Ethnobotanical knowledge of Kewrat community of Morang district, eastern Nepal

Bishnu Dev Das, Niroj Paudel, Megharaj Paudel, Madan Kumar Khadka, Sajita Dhakal and Amrit KC

Research

Abstract

Background: Nepal is very rich in castes, ethnic groups and languages that have their own traditional and ritual practices on health care system. Among them, Kewrat is a multilingual group of people living in eastern Terai region of Nepal and its adjoining part of Bihar and West Bengal of India. Their mother tongues are either *Surjapuri*, *Angika* or *Bengali*. Different studies on ethnobotany have been conducted in Nepal but the study on Kewrat community has not been conducted till the date and this study was conducted among the *Surjapuri* speaker of Kewrat community.

Methods: Ethnobotanical study using Ethnobotanical Participatory Appraisal (EPA) method was conducted at Sanbarish (Sunbarshi) municipalit of Morang district of Nepal. Interviews and group discussions were employed among *Surjapuri* speaking Kewrat people in Sunbarshi municipality ward number 4 (Kashijan), 5 (Ramanpur), 6 (Saranpur) and 7 (Bardanga) among 65 individuals including elderly people and traditional healers following the transect walk survey.

Results: A total of 60 medicinal plant species belonging to 37 families were reported based on their religious practices and believes from study area. Among them, 29 herbs (48%), 12 shrubs (20 %), 15 tree (25%) and 4 climbers (7 %) were recorded. Kewrat people are found to be very rich in ethnobotanical knowledge. The plants resources have been used by Kewrat people in treating 35 different types of ailments along with traditional uses in different ritual and religious occasions.

Conclusions: The people of *Surjapuri* speaker of Kewrat community have a very crucial knowledge of medicinal plants. The study has documented the baseline data for further studies in the field of ethnobotany, medicinal plants and diversity. The ethnobotanical knowledge of Kewrat people is based on strong belief system and custom. They depend mostly on plant resources for curing ailments. This study suggests that the indigenous community of Kewrat has an in-depth knowledge of use of local plant resources.

Keywords: Ailments, Indigenous knowledge, Kewrat community, Medicinal plant, Plant diversity, Surjapuri language, Traditional use.

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Background

Globally, different ethnic groups have been practicing traditional means of health care by using medicinal plants (Sheng-Ji 2001). It was also estimated that about 80% of Asian and African populations use traditional medicine for their healthcare needs (WHO 2008). Mostly the indigenous people who live in rural areas, the people depend on traditional practices of health care system using medicinal plants since long time ago (Manandhar 1993, Thorsen & Pouliot 2015).

The term ethnobotany was probably first coined as a term in 1895 by one of the Florida's early botanists, John W. Harshberger. He described ethnobotany as the study of the interaction between people, plants, and culture (Harshberger 1896). It refers to studies that explore the reciprocal relationship among plants, people and traditions (Cotton 1996).The study of ethnobotany, thus, may go far in explaining and predicting patterns and processes of the plant people relationship through the use of ecological theories, methods and analyses applied to questions within ethnoecology and ethnobotany (Albuquerque & Lucena 2005).Thus ethnobotany is an interdisciplinary science, involving knowledge and use of plants and their ecology in the context of their cultural, social and economic significance. It is the study of interactions between people and plants at spatial, temporal, historical and cross-cultural scales, particularly the role of plants in human culture, how humans have used and modified plants, and how they represent them in their systems of knowledge (Austin 2004).

There are 125 caste/ethnic groups, 123 languages and 10 religious groups in Nepal (CBS 2011).There are many studies related to medicinal plants and associated indigenous knowledge in Nepal have been Nepal carried out (Rai 2004, Luitel *et al.* 2014, Malla*et al.* 2015, Paudel *et al*. 2017,Bhattarai 2018, Paude l*et al*. 2018a, 2018b).
Various studies have been conducted in the field of applications of plant resources such as Rai (2004) reported 64 plant species used by Meche people from Jhapa district, Luitel *et al*. (2014) reported a total of 161 plant species belonging to 86 families and 144 genera to cure 89 human ailments used by the Tamang community in the Makawanpur district of central Nepal. Malla *et al.*(2015) documented a total of 132 ethnomedicinal plant species belonging to 99 genera and 67 families used by ethnic people in Parbat district of western Nepal, Paudel *et al*. (2017) reported more than 25 species of medicinal plants out of 95 documented plant species from Arghakhnachi district of western Nepal, Bhattarai (2018) explored 30 plants from 24 families and 29 genera used by Thami community from Ilam district of eastern Nepal, Paudel *et al*. (2018a) reported 12 medicinal plants from Kathmandu valley of central Nepal, and also Paudel *et al*. (2018b) explored 32 medicinal plants from Biratnagar of eastern Nepal.

