



Original Research Article

doi: <https://doi.org/10.20546/ijcrbp.2020.707.006>

Ethnobotanical and medicinal uses of various wild fruit plants of Tehri Garhwal, Uttarakhand (India)

Sanjeev Lal*, Jai Laxmi Rawat and Richa Badhani

Department of Botany, R.C.U. Govt. P.G. College, Uttarkashi (Uttarakhand) – 249 193, India

*Corresponding author; e-mail: sanjeev1983@gmail.com

Article Info

Date of Acceptance:
30 June 2020

Date of Publication:
06 July 2020

Keywords

Ethnobotany
Medicine
Nutrition
Uttarakhand
Wild fruit

ABSTRACT

The represent of this evaluation was to explore the ethnobotanical and medicinal properties of the wild fruit plant species of the different village of Tehri Garhwal region of Uttarakhand State, India. Uttarakhand is one of those places, which are suitable for the wild edible fruiting plants, because of their difficult geography and climatic conditions and remarkable taste of fruits, which are attracted by their people as a rich source of their nutrition and medicinal values. Fruit is a ripened ovary and it may either fleshy or nut and divided into cultivated as well as wild categories. Wild fruits are worldwide distributed and mostly found in their part of earth surface, where anthropogenic activities are negligible. The uses of Himalayan plant species for food & medicine has been known for a long time. Wild edible plants are very important for the well being of rural populations in the region, which is not only as sources of supplemental food, nutritionally balanced diets, medicines, fodder and fuel, but also for their income generating potential. Large numbers of the wild fruits along with their edible values used in medicine against different diseases have high nutritive quality & used by the local peoples. Such wild plants might be explore for their nutritional and medicinal properties and need to conserve for biodiversity maintenance in the study area. Therefore, presently there is a need to conserve the wild fruit plants in the villages of Tehri Garhwal region in the future for their value in the human kind.

Introduction

Uttarakhand is a part of the North-Western Himalayas and it is located between the 28° 43'-31° 27' N latitudes and 77° 34'-81° 02' E longitudes. Uttarakhand is one of place, which is suitable for the wild edible fruiting plants, because of their difficult geography, climate and amazing taste of the fruits, which is attracted by their people as a rich source of their nutrition (Meyers et al., 2003). Consumption of wild edible fruits meets the protein, carbohydrates, fats, vitamin and mineral

requirement of poor rural region. The fruit is a ripened ovary of flower and may either fleshy or nut, generally cultivated as well as wild. Cultivated fruits are grown by farmers for their economical benefits, while wild fruits are occurring only in their natural environment. As population increases the areas of plantation and forest used for human welfare and number of plants decreases so wild plants lost their identity and decrease in their number. Wild fruiting plants are major in numbers in that place which are not affected by human interaction due to their difficult geography and

climatic conditions, which is not suitable for human survival as was noted by Tiwari et al. (2010). The use of plant species of the Himalaya as food and medicine has been known for a long time and about 1748 economically important plants have been reported from Indian Himalaya as was noted by Samant et al. (1998). The unique diversity of such important plants in the region is manifested by the presence of a number of native (31%), endemic (13.5%) and threatened (14%) of total red data book species of Indian Himalayan region was noted by Saklani et al. (2011). Wild edible plants are very important for the well being of rural populations in the region, not only as sources of supplemental food, nutritionally balanced diets, medicines, fodder and fuel, but also for their income generating potential as was observed by Gangwar et al. (2010). The greater Himalaya is the Northern boundary of the state and it is also the international border with China. Most of the people of this state are dependent on their natural environment and it is characterized by a rich diversity of ethno-botanical plant as well as rich heritage of wild edible plants system. On the basis of this information, the present research work focused on the nutritional and medicinal values of wild fruit plants of the Tehri Garhwal region, which are located in Uttarakhand state. This can be exploring for their great nutritional and medicinal properties of these wild fruit plants and conserve it in the future.

