

# Ethnomedicinal Uses of Plant Resources of the Haigad Watershed in Kumaun Himalaya, India

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## ABSTRACT

The present study was carried out in the Haigad watershed of Kumaun Himalaya. A total of 32 medicinal plant species belonging to 26 families were recorded. A major proportion of species were in forested landscape (62%) and the rest in cultural landscape (38%) of the watershed. The plants used for medicinal purposes in the local health traditions are gradually becoming extinct due to developmental activities, population explosion and other anthropogenic reasons. To avoid overexploitation and promote sustainable use, rapid conservation efforts are needed. Farmers should be involved in the cultivation of medicinal plants emphasizing suitable production methods, especially on barren and fallow land.

**Keywords:** ethnomedicine, plant resources, watershed, Himalaya

## INTRODUCTION

There are over 400 different tribal and other ethnic groups in India (Jain 1991) constituting about 7.5% of India's population. Plants have been used in traditional medicine for several thousands of years (Abu-Rabia 2005). During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India and there are many reports on the use of plants in traditional healing by either tribal people or indigenous communities of India (Maruthi 2000; Chhetri *et al.* 2005). The knowledge of medicinal plants has accumulated over the course of many centuries and has been documented in different medicinal systems such as Ayurveda, Unani and Siddha. In India, it is reported that traditional healers use 2500 plant species while 100 species of plants serve as regular sources of medicine (Pei 2001). Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources.

The Himalayan regions are particularly rich in biodiversity because of their varied geographical, physiographical, topographical, climatic and ecological zones (Khosho 1992). Plant resources have been in use by different communities for various purposes such as food, fodder, fuel, medicine, religious and other purposes (Badhwar and Fernandez 1964; Pangtey *et al.* 1982; Negi 1988; Negi and Gaur 1994). Many plants have become associated with environments close to human dwellings, such as homes or kitchen gardens (Borthakur *et al.* 1998). Due to cultural and ethnic diversity in different biogeographic provinces of the region the traditional knowledge base varies considerably. Based on the use of local natural resources such knowledge/practices are closely linked to the ecological and socioeconomic conditions of the region.

The Indian Central Himalaya covers an area of 51,125 km<sup>2</sup>. The indigenous knowledge of the region is unique. Such knowledge is widely followed and relied upon throughout this region, particularly by people of remote areas. Increasing population pressure, and the spread of global market economics and consumerism have already

brought profound changes to the region, and its inhabitants are gradually changing their traditional way of life (Rawat *et al.* 2000). However, with renewed global interest in traditional medicine and the increasing demand for plant products, the documentation of such knowledge is necessary to maintain the cultural view point as well as to establish a sound scientific basis of the efficacy of traditional medicine, and for the conservation of important species.

This study attempts to identify and document the existing important ethnomedicinal plants used by the people of the Haigad watershed in Kumaun Himalaya (Fig. 1).

## MATERIALS AND METHODS

The study was carried out in the Haigad watershed, which is located in the Lesser Himalayan belt. The area of the watershed (9.5 km<sup>2</sup>) includes four villages, Hawil-Kulwan, Jyuna Estate, Laskar Khet and Pinglon. The watershed represents a typical, densely populated mountainous ecosystem. With an altitudinal range of 1160 to 2338 m, this watershed can serve as an interesting example for a large part of the Central Himalayan Range, because most of the rural population is concentrated in this altitudinal zone of the Central Himalaya. Due to the high anthropogenic impacts, this altitudinal zone is popularly referred as the "problem zone". About 47.3% of the area of the watershed is under forest and administered by the State Forest Department, 1.0% under community forest while 51.7% are agricultural land (Joshi *et al.* 2009).

Extensive field surveys were conducted in and around the Haigad watershed to collect ethnomedicinal information and indigenous knowledge on plants from natural habitats (forest) as well as from the home gardens (cultivated landscape). The survey involved collection of plant specimens during the different seasons of a year.

