



Case Study

Ethnomedicinal Plants Used in Tharu Community, A Case Study of Rapti Sonari, Western Nepal

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Abstract

Tharu is a tribal community residing tropical region of Nepal, growing crops, and practicing diverse natural remedies for curing human and livestock diseases since long. They have firm belief in the use of medicinal plants to treat ailments such as cough, common cold, fever, burn, wound, fracture, stomach-ache, headache, gastritis, loss of appetite, nausea, vomiting, diarrhoea, dysentery, and so on. The present study focused to document their traditional knowledge on the use of medicinal plants. Information was collected via survey and the focus group discussion (FGD). A detailed structured questionnaire was used for interview in order to document medicinal practices. A total of 44 local people aged between 20-80 years old were participated including 23 farmers, five local health workers, nine teachers, and one community head. Plant specimen was collected from nearby forest and agroecosystem with the help of local guide. Specimen were identified in laboratory with the help of experts, digital herbarium images and published literatures. Frequency of citation (FC) and Relative Frequency of Citation (RFC) were calculated for each plant species. Altogether 30 plant species including wild and cultivated species, belonging to 24 families were documented. The Relative Frequency of Citation (RFC) was highest for *Ocimum tenuiflorum* (0.91) followed by *Citrus aurantiifolia* (0.89), and *Zingiber officinale* (0.77). The people in *Tharu* community are practicing their ethnic traditional practices for curing different ailments with the help of locally available plants. Their ethnic knowledge differed slightly than that of other ethnic community and such practices seems less familiar among youngsters which may indicate the possible threat to these knowledges in near future.

Keywords: Ethnomedicine, Medicinal Plants, *Tharu* Community, Ailments, Indigenous Knowledge

Abbreviations

FC- frequency of citation; RFC- Relative frequency of citation; n-number; asl-above sea level

Introduction

Tharu is a tribal community residing along the southern foothills of Nepal Himalaya and they are the first people who settled in the Terai region and they have a different culture as well¹. *Tharu* people have their language, norms, values, festivals, dress, traditions, and so on. They worship some holy plants such as “Tulsi”².

These plants are used traditionally as medicine, food, fodder, dyes, energy, construction, to perform rituals, and many more³. Their major occupation is agriculture since a long, and prefer to live closer to the forests⁴. They are fond of growing crops and following their own traditions and culture from food preference to the healthcare practices. They are practicing diverse natural remedies for curing human and livestock diseases. These therapeutic drugs and their practices are not a new discovery, rather it is a long-practiced medication system among the members of *Tharu* community residing adjacent to the forest and utilizing the available resources. Along with *Tharu* people, most of the other people living in the rural areas of Nepal, also depend on the traditional medicine for their basic health care needs^{5,6}.

Traditional healers and elderly people of the community have learned folklore through apprenticeships to treat common health disorders based on their traditional knowledge^{7,8}. Some ethnic groups have developed their own traditional healing systems and they transfer their knowledge orally through generations^{7,9}. *Tharu* is one of the largest ethnic groups representing 6.56% of national population and 13.47% of the Tarai population¹⁰. They have a distinct language, culture, folklore, rituals, customs, lifestyles as well as traditional knowledge about medicinal plants and their uses. Their Guruwa, a local healer uses plants and its resources to treat various health issues. Now adays, with availability of modern drugs and clinical services, such valuable traditional knowledge and healing practices are at the risk in lack of written documents¹¹. Whereas, plants with medicinal properties are used to cure several ailments and it is essential to produce different medicines¹².

Documentation of ethnobotanical information and traditional healing systems

among *Tharu* community residing different part of Banke district awaited long. The present study aimed to document the traditional knowledge on medicinal plants from ethnic *Tharu* community in Rapti-Sonari. They have firm belief in the use of medicinal plants to treat ailments such as cough, common cold, fever, burn, wound, fracture, stomach-ache, headache, gastritis, loss of appetite, nausea, vomiting, diarrhea, dysentery, and so on. The present study focused to document their traditional knowledge on the use of medicinal plants.

Materials and Methods

Study Area

The present study enlisted the knowledge on the medicinal use of plants among the *Tharu* community residing in Rapti Sonari Rural Municipality-09. It lies at 28.002'40''N and 81.057'19''E at an altitude of 80 m above sea level (Fig 1). It falls under the Banke district, Lumbini Province of Nepal, with a total population of 5,584 people including 2919 females and 2665 males¹⁰. The area is dominated by *Tharu* ethnic community and others were Brahmin, Chhetri, Magar, Kami, Kumal, Damai, Kurmi, Gurung, and Dhobi¹⁰. *Tharu* is the major language (48.31%) spoken in the area, followed by Nepali (41.07), and others (10.62%)¹⁰.

