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# Diversity of Ethno-medicinal Plant: A Study in Pithoragarh District of Uttarakhand

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## ABSTRACT

**Background:** The hilly areas of Uttarakhand embraces a large heirloom awareness of traditional medicinal plants. In Uttarakhand, medical facilities are very less in number. Due to unavailability of modern health facilities, poverty, connectivity with urban centre, awareness, *etc* people in hilly and rural areas are still depend on traditional medicines for their health care. Some of the communities are using wild plant parts for healthcare.

**Methods:** Thus, a study was conducted to document the ethno-medicinal plants used traditionally in *Munsyari* tehsil of Pithoragadh District of Uttarakhand. Out of 219 villages under tehsil *Munsyari*, total five villages *viz*; *Basari*, *Chhija*, *Diya Palla*, *Kheta*, *Kutima* were selected purposively. Participatory Rural Appraisal, Group Discussion techniques were used to document the medicinal plants.

**Result:** These medicinal plants are highly valuable and appropriate for economic upliftment of the region. People are dependent upon food, fruits, fodder and medicinal plants for their healthcare. Hilly people use these traditionally available medicinal plants for health and believe that these are easily available, less expensive and have no side effects as compare to modern medicine. Present scenario as deforestation, tourism affects medicinal plants. Thus, conservation of these species is necessary. Proper policies should be needed to conserve the forests and medicinal plants.


**Key words:** Economic upliftment, Medicinal plants.

## INTRODUCTION

Indian Himalayan region has widespread traditionally used medicinal plants. The ethnomedicinal plants perform a vital role in the nourishment across the Globe. Kumari *et al*. (2012) and Palni (2001). According to Sharma *et al*. (2020) the community of Uttarakhand state exercises the use of available medicinal herbs that particularly rely on the conventional knowledge as a primary resource for their medical care. Chandra *et al.* (2016) Tewari *et al.* (2014). Plants has a major role in our everyday life and the development of the advanced medical care system. Over the past years, the research of medicinal plants and its traditional herbal cure has remarkably raised. In India, traditional medicines are widely used in pharmaceutical fields and also as a dietary therapy (Kumar *et al.,* 2020). According to WHO, 70 per cent of people in developed countries utilize some other alternative or substitute medicines. Several research studies on traditional medicinal herbs have been reported that it displays a potential cure against numerous health disorders and diseases (Palni, 2001; Singh *et al.,* 2007; Singh and Rawat, 2011; Uniyal, 2003).

United Nations defines traditional knowledge as this is a type of local knowledge for human achievement in comprehending the complexities of life and survival in often unfriendly environments (Uniyal, 2004). Medicinal plants are used for spiritual activities as worshiped of god and goddesses. In Uttarakhand, medical facilities are very less in number. Due to unavailability of modern health facilities, poverty, connectivity with urban centre, awareness, *etc* people in hilly and rural areas are still depend on traditional medicines for their health care. Some of the communities are using wild plant parts for healthcare. Traditional knowledge may be technical, social, organizational, or cultural was obtained as part of the great human experiment of survival and development. This provides the basis for problem-solving strategies for local communities, especially the poor.

The properties of medicinal plants and their economic values were well-understood by the locals through observation, necessity, trail and experiences passed on from the elders. Common health disorders like aches, pains, wounds, respiratory problems and musculoskeletal diseases are cured by using indigenous herbs. The locals usually use medicinal plants without prior guidance from the

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traditional herbalist since from ages such plant species are used (Singh *et al*., 2017). Various researches depicts that in Uttarakhand people are using medicinal plants in wide range. Many studies have been conducted on the use of medicinal plants in the Uttarakhand region but documentation of indigenous knowledge among women is still lacking. Singh *et al*. (2010) studied that *Z. armatum* is popularly used in the Indian system of medicines. Conventionally, the *Bhotias* of *Dharcula* in Pithoragarh district, Uttarakhand use this plant as a source of food and medicines. In the Dharchula region of Pithoragarh district, the native people intake *Cordyceps* with alcohol. Before consuming, they soak the *Cordyceps* into the alcohol for a short duration. Investigated the isolation of *Cordycepic* acid, *i.e*. an isomer of quinic acid present in cinchona bark from the fungus *Cordyceps.* The value of medicinal plants is high for taking appropriate measures to conserve these species and use them for economic upliftment of the region (Garbyal *et al.,* 2004). According to Pandey *et al.* (2017) many studies have been conducted on the use of medicinal plants in the Uttarakhand region but documentation of indigenous knowledge among women is still lacking. Keeping all these points in mind a research investigation was designed with the following objectives:

