

Ethnobotany of Medicinal Plants Used by Kathariya (Tharu) Community in Kailali District, Nepal

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Abstract

This study aims to document the traditional knowledge on medicinal use of plants by Kathariya (Tharu) community in Kailali district. Kathariya is one of the sub-group of the Tharu community whose culture and language is slightly different from other sub-groups. Traditional healers Guruwa of Kathariya community from five study sites viz. Sisaiya, Tappa, Udasipur, Pawera and Joshipur of Kailali were identified as key informants. Exploratory research design was adopted and interview method was used to collect the primary information through Semi-structured open-ended questionnaire. Altogether 70 species of plants used for medicinal purposes were documented. Sixteen species were found useful in cuts, wounds and swelling which is one of ten health issues categorized in the present study. Thirteen and Twelve species were recorded to be used in abdominal disorders and skin diseases respectively. The community usually mixes powder in measurement of two and half grains of each Barley and Black Pepper during preparations of medicine for oral route of consumption. Based on habit, highest number of plant species belongs to herbs (30 species). Among five study sites, highest number of species was recorded in Udasipur with 35 species. Regarding the parts of plant used, roots and leaves were found to be used often equally, which were represented by 24 species each. *Achyranthes aspera*, *Euphorbia hirta*, *Azadirachta indica* and *Clerodendrom infortunatum* were the most frequently used species. This study generated preliminary but crucial information which may open the avenue for utilization of biological resources. Further research leading to bio-prospecting is needed to utilize these resources.

Keywords: Ethnic group, Guruwa, Health problem, Life form, Medicinal purposes

Introduction

Traditional beliefs about the diverse uses of plants are deeply rooted in Nepalese culture. Various ethnic groups of the country have developed their own indigenous knowledge systems relating to the role of plants in food, shelter, health care and their spiritual needs. Traditional herbal practices are the outcome of the long history of trial and error practiced from generation to generation and confined by traditional practitioners with knowledge of plants and their ecology (Miehe et al., 2015). Indigenous plants are being largely utilizes as an exclusive means of combating human as well as animal diseases in many tribal societies of Nepal. This unique empiric knowledge about plants having curative properties which generally get transferred from one generation to another generation only on verbal basis and many times kept secret (Chaudhary, 1998). Ethnobotanical survey has been found to be

one of the reliable approaches to drug discovery (Fabricant & Farnsworth, 2001). Several active compounds have been discovered from plants on the basis of ethno-botanical information (Carney et al., 1999).

Nepal is not only rich in biodiversity but also rich in ethnic diversity. Each ethnic community has localized distribution with unique socio-cultural characteristics. Some ethnic group represented by significant population proportion while other represented by very few population. Tharu is one of the major ethnic group, mostly inhabiting in the Terai region and the inner Tarai. It is subdivided into different clans, namely, Kochila Tharu, Chitwaniya Tharu, Rana Tharu, Kathariya Tharu and Dagaura Tharu. Each sub-clan speaks slightly different form of speech. Kathariya were migrated from Katiyar village of India and localized in different village of Kailali. Kathariya is classified as central subgroup of

Indo-aryan languages, which is close to Rana Tharu and Dagauna Tharu (Regmi, 2014).

According to National Population and Housing Census (2021), the Tharu population count 1807124 representing 6.20% of total population. Regmi (2015) explored the relationship among the Indo-aryan languages including Kathariya Tharu and found endanger vitality level. Kathariya's main occupation is agriculture and celebrates Holi as main festival. They plant Simal (*Bombax ceiba*) for religious purpose. They mostly depend on plant resources for their livelihood. Plants are their main source of remedy for the various diseases. Several Guruwa of this community use various plants to treat the diseases since the time immemorial (Angreji Mahato, Personal communication, May 31, 2016).

Ethnobotanical study on medicinal and other uses of plants by Tharu community in different places were previously studied by several authors such as Kailali (Bhattarai & Acharya, 2013), Sunsari (Chaudhary & Rai, 2017), Eastern Nepal (Chaudhary et al., 2020), Chitwan (Dangol & Gurung, 1991), Rupendehi and

Nawalparasi (Thapa, 2020), Rupendehi (Acharya & Acharya, 2009) and near Bara (Sing, 2017) etc. Ethnobotanical study on Kathariya Tharu community in Nepal has not been reported till date. The present study aims to explore medicinal uses of plant resources by Kathariya (Tharu) community in Kailali and to assess associated ethno botanical knowledge with respect to their utilization and management.

