

## **Ethno-Medicinal Uses and Agro-Biodiversity of Barmana Region in Bilaspur District of Himachal Pradesh, Northwestern Himalaya**

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**Issued June 01, 2009**

### **Abstract**

India is one of the richest countries in traditional knowledge, because of its ambient biodiversity, variety of habitats and rich ethnic divergence. Thus we have had well established local health tradition still relevant in indigenous healthcare system. The paper provides first hand information on the agro-biodiversity and ethno-medicinal uses of the area. In the present study 50 species belonging to 37 genera and 17 families i.e. Shrub (1 spp.), tree (1 spp.), herb (48 spp.) were recorded under the agro-biodiversity region of the area. The utilization pattern of the species indicated that leaves of 22 species, stem of 1 species and seeds of 23 species, whole part of 11 species, tubers and flowers of 4 species, fruits of 18 species, each are used. 6 species were Indian origins, while others were non-native to Indian Himalayan Region.

**Keywords:** Ethno-medicinal uses, Indian Himalayan Region, Agro-biodiversity, Traditional Knowledge.

### **Introduction**

The history of agriculture is closely interwoven with the progress of culture, for it is the development of crops, which enabled human beings to find a certain amount of leisure to create the initial ingredients of a civilization. Indian agriculture began by 9000 BCE as a result of early cultivation of plants and domestication of crops and animals. Settled life soon followed with implements and techniques being developed for agriculture. Plants and animals considered essential for the survival of man. Agriculture has always been India's most important economic sector.

The Indian Himalayan Region (IHR) extending from Jammu & Kashmir in the North-West to the Arunachal Pradesh in the East, covers approximately 4, 19,873 km<sup>2</sup> area (Rodger & Panwar, 1988) and very well known all across the globe for its natural resources. The IHR has been identified one of the mega biodiversity hotspots and supports 18,440 species of plants (25.3% endemic species) (Singh & Hajra, 1996; Samant *et al.*, 1998), 1748 medicinal plants (Samant *et al.*, 1998), 675 wild edibles (Samant & Dhar, 1997), 279 fodder species (Samant *et al.*, 1998) and 155 sacred plants (Samant & Pant, 2003), 118 essential oil plants with medicinal values (Samant & Palni, 2000).

The Himachal Pradesh, a part of Trans and Northwestern biogeographic provinces of the Indian Himalaya is placed as a rapidly developing region. Himachal Pradesh which is very well known for its typical topography, large altitudinal range, diverse habitats and socio-economically important biodiversity, is also facing high pressures. Though, the official records show that of the total geographical area, about 66.45% area is under forests; 59.3% under protected forests and 3.41% under Reserve Forests and 32 notified protected areas (Singh *et al.*, 1990, Mathur *et al.*, 2000). The state represents anthropological, cultural, environmental and topographical diversity. Its reflection is seen in the variations of architecture of houses, clothing styles, food and food habits. The variations in availability of raw materials, environmental conditions clubbed with the time tested traditional knowledge and wisdom have made the people of different regions of this hill state to formulate, develop and perpetuate the consumption of a wide range of traditional foods and beverages unique to its places since ages. However, the production of these foods and beverages is largely limited to household level. Therefore, present study focused to the Ethno-medicinal Uses and agro-biodiversity of the study area.

## **Materials and Methods**

The nearby areas were surveyed for the collection and identification of plants from June to January, 2008. Knowledgeable person of the villages were interviewed for gathering the information on indigenous uses of the plants. Indigenous uses of plants were also gathered from the secondary sources (Anonymous 1970-1988, Singh and Rawat 2000, Samant *et al.* 1998, Samant and Palni 2000). The samples of each plant species were collected and identified with the help of local flora (Chowdhery and Wadhwa 1984, Dhaliwal and Sharma 1999, Singh and Rawat 2000). For nomenclature of the species, Anonymous (1970-1988) and Samant *et al.* (1998) were followed. Local people were interviewed for generating information on utilization pattern of agro-biodiversity. Information on the local names, life forms, part(s) used and Indigenous use was gathered. For external use, the useful part is crushed and converted into paste. The paste is used to cure diseases and heal the wounds. The wild edibles are eaten fresh, boiled, cooked or eaten in the form of dried or liquid products. Fodder is either fed fresh or stored after drying to use during the lean period. The information was compiled and analyzed for the utilization pattern following Samant *et al.*, (2000).

