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Traditional Uses of Medicinal Plants by The Magar Community of Pokhara Metropolitan City

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ABSTRACT

Most people still widely use medicinal plants for their primary health care needs in Nepal. Ethnomedicinal studies play a key role in conserving traditional knowledge and its use. This current research was conducted to document the medicinal plants used by the Magar community for various disease ailments among the selected wards of Pokhara Metropolitan City. This study uses both primary and secondary data. The primary data were collected through field visits, group discussions, and interviews using a semi-structured questionnaire. Altogether 101 medicinal plant species belonging to 55 families and 89 genera have been recorded. The dominant family was Asteraceae having 9 species. Herbs (37 species) were the most used life form of the plant while rhizomes (33 species), were the most used plant part. The most favored mode of drug preparation was found to be paste form (31 species). The highest number of plants were used for gastrointestinal disorders. The indigenous knowledge of lesser-known plants is rapidly decreasing. Therefore, necessary efforts should be taken by the federal, provincial, and local governments for the conservation and sustainable use of medicinal plants.

Keywords: *Ailment, cultural heritage, ethnomedicine, floral diversity, folk practices, phytochemical*

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INTRODUCTION

Since the beginning of Human Civilization, plants, and plant products have been used by humans (Kunwar *et al.,* 2006) for various purposes like medicine, food, timber, firewood, oils, gums, etc. The science of the interaction of People with plants is called ethnobotany (Bennet, 2002). It deals with the documentation of knowledge about the practical use of plants especially by the indigenous group who have their ethnic knowledge of plant use. The term Ethnobotany was coined by John W. Hershberger in 1896 (Davis, 1995). Ethnomedicinal studies are a suitable source of knowledge regarding useful medicinal plants (Njoroge, 2004). Throughout history, many plants as medicine, remedies, and oils have been described with many bioactive natural products still being unidentified (Dias *et al.,* 2012).

In many developing countries, the local communities even today rely on plant-based medicines whereas even the modern system of well-being is mainly dependent on plant-based elements (Sristhi, 2009). Traditional medicine refers to the practices that have been followed culturally for generations, formed by the trial-and-error method for years.

Nepal is a magnificent repository of cultural heritage for diverse ethnic groups, and it has a rich tradition of folk practices for the utilization of wild plants (Manandhar, 1993). The interconnection between indigenous communities and biotic resources and their understanding of how to manage medicinal plant resources is attaining identification worldwide (Ghimire & Bastakoti, 2009). The belief that plants are safer than current synthetic drugs, easily attainable, provide a low-cost method of treatment and have reduced side effects than modern drugs might be the reason (Khan *et al.,* 2014).

The long-established ethnomedicinal knowledge of plants is slightly decreasing with modernization. Unsustainable collecting, not in accordance with any regulatory procedure or recognized management practices, has risked the survival of plants and reduced the quality of many herbs (Hasan *et al.,* 2013). Nepal's Government aims to elevate the use of medicinal plants and promote conservation programs for livelihood improvement and poverty alleviation through various policies (Sharma *et al.,* 2004).. Magars belong to Mongoloid race, having a traditional homeland in Western Nepal from the high-ranging Himalayan Hills and valleys to the plains of Terai, (Dutta, 2007), dominant in districts like Palpa, Rukum, Myagdi, Rolpa etc. (Acharya, 2021).

When indigenous knowledge is incorporated in scientific research, new hypothesis can be set up for the sustainable conservation of the resources (Henfrey, 2002). Even from the common documented species, the use for aliment can be different from place to place

so the comparisons among the report can give the diversity of use pattern among different communities and places. This research helps in understanding the uses of unknown plants as well as new uses of the plants that are already known. So, to conserve, record, and utilize the knowledge for the benefit of society, the ethnobotanical survey is important. The present work aims to document the traditional medicinal plant used for various ailments among Magar communities of selected wards in Pokhara Metropolitan City along with the local and scientific name, family, mode of use and administration, and use description.

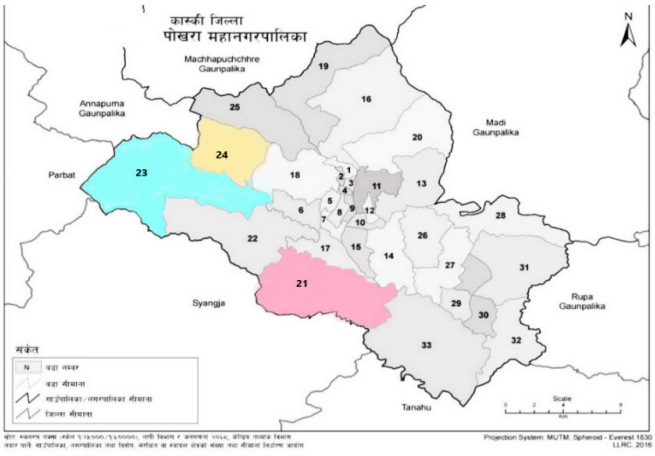
MATERIALS AND METHODS

The study was carried out among the selected Wards of Pokhara Metropolitan City, Ward no. 21, 23, and 24, Kaski District. Pokhara Metropolitan City has an average elevation of 822m above sea level. To the east is Madi and Rupa Rural Municipality, Parbat, Annapurna Rural Municipality, and Syangja District to the west. Syanja and Tanahu district are in the south and to the north are Machhapuchhre and Madi Rural Municipality (Figure 1).