Materials and Methods

The literature review was done extensively with various relevant documents. On the basis of literature review all the workplan of research (methodology and study site) was finalized.

Study area

Since the research was mainly confined with traditional knowledge on medicinal uses of different plants by Kathariya community, the study areas were selected where Kathariya community lives. Total five study sites were selected for the study (Figure 1).

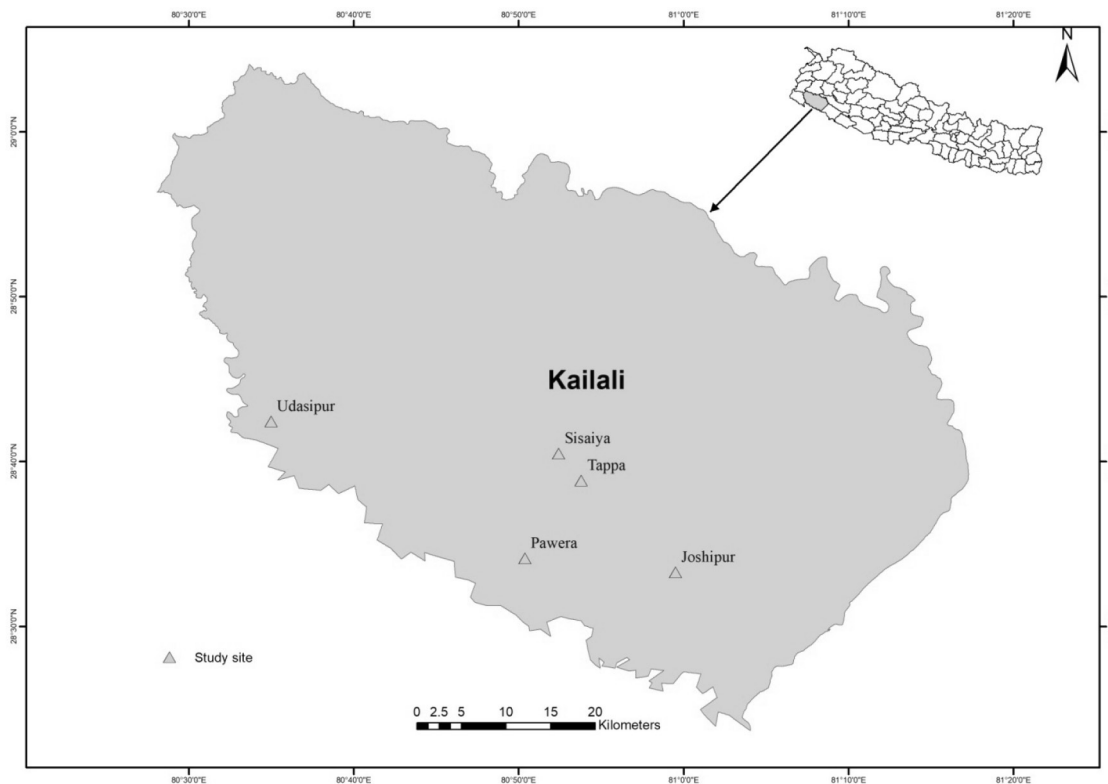


Figure1: Map showing the study areas of Kailali district

Research design and data collection

Field study was conducted in April to June 2016. Exploratory research design was adopted for present study. The study mainly focused on collecting and analyzing the first hand information i.e. primary data. While secondary data were also analyzed at the discussion part of the study. Firstly, those households were selected with the help of local informants where traditional healers and old aged persons were available. Total seven (all male with age from 55 to 85 years) traditional healers (Guruwas) from five study sites were selected as key informants.

Interview method was used to collect the primary information about medicinal uses of plants. Semi-structured, open-ended questionnaire was used while interviewing the respondent. Before taking the interview, prior informed consent was taken from respondents verbally. After completing the interview, transect walk was conducted in the field where photograph of available plants, information of plants and herbarium specimens of uncommon species were collected. Audio recordings were also taken in the interview and in the transect walk. The specimens were identified with the help of experts from KATH. The herbarium prepared during the study was stored in Plant Research Center Kailali Herbarium. Scientific name, family, Kathariya name, Nepali name, habit, part used, disease and study area of medicinal plants under study was documented (Table1).

