Original Article

A Case Study of Medicinal Plants and Their Uses by the Sundar Haraicha Nagarpalika Community in Morang District, East Nepal

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Abstract

Background: Nepal is considered as a staple area for wild as well as local medicinal plants. Traditional botanical medicine is the primary mode of health care for most of the people. Several case studies were conducted across the country but some of them were unexposed. So such studies were conducted in order to reveal the importance of locally available medicinal plant species which leads to the discovery of useful drugs and socio-economic development of the community. **Objectives:** The main objective of this study is to evaluate the importance of each plant species and reveal the purposes to use of the medicinal plants by the local community. **Materials and methods:** Data was collected in the Morang district of East Nepal. Informal meetings, group discussion, participants observations and schedule surveys were primary sources of data collection. A total of 60 respondents were questioned through an interview by the semi structured English language questionnaire. **Result:** A total of 60 respondents were recorded. 37 species of medicinal plants belonging to 30 families and 35 genera were documented. The majority of them were herbs and these herbs were able to cure fever, headache, stomachache, cuts and wounds, snake bite etc. Additionally, 26% of medicinal plants are used to treat ailment in the peoples, 48% for both animals and humans, and 25% for marketing. **Conclusion:** Through this case study, it leads to discovering high priority medicinal plants. Similarly, high potential for the establishment of crude drugs and socio-economic development.

Keywords: Local medicinal plants, medicinal plant species, traditional botanical

Introduction

Nepal offers a wide range of meteorological and geographical conditions. As a result, it has a high floral richness, with over 6500 flowering plants and ferns, 2000 of which are regularly employed in traditional. Nepal is ranked 9th in terms of floral diversity.[1] People mostly use medicinal plants and other natural products for their chemical and pharmacological properties.[2] Medicinal plants played an essential part in agronomy and pharmacy throughout the 18th and 19th centuries since they provided raw materials for the pharmaceutical industry and were used as a medicine on a daily basis.[3] People mostly use medicinal plants and other natural products for their chemical and pharmacological properties.[3]

The majority of the medications are made from plants that have been obtained in the wild.[4] Herbal medicine is widely used for medical treatment in many underdeveloped countries.[5] Leaf, seed, bark, stem, flower, root, rhizome, tuber, stem bark, root bark, peel, and other therapeutic portions of medicinal plants are referred to as phytoplants. Medicinal plants are antioxidant-rich substances that contain phenolic compounds, flavonoids, carotenoids, vitamins, nitrogen compounds, and terpenoids and are utilized mostly for primary health care. Anti-inflammatory, antitumor, anticarcinogenic, antimutagenic, antiatherosclerotic, antibacterial, and antiviral activities are all present in them.[6] The careful research and exploitation of plants that grow in the mountainous and Himalayan regions

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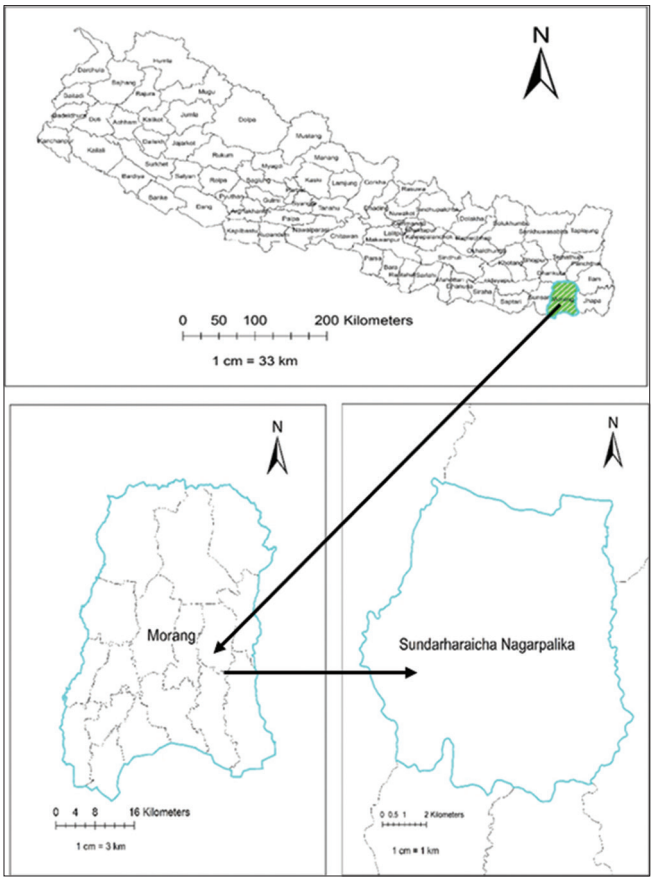