Ethnomedicinal information of plants on the villages at different altitudes was collected using direct interviews with the adult laypeople (men and women), as well as local *vaidyas* (healers) of the villages who were randomly selected and interviewed after obtaining prior informed consent. Of total existing households of the villages, the 10% households sampling survey was done randomly using well structured questionnaire. Each selected household was personally interviewed to collect information which was also

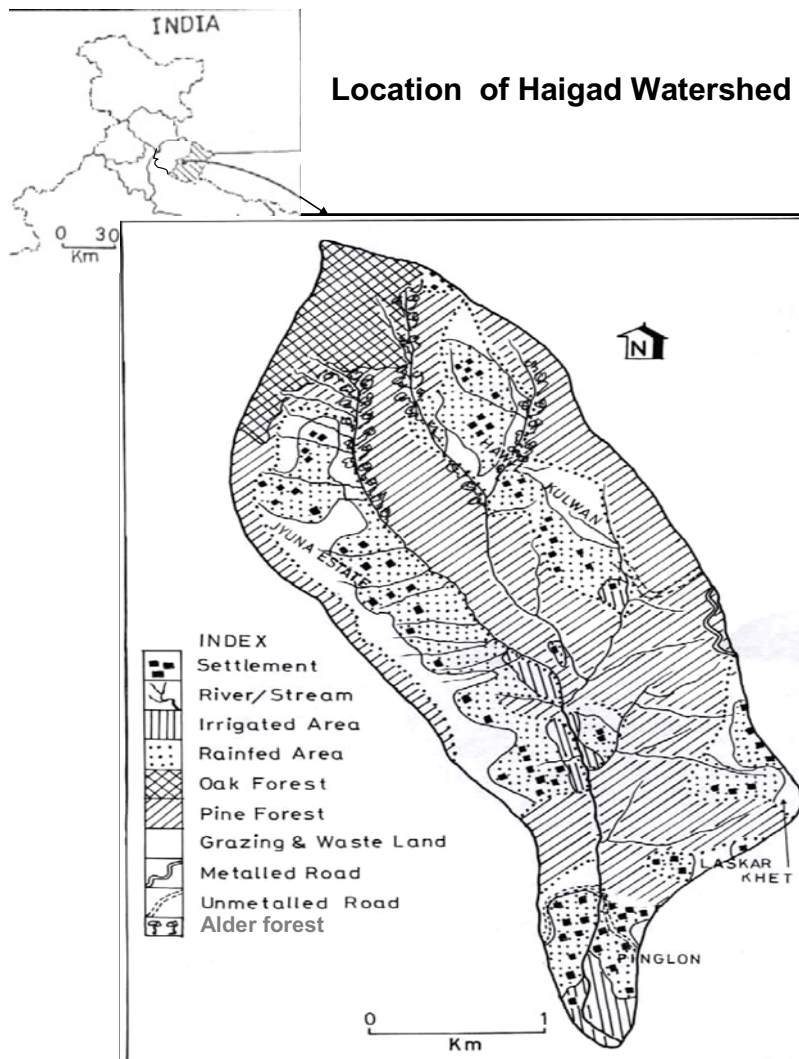


Fig. 1 Location of the study area.

verified with relevant existing ethnobotanical literature. The information was collected from both male and female adults approximated uniform ratio of male and female were taken to avoid error between the opinion. The youth have not given relevant information of the ethnomedicinal plants therefore only opinions of adult peoples have been considered.

Personal field observations of ethnomedicinal uses of plants for curing particular diseases were carried out in each village and the results were discussed with the villagers involved. The gained information was compared between the villages and to available scientific literature. A survey of the vegetation was also conducted as part of an ecological study of the region.

## RESULTS AND DISCUSSION

The survey of the available literature reveals that about 2500 species from the Indian sub-continent have local medicinal use for commerce and trade, especially for the pharmaceutical industry (Singh *et al.* 2005). Out of these, 1745 species are from the Indian Himalayan region and most of these are found in Uttarakhand (Kirtikar and Basu 1933; Nadkarni 1954; Chopra *et al.* 1956). The state of Uttarakhand is a part of north-western Himalaya and has a dense vegetation cover (65%) harboring a vast range of important medicinal plants (Singh *et al.* 2005). People in this region are partially or completely dependent on forest resources e.g. for medicine, food, and fuel.

In the present study a total of 32 medicinally important plant species from 26 families in the watershed area were found (Table 1). 12 species each were trees and herbs and 8 shrubs. A major proportion of the species were recorded

from forested landscape (62%) and the rest from the cultural landscape (38%). Interestingly, the majority of tree species (67%) were recorded from the cultural areas, while a higher proportion of shrubs and herbs were found in the forest (88 and 75% for shrubs and herbs, respectively). The traditional home gardens harbor a rich mixture of often otherwise uncommon, annual or perennial species grown in association (Agnihotri *et al.* 2004).