The total area of Ward no. 21, 23, and 24 of Pokhara Metropolitan City is 35.9 km^2, 47.8 Km^2 and 18.5 km^2 respectively. The study area was selected because of its rich vegetation and an area with good residents of Magar Community. The five Magar villages i.e. Chilaune kharka, Dhurseni, Thuliswara from 21, Raikar Magar village from 23, and Chilimdada from 24 were mainly focused. According to the 2021 Nepal census, ward numbers 21, 23, and 24 have a population of 9070, 4276 and 5950 respectively.

Figure 1

Map of Pokhara Metropolitan City (Source: PMC, 2018)



The primary data were collected through direct field visits, 2 group discussions with 5 person in each group, and interviews with semi-structured questionnaires in which participatory rural appraisal (PRA) like herbarium sample collection and rapid rural appraisal (RRA) tools like semi- structured questionaires and direct observation were used to acquire knowledge from local people regarding ethnomedicinal uses of plants in their surroundings. The information given by the informants was written down in a notebook. Photographs of most of the plants were taken from the field for easy identification. Plants were identified with the help of local people only. The herbarium specimens were prepared with the permission of concerned authority. Photos and herbarium specimens were compared with the established literatures, books, and websites for scientific names and reconfirmed with locals (Dutta, 2007; Adhikari *et al*., 2019; Bastakoti, 2019; Bhattarai, 2020).

RESULTS AND DISCUSSION

Informant Profile

A total of 35 Informants from the age of 25 to 85 years were interviewed for the study, among which 16 (46%) are female and 19 (54 %) are male. Among the total informants, 6% were illiterate, 52 % had a primary level, 34% had secondary and 8% people had a secondary level of education. The candidates were selected by snowball sampling method (Bastakoti,2019). The first person was precisely selected then the first candidate was asked to suggest the following name and so on.

Medicinal Uses and Floral Diversity

From the conducted research altogether 101 medicinal plant species belonging to 55 families and 89 genera have been recorded. The medicinal plant has been documented with botanical name, local Name, habitat, plant part used for medicine preparation, and use description. The mode of preparation and route of administration is also mentioned in the use description. Also, the use description that was found to be similar to another research is also mentioned. The Documented plant species are presented in the table below in alphabetical order of scientific name (Table 1).

Medicinal Plant Distribution Based on Family

Among the documented 55 families Asteraceae was the dominant family (nine species) followed by Lamiaceae (eight species), Fabaceae, Poaceae (five species each), Malvaceae, Moraceae

(four species each), Amaranthaceae, Apocynaceae, Euphorbiaceae, Menispermaceae, Rutaceae (three species each), Anacardiaceae, Convolvulaceae, Lauraceae, Myrtaceae, Pteridaceae, Rosaceae, Zingiberaceae (two species each) and remaining 36 families has one species each (Table 2).

Table 1

Documentation of medicinal plants with botanical name, local name, family, habitat and use description