Figure 1: Sundar Haraicha Nagarpalika's map

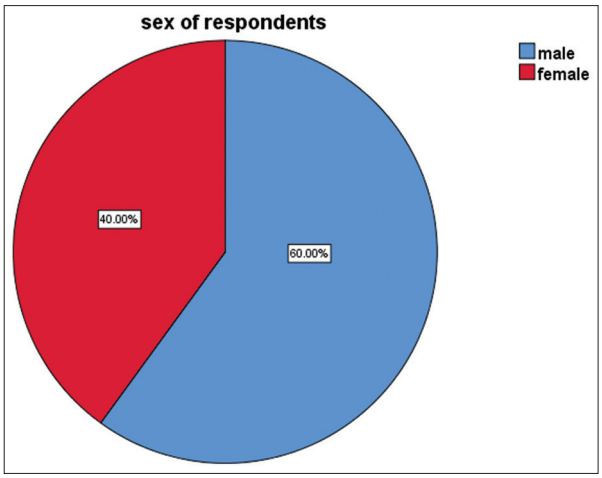

Figure 2: Chart depicting the gender of survey participants

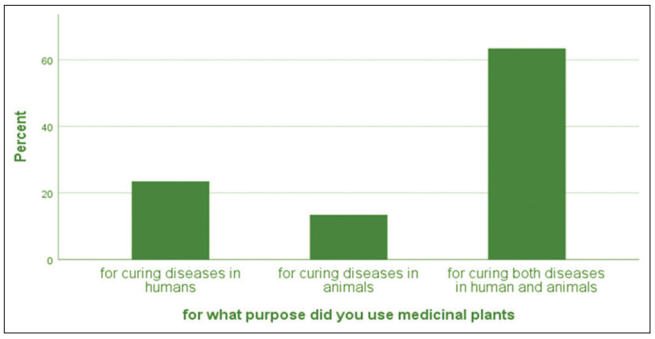

Figure 4: Medicinal plant uses

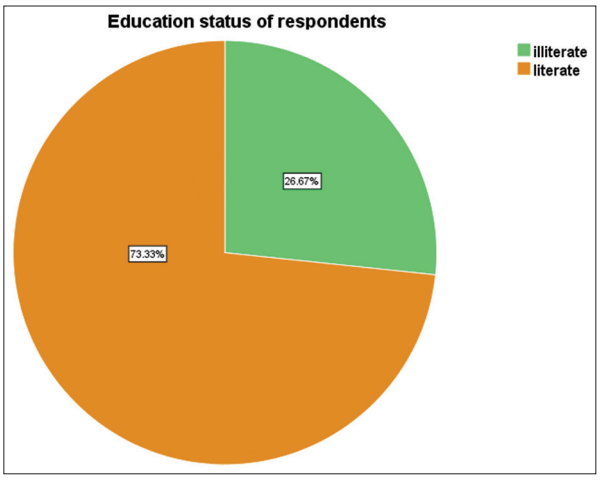

Figure 3: A chart depicting the educational status of survey participants

provide job opportunities for the local communities to promote social and economic growth.

Plants were once solely used in local areas, but now, they are commercialized and exported to various parts of the world, where they are in high demand.[7] Many medicinal plants can be found in forests, fields, our backyards, and even our gardens, but due to the loss of plant habitat caused by rapid urbanization and the passing of elderly traditional healers without knowledge transfer to the next generation, knowledge of their ethnobotanical uses is fading.[8] People in the city and the terai, who lack access to well-equipped hospitals and pharmacies, rely entirely on chemical medications, which have side effects. The purpose of this research is to learn about the medicinal plants that can be found in Nepal's Eastern Terai and how they can be used to treat a variety of health conditions at home.

