Ethno-Medicinal Uses of Wild Edible Fruits in Pokhara Valley, Nepal

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ABSTRACT
The wild fruits are freely available as a source of food. The phytochemicals available in such fruits can be used to cure different health problems of human beings naturally. This study was carried out from July 2020 to August 2021 in different places, particularly in less populated areas like Ward No. 19, 21, 22, 23, 28, 29, 30, 31, 32 and 33 of Pokhara Metropolitan City in Kaski District, Nepal. The data were collected, using a verbal questionnaire in which the respondents were locals and traditional healers. The study was conducted almost in a rural condition, but there was still a good vegetation in its core town areas. People of these areas consume wild fruits mostly as a source of nutrition, vitamins and minerals, but they take them as raw food and know less about their medicinal values. Some wild fruits like *Berberis aristata* (Chutro), *Citrus limon* (Jyamir), *Cassia fistula* (Rajbrikshya), *Mangifera indica* (Anmp), *Punica granatum* (Anar), *Sapindus mukorossi* (Rittha), *Tamarindus indica* (Imili) and *Ziziphus jujuba* (Bayar) show their tremendous medicinal values to cure various health problems. Similarly, there are other well-known fruits like *Aegle marmelos* (Bel), *Emblica officinalis* (Amala), *Piper longum* (Pipla), *Solanum nigrum* (Jangali bihi), *Terminalia bellerica* (Barro) and *T. chebula* (Harro), which can be used for herbal medicines. The results revealed that 41 species of plants belonging to 24 families have been used as the wild fruits with ethno-medicinal values. Such families are Anacardiaceae, Berberidaceae, Bignoniaceae, Caesalpinaceae, Combretaceae, Elaeagnaceae, Elaeocarpaceae, Euphorbiaceae, Juglandaceae, Lauraceae, Moraceae, Myricaceae, Myrsinaceae, Myrtaceae, Papillionaceae, Piperaceae, Punicaceae, Rhamnaceae, Rosaceae, Rutaceae, Sapindaceae, Solanaceae, Trapaceae and Vitaceae. This study is the first report to show the ethno-medicinal uses of wild edible fruits in Pokhara valley, Nepal.

KEYWORDS: Ethno-medicine, health problems, non-timber forest products, wild fruits
INTRODUCTION

Plant species that are not in domestication practice and occur in a natural habitat are “wild plants.” Fruits produced by such plants are called “wild fruits.” In this sense, the wild plants which are growing in the waste land produce wild fruits. Some wild fruits are edible and some are not. The wild edible fruits are most important aspect of non-timber forest products (NTFPs). They are sources of food and herbal medicine since the beginning of human civilization. Now, they are the source of income nowadays. In many rural parts of Nepal, the people use wild plants to cure their health problems like root, stem, leaf and bark; the wild fruits also used for various other purposes. Such knowledge is deeply rooted in rural areas. The people like the native inhalers and traditional medicinal workers contribute a lot to conserve and explore such plants. In this regard, Katrahalli and Siddeshwari (2021) remark, “Wild edible fruits are among the most widely used non-timber forest products and play an important role in the nutrition, medicine and traditional life style of the local people.” Similarly, Mahato (2014) states, “The rural people have better knowledge of wild fruits as they visit the forest regularly and have constant association and dependence on these forests” Thus, in Nepal, wild fruits are very important plants that can be used for food as well as for medicinal purposes.

MATERIALS AND METHODS

Pokhara Metropolitan city is geographically largest and serve as headquarter of Gandaki Province and Kaski district. Its elevation ranges from 505 m to 2650 m above sea level. It observes 7°C as lowest temperature during winter and up to 31 °C as maximum during summer. It receives about 3800 mm rainfall annually. The city is surrounded by Macchapucchre and Madi Rural Municipalities on north-east, Rupa Rural Municipality on the east, Annapurna Rural Municipality on the north-west and Syangja and Tanahun districts on south. Due to diversity in physiography, altitudinal variation and high rain fall the valley show diversified plants with important wild fruits too.

