

# Medicinal Uses of Traditionally Used Plants in Bhatwari Block, District Uttarkashi, Uttarakhand, India

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**Abstract:** The prolific plant diversity of Uttarakhand hills has provided an initial lead to the local people to look for various plant species for the purpose of food, medicine, spices and perfumes. Over the period of time, they have compiled the knowledge on the use of various plant species. The present study aims to document such information, especially the use of plants for medicine, as spice and as perfumes. Field surveys carried out in the villages of Bhatwari block have resulted in the documentation of 60 medicinal, aromatic and spice plant species. These species were distributed over various life forms, like tree, shrub and herbaceous forms. For curing various ailments, the use of aboveground plant parts was relatively higher than the belowground parts. Different belowground plant forms such as root, bulb, tuber and rhizome were used for preparing herbal medicines. About 15% of these species, which include *Aconitum heterophyllum* Wall. Ex Royle, *Rheum australe* D. Don, *Nordostachys jatamansi* (D. Don) DC., *Podophyllum hexandrum* Royle, *Taxus baccata* L. and *Angelica glauca* Edgew. have become threatened due to over exploitation, natural and anthropogenic pressures. Conservation and sustainable utilization of these valuable medicinal plant species is essential to protect the traditional knowledge regarding plants and plant based healing practices.

**Index Terms:** medicinal plants, traditional uses, threatened species, Himalaya, biodiversity, aboveground.

## I. INTRODUCTION

Since the prehistoric times, human civilization got interested in the study of medicinal plants. India is rich in medicinal plants with all the three levels of biodiversity such as species, genetic and habitat diversity. Due to its unique geographical location and moderate to cool climatic conditions, Uttarakhand Himalaya is endowed with rich biodiversity. The Himalayan region especially in Uttarakhand is well known for its biodiversity wealth, including medicinal, aromatic and spice plant species.

This rich reserve of plant species holds tremendous potential for domestication that can be an important option for sustainable livelihood of the hilly people.

Phytogeographically, Uttarakhand state of India being located in the Himalayas is divided into alpine, subalpine, temperate and subtropical regions. This provides a remarkable range of habitats and micro-habitats for variety of useful flora and fauna. Since long, the natives of Uttarakhand hills have been thriving on these natural resources which form an integral component of their livelihoods. Due to the affluent plant diversity of Uttarakhand state, most of the population depended on the forest for meeting their requirements of food, medicine, spice, perfumes etc. Over the years, they have developed a great deal of knowledge on the use of various plant species.

Slowly, the traditional knowledge on the use of plant resources is shrinking going to several reasons, including shift in attitude of present generation towards a more western lifestyle, increased usage and availability of allopathic medicines along with declining interest of younger generations to carry forward the tradition. Therefore, a need is repeatedly felt to document such valuable information on the use of plant species before it vanishes completely.

Uttarkashi district comes under the region of Upper Himalaya and contains within itself variety of geographic environment ranging from snow free valley and outer hills to the peaks with perpetual snow and glaciers. Due to the different climate and topographic conditions in Uttarkashi district, an extensive range of vegetation and habitats is available to diverse species of wild life. In hilly areas, people still use the traditional way of life and hence use nearby plant species for curing diseases and other purposes. Villages of Bhatwari block being tucked deep into the hills, the inhabitants of this area are relatively less influenced by the modern forces. In this background, the present study aims to

document the plant species used by the inhabitants of Bhatwari block, especially for curing diseases and use as perfumes.

## II. MATERIAL AND METHODS

The present study was based on a field survey conducted in 2017-18 in Bhatwari block district Uttarkashi, to find the plants of medicinal, perfumery and spice values. The work was conducted among local people, rural folk, farmers and Vaidyas to collect valuable information about medicinal importance of mentioned plants. The plants with medicinal values, as known from local people and rural persons were collected and studies were made to know their medicinal and other uses by consulting relevant literature.

### A. Study area

Uttarkashi (30°44'2" N 78°17'2" E and 30.73°N 78.45°E) is the border district of the state of Uttarakhand, and is bounded with Tibet and Kinnaur district of Himachal Pradesh to its north, Tibet and China to the east, Tehri Garhwal to the south and the district of Dehradun and part of Himachal Pradesh to the west (Fig.1). The district covers a total area of 8,016 sq. kms, with a total population of 330,086 (2011 Census). More than 92% of the population live in rural areas. The maximum stretch from east to west is 154 km and from north to south is 109 kms respectively. The district comprises 6 Tehsils, 6 blocks, 677 revenue villages & 427 Gram Sabhas.