Along an altitudinal gradient (300 to 2400 m asl) in Garhwal of Central Himalaya, Kumar *et al.* (2008) recorded a total of 61 plants species used by the local inhabitants for curing various diseases (e.g., dysentery, cold, scabies, rheumatism, cholera, malarial fever, etc.). Similar studies on ethnomedicinal plants of Uttarakhand have been carried out for the Jaunsari tribals and a total of 66 plant species were recorded, including 9 trees, 11 shrubs and 46 herbs (Bhatt and Negi 2006). In the urban environment of Varanasi, Uttar Pradesh, 72 ethnomedicinal plants were recorded (Verma *et al.* 2007). Acharya and Rokaya (2005) conducted a study in Nepal and concluded that in spite of the establishment of modern western styled medical centers, traditional practices on the uses of medicinal plants will continue to play a significant role in the socio-cultural life of people. The research in ethnomedicinal practices can lead to add the knowledge on new and less known medicinal plants. Therefore, it is essential to conserve such knowledge hidden in the different parts of the country and people should be encouraged to use herbal medicines for the ever increasing requirements of human health care which has less or no side effects.

The medicinal plant resources used in the local health

**Table 1** Ethnomedicinal uses of plant resources of Haigad watershed in Kumaun Himalaya

Botanical Name	Local name	Family	Habitat	Part used	Uses
<b>Trees</b>					
<i>Rhododendron arboreum</i> Sm.	Burans	Ericaceae	F	Flower	Flower juice used for heart patients as tonic, in diarrhea and dysentery.
<i>Bauhinia variegata</i> L.	Quairal	Fabaceae	HG	Bark	Astringent, tonic useful in ulcers and skin diseases.
<i>Cinnamomum tamala</i> Nees ex Eberm.	Tejpat	Lauraceae	F	Bark, leaves	Leaves are carminative and are used in colic and diarrhea. Leaves and bark are also used as condiment.
<i>Ficus palmata</i> Forsk	Bedu	Moraceae	F	Fruit, twigs	Used in the treatment of lung and bladder diseases, milky juice used in skin diseases
<i>Ficus semicordata</i> Buch.Ham ex J.E Smith	Kheun	Moraceae	HG	Fruit, Root	Fruit used for the treatment of afts. The juice of the root is used in bladder ailments
<i>Ficus roxburghii</i> Wallich ex Miq.	Timil	Moraceae	HG	Fruit	Used as laxative.
<i>Myrica esculenta</i> Buch.-Ham.	Kaphal	Myricaceae	F	Fruit, bark	Fruit edible used as a source of vitamin C. Bark decoction used for asthma, chronic bronchitis, diarrhea. Bark chewed to relieve toothache.
<i>Pinus roxburghii</i> Sargent	Chir	Pinaceae	F	Aerial parts	Resin used for treatment of cracked toes.
<i>Punica granatum</i> L.	Anar	Punicaceae	HG	Fruit, flower	Dried rind is chewed in cough, fruit juice as tonic.
<i>Pyrus pashia</i> Buch.-Ham. ex D.Don	Mehal	Rosaceae	HG	Bark, fruit	Fruit is astringent, laxative. Bark is anthelmintic, febrifuge. Flower to stop nosebleeds.
<i>Sapindus mukorossi</i> Gaertner	Ritha	Sapindaceae	HG	Fruit, seed	Fruit is expectorant, antiepileptic, emetic. Seed is febrifuge and used in dental caries.
<b>Shrubs</b>					
<i>Debregeasia longifolia</i> (Burm. f.) Wedd.	Tusar	Urticaceae	F	Bark	Bark is used in the treatment of bone fractures.
<i>Berberis asiatica</i> L.	Kilmore	Berberidaceae	F	Fruit, root	Fruits are a mild laxative for children. Root and bark used as astringent, stomatic, diaphoretic, and curative of piles.
<i>Berberis lyceum</i> Royle	Kilmore	Berberidaceae	F	Root, stem	Used in the treatment of eye problems and piles.
<i>Tinospora cordifolia</i> (Willd.)f. & Thomson	Giloy	Menispermaceae	HG	Aerial parts	Used for the treatment of debility, dyspepsia, fevers and urinary disease. Leaf decoction is used for the treatment of gout. Dried powered fruit used for jaundice and rheumatism.
