



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

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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, trial 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

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 km² 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 km², 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 obscurity 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 kurroa*, these species may be categorized as low-volume and high-value medicinal species of Uttarakhand. *Saussurea lappa* and *Picrorhiza kurroa* are enlisted as endangered species of Wild Fauna and Flora. Cultivation of *S. lappa* and *P. kurroa* 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. kurroa* 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
<i>Haldina cordifolia</i> , (Roxb.)	Haldu	Bud and Leaf	For Wound and fever
<i>Acacia catechu</i> (L.f.) Willd.	Khair	Bark, Stem	Foot diseases, bone fracture, internal injury, dysentery, diarrhoea, wounds and urinary troubles.
<i>Achyranthes aspera</i> 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
<i>Aconitum balfouria</i> , stapf.	Bishjhar	Root	Septics, boils, stomachache, tonsil, gastritis, leprosy, rheumatism, swelling, wounds
<i>Agrimoniapilosa</i> Ledebour.	Kafliya	Whole Plant	Sores, wounds, blood purifier.
<i>Ajuga parviflora</i> , Benth.	Ratpatia	Whole Plant, Leaf, root	Jaundice, ascariasis, fever, stomachache, arthritis
<i>Allium stracheyi</i> Baker.	Jambu	Whole Plant	For stomach problem
<i>Aloe vera</i> L. Burm f.	Patquar	Leaf	Stomach problem, inflammation of the body
<i>Althaea coromandeliana</i> GV.	Jangalihauli	Root	For termination of pregnancy
<i>Anagalis arvensis</i> L.	VishKhaparia	Whole Plant, Fruit/Leaf Seed	Diphtheria, pain killer
<i>Anemone obtusiloba</i> D. Don.	Kakaria	Leaf, Root, Seed	Rheumatism
<i>Atropa belladonna</i> , Linn.	DhaturJahar	Leaf	In injury as pain killer
<i>Berberisaristata</i> 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.
<i>Bergenia ciliate</i> (Haworth) Stornb.	Silphora, 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.
<i>Betula utilis</i> D. Don	Bhuj, Bhojpatra	Resin, Bark	Internal injuries, cough, dysentery, painful outgrowth below tongue, wounds, cuts, alimentary disorders, burns, jaundice, In poor appetite
<i>Brassica napus</i> , (L.) Hook. f. and Anderson	Kali sarso	Seed	
<i>Butea monosperma</i> (Lam.) Kuntze	Dhank	Flower, Seed	As pain killer
<i>Boenninghausenia albiflora</i>	(Pissumar	Aerial parts	to wipe out lice, fleas and insects
<i>Centella asiatica</i> (Linn.) Urban	Brahmi	Leaf	Painful and slow urination, eye trouble, fever, snake-bite, brain tonic, malaria, cholera, brain fever, sunstroke.
<i>Chenopodium album</i> L.	Bethuwa	Leaf, Seed	Cuts, wounds, sores, smooth delivery, haematuria, stomach trouble, worm.
<i>Cinnamomum tamala</i> (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.
<i>Cordyceps sinensis</i>	Keeda	Whole plant	For gastric problem
<i>Cuminum cyminum</i> , L.	Jeera	Seed	For indigestion
<i>Curcuma angustifolia</i> , Roxb.	Banhaldi	Root	In gastric problem, anti worm
<i>Cedrus deodara</i>	Devdar	Bark and Wood	To treat urinary disorder
<i>Cannabis sativa</i>	Bhang	Aerial part	Sedative, ringworm, analgesic
<i>Daturametel</i> L.	Dhatura	Seed, Leaf, Root	Fistula, gum trouble, pyorrhoea, asthma, as pain killer (for external use only)