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Abelmoschus manihot (L.)	Ban kapas	Malvaceae	Shrub	Root	The root is wetted for about 10-12 hrs. and taken orally (gel-like structure appears) to treat body heat and fever.
Abies spectabilis (D.Don) Mirb.	Gobre salla	Pinaceae	Tree	Bark	The bark is Dried, Powdered, and consumed to treat Rheumatoid - Arthritis.
Achyranthes aspera (L.)	Datiwan	Amaranthaceae	Herb	Stem/ root	The stem is used as a toothbrush to aid tooth-care.
Acmella calva (DC.) R.K. Jensen	Marathi	Asteraceae	Herb	Fruit	The infusion of fruit is gargled to cure a sore mouth or infection in the mouth.
Acmella oleracea (L.) R.K.Jansen	Marathi	Asteraceae	Herb	Root and flower	The decoction is made of root and gargle for throat pain. The Flower of a plant is chewed for tooth-ache problems.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Acorus calamus (L.)	Bojho	Acoraceae	Herb	Rhizome	The rhizoid is chewed to cure cough, cold, and throat problems (tonsilitis).
Adhatoda vasica Nees.	Asuro	Acanthaceae	Shrub	Leaf	The stream of leaves is taken for sinusitis and breathing problems. It was also used during coronavirus epidemics.
Aegle marmelos (L.) Correa	Bel	Rutaceae	Tree	Fruits	The unripe fruit is eaten orally to treat Gastric, diarrhea, and indigestion.
Ageratina adenophora (Spreng). R.M. King & H.Rob.	Banmara	Asteraceae	Shrub	Leaf	The leaf paste is externally used to treat cuts and wounds.
Ageratum conyzoides (L.)	Ganne	Asteraceae	Herb	Leaf	The leave paste is applied externally on cuts and wounds.
Aleuritopteris bicolor (Roxb.) Fraser – Jenk	Rani sinki , Dankerno	Pteridaceae	Herb	Leaf	The paste of leaves is taken Orally for the treatment of gastric.
Aloe vera (L.) Burm	Ghiukumari	Asphodelaceae	Herb	Leaf	The gel of leaves is applied on the skin to reduce the burning sensation and cure wounds and cuts. The gel is taken orally for gastric and jaundice.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Amaranthus spinosus (L.)	Kande/lude	Amaranthaceae	Herb	Shoot and root	The decoction of the shoot improves digestion and root juice is used in urine problems.
Ananas comosus (L.) Merr.	Darae	Bromeliaceae	Herb	Fruit	The fruit is used to cure the hotness of the body.
Angiopteris helferiana C, Presl	Gaikhure	Marattiaceae	Herb	Rhizome	The Powdered form of rhizoid is taken to get relief from back pain, White vaginal discharge in women, and uterine fibroids and also makes the bone strong.
Artemisia indica (Willd.)	Titepati	Asteraceae	Shrub	Leaf	Externally the leaf paste is used for Scabies (luto). The leaf infusion is taken to open the throat.
Artocarpus lakoocha Roxb.	Badahar	Moraceae	Tree	Bark, Latex	The powder of bark is taken along with water for stomachache and Hernia. The latex is applied to the skin for cuts and wounds.
Azadirachta indica A. juss	Neem	Meliaceae	Tree	Leaf	The juice of leaves is taken to cure fever. The paste of leaves is applied externally to cure Skin disease and dandruff.
Bauhinia malabarica Roxb.	Tanki	Fabaceae	Tree	Bark	The bark decoction is taken to treat typhoid.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Bauhinia variegata (L.)	Koiralo	Fabaceae	Tree	Bark	The bark is boiled in water and given for the treatment of diarrhea and dysentery.
Belamcanda chinesis (L.)	Khadkadari	Iridaceae	Herb	Rhizome	The juice of root is used to treat liver problems and improve appetite.
Berberis aristata DC.	Chutro	Berberidaceae	Shrub	Root	The paste of the root is taken for the treatment of Diabetes.
Bidens pilosa (L.)	Kale kuro	Asteraceae	Herb	Leaf, Root	The paste of leaves is applied to cuts and wounds. The juice of the root is used to treat fever.
Bryophyllum pinnatum (Lam.) Oken.	Ajambbari	Crassulaceae	Herb	Leaf	The juice of leaves is put into the ear during earache. The infusion is made of its leaves (5 to 7 leaves in 1 liter water), kept till night, and drunk in the morning to treat kidney stones.
Callicarpa macrophylla (vahl.)	Dahigala / Dahichamle	Lamiaceae	Shrub	Root, fruit	The juice extracted from the root of the plant is taken orally to cure Fever, cough, and typhoid. The fruit is also eaten to reduce fever.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Carica papaya (L.)	Mewa	Caricaceae	Tree	Fruit, Latex	The ripe fruit is taken during jaundice. The latex coming from raw fruit is used in wounds.
Castanopsis indica (Roxb. Ex Lindl.)	Dhale katus	Fagaceae	Tree	Leaf and bark	A paste of leaves is applied for headaches. The bark is applied to the chest to control chest pain and taken orally for hernia.
Catharanthus roseus (L.) G.Don	Kuvija / Sagabaharful	Apocynaceae	Herb	Leaf and flower	The herbal tea made from the leaves and flowers of this plant is used to control Sugar levels in the blood. The flower of the plant is also used for skin treatment.
Centella asiatica (L.) Urb.	Ghodtapre	Apiaceae	Herb	Whole plant	The juice of the plant is taken orally to treat typhoid, asthma, Skin disease, cough, and fever.
Cheilanthes albomarginata C.B. Clarke	Dankerno	Pteridaceae	Herb	Whole part	The juice of the rhizome is used to treat peptic ulcers. The leaf juice is used for Gastric.