Nepal is rich in both socio-cultural and biological diversity due to having its unique geography and climatic variations. There are 125 caste/ethnic groups, 123 languages and 10 religious groups in Nepal (CBS 2011).In recent years, there are many studies related to medicinal plants and associated indigenous knowledge in Nepal have been carried out (Rai 2004, Luitel *et al.* 2014, Malla *et al.* 2015, Paudel *et al*. 2017,Bhattarai 2018, Paudel *et al*. 2018a, 2018b) but there is no any ethnobotanical documentation has occurred in Kewrat group till the date. Therefore, this study has been designed to document the ethnobotanical knowledge of Kewrat community of Surjapuri language speaker and also to explore the plant diversity of the study area.

Materials and Methods

Study area

There are varieties of plant species and different part used by Kewrat community in healing the different ailments. The traditional healers believed that medicinal plants should be collected only during specific day and time silently during the collection. During the collection, we should pray for the specific goddess with Mantra to activate the plant for particular function, otherwise the plant won't work as medicine. It is believed and found in practice that after recovery, patient should sacrifice goat, duck or pigeon or offer banana and milk according to the requirements of specific goddess. Thus, it can be concluded that the ethnobotanical knowledge of Kewrat people is based on strong belief system and custom.

Morang district is situated in the south-east part of the Koshi zone and is geographically located between the latitudes $26^0$20'N to $26^0$53'N and longitudes $87^0$16'E to $87^0$41'E.It has a total area of 1,855 km^2 which is 1.26% of the total land area of Nepal. The lowest elevation point of the district is 60 meters and the highest is 2410 meters above sea level. The maximum temperature of the district is 42^0c and the minimum temperature is 3^0c and receives 1,812.8 mm rainfall annually. Morang has one metropolitan city (Biratnagar), eight municipalities and eight rural municipalities. The total area of Morang is 1,855 km^2.

The study was conducted in Sanbarish (Sunbarshi) municipality ward no 4 (Kashijan) and 5 (Ramanpur), 6 (Saranpur) and 7 (Bardanga) of Morang district were selected due to the presence of high Kewrat populated area (Fig. 1).The municipality is divided

into 9 wards and total area is 106.4 km^2 and the population of the municipality is 50758, according to the census of Nepal in 2011. The Sunabarshi Municipality name was given from oldest Sunabarshi Maharajthan (divine king of the area). The study area is located between 26.45^0 N to 87.54^0 E. Climatically the study area is tropical and a part of Terai region. The total number of Kewrat population is about 15,000 in study area.

