ointment
74	*Saccharum bengalense* Retz. [Poaceae]	Munj	55	Nocturnal emission	Oral
75	*Semecarpus anacardium*L.f. [Anacardiaceae]	Bhilawa	21	Vermifuge	Oral
76	*Senna tora* (L.) [Fabaceae]	Chakwad	48	Ring worm	Ointment
77	*Shorea robusta*Gaertn. [Dipterocarpaceae]	Shaku	42	Dysentery	Oral
78	*Sidarhombi folia* L. [Malvaceae]	Bariari	54	Nocturnal emission	Oral
79	*Solanum virginianum* L. [Solanaceae]	Bhatkataiyya	25	Toothache	Smoke
85	*Sphaeranthu sindicus* L. [Asteraceae]	Lal mundi	13	Inflammation of eye	Oral
86	*Syzygium cumini* (L.) [Myrtaceae]	Jamun	39	Diarrhea	Oral
87	*Tamilnadiauliginosa* (Retz.) [Rubiaceae]	Pindar	64	Loose motion	Oral
88	*Tectaria zeylanica* (Houtt.) [Tectariaceae]	Kamraj	51	Impotency	Oral
89	*Tephrosia purpurea* (L.) [Fabaceae]	Sarpoka	51	Skin itching	Ointment
90	*Terminalia bellirica* (Gaertn.)	Bahera	21	Constipation	Oral

	[Combretaceae]				
91	*Tinospora cordifolia* (Willd.) [Menispermaceae]	Giloh	27	Loose motion with blood	Oral
92	*Trachyspermum ammi* (L.) [Apiaceae]	Ajwan	37	Cough & cold	Oral
93	*Tribulus terrestris* L. [Zygophyllaceae]	Gokhura	54	Little and frequent urine	Orally
94	*Tridax procumbens* (L.) L. [Asteraceae]	Phoolni	63	Nocturnal emission	Oral
95	*Uraria lagopodoides* (L.) [Fabaceae]	Eksoria	16	Boils and blisters	Ointment
96	*Ventilago denticulata*Willd. [Rhamnaceae]	Hariabori	28	Skin burn	Ointment
97	*Vernonia anthelmintica* (L.) [Asteraceae]	Kalajiri	12	Fever	Oral
98	*Vitex negundo* L. [Lamiaceae]	Sambhalu	34	Fever	Oral
99	*Wrightia tinctoria* R. Br. [Apocynaceae]	Dudhi	22	Vomiting	Oral

The common ailments in the area are diarrhea, injuries, cold & fever, jaundice, anorexia (loss of hunger), dermatitis (skin itching), and sprains. The role of allopathic treatments has increased among Tharu tribes because it provides quick relief, but traditional therapies are still used in primary health care due to the lack of hospitals and wide-spread poverty in the study area. Some of the ailments like minor injuries, dermatitis, bone dislocation, toothache, male reproductive ailments, and maternityrelated issues are still preferably treated by ethnomedicines. Similar observations have been reported from different parts of India by Kumar and Bharati[46], and Kumar et al.[47]

The data were evaluated by two quantitative statistical tools of ethnobotany: informant consensus factor (FIC) and frequency of citation. The major aim of the statistical analysis was to identify the frequently used medicinal plants among Tharu tribes. The frequency of citation was highest for the following ten plants: *Moringa oleifera* Lam., *Piper longum* L., *Nicotiana tabacum* L., *Cleome viscosa* L., *Ceriscoides turgida* (Roxb.) *Tirveng., Lawsonia inermis* L., *Cissampelos pareira* L., *Andrographis paniculata* (Burm. f.) Nees, *Tamilnadia uliginosa* (Retz.) Tirveng. & Sastre, *Tridax procumbens* (L.) L., and *Hibiscus rosasinensis*L.. The greatest number of taxa (24) was used to treat digestive ailments. This is similar to observations reported by Dey and De [48], and Sen et al. [49]. The conservation-related aspects are not included in the present study because the species recorded during the investigation are not mentioned in red-data book of plants Schippmann et al.[50]

The FIC technique was applied to calculate the consensus of informants for the treatment of a certain use category.[51] In our study, the FIC value ranged from 0.94 to 0.98, with a high value for FIC indicating greater agreement among informants for medicinal uses of species for certain categories of ailments. The frequency of citation technique was used to determine the level of consensus among informants for a particular medicine for an ailment. The species having both high frequency of citation and high FIC value are promising plants for phytochemical and pharmacological studies.[52]

Information on 99 species of plants was recorded. The review of literature revealed that 34 species are reported here for new ethnomedicinal uses for this region of India. These species have been previously reported here and elsewhere for different medicinal properties, but the new medicinal uses are highlighted separately.