Chenopodium album (L.)	Bethe ko saag	Amaranthaceae	Herb	Seed	Puwa is made with a mixture of seed and anadi rice, which is used to cure Gastric problems.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Cinnamomum tamala (Buch. – ham.)	Dalchini	Lauraceae	Tree	Leaf	The leaf of the tree is boiled in tea and taken to cure cough and cold.
Cirsium verutum (D. Don) Spreng.	Thakali kanda	Asteraceae	Herb	Root	The juice of the root is taken to treat Gastric problems.
Cissampelos pareira (L.)	Batulpate Batulpate ??	Menispermaceae	Climber	Rhizome	The powder form of the rhizome is taken along with warm water for good digestion and hernia problems.
Cissus javana DC.	Jogi lahara	Vitaceae	Climber	Root	The root of the plant is dried, powdered, and used by pregnant women during child delivery.
Citrus aurantifolia (Cheistm.) Swingle	Kagati	Rutaceae	Tree	Fruit	The juice of citrus is mixed with water and taken orally to relieve heat stress.
Citrus medica (L.)	Bimiro	Rutaceae	Tree	Root	The root of the bimiro plant is powdered, dried, and consumed to cure constipation. When mixed with the powdered root of the *Morus alba* plant, used to cure intestinal worms.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Cleistocalyx operculatus (Roxb.) Merr. & Perry	Kyamuno	Myrtaceae	Tree	Leaf, Fruit, Bark	It is used for the treatment of Headaches, sinusitis, and throat pain.
Coix lacryma - jobi (L.)	Virkamli	Poaceae	Herb	Seed and root	The paste of the root is taken to stop diarrhea and typhoid.
Colebrookea oppositifolia Sm.	Dhurseli	Lamiaceae	Shrub	Leaf	The juice of Plant leaves is added to the eye for corneal scar problems.
Costus speciosus (J. Koenig) C. Specht	Betlauri	Costaceae	Shrub	Rhizome	The bark paste is used for fever.
Crateva unilocularis Buch. – Ham.	Siplikan	Capparaceae	Tree	Shoots	The young shoots are cooked as curry, it is used for the treatment of diabetes.
Cucurbita maxima Duchesne	Farsi	Cucurbitaceae	Climber	Fruit	The fruit is taken as a vegetable, it is used for the treatment of jaundice.
Cucurma caesia Roxb.	Kalo haledo	Zingiberaceae	Shrub	Rhizome	The juice of rhizome is taken for remedy of anorexia problem.
Cuscuta reflexa Roxb.	Akashbeli	Convolvulaceae	Climber	Whole part	Paste of the plant is applied to relieve back pain. Plant juice is given to treat jaundice and fever.
Cymbopogon citratus (DC.) Stapf	Lemon grass	Poaceae	Herb	Leaf	The infusion of the leaves is taken to cure colds and coughs.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Cynodon dactylon (L.) Pers.	Dubo	Poaceae	Herb	Leaf	The juice of leaves is used to treat Diarrhea, good sleep, and anorexia problems.
Dendrocalamus hemiltonii Nees & Arn. ex-Munro	Baans	Poaceae	Tree	Root/ Rhizome	The paste of rhizome is applied on wounds. Drinking water inside the bamboo stem helps with smooth urination.
Dischidia bengalensis Colebr.	Thirjo	Apocynaceae	Climber	Whole part	The plant is dried, Powdered, and mixed with puwa for the treatment of back pain. It is also good for pregnant women.
Drymaria diandra Blume	Abhijalo	Caryophyllaceae	Herb	Whole plant	The stream of leaves is taken for sinusitis problems, Hernia, Fever, and Common cold.
Drynaria quercifolia (L.) J.Sm.	Kammaru	Polypodiaceae	Herb	Rhizome	The rhizome is Dried, Powdered, and consumed to treat back pain, and bone fracture. It is also used by mixing with Powdered *Dischidia bengalensis* and anadi rice.
Duchesnea indica (Andrews.) Focke.	Bhui kafal	Rosaceae	Herb	Leaf	The paste of leaves is applied externally in burns and boils.
Eclipta prostrata (L.) L.	Bhringeraj	Asteraceae	Herb	Leaf	The paste of the leaf is applied to cuts and wounds.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Erythrina stricta Roxb.	Faledo	Fabaceae	Tree	Bark	The powdered bark is mixed with water and taken to cure stomachache, typhoid, and fever.
Euphorbia hirta (L.)	Dudilo jhar Lalupate	Euphorbiaceae	Herb	Leaf	The paste of leaves is used for treatment against piles, asthma, and ulcers. It is also applied externally in wounds and cuts.
Euphorbia royleana Boiss.	Siudi	Euphorbiaceae	Shrub	Stem, leaf	The flesh inside the leaf is used for skin allergy and for pressure but shouldn't be consumed anymore. It is also used to treat constipation problems.
Ficus racemose (L.)	Dhumre	Moraceae	Tree	Root	The water coming from the root is taken to cure fever and a burning sensation in urine.
Ficus semicordata Buch. Ex J.E. Smith	Khaniyo	Moraceae	Tree	Root	The water coming from the root is collected, mixed with rock sugar, and taken on an empty stomach. It helps to control body heat, Stomach burning, and anorexia.
Hibiscus rosa sinensis (L.)	Barhamasaful	Malvaceae	Shrub	Leaf	The leaf paste of this plant is used orally to reduce heat stress.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Kaempferia rotunda (L.)	Bhuin Champa	Zingiberaceae	Herb	Rhizome	The paste of rhizome is applied (layered) during fracture.
Lepidium sativum (L.)	Chamsur	Brassicaceae	Herb	Seed	The seed of the chamsur plant is boiled with milk and consumed to cure back pain and muscle pain. The mixture of Chamsur seed, *Anethum graveolens* (Soaf) seed, and *Thymes vulgaris* (Jwano) seed is consumed during pregnancy.
