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Ethnomedicinal Study of Plants Used by Newar Community in Sindhupalchowk District, Nepal

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Abstract

The information presented in this paper was gathered by field visits in the study area, key informant interview, informal interviews and group discussion with traditional healers and person from different age having knowledge about the plant and plant based remedies. From the study area, it was found that Newar community uses 32 species of plants belonging to 25 families for treating 13 types of ailments. Leaves and roots were the top priority plant part used for different ailments treatments. The Newar community has used plant resources for centuries and is still reliant on them for a living. The study area was discovered to be rich in plant resources and the elderly have extensive knowledge of the use of medicinal plants. However, due to the ease of access to hospitals and modern medical facilities, the younger generation is uninterested in herbal medicine. Many useful plant species are at risk of extinction in this area due to a lack of proper documentation, conservation and cultivation practices. With the introduction of modern and alternative treatment facilities in the district, indigenous traditional knowledge that has been transmitted orally for years is becoming extinct. Because of the preference of peoples of Newar communities for modern medicine and hospital facilities, indigenous knowledge and skills in medicine have become less focused as a result of modernization. As a result, documentation of such knowledge has become an urgent requirement. The documentation of this research is critical for the enhancement and preservation of local people's traditional knowledge in Indrawati Rural Municipality.

Keywords: Ailments, Baidhya, Indigenous knowledge, Medicinal plants, Traditional medicine

Introduction

Medicinal use of plants is one of the major applications of ethnobotany, which contributes to drug discovery and socioeconomic development by exposing the historical and current use of plants (Dhital et al., 2021). Furthermore, many plants have been used for medicinal purposes since time immemorial. In the current context of widespread use of modern treatment systems, there is still a large space for medicinal plants that have been used in various ways. Except for highly communicable diseases and emergency cases, many people still rely on traditional medicinal practices to treat common diseases such as dysentery, diarrhea, stomach problems, gastritis, jaundice and skin problems (Bhattarai & Tamang, 2017). People in rural areas are inextricably linked to the vegetation and flora that surrounds them (Rana et al., 2015).

The ethnic people who live in different geographical belts of Nepal rely on wild plants to meet their basic needs, and each ethnic community has its own pool of secret ethno medicinal and ethno pharmacological knowledge about the plants available in their surroundings, which has served rural people with superiority (Dhami, 2008). Ethnomedicine has been practiced in Nepal since the late nineteenth century. The Royal Nepal Academy published the first book on medicinal plants, "Chandra-Nighantu," in 1969 (2025 B.S.). Following that, numerous ethnobotanical studies on various ethnic communities were conducted (Gubhaju & Gaha, 2019). People in Nepal's rural areas, where access to government health care is limited, rely on medicinal plants and local healers to address health issues (Ambu et al., 2020). It is well known that the method of administration for curing disease with a specific plant varies greatly among indigenous people as well as healers, jhakris and amchies (Manandhar, 2002; Shrestha & Dhillion, 2002). It is true that a large number of medicinal plants and associated indigenous knowledge on their uses are still not documented (Chaudhary, 1998).

The study and documentation of indigenous knowledge and practices on use of medicinal plants by Newar community's were the main goals of this research. The district of Sindhupalchowk was selected for the research because it has significant medicinal plant resources, is remote from urban areas and has a sizable Newar population and these people still practice traditional herbal medicine. The Newar are the indigenous inhabitants of the Kathmandu Valley and are known for their rich artistic and cultural tradition. In spite of technological advancements, the Newar society of Nepal still uses ethnobotanical knowledge, which is mainly held by older generations such as Vaidyas, Dhamis and Jhankris (traditional healers). Only a few important members of the Newar community have access to their traditional healing methods, which are passed down verbally from generation to generation. Very few sporadic studies have been conducted in this setting to gather ethnobotanical data and the traditional knowledge systems of the Newar community (Ambu et al., 2020; Balami, 2004). To record the traditional knowledge on medicinal plants with their indigenous uses and practices in light of the foregoing, the current study was designed.

Materials and Methods

There are around 126 ethnic groups living in Nepal. Newar are one of the indigenous peoples recognized by the Nepalese government. Newar can be found throughout the country and beyond, but they are the original inhabitants of Kathmandu, Bhaktapur and Lalitpur. According to the 2011 National Census, the population of Newar was 1,321,933 accounting for nearly 5% of the total population of the country. They speak Nepal Bhasa, which is their native language. Sindhupalchowk has a total population of 285,770 with 1,938 Newar living in Indrawati Rural Municipality (Karki, 2019). In the study area, Newar is the main ethnic group, while the other group represents a minority.