Figure 1
Map of Pokhara Metropolitan City

Source: Google search
This paper is prepared by seasonal visits over thirteen months in the non-populated areas of Pokhara. A few questionnaires were set regarding the use and benefits of wild fruits during the field visits. A total of 30 (3 for each rural ward) traditional healers were selected as per their experience. Among them, 60% were men and 40% were women. The data were collected using a verbal questionnaire with the respondents such as local people and traditional healers. The verbal questions were asked to the respondents about wild edible fruits and their ethno-medical uses. The information collected during the field visits was documented, cross-examined, and confirmed with the help of related articles and research findings from different journals.

RESULTS AND DISCUSSION

The findings of the study revealed that the local residents have a good concept of wild fruits and vegetation around them. They are more familiar with taste and nutrition values of wild fruits rather than medicinal uses. Hopefully, a discussion with them about ethno-medicinal uses gained their attention regarding another important aspect of wild fruits. In this sense, the paper aims to explore the medicinal values of wild fruits, which could be a good option for local residents. This study found 41 species belonging to 24 families that are used as ethno-medicinal fruits. Among these families, maximum species yielding such fruits are Rutaceae, Rosaceae, Anacardaceae, Moraceae and Myrtaceae respectively. The study also revealed that tree species contributed the highest (60.97%) ethno-medicinal fruits yielding followed by the shrubs (26.82%), herbs (7.31%) and climbers (4.87%).

The following are the details about the species and the families that they belong to. The list provides the scientific name, family, vernacular name, English name and its uses.

1) *Aegle marmelos* (L.) Correa.
   - Family: Rutaceae
   - Vernacular name: Bel
   - English common name: Bel
   - Uses: The fruit pulp is widely used for improving digestion in stomach due to its alterative, nutritive, digestive and tonic properties. The fruit is used for treatment of diarrhea, stomach problems, diabetes, dysentery, constipation, dyspepsia and abdominal disorder.

2) *Berberis aristata* DC.
   - Family: Berberidaceae
   - Vernacular name: Chutro
   - English common name: Nepal’s barbery
   - Uses: Fresh fruits show laxative and cooling properties and are used to cure piles and sores. Ripe fruits are used to treat in jaundice and diarrhea.

3) *Cassia fistula* Linn.
   - Family: Leguminosae
   - Sub-family: Caesalpinaceae
   - Vernacular name: Rajbrikshya
   - English common name: Cassia pod
   - Uses: This fruit shows analgesic, laxative, antipyretic, cathartic, purgative and tonic. Hence, the fruit and its pulp is useful in constipation, stomach disorder, liver disorder, leprosy, diabetes, urinary problems, diarrhea, dysentery, indigestion and biliousness. It is also used to cure rheumatism.

4) *Citrus aurantifolia* Swingle.
   - Family: Rutaceae

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*Prithvi Academic Journal, Volume 5, May 2022 [pp. 28-37]*
Ethno-Medicinal Uses of Wild Edible Fruits in Pokhara Valley, Nepal

Vernacular name: kagati
English common name: Lemon
Uses: This fruit is of digestive, disinfectant, cooling and refrigerant properties. Therefore, the fruits are used in asthma, diarrhea, dysentery, cold, cough and urinary calculus.

5) *Citrus limon* (Linn.) Burm.F.
   Family: Rutaceae
   Vernacular name: Jyamir
   English common name: Rough lemon
   Uses: The fruit is of anthelmintic, stomachic and tonic properties. Therefore, it is taken to treat asthma, cough and cold, constipation, headache, scurvy, rheumatism and vomiting. Its juice is useful to remove pimples and dandruff.

6) *Citrus medica* Linn.
   Family: Rutaceae
   Vernacular name: Bimiro
   English common name: citron
   Uses: The fruit shows astringent, anthelmintic, carminative, cooling, stomachic and tonic properties. Hence, the fruit is useful to treat asthma, constipation, cough and cold, dyspepsia, fever, headache and sciatica.

7) *Elaeagnus latifolia* L. sensu FBI
   Family: Elaeagnaceae
   Vernacular name: Guyalo
   English common name: Bastard Oleaster
   Uses: This fruit is used to cure stomach problems.