## **Study Area**

The state of Himachal Pradesh (30<sup>0</sup>22'40"- 33<sup>0</sup>12'40" N to 75<sup>0</sup>45'55"- 79<sup>0</sup>04'20" E) includes parts of the Trans and Northwest Himalaya covers 55, 673 km<sup>2</sup>; 9% of the IHR. Like other states of the IHR, Himachal Pradesh has a representative, natural, and socio-economically important biodiversity. It has a large altitudinal range (200-7109m), with diverse habitats, species, populations, communities and ecosystems. The Bilaspur district is mostly hilly and has no mountains of higher altitude from the mean sea level. The climate of this district is generally temperate compared to the near plains of Punjab. As of 2001 India census, Bilaspur had a population of 13,058. Males constitute 53% of the population and females 47%. The district has an average literacy rate of 83%, higher than the national average of 59.5%; with male literacy of 85% and female literacy of 81%. 10% of the population is under 6 years of age.

Barmana is situated at 31<sup>o</sup> 25.022` N Latitude and 76<sup>o</sup> 49.789` E Longitude at an altitude 547m amsl. This region lies on both the banks of river Satluj which forms the boundary between Mandi and Bilaspur districts and is about 18 Km north of Bilaspur connecting Ambala and Manali on National Highway NH-21 as in Fig.1.

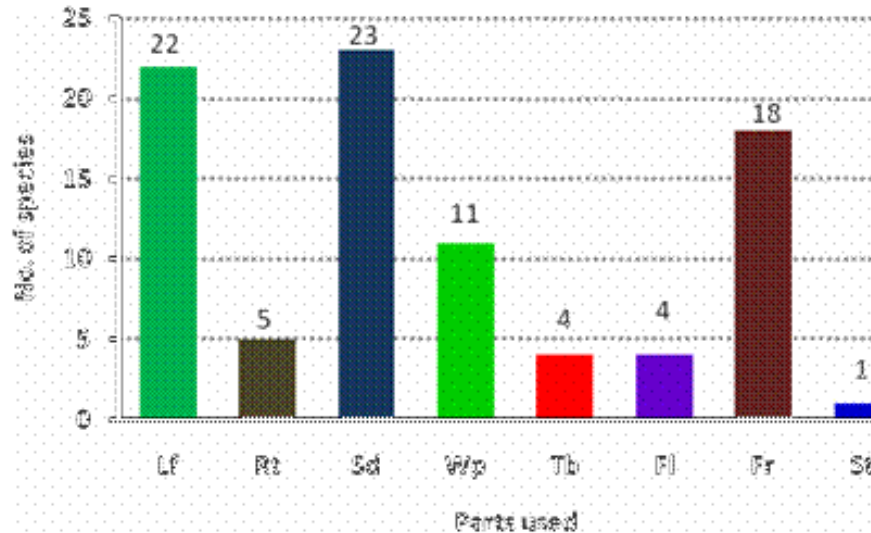


**Figure 1:** Location map of the Study Area

## Results and Discussion

### Diversity

In the present study 50 species belonging to 37 genera and 17 families i.e. Shrub (1 spp.), tree (1 spp.), herb (48 spp.) were recorded under the agro biodiversity region of the area. The families, Brassicaceae (7 spp.); Fabaceae (7 spp.); Cucurbitaceae (6 spp.); Poaceae (6 spp.); Solanaceae (6 spp.); Apiaceae (3 spp.) were species rich. Among genera, *Brassica* (5 spp.), *Solanum* (3 spp.), *Allium* (2 spp.), *Cucurbita* (2 spp.), *Ocimum* (2 spp.) were the dominant genera. Araceae, Asteraceae, Chenopodiaceae, Liliaceae, Musaceae, Myrtaceae, and Vitaceae were the monotypic families as Shown in Table 1. The utilization pattern of the species indicated that leaves of 22 species, stem of 1 species and seeds of 23 species, whole part of 11 species, tubers and flowers of 4 species, Fruits of 18 species, each are used as in Fig.2.