Description of the area and people

Sundar Haraicha Nagarpalika is located in the Morang district of Province 1 in Nepal's eastern region [Figure 1]. Morang's latitude and longitude are 26.668203° N and 87.385310° E, respectively. It is bordered on the south by Bihar, India, on the east by Jhapa, on the north by Dhankuta and Panchthar, and on the west by Sunsari. The Sundar Haraicha Nagarpalika covers an area of 110 km^2 and has 12 wards. Ward number: 2, ward number: 7, ward number: 8, ward number: 9, ward number: 11, and several wards of the Nagarpalika were connected with Mahendra highway which were all designated as research areas. The vegetation scenario is dominated by Sal forest, with other plant species thrown in for good measure: Sal (*Shorea robusta*), Sissoo (*Dalbergia sissoo*), *Cassia fistula*, *Dillenia pentagyna*, *Alnus nepalensis*, *Pinus roxburghii*, and other trees commonly found in the forest. The average yearly temperatures are maximum 30.6°C and minimum 14.6°C, respectively. Sundar

Table 1: Medicinal plants identified in the research area

Scientific name	Family	Parts used	Route	Uses
Azadirachta indica (Neem)	Meliaceae	Leaves, seed, neem tree	Poultices, pastes, oil	Treating skin fungus conditions, to treat men suffering from enlarge prostate gland
Ocimum sanctum (Tulsi)	Lamiaceae	Root, leaves, flower, seeds, other parts	Powder in water, juice and honey for 6 months, boil few leaves in water and use it	Curing diabetes, expel kidney stones, fever, sore throat, dental problem
Tinospora cordifolia (Gurjo)	Menispermaceae	Roots, Lahara	Juice	Fever, cold, tonsillitis, shortness of breaths
Aloe vera (Ghew Kumari)	Asphodelaceae	Leaves	Aloe gel, latex	Cuts, burns, improve digestive system
Cinnamomum tamala (Tejpatta)	Lauraceae	Leaves	Tea of Tejpatta, decoction	Cold cough, allergy, abdominal pain, indigestion
Tagetes spp. (Marigold)	Asteraceae	Flower	Made into infestation, tincture sand ointments Marigold tea	Skin wound rashes, burns, acne, strokes , cancer
Mimosa pudica (Touch me not)	Fabaceae	Root	Aqueous extract of root	Dysfunction uterine bleeding, antifertility agent
Curcuma longa (Turmeric)	Zingiberaceae	Rhizome	Powder	Lower risk of heart diseases, reduces inflammation and pain, fever cough
Terminalia chebula (Harro)	Combretaceae	Fruit	Taking by mouth	Dysentery, Sore eyes, used as route for treatment for vaginal infections
Terminalia bellirica (Barro)	Combretaceae	Fruit	Dried ripe fruit, decoction, pulp of fruit	Cough, diarrhoea, dropsy, leprosy, piles
Oroxylum indicum (Totela)	Bignoniaceae	Seed and bark leaves	Juice, decoction	Body pain, fever, burns, and wounds, diarrhoea, dysentery, jaundice, stomach ache
Phyllanthus emblica (Amla)	Phyllanthaceae	Fruit	Powder	Diabetes, diarrhea, dysentery, piles, eye problem, cancer
Syzygium aromaticum (Lwang)	Myrtaceae	Dried flower buds	Clove oil	Toothache and dental pain
Shorea robusta (Sal tree)	Dipterocarpaceae	Resin, resin bark	Taken orally and powder	Reduce swelling and bleeding, treat urinary tract infection, female disorder like menorrhagia and leukorrhea
Euphorbia hirta (Dudhe jhar)	Euphorbiaceae	Entire plant leaf	Plant juice orally	Wounds and cuts, diarrhoea
Senegalia catechu (Khair, Catechu)	Fabaceae	Bark, wood, bark	Decoction (orally), paste	Toothache, intestinal pain, skin diseases
Mangifera indica (Aanp)	Anacardiaceae	Young tender leaves, bark tree gum	Crush with water boil, crush and extract juice, make ointment with lemon juice and apply	Toothache, bleeding and swollen gums, diarrhoea and ingestion, cure skin diseases like ringworm itching
Acorus calamus (Bojho)	Acoraceae	Roots/rhizome	Powder, apply directly to the skin	Asthma, bronchitis, cough, skin diseases, sore throat, joint pain, hysteria, insomnia
Cynodon dactylon (Dobo jhar)	Poaceae	Entire plant	Paste, orally with sugar	Cuts and wound, bleeding piles and digestion
Lepidium sativum (Chamsur, Cress)	Cruciferae	Leaves and stem	Consumption	Broken bones heal faster, cough and asthma
Allium sativum (Lasun, Garlic)	Amaryllidaceae	Bulb	Oil	Cardiovascular disease, regulate blood pressure, lower cholesterol level, anti-bacterial property, treat acne, immunity booster
Mentha spp. (Pudina, Mint)	Lamiaceae	Whole plant	Leaves decoction	Throat infection and indigestion, Rashes, itching, reduce pain, avoid inflammation, acidity nausea, food poisoning
Artemisia spp. (Titepati)	Asteraceae	Leaves, flowering, stems and roots	Infusion, juice, paste (externally), roots	Asthma, brain diseases, improve appetite, diarrhoea, dysentery, and abdominal pain, wounds and tonic for kidney
Allium cepa (Onion)	Amaryllidaceae			Lowering blood pressure, cholesterol, relieve stomach upset, gastrointestinal disorder, relieve congestion, strength appetite
Calotropis procera (Aank, Apple of sodium)	Apocynaceae	Root, latex, leaf	Powder, latex	Bronchitis, asthma, leprosy, toothache, joint swellings, joint pain, reduce swelling
Datura spp. (Daturo)	Solanaceae	Leaves, leaf, fruit	Vapours of leaf infection, smoke from burning leaf inhaled, juice applied to scalp	Headache, relief pain of rheumatism and gout asthma and bronchitis