The study was carried out in Indrawati Rural Municipality Ward no. 5, Sindhupalchowk district of Bagmati province. Indrawati Rural Municipality is situated on a high hill with a natural scenic structure on the river's banks. Indrawati Rural Municipality is situated at an elevation of 654 m above sea level. It is bound to the north by Panchpokhari Thangpal Rural Municipality and Jugal Rural Municipality, to the west by Melamchi Municipality, to the south by Kavreplanchok district and to the east by Chautara Sangachokgadhi Municipality and Jugal Rural Municipality (Figure 1). Although some hilly areas have cultivable fertile land, the majority of the hilly areas are covered by forests. Their main occupations are agriculture.

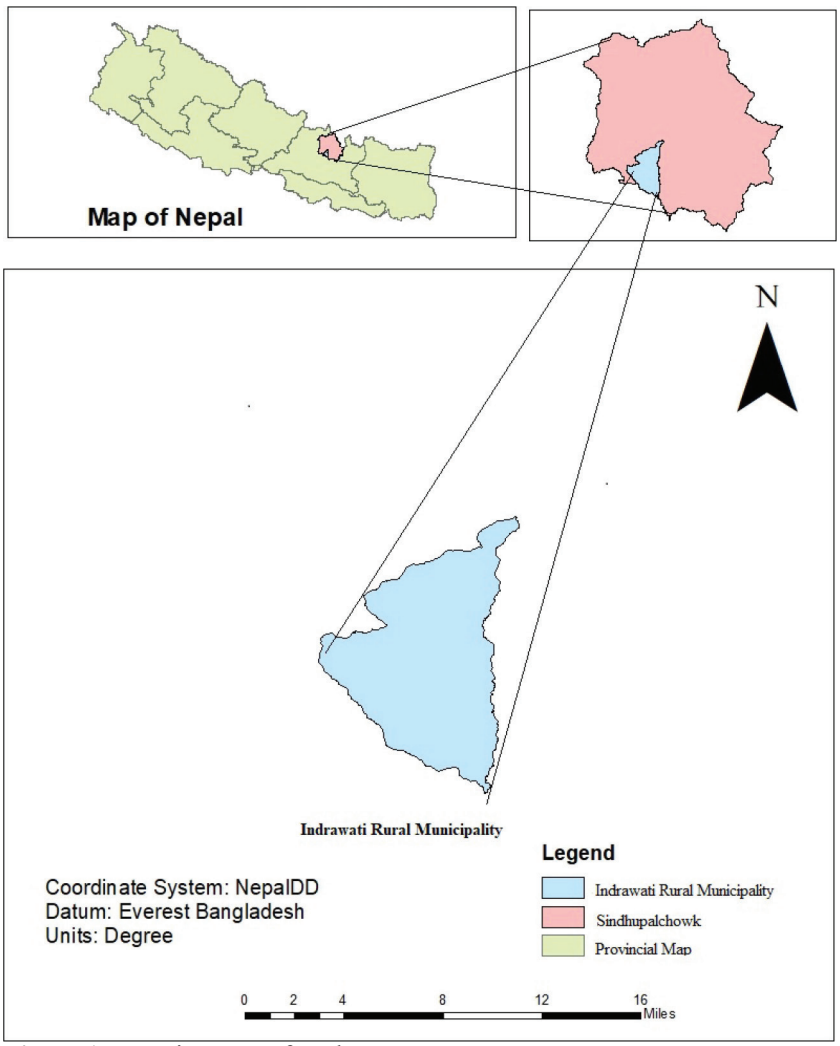

Figure 1: Location map of study area

Prior informed consent

The study goals were briefly explained to the key informants during a group discussion before data collection. By doing this, the informants' assistance in preserving local knowledge was recognized and their confidence in giving accurate information was increased. All participants who took part in interviews and discussions provided their preliminary informed permission for the documentation and dissemination of local knowledge regarding ethnobotanical uses of plant species.

Field survey and data collection

The study was carried out in April 2022. Ethnobotanical data were collected using a structured and semi-structured questionnaire with key informant interviews and local community. Ethnobotanical and ethnomedicinal data on plants has been collected by interviewing 18 informants from the study area. A questionnaire survey was conducted to compare and analyze informants' knowledge of plant habits and habitat, uses, medication forms, dose and route of administration of medicines and so on. According to Heinrich et al. (1998) reported ailments were classified into major categories. Four key informants were traditional healers selected by the following criteria: experience (local healers); age (knowledgeable elder villagers); occupation (farmers).