**Abbreviations used:** Lf=leaves; St=Stem; Fr=Fruit; Rt=Root; Sd=Seed; Fl=Flower; Tb=Tuber and Wp=Whole Plant

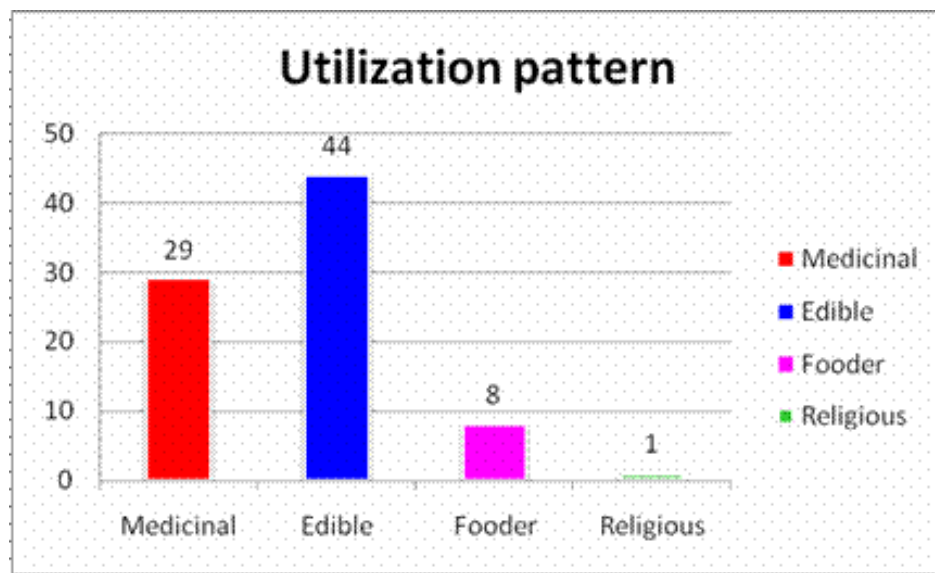
**Fig. 2.** Use pattern of the species in Barmana region

### *Nativity*

Among these 6 species were Indian origins, while others were non-native to Indian Himalayan Region (IHR) and were originated from biogeographic regions including Europe, Australia, Oriental India, Tropical Asia, America, China, etc.

### *Indigenous Uses*

Besides fodder value, there were many species used as wild edible (food), medicine, fuel, religious and various other purposes by the inhabitants. Of the total species, 29 species were used as medicine, 44 species as wild edibles, 8 species as fodder, 1 species as religious purposes in various forms as in Fig. 3. The species used as medicine for the major diseases like Piles, Bronchitis, menstrual complaints, dysentery, cough, bone fracture, pneumonia, scabies, diarrhoea, jaundice, tetanus, snake bite, diabetes, antifertility, Abortifacient, blood purifier, whooping cough, ulcers, constipation, Tuberculosis, etc. as in Table. 1.



**Fig. 3.** Utilization pattern of the species in Barmana Region

**Table. 1.** Agro-biodiversity and Ethno-medicinal Uses of Plants in Barmana Region:

Family/Taxa	Local Name	Life form	Nativity	Part Used	Uses
<b>Alliaceae</b>					
<i>Allium cepa</i> Linn.	Pyaz	H	Pers Beluchist	Lf, Rt	Medicinal (Anthelmintic, boils, listers, bronchitis, piles, ring worm); Edible
<i>A. sativum</i> Linn.	Garlic, Lasson	H	Europ	Lf, Rt	Medicinal (Eczema, piles, rheumatic pain, whooping cough); Edible
<b>Apiaceae</b>					
<i>Coriandrum sativum</i> Linn.	Dhania	H	Europ Austr Oriens	Lf, Sd, Wp	Medicinal (Bleed piles, colic, flatulence, chicken pox, stomachache); Edible
<i>Daucus carota</i> Linn.	Gajar	H	Europ Oriens	Lf, Tb	Medicinal (Child birth, toothache); Edible
<i>Foeniculum vulgare</i> Mill.	Saunf	H	Europ	Sd, Lf	Medicinal (Burning sensation in body, carminative, chest disorders, colic, cough, dysentery, fever, flatulence, headache, kidney, menstrual & spleen complications, toothache, wounds); Edible
<b>Araceae</b>					
<i>Colocasia esculenta</i> Schott.	Arbi, Kachalu	H	As Trop	Lf, Fl, Tb	Medicinal (Atrophy, bronchial disorders, cough, cuts, injuries as haemost burns, stings of bees, wounds); Edible
<b>Asteraceae</b>					
<i>Helianthus annuus</i> Linn.	Surajmukhi	H	Am Bor	Sd, Fl, Rt	Medicinal (Bone fracture, carbuncle, colic, diarrhoea, dysentery, dysuria, eye complaints, fever, menorrhoea, nose bleeding, postnatal complaints, scorpion sting, snake bite, sores, spleen complaints, whitlow, wounds, toothache)
<b>Brassicaceae</b>					
<i>Brassica campestris</i> Linn.	Sarsoin	H	Cosmop	Lf, Sd, Wp	Medicinal (Boils, migraine, muscular pain, skin disorder, bronchial disorder, cough, leprosy, pneumonia, scabies, syphilis); Edible

