



Ethno botanical and medicinal uses of some wild edible fruiting plants in hills region of Garhwal Himalaya

¹P S Chauhan, ²MPS Parmar and ³Indu Tiwari

^{1,3}Department of Botany, Govt. PG College Rishikesh, Uttarakhand (India)

²Department of Botany, Govt. PG College Uttarkashi Uttarakhand (India)

Correspondence author: drpschauhan17@gmail.com

Abstract: Garhwal Himalayas is characterized by a rich diversity of ethno botanical and medicinal plants as well as rich heritage of wild edible fruits. A study was conducted to explore the ethno medicinal uses of different wild edible fruiting plants. The present study was carried out in 9 blocks and 45 villages of district Tehri Garhwal. Twenty-four wild edible fruiting plant species were identified from the study area viz; *Aegle marmelos*, *Benthamidia capitata*, *Berberis aristata*, *Berberis lyceum*, *Carissa opaca*, *Celtis australis*, *Embilica officinalis*, *Ficus auriculata*, *Ficus palmate*, *Ficus racemosa*, *Ficus semicordata*, *Flacourtia indica*, *Grewia optiva*, *Morus serrata*, *Myrica esculenta*, *Phoenix humilis*, *Punica granatum*, *Pyrus pashia*, *Rhus parviflora*, *Rubus ellipticus*, *Rubus paniculatus*, *Solanum nigrum*, *Syzygium cumini*, and *Ziziphus glaberrima*.

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Introduction

Garhwal Himalayan region is rich in diversity of wild plant species and it plays a significant role in the life of human kind (Gaur RD, 1999). Wild edible plants are very important for the well being of rural peoples in the hilly regions, not only as sources of supplementary food, nutritionally balanced diets, medicines, fibre, fodder and fuel, it also as source for their income generating potential (Gangwar et al., 2010). Uttarakhand is highly enriched with its vegetation including wild edible fruits due to its varied eco-geographical and eco-climatic conditions (S Saklani, S Chandra, 2011). The Indigenous communities living in rural and mountainous territories of developing world consider livestock a vital source for economy, social security, and food and is thought to be a symbol of prestige for a particular family (Abbasi et al. 2013). Some wild fruits have been identified to have their better nutritional value than cultivated fruits (Eromosele et al., 1991; Maikhuri et al., 1994). Consumption of wild edible fruits meets proteins, carbohydrates, fats, vitamins and minerals requirement of poor rural peoples in hilly areas of Uttarakhand (Sundriyal and Sundriyal, 2001). The utilization of traditional remedies poses a cheaper, easier, and sustainable alternative to synthetic drugs and pharmaceuticals (Dilshad et al. 2010). Peoples who do not have earning sources in hills, they wait for ripening time as it carries a lot of commercial importance. The popularity of the species can be

judged from the fact that local people of the hills can earn more money in every season from selling of the wild fruits (Bhatt et al., 2000). The utilization of traditional remedies poses a cheaper, easier, and sustainable alternative to synthetic drugs and pharmaceuticals (Dilshad et al. 2010). The present study focused on ethno botanical and medicinal uses of wild edible fruiting plants in the hills of Garhwal.

Materials and methods

District Tehri Garhwal has selected for present investigation. It has composed of nine blocks i.e. Chamba, Pratapnagar, Hindolakhil, Thouldhar, Jakhanihar, Fakot, Jaunpur, Kirtinagar and Bhilangna and 5 villages selected from each block. Based on availability of wild fruits, study area divided in three regions i.e. tropical, subtropical and temperate. Total forty-five villages surveyed during investigation in different seasons. The study based on intensive and extensive field survey. Main data collection centre made in New Tehri town (District headquarters of Tehri Garhwal) and local information station made in each selected villages for current information. Each selected village and identified areas visited over the year in different seasons with the help of local inhabitants. Information station has contacted regularly to know the availability of wild fruits in different season. The ethno medicinal property of each identified fruits obtained through informed consent semi-structured interviews, questionnaires, market

survey, group conversation, unceremonious dialogue and village walks with key informants. Indigenous knowledge of local traditional healers about plants used for medicinal purposes was also collected through questionnaire and interviews. Ten questions asked from five peoples in each selected villages. Cultural significance of all identified plants calculated based on the use as reported by participants at each study site. Different parameters i.e. medicinal value, ethno botanical uses and morphological feature has observed for all identified plants.