Data collection & analysis

The data collection was made between January and April 2023. Individual informant consent was taken orally for the recording and publication of their information on the use of plant resources, with assurance that their details to be confidential and unpublished. The individual interview was highly preferred, however, focus group discussions (FGD) were made in the case of health workers and teachers for their time convenience.

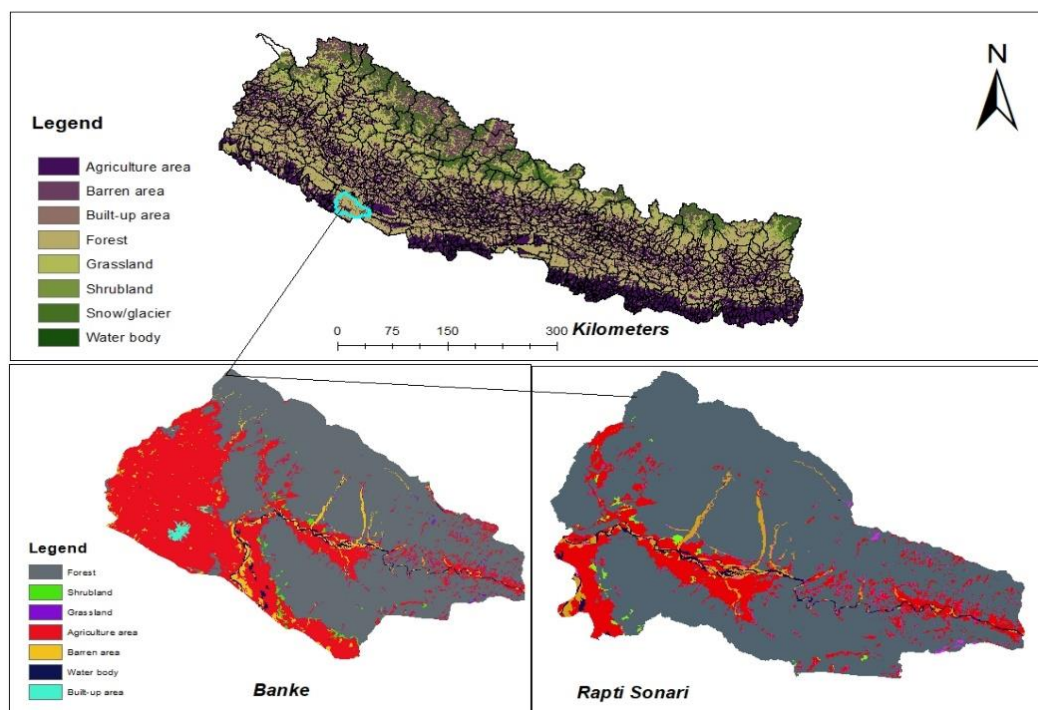


Fig 1: Map of Study Area

A total of 44 respondents (23 female & 21 male) participated in the interview belonging to different age groups (Table 1). Among the respondents, key informants were local

health workers (n=5), teachers (n=9), and farmers (n=23). A structured questionnaire was used to record details on the medicinal use of plants.

Table 1: Socio-Demographic Status

Demographic Characteristics	No. of Respondents N=44	Percentage (%)
Gender		
Male	21	47.72
Female	23	52.27
Age		
20-35 Years	16	36.36
36-50 Years	7	15.90
51-65 Years	10	22.72
65- above	11	25
Occupation		
Agriculture	23	52.27
Student	2	4.54
Housewife	9	20.44
Local Healer	5	11.36
Labor	4	9.09
Teacher	1	2.27
Educational Status		
Literate	34	77.27
illiterate	10	22.72

Guided field visits were made for specimen collection and identification of plants by local names with the help of Local herder. Later, collected specimens were identified by comparison with the digital herbarium, and confirmation was made based on published

literature including floras, revisions, articles, and books. Further, using interview data, the frequency of citation (FC) and relative frequency of citation (RFC) were calculated¹³.

Results

In total 30 plant species (16 wild and 14 cultivated) were reported with their medicinal properties. Various combinations of these plants were known for the treatment of various ailments in the *Tharu* community within a single ward of Rapti Sonari rural municipality. The details on the parts of plants used, use methods, and major ailments

treated were enlisted (Table 2). Among the 30 species belonging to 24 families, Combretaceae, Zingiberaceae, Poaceae, Rutaceae, and Solanaceae have 2/2 species and remaining families have single species (Fig 2). The most of medicinal plant species reported were herbs (n=15) followed by trees (n=8) and shrubs (n=7).