<i>Delphinium denudatum</i> 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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<i>Dactylorhiza hatagirea</i> (D.Don) Soo.	Salam Panja, Hathajari	Whole plant	Wounds.
<i>Ephedra gerardiana</i> , Wall. Ex Stapf	Gidjing	Leaf, root, stem	Eye trouble, bronchial disorders, cardiac trouble, wounds, headache, rheumatism, asthma, pain
<i>Euphorbia prolifera</i> , Buch.Ham. ex. D.Don.	Duwila	Fruit	Used in dog bite
<i>Fragaria vesca</i> L.	Pudalia Kafal	Root, Leaf	Protect abortion, inflammation
<i>Fumaria parviflora</i> Lamk.	Pitpapara	Whole Plant	Fever, influenza, skin etching (disease)
<i>Ficus palmate</i>	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
<i>Gentiana tenella</i> (Roltb) H. Smith.	Kutki, Katuwi	Fruit	In hysteria, In weakness
<i>Juglans regia</i> 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
<i>Juniperus communis</i> L.	Jhora, khichiya	Fruit	In liver disease
<i>Myrica esculenta</i>	Kafal	Fruit, Bark	cardiac infirmity, swelling, hemoptysis and wax obtained from fruit outer coating is used for curing ulcer.
<i>Melilotus alba</i> Medik. exDesr.	Banmethi	Whole Plant	Stomachache, indigestion.
<i>Nardostachys jatamansi</i>	Mansi	Whole Plant	Epilepsy, hysteria, skin diseases, throat trouble, lumbago, ulcers, rheumatism, paralysis, cough, diuretic, snake-bite
<i>Ocimum sanctum</i> L.	Tulsi	Whole plant	Malaria, cough, cold, coryza, fever
<i>Origanum vulgare</i> L.	Jangali tulsi	Whole Plant	Relieving diarrhoea, dysentery.
<i>Primula denticulata</i> , Smith.	VishKhaparia	Fruit	In cough, useful for mammary glands
<i>Punica granatum</i> L.	Darim	Skull of fruit	Fever, dehydration, indigestion, gastric troubles, tonic, internal parasites, burns, paralysis, flatulence, tympany, antimicrobials
<i>Picrorhiza kurrooa</i> Royle ex Benth.	Katki	Whole Plant	Digestive troubles, dysentery, alimentary disorders, intestinal worm, tonsil, diarrhoea
<i>Rubus lasiocarpus</i> , Sm.	Kala Hisalu	Leaf	In pregnancy
<i>Rheum emodi</i> , Wall.	Dolu, Archa	Root	Wounds, cuts, inflammation, piles, swelling, sprains, jaundice, stomach trouble, muscular pain, blood purification, energy
<i>Rumex hastatus</i> , D. Don	Bhilmora	Whole Plant	Pimples, wounds, food poisoning, scorpion stings, foot and mouth diseases, eye diseases, giddiness or insanity, skin disease, fever
<i>Rhododendron arboreum</i>	Burans	Flower	Cures headache
<i>Swertia purpurascens</i> , (D.Don) C.B.Clarke	Ciraita	Whole Plant	In fever, In weak appetite.
<i>Senecio chrysanthemoides</i> DC.	Ratpatia	Whole Plant	For skin disease
<i>Thymus serpyllum</i> L.	Van ajmain	Whole Plant	In chest pain
<i>Trifolium repens</i> L.	Garila	Whole Plant	Nervous diseases.
<i>Viola biflora</i> L.	Banpansa	Whole Plant	Skin and heart diseases, liver disorders.
<i>Valeriana hardwickii</i> Wall, ex Roxb.	Samyo, Dhup	Root	Apoplexy, epilepsy.
<i>Woodfordia floribunda</i> , Salisb	Dhow	Flower	Fever, energy syrup
<i>Zingiber officinale roscoe</i>	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.
<i>Zanthoxylum armatum</i>	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)
<i>Allium stracheyii</i> (Jambu)	700-800	1-2
<i>Bergenia ciliata</i> (Pashanbed)	50,000-60,000	6-7
<i>Cordyceps sinensis</i> (Keeda)	400-500	400-500
<i>Dactylorhiza hatagirea</i> (Hathajari, Salam Panja)	300-400	2-3
<i>Juglans regia</i> (Akhrot)	20,000-25,000	6-7
<i>Picrorhiza kurroa</i> (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: None.

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