Results and Discussion

The total twenty-four wild fruiting plants has identified from the study area and documented with their ethno medicinal value including their botanical names, vernacular names, family names and parts used etc. presented in Table-1. Morphological features viz shape, colour, taste, fruiting season etc. of all observed wild fruits have been discussed in Table-2 and Fig-1. The identified fruiting plants grow abundantly across an altitudinal gradient in the forest of Garhwal Himalayas and these fruiting plants bear maximum fruits during summer and winter season. Deforestation, construction of roads, and over exploitation of natural resources are major factors, which affects the natural habitat of wild fruiting plants and due to such interference these plants slowly becoming extinct. Wild fruiting plants are major in numbers in that place that are not affected by human interaction due to their difficult geography and climatic conditions which is not suitable for human survival (Tiwari et al., 2010). Wild fruits contain carbohydrates, vitamins, proteins, minerals, fibre and enormous rich ethno medicinal values. It is also an important source of balance diet and its regular uses can increase immunity of human body. Almost poor people are dependent on wild fruits for nutrition and economy generation in hills. Even in all over the world poor people use hundreds of wild fruits and it plays a significant role in his life. Even millions of people in many developing countries do not have enough food to meet their daily requirements and are deficient in one or more nutrients (FAO, 2004). In many others developing countries, wild plants are exploited as sources of food and other life supporting commodities and thus provide an adequate level of nutrition to the human beings (Aberoumand and

Deokule, 2010). Fruits are also an important source of micro and macronutrients, which contribute essential nutritional requirements to the rural communities. The wild fruits are natural and pure due to their difficult geography and climatic conditions, and awesome taste of fruits, which attracts people as a rich source of their nutrition (Meyers et al., 2003). Poverty is the major contributor to the low consumption of fruits in hilly areas of Uttarakhand but rural peoples believe on wild fruits and they consume enough in every season. The use of plant species of the Himalaya as food and medicine have been known for a long time and several economically important plants have been reported from Indian Himalaya (Samant et al., 1998). *Aegle marmelos*, *Benthamidia capitata*, *Embilica officinalis*, *Myrica esculenta*, *Pyrus pashia* and *Syzygium cumini* are important sources of many nutrients, including potassium, calcium, fibre, vitamin C and folic acid, which increase the immune system of body and make strong against different pathogenic agents. Some wild fruits rich in poly phenols, minerals and regarded as one of the richest source of vitamin C (Krishnaveni M, Mirunalin S 2011). Some wild fruits belong to family Ficaceae are juicy with honey and local peoples used it for digestive and respiratory disorder. Such juicy fruits are rich source of minerals and a small amount of Vitamin C and beneficial in the disease of lungs and the gall bladder (Bhowmik et al. (2013). Jamun, Mol, Dalimu and Kaphal wild fruits are source of different alkaloids, after regular using of these fruits can remove the toxic substances from body. The fruiting plants yields large quantity of alkaloids in which isoquinoline type alkaloids like berberine, palmatine, jetrorrhizine, and columbamine are the most studied phyto constituents in various wild fruiting plants (Dehar et al., 2012). Karonda is also one of the important juicy fruit which helpful in respiratory disorders. It is a strong purgative and used as one of the ingredients in some purgative preparations. A large dose of Karonda roots useful for the fatal owing to profuse purging (Parmar C, Kaushal MK,1982). The wild fruits are do not spoiling very soon due its genetic and physical purity in comparison to cultivated fruits. Local inhabitants store it for long time after harvesting. Bel, Dalimu, Jamun and Bhamora are the common example of wild fruits, which can store for long time without refrigerator.

Table 1. Ethnomedicinal uses of some wild edible fruiting plants in hills.