[1] To document the ethno-medicinal plants of the area and to collect information regarding ethno-medicinal use of plants.

[2] To make a platform for future research.

## MATERIALS AND METHODS

The study was performed at Pithoragarh district of Uttarakhand located at 29.58° North latitude and 80.22° East latitude. It lies in the revenue Division of Kumaon and situated in the centre of the western half of the Saur Valley. Uttarakhand has a total area of 53,483 km$^2$ of which 86 per cent is mountainous and 65 per cent is covered by forest. Uttarakhand has a multiplicity range of flora and fauna. It has a recorded forest area of 34,666 km$^2$, which constitutes 65 per cent of the total area of the state. Uttarakhand is home to rare species of plants and animals, many of which are protected by sanctuaries and reserves. About 18,000 plant species have been recognised in the state out of which 1,800 are deemed to be of medicinal value. Herbal Research and Development Institute helps conserve medicinal herbs that are found in abundance in the region. Local traditional healers still use herbs, in accordance with classical Ayurveda texts, for diseases that are usually cured by modern medicine.

Present research study was conducted to document the ethno-medicinal plants used traditionally in Munsyari tehsil of Pithoragadh District of Uttarakhand. Out of 219 villages under tehsil Munsyari, total five villages *viz*; *Basari, Chhija, Diya Palla, Kheta, Kutima* were selected purposively. Participatory Rural Appraisal, Group Discussion techniques were used to document the medicinal plants. These medicinal plants are highly valuable and appropriate for economic upliftment of the region. The collected information was validated by consulting important works pertaining to medicinal plants and ethno-botany and identification of medicinal plant species was made with the help of available literature and local experts.

## RESULTS AND DISCUSSION

The present study compiles 59 ethno-medicinal plants species for various medicinal purposes. The present study explores the therapeutic uses of medicinal plant species and the associated traditional knowledge preserved by the indigenous community in Kumaun region.

The documentation of 59 plantspecies collected from study areas and their medicinal use against various ailmentsare presented in Table 1. Species names are followed by vernacular names, localnames, habit of plant and plant parts used.

Diseases are the obscenity for society ever since it arrived on this planet. Human are doing struggle against many diseases from ancient period. Thus, Humans have developed a system for curing diseases through medicinal plants. All over the World, many people depends on forest and forest products like medicinal plants, aromatic plants, edible roots, food and many other things for their livelihoods as well as primary health needs. During the survey it was found that hilly people were using more than forty medicinal plants for curing the diseases.

Almost all the hilly people are using medicinal plants as per the need required.

### Market value of medicinal plants

Data related to market value of medicinal plants were collected from local collectors and traders. During field survey, it was found that *Allium stracheyii* (*Jambu*), *Bergenia ciliata* (*Pashanbed*), *Cordyceps sinensis* (*Keeda*), *Dactylorhiza hatagirea* (*Hathajari, Salam Panja), Picrorhiza kurroa* (*Katki*) medicinal plants are found in larger amount having values in more than 3 to 4 lakh Rs (Table 2).

According to Official database of the HRDI, during 2006-07 to 2012-13 a total of 3419 transit passes were issued to the different growers for marketing of approximately 4939 MT, medicinal plants raw material belonging to almost 18 to 22 species. The value of this material was almost Rs. 92,625,000 or US$ 1,684,703.