A total of 44 Newari households were surveyed from total of 75 Newari household. A semi-structured questionnaire survey was conducted to investigate general information about households and knowledge of medicinal plants for disease cure among the Newar community.

Table 1: Percentage of respondent according to age and sex

Variables	Category	Indrawati Rural Municipality (%)
Age (Years)	Young (18-35)	24.52%
	Adult	33.96%
	Older	41.50%
Sex	Male	55.66%
	Female	44.33%

Plant specimens were collected and partly identified by the local people and mostly by the key informant. Local names and medicinal uses were documented critically. The plant specimens were photographed, pressed between newspapers and sun-dried in the field using a natural drying technique (Forman & Bridson, 1989). Various books were used to determine scientific names (Baral & Kurmi, 2006; Manandhar, 2002; Polunin & Stainton, 1984; Stainton, 1988). The gathered data were represented systematically in tabular form. The information such as botanical name, local name, life form, family, parts used and ethnomedicinal uses were provided for each species (Table 2).

Results and Discussion

The present research revealed the use of 32 plant species belonging to 25 different families which is shown in Table 2. Among 32 medicinal plant species, 13 species were herbs, 6 species shrubs, 5 species climbers and 8 species were trees. The share of plant species, herbs was 41%, shrubs was 19%, tree was 25% and climber was 15%. This proportion was comparable to other studies on medicinal plants conducted in central Nepal (Shrestha & Dhillion, 2003; Uprety et al., 2010) and west Nepal (Kunwar et al., 2006; Shrestha & Dhillion, 2003). Among the medicinal plants, 20 are only collected from the wild, 10 are cultivated and 2 species were both cultivated and wild (Table 2). This demonstrates that the area has little practice of cultivating medicinal plants. If the plant species are harvested in large quantities for trade, this situation could lead to resource depletion or even extinction in the long run.

Table 2: List of medicinal plants along with their ethnic name, family, used parts, life form, purpose used and mode of use

S.N.	Scientific name	Newari name	Family	Parts used	Life form	Purpose used	Mode of use	Status
1	*Abrus precatorius* L.	Lalgedige	Fabaceae	Seeds	Shrub	Seeds are applied over the eye. Improves vision of eye.		W
2	*Acorus calamus* L.	Bojho/Safi	Acoraceae	Rhizome	Herb	To treat cough, fever and sore throat	Dried or fresh raw pieces ;1-2 gm taken orally to cure sore throat	C/W
3	*Aloe vera* (L.) Burm.f.	Ghiu kumara/	Liliaceae	leaf	Herb	Blood pressure control, to treat cut, burn and wounds	Leaf sap is applied over burn area. 3-4 spoonful of leaf sap taken orally every morning	C
4	*Artemisia dubia* Wall. ex Bess.	Titepati	Compositae	leaves	Herb	To control high blood pressure		W/C
5	*Berberis aristata* DC.	Chutro/	Berberidaceae	Bark, root	Shrub	To control high sugar and blood pressure	Root juice about 2 teaspoons twice a day.	W
6	*Cannabis sativa* L.	Ganja	Cannabaceae	Leaf,stem	Herb	To treat diarrhea, can be used during pains and stomachache	Leaf powder can be used during diarrhea.	C
7	*Citrus limon* (L.) Burm. fil.	Kagati	Rutaceae	Fruit	Tree	To control high blood pressure	Fruit juice is consumed with water.	C
8	*Clematis buchananiana* DC.	Pahelolahara	Ranunculaceae	Roots	Climber	To treat gastritis and jaundice	Root is grinned and is taken orally.	W
9	*Coccinia grandis* (L.) Voigt	Golkakri	Cucurbitaceae	Fruit	Climber	To treat constipation, dysentery and gastritis	Fruits are eaten raw	W
10	*Curcuma caesia* Roxb.	Kalohaledo	Zingerberaceae	Bulb, root	Herb	Menstrual disorder, untimely period and to treat back pain		W
11	*Curcuma longa* L.	Besar	Zingerberaceae	Rhizome	Herb	Rhizome powder is boiled with water for treating common cold	Powder; 5gm is taken orally to cure cough and cold	C
12	*Delphinium cooperi* Munz.	Niramsi	Ranunculaceae	Roots	Herb	Gastric	Root is grinded and mixed with water	W
13	*Dioscorea deltoidea* Wall. ex Griseb.	Ban tarul	Dioscoreaceae	Fruit	Climber	To treat constipation, dysentery and gastritis		W
14	*Potentilla indica* (Andr.) Wolf	Bhuikaphal	Rosaceae	Roots	Herb	To treat typhoid	Root is grinned and it's juice is taken	W
15	*Jasminum auriculatum* Vahl.	Jai phul	Oleaceae	Flower	Shrub	To treat sore throat and skin rashes	Flowers eaten raw	W