8) *Elaeocarpus sphaericus* (Garten.) K. Schum.
   Family: Elaeocarpaceae
   Vernacular name: Rudrakshya
   English common name: Utrasum Bead tree
   Uses: The fruit is sour in taste and is useful to cure blood pressure problem, epileptic fits, headache and respiratory problems.

9) *Emblica officinalis* Gaertn.
   Synonym: *Phyllanthus emblica* Linn.
   Family: Euphorbiaceae
   Vernacular name: Amala
   English common name: Emblic Myrobalan
   Uses: The fruit has cooling, acidic, laxative, stomachic, cardiac, diuretic, astringent, tonic and refrigerant properties. In this sense, it is widely used to cure jaundice, anemia, diarrhea, sore throat, dysentery, menorrhagia, dyspepsia, hemorrhage, cough, cold, inflammation of the eyes and heart problems.

10) *Eugenia jambolina* Linn.
    Synonym: *Syzygium cumini* (L.) Skeels.
    Family: Myrtaceae
    Vernacular name: Jamuna
    English common name: Black berry
    Uses: The fruit is of astringent, diuretic, carminative, stomachic and febrifuge properties. It is useful to treat ulcers, asthma and bronchitis. Its decoction and seed is useful to cure diabetes.

11) *Eugenia operculata* Roxb.
    Family: Myrtaceae
    Vernacular name: Kyamuno
Ethno-Medicinal Uses of Wild Edible Fruits in Pokhara Valley, Nepal

English common name: NA
Uses: The fruit is useful to cure rheumatism.

12) *Ficus cunea* Buch.-Ham.ex.Roxb.
   Synonym: *Ficus semicordata* Buch.-Ham.ex.Smith.
   Family: Moraceae
   Vernacular name: Khanayo
   English common name: Drooping Fig
   Uses: The ripe fruit is used to treat constipation, indigestion, headache, leprosy and apathy complaints.

13) *Ficus religiosa* Linn.
   Family: Moraceae
   Vernacular name: Peepal
   English common name: Peepal tree
   Uses: The fruit is of laxative property and is used in asthma and other respiratory problems.

14) *Juglans regia* L. var, kamaonica C. DC.
   Family: Juglandaceae
   Vernacular name: Okhhar
   English common name: Walnut
   Uses: The fruit and kernel are widely used to cure rheumatism and cotyledons for heart problems, colic and dysentery.

15) *Lindera neesiana* (Nees) Kurz.
   Family: Lauraceae
   Vernacular name: Siltimur
   English common name: Lindera Seeds
   Uses: The fruits are used to treat stomach problems.

16) *Maesa chisia* Buch.Ham.ex.D.Don
   Family: Sapotaceae
   Vernacular name: Bilaune
   English common name: Wild Berry
   Uses: The fruit is of anthelmintic property.

17) *Mahonia nepaulensis* DC.
   Family: Berberidaceae
   Vernacular name: Jamanemandro
   English common name: Mahonia
   Uses: The fruits are taken for diuretic and demulcent functions.

18) *Mallotus philippensis*(Lam.) Muell,-Arg.
   Family: Euphorbiaceae
   Vernacular name: Sindhure
   English common name: Kamal tree
   Uses: The dried fruits are taken for scabies and eliminating intestinal worms.

19) *Magnifera indica* linn.
   Family: Anacardiaceae
   Vernacular name: Anmp
   English common name: Mango
   Uses: The fruit shows astringent, cardiac, carminative, laxative, appetizer and aphrodisiac properties. The unripe fruit is used to cure ophthalmic problems, scabies and other skin problems. The ripe fruit, on other hand, is taken to treat bleeding piles, haemorrhage from intestine, uterus and lung.

20) *Morus alba* Linn.
Family: Moraceae  
Vernacular name: Kyun kaphal  
English common name: Mulberry  
Uses: This fruit is of laxative, cooling, anthelmintic and acrid properties. Therefore, it is useful in different problems like stomach problem, smallpox, biliousness, diarrhea, dyspepsia, heart and spleen.

21) *Myrica esculenta* Buch.-Ham.ex.D.Don.  
Family: Myricaceae  
Vernacular name: kaphal  
English common name: Box Myrtle  
Uses: The fruits show carminative, alternative, stomachic, sedative and stimulant properties. Thus, it is useful to treat asthma, bronchitis, inflammation and cough.