According to Kuniyal *et al.* (2003), based on the trends in marketing of *Saussurea lappa* and *Picrorhiza kurrooa*, these species may be categorized as low-volume and high-value medicinal species of Uttarakhand. *Saussurea lappa* and *Picrorhiza kurrooa* are enlisted as endangered species of Wild Fauna and Flora. Cultivation of *S. lappa* and *P. kurrooa* is encouraging for the conservation as well as it will be a valuable optional activity for improving rural livelihood. Constant supply of *S. lappa* and *P. kurrooa* from cultivated sources has encouraged the Government of Uttarakhand for fixing minimum procurement prices for these species.

**Table 1:** Ethno-medical use of medicinal plants.

| Botanical name | Local name | Part use | Ethno-medical use |
|---|---|---|---|
| *Haldina cordifolia*, (Roxb.) | Haldu | Bud and Leaf | For wound and fever |
| *Acacia catechu* (L.f.) Willd. | Khair | Bark, Stem | Foot diseases, bone fracture, internal injury, dysentery, diarrhoea, wounds and urinary troubles. |
| *Achyranthes aspera* L. | Chirchira | Whole Plant | Cramps, mouth-blisters, cough, cold, scorpion sting, snake-bite, piles, check bleeding, boils, blisters, cataract, cuts, skin diseases, spermatorrhoea, headache, stomachache, toothache, body-ache, dysentery, ear trouble, ribs pain, eye trouble, For teeth problem, Dog bite, glactagogue |
| *Aconitum balfouria*, stapf. | Bishjahar | Root | Septics, boils, stomachache, tonsil, gastritis, leprosy, rheumatism, swelling, wounds |
| *Agrimoniapilosa*Ledebour. | Kafliya | Whole Plant | Sores, wounds, blood purifier. |
| *Ajuga parviflora,* Benth. | Ratpatia | Whole Plant, Leaf, root | Jaundice, ascariasis, fever, stomachache, arthritis |
| *Allium stracheyi* Baker. | Jambu | Whole Plant | For stomach problem |
| *Aloe vera* L. Burm f. | Patquar | Leaf | Stomach problem, inflammation of the body |
| *Althaea coromandeliana* GV. | Jangalihauli | Root | For termination of pregnancy |
| *Anagalis arvensis* L. | VishKhaparia | Whole Plant, Fruit/Leaf Seed | Diphtheria, pain killer |
| *Anemone obtusiloba* D. Don. | Kakaria | Leaf, Root, Seed | Rheumatism |
| *Atropa belladonna*, Linn. | DhaturJahar | Leaf | In injury as pain killer |
| *Berberisaristata* DC. | Kilmori | Root and Stem, Whole Plant | Cold, fever, conjunctivitis, malaria, typhoid, eucorrhoea, hemorrhoids, jaundice, snakebite, boils, anticancer, blood pressure, neck sore, yolk sore, sunstroke, fever, weakness, wounds, food poisoning. |
| *Bergenia ciliate* (Haworth) Stornb. | Silfhora, Pashanbed | Root | Constipation, dysentery, kidney stones, gall bladder stones, painful and small urination, wormicide, boils, wounds, burn, piles, urinary trouble, asthma, fever, mastitis, haemachuria, hydrophobia. |
| *Betula utilis* D. Don | Bhuj, Bhojpatra | Resin, Bark | Internal injuries, cough, dysentery, painful outgrowth below tongue, wounds, cuts, alimentary disorders, burns, jaundice, |
| *Brassica napus,* (L.) Hook. f. and Anderson | Kali sarso | Seed | In poor appetite |
| *Butea monosperma* (Lam.) Kuntze | Dhank | Flower, Seed | As pain killer |
| *Boenninghausenia albiflora* | (Pissumar | Aerial parts | To wipe out lice, fleas and insects |
| *Centella asiatica* (Linn.) Urban | Brahmi | Leaf | Painful and slow urination, eye trouble, fever, snake-bite, brain tonic, malaria, cholera, brain fever, sunstroke. |
| *Chenopodium album* L. | Bethuwa | Leaf, Seed | Cuts, wounds, sores, smooth delivery, haematuria, stomach trouble, worm. |
| *Cinnamomum tamala* (Buch.-Ham.) Nees | Kiriya, karkiriya, Dalchini | Leaf, bark | Cold, cough, lumbago, heart troubles, broken horn, neck sore, yolk sore and tetanus stomach problem, gastric problem, wounds and foot and mouth diseases. |
| *Cordyceps sinensis* | Keeda | Whole plant | For gastric problem |
| *Cuminum cyminum*, L. | Jeera | Seed | For indigestion |
| *Curcuma angustifolia*, Roxb. | Banhaldi | Root | In gastric problem, anti worm |
| *Cedrus deodara* | Devdar | Bark and Wood | To treat urinary disorder |
| *Cannabis sativa* | Bhang | Aerial part | Sedative, ringworm, analgesic |
| *Daturametal* L. | Dhatura | Seed, Leaf, Root | Fistula, gum trouble, pyorrhoea, asthma, as pain killer (for external use only) |
| *Delphinium denudatum* Wall. Ex Hook. F. and Thomson | Nirwishi, Munel | Root, Leaf | Contusions, ulcer, toothache, abdominal pain, respiratory disorders, ulcer, cut, burn. |