Results and Discussion

Taxonomic diversity

Altogether 70 plant species were identified and documented which were used by Kathariya community for medicinal purposes. Among these, 67 species were identified upto species level and 3 species upto genera level. Identified plant species belonged to 42 family and 66 genera. Among 70 plant species, 54 species were belonged to Dicotyledon, 15 species were belonged to Monocotyledon and one species of Pteridophyte was recorded. The largest

family was Fabaceae having 7 species followed by Poaceae (4 spp.), Lamiaceae (4 spp.), Solanaceae (3 spp.), Malvaceae (3 spp.), Convolvulaceae (3 spp.) and Combretaceae (3 spp.) etc. Thapa (2020) and Bhattarai & Acharya (2013) also found Fabaceae as the most prominent family in their study.

Plant species and locality

Among five study sites, highest number of species was recorded in Udashipur of Kailali, with 35 species (50%) of total plants. This figure was followed by Sisaiya (20 spp., 28.57%), Joshipur (18 spp., 25.71%), Tappa (16 spp., 22.86%) and Pawera (11 spp., 15.71%) respectively (Figure 2). Some plant species were repeated in different study sites, so total count seemed to more than the actual number of species enumerated during the study.

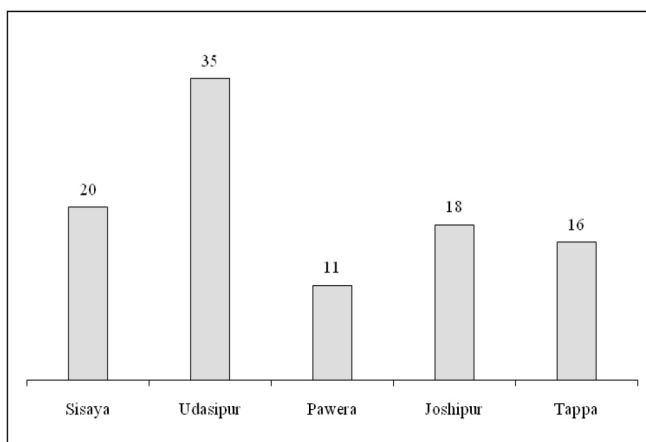


Figure 2: Number of plant species used for medicinal purposes by Kathariya in different locality

Life form

Based on habit, highest number of plants were belonged to herbs (30 spp., 42.85%), followed by trees (20 spp., 28.57%), shrubs (11 spp., 15.71%). Lowest number was represented by climber with 9 species (12.85%) (Figure 3). This might be due to the reason that the herbs are most abundant life forms, easy to collect due to small size and easy to cultivate. Several other researchers also found herbs as most dominant life forms for medicinal purposes (Bhattarai & Acharya, 2013; Chaudhary & Rai, 2017; Thapa, 2020).

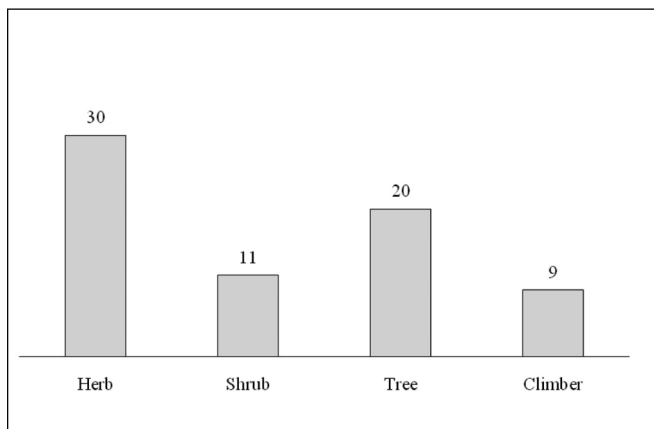


Figure 3: Number of plant species used for medicinal purposes and their life forms

Species and health problem

According to type of health problems, greater number of plant species (16 spp., 22.85%) were found to treat wounds, cuts and swelling, which was followed by abdominal disorders (13 spp., 18.57%); skin diseases (12 spp., 17.14%); liver, kidney, lungs and pancreas problems (8 spp., 11.42%) and fever, cold and cough (8 spp., 11.42%). Other major health problems treated through plant species were bone fractures, joint problems, head and eye problems, dental problems, snake and scorpion bite, lactation, menstrual problem, domestic cattle and bird’s health problems etc (Figure 4). Some species were used to treat multiple health problem. This result is somewhat close to the result found by Bhattari and Acharya(2013). They found abdominal disorder as most common disease followed by cuts and wounds.