22) *Oroxyllum indicum* (L.) Vent.  
Family: Bignoniaceae  
Vernacular name: Tatelo  
English common name: Indian Trumpet flower  
Uses: The fruits are of stomachic and carminative nature and used to cure leucoderma, indigestion and stomach problems.

23) *Piper longum* Linn.  
Family: Piperaceae  
Vernacular name: Pipla  
English common name: Long Pepper  
Uses: The immature fruit decoction is useful to cure cough and chronic bronchitis. The ripe fruit, on the other hand, is useful to treat fever, abdominal problems, leucoderma, tumors, jaundice, piles and spleen complaints.

24) *Prunus cerasoides* D.Don.  
Family: Rosaceae  
Vernacular name: Painyu  
English common name: Himalayan cherry.  
Uses: The fruits show astringent property.

25) *Prunus domestica* Linn.  
Family: Rosaceae  
Vernacular name: Alubokhara  
English common name: Plum tree  
Uses: The fruits are of astringent, refrigerant and laxative nature and mostly used to cure leucorrhea and irregular menstruation.

26) *Prunus persica* Sieb. Et Zuce.  
Family: Rosaceae  
Vernacular name: Aru  
English common name: Peach tree  
Uses: The fruit is used as antiscorbutic, stomachic and demulcent.

27) *Psidium guajava* Linn.  
Family: Myrtaceae  
Vernacular name: Amba, Belauti  
English common name: Guava tree  
Uses: The fruit is taken as laxative, tonic and cooling for medicinal purposes.

28) *Punica granatum* Linn.  
Family: Punicaceae  
Vernacular name: Anar  
English common name: Pomegranate
Uses: The unripe fruit is taken as appetizer and useful to control vomiting. The ripe fruit cures fever, sore throat, biliousness and heart problems. The rind of fruit is anthelmintic. Its powder and juice are useful to treat cough, fever, diarrhea, dysentery and bronchial trouble. The fruit pulp is stomachic and useful in cardiac problems.

29) *Rhus javanica* Linn.
   Synonym: *Rhus semilata* Murray.
   Family: Anacardiaceae
   Vernacular name: Bhakimlo
   English common name: Sumac
   Uses: The fruit is used to treat diarrhea, colic and skin diseases. Its decoction is useful to cure stomach problems.

30) *Rhus parviflora* Roxb.
   Family: Anacardiaceae
   Vernacular name: Satibayer
   English common name: NA
   Uses: The fruit decoction is widely used to treat dysentery.

31) *Rubus ellipticus* J.E.Smith.
   Family: Rosaceae
   Vernacular name: Ainselu
   English common name: Raspberry
   Uses: The ripe fruit is taken to cure dysentery, general debility and indigestion. The fruit juice is taken to cure cough, fever and sore throat.

32) *Solanum nigrum* Linn.
   Family: Solanaceae
   Vernacular name: Kaligedi / Jangali bihi
   English common name: Black night shade
   Uses: The fruit is laxative and tonic in nature. It is widely used to treat asthma, constipation, urinary problems, insomnia, weak appetite and excessive thirst. The fruit juice is used to treat fever and headache. The unripe fruit paste is useful to cure a skin problem like a ringworm.

33) *Sapindus mukorossi* Gaertn.
   Family: Sapindaceae
   Vernacular name: Rittha
   English common name: Soap nut tree
   Uses: The fruit is anthelmintic, emetic, expectorant, detergent, and tonic in nature. It is therefore useful in the treatment of epilepsy, asthma, diarrhea, cholera, salvation and indigestion. The fruit is also useful to treat scorpion sting, snake bite and dandruff.

34) *Tamarindus indica* Linn.
   Family: leguminosae / sub-family: Caesalpinoidae
   Vernacular name: Imili
   English common name: Tamarind
   Uses: The fruit is regarded as carminative, laxative, digestive and refrigerant. It is used to cure inflammatory swelling, mild cataract, constipation, bile problems and urinary problems such as indigestion and gonorrhea.