**Table 1: Continue...**

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|---|---|---|---|
| *Dactylorhiza hatagirea* (D.Don) Soo. | Salam Panja, Hathajari | Whole plant | Wounds. |
| *Ephedra gerardiana*, Wall. Ex Stapf | Gidjing | Leaf, root, stem | Eye trouble, bronchial disorders, cardiac trouble, wounds, headache, rheumatism, asthma, pain |
| *Euphorbia prolifera*, Buch.Ham. ex. D.Don. | Duwila | Fruit | Used in dog bite |
| *Fragaria vesca* L. | Pudalia Kafal | Root, Leaf | Protect abortion, inflammation |
| *Fumaria parviflora* Lamk. | Pitpapara | Whole Plant | Fever, influenza, skin etching (disease) |
| *Ficus palmate* | Bedu | Fruit | Effective remedy in case of bladder and renal diseases. Besides these, they are a great resource of phosphorus, minerals and a slight amount of Vitamin C |
| *Gentiana tenella (Roltb)* H. Smith. | Kutuki, Katuwi | Fruit | In hysteria, In weakness |
| *Juglans regia* L. | Akhore | Bark, Leaf, Fruit | Herpes, eczema, scrophula, syphilis, tooth diseases, scrofula, syphilis, pyorrhoea, toa sores, during retention of placenta, hoof diseases, bone fracture, broken horn, eye diseases, impaction, tympany, anti worm |
| *Juniperus communis* L. | Jhora, khichiya | Fruit | In liver disease |
| *Myrica esculenta* | Kafal | Fruit, Bark | cardiac infirmity, swelling, hemoptysis and wax obtained from fruit outer coating is used for curing ulcer. |
| *Melilotus alba* Medik. exDesr. | Banmethi | Whole plant | Stomachache, indigestion. |
| *Nardostachys Jatamansi* | Mansi | Whole plant | Epilepsy, hysteria, skin diseases, throat trouble, lumbago, ulcers, rheumatism, paralysis, cough, diuretic, snake-bite |
| *Ocimum sanctum* L. | Tulsi | Whole plant | Malaria, cough, cold, coryza, fever |
| *Origanum vulgare* L. | Jangali tulsi | Whole plant | Relieving diarrhoea, dysentery. |
| *Primula denticulata,* Smith. | VishKhaparia | Fruit | In cough, useful for mammary glands |
| *Punica granatum* L. | Darim | Skull of fruit | Fever, dehydration, indigestion, gastric troubles, tonic, internal parasites, burns, paralysis, flatulence, tympany, antimicrobials |
| *Picrorhiza kurrooa* Royle ex Benth. | Katki | Whole plant | Digestive troubles, dysentery, alimentary disorders, intestinal worm, tonsil, diarrhoea |
| *Rubus lasiocarpus*, Sm. | Kala Hisalu | Leaf | In pregnancy |
| *Rheum emodi*, Wall. | Dolu, Archa | Root | Wounds, cuts, inflammation, piles, swelling, sprains, jaundice, stomach trouble, muscular pain,blood purification, energy |
| *Rumex hastatus*, D. Don | Bhilmora | Whole plant | Pimples, wounds, food poisoning, scorpion stings, foot and mouth diseases, eye diseases, giddiness or insanity, skin disease, fever |
| *Rhododendron arboreum* | Burans | Flower | Cures headache |
| *Swertia purpurascens*, (D.Don) C.B. Clarke | Ciraita | Whole plant | In fever, In weak appetite. |
| *Senecio chrysanthemoides* DC. | Ratpatia | Whole plant | For skin disease |
| *Thymus serpyllum* L. | Van ajmain | Whole plant | In chest pain |
| *Trifolium repens* L. | Garila | Whole plant | Nervous diseases. |
| *Viola biflora* L. | Banpansa | Whole plant | Skin and heart diseases, liver disorders. |
| *Valeriana hardwickii* Wall, ex Roxb. | Samyo, Dhup | Root | Apoplexy, epilepsy. |
| *Woodfordia floribunda*, Salisb | Dhow | Flower | Fever, energy syrup |
| *Zingiber officinale roscoe* | Banhaldi | Root | Indigestion, heatstroke, tonic, strength, constipation, cough, dysentery, diarrhoea, food poisoning, mange, hoof diseases, blot, stomachache, skin diseases, abdominal swelling, retention of placenta, tympany, stomachic, paraplegia, tetanus. |
| *Zanthoxylum armatum* | Timur | Fruit | Treatment of Pneumonia and tick infestation caused by ectoparasite. Cure for gum diseases. Curing roundworm. |