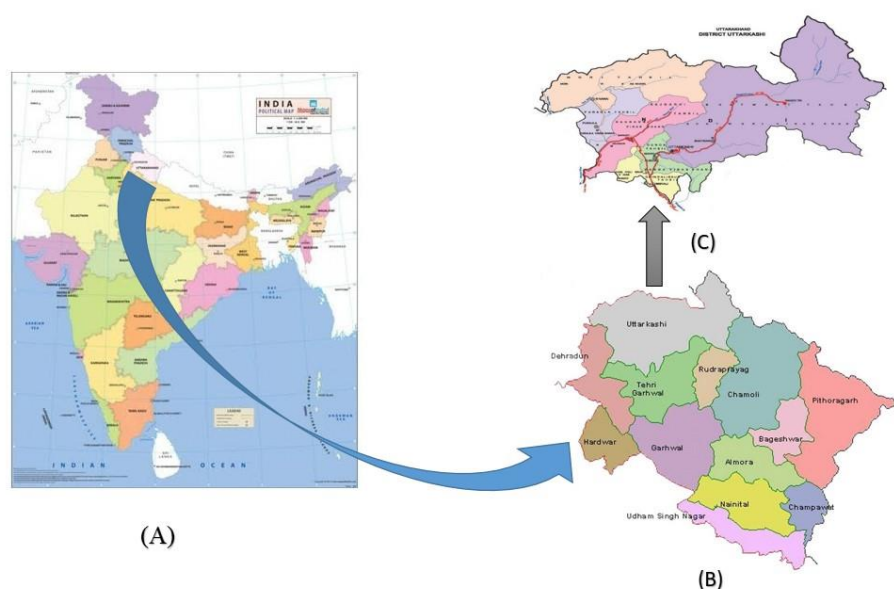


Fig. 1. (A). Location of Uttarakhand in India, (B). Map of Uttarakhand State, (C). Map of Uttarkashi District

Table 1. Plants used as medicines, perfumes and spices by local people in Villages of Bhatwari block of Uttarkashi district in Uttarakhand state of India

S.No.	Local name	Botanical Name	Family	Part Used	Uses	Reference
1.	Kewda/ Ketki	<i>Pandanus fascicularis</i> Lam.	Pandanaceae	Leaf, Flower, Root, Fruit	Cold/flu, hepatitis, dysuria, hemorrhoids, antispasmodic, aphrodisiac, and leprosy Perfumery	Adkar & Bhaskar(2014)
2.	Atis	<i>Aconitum heterophyllum</i> Wall.	Ranunculaceae	Root	Throat infection, indigestion, flatulence, arthritis, abdominal distension, dyspepsia and stomachache	Kumar <i>et al.</i> , (2016)
3.	Kutki	<i>Picrorhiza scrophulariflora</i> Pennell	Scrophulariaceae	Root	Biliousness, urinary discharge, blood troubles, burning sensations, leucoderma, and jaundice	Kumar <i>et al.</i> , (2016)
4.	Kingod	<i>Berberis aristata</i> DC.	Berberidaceae	Root	Malaria, bleeding, skin and eye infections, jaundice, and hepatitis	Prasad (2014)