35) *Terminalia bellirica* (Gaertn.) Roxb.
   Family: Combretaceae
   Vernacular name: Barro
   English common name: Belleric Myrobalan
Uses: The fruit is of laxative, digestive, anthelmintic, antipyretic, astringent, aperient and tonic properties. It is widely taken to cure stomach disorders like indigestion, gastric problem, dropsy, dyspepsia, biliousness, headache and spleen problems. Its juice obtained after boiling the fruits is useful to cure bronchitis, asthma and other respiratory disorders.

36) *Terminalia chebula* Retz.
   Family: Combretaceae
   Vernacular name: Harro
   English common name: Chebulic myrobalan
   Uses: The unripe fruit is of astringent property and useful to treat diarrhea and dysentery. The ripe fruit, on the other hand, has carminative and purgative properties and is useful to cure diseases of eye, spleen, stomach problems, respiratory problems, ulcers, cough, cardiac problem, fever, skin problems and piles.

37) *Trapa bispinosa* Roxb.
   Family: Trapaceae
   Vernacular name: Simalkande
   English common name: Water Chestnut
   Uses: The spiny fruit contains white fleshy mass that is used in diarrhea, bronchitis, urinary problems and bilious affections.

38) *Vicia sativa* Linn.
   Family: Leguminosae
   Sub-family: Papilionaceae
   Vernacular name: Kutilkosa
   English common name: Common Spring vetch
   Uses: The fruits as green pods are widely taken as alterative and useful to treat insomnia.

39) *Vitis venifera* Linn.
   Family: Vitaceae
   Vernacular name: Dakh/ Jangali angoor
   English common name: wild grape
   Uses: The fruit is diuretic, cooling, laxative, expectorant, antispasmodic and nerve tonic. It is used to cure cough, indigestion, dyspepsia, diarrhea, hoarseness and breathing problems.

40) *Zanthoxylum armatum* DC.
   Synonym: *Zanthoxylum alatum* Roxb.
   Family: Rutaceae
   Vernacular name: timmur
   English common name: Prickly ash bark
   Uses: The fruit is of stomachic and carminative properties. Therefore, it is taken to treat toothache, cough and cold, gastritis, headache, piles, internal worms, diarrhea, stomach problems, fever and nervous debility. It improves appetite. The paste of immature fruit is useful to cure wound.

41) *Ziziphus jujuba* Lam.
   Synonym: *Ziziphus mauritiana* Lam.
   Family: Rhamnaceae
   Vernacular name: Bayer
   English common name: Indian Plum
   Uses: The fruit is used to cure cough, blood problems, indigestion, constipation, stomach problems, asthma and biliousness.
Ethno-Medicinal Uses of Wild Edible Fruits in Pokhara Valley, Nepal

People living in the study area habitually used seasonal wild fruits for different purposes. In the case of thirst feeling, they take ripe fruits of *Rubus ellipticus* and root tuber of *Nephrolepis cordifolia*. In the case of gastrointestinal problems, they use to take fruits of *Zanthoxylum armatum*. In the case of general disability, they use the fruits such as *Punica granatum*, *Musa paradisiaca* and *Vitis vinifera*. Similarly, in the case of urine inflammation and irregular urination, they take the fruits such as *Cassia fistula*. The consumption of such wild edible fruits helps the health condition of rural people as these are the sources of carbohydrates, vitamins, minerals, etc. There is a vast hidden or not explored knowledge about wild fruits and their nutritional health benefits in the study area. These wild fruits are taken orally. The present study was conducted to document and explore such fruits. Finally, the author strongly recommends initiating certain programs by the concerned local and central governmental authorities to help the people participate in such projects like the cultivation and commercialization of wild fruits.

CONCLUSION

This study shows 41 wild edible fruits generally consumed by rural and other peoples of Pokhara mainly due to their food values and taste. Although the wild edible fruits are an important alternative source of raw food and income for local people. As an established fact, these fruits are also important as the herbal medicines to cure many diseases. The result shows that more than 50 diseases have been cured by using wild edible fruits in the study area. In this sense, the wild fruits are an important natural source for the wellbeing of the people and country, too. Therefore, the people and the government should pay attention to this aspect.

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