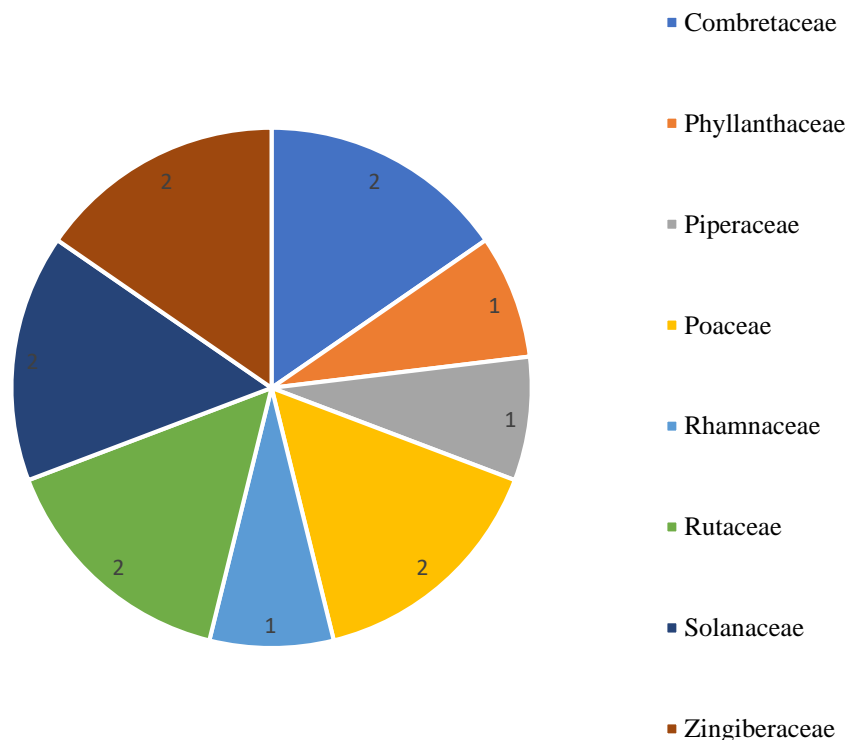


Fig 2: Number of species along families

Table 2: List of medically important plants used by local inhabitants of the study area

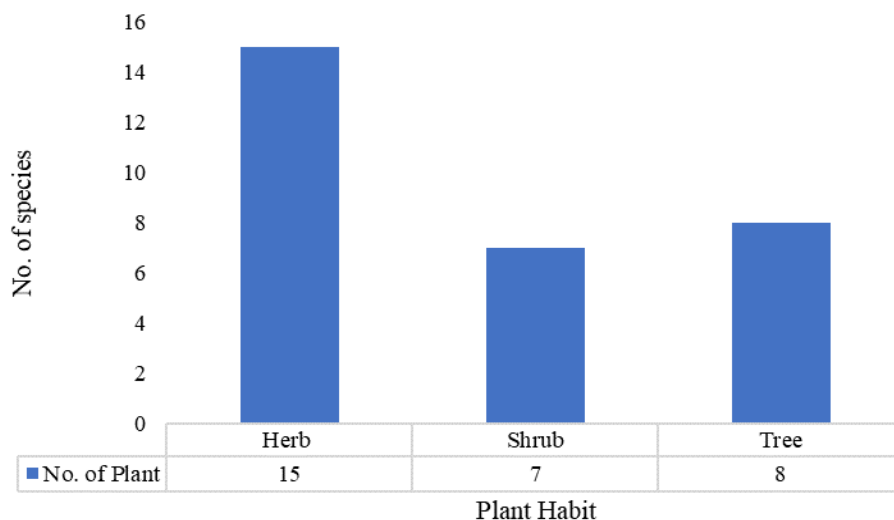
Family	Scientific name	Common name	Local name	LF	Parts use	Aliments	Mode of use	Use method	Preparation methods
Lamiaceae	<i>Ocimum tenuiflorum</i> L.	Holy Basil	Tulsi	H	Leaves	Inflammation, Common cold, Hypoglycaemia	R, C	O	Boiling leaves with water
Asphodelaceae	<i>Aloe vera</i> (L.) Burm.f.	Aloe vera	Ghyukum ari	H	Pulp	Gastritis, Hypertension, Skin problem, Headache	R	O, T	Extract gel from leaves and apply
Combretaceae	<i>Terminalia chebula</i> Retz.	Black myrobalan	Haran/Harro	T	Stem, Bark, Fruit	Asthma, Indigestion, Urinary tract infection	R	O, To	Use dry fruit
Combretaceae	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Beach-almond	Bahera/Barro	T	Stem, Bark, Fruit	Fever, Asthma, Wound, Kidney problem	R	O, To	Use dry fruit
Piperaceae	<i>Piper longum</i> L.	Long pepper	Pipala	H	Fruit	Asthma	R	O	Drying the fruit and use of it powder
Euphorbiaceae	<i>Euphorbia hirta</i> L.	Spurge	Dudhi	H	Leaves	Diarrhoea, Dysentery	R	O	Making juice from leaves
Rutaceae	<i>Aegle marmelos</i> (L.) Corrêa	Stone apple	Bael	T	Fruit, leaves, Pulses	Fever, Fatigue, Diarrhoea, Dysentery	R	O, To	Making juice from fruit
Apocynaceae	<i>Calotropis gigantea</i> (L.) W.T.Aiton	Crown flower	Aank	S	Leaf, flower, Fruit	Vomiting, Common cold, Skin problem, Swelling, Inflammation	R	O, To	Applying latex from stem
Phyllanthaceae	<i>Phyllanthus emblica</i> L.	Indian gooseberry	Amla	T	Fruit	Indigestion, Skin problem	R, C	O, To	Grinding the fresh fruit and apply on hair
Meliaceae	<i>Azadirachta indica</i> A.Juss.	Indian lilac	Neem	T	Leaves, Twigs, Bark	Inflammation, Toothache, Wound, Diabetes, Asthma, Fever	R	O, To	Boiling with water
Amaryllidaceae	<i>Allium sativum</i> L.	Garlic	Lasun	H	Bulb	Arthritis, gastritis, Headache	R, C	O, To	Eating raw
Zingiberaceae	<i>Zingiber officinale</i> Roscoe	Ginger	Aduwa	H	Rhizome	Stomach-ache, Common cold	R, C	O	Taking raw or boiling with water
Rhamnaceae	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn	Chinese jujube	Bayer	S	Fruit	Gastritis	R	O	Taking raw or powder
Caricaceae	<i>Carica papaya</i> L.	Papaya	Mewa	T	Fruit	Gastritis, Constipation	R, C	O	Taking or in Vegetable or Fruit Salad