4. CONCLUSIONS

Ethnobotany usually considered synonymous with traditional or indigenous knowledge. Although, there is no universally accepted definition of traditional knowledge (TK) yet, it refers to tradition-based literary, artistic or scientific work; performances, inventions; scientific discoveries; designs; marks, names and symbols, undisclosed information and other tradition-based inventions and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields. Tradition-based referred to knowledge systems, creations, innovations and a cultural expression, which has generally been transmitted from generation to generation, are generally regarded as pertaining to particular people or its territory, and are constantly evolving in response to a changing environment. The traditional or indigenous knowledge could include-agriculture, science and technology, medicine, biodiversity, ecology and environment in its range, which differs from modern knowledge into manner of creation. The traditional or indigenous knowledge is normally validated empirically in nature and laboratory of life whereas modern knowledge is validated through human invented tool and techniques in the laboratory of bricks and concretes.

In this study, 99 medicinal plants were identified and documented. Informants preferred to treat some ailments like minor injuries, dermatitis, bone dislocation, toothache, male reproductive ailments and maternity-related issues with traditional medicines. Preparations identified in this research as having higher informant consensus factors may have potential for wider use elsewhere.

5. ACKNOWLEDGMENTS

The author extends sincere gratitude to the ethnic community and local people of the research areas for their generous cooperation during field study. The Department of Botany Government of Nepal, D.F.O. and Forest officer of the district are acknowledged for facilitating the field trips. Similarly, local traditional healers are also acknowledged for providing valuable information.

REFERENCES

1. Acharya KP and Acharya M. Traditional knowledge on medicinal plants used for the treatment of livestock diseases in Sirdikhola VDC, Kaski, Nepal. 2010; Nepal Journal of Medicinal Plants Resources, 2010; 4: 235-239.
2. Acharya, Meena. 2007. Gender Equality and Empowerment of Women in Nepal. Kathmandu, Nepal: United Nations Population Fund (UNFPA).
3. Acharya, R. & K.P. Acharya. 2009. Ethnobotanical study of medicinal plants used by Tharu community of Parroha VDC Rupandeshi district, Nepal. Scientific World, 7(7): 80– 84.
4. Rokaya, M. B., Munzbergova, Z. and Timsina, B. 2010. Ethnobotanical study of medicinal plants from the Humla district of western Nepal. Journal of Ethnopharmacology, 185(3): 485–504.
5. Koirala, R.R., Khaniya, B.N., 2009. Present status of traditional medicines and medicinal and aromatic plants related resources and organizations in Nepal Health Research Council.
6. Adhikari, K. 1997. Indigenous healing practices in Nepal: A case study of the Tharus in Amrai village, Dang. M. A. dissertation, Central Dept. of Sociology/Anthropology, Tribhuvan University, Kirtipur, Nepal.
7. Singh, A.G., Kumar, A., Tewari, D.D., 2012. An ethnobotanical survey of medicinal plants used in terai forest of western Nepal. Journal of Ethnobiologyand Ethnomedicine, 8: 19.
8. Manandhar, N.P. 1997. Role of ethnobotany in the context of Nepal. Paper presented at workshop on Application of Ethnobotany to Community Development. January 6-13 1997, Sauraha, Chitwan, Nepal.
9. Acharya, K.P., Acharya, R., 2009. Ethnobotanical study of medicinal plants used by Tharu community of Parroha VDC, Rupandehi district, Nepal. Scientific World, 7(7): 80–84.