5.	Amla	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Fruit, root, leaves	Heart diseases, obesity, Alzheimer's disease, Parkinson's disease and Huntington's chorea	Velayutham <i>et al.</i> , (2012)
6.	Kafal	<i>Myrica esculenta</i> Buch.-Ham. ex D.Don	Myricaceae	Fruit, Bark, Flower, Root	Rheumatoid arthritis, menorrhagia menstrual disorders, asthma, cholera and cough	Siddiqui <i>et al.</i> , (2014)
7.	Himalayan raspberry	<i>Rubus ellipticus</i> Sm.	Rosaceae	Root, fruit	Diabetes mellitus, inflammatory disorders and ulcers	Vadivelan <i>et al.</i> , (2009)
8.	Fig	<i>Ficus carica</i> L.	Moraceae	Fruit	Colic, indigestion, loss of appetite, coughs, bronchial problems and cardiovascular disorders	Mawa <i>et al.</i> , (2013)
9.	Aniyar	<i>Lyonia ovalifolia</i> (Wall.)Drude	<i>Ericaceae</i>	Bark	Scabies, mastitis, food poisoning	Pande <i>et al.</i> , (2007), Phondani <i>et al.</i> , (2010)
10.	Wild Himalayan Cherry	<i>Prunus cerasoide s</i> Buch.-Ham. ex D. Don	Rosaceae	Bark, seed	Stomach trouble, seminal weakness, leprosy, hallucinations, leucoderma, burnings, sprains, wounds, ulcers, skin discoloration, and cardiac debility	Joseph <i>et al.</i> , (2016)
11.	Garlic	<i>Allium sativum</i> L.	Liliaceae	Bulb	Inflammation, high cholesterol, high homocysteine, high blood pressure, diabetes and Alzheimer's disease	Bongiorno <i>et al.</i> , (2008)
12.	Chora/ Gandrayan	<i>Angelica glauca</i> Edgew.	Apiaceae	Root	Atrophy, carminative, dysentery, dyspepsia, menorrhagia and nausea, spice	Sarker & Naher, (2004)
13.	Brahmkamal	<i>Saussurea obvallata</i> (DC.)Edgew.	Asteraceae	Leaf, root	Cardiac diseases, cuts and wounds	Maikhuri <i>et al.</i> , (2000)
14.	Kandali/ Bichchughas	<i>Urtica dioica</i> L.	Urticaceae	Leaf, fruit	Inflammation, cancer, rheumatism	Nadiroglu <i>et al.</i> , (2019)
15.	Akhrot	<i>Juglans regia</i> L.	Juglandaceae	Leaf, fruit, root	Inflammation and heart disease	Asadi-Samani <i>et al.</i> , (2017)
16.	Gahat	<i>Macrotyloma uniflorum</i> (Lam.) Verdc.	Fabaceae	Seed	Kidney stones, flatulence menstrual bleeding, urinary dieases, piles, common cold, throat infection and fever, food	Ramachandraiah <i>et al.</i> , (2019)
17.	Wild apricot	<i>Prunus armeniaca</i> L.	Rosaceae	Fruit	Constipation, carminative	Shan <i>et al.</i> , (2019)
18.	Pudina	<i>Mentha arvensis</i> L	Lamiaceae	Whole plant	Jaundice, abdominal pain, antiemetic, food, flavouring agent	Janghel <i>et al.</i> , (2019)
19.	Jatamansi	<i>Nardostachys jatamansi</i> (D.Don) DC.	Valerianaceae	Rhizome	Epilepsy, cerebral ischemia, liver damage insomnia, hypertension and heart diseases	Purnima & Kothiyal., (2015)
20.	Dhania	<i>Coriandrum sativum</i> L.	Apiaceae	Leaf, seeds	Diabetes, inflammation, insomnia, anxiety, convulsion, measles, food, spice	Wei <i>et al.</i> , (2019)
21.	Matosha	<i>Selinum tenuifolium</i> Wall. ex C.B. Clarke	Apiaceae	Root	Treating swelling which develops after childbirth	Uniyal <i>et al.</i> , (2006)
22.	Banwangun/Banka kri	<i>Podophyllum hexandrum</i> Royle	Berberidaceae	Rhizome, roots	Vermifuge, wounds, leucorrhoea, diabetes and constipation	Negi <i>et al.</i> , (2019) Fayaz <i>et al.</i> , (2019)
23.	Timur	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Bark, fruit,	Fever, dyspepsia, dental troubles, snake bite	Singh & Singh (2011)