Materials and methods

The present study was deals with the major wild fruit plant species of Tehri Garhwal, Uttarakhand state. This study was based on the extensive and intensive fields surveys were made during 2019 till to 2020. The frequent field studies were made from selected sites for the observation of wild fruit plants and collected ethnobotanical and medicinal information. During this course the information were also obtained by farmers and agriculturalists of each site about seasonal wild fruit plant species and important notes were reported.

Study area

The study site was located in Tehri, Garhwal region of Uttarakhand state. The present study was conducted during the year 2019 till to 2020 in

Tehri Garhwal region and its adjacent areas/villages. Tehri Garhwal is a district in the hill state of Uttarakhand, India. Its administrative headquarters is located at New Tehri. It is surrounded by Rudraprayag District in the East, Dehradun District in the West, Uttarkashi District in the North and Pauri Garhwal District in the South. The present study was based inventory on the field level information of adjoining area of Tehri Garhwal region, where we find out the wild fruit plant species in our proposed work. In that region found different types of wild fruit plants diversity and which show the biodiversity variability so we were choose that area for our proposed work. While conducting the surveys on biodiversity of wild fruit plants of the above regions, information was also gathered from the local farmers.



Fig. 1: Map of Tehri Garhwal.

Objectives of present work:

The following objectives were selected for the proposed work:

- ✓ Extensive survey and inventory within the different study areas/villages of Tehri District (Uttarakhand).
- ✓ Literature collection with the help of College libraries, Forest research Institute and Botanical survey of India, Dehradun.

- ✓ The different wild fruit plant species were studied with their botanical name, local name and its family.
- ✓ Discussed the status of the wild fruit plants and their ethnobotanical, medicinal and nutritional values
- ✓ Updated the developed methods for the conservation of the wild fruit plants and suggest strategy for the management and increasing the production of different wild fruit plants.
- ✓ Studied, the uses of the wild fruit plants against different diseases.

Results

The present investigation has been carried out the extensive survey on the wild fruit plants and describes the ethnobotanical and medicinal uses of these plants. The wild fruit plants were observed from the study site with their botanical name, local name and family are listed below:

1. Hisalu/Hishar

Botanical name is *Rubus ellipticus*, local name is yellow Himalayan raspberry, Hisalu, Ashilo and belongs to the *Rosaceae* family. It plays a major role to providing free energy packets for the people, who are travelling mountains and they can be finding them everywhere (Fig. 1A).

2. Plum

Botanical name is *Prunus persica*, local name is Plum and belongs to the family *Rosaceae*. Plum fruits are used widely in the preparation of jellies, jams and desserts. People even use dry plum as dry fruit. Medicinally it is use in wound healing (Fig. 1B).

3. Kafal

Botanical name is *Myrica esculenta*, local name is Kafal or Kaphal and belongs to the family *Myricaceae*. Besides being useful in a wide range of ailments specified decoctions of fruits, the stone and also its bark are claimed to be beneficial in

cardiac debility, edema and haemoptysis. A wax covering on the fruit is extracted by scalding the fruit with boiling water. Among the local inhabitants it is said to be used as an application for ulcer healing (Fig. 1C).

4. Fedu

Botanical name is *Ficus palmata*, local name are Khemri in Hindi, Pheru in Jaunsar, Bedu in Kumaun, Indian Fig in English and Bendu in Nepali and belongs to the family *Moraceae*. The Bedu fruit is very juicy and contain 45 percent of juice. The fruit is beneficial in the disease of lungs and bladder. It is a source of minerals, phosphorus and a small amount of Vitamin-C (Fig. 1D).

5. Darim:

Botanical name is *Punica granatum*, local name is Darim and belongs to the family *Lythraceae*. It has a good amount of minerals, phosphorous, calcium and magnesium. Pomegranate fruit juice is known as a delicacy, which has diuretic and cooling effect and having glucose, fructose, tannins, oxalic acid and reduces thirst in cases of fevers, supplies the required minerals and helps the liver to preserve vitamin-A. The rind of the fruit and the bark are used as a traditional remedy against diarrhea, dysentery and intestinal parasites (Fig. 1E).