10. Adhikari, M.K. 2000. Mushrooms of Nepal. Edited by G. Durrieu. P.U. Printers Battishputali, Kathmandu, Nepal.
11. Adhikari, S. M. 1998. Health Care by Local Herbal Resources (Sthaniya Jadibuti Dwara Swasthya Racchya). Mahendra Sanskrit University, Dang, Nepal.
12. Panthi, M.P., Chaudhary, R.P., 2003. Ethnomedicinal plant resources of Arghakhanchi district, West Nepal. Ethnobotany, 15: 71–86.
13. Anonymous 1997. *Medicinal Plants of Nepal*. Bulletin of Department of Medicinal Plants No. 3. Govt. of Nepal, Ministry of Forest and Soil Conservation, Department of Plant Resources, Kathmandu, Nepal.
14. Rokaya, M.B., Munzbergovaa, Z., Timsina, B., 2010. Ethnobotanical study of medicinal plants from the Humla district of western Nepal. Journal of Ethnopharmacology, 130: 485–504.
15. Wagner, A., Kriechbaum, M. and Koch, M.A. 2008. Applied vulnerability assessment of useful plants: A case study of Tibetan medicinal plants from Nepal. Botanische Jahrbücherfür Systematik, 127(3): 1-29.
16. Bhattarai, T.R. 1995. Chepangs: Status, efforts and issues: A Syo's perspective. Pp. 5-11 in Chepang Resources and Development. Edited by T.R. Bhattarai. Netherlands Development Organisation in Nepal (SNV)/ School for Ecology, Agriculture and Community Works (SEACOW), Kathmandu.
17. Baral, S. R., and Kurmi, P. P. 2006. A Compendium of Medicinal Plants in Nepal. MrsRachana Sharma, Kathmandu, Nepal.
18. Acharya, R. & K.P. Acharya. Ethnobotany study of medicinal plants used by Tharu community of Parroha VDC Rupandeshi district, Nepal. Scientific World., 2009; 7(7): 80-84.
19. Bhattarai S, Chaudhary RP, Taylor RL. Ethnomedicinal plants used by the people of Nawalparasi district, central Nepal. Our Nature., 2009; 7: 82-99.
20. Rajbhandari, K.R. 2001: Ethnobotany of Nepal. Ethnobotanical Society of Nepal, Kathmandu, Nepal.
21. Manandhar, N.P. 1985. Ethnobotanical notes on certain medicinal plants used by Tharus of Dang-Deokhuri district, Nepal. International Journal of Crude Drug Research, 23(4): 153–159.
22. Manandhar NP. Ethnobotanical notes on certain medicinal plants used by Tharus of Dang-Deukhuri district, Nepal. Int. J. Crude Drug Res., 1991; 23(4): 153-159.

23. Bhattarai, S., R.P. Chaudhary & R.S.L. Taylor. 2009. Ethno-medicinal plants used by the people of Nawalparasi district, central Nepal. Our Nature, 7: 82–99.
24. Joshi, K., Joshi, A.R., 2000. Indigenous knowledge and uses of medicinal plants by local communities of the Kali Gandaki Watershed Area, Nepal. Journal of Ethnopharmacology, 73: 175–183.
25. Shrestha, K.K., Tiwari, N.N., Ghimire, S.K., 2001. MAPDON-Medicinal and aromatic plant database of Nepal. In: Proceedings of Nepal-Japan Joint Symposium on Conservation and Utilization of Himalayan Medicinal Sources: 6–11 November 2000; Kathmandu, Nepal, pp. 53–74.
26. Shrestha, P.M., Dhillion, S.S., 2003. Medicinal plant diversity and use in the highlands of Dolakha district, Nepal. Journal of Ethnopharmacology, 86: 81–96.
27. Mahato, R.B., Chaudhary., R.P., 2003. Ethnomedicinal study and antibacterial activities of selected plants of Palpa district, Nepal. Scientific World, 2: 38–45.
28. Kunwar, R.M., Bussmann, R.W., 2008. Ethnobotany in the Nepal Himalaya. Journal of Ethnobiology and Ethnomedicine, 4: 24.
29. Panthi, M.P., Chaudhary, R.P., 2003. Ethnomedicinal plant resources of Arghakhanchi district, West Nepal. Ethnobotany, 15: 71–86.
30. Sharma, U.R., Malla, K.J., Uprety, R.K., 2004. Conservation and management efforts of medicinal and aromatic plants in Nepal. Banko Janakari, 14: 3–11.
31. Bhattarai, K.R., Maren, I.E., Chaudhary, R.P., 2005. Medicinal plant knowledge of the Panchase region in the middle hills of the Nepalese Himalayas. Banko Janakari, 21(2): 31–33.
32. Ghimire, K., Bastakoti, R.R., 2009. Ethnomedicinal knowledge and healthcare practices among the Tharus of Nawalparasi district in central Nepal. Forest Ecology and Management, 257: 2066–2072.
33. Kunwar, R.M., Uprety, Y., Burlakoti, C., Chaudhary, C.L., Bussmann, R.W., 2009. Indigenous use and ethnopharmacology of medicinal plants in Far-west Nepal, 7: 005–028 Ethnobotany Research and Applications, 7: 005–028.
34. Acharya, K.P., Acharya, R., 2009. Ethnobotanical study of medicinal plants used by Tharu community of Parroha VDC, Rupandehi district, Nepal. Scientific World, 7(7): 80–84.
35. Upreti, Y., Asselin, H., Boon, E.K., Yadav, S., Shrestha, K.K., 2010. Indigenous use and bio-efficacy of medicinal plants in the Rasuwa district central Nepal. Journal of Ethnobiology and Ethnomedicine, 6: 3.