Litsea chinensis	Rukh Hadchur	Lauraceae	Tree	Bark	The bark of the plant is Powdered, cooked with Puwa of rice flour, and consumed for the remedy of back pain and Fracture.
Macaranga pustalata King ex Hook. F.	Malleto	Euphorbiaceae	Tree	Leaf	The leaves paste is applied externally to treat boils and wounds.
Malvaviscus arboreus Cav.	Baramaseful	Malvaceae	Shrub	Leaf	The leaf decoction is orally used for Diarrhea. Also, the young shoot is applied externally for boils and fever.
Mangifera indica (L.)	Aanp	Anacardiaceae	Tree	Bark	The bark is used to cure dysentery and other stomach problems.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Mentha longifolia (L.) Huds.	Vix jhar	Lamiaceae	Herb	Leaf	The vapour coming from leaf decoction is inhaled for treatment of the common cold.
Mentha spicata (L.)	Pudina	Lamiaceae	Herb	Whole plant	The leaves of Mentha are taken to reduce body heat, jaundice, and anorexia problems.
Mimosa pudica (L.)	Lajjawati	Fabaceae	Herb	Root	The root paste is applied to treat fractures of the bone.
Mimosa rubicaulis Lam.	Aaurelu	Fabaceae	Shrub	Root	The paste of the root is applied during bone fracture and back pain.
Morus alba (L.)	Kyu kafal , Kimbu	Moraceae	Tree	Root	The root of the plant is wetted with water and infusion is made. It is used for the remedy of intestinal worms.
Musa paradisiaca (L.)	Kera	Musaceae	Tree	Unripe fruit	The unripe fruit of bananas is used to treat dysentery and diarrhea.
Mussaendra macrophylla Wall.	Dhobyani	Rubiaceae	Shrub	Root	The root powder of this plant is used to treat typhoid, anorexia, cough, and cold.
Nephrolepis cordifolia (L.)	Pani amala	Nephrolepidaceae	Herb	Tuber	The fruit of the plant is consumed to cure diabetes, Cough, Fever, and Indigestion.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Ocimum basilium (L.)	Bawari	Lamiaceae	Shrub	Seed	The seed is soaked in water, mixed with misri, and consumed to relieve body heat.
Ocimum tenuiflorum (L.)	Tulsi	Lamiaceae	Herb	Leaf	The infusion of leaves is used to treat colds, fever, sore throat, and cough.
Oxalis corniculata (L.)	Chari amilo	Oxalodaceae	Herb	Leaf	The plant is used to cure stomach problems like indigestion.
Periploca calophylla (Wight) Falc.	Chautejor	Apocynaceae	Climber	Root	The Root of a plant is used to cure Back pain and Fracture.
Phyllanthus emblica (L.)	Amala	Phyllanthaceae	Tree	Fruit	The fruit is consumed to treat Cough, cold and indigestion.
Piper chaba Hunter	Chabo	Piperaceae	Climber	Fruit	The powdered form of the plant is used to treat Cough.
Plumeria rubra (L.)	Galaicha	Dogbane	Tree	Bark	The Powder form of bark is taken during fever.
Pogostemon benghalensis (Burm.f.) Kuntze	Rudilo	Lamiaceae	Shrub	Leaf	The decoction of leaves is used to treat fever (up to 2 yrs. old child), cold, and breathing problems.
Poranopsis paniculata (Roxb.) Roberty	Sikhari laharo	Convolvulaceae	Climber	Stem/ Bark	The bark of the plant is used to cure fractures and sprains.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Portylaca oleracea (L.)	Nundhike	Portulacaceae	Herb	Leaf	The decoction of stem bark is used to treat Diarrhea, Dysentery, and gastric.
Premna obtusifolia R. Br.	Gineri	Verbenaceae	Shrub	Bark	The bark juice has the medicinal quality to cure fever.
Psidium guajava (L.)	Belauti	Myrtaceae	Tree	Bark and leaf	The paste of the bark and leaf is taken to treat diarrhea, dysentery, and hernia.
*Punica granatum (*L.)	Anar	Punicaceae	Tree	Fruit Exocarp	The exocarp of Fruit is used to treat diarrhea and dysentery.
Rhus chinensis Mill.	Bhaikimlo	Anacardiaceae	Tree	Fruit	The fruit of the tree is taken to cure Diarrhea.
Rubus ellipticus Smith	Aiselu	Rosaceae	Shrub	Fruit	The ripe fruit is eaten which helps to cure cough, cold, and fever.
Saccharum officinarum (L.)	Ukhu	Poaceae	Shrub	Stem	The juice of the stem is taken internally for jaundice.
Saccharum spontaneum (L.)	Kaans	Gramineae	Shrub	Root	The root juice is taken to get relief from fever and stomachache.
Sansevieria trifasciata (Prain) Mabb.	Vikhmari jhar	Asparagaceae	Shrub	Leaf	The paste of leaves is applied externally on Snake bites.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Sida cordifolia (L.)	Balu jhar	Malvaceae	Shrub / wild	Leaf	The paste of leaves is applied for the treatment of wounds and boils.
Solanum nigrum (L.)	Kaligedi	Solanaceae	Herb	Fruit	The Fruit of the plant is used to treat fever.
Solanum torvum Sw.	Kantha gedi Kantakari	Solanaceae	Shrub	Fruit	The fruit is burned, and the smoke is inhaled. It helps in reducing the tooth worm.
Stephania japonica (Thunb.) Miers.	Chillo Batulpate	Menispermaceae	Climber	Leaf, Roots	Root juice is used to treat Hernia. The leaf juice is extracted to cure cough.
Tectaria coadunate (J.Sm.)C.Chr.	Kalo neuro	Dryopteridaceae	Herb	Rhizome	The paste of rhizome is consumed to treat stomach pain, dysentery, and diarrhea.
Terminalia chebula Retz.	Harro	Combretaceae	Tree	Fruit	The Fruit is consumed directly or by making powdered form to treat cough and ulcers.
Tinospora sinensis (Lourr.) Merr.	Gurjo	Menispermaceae	Climber	Stem	The squeezed stem is kept in water overnight and decanted water is taken the next morning as a remedy for stomach troubles. It was highly used by people during the coronavirus pandemic.