<i>B. nigra</i> Koch	Rai	H	Cosmop	Lf, Sd	Medicinal (Rheumatism); Edible, Fodder
<i>B. oleracea</i> Linn. Var.	Phulgobbi	H	Europ Occ Cosmop	Fr, Lf	Edible
<b>Botrytis</b>					
<i>B. oleracea</i> (capitata) Linn.	Bandgobbi	H	Cosmop	Fr, Lf	Edible
<i>B. rapa</i> Linn.	Shalgum	H	Cosmop	Tb, Lf	Edible
<i>Eruca sativa</i> Mill.	Taramira	H	Reg Mediter As Occ	Lf, Sd	Edible
<i>Raphanus sativus</i> Linn.	Mooli	H	Europ	Tb, Lf, Sd, Rt	Medicinal (Acidity, ringworm, skin eruptions); Edible
<b>Chenopodiaceae</b>					
<i>Spinacia oleracea</i> Linn.	Palak	H	Cosmop	Wp	Edible
<b>Cucurbitaceae</b>					
<i>Cucumis sativus</i> Linn.	Khira	H	Ind Or	Fr, Lf	Medicinal (Fever, headache, whoop cough); Edible
<i>Cucurbita maxima</i> Duch. ex Lam.	Kaddu	H	As Trop	Fr, Sd	Medicinal (Intestinal worms); Edible
<i>C. pepo</i> Duch.	Pumpkin	H	Oriens Afr Trop	Fr, Fl	Medicinal (Diarrhoea); Edible
<i>Luffa cylindrica</i> M. Roem.	Tori	H	Ind China	Fr	Edible
<i>L. acutangula</i> M.Roem	Kali tori	H	Geront Trop	Fr	Medicinal (Convulsion, cramps, fever, jaundice, madness, scabies, syphilis, tetanus, snake bite); Edible
<i>Momordica charantia</i> Linn.	Karela	H	Amphig Trop	Fr, Sd	Medicinal (Anthelmintic, bile excess, cause vomiting, diabetes, eczema, malaria, oedema, rheumatism, sores); Edible
<b>Fabaceae</b>					
<i>Cicer arietinum</i> Linn.	Channa	H	Europ Oriens Ind Or	Sd, Wp	Medicinal (Jaundice); Edible, Fodder
<i>Glycine max</i> Merr.	Soyabean	H	As Trop	Sd, Fr	Medicinal (stomach disorder of buffaloes, other cattle); Edible
<i>Lens culinaris</i> Medik.	Masar, Masari	H	Oriens	Sd	Edible
<i>Phaseolus vulgaris</i> Linn.	Rajmah	H	Cosmop	Sd	Edible
<i>Pisum sativum</i> Linn.	Mattar	H	Europ As Bor	Sd	Medicinal (Antifertility, diabetes); Edible, Fodder
<i>Vigna mungo</i> (Linn.) Hepper	Urd, Mah	H	Reg Trop	Sd	Edible
<i>V. radiata</i> (Linn.) Hepper	Mungi, Moong	H	Reg Trop	Sd	Edible
<b>Lamiaceae</b>					
<i>Ocimum gratissimum</i> Linn.	Tulsi	H	Ind Or	Lf	Medicinal (Intestinal disorders, gonorrhoea)
<i>O. sanctum</i> Linn.	Tulsi	H	Geront Trop	Lf, Sd	Medicinal (Abortifacient, anasarca, blood purifier, bronchial disorder, chicken pox, cholera, cold, constipation, cooling drink, cough, diarrhoea, dropsy, ear complaints, fever, gastric disorder, headache, intestinal disorder, itching, leprosy, liver complaints, malaria, postnatal complaints, protracted labour, ringworm, snake bite, vomiting, wounds); Edible, Religious
<b>Liliaceae</b>					
<i>Linum usitatissimum</i> Linn.	Alsi	H	Europ Oriens	Sd, Wp	Edible
<b>Malvaceae</b>					
<i>Abelmoschus esculentus</i> Moench	Bhindi	H	osmop Trop	Fr, Wp	Medicinal (Abortifacient); Edible, Fodder