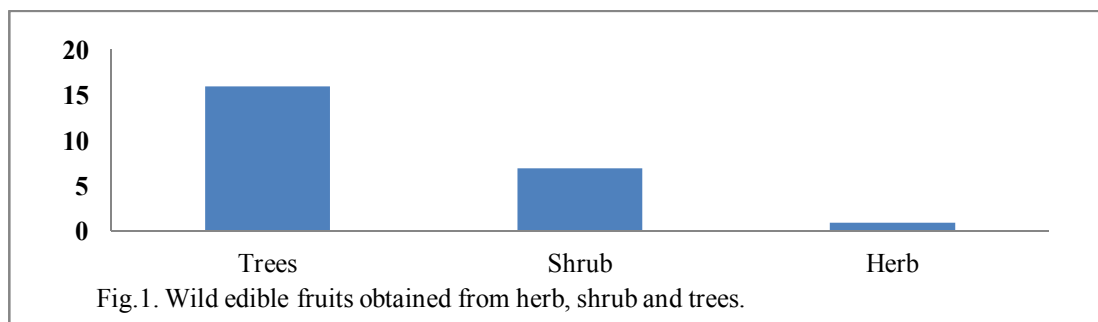
S.N	Botanical Name	Vernacular Name	Family	Ethno botanical and Medicinal uses
1	<i>Aegle marmelos</i> (L.)	Bel	Rutaceae	Ripe fruits edible, juice used in digestive, cardiac and respiratory disorder. Leaves commonly known Belpatri and offered to lord Shiva.
2	<i>Benthamidia capitata</i> (Wall. Ex. R.)	Bhamora	Cornaceae	Fruits source of calcium, multivitamin. Wood used to make agricultural implements.
3	<i>Berberis aristata</i> (DC. Syst.)	Kingor	Berberidaceae	Fruit edible, bark and root extract used in jaundice, diabetes and fever. Root extract used in eye flue. Yellow dye obtained from root and bark.
4	<i>Berberis lyceum</i> (Royle. Tr.)	Kingor	Berberidaceae	Root extract used in Jaundice and eye ailments. Root and bark source of yellow dye.
5	<i>Carissa opaca</i> (Stapf ex. Hai.)	Karaunda	Apocynaceae	Fruits chewed with <i>Tungla</i> leaves as pepper. Roots used for fatal owing to profuse purging. Leaves browsed by goats and sheep, wood used as fuel.
6	<i>Celtis australis</i> (L. Sp. Pl.)	Kharik	Ulmaceae	Fruit edible, leaves fodder, wood used as fuel and making small agricultural implements, bark source of dye, and its paste applied for bones fracture and joint pain.
7	<i>Embilica officinalis</i> (Gaert. Fru. Sem.)	Awnla	Euphorbiaceae	Fruits edible and rich source of vitamin C. Fruits used as pickle and ingredient of <i>Trifala</i> , commonly used for several disorders. Leaves fodder and bark source of tannin.
8	<i>Ficus auriculata</i> (L. Fl. Coch.)	Timla	Moraceae,	Leaves fodder, cup and plates are making from leaves, ripe fruits edible and contain honey, unripe fruits made into vegetable after toast, white latex anti diabetic.
9	<i>Ficus palmate</i> (For. Fl. Aeg.)	Bedu	Moraceae,	Leaves fodder, fruit edible, bud and unripe fruits often used as vegetable after fried. Fruit used for digestive disorder. Plants are also useful in agro forestry.
10	<i>Ficus racemosa</i> (L. Sp. Pl.)	Umra	Moraceae,	Fruits edible, immature fruits cooked and fried. Leaves used as fodder, plant useful in Hindu religious.
11	<i>Ficus semicordata</i> (Buch. Ham. Ex. JE)	Khaina	Moraceae,	Fruit edible, wood used as fuel and leaves fodder.
12	<i>Flacourtia indica</i> (Burm. F.)	Kangu	Flacourtiaceae	Leaves fodder, fruit edible and used in hepatitis fever, dysentery, diarrhea. Leaves and bark paste applied on wounds.
13	<i>Grewia optiva</i> (J.R. Dru. Ex Bu.)	Bhimal	Tiliaceae	Fruit edible, leaves used as fodder, sticks fiber used as soap and shampoo, sticks lit fire. Ropes, nets, brushes, brooms and cattle tie ropes making from fiber and fruits used in Urinary troubles.
14	<i>Morus serrata</i> (Roxb. Fl. Ind.)	Sahtoot	Moraceae	Fruit edible, leaves used as fodder, agricultural implements making from wood.
15	<i>Myrica esculenta</i> (Buch. Ham. Ex. Ddun)	Kaphal	Myricaceae	Fruit edible, soup used in digestive and cardiac disorder. Bark used to yield dye. Wood used as fuel and agricultural implements.
16	<i>Phoenix humilis</i> (Roy. Il. Bot. H.)	Khajoor	Arecaceae	Fruit edible, leaves used mats, hats and brooms. Dry leaves also used to prepare strong roof of mud houses.
17	<i>Punica granatum</i>	Dalimu	Punicaceae	Fruits edible, source of minerals and used in cough and cold.
18	<i>Pyrus pashia</i> (Buch. Ham. Ex. Ddun)	Mole	Rosaceae	Fruits edible and blood purifier, leaves used as fodder, wood make into sticks and agricultural implements.
19	<i>Rhus parviflora</i> (Rox. Fl. Indica)	Tungula	Anacardiaceae	Fruits edible, leaves mixed with tobacco and used for smoking. Leaves often used as bio-fence. Wood used as fuel, stem used for toothbrush and used in toothache.
20	<i>Rubus ellipticus</i> (Smith Res. Cy.)	Hinsar	Rosaceae	Fruits source of vitamin C. Flowers are useful in apiculture.
21	<i>Rubus paniculatus</i> (Smith Res. Cy.)	Kali Hinsar	Rosaceae	Fruit source of energy and flowers useful in apiculture.
22	<i>Solanum nigrum</i> (L. Sp. Pl.)	Makoi	Solanaceae	Fruit edible and stem extract used in diarrhea, fever Liver. Fruits used in digestive disorders & dysentery. Leaves extract useful in ear pain.
23	<i>Syzygium cumini</i> (L. Sk. US Dept. A.B.)	Phalendu/ Jamun	Myrtaceae	Fruit edible, multivitamin, used in diabetes, bark used for dyeing and tannin.
24	<i>Ziziphus glaberrima</i> (L. Mill. G. Dict. Ed.)	Ber	Rhamnaceae	Fruit edible and more nutritive, rich source of calcium and potassium, root is useful and applied to old wounds and ulcers. Leaves extract helpful in liver trouble, asthma and fever.