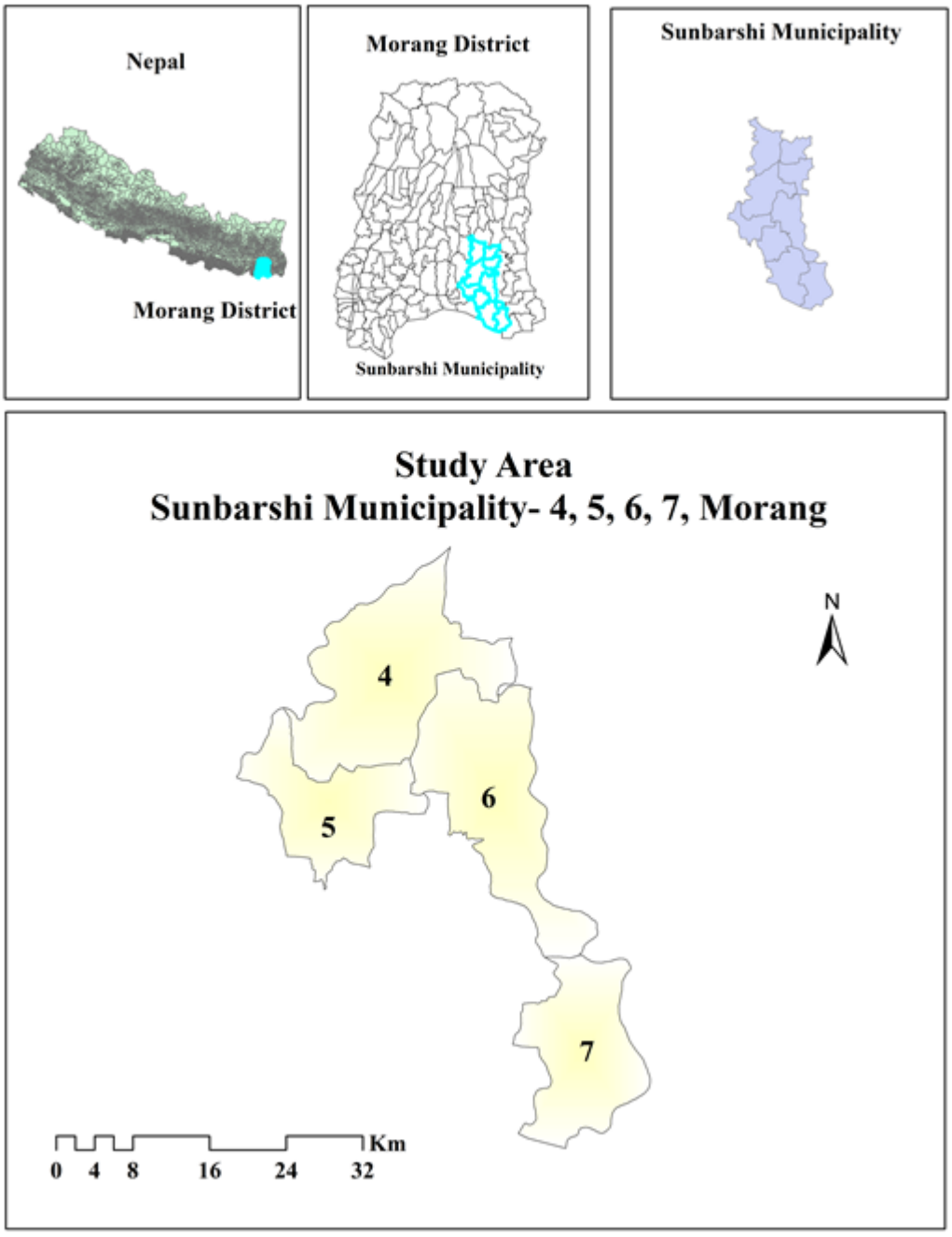

Figure1. Map of study area

Field Methods and data collection

During the period of January 2019 to March 2020, field work investigation was carried out to formulate the ethnobotanical information and their medicinal verification in the study area. Participatory Rural Appraisal (PRA) technique (Bazai *et al*. 2013) was applied to get information from the local people about the knowledge of different uses of plant species, location, and place of availability and category of uses. The Interviews were taken with 40 men and 25 women from different villages that have a strong linkage and experience with folk medicine practices. This interview technique employed questionnaire

about the use of plant for different purposes like medicine, food, fodder, timber, firewood etc. Similarly, old aged and professional health healers (locally called Dhami or Ojha) of Kewrat community were gathered and asked for use of plants for different purposes like medical, social, and cultural uses and other used such food, fodder, fuel, fiber, timber etc. Survey was carried out along the home gardens, roadsides and agriculture fields with the help of key informants. The plant specimens were collected by the help of local people. During the collection, field notes on taxonomic characters such as location, habit, habitat, color of flower and period of flowering and fruiting were noted for identification. The collected specimens were properly tagged with field number before keeping them in polythene bags.

The collected specimens were used for the preparation of herbarium specimens by pressing in between newspapers and dried by using standard technique (Jain & Rao 1967) and identified using literature (Polunin & Stainton 1984, Press *et al.* 2000, Manandhar 2002). Local names of the medicinal plants were noted in the field. Voucher specimens were deposited at the Department of Botany, Mahendra Morang Aadarsh Multiple Campus Biratnagar (Tribhuvan University), Nepal.