<i>Crataegus cremulata</i> Roxb.	Ghingaroo	Rosaceae		Fruit, leave	Used as heart tonic.
<i>Solanum indicum</i> L.	Banbhatuja	Solanaceae	F	Root, fruit	Root is used for cough, catarrhal affections, colic and nasal ulcers. Fruits are laxative.
<i>Datura stramonium</i> L	Dhatura	Solanaceae	F	Leaves	Leaves are applied to boils and sores. Flower is used for earache. Fruit juice used for dandruff control and hair loss.
<i>Urtica dioica</i> L.	Bichhu	Urticaceae	F	Whole plant	Plant is diuretic, anti-rheumatic, astringent, anthelmintic, used for Jaundice, hemorrhages form the kidney, nephritic troubles and sciatica.
<b>Herbs</b>					
<i>Centella asiatica</i> L.	Brahmi	Apiaceae	HG	Leaves	Plant infusion is used in the treatment of leprosy, as alterative tonic, to increase memory, healing of wounds.
<i>Drymaria cordata</i> (L.) Willd. ex Roemer & Schultes	Pithpapa	Caryophyllaceae	F	Aerial parts	Plant extract has laxative and anti-febrile properties.
<i>Diosorea bulbifera</i> L.	Gethi	Dioscoreaceae	HG	Tuber, leaves	Tuber is expectorant, useful in asthma, bronchitis, anti-diarrheic, for dyspepsia, urinary discharge, leucoderma, bronchitis. Leaves are febrifuge.
<i>Ocimum sanctinum</i> L.	Tulsi	Lamiaceae	HG	Whole Plant	Leave juice is used in catarrh, bronchitis, as expectorant and diaphoretic, and anti-periodic. Leave infusion used as a stomatic in gastric disorders of children and in hepatic affections. Root used to treat malaria.
<i>Thymus serpyllum</i> L.	Banajwain	Lamiaceae	F	Aerial parts	Anti-asthmatic, expectorant, carminative, antiseptic, anti-convulsive, for whooping cough, kidney and eye troubles, bronchitis.
<i>Oxalis corniculata</i> L.	Chalmori	Oxalidaceae	F	Aerial parts	Good appetizer, astringent, cures dysentery and diarrhea, skin disease, scurvy, as diuretic, refrigerant and astringent.
<i>Thalictrum foliosum</i> DC.	Mamira	Ranunculaceae	F	Whole plant	Diarrhea, purgative, diuretic, febrifuge, discoloration of the skin, eye problems.
<i>Fragaria vesca</i> L.	Gand-kaphal	Rosaceae	F	Fruit, leaves	Fruit is astringent and diuretic. Leave infusion is given in diarrhea and problems of urinary organs.
<i>Potentilla fulgens</i> L.	Bajradanti	Rosaceae	F	Root	Diarrhea, strengthens the gums and teeth, spasmolytic, anticancer
<i>Berginia ligulata</i> Wall. Engl	Pasanbhed	Saxifragaceae	F	Leaves, root	Leaves are used in earache. Root is astringent, diuretic, anti-diarrheal, febrifuge, cures pulmonary affection, dissolve kidney stones.
<i>Valeriana wallichii</i> (DC.) Wall.	Shameo	Valerianaceae	F	Rhizomes	Used in hysteria, hypochondriasis, nervous affections, itch fever and as an incense.
<i>Viola conescense</i> (Wall.) Roxb.	Banafsha	Violaceae	F	Whole plant	Expectorant, antipyretic, diaphoretic, blood purifier, catarrhal and pulmonary troubles, treatment of skin diseases and relief of ear pain.

HG=Home Garden, F=Forest

traditions are gradually destroyed by developmental activities, population explosion and other anthropogenic impacts. In order to reverse this trend, the domestication of wild medicinal species is of high importance. Farmers should be

involved in the cultivation of medicinal plants at least on their barren and fallow land. This would augment their income and in turn help in the conservation of the species. Appropriate research should be carried out in institutions in

the hills to develop agro-techniques for the cultivation of medicinal plants on priority basis (Chettri *et al.* 2005).

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