				seed, branches		
24.	Chir	<i>Pinus roxburghii</i> Sarg.	Pinaceae	Gum	Pharynx diseases, foul ulcers, haemorrhages, haemoptysis, worn infections, flatulence, liver diseases, bronchitis, inflammations and giddiness	Agarwal (2019) Kaushik <i>et al.</i> , (2012)
25.	Deodar	<i>Cedrus deodara</i> (Roxb.ex Lamb.) G.Don	Pinaceae	Leaves, bark, root	Rheumatism, diabetes, cancer, stomach disease, inflammation	Kumar <i>et al.</i> , (2019)
26.	Banj	<i>Quercus leucotrichophora</i> A.Camus ex Bahadur	Fagaceae	Bark, leaves	Constipation, diarrhea and asthma.	Singh <i>et al.</i> , (2019) Parihaar <i>et al.</i> , (2014)
27.	Burans	<i>Rhododendron arboretum</i> Sm.	Ericaceae	Flower, leaves, bark	Chronic eczema, diarrhea and menstrual disorders, high blood pressure	Nisar <i>et al.</i> , (2016) Uniyal & Shiva, (2005)
28.	Premathandu/ kandra	<i>Argemone Mexicana</i> L.	Papaveraceae	Leaf, stem, seed	Wounds, skin diseases, toothache, dropsy, malaria, bronchitis, leprosy	Apu <i>et al.</i> , (2018)
29.	Mehal/Himalayan pear	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Rosaceae	Leaf, fruit, bark	Digestive disorder, leishmaniasis, eye problems, anemia, peptic ulcer, gastric ulcer and typhoid fever	Janbaz <i>et al.</i> , (2015)
30.	Sadpottar/ silphara	<i>Bergenia ciliate</i> (Haw.) Sternb.	Saxifragaceae	Rhizome	Pulmonary infections, coughs, diarrhea, vomiting and fever	Rai <i>e tal.</i> , (2000) Uniyal <i>et al.</i> , (2006)
31.	Bhindi	<i>Abelmoschu sesculentus</i> (L.)Moench.	Malvaceae	Seed	Fever, vegetable	Tomar (2017)
32.	Doob	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Leaf	Diabetes, burning sensation, dysentery, vomiting.	Dangwal (2015)
33.	Bedu	<i>Ficus grossularioides</i> Burm.f.	Moraceae	Fruit	Lungs disease, bladder disease,	Sharma <i>et al.</i> , (2017)
34.	Kala bhatt	<i>Glycine max</i> (L.)Merr.	Papilionaceae	Seed	Eyesores, diabetes, menstrual disorders	Bisht <i>et al.</i> , (2013) Shah (2014)
35.	Jau	<i>Hordeum vulgare</i> L.	Poaceae	Seed	Cataract and eye diseases, diabetes and asthma.	Bisht <i>et al.</i> , (2013)
36.	Kamach	<i>Mucuna pruriens</i> L. DC.	Fabaceae	Seed	Snake venom	Bhattacharjee, (2013)
37.	Ghigharu	<i>Pyracantha crenulata</i> (Roxb. ex D.Don) M.Roem.	Rosaceae	Fruit	Burgor's disease, hypertension, arteriosclerosis, cardiac failure, paroxysmal tachycardia	Sharma <i>et al.</i> , (2017)
38.	Jungli Gainda	<i>Tagetes minuta</i> L.	Asteraceae	Flower	Insecticide, sedative, anti-septic, antispasmodic, anti-parasitic, stomach problem, respiratory inflammations	Bandana <i>et al.</i> (2018)
39.	Arandi	<i>Ricinus communis</i> L.	Euphorbiaceae	Leaf	Internal injury, arthritis, constipation	Topwa (2018) Pandey <i>et al.</i> , 2017
40.	Bhang	<i>Cannabis sativa</i> L.	Cannabaceae	Seed, leaf	Cancerous ulcers, tumors, diabetes, , epilepsy, gonorrhoea	Kuddus <i>et al.</i> (2013)
41.	Kachnar	<i>Bauhinia variegata</i>	Fabaceae	Leaf, bark, flower buds	Heartburn, diarrhea, menorrhagia, obesity, worms, bleeding hemorrhoids	Lim (2014)
42.	Basya	<i>Eupatorium adenophorum</i> (Spreng.) King & H.Rob.	Asteraceae	Aerial parts	Treat cuts and wounds	Joshi <i>et al.</i> , (2016)