Contd...

Table 1: Contd...

Scientific name	Family	Parts used	Route	Uses
Justicia adhatoda (Asuro)	Acanthaceae	Leaves, flower, dried plant	Decoction of honey	Cough and cold, rheumatic joints inflammation, swelling, vomiting, diarrhoea, dysentery, malarial fever, tuberculosis
Sesamum indicum (Til, Sesame)	Pedaliaceae	seeds	Juice after boiling taken orally	diarrhoea
Nyctanthes arbor-tristis (Night flowering jasmine)	Oleaceae	Leaves, flower, stem	Juice, decoction, powder	Fever, cough, arthritis, worm infection, constipation, gastric, joint pain, malaria
Centella asiatica (Ghodtapre)	Apiaceae	Whole plant	Decoction, Juice taken orally	Urine infection, digestion.
Hibiscus sabdariffa (Belchanda)	Malvaceae	Flower buds	Juice obtained after boiling taken orally	diarrhoea
Urtica dioica (Sisnu)	Urticaceae	Leaves, roots	Dried powder, cooked as food, juice/tea	High blood pressure, diabetes, broken limbs in human and animals, vitamin for pregnant women, allergy
Oxalis latifolia (Chari amilo)	Oxalidaceae	leaves	Directly chewing with black salt, juice (inside eye), decoction along with cow ghee (in piles)	Indigestion, low appetite, eye infection, piles.
Drymaria cordata (Abijalo, west Indian chick weed)	Caryophyllaceae	Leaves, roots, whole plant	Dried and smoked like cigarette, infusion, poultice, soup from crushed roots	Chest complaints, bronchitis, jaundice, cold, malaria, injury, sores, tumors, diarrhoea
Shorea robusta (Sakhua)	Dipterocarpaceae	Bark	Juice taken orally	Stomach ache, diarrhoea
Cyathula prostrata (Itin Jhar)	Amaranthaceae	Whole plant	Infusion, pulp, poultice	Fever, dysentery, sores, burns, fractures
Trigonella foenum-graecum (Methi)	Fabaceae	Seeds	Taken by mouth	Loss of appetite, constipation, gastritis.

Haraicha Municipality has an estimated population of 80,518 people, according to census 2068 B. S. People speak Nepali, although they also speak Maithili, Tharu, Rajbanshi, Limbu, and other languages. We discovered through our survey that the majority of individuals engage in agriculture by growing rice, maize, and jute. They are also involved in the raising of livestock. In addition, several residents in the area began farming by clearing woodland. The municipality is home to a wide variety of plant species. As a result, the most important medicinal herbs utilized by local people were surveyed, as well as primary data and other sources of information.

Data collection methods

The approval of the municipality, community, and individual levels was secured prior to conducting the survey activity into an action. To all of the relevant authorities, we lay out the entire objective and goal of our survey. Informal meetings, group discussions, participant observation, and scheduled surveys were the primary sources of data collecting after sufficient consent was obtained. We paved our way using a technique known as random sampling. With the assistance of a local assistant, a total of 60 respondents were questioned. During the interviews with participants, a semi-structured English language questionnaire was translated into Nepali [Figures 2 and 3]. The questions were broken down into two areas: A sociodemographic description of the participants and the primary topic portions. For descriptive analysis, Microsoft Excel 2016 and IBM SPSS version 26 were used. IBM SPSS is used to create pie charts and bar graphs.

Discussion of the Findings

Characteristics of the socioeconomic system

The characteristics of the respondents were obtained and documented during face-to-face interviews with the survey participants, and data were collected. A total of 60 houses were chosen at random for this site survey, with 60% of the males (36), and 40% of the females (24), being between the ages of 20 and 90. This area has a literacy rate of 73.3%, with 26.7% being illiterate. Hinduism, which is practiced by 90% of the people, is the most common ethnicity in this area, followed by Muslim and Buddhist. The vast majority of those employed in agriculture.