6. Berbrise

Botanical name is *Berberis asiatica*, local name Kingod, Marpyashi, Darbi and belongs to the family *Berberidaceae*. In Ayurvedic medicinal system it is named as ‘Daruharidra’ or Wood Turmeric due to similar properties as of turmeric, which is used in antimicrobial, wound healing, hepatoprotective and cytotoxicity etc. The plant yields fairly large quantity of alkaloids in which isoquinoline type alkaloids like barbering, palmatine, jetrorrhizine and columbamine are the most studied phytoconstituents (Fig. 1F).

7. Makoi

Botanical name is *Solanum nigrum*, local name is Black Nightshade and belongs to the family *Solanaceae*. It has expectorant, analgesic, sedative, diaphoretic properties. Its external application

cures skin diseases and gives relief in burns, itching and pain etc. As per Ayurveda, this plant is hot and balances Tridosha. The juice of leaves is used as ear drop to get relief from pain in ears. It also contains polyphenolic compounds such as gallic acid, catechin, protocatechuic acid, caffeic acid, epicatechin, rutin and naringenin (Fig. 1G).

8. Ghigharu

Botanical name is *Pyracantha crenulata*, local name is Ghigharu and belongs to the family *Rosaceae*. Fruits can be made into a preservative. Medicinally, it has cardio-tonic, coronary vasodilator and hypertensive properties. It has been used for cardiac failure, myocardial weakness, paroxysmal tachycardia, hypertension, arteriosclerosis and Burgor's disease. The antioxidants present in fruits are helpful in reducing the ill-effects of free-radicals in our body, maintain blood-pressure and reduce cholesterol. Apart from this the fruits are helpful for rejuvenation in aged people, reduce joint pains and act as appetizer. The leaves are used in the preparation of herbal tea, sun burn creams and many facial creams. The bark of the shrub is used in heavy bleeding during menstrual cycles. A combination of *Ginkgo* and *Pyracantha* leaves are a tonic to mind. The stem bark is useful in fevers especially malaria. It is rich in beta-carotene, iron, potassium, antioxidants and therefore a healthy choice (Fig. 1H).

9. Apricot/khubani

Botanical name is *Prunus armeniaca*, local name is Khubani and belongs to the *Rosaceae* family. Fruit have high in carotene and vitamin-C, which provides a valuable source of food eaten fresh as jams, dried or cooked in the meat dishes. The kernels can also be eaten, pressed to make almond oil or used medicinally. Recent studies suggest that the amygdalin extracted from apricot kernels can be used as an alternative treatment for the cancer diseases (Fig. 1I).

10. Mulberries

Botanical name is *Morus alba*, local name is Mulberries also known as White Mulberry and belongs to the family *Moraceae*. It is used from make jams or jellies add some lemon juice to perk

up the flavor. The ripe fruit is edible and it is widely used in pies, tarts, wines, cordials and tea. Unripe fruit and green parts of the plant have a white sap that may be toxic, stimulating or mildly hallucinogenic. Mulberry leaves, particularly those of the white mulberry are ecologically important as the sole food source of the silkworm (*Bombyx mori*); anthocyanins are responsible for the attractive colors of fresh plant foods, including orange, red, purple, black and blue. These colors are water-soluble and easily extractable, yielding natural food colorants (Fig. 1J).

11. Timil/Timla

Botanical name is *Ficus auriculata*, local name is Timul, Timil and Timla and belongs to the family *Moraceae*. Gastro intestinal problems can be treated by using 50-100 ml fresh juice of leaves with water for about 10 days. Bark and root show hypoglycemic and anthelmintic activity. The extracts also reported to inhibit insulinase activity from liver and kidney. Fruit extracts exhibits anti-tumor activity. Traditionally, the plates make by the leaves of Timla plants for the eating propose of food materials in the party and marriage occasion and fruit also eating with the mixture of salt as was observed by Lal et al. (2018) (Fig. 1K).