Botanical Name	Local Name	Family	Habit	Parts used	Uses description of plants
Urtica dioica (L.)	Sisnoo	Urticaceae	Shrub	Root	The juice of the root is taken on an empty stomach to cure gastric.
Vernonia amygdalina Del.	Sugar plant	Asteraceae	Shrub	Leaf	The juice of sugar plants helps to control sugar and pressure.
Vitex negundo (L.)	Simali	Lamiaceae	Shrub	Young shoot	The leaves are boiled, and the vapour is inhaled to treat headaches, Sinusitis, and constipation.

Table 2

Medicinal Plant Distribution Based on Family

Family Name	Number of Species	Percentage Distribution
Asteraceae	9	8.91%
Lamiaceae	8	7.92%
Fabaceae,Poaceae	5 Species Each	4.95% Each
Malvaceae,Moraceae	4 Species Each	3.96% Each
Amaranthaceae , Apocynaceae , Euphorbiaceae , Menispermaceae , Rutaceae	3 Species Each	2.97% Each
Anacardiaceae , Convolvulaceae , Lauraceae ,Myrtaceae , Pteridaceae , Rosaceae , Zingiberaceae , Solanaceae	2 Species Each	1 98% Each
Remaining 36 Families	1 Species Each	0.99 % Each

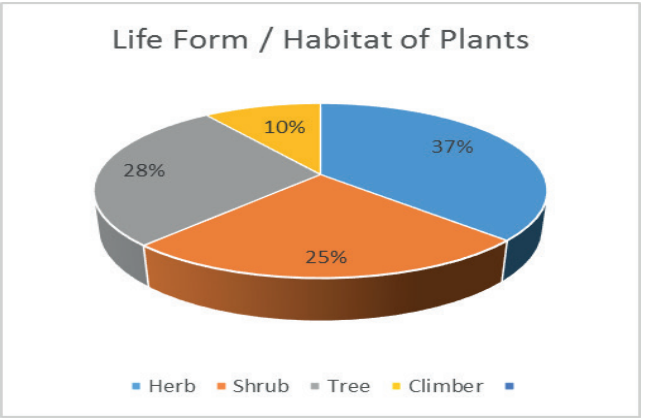
Life Form of Plant and the Proportion of Plant Parts Used.

Out of the total documented species, much of the life form of the plant was herbs (37%), followed by trees (28%), shrubs (25%), and Climbers (10%) (Figure 2). Herbs were found to be the most used growth form also in Adhikari *et al.,* (2019), Acharya, (2012), and Thapa, (2020). It might be because herbs are easier to collect and make medicines. The pie chart illustrating the proportion of the reported life form of the plant is given in (Figure 2). The residents use both cultivated (37.63%) and wild plants (41.58 %), (19.80%) species were both

cultivated as well as wild for medicinal purposes.

Figure 2

Percentage of Life Forms of Plants

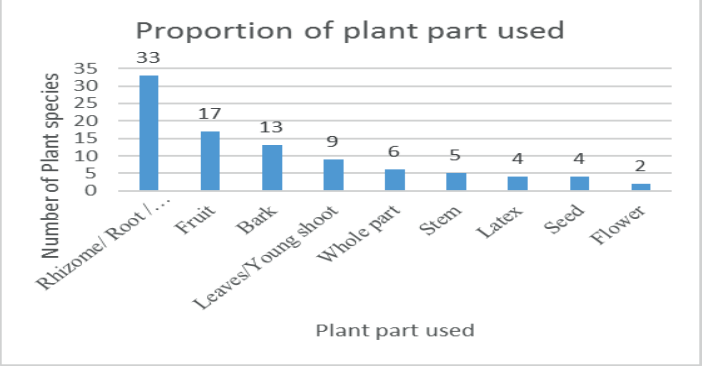


Various plant parts like a rhizome, tuber, leaf, stem, bark, fruit, flower, seed, latex, etc. were used for medicine. In some plants, more than one plant part was used as medicine. The most common part used was rhizome / root / tuber (33 species), followed by fruit (17 species), bark (13 species), leaves / young shoot (nine species), whole part (six species), stem (five species), latex (four species), seed (four species) and flower (two species) (Figure 3). The presence of a greater amount of active principle in the root might be the reason for the preference of the root over other parts (Bhattarai, 2006).