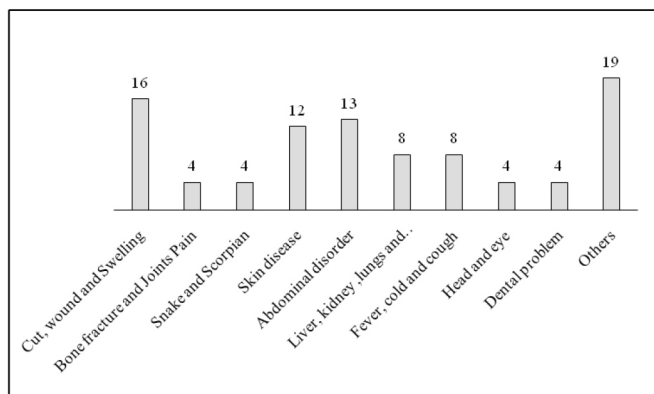


Figure 4: Number of species to treat health problems

Plant parts

The most commonly used parts of plants for medicinal purpose were root (24 spp., 34.28%) and leaf (24 spp., 34.28%) equally used as per study Statistics, followed by fruits and seeds (11 spp., 15.71%), whole plant (7 spp., 10%), latex (7 spp., 10%), bark (6 spp., 8.57%), stem (4 spp., 5.71%) and 8 spp. had other parts such as node, young Shoot, flower and juice used for medicinal purpose (Figure 5). Some species have more than one part used for medicinal purposes so the virtual number of species seems to be more than total number of species enumerated in the study. Leaves as one of the most common used parts is also supported by the results of other researchers like (Acharya & Acharya, 2009; Chaudhary & Rai, 2017; Sing, 2017). But, Roots as a most common parts used for medicinal purpose by Kathariya is contrast of others.

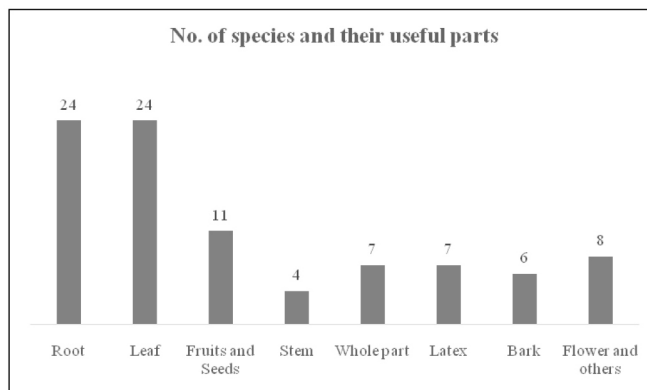


Figure 5: Number of species and their useful parts

Achyranthes aspera, *Euphorbia hirta*, *Azadirachta indica* and *Clerodendron infortunatum* were the most frequently used plant species representing 4, 4, 3 and 3 study sites respectively. Six popular fruits plants and 4 vegetable plants were also found to use for medicinal purposes by kathariya community. Interesting findings was that the part they used for medicinal purposes were other than the parts used for fruits and vegetables. Such as latex of *Artocarpus heterophyllus* was used for tooth and gum ache, flowering twigs of *Mangifera indica* was used for scorpion bites, roots of *Ziziphus mauritiana* for stone, seeds of *Annona squamosa* for antiparasitic to lice and latex and root of *Carica papaya* was used for skin disease and gum swelling and flower and fruit

juice of *Musa paradisiaca* was used in dysentery. Similarly roots of *Abelmoschus esculentus* (vindi) for leucorrhoea in female, roots of *Amaranthus spinosus* for microbial infestation in finger, roots of *Lagenaria siceraria* (Lauka) for enhancing lactation in female and leaf of *Lablab purpureus* for skin disease. Although Katharia community has a strong traditional knowledge on medicinal use of plants, it has limited to traditional healer and old aged people. It may be due to easy access of hospital and also less availability of medicinal plants associated with habitat loss.