36. Joshi, K., Joshi, R., Joshi, A.R., 2011. Indigenous knowledge and uses of medicinal plants in Macchegaun, Nepal. Indian Journal of Traditional Knowledge, 10: 281–286.
37. Malla, B., Gauchan, D.P., Chhetri, R.B., 2014. Medico-ethnobotanical investigation in Parbat district of western Nepal. Journal of Medicinal Plants Research, 8(2): 95–108.
38. Malla, B., Chhetri, R.B., 2012. Indigenous knowledge on medicinal non-Timber forest products (NTFP) in Parbat district of Nepal. Indo Global Journal of Pharmaceutical Sciences, 2(2): 213–225.
39. Thapa, S., 2012. Medico-ethnobotany of Magar community in Salija VDC of Parbat district, central Nepal. Our Nature, 10: 176–196.
40. Malla, B., Gauchan, D.P., Chhetri, R.B., 2014. Medico-ethnobotanical investigation in Parbat district of western Nepal. Journal of Medicinal Plants Research, 8(2): 95–108.
41. CBS. 2001. Statistical Year Book. Central Bureau of Statistics, Government of Nepal, Kathmandu, Nepal.
42. HMGN. 2001. Flowering Plants of Nepal (Phanerogams). Ministry of Forest and Soil Conservation, Department of Plant Resources, National Herbarium & Plant Laboratories, Bulletin no. 18, Kathmandu, Nepal.
43. Cunningham, A.B. 2001. Applied Ethnobotany: People, wild plant use & conservation. Earthscan Publishing Limited, London, U.K.
44. Kumar, R., M.K. Singh & K.A. Bharati. 2013. Ethnobotany of Tharus of Dudhwa National Park, Inda. Mintage Journal of Pharmaceutical & Medicinal Sciences, 2(1): 6–11.
45. Collins, S., X. Martins, A. Mitchell, A. Teshome & J.T. Arnason. 2006. Quantitative ethnobotany of two east Timorese cultures. Economic Botany, 60(4): 347–361.
46. Kumar, R. & K.A. Bharati. 2012. Folk veterinary medicines in Jalaun district of Uttar Pradesh, India. Indian Journal of Traditional Knowledge, 11: 288–295.
47. Kumar, A., V.C. Pandey & D.D. Tiwari. 2012. Documentation and determination of consensus about phytotherapeutic veterinary practices among the Tharu tribal community of Uttar Pradesh, India. Tropical Animal Health Production, 44: 863–872.
48. Dey, A. & J.N. De. 2012. Ethnobotanical survey of Purulia district West Bengal India for medicinal plants used against gastrointestinal disorders. Journal of Ethnopharmacology, 143: 68–80.
49. Sen, S., R. Chakraborty, B. De & N. Devanna. 2011. An ethnobotanical survey of medicinal plants used by ethnic people in West and South district of Tripura, India. Journal of Forestry Research, 22(3): 417–426.

50. Schippmann, U., D.J. Leaman & A.B. Cunningham. 2002. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity Global Trends and Issues. Food and Agricultural Organization, Rome, Italy.
51. Heinrich, M., S. Edwards, D.E. Moerman & M. Leonti. 2009. Ethnopharmacological field studies: A critical assessment of their conceptual basis and methods. Journal of Ethnopharmacology, 124: 1–7.
52. Newman, D.J. & G.M. Cragg. 2007. Natural products as sources of new drugs over the last 25 years. Journal of Natural Products, 70: 461–477.
53.