**Table 2:** Market value of medicinal plants.

| Name of medicinal plants | Quantity (kg) | Value (Rs. In Lakh) |
|---|---|---|
| *Allium stracheyii (Jambu)* | 700-800 | 1-2 |
| *Bergenia ciliata (Pashanbed)* | 50,000-60,000 | 6-7 |
| *Cordyceps sinensis (Keeda)* | 400-500 | 400-500 |
| *Dactylorhiza hatagirea (Hathajari, Salam Panja)* | 300-400 | 2-3 |
| *Juglans regia (Akhrot)* | 20,000-25,000 | 6-7 |
| *Picrorhiza kurroa (Katki)* | 50,000-60,000 | 90-100 |

### Practices to conserve indigenous rare, endangered medicinal species

Herbal Research Development Institute (HRDI), Uttarakhand has set up a Herbal Museum in Chamoli district to promote the conservation of rare and endangered indigenous medicinal plant species. There is an urgent need for such a museum, following an uptick in the demand for herbal products across the world. Herbal renaissance is occurring is a global concept, as herbal products are considered safer than synthetic modern drugs. Looking at the importance of medicinal and aromatic plant-based natural products, HRDI has developed a National-level Herbal Museum (Hindustan, 2020).

Uttarakhand is a storehouse of a rich variety herbs and medicinal and aromatic plant species. The Government intends to exploit this advantage. Uttarakhand has observed an increase in the area under cultivation of aromatic and medicinal plants. The number of farmers engaged in cultivation of aromatic plants in Uttarakhand has dramatically increased from 301 in 2003-04 to 2714 in 2006-2007 and the area under aromatic plants has increased tenfold.

## CONCLUSION

On the basis of above paper, this can be concluded that in Uttarakhand people are closely linked with nature. People are dependent upon food, fruits, fodder and medicinal plants for their healthcare. Hilly people use these traditionally available medicinal plants for health and believe that these are easily available, less expensive and have no side effects as compare to modern medicine. Present scenario as deforestation, tourism affects medicinal plants. Thus, conservation of these species is necessary. Proper policies should be needed to conserve the forests and medicinal plants.

### Conflict of interest

All authors declare that they have no conflicts of interest.

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