Asteraceae	<i>Artemisia myriantha</i> Wall. ex Besser	Mugwort	Titepati	S	Leaves	Wound, Gastritis	R	O	Boiling leaves and squeeze it on cuts
Apocynaceae	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Java devil pepper	Sarpagandha	H	Roots	Hypertension	R	O	Clean the root and consume
Fabaceae	<i>Mimosa pudica</i> L.	Touch me not plant	Lajawati	H	Entire plant	Fever, Leucorrhoea	C	O	Drying roots
Poaceae	<i>Cymbopogon flexuosus</i> (Nees ex Steud.) W.Watson	Lemon grass	Kagati ghas	H	Leaves	Stomach-ache, Vomiting, Common cold	R	O	Dry leaves boil in water
Lauraceae	<i>Cinnamomum tamala</i> (Buch. - Ham.) T.Nees & Eberm.	Bay leaf	Tejpat	T	Leaves	Common cold, Tuberculosis	R, C	O	Dry leaves boil in water
Zingiberaceae	<i>Curcuma longa</i> L.	Turmeric	Besar	H	Rhizome	Wound, Inflammation, Skin problem	R, C	O, To	Grind and boil in water
Acoraceae	<i>Acorus calamus</i> L.	Sweet flag	Bojo	H	Roots	Stomach-ache	R	To	Drying leaves
Asparagaceae	<i>Asparagus officinalis</i> L.	Asparagus	Kurilo	S	Roots	Ulcer, Stomach-ache	R	O	Making juice of fresh roots
Solanaceae	<i>Datura metel</i> L.	Nightshades	Dhaturo	S	Seeds	Intestinal problem, Toothache	R	O	Grinding the seeds
Cannabaceae	<i>Cannabis sativa</i> L.	Hemp	Ganja	S	leaves, bark, seed	Body ache, Sleeping disorder, Loss of appetite	R	O	Dry leaves with smoke
Amaranthaceae	<i>Achyranthes aspera</i> L.	Pigweed	Ultekuro	H	Roots	Loss of appetite	R	O	Boiling with water
Poaceae	<i>Saccharum officinarum</i> L.	Sugarcane	Ukhu	H	Stem	Constipation, Stomach-ache, Cancer, Jaundice	R	O	Direct consume and juice
Solanaceae	<i>Solanum lycopersicum</i> L.	Tomato	Tamatar	H	Fruit	Burn	R, C	O, To	Apply liquid part of tomato on burned area
Rutaceae	<i>Citrus aurantiifolia</i> (Christm.) Swingle	Lemon	Nibuwa	T	Fruit	Indigestion, Vomiting	R	O	Mixing lime juice with water or eating raw
Asteraceae	<i>Eclipta prostrata</i> (L.) L.	False daisy	Bhringraj	H	Shoot	Diarrhoea, Dysentery	R	O	Making juice of shoot and adding mustard oil
Cactaceae	<i>Opuntia monacantha</i> Haw.	Prickly pear	Siudi	S	Latex, fruit	Pneumonia	R	O	Applying latex from cactus and raw fruit

*Note: [*Notes on Table 2: Herb-H; Shrub-S; Tree-T; Raw-R; Cooked-C; Oral-O; Topical-To]

Medicinal plant species with medicinal property were reported in different life form as herb, shrub, and tree (Fig 3). Among them, herb species (15) were dominant than shrub (7), and tree (8) species. Interestingly among

30 species, 25 were recorded first time as medicinal plants used by *Tharu* community in that area (Table 2; represented by * after each scientific name).