Results and Discussions

A total of 60 different plant species belonging to 37 families were reported (Table 1) based on their religious practices and believes from study area comprising 22 wild species and 38 cultivated. Among them, 29 herbs (48%), 12 shrubs (20 %), 15 tree (25%) and 4 climbers (7 %) were recorded (Fig. 2). The leaves and stem of *Juniperus indica* Bertol were bought from market or collected from hill sides and commonly stored for medicinal as well as spiritual uses in different ritual ceremonies specially for its pleasant aroma. The plants resources have been used by Kewrat people in different 35 types of ailments such as fever, pneumonia, toothache, fever, burn, diabetic, indigestion, skin diseases, jaundice, cough, cold, anxiety, sleeplessness, eczema, dysentery, diarrhea, vitiligo, arthritis, common colds, tonsillitis, high blood pressure, mental disorders, meditation, piles, abdominal pain, leprosy, lice, nausea, ,vomiting, gastric, wounds and cuts, appetizer, eye swelling, rheumatism and constipation along with traditional uses in different ritual and religious occasions (Table 1). The overall results showed that the people of Kewrat community have very rich in ethnobotanical knowledge.

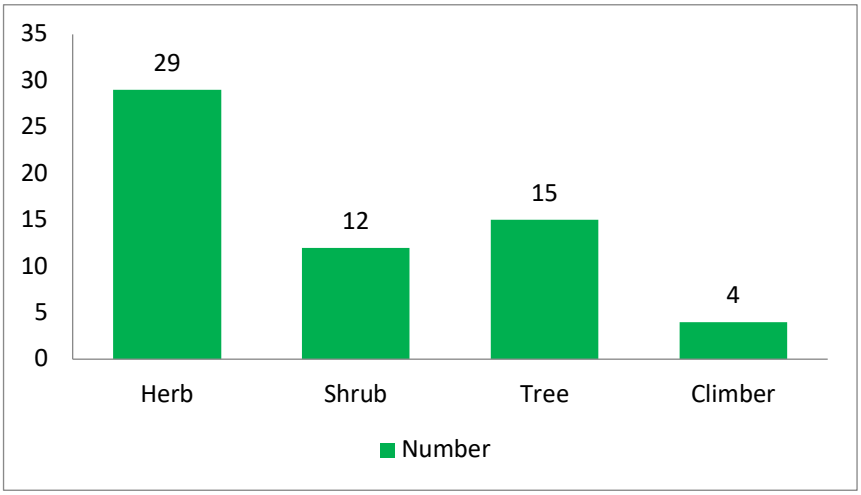

Figure 2. Habit of studied plants

Application of medicinal plant species in the treatment of in various 35 ailments in different forms shows that people of the Kewrat community have indigenous knowledge in the field of treatment. The most commonly used plant species is Acorus *calamus* L in the treatment of cough, cold and sore throat. Similarly, *Azadirachta indica* and *Aloe vera* (L.) Burm. f. were also found to be used frequently throughout the study. The application of a small branch of *Ziziphus xylopyrus* (Retz.) Wild in the main gate of house is supposed to be protecting the newly borne baby and mother from devil eyes.

Out of medicinal applications, some other interesting applications are also investigated during the study. The fresh shoots and corms of *Colocasia esculenta* (L.) Schott are cooked as vegetables and leaves are used to prepare a special traditional dish called 'Darkach'. The tree of *Ficus religiosa* L. is of great religious value and is worshipped with water on Saturday morning. Straw of *Oryza sativa* L is good sources of fodder and flour prepared from rice grains is used to prepare cultural dishes such as pittha/bagiya, Bhakka and roti (bread) etc.