43.	Pipal	<i>Ficus religiosa</i> L.	Moraceae	Root, bark, leaf, fruit	Diabetes, liver diseases, migraine, epilepsy, tuberculosis, gonorrhoea, chickenpox, cardiac edema, Scabies, leucorrhoea	Singh <i>et al.</i> , (2011)
44.	Beefsteak/ Bhangjeer	<i>Perilla frutescens</i> (L.) Britton	Lamiaceae	Leaf, seed, stem	Anxiety, depression, asthma, chronic bronchitis, vomiting	Bachheti et al,(2014)
45.	Amedu	<i>Rumex hastatus</i> D.Don	Polygonaceae	Whole plant	Wounds, cuts, burns, stomachache	Singh <i>et al.</i> , (2017)
46.	Guduch/ Giloy	<i>Tinospora cordifolia</i> (Wild.) Miers	Menispermaceae	Stem, root	Dyspepsia, jaundice, skin diseases, snake bit, diabetes mellitus,	Singh <i>et al.</i> , (2003)
47.	Genthi	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Tuber, stem, leaf	Syphilis, Eye disorder, Goitre, lung bleeding, food	Ghosh <i>et al.</i> , (2015)
48.	Bel	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Leaf, fruit, stem, root	Peptic ulcer, diarrhea, constipation, respiratory infections, jaundice	Virendraet al., (2018)
49.	Yam	<i>Dioscorea deltoidea</i> Wall. exGriseb.	Dioscoreaceae	Root	Piles, Spermatonorrhoea, dysentery	Joshi &Tyagi (2011)
50.	Karipatta	<i>Murraya koenigii</i> L.Spreng.	Rutaceae	Leaf	Inflammation, itching, vomiting, bites of poisonous animals,	Handralet <i>et al.</i> , (2012)
51.	Janglichaulai	<i>Amaranthus viridis</i> L.	Amaranthaceae	Whole plant	Wounds, boil	Kumar <i>et al.</i> , (2013)
52.	Muli	<i>Raphanus sativus</i> L	Brassicaceae	Seed	Appetizing, expectorant	Akgulet <i>et al.</i> , (2016)
53.	Adrak	<i>Zingibe roffcinale</i> Roscoe	Zingiberaceae	Rhizome	Headache, toothache, cough	Rawat& Jalal (2011)
54.	Haldi	<i>Curcuma longa</i> L.	Zingiberaceae	Rhizome	Fracture, wounds, galactagogue, mastitis, skin disease, cold	Tiwari & Pandey, (2010)
55.	Sahjan	<i>Moringa oleifera</i> Lam.	Moringaceae	Leaf, flower, seed	Rheumatism, venomous bites, cardiac and circulatory diseases, abdominal tumors, counter-irritant, purgative, expectorant, mild diuretic, epilepsy, hysteria	Pandey <i>et al.</i> , (2011)
56.	Euphorbia	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Whole plant	Asthma, scabies, bronchitis	Sekar(2012)
57.	Moru	<i>Quercus robur</i> L.	Fagaceae	Bark	Dysentery	Kumari <i>et al.</i> , ( 2009)
58.	Ogal	<i>Fagopyrum acutatum</i> (Lehm.) Mansf. ex K.Hammer	Polgonaceace	Whole plant	Anti-tumor,anti-diabetic	Singh & Thakur (2014)
59.	Paiyaan	<i>Prunus cerasoides</i> Buch.-Ham. exD. Don	Rosaceae	Bark, fruit	Leprosy, leucoderma, burnings, asthma	Tiwari, et al.(2010)
60.	Bhilmoru	<i>Oxalis corniculata</i> L.	Oxildaceae	Whole plant	Astringent, diarrhea, dysentery, dysmenorrhoea, hepatitis, burningsensation	Kaur et al. (2017)

### III. RESULT AND DISCUSSION

The present investigation has resulted in the documentation of 60 plant species, which were used in curing various ailments; many of these species were also used as food, spice and perfumes (Table 1). These species were distributed over various life forms *viz.*, tree species, herbaceous, and shrub species. Different plant parts were used as medicine by the local people

of Bhatwari block. For curing ailments, the use of aboveground plant parts was relatively higher than the belowground plant parts (Fig.2). Of the aboveground plant parts, fruits and leaves were used in the majority of cases, followed by seed and bark of woody species. Different below ground plant forms such as root, bulb, tuber and rhizome were also used as a medicine for the treatment of various ailments. Among above ground parts, flowers were used in minimum cases. Being a remote hilly

region, the use of various plant species remained intact in the study area for centuries. With due course of time, the advent of commercial interests has overexploited many important plant species. The loss of native biodiversity due to natural and anthropogenic pressures and changes in traditional land-use practices altered the natural vegetation composition. The decline in diversity of useful plant species may ultimately affect the traditional system of plant use for medicine, perfumery and spice. Number of traditional herbal healers are also declining in the state due to the decline in number of youth coming forward to learn this tradition in the state. Moreover, migration of youth from hills to towns and metro cities is also playing a major role in the decline in the age old traditional therapeutics. Therefore, compilation of such valuable information is utmost essential to keep alive the traditional knowledge for the use of future generations. Scientific validation of this knowledge by isolation and purification of the phytoconstituents is also necessary for large scale use of the plants or their decoctions.

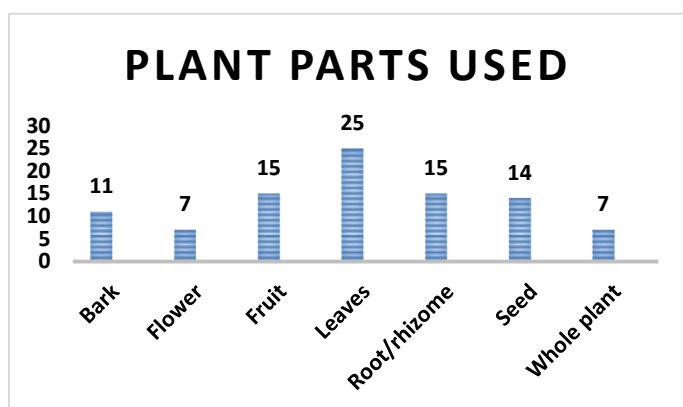


Fig. 2. Parts of plants used for medicinal importance (Numerical value above each bar indicates number of plants where particular part is utilized)

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