Almost half of the ailments were reported with multiple species option to cure (n=17) and remaining half with single species (n=17) (Table 3). The ailments with many plant species alternatives were common cold, gastritis, stomach-ache, wound, fever, and skin problems. Similarly, the most used plant

species in various ailments were *Calotropis gigantea*, *Azadirachta indica*, *Saccharum officinarum*, *Cannabis sativa*, *Aegle marmelos*, *Curcuma longa*, and *Aloe vera*.

Table 3: Ailments and plant species used by *Tharu* community for medicine

Ailments	Name of plant species
Arthritis	<i>Allium sativum</i>
Asthma	<i>Terminalia chebula</i> , <i>Terminalia bellirica</i> , <i>Piper longum</i> , <i>Azadirachta indica</i>
Body ache	<i>Cannabis sativa</i>
Burn	<i>Solanum lycopersicum</i>
Cancer	<i>Saccharum officinarum</i>
Common cold	<i>Ocimum tenuiflorum</i> , <i>Calotropis gigantea</i> , <i>Zingiber officinale</i> , <i>Cymbopogon flexuosus</i> , <i>Cinnamomum tamala</i>
Constipation	<i>Carica papaya</i> , <i>Saccharum officinarum</i>
Diabetes	<i>Azadirachta indica</i>
Diarrhoea	<i>Euphorbia hirta</i> , <i>Aegle marmelos</i> , <i>Eclipta prostrata</i>
Dysentery	<i>Euphorbia hirta</i> , <i>Aegle marmelos</i> , <i>Eclipta prostrata</i>
Fatigue	<i>Aegle marmelos</i> (L.) Corrêa
Fever	<i>Terminalia bellirica</i> , <i>Aegle marmelos</i> , <i>Azadirachta indica</i> , <i>Mimosa pudica</i>
Gastritis	<i>Aloe vera</i> , <i>Allium sativum</i> , <i>Ziziphus nummularia</i> , <i>Carica papaya</i> , <i>Artemisia myriantha</i>
Headache	<i>Aloe vera</i> , <i>Allium sativum</i>
Hypertension	<i>Aloe vera</i> , <i>Rauvolfia serpentina</i>
Hypoglycaemia	<i>Ocimum tenuiflorum</i>
Indigestion	<i>Terminalia chebula</i> , <i>Citrus aurantiifolia</i> , <i>Phyllanthus emblica</i>

Inflammation	<i>Ocimum tenuiflorum</i> , <i>Calotropis gigantea</i> , <i>Azadirachta indica</i> , <i>Curcuma longa</i>
Intestinal problem	<i>Datura metel</i>
Jaundice	<i>Saccharum officinarum</i>
Kidney problem	<i>Terminalia bellirica</i>
Leucorrhoea	<i>Mimosa pudica</i>
Loss of appetite	<i>Cannabis sativa</i> , <i>Achyranthes aspera</i>
Pneumonia	<i>Opuntia monacantha</i>
Skin problem	<i>Aloe vera</i> , <i>Calotropis gigantea</i> , <i>Phyllanthus emblica</i> , <i>Curcuma longa</i>
Sleeping disorder	<i>Cannabis sativa</i>
Stomach-ache	<i>Zingiber officinale</i> , <i>Cymbopogon flexuosus</i> , <i>Acorus calamus</i> , <i>Asparagus officinalis</i> , <i>Saccharum officinarum</i>
Swelling	<i>Calotropis gigantea</i>
Toothache	<i>Azadirachta indica</i> , <i>Datura metel</i>
Tuberculosis	<i>Cinnamomum tamala</i>
Ulcer	<i>Asparagus officinalis</i>
Urinary tract infection	<i>Terminalia chebula</i> Retz.
Vomiting	<i>Calotropis gigantea</i> , <i>Cymbopogon flexuosus</i> , <i>Citrus aurantiifolia</i>
Wound	<i>Azadirachta indica</i> , <i>Terminalia bellirica</i> , <i>Artemisia myriantha</i> , <i>Curcuma longa</i>

Furthermore, fruit (n=11) was reported as a most used plant part for medicinal purposes followed by leaf (n=9), bark (n=4), roots (n=4), and stem (n=3). Other parts used were bulbs, flowers, and latex obtained from few

species with specific medicinal value, and some species with entire plant parts (Fig 4).