<i>A. manihot</i> Linn.	Bhindi	H	Ind Or	Lf, Rt, Fr	Medicinal (Tbberculosis); Edible, Fodder
<b>Musaceae</b>					
<i>Musa paradisiaca</i> Linn.	Kela	H	Ind	Fr	Edible
<b>Myrtaceae</b>					
<i>Psidium guajava</i> Linn.	Amrood	T	Am Trop	Lf, Fr	Medicinal (Antiemetic, blisters in mouth, carbuncle, cough, cold, diarrhoea, dysentery, fever, headache, gonorrhoea, jaundice, menstrual disorder, sores, stomachache, tonic); Edible
<b>Poaceae</b>					
<i>Avena sativa</i> Linn.	Javi	H	Temp (Cult)	Sd, Wp	Fodder
<i>Oryza sativa</i> Linn.	Dhan	H	As Trop	Sd, Wp	Medicinal (Antifertility); Edible, Fodder
<i>Sorghum bicolor</i> (Linn.) Moench	Jowar, Chari	H	Reg Trop et. Subtrop	Wp	Fodder
<i>Saccharum officinarum</i> Linn.	Ganna	H	Rig Callid Cult	St, Lf,	Medicinal (Gall bladder complaints, constipation); Edible, Fodder
<i>Triticum aestivum</i> Linn.	Kanak, Gehun	H	Cosmop	Sd, Wp	Medicinal (Soles, of grass Stoes); Edible, Fodder
<i>Zea mays</i> Linn.	Makki, Challi	H	Paraguay	Sd, Wp	Medicinal (Kidney disorder, pneumonia, stomachache, whoop cough); Edible, Fodder
<b>Solanaceae</b>					
<i>Capsicum annuum</i> Linn.	Pipli, Mirch	H	Reg Trop	Fr	Edible
<i>Lycopersicum esculentum</i> Mill.	Tamatar	H	Am Austr	Fr	Edible
<i>Nicotiana tabacum</i> Linn.	Tambacco	H	Am Austr	Lf	Medicinal (eczema, itch, food poison, haemost, snake bite, toothache, spongy gums, wounds)
<i>Solanum melongena</i> Linn.	Baingan	H	Geront Trop	Fr	Medicinal (Piles); Edible
<i>S. nigrum</i> Linn.		H	Venzeula	Wp, Fr, Lf, Fl, Sd	Medicinal (Antidote o opium toxic, boils, cough, diarrhoea, dysentery, ear complaints, eye complaints, fever, goiter, heart ailments, inflammation of scrotum, testicles, kidney, bladder, jaundice, liver complaints, nostril complaints, piles, rheumatism, skin disorder, sores, sprain, stomachache, swell, throat troubles, ulcers in mouth, urine complaints)
<i>S. tuberosum</i> Linn.	Aaloo	H	Am Bor et Austr	Fr	Medicinal (Frost bite); Edible
<b>Vitaceae</b>					
<i>Vitis vinifera</i> Linn.	Grape, Angoor	S	Oriens, Ind Bor Occ	Fr, Lf	Medicinal (Boils, toothache, epilepsy); Edible
<b>Zingiberaceae</b>					
<i>Curcuma longa</i> Val.	Haldi	H	As Trop	Rh	Medicinal (Anthelmintic, antifertility, atrophy, blindness, bronchial disorders, carbuncle, cholera, cold, cough, dyspepsia, eye