Table1. List of documented plant species with their various application (N=Nepali name, S= Surjapuri name, V=Voucher number)

Scientific name	Family	Local name (S)	Habit	Part Used	Ailments	Mode of application
Abelmoschus esculentus L. (V=11)	Malvaceae	Ramtoriya(N); Ramtarai(S)	Herb	Fruits, stem	Urinary problems, constipation	Fruits are eaten as vegetables (curry) to cure urinary problems and constipation.
Achyranthes aspera L. (V=18)	Amaranthaceae	Datiwan (N); Chichiri (S)	Herb	Root, stem	Fever, Pneumonia toothache	A decoction of plant is applied Stem is used as toothbrush.
Acorus calamus L. (V= 1)	Acoraceae	Bojo (N), Banchwa (S)	Herb	Rhizome	Cough, cold, sore throat	Small piece of dried rhizome is chewed thrice a day until recovery.
Allium sativum L. (V=26)	Amaryllidaceae	Lasun(N); Rosun (S)	Herb	Leaves, bulb	Fever, and cough, high	Raw bulb or paste (3-5)is used have once a day for a week.
Aloe vera(L.) Burm.f. (V=41)	Asphodelaceae	Ghiyu kumari (N; S)	Herb	Leaf	Pimples, high blood pressure, constipation	Leaf pulp is applied to cure pimples twice a day for a week. Pulp juice is used to drink twice a day for a week to cure constipation and high blood pressure
Annona squamosa L. (V=43)	Annonaceae	Sarifa(N); Sarfa(S)	Tree	Ripen fruit	Indigestion	Ripen fruits are eaten to cure indigestion.
Artocarpus heterophyllus Lam. (V=25)	Moraceae	Rukhkatahar (N);Dahuwa(S)	Tree	Leaf, fruit	Skin diseases and dysentery	Leaf paste is used for skin diseases. Fresh ripen fruits or a decoction of is used to treat dysentery
Azadirachta indica A.Juss (V=28)	Meliaceae	Neem(N;S)	Tree	Leaf, stem	Skin diseases,toothache	Leaves are boiled in water for 10 minutes and get a th after cooling. Stem is used as toothbrush.
Cajanus cajan (L.) Huth (V=27)	Fabaceae	Rahar (N); Lahir(S)	Shrub	Leaf,	Jaundice, cough and cold and diarrhea	Leaf juices and seeds are cooked as soup called as ‘daal to cure.
Cannabis sativa L. (V=44)	Cannabaceae	Bhang (N; S)	Herb	Leaf	Anxiety, sleeplessness	Juice extracted from 3-5 leavesis used to have once a day for 2 weeks.
*Carica papaya*L. (V=2)	Caricaceae	Meba (N); Popita(S)	Shrub	Leaf, fruits	Eczema	Leaf latex is used to treat eczema
Citrus aurantifolia (Christ.) Swingle (V=17)	Rutaceae	Kagati (N); Kajjinemu (S)	Shrub	Fruits	Indigestion, vitiligo	Fruit juice with hot water is used to take twice a day. Fruit juice with Sodium thio-sulphate ($Na_2S_2O_3$) is applied on infected part once a day exposing in sunlight for half an hour for 15 days to cure white spots on skin (vitiligo)

Clerodendrum viscosum Vent (V=45)	Lamiaceae	Bhant (N/S)	Herb	Leaves, root	Skin disease	Root and leaf paste is used to cure skin disease. Stem is used as toothbrush.
Colocasia esculanta (L.) Schott (V=40)	Araceae	Pindalu (N); Kachu aalu(S)	Herb	Leaf, petiole, corm	Cuts and wounds	The watery substance from petiole is applied to cure cuts and wounds.
Cucurbita maxima Duch. Ex Poiret (V=3)	Cucurbitaceae	Pharsi(N), Kadma(S)	Climber	Leaf, fruits	Indigestion	Roasted ripen seeds are eaten to cure indigestion. Raw leaves and fruits are eaten as vegetables.
Curcuma longa L. (V=29)	Zingiberaceae	Besar (N); Haldi(S)	Herb	Rhizome	Arthritis, cough, common colds and tonsillitis.	A decoction of rhizomes powder with hot milk is used twice a day to cure.
Cynodon dactylon (L.) Pers. (V=52)	Poaceae	Dubo (N); Dubri (S)	Herb	Stem, leaf	Cold and cough	A decoction of stem is used to cure cold and cough.
Datura metel L. (V=10)	Solanaceae	Daturo (N); Dhutra (S)	Shrub	Leaf, fruit	Cough and cold,	A therapy is given applying ghee (clarified cow butter or mustard oil) over the chest of child through leaf applying mild heat.
Dendrocalamus strictus (Roxb.) Nees (V=39)	*Poaceae*	Choyabans (N); Bans (S)	Herb	Stem	Cuts and wounds	Powder of epidermal green layer of stem is applied to cure cut and wounds
Elaeocarpus sphaericus (Gaertn.) K. Schum. (V=30)	Elaeocarpaceae	Rudraksha(N); Rudraksha(S)	Tree	Fruit	High blood pressure, mental disorders, meditation	Fruits juice is useful to cure high blood pressure and mental disorders.
Eulaliopsis binata (Retzius) C.E.Hubbard (V=4)	Poaceae	Babiyo(N); Iluwa(S)	Herb	Leaf	Indigestion	Plant leaves are used to feed to cattle to cure indigestion.
Ficus benghalensis L. (V=31)	Moraceae	Bar(N/S)	Tree	Stem	Dysentery, diarrhea and diabetes, toothache.	Bark decoction is used to cure dysentery, diarrhea and diabetes. Latex is applied to cure pains, rheumatism and toothache.
Ficus glaberima Blume (V=32)	Moraceae	Pakhuri (N); Pakhar (S)	Tree	Fruit, stem	Jaundice	The past of tree bark with the bark of Mango is applied on the skin the presence of sunlight to cure jaundice
Ficus religiosa L. (V=46)	Moraceae	Peepal (N/S)	Tree	Leaf, stem	Jaundice	The past of tree bark with the bark of Mango is applied on the skin the presence of sunlight to cure jaundice