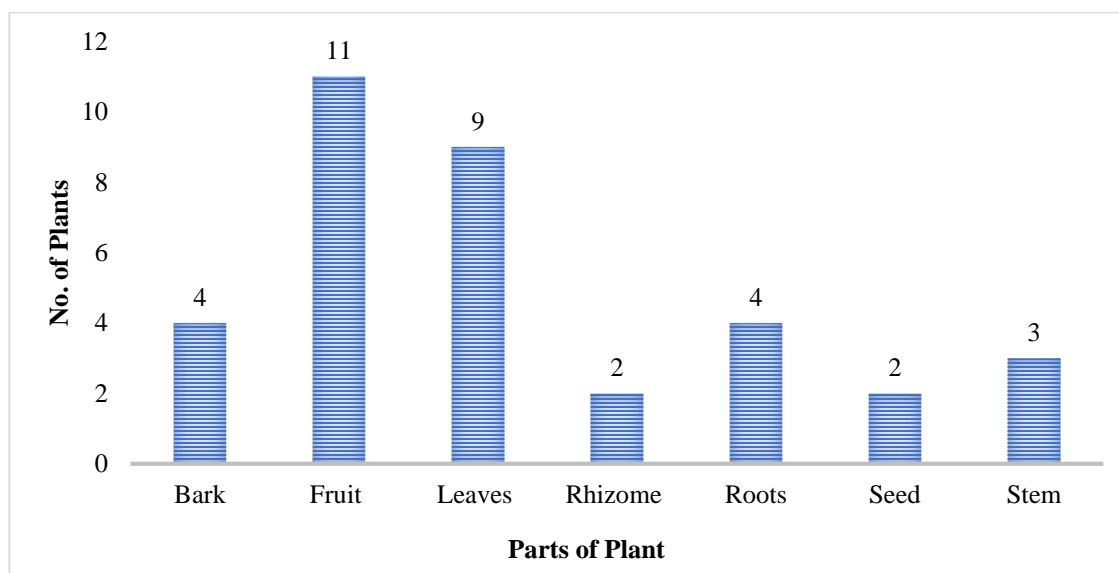


Fig 4: Parts of plants used for medicinal purpose

The frequency of citation for each species implies the recurrence in their use reported. The values of frequency of citation ranged from 13 to 42 and accordingly the value of relative frequency of citation was between

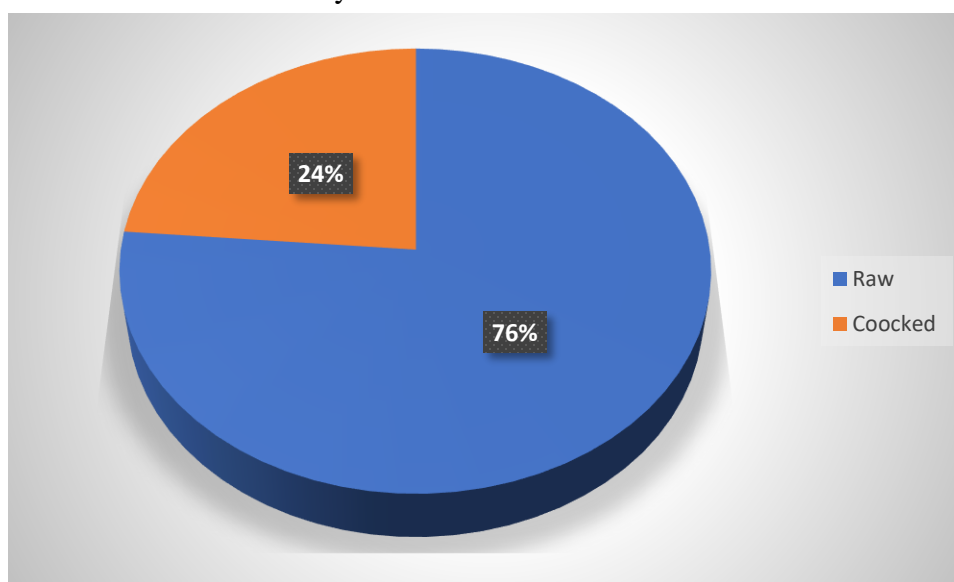
0.30 to 0.95 (Table 4). The RFC value was highest for *Azadirachta indica* (n=0.95) followed by *Ocimum tenuiflorum* (n=0.91), *Citrus aurantiifolia* (n=0.89), and lowest for *Cinnamomum tamala* (n=0.30).