12. Bael

Botanical name is *Aegle marmelos*, local name is Bael or Indian Bael, Golden apple, Elephant apple, Baelputri, Sirphal, Siriphal and belongs to the family *Rutaceae*. The fruit is eaten fresh or dried. If fresh, the juice is strained and sweetened to make a drink and use for sharbat. The dried fruit is usually used for slice and sun-dried than hard leathery slices are immersed in water. The fruit pulp has detergent action (Fig. 1L).

13. Ber

Botanical name is *Ziziphus jujube*; local name is Ber and belongs to the family *Rhamnaceae*. The delicious fruits used as an effective herbal remedy. It increases the weight, stamina and improves muscular strength. In Chinese medicine, it is prescribed as a tonic to strengthen liver function. Its functions as diuretic, emollient and expectorant also said to promote hair growth.



Fig. 1: the ethnobotanical and medicinal fruit plants.

The dried fruits of Ber are anticancer, pectoral, refrigerant, sedative, stomachache, styptic and tonic. They also help in purify the blood and aid digestion. They are used internally in the treatment of chronic fatigue, loss of appetite, diarrhea, anemia, irritability and hysteria. The seed is hypnotic, narcotic, sedative, stomachache and tonic. It is used internally in the treatment of palpitations, insomnia, nervous exhaustion, night sweats and excessive perspiration. The root is used in the treatment of dyspepsia. Root has been used in the treatment of fevers. The root is made into a powder and applied to old wounds and ulcers. The leaves are helpful in the liver troubles, asthma and fever. The fruit is very nutritious with potassium, phosphorus, calcium, manganese and also rich source of Vitamin-C and Vitamin-B complex and anti-oxidant content of fresh fruits is higher than most of fruits (Fig. 1M).

14. Wild grapes

Botanical name is *Vitis vulpina*, local name is forest grape and belongs to the family *Vitaceae*. The fruits are used in juice, wine and jelly. Unripe grapes were used for the treating sore throats and raisins were given as treatments for consumption (tuberculosis), constipation and thirst. Ripe grapes were used for the treatment of cancer, cholera, smallpox, nausea, skin and eye infections as well as kidney and liver diseases (Fig. 1N).

15. Wild pear

Botanical name is *Pyrus pyrifolia*, local name is wild pear and belongs to the family *Rosaceae*. The fruits are juicy, edible and a good preservative for the jam (Fig. 1O).

16. Red berries

Botanical name is *Viburnum opulus*, local name is Guelder rose, water elder, cramp bark, snowball tree and belongs to the family *Adoxaceae*. It is used as an ornamental plant. In cooking, it is used as a cranberry substitute when making preserves and jellies. It can be eaten either raw or cooked, but use caution when using the berries of this plant in foods, as it can cause diarrhea, nausea and vomiting if eaten in large quantities or when unripe. Generally, if ripe and

cooked, the fruit has very low toxicity. The fruit also contains a red dye which was used by early Native Americans to make ink. A decoction of the bark was also used as a beverage for both social drinking and medicinal purposes (Fig. 1P).

17. Indian fig

Botanical name is *Ficus carica*, local name is edible fig and belongs to the family *Moraceae*. All parts used in the native system of medicine in different disorders such as colic, indigestion, diarrhea, sore throats, coughs, bronchial problems, inflammatory, cardiovascular disorders, ulcerative diseases and cancers. The latex from the sap can be used to coagulate plant milks (Fig. 1Q).

18. Hill raspberry

Botanical name is *Rubus niveus*, local name is Hill Raspberry, Kala Hinsalu and belongs to the family *Rosaceae*. The fruits are enjoyed fresh, alone or served with sugar and cream or ice cream. They are excellent for making pie, tarts, jam and jelly. The fresh fruit can be quick-frozen for future use (Fig. 1S).

19. Bhambti

Botanical name is *Parthenocissus semicordata*, local name is Bhambti, Phlankur and belongs to the family *Vitaceae*. The fruits have multiple uses mostly edible (Fig. 1T).