(Source of data from local inhabitants and Flora of the District Garhwal North West Himalaya, RD Gaur 1999).

Table 2- Morphological characters of wild edible fruits.

S.N.	Botanical Name	Color	Shape	Fruiting season	Taste
1	<i>Aegle marmelos</i>	Pale yellow	Pyriform	Summer	Sweet-sour
2	<i>Benthamidia capitata</i>	Dark brown	Round	Winter	Bitter-sweet
3	<i>Berberis aristata</i>	Purple	Oblong	Summer	Sweet-sour
4	<i>Berberis lyceum</i>	Purple	Oblong	Summer	Sweet-sour
5	<i>Carissa opaca</i>	Black	Oval	Summer	Sweet
6	<i>Celtis australis</i>	Light red	Oval	Winter	Sweet
7	<i>Embilica officinalis</i>	Pale yellow	Round	Winter	Sour
8	<i>Ficus auriculata</i>	Red	Pyriform	Summer	Sweet
9	<i>Ficus palmate</i>	Purple	Pyriform	Summer	Sweet
10	<i>Ficus racemosa</i>	Red	Pyriform	Summer	Sweet
11	<i>Ficus semicordata</i>	Red	Pyriform	Summer	Sweet
12	<i>Flacourtia indica</i>	Light green yellow	Round	Summer	Sweet
13	<i>Grewia optiva</i>	Black	Oblong (4 lobed)	Winter	Bitter-sweet
14	<i>Morus serrata</i>	Violet	Oblong	Summer	Sweet-sour
15	<i>Myrica esculanta</i>	Red	Round	Summer	Sweet
16	<i>Phoenix humilis</i>	Black	Oval	Summer	Sweet
17	<i>Punica granatum</i>	Red	Oval	Winter	Sweet-sour
18	<i>Pyrus pashia</i>	Black	Round	Winter	Bitter-sweet
19	<i>Rhus parviflora</i>	Red yellow	Round flat	Winter	Sweet-sour
20	<i>Rubus ellipticus</i>	Yellow	Round	Summer	Sweet
21	<i>Rubus paniculatus</i>	Black	Round	Summer	Sweet
22	<i>Solanum nigrum</i>	Red	Round	Winter	Sweet
23	<i>Syzygium cumini</i>	Purple	Oblong	Summer	Bitter-sweet and sour
24	<i>Ziziphus glaberrima</i>	Red	Oval	Winter	Sour-sweet

(Source of data from local inhabitants)



Conclusions

Local inhabitants are using seasonal wild fruits in large scale and earn more money in every season. It is not only as sources of supplementary food but it is also play a significant role in the life of poor peoples. Migration from hills and ignorance of wild fruits management is two serious problems which can loss the existence of wild fruits from hills. Need only to develop and protect it by the scientific techniques and methods. Therefore it can make the strong source of local peoples as nutrition and economic generation.