S.N.	Scientific name	Newari name	Family	Parts used	Life form	Purpose used	Mode of use	Status
16	*Jatropha curcas* L.	Sajjiwan	Euphorbiaceae	Fruit	Shrub	To control hair fall and skin cracks		W
17	*Macrotyloma uniflorum* (Lam.)Verdc.	Gahat	Leguminosae	Seeds	Climber	To treat kidney stone	Cooked or the juice is taken	C
18	*Melia azedarach* L.	Bakaino	Meliaceae	Leaf	Tree	To relief headache	Leaf extract can be used	W
19	*Mentha arvensis* L.	Pudhina	Lamiaceae	Leaf	Herb	To treat cough, fever and sore throat	Juice of 4-5 fresh leaves is used.	C
20	*Myrica esculenta* (Buch.-Ham. ex D.Don)	Kaphal	Myrtaceae	Leaf, bark	Tree	To cure fever, headache		W
21	*Nyctanthes arbor-tristis* L.	Parijat	Oleaceae	Flower	Shrub	To treat sugar and pressure		C
22	*Ocimum sanctum* L.	Tulsi	Lamiaceae	Leaf	Herb	To treat cough, fever and sore throat	Leaf decoction used for cough and cold	C
23	*Phyllanthus emblica* L.	Amala	Euphorbiaceae	Fruit	Tree	To treat diarrhea, dysentery, anemia and jaundice	Fruit is dried or pickled and taken orally.	W
24	*Rhododendron arboreum* Sm.	Lali gurans	Ericaceae	Flower	Tree	Flower powder can be orally taken orally to dissolve unswallowed fish bones		W
25	*Rhus chinensis* Mill.	Bhakiamilo	Anacardiaceae	Fruit	Tree	To treat scabies		W
26	*Rubus ellipticus* Smith.	Ainselu	Rosaceae	Root	Shrub	To cure fever and gastritis	Watery extract of Root is taken orally.	W
27	*Saccharum officinarum* L.	Ukhu	Graminae	Stem	Herb	To treat asthma	Steam juice can be orally taken	C
28	*Schima wallichii* (DC.) Korth.	Chilaune	Theaceae	Bark	Tree	To treat cuts and wounds		W
29	*Tinospora sinensis* (Lour.) Merr.	Gurjo	Menispermaceae	Whole plant	Climber	To treat cough and cold, to boost immunity	Stem is boiled and a glass of it is taken everyday	W
30	*Urtica dioica* L.	Sisno	Verbenaceae	root	Herb	To treat headache and Jaundice	Root lotion and extract can be used	W
31	*Zingiber officinale* Roscoe	Adhuwa	Zingerberaceae	Rhizome	Herb	Rhizome is directly chewed to cure cough and cold	Rhizome and its extract is chewed orally/crushed and its extract is mixed with Tulsi to cure cold.	C
32	*Ziziphus mauritiana* Lam.	Bayar	Rhamnaceae	Fruits	Tree	Fruits paste is consumed to treat stomach problem and body cooling	Ripe fruits are taken directly.	W

Note: W = Wild; C = Cultivated

The plant parts used for treating different ailments were roots, fruits, leaves, flower, seeds, stem, bark and other (Table 3). The most frequently used plant part was root followed by fruits. Roots are the most preferred parts, possibly because they contain higher amount of bioactive compounds than other parts (Srithi et al., 2009).

The highest number of medicinal plants is being used for headache and fever ailments (7 spp.) followed by gastrointestinal (5 spp.), throat problems, blood pressure and sugar (4 spp. in each), skin problems (3 spp.), wounds/cuts and typhoid (2 spp. in each) and least for kidney, asthma, menstrual disorder, pneumonia and eye problem (1 spp. in each) shown in (Table 4). The present report had reported the use of root of *Clematis buchananiana* for the treatment of gastritis and jaundice. The findings have been supported by Joshi et al. (2019) where they listed the use of root of *Clematis buchananina* for curing cough and peptic ulcer. Bhattarai and Khadka (2016) reported that, the juice of *Clematis buchananina*is put inside nostril for curing sinusitis and epistaxis in Illam district by Brahmin and Chhetri.