Application of medicinal plants

According to this investigation, roughly 95% of diseases, such as cuts, burns, wounds, fever, and the common cold, can be treated if used appropriately. According to the findings of this survey, around 26% of medicinal plants are used to treat ailments in people, 48% for both animals and humans, and 25% for marketing purposes. The majority of individuals considered medicinal plants to be useful for minor ailments such as cuts, burns, wounds, fever, and the common cold, as well as more serious ailments such as typhoid, jaundice, tuberculosis, asthma, and heart trouble.

Medicinal plant marketing

There is no medicinal plant processing sector, and marketing facilities are scarce. Despite this, approximately 16.67% of people in that specific locality cultivate or farm medicinal plants for commercial purposes. They use their product in the treatment of various diseases and also supply raw materials to

various pharmaceutical companies located in different parts of the country, such as Birgunj, Sunsari, and some parts of India via the Kakarvita border.

Medicinal plant diversity

The majority of plant species were discovered to be employed for several purposes, including human and animal cures as well as commercial uses. The majority of plant species are used to treat common colds, burns, coughs, wounds, fevers, and diarrhoea. Due to illiteracy, a lack of hospitals, and religious faith in therapeutic herbs, people developed a very positive attitude about them.

The site survey discovered a total of 37 medicinal plant species belonging to 30 families and 35 genera, with roots, rhizomes, tubers, bark, leaves, flowers, fruits, pollen, and young shoots used for commercial purposes and different medicinal formulations for the treatment of cuts, worms, cough, gastrointestinal problems, and also for animal treatment. It was discovered that traditional healers were consulted for chest pain, menstruation disorders, eyes, and renal diseases.[9]

Understanding of medicinal herbs

As shown in Table 1, the common name, local name, Botanical name, family, and uses are listed.

Conclusion

Many medicinal plants have been discovered at the study site, but due to a lack of education, training facilities, and a processing center, they are missing in identification, information about the medicinal plants' growth practices, and conservation. People believe in medical herbs because they are illiterate and have a religious belief in them. Medicinal plants, on the other hand, play an essential role in the pharmaceutical business since they produce raw materials. There are no Ayurveda centers or training programs in the area. People used medicinal plants based on their own beliefs, knowledge, and beliefs. They have faith in the wisdom of the elderly. As a result, a study is required in this field in order to improve these high-value medicinal plants, as well as the creation of a processing unit [Figure 4]. The government and other local organizations should support these ongoing actions as well as the dissemination of results.

Declaration of the author

There are no conflicts of interest declared by the authors. All authors contributed equally to the creation of this work at all stages. Similarly, all authors gave their approval to the final version of the paper.

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Conflicts of interest

There are no conflicts of interest.

References

1. Ambu G, Chaudhary RP, Mariotti M, Cornara L. Traditional uses of medicinal plants by ethnic people in the Kavrepalanchok district, Central Nepal. Plants (Basel) 2020;9:759.
2. Moro CO, Basile G. Obesity and medicinal plants. Fitoterapia 2000;71 Suppl 1:S73-82.
3. Abou-Arab AA, Abou Donia MA. Heavy metals in Egyptian spices and medicinal plants and the effect of processing on their levels. J Agric Food Chem 2000;48:2300-4.
4. Jäger AK, van Staden J. The need for cultivation of medicinal plants in southern Africa. Outlook Agric 2000;29:283-4.
5. Shakya AK. Medicinal plants: Future source of new drugs. Int J Herbal Med 2016;4:59-64.
6. Ozkan G, Kamiloglu S, Ozdal T, Boyacioglu D, Capanoglu E. Potential use of Turkish medicinal plants in the treatment of various diseases. Molecules 2016;21:257.
7. Rai LK, Prasad P, Sharma E. Conservation threats to some important medicinal plants of the Sikkim Himalaya. Biol Conserv 2000;93:27-33.
8. Joshi AR, Joshi K. Indigenous knowledge and uses of medicinal plants by local communities of the kali gandaki watershed area, Nepal. J Ethnopharmacol 2000;73:175-83.
9. Uprety Y, Asselin H, Boon EK, Yadav S, Shrestha KK. Indigenous use and bio-efficacy of medicinal plants in the Rasuwa District, Central Nepal. J Ethnobiol Ethnomed 2010;6:3.