Conclusion

Altogether 70 species of plants were found to be used by Kathariya community from five study sites to treat almost all the common health problems such as cuts, wound, swelling, abdominal disorder, skin diseases, fever, common cold, diabetes and stone etc. The community usually mixes powder in measurement of two and half grains of each Barley and Black Pepper during the preparations of medicine for oral route of consumption. Among parts of plant, roots and leaves were found to be used often equally, which were represented by 24 species each. Roots as the most common parts used for medicinal purpose by Kathariya are in contrast to the other researches in ethnomedicinal use of plants. From above results, it can be concluded that Kathariya community still have a strong traditional knowledge on the use of medicinal plants and they are still applying traditional healing practices. The study generated preliminary but crucial information which may open the avenue for utilization of biological resources. Further research leading to bio-prospecting is needed to utilize such resources rationally

Author Contributions

All the authors were involved in concept development, research design, literature review and data collection. MS Thapa Magar and C Khanal analyzed the data and prepared the manuscript.

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Table 1: List of plant species and their information

S.N.	Scientific name	Family	Kathariya name	Nepali name	Habit	Parts used	Disease / uses	Study area
1	<i>Abelmoschus esculentus</i> (L.) Moench	Malvaceae	Dadaturai	Ramtoria, Vindi,	Shrub	Root	Leucorrhoea in female	Tappa
2	<i>Abrus precatorius</i> L.	Fabaceae	Ratigedi, Titahar	Ratigedi	Climber	Leaf	sore in tongue	Udasipur
3	<i>Achyranthes aspera</i> L.	Amaranthaceae	Ultachakchira, Latajira	Datiwan, Ultekuro	Herb	Root, Leaf	Diarrhea, Migraine, Child pneumonia, cough, Fever, stoneetc.	Sisaya, Tappa, Udasipur, Pawera
4	<i>Acorus calamus</i> L.	Acoraceae	Bajh	Bojho	Herb	Root	Dry cough	Sisaya
5	<i>Adiantum philippense</i> L.	Pteridaceae	Kochya	Unyau	Herb	Stem	Sore in the inner side of mouth	Udasipur
6	<i>Alium sativum</i> L.	Amaryllidaceae	Lasun	Lasun	Herb	Bulb (Modified leaf)	Cough and common cold	Udasipur
7	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Chhatiwan	Chhatiwan	Tree	Stem, Latex	Chest pain and state of mental disorder	Sisaya
8	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Kate marcha	Latte	Herb	Root	Microbial infestation in finger	Joshipur
9	<i>Annona squamosa</i> L.	Annonaceae	Sarifa	Sarifa	Tree	Seeds	Anti-parasitic to Lice.	Udasipur
10	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Katahar	Katahar	Tree	Latex	Tooth/gums ache	Sisaya
11	<i>Asparagus recemosus</i> Willd.	Asparagaceae	Kurla, Satawar	Kurilo,	Herb	Root	Enhance lactation during pregnancy, Alcohol fermentation	Pawera and Josipur
12	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Neem	Tree	Leaf	Soothing effects during high temperature	Sisaya, Udasipur and Josipur.
13	<i>Calotropis gigantea</i> (L.) R. Br. ex Schult	Apocynaceae	Madar, Ankudara	Ank	Shrub	Latex, Flower	Fish/aquatic Crustacean bite, Rabies, wound, skin infection (sore/ fungal)	Sisaya and Udasipur
14	<i>Cannabis sativa</i> L.	Cannabaceae	Bhang	Bhang	Herb	Root	anti anaesthetic, rabies	Sisaya and Udasipur
15	<i>Carica papaya</i> L.	Caricaceae	Mewa, Dandewa	Mewa	Tree	Latex, Root	Skin disease (Ring worm), gum swelling, stone	Joshipur and Udasipur(F)
16	<i>Cassia fistula</i> L.	Fabaceae	Aroga	Rajbikhya	Tree	Fruits	Cough and common cold in children	Joshipur and Tappa