Juniperus indica Bertol (V=48)	Cupressaceae	Dhupee (N);Dhuman(S)	Tree	Leaf	Diarrhea, piles, abdominal pain,	Leaf juice is used to cure twice a day for 15 days.
Lablab purpureus (L.) Sweet. (V=51)	Fabaceae	Hiundesimi (N); Puthiya (S)	Climber	Leaf	Skin diseases	Leaf juice is applied to cure skin diseases. The plant is used as fodder.
Lagenaria siceraria (Molina) Standley (V=5)	Cucurbitaceae	Lauka (N); Kaddu (S)	Climber	Fruits	Indigestion	Fruits juice is used to cure indigestion.
Lawsonia inermis L. (V=6)	Lythraceae	Mehandi (N/S)	Shrub	Leaf	Skin diseases	Leaf paste is applied to cure skin diseases. Leaf paste with khair (*Senegalia catechu*)
Leucas aspera (Willd.) Link (V=47)	Lamiaceae	Dunphi (S)	Herb	Leaf, flowers	Fever, rheumatism	Decoction of leaves is used for treatment.
Madhuca longifolia (Koeing) Machr. (V=33)	Sapotaceae	Mahuwa(N; S)	Tree	Stem,	Diabetes, cough and cold	Decoction of the bark is given to cure diabetes. A decoction of flower is about 4 teaspoonfuls thrice a day is given to cure cough and cold.
Mangifera indica L. (V=9)	Anacardiaceae	Aanp(N); Aanm(S)	Tree	Bark	Jaundice	Paste prepared is applied on skin of hole body in sunlight
Melia azedarach L. (V=7)	Melaceae	Bakaino (N); Bakaina(S)	Tree	Leaf	Leprosy, skin diseases, lice	Bark juice is used to cure leprosy and skin diseases. Decoction made from fruits and flowers is used to kill lice. Leaves are used as fodder.
Mentha spicata L. (V= 49)	Lamiaceae	Pudina (N; S)	Shrub	Leaf,	Nausea, diarrhea, dysentery, vomiting and gastric	Leaf juice is given twice a day for a week for better result. Leaves are also used to prepare pickle.
Momordica charantia L. (V=34)	Cucurbitaceae	Karela (N); Karla (S)	Climber	Leaf, fruits	Eczema., high blood pressure	The leaf juice is used to cure skin diseases like eczema. The fruits are used to cure high blood pressure.
Moringa oleifera Lam. (V=50)	Moringaceae	Sajiun (N/S)	Shrub	Fruits	Indigestion	The soup prepared from leaves or fruits is applied to cure indigestion.
Morus macroura Miq. (V=15)	Moraceae	Kimbu (N); Toot (S)	Shrub	Stem, fruits	Wounds and cuts,	Bark juice is applied to cure cuts and wounds. Fruits eaten to cure fever and sore throat.
Musa acuminata Colla (V=35)	Musaceae	Kera (N); Malbhog Kela (S)	Herb	Leaves, fruit	Indigestion	Ripen fruits are applied applied to cure indigestion.
Musa balbisiana Colla (V=53)	Musaceae	Kera (N); Athiya Kela (S)	Herb	Root, Fruits	Stomach disorder	Ripen fruits are eaten to cure stomachic disorder