Correspondence author:

Dr. P S Chauhan
Department of Botany, Govt. PG College Rishikesh,
Dehradun,

Uttarakhand (India)

References

1. Abbasi AM, Khan SM, Ahmad M, Khan MA, (2013). Quave CL, Pieroni A. Botanical ethnoveterinary therapies in three districts of the Lesser Himalayas of Pakistan. *J Ethnobiol Ethnomed*;9:1–21. doi: 10.1186/1746-4269-9-1.
2. Aberoumand and Deokule (2010). Preliminary studies on proximate and mineral composition of Marchubeh stem (*Asparagus officinalis*) vegetable consumed in the Behbahan of Iran. *World Appl. Sci J.*, (9) 127-130.
3. Bhatt, I.D., Rawat, R.S. and Dhar, U (2000). The availability, fruit yield and harvest of *Myrica esculenta* Buch- Ham ex D. Don in Kumaun

- (West Himalaya), India. *Mountain Research and Development* 20, 2, 146-153.
4. Bhowmik D, Gopinath H, Kumar BP, Duraivel S, Aravind G (2013). Medicinal Uses of *Punica granatum* and Its Health Benefits. *J Pharmacognosy Phytochem*, 1 (5) 2278- 4136.
 5. Dehar N, Walia R, Ratol S (2012). Potentiation of Thiopentone Sodium Induced Hypnosis by *Berberis Aristata* In Rodents. *Asian J Pharmacol Clinic Res.* 5 (1) 131-133.
 6. Dilshad SMR, Rehman NU, Ahmad N, Iqbal A (2010). Documentation of ethnoveterinary practices for mastitis in dairy animals in Pakistan. *Pak Vet J.*;30:167-171.
 7. Eromosele IC, Eromosele CO and Kuzhkzha DM (1991). Evaluation of mineral elements and ascorbic acid contents in fruits of some wild plants. *Plant Food Hum Nutr.* (41), 151-154.
 8. Food and Agricultural Organization of the United Nations, FAO (2004). The state of food insecurity in the world. Monitoring the progress towards the world food summit 2nd millennium development goals.
 9. Gangwar KK, Deepali, Gangwar RS (2010). Ehanobotanical plant diversity in Kumaun Himalaya of Uttarakhand, India. *Nat. Sci* 8 (5) 66-78.
 10. Gaur RD (1999). *Flora of the District Garhwal North West Himalaya (With Ethno Botanical Notes)*. Transmedia publisher Srinagar (Garhwal), UP.
 11. Krishnaveni M, Mirunalin S (2011). Amla- The Role of Ayurvedic Therapeutic Herb in Cancer. *Asian J Pharma Clinical Res.* 4, 3, 13-17.
 12. Maikhuri RK, Semwal RL, Singh A and Nautiyal MC (1994). Wild fruit as a contribution to sustainable rural development: A case study from the Garhwal Himalaya. *Inter. J Sustain Dev. World Ecol.*, 1,56-68.
 13. Meyers, K. J., Watkins, C. B., Pritts, M. P. and Liu, R. H (2003). Antioxidant and antiproliferative activities of strawberries. *Journal of Agricultural and Food Chemistry*, 51, 6887-6892.
 14. Parmar C, Kaushal MK (1982). *Wild Fruits of the Sub-Himalayan Region*. Kalyani Publishers. New Delhi, India.
 15. S. Saklani, S Chandra (2011). Evaluation of Nutritional profile, medicinal value and quantitative estimation in different parts of *Pyrus pashia*, *Ficus palmata* and *Pyracantha crenulata*, *JGTPS*, 2, (3) 350-354.
 16. Samant SS, Dhar U, Palni LMS (1998). *Medicinal Plants of Indian Himalaya: Diversity Distribution Potential Values*. Gyanodaya Prakashan, Nanital, India.
 17. Sundriyal, M. and Sundriyal, R. C (2001). Wild edible plants of the Sikkim Himalaya, nutritive values of selected species. *Economics Botany*, 55, 377-390.
 18. Tiwari JK, Ballabha R, Tiwar 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.

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