S.N.	Scientific name	Family	Kathariya name	Nepali name	Habit	Parts used	Disease / uses	Study area
17	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Ghodtapre	Ghodtapre	Herb	Leaf	Appetizer	Udasipur
18	<i>Hellenia speciosa</i> (J. Koenig) S.R.Dutta	Costaceae	Kewa	Betlauri,	Shrub	Root	Jaundice	Tappa
19	<i>Cisampelos</i> sp.	Menispermaceae	Batulia, Batulpate	Batulpate,	Climber	Leaf, Root	Eye ache, stomach ache, constipation, snake bite, pneumonia	Sisaya, Udasipur and Tappa.
20	<i>Clausena karpurensis</i> Molino	Rutaceae	Tyarra, Ghichinia		Herb	Leaf, Root	Menstruation problem, itching	Sisaya, Pawera
21	<i>Clerodendrum infortunatum</i> L.	Lamiaceae	Bhathi, Bhath		Herb	Leaf, Root	Swelling, Stomach ache	Udasipur, Sisaya and Joshipur
22	<i>Curculigo orchiooides</i> Gaertn.	Hypoxidaceae	Ban lasun	Kalomusli,	Herb	Root	Aphrodisiac	Pawera
23	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Amarbed, Amulbed	Aakasebeli	Herb	Whole part	Jaundice, Headache	Joshipur an Sisaya
24	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae	Jarakush	Kaagati ghash	Herb	Root	Tooth ache	Tappa
25	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Dubo	Dubo	Herb	Leaf, Stem, Flower and Whole part	leg cracks/cramps, skin disease	Tappa and Udasipur
26	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Sisoo, sisam	Sisoo	Tree	Bark, Leaf	Fracture, soothing effects	Udasipur and Joshipur
27	<i>Datura metel</i> L.	Solanaceae	Dhaturo	Dhaturo,	Shrub	Leaf, Root	Rabies, conjunctivitis	Sisaya and Udasipur
28	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Poaceae	Baas	Baas	Tree	Node	Cut	Joshipur
29	<i>Dioscoria bulbifera</i> L.	Dioscoreaceae	Tiuka	Githa	Climber	Root	Wound	Joshipur
30	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Dudhia, Lelgudhni, Dudhputri	Dudhi	Herb	Leaf, Branch, Whole part, and Latex	Pneumonia, skin disease (Ring worm)wound	Pawera, Udasipur Tappa and Joshipur
31	<i>Evolvulus nummularius</i> (L.) L.	Convolvulaceae	Gadhiko Dabai	-	Herb	Leaf	sore in fingers	Udasipur
32	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Ghantiphul	Ghantiphul	Shrub	Leaf, Flower	Wound, cold Swelling	Joshipur
33	<i>Hordeum vulgare</i> L.	Poaceae	Jau	Jau	Herb	Fruits	Wound	Udasipur
34	<i>Ipomoea carnea</i> Jacq.	Convolvulaceae	Besaram	Besaram	Shrub	Latex	water blisters	Joshipur