Table 3: Plant parts used for treating different ailments

S.N.	Plants parts	Medicinal plants
1	Flowers	*Jasminum auriculatum ,Nyctanthes arbor-tristis, Rhododendron arboreum*
2	Fruits	*Jatropha curcas, Rhus chinensis, Citrus limon, Dioscorea deltoidea, Zizyphus mauritiana, Phyllanthus emblica*
3	Leaves	*Aloe vera, Artemisia dubia, Mentha arvensis, Ocimum sanctum, Myrica esculenta, Cannabis sativa, Melia azedarach*
4	Root	*Delphimium cooperi, Coccinia grandis, Curcuma caesia, Clematis buchananiana, Duchesnea indica, Berberis aristata, Rubus ellipticus, Urtica dioica*
5	Seed	*Abrus precatorius, Macrotyloma uniflorum*
6	Stem	*Saccharum officinarum, Cannabis sativa*
7	Others	*Tinospora sinensis, Curcuma caesia, Acorus calamus*
8	Bark	*Berberis aristata, Schima wallichii, Myrica esculenta*
9	Rhizome	*Curcuma longa, Zingiber officinale*

Table 4: Categories of ailments treated by Baidhya using medicinal plants

S.N.	Categories of ailments	Used medicinal plants
1	Gastrointestinal	*Delphimium cooperi, Dioscorea deltoidea, Clematis buchananiana, Cannabis sativa, Phyllanthus emblica*
2	Throat problems	*Coccinia grandis, Mentha arvensis, Acorus calamus, Ocimum sanctum*
3	Wounds and cut	*Aloe vera, Schima wallichii*
4	Blood pressure and sugar	*Aloe vera, Citrus limon, Berberi saristata, Nyctanthes arbor-tristis*
5	Skin problems	*Rhus chinensis, Jasminum auriculatum , Jatropha curcas*
6	Headache and fever	*Mentha arvensis, Acorus calamus, Ocimum sanctum, Myrica esculenta, Rubus ellipticus, Urtica dioica, Melia azedarach*
7	Typhoid	*Duchesnea indica, Zizyphus mauritiana*
8	Kidney	*Macrotyloma uniflorum*
9	Asthma	*Saccharum officinarum*
10	Menstrual disorder	*Curcuma caesia*
11	Pneumonia	*Coccinia grandis*
12	Cough and cold	*Curcuma longa, Zingiber officinale*
13	Eye problem	*Abrus precatorius*

Rana et al. (2015) reported that root of *Berberis aristata* is taken to kill intestinal worms human by Gurung community of Kaski district where as Shrestha (2016) reported that the root of *Berberis aristata* is used for curing jaundice by Rai and Limbu in Sakhuwasabha district. *Berberis aristata*, which is used for eye problems, has widespread use as an extract in eye drops for conjunctivitis (Sabir & Bhide, 1971). Similarly, Thapa (2021) reported that the Sherpa community of Tapejung uses root juice of *Berberis aristata* to treat jaundice and typhoid. Malla and Gauchan (2015) reported that the Magar and Majhi community of Parbat used root juice to treat fever, dysentery, skin troubles and blood purification. Sigdel (2013) reported that the root juice can be used to treat eye diseases, fever and stomach problem. Some of the plants used by the peoples of Newar communities in Sindhupalchowk district have good evidence of effectiveness. Many of these species were previously reported to have phytochemical or pharmacological properties. For example, the use of *Acorus calamus* for throat problems is supported by other studies (Devkota et al., 1999; Shinwari & Khan, 2000) mentioning that the stem and rhizomes have antimicrobial properties.

Conclusion

The community has extensive traditional knowledge of medicinal plants, which is a valuable source of primary healthcare. Despite the availability of some allopathic medicines in government "health posts," most indigenous peoples rely on traditional local healers and Baidhya for primary health care. The peoples of Newar are skilled at using plants for medicinal purposes. Local healers (Baidhya) and older wise people were the most popular in the villages for using plant species for medicine. Likewise herbs were generally used for the treatment of diseases followed by tree, shrubs and climbers. Maximum plant species in the study area were used to treat gastrointestinal disorder followed by throat problems, headache and fever and blood pressure and sugar and leaves of the plants was mostly used for preparing ethno medicine in the study area. The highest number of plant was used to treat headache and fever. The elderly people were found to have more knowledge about ethno medicinal use of plants. However, young aged people were found to be less interested in traditional medicine practices. However there are not any initiatives taken for the conservation and promotion of ethnomedicinal knowledge.

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