Nelumbo nucifera Gaertn. (V=8)	Nelumbonaceae	Kamal (N); Chakha Hela (S)	Herb	Tubers, rhizome, leaf	Indigestion	Tubers and rhizomes are boiled and eaten as food to cure indigestion.
Nyctanthes arbor-tristis L. (V=55)	Oleaceae	Parijat (N; S)	Shrub	Leaf	Diabetic, high blood pressure	Decoction of is used once a day to cure diabetic and high blood pressure
Nymphaea nouchali Burm. f. (V=16)	Nymphaeaceae	Kamal (N); Hela (S)	Herb	Tubers, rhizome	Indigestion	Tubers and rhizomes are boiled and eat as food to cure indigestion
Ocimum tenuiflorum L. (V=19)	Lamiaceae	Tulsi (N; S)	Herb	Leaf	Common cold, indigestion	A decoction of leaf is with ginger is given thrice a day
Oryza sativa L. (V=54)	Poaceae	Dhan (N; S)	Herb	Leaf, fruits	Indigestion, dysentery	Steamed and boiled rice grains are given to cure indigestion and dysentery.
Oxalis comiculata L. (V=59)	Oxalidaceae	Chari amilo (N); Amliya khatta (S)	Herb	Leaf	Indigestion	Leaf decoction is applied to cure indigestion.
Phoenix sylvestris L (V=14).	Arecaceae	Khajur (N; S)	Shrub	Juice	Indigestion, appetizer	The juice technically extracted from the stem of the plant called 'Tari' is very nutritious drink and used to cure the stomachic disorder.
Psidium guajava L. (V=24)	Myrtaceae	'Bilati' (N).	Shrub	Leaf, fruits	Dysentery, toothache	Leaf juice is used to cure dysentery. Leaf paste is applied for rheumatism, cuts and wounds. Leaf buds are chewed to cure toothache.
Saccharum officinarum L (V=36)	Poaceae	Ukhu (N); Kusiyar (S)	Herb	Stem juice	Indigestion, jaundice	Stem juice is used to treat indigestion and jaundice.
Solanum melongena L (V=23)	Solanaceae	Bhanta(N); Began (S)	Herb	Fruits	Cough and cold, skin diseases	A green fruit is roasted and eaten to relieve cough and cold. Fruits are used to offer to Hindu lord 'Shiva' with praying to cure skin diseases.
Swertia angustifolia Buch.–Ham.ex D.Don. (V=37)	Gentianaceae	Chiraito' (N); Chirato (S)	Herb	Root, leaf	High blood pressure, indigestion,	Decoction of whole plants is used to cure high blood pressure, cough and cold.
Syzygium cumini (L) Skeels (V=20)	Myrtaceae	Jamun (N; S)	Tree	Leaf, fruits, stem	Dysentery, diabetes.	Decoction of bark or leaf (20 ml) is drunk twice a day for five days to cure dysentery. Fruits are eaten to cure diabetes.
Tagetes erecta L. (V=60)	Asteraceae	Sayapatri (N); Gena (S)	Herb	Leaf, flowers	Pneumonia,	Leaf juice (half cup) is used twice a day for five days to cure pneumonia.
Tamarindus indica L (V=13)	Fabaceae	Titri(N); Tetul (S)	Tree	Fruits,	Indigestion, stomachache	Paste of three seeds is eaten to cure stomachache.