S.N.	Scientific name	Family	Kathariya name	Nepali name	Habit	Parts used	Disease / uses	Study area
35	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Paththarchhatta	Paththarchhatta	Herb	Leaf	Swelling	Udasipur
36	<i>Kigelia africana</i> (Lam.) Benth.	Bignoniaceae	Balmakhira	-	Tree	Fruits	Snake bite	Udasipur
37	<i>Lablab purpureus</i> (L.) Sweet	Fabaceae	Simi	Simi	Climber	Leaf	Skin disease (Ring worm)	Udasipur
38	<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae	Lauka	Lauka	Climber	Root	Enhance lactation during pregnancy	Udasipur
39	<i>Lantana camara</i> L.	Verbenaceae	Duniabakot	Kaligedi	Shrub	Whole part	anti ectoparasite in poultry	Joshipur
40	<i>Leea asiatica</i> (L.) Ridsdale	Vitaceae	Asidhda	-	Shrub	Root	Stomach ache	Tappa
41	<i>Lowsonia inermis</i> L.	Lythraceae	Mehandi	Mehandi	Shrub	Leaf	Microbial infection	Uasipur
42	<i>Mangifera indica</i> L.	Anacardiaceae	Riam	Aap	Tree	Flowering twigs	Scorpion bite	Udasipur
43	<i>Musa paradisiaca</i> L.	Musaceae	Kera	Kera	Shrub	Fruits, Flower and Juice	Dysentery,	Udasipur
44	<i>Nervilia</i> sp.	Orchidaceae	Dudhkuatri	-	Herb	Bulb (Root)	Enhance lactation during pregnancy	Udasipur
45	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Tulasi	Tulasi	Herb	Leaf	Cough and common cold	Uasipur
46	<i>Oxalis corniculata</i> L.	Oxalidaceae	Aamchocho	Chariamilo	Herb	Whole part	Skin disease (Ring worm)	Pawera
47	<i>Pelatantheria insectifera</i> (Rchb.f.) Ridl.	Orchidaceae	Hadjuri	-	Herb	Whole part	Fracture	Joshipur
48	<i>Phanera vahlii</i> (Wight & Arn.) Benth.	Fabaceae	Namrenitata	Vorla	Climber	Root	Menstruation problem	Pawera
49	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Aura, Iura	Amala	Tree	Fruits	Digestion	Pawera and Sisaya
50	<i>Piper peepulooides</i> Wall.	Piperaceae	Pipara	Pipala	Climber	Fruits and Root	Cough, Tonic and Lactation	Sisaya and Tappa
51	<i>Pogostemon benghalensis</i> (Burm.f.) Kuntze	Lamiaceae	Bhathi	Rudilo	Herb	Leaf	Allergies	Tappa
52	<i>Prunus persica</i> (L.) Batsch	Rosaceae	Aaru	Aaru	Tree	Leaf	Anti-ectoparasite, in pigs, cattle.	Udasipur
53	<i>Psidium guajava</i> L.	Myrtaceae	Amba	Amba	Tree	Twigs	Diarrhea, dysentery	Udasipur
54	<i>Salvia plebeia</i> R. Br.	Lamiaceae	Samansokh	Banabari	Herb	Whole part	Cooling effects	Udasipur
55	<i>Senna occidentalis</i> (L.) Link	Fabaceae	Badkikasauji	Tapre	Herb	Leaf	Piles, Chickenpox	Tappa

S.N.	Scientific name	Family	Kathariya name	Nepali name	Habit	Parts used	Disease / uses	Study area
56	<i>Senna tora</i> (L.) Roxb.	Fabaceae	Chotkikasauji	Tapre	Herb	Root	Diarrhea	Tappa
57	<i>Shorea robusta</i> Roth	Dipterocarpaceae	Sal	Sal,	Tree	Bark, Latex	Diarrhea, dysentery, vomiting and wound	Udasipur and Sisaya
58	<i>Solanum tuberosum</i> L.	Solanaceae	Aalu	Aalu	Herb	Tuber bark (Modified stem)	Scorpion bite	Udasipur
59	<i>Solanum virginianum</i> L.	Solanaceae	Bhatkacharia	Kanthakari,	Shrub	Fruits	Tooth abscess	Udasipur
60	<i>Spondias pinnata</i> (L. f.) Kurz	Anacardaceae	Amar		Tree	Seeds	Burning	Joshipur
61	<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Jam	Jaamun	Tree	Bark	Diarrhea, dysentery	Joshpur
62	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun	Arjun	Tree	Bark	Joint pain,	
63	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Behada	Barro	Tree	Fruits and seeds	Gastrointestinal discomforts	Pawera, Sisaya
64	<i>Terminalia chebula</i> Retz.	Combretaceae	Harrai	Harro	Tree	Fruits and Bark	Cough and common cold, drying and wound healing	Joshipur
65	<i>Tinospora cordifolia</i> (Thunb.) Miers	Menispermaceae	Gurich	Gurjo	Climber	Stem	Gastritis, Diabetes, stomach pain.	Paera
66	<i>Triumfetta bartramia</i> L.	Malvaceae	Bishmari	Bishmari	Herb	Leaf	Cut	Udasipur
67	<i>Typhonium trilobatum</i> (L.) Schott	Araceae	Nirbishi	-	Herb	Bulb (Root)	Stone	Sisaya
68	<i>Vitis</i> sp.	Vitaceae	Tiuka	-	Climber	Leaf and Root	Joint pain and Jaundice	Tappa
69	<i>Xanthosoma sagittifolium</i> (L.) Schott	Araceae	Maanmud	Darsanpipal,	Herb	Leaf	Common cold	Sisaya
70	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Jhalberia	bayar	Tree	Root	Stone	Tappa (F)