20. Amla

Botanical name is *Phyllanthus emblica*, local name is Amla and belongs to the family *Phyllanthaceae*. The entire plant is economically important. The dried fruit, nut or seed, leaves, root, bark and flowers of *Phyllanthus emblica* are frequently employed. The ripe fruits are generally used fresh, but dried fruit are also used. It is rich in polyphenols, minerals and is regarded as one of the richest source of vitamin-C. Therapeutic uses as an energy refiller, aperient, antibacterial, antifungal, antiviral in gonorrhoea, analgesic and skin fairness to stop nausea and vomiting, antitumour activity and Hepatoprotective activity (Fig. 1U).

21. Jamun

Botanical name is *Syzygium cumini*, local name is Jamun, Java plum, Black plum, Jambul and Indian blackberry and belongs to the family *Myrtaceae*. Fruit syrup is very useful for curing diarrhea. It is stomachache, carminative and diuretic, apart from having cooling and digestive properties. Vitamin-C is able to regenerate other antioxidants such as vitamin-E. The fruits of *Syzygium cumini* are used in making jam, jellies, squash, vinegar and ice cream for its beautiful and attractive purple colour (Fig. 1V).

22. Imli

Botanical name is *Tamarindus indica*, local name is Madeira Mahogany, Indian Date, Tamarind Tree, Tentul, Chinta, Anbli, Tamrul, Amli, Imli and belongs to the family *Leguminosae*. The fruit pulp is used for seasoning as a food component to flavor confections, curries, sauces and is a main component in juices and certain beverages. Fruit pulp is eaten fresh and often made into a juice infusion or brine (Fig. 1W).

23. Black raspberry

Botanical name of black raspberry is *Rubus occidentalis*; local name is Black raspberry, wild black raspberry, black caps, black cap raspberry and belongs to the family *Rosaceae*. It has high amount of anthocyanins, which is very useful for natural dyes and also beneficial for cancer treatment. The leaves can be used fresh or dried in herbal teas. It has astringent flavor and use in herbal medicine (Fig. 1X).

24. Sea buckthorn

Botanical name is *Hippophae rhamnoides* is genus of sea buckthorn, deciduous shrubs and belongs to the family *Elaeagnaceae*. *Hippophae rhamnoides* produces orange-yellow berries, which have been used over centuries as food, traditional medicine and skin treatment in Mongolia, Russia and Northern Europe, and these regions are believed to be its origin. *Hippophae rhamnoides* is planted to inhibit soil erosion and reclamation for nitrogen fixing properties, wildlife habitat and soil enrichment.

Discussion

The present analysis has been carried out to survey the ethnobotanical exploration, identification, concerns and future potentialities of the wild edible plants of Garhwal region and recorded total 24 plant species belonging to different families. The similar observation was also recorded by Valvi (2011), Adhikari et al. (2010) and Joshi (2014) respectively. Wild edible fruits were mainly used for the direct consumption and in the majority of the wild edible plant occurs variation in the available species, culture of the communities with respect to food preference and preparation as was noted by Kebede et al. (2017). Wild edible fruits were traditionally used as food, medicine and also used in wine and pickle preparations. Similar uses were reported by earlier studies conducted by Reddy (2007). Based on the opinions of the respondent's encroachment, deforestation, low rainfall was affecting the diversity of the wild edible fruit plant species. Similar factors were also reported by Kebede et al. (2017). The local people prefer the species which is economically important. These species were having high demand in local markets and it can be also used in value addition such as edible and medicinal purposes. Wild edible fruits were cultivated by the local people and the main reasons for the cultivation was own consumption or direct edible purpose, income generation and livelihood improvements.