The Proportion of Plant Parts Used

Figure 3

Proportion of Plant Parts Used

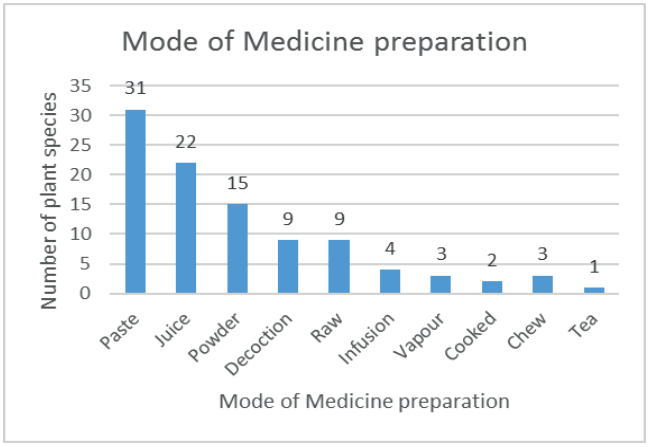


Mode of Drug Preparation and Route of Administration

The most common mode of medicine preparation was found to be paste form (31 species), juice (22 species), powder (15 species), decoction (nine species), raw (nine species), infusion (nine species), vapour (three species), chew (three species) and tea (one species). Some of the dosages were prepared by mixing powder form with puwa and some by adding Misri (Sugar candy) to the juice (Figure 4).

Figure 4

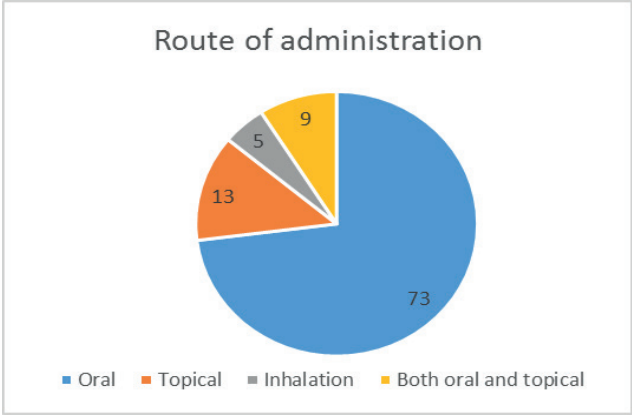
Mode of Medicine Preparation



The most reported route of administration was oral (73 species) followed by external (14 species), inhalation (5 species) and 9 species had both oral and topical routes of administration (Figure 5).

Figure 5

Route of Administration of Medicine



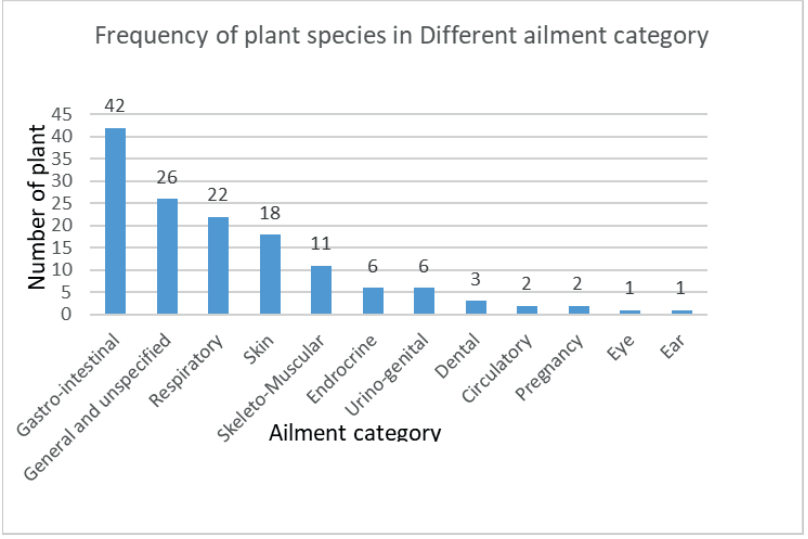
Medicine was prepared both singly as well as by mixing two or more plants for a more effective combination (Table 6). Some women mentioned that while mixing various plant species for an ailment, usually an odd number of plant species are added.

Plant Use for Disease Ailments

The people of the study area used the documented medicinal plants for the treatment of 61 different ailments categorized into 12 groups which is mentioned in Table 4. The highest number of plants (42 species) was reported to be used for Gastro-intestinal disorders like Diarrhoea, Dysentery, Stomach pain, Gastric, Anorexia, etc. followed by general and unspecified (26 species) ailments like Headache, Fever, Typhoid, Hernia etc., Respiratory ailment (22 species), Skin disorder (18 species), Urino-genital and Endocrine (six species each), Circulatory and Pregnancy (two species each) and Ear and Eye (one species each (Figure 6).