Table 4: Frequency of citation and Relative frequency of citation

Plant species	FC	RFC (FC/N)	Plant species	FC	RFC (FC/N)
<i>Ocimum tenuiflorum</i> L.	40	0.91	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	23	0.52
<i>Aloe vera</i> (L.) Burm.f.	30	0.68	<i>Mimosa pudica</i> L.	21	0.48
<i>Terminalia chebula</i> Retz.	17	0.39	<i>Cymbopogon flexuosus</i>	17	0.39
<i>Terminalia bellirica</i>	33	0.75	<i>Cinnamomum tamala</i>	13	0.30
<i>Piper longum</i> L.	21	0.48	<i>Curcuma longa</i> L.	15	0.34
<i>Euphorbia hirta</i> L.	25	0.57	<i>Acorus calamus</i> L.	16	0.36
<i>Aegle marmelos</i> (L.) Corrêa	24	0.55	<i>Asparagus officinalis</i> L.	23	0.52
<i>Calotropis gigantea</i>	22	0.50	<i>Datura metel</i> L.	24	0.55
<i>Phyllanthus emblica</i> L.	32	0.73	<i>Cannabis sativa</i> L.	37	0.84
<i>Azadirachta indica</i> A.Juss.	42	0.95	<i>Achyranthes aspera</i> L.	33	0.75
<i>Allium sativum</i> L.	36	0.82	<i>Saccharum officinarum</i> L.	32	0.73
<i>Zingiber officinale</i> Roscoe	34	0.77	<i>Solanum lycopersicum</i> L.	18	0.41
<i>Ziziphus nummularia</i>	25	0.57	<i>Citrus aurantiifolia</i> (Christm.) Swingle	39	0.89
<i>Carica papaya</i> L.	22	0.50	<i>Eclipta prostrata</i> (L.) L.	22	0.50
<i>Artemisia myriantha</i>	18	0.41	<i>Opuntia monacantha</i> Haw.	29	0.66

These plant resources were recorded to be used either in raw or cooked form depending upon ailment, resource availability and species used in medicine preparation (Fig 5). Most of the species were reported to be used in raw form (76%) and remaining in cooked form (24%). And these medicinal plants were applied to the treatment of ailment by means

of topical application or oral consumption (Fig 6). Regarding application of medicine, 29 plant species were reported to be orally consumes, and 1 species being used both orally and topically, while only one species being used topically alone.

**Fig 5:** Use methods of plant parts

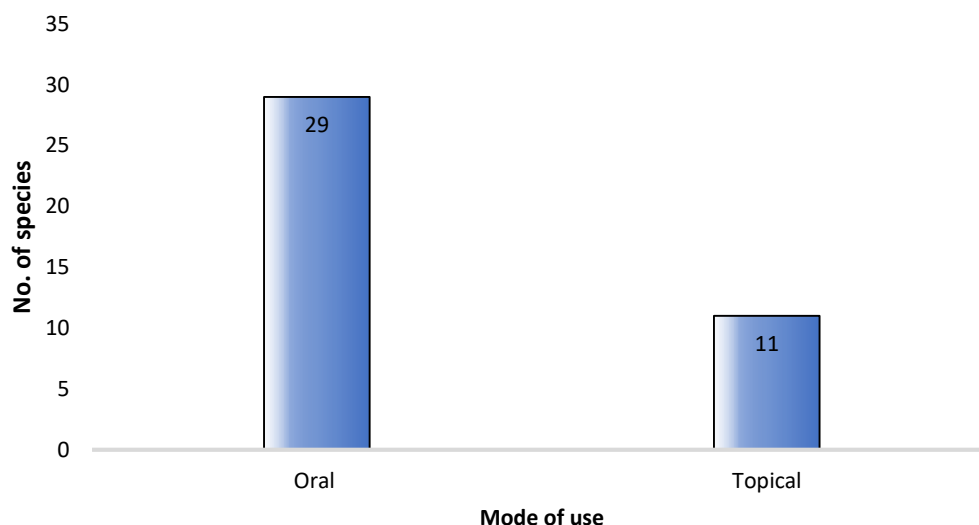


Fig 6: Mode of use of extracts of medicinal plants

Discussion

People of *Tharu* community uniquely cited the use of different plant species available locally and from market for the cure of disease and their symptoms. Such medicinal use of plants is not new rather, as older as origin of disease in the human being. *Tharu* community of Eastern and Central Nepal has also cited a good number of plant species for medicinal use^{1,14,15}. Although previous study has been made more recently in the area, interestingly, this study further added 25 different species in the record of medicinal plants used by *Tharu* community from the same area¹⁶. Continue addition of species with exploration of larger areas shows uniqueness and importance of medicinal plants among these communities. Further, it has essential role in the livelihood of people residing rural region and support the income by employing chain of people from collection to the market¹⁷.

Diverse plant species reported in different life form; dominated by use of herbaceous plant species might refer to the efficacy,

sustainability, and wide distribution range of herbs. Shorter life cycle, easier access, plant variation, and food habit might have supported the diversity and use of herbs among *Tharu* people for treatment practices^{1,14}. Study further revealed common cold, gastritis, stomach-ache, wound, fever, and skin problems with many species alternative to treat them, that might because these diseases and symptoms are quite abundant in the area and all the resources are not available throughout the year; and consequently, practice was made in such a way that a single ailment can be treated using different species depending on availability of resources in that season. Also, cultivated species might be an alternative to wild species for easy access to them in need. Formerly, headache, menstrual disorder, snake bites, cuts, wounds, respiratory problem, skin diseases, cold and cough, headache, fever, and toothache were common ailments reported among *Tharu* community treated using locally available plant species^{1,14,15}.