Conclusion

The present study was concluded that from the study site to investigate and categorize the importance of 24 wild fruit plant species. The wild fruit plants are worldwide in the distribution, but in very low quantity. The wild fruiting plants are generally in majority in that place which is not affected by human interaction due to their difficult geography and climatic conditions, which is not suitable for human survival. Uttarakhand is characterized by a rich diversity of ethnobotanic plant as well as rich heritage of wild edible plants system. Consumption of wild edible fruits meets the protein, carbohydrates, fats, vitamin and mineral requirement of poor rural people in the region. Wild edible plants are very important for the well being of rural populations in the region, not only as sources of supplemental food, nutritionally balanced diets, medicines, fodder and

fuel, but also for their income generating potential of local farmers. Many wild fruits such as *Rubus ellipticus*, *Prunus persica*, *Myrica esculenta*, etc. have high nutritive quality and used by the local peoples for different edible products. Among these many other wild fruits such as *Punica granatum*, *Berberis asiatica*, *Solanum nigrum*, *Ficus auriculata*, etc. have been reported for the good medicinal properties. The traditional knowledge about the use of indigenous medicinal plants has been explore, therefore, the ethnological knowledge of people and listing of plants of particular region are important tools that may help in understanding the human environment interactions, but at the village level the local farmers has not knowledge about the medicinal uses of these such wild fruit plants. For the knowledge of local people should be need to aware through the advertisement such as seminar, workshop and short term training by Government and Non-Government agencies for their income generating potential.

Conflict of interest statement

Authors declare that they have no conflict of interest.

Acknowledgement

Authors are thankful to farmers and agriculturists of the study area for sharing valuable information about seasonal wild fruit plant species with us.

References

- Adhikari, B., S., Babu, M.M., Saklani, P.L., Rawat, G. S., 2010. Medicinal plants diversity and their conservation status in Wildlife Institute of India (WII) Campus, Dehradun. Ethnobot. Leaflet. 14(1), 46-83.
- Gangwar, K.K., Deepali, Gangwar, R.S., 2010. Ethnobotanical plant diversity in Kumaun Himalaya of Uttarakhand, India. Nat. Sci. 8(5), 66-78.
- Joshi, Y., Joshi, A. K., Prasad, N., Juyal, D., 2014. Review on *Ficus palmata* (Wild Himalayan Fig). J. Phytopharmacol. 3(5), 374-377.
- Kebede, A., Tesfaye, W., Fentie, M., Zewide, H., 2017. An ethnobotanical survey of wild edible plants commercialized in Kefira market, Dire Dawa City, Eastern Ethiopia. Plant 5(2), 42-46.
- Lal, S., Dhingra, G. K., Kaur, R., 2018. Survey on the traditional medicinal plant species used to cure diabetes. Int. J. Environ. Rehab. Conserv. IX(1), 23-33.
- Meyers, K. J., Watkins, C. B., Pritts, M. P., Liu, R. H., 2003. Antioxidant and antiproliferative activities of strawberries. J. Agric. Food Chem. 51(23), 6887-6892.
- Reddy, G. T. C., 2007. Studies on population status of wild edible fruit tree species in two vegetation types of Kodagu. M.Sc., Thesis, University of Agricultural Sciences, Bangalore, Karnataka (India), 102 p.
- Samant, S. S., Dhar, U., Palni, L.M.S., 1998. Medicinal plants of Indian Himalaya: Diversity distribution potential values. Gyanodaya Prakashan, Nanital, India.
- Saklani, S., Chandra, S., Mishra, A.P., 2011. Evaluation of nutritional profile, medicinal value and quantitative estimation in different parts of *Pyrus pashia*, *Ficus palmata* and *Pyracantha crenulata*. J. Global Trends Pharmaceut. Sci. 2(3), 350-354.
- Tiwari, J.K., Ballabha, R., Tiwari, P., 2010. Some promising wild edible plants of Srinagar and its adjacent area in Alaknanda Valley of Garhwal Himalaya, India. J. Am. Sci. 6(4), 167-174.
- Valvi, S.R., Deshmukh, S.R., Rathod, V.S., 2011. Ethnobotanical survey of wild edible fruits in Kolhapur District. Int. J. Appl. Biol. Phamaceut. Technol. 2(1), 194-197.

How to cite this article:

Lal, S., Rawat, J.L., Badhani, R., 2020. Ethnobotanical and medicinal uses of various wild fruit plants of Tehri Garhwal, Uttarakhand (India). Int. J. Curr. Res. Biosci. Plant Biol. 7(7), 54-61.

doi: <https://doi.org/10.20546/ijcrbp.2020.707.006>