Figure 6

Frequency of Plant Species in Different Ailment Category



Most of the medicinal plants were reported for gastrointestinal ailments like diarrohea, dysentery, Gastric, Anorexia, Jaundice, etc. Most of the people in the area were farmers and very busy with their work, due to which their eating schedule is not proper, this irregular eating habit might result in problems like gastric. While working in the field they are continuously associated with soil, and organic fertilizers like cow dung, etc. which might result in the contamination of their hand or nails by a worm's egg, this might be the cause of intestinal worm's diarrhea, and dysentery. The villages usually had one meal, and people had to carry

heavy loads of grain for grinding to far distance, sometimes even carrying water from a longer distance, this lifting of heavy material might result in the condition called Gano janu by locals. Pricking skin with thorns, sometimes by agricultural tools like sickles while cutting grass, and working in bushes might be the common reason for causes of these ailments.

The current research was comparatively analysed with other communities like Tharu from Rupendehi and Nawalparasi (Thapa, 2020), Magar community of another area like Gulmi district (Acharya, 2012), and the Magar ethnic community of Palpa district (Pangeni, 2020). Also from the Machhapuchhre ethnic community of Kaski (Adikari et al.,2019) Bharatpokhari of Kaski district (Adhikari et al., 2021), and from Lekhnath Municipality of Kaski district (Dwa, 2013).

In this study, *Cynadon dactylon* leaf juice is taken orally for diarrhea, anorexia, and sleeping disorders while in Badagaun VDC of Gulmi district, it was found to be taken to improve defects of the eye, indigestion, excessive bleeding during mensuration, and gastritis (Acharya, 2012). Similarly, the bark of *Mangifera indica* is used for diarrhoea and stomach problems by the Magar Community of the studied area whereas in Illam it is used for urinary problems, unripe fruit for anorexia, and riped fruit for piles and tonic (Bhattarai, 2020). The rhizome of *Cissampelos pareira* is used for indigestion and Hernia while the same part of the plant in the Magar community of Palpa is used for Malarian fever (Pangeni, 2020). In this study, the bark of *Bauhinia variegate* is used for diarrhoea and dysentery but the same part of the plant is taken as an antidote for snake bites in the Gulmi district (Acharya, 2012). Likewise, the root paste of *Mimosa pudica* is used for fracture in the Magar community of the study area while the same is used for piles in the Tharu community of Rupendehi and Nawalparasi district (Thapa, 2020) and wounds in Illam district (Bhattarai, 2020).

In Durseni village Some people were even involved in the business of medicinal plants at the local level (specially for pregnant women and skeletomuscular problems) in their homes only. Plants like chautajor, hadchur, and Gaikhure were found to be there. They stated that they gained knowledge from their ancestors and collected the medicinal herbs mostly from the jungle in groups and it is not easy to collect them. People believed that some medicinal plants became even more effective after chanting them with the Gayatri mantra by priests. Some people even claimed that medicinal plants were able to cure diseases that were not cured by medicines. People were not aware of the fact of how precious knowledge they had. This knowledge does not have any documentation, it is being passed only verbally from generation to generation and is at risk as younger generations are declining their interest.

CONCLUSIONS

From the conducted research it can be concluded that the Rural Magar Ethnic community of Pokhara Metropolitan City still has good knowledge on the use of the medicinal plant for various disease ailments especially among the elder generation. Also, there is quite enough diversity of flora as a total of 101 medicinal plant belonging to 55 families and 89 genera have been recorded with Asteraceae being the dominant family and the medicinal plants were mostly used for gastro-intestinal disorder followed by General and unspecific and Respiratory category.

Issues like unsustainable harvesting of medicinal plants and lack of cultivation of Medicinal and Aromatic Plants were found to be the causes of the decline of medicinal plants. While some people say that a good number of medicinal plants are available and there is no reduction of the plant resources. The problem is the lack of identification. Because of the unrecognition of the resource and its use, many valuable Plants are unused or misunderstood as just a weed. People of chilaune kharka reported that *Drymaria querciafolia* species have been reduced in a near resident area compared to the early years, because of excessive plucking by people. Though can be found in a nearby jungle, younger generations had less knowledge and interest in ethnomedicinal use and the elder generation, though they had good knowledge had difficulty in collecting medicinal plants from forests. The bark of *Dischidia bengalensis* was found to be severely scratched, during the collection of bark for medicinal purposes by people in Raikar.

While collecting the bark from the tree, collection should be done from the secondary branch rather than the main branch. Collecting from the main branch affects the plant's condition. While collecting the plant by root, rhizome, and tuber it should be assured that the collected species is not the last species left around the area. Naturally occurring plants like *Drymaria quercifolia* need to be protected. Over exploitation of plants must not be done, and collection should be done sustainably when needed only.

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