The major species used as medicinal plants were *Calotropis gigantea*, *Azadirachta indica*, *Saccharum officinarum*, *Cannabis sativa*, *Aegle marmelos*, *Curcuma longa*, and *Aloe vera*. *Ocimum tenuiflorum* noted as used for curing inflammation, common cold, and hypoglycaemia is a holy plant that has been used for long. It might be due to long practiced use of holy basil via cultural and traditional aspect. It contains some radio-protective properties¹⁸. Plants are identified as the main sources of novel bio-molecules¹⁹.

Piper longum reported to be used for asthma in the recent study and similarly, effective in curing diseases like cancer, inflammation, depression, diabetes, obesity, and Cough²⁰. *Aloe vera* is reported with use in gastritis, hypertension, skin problem, and headache might due to cooling and digestive property in it. Prior studies reported *Aloe vera* to care ulcers in men and burn and frostbite injuries in animals²¹. *Terminalia chebula* reported here to be used for the treatment of asthma, indigestion, and urinary tract infection that might due to its vitamin and mineral rich nutrient composition. Nutritious feature of *Terminalia chebula* for health benefits were discussed quiet earlier as well²².

Phyllanthus emblica is highly nutritious and contains a high source of vitamin C, amino acids, and minerals which is useful in the treatment of jaundice, diarrhoea, and inflammation²³. However present study reported its use for digestion improvement and caring skin problems and as mentioned earlier its vitamin, mineral and fibre content might have supported the health benefit over these ailments reported. *Azadirachta indica* is quite common and familiar remedy in Terai region, especially among ethnic communities as Tharu community in present study, due to its highly effective curing property in different ailments such as inflammation,

toothache, wound, diabetes, asthma, and fever²⁴.

Zingiber officinale (Ginger) has been effective for the treatment of stomach-ache and common cold, effective for pregnancy-induced and postoperative nausea and vomiting, somehow it is also used to treat arthritis symptoms²⁵. Gastritis and constipation were treated by using papaya, might due to its nutrient composition and known as traditional systems of medicine and valuable nutraceutical fruit plant²⁶. *Curcuma longa* has healing mechanism on wound, inflammation, and skin problem that has been previously reported with cure for stomach and liver ailments²⁷. *Cymbopogon flexuosus* (Lemon grass) used to treat stomach-ache, vomiting, common cold, might because it contains antioxidant property and thus used to treat cough, diarrhea, stomach-ache, hypertension, gastrointestinal problems, and fever in other places as well²⁸.

Artemisia myriantha used for wound healing and gastritis control. *Artemisia* herbs are highly fragrant and medicinal herb used worldwide and *Artemisia vulgaris* has been considered as “mother of herbs” in middle age²⁹. *Saccharum officinarum*, *Calotropis gigantea*, *Aegle marmelos*, *Euphorbia hirta*, *Mimosa pudica*, *Cinnamomum tamala*, *Acorus calamus*, *Rauwolfia serpentina*, *Eclipta prostrata*, and *Ziziphus mauritiana* as recorded in present study, has highly medicinal value with both topical and oral modes of use for different cardiovascular, hepatological, pulmonary, insomnia, gastrointestinal, sexual, and hormonal ailments³⁰⁻⁴¹.

Similarly, *Solanum lycopersicum*, *Asparagus officinalis*, *Allium sativum*, *Citrus aurantifolia*, *Opuntia monacantha*, *Cannabis sativa*, and *Datura metel* due to presence of vital nutrients including vitamins, mineral,

protein, and fibres and their antioxidant, anti-inflammatory, and antibacterial property, used for the control of dermatological, cardiovascular, renal, gynaecological and gastrointestinal problems^{9,15, 22,23,26,30,39,41,44}.

It suggests the need of well documentation and understanding on valuable plant species and their ethnomedicinal use in different ailments. Availability of modern medicines, has limited the use and practices of traditional medicines especially in the young generation indicating towards the threat over local practices and ethnic knowledge. There seems need of conservation of ethnobiological knowledge via proper documentation and application of such knowledge to seek new aspect utilizing locally available resources, connecting to development of industries, opportunity generation and resource sustainability in coming days.

Conclusion

Study revealed ethnomedicinal use of different plant species from Tharu community of Rapti-Sonari area of Banke district and added some valuable wild and cultivated species in the list of previous medicinal herbs in the area. The mode of use and practices for their consumption helped to understand the detail approach to use them and look forward for their biochemical and modern synthesis of drug.

Declarations

Ethics approval and consent to participate:

Prior interview, oral informed consent was taken from each participant.

Consent for publications: Not applicable.

Availability of data and materials: All data are mentioned in the manuscript

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Author Contribution: SDG, PN, and GTM developed the idea. SDG and PN collected data from field. AKS and GTM analysed and prepared the manuscript draft. Final manuscript is reviewed and confirmed by all the authors.

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