Terminalia bellirica (Gaertn.) Roxb. (V=58)	Combretaceae	Barro (N)	Tree	Fruits	Constipation gastric	Four fruits are powdered and it is drunk with cold water to get relief from constipation and gastric
Terminalia chebula Retz. (V=22)	Combretaceae	Harro (N); Hartikka (S)	Tree	Fruits	Constipation, gastric	Decoction of fruits is drunk everyday for gastric and indigestion till recovery.
Triticum aestivum L. V=56)	Poaceae	Gahun (N); Gaham(S)	Herb	Grains,	Indigestion, diabetes, fever, cold and cough	The bread prepared from wheat flour is used to eat as food articles to cure indigestion, diabetes, fever, cold and cough.
Typha angustifolia L. (V=42)	Typhaceae	Pater (N; S)	Herb	Leaf	Jaundice	Root decoction is applied to cure jaundice.
Urena lobata L. (V=38)	Malvaceae	Bhere jhar (N)	Herb	Leaf ,	Skin infection and eczema	Young leaves with aerial part of *Drymaria cordata* are pasted and applied for skin infection and eczema
Vigna mungo (L.) Hepper. (V=57)	Fabaceae	Mas (N); Maskalai(S)	Herb	Fruits	Indigestion, dysentery	The soup prepared from seeds is applied to cure indigestion and dysentery.
Ziziphus xylopyrus (Retz.) Wild (V=12)	Rhamnaceae	Bayar (N); Bayeer (S)	Shrub	Leaves	Eye Swelling	Three fresh leaves are touched over the surface of swollen eye twice a day for 3 days to cure eye swelling.
Zea mays L. (V=21)	Poaceae	Makai (N); Makhai (S)	Herb	Fruits, leaf	Jaundice, indigestion	The bread prepared from maize grains is used as food during jaundice and indigestion

The traditional practices have become a minor source of income for traditional healers. This practice does not provide sufficient source of income and the new generation don't show any interest in this practice. Similarly, only the jobless and old aged few people having age above 40 were found to be involved in traditional practices and utilization of medicinal plants for social prestige and respect. Thus, there is need for commercialization of such an ethnobotanical knowledge for its preservation and elaboration otherwise this knowledge will be extinct from the society after few decades. Further, the research for ethnobotanical knowledge of other Kewrat community of Angika and Bengali mother tongue of Nepal will be very important for valuable information in this field.

This study can be compared with the various available literatures from Nepal, India and Pakistan. Such as Luitel *et al.* (2014) documented a total of 161 plant species belonging to 86 families and 144 genera to cure 89 human ailments used by the Tamang community in the Makawanpur district of central Nepal. Pradhan *et al*. (2020) documented a total of 139 plant species belonging to 74 families were found to have ethnobotanical significance among which herbs accounted for 41% followed by trees (29%), shrubs (14%), climbers (9%), grasses (3%), epiphytes (1%), ferns (1%), fungi (1%), and lichens (1%) from Khandadevi and Gokulganga Rural Municipality of Ramechhap District of Nepal. Rajbanshi and Thapa (2020) reported 40 species medicinal plants belonging to 32 families traditionally used by Kisan community of eastern Nepal for the treatment of 34 kinds of diseases. Bhatt, and. Kunwar.(2020) recorded 74 species of flowering plants at Bhimdatt-18, (Katan) Kanchanpur district of Far-Western Nepal. Similarly, Kumar *et al*. (2008) documented 20 important plant species used against various hair disorders, viz.: hair fall, dandruff and graying of hair etc. and as hair tonic by Tharu tribe from 46 villages of Devipatan division of U.P. India. Sher et al. (2020) found 53 medicinal plants of 38 genera, belonging to 25 families from Hindubag Mountain, Lalku valley, District Swat, Pakistan.

Conclusions

This study has documented the information of ethnobotanical knowledge among the people of Kewrat community and plant diversity of the study area. Out of 60 documented plant species during the study, *Acorus calamus* L., *Azadirachta indica* and *Aloe vera* (L.) Burm.f. were found to be the most popularly used in medicinal as well as cultural aspects. Their in-depth knowledge of application of medicinal plants should be preserved and promoted for the welfare of human kind. This study will also provide the baseline data for the further research in this field.

Declarations

List of abbreviations: Not applicable.

Ethics approval and consent to participate: The study was conducted by the permission oflocal non-governmental organization 'Surjapuri Language Development Academy', Sunbarshi municipality ward number 4, Morang district, Nepal.

Consent for publication: Not applicable.

Availability of data and materials: The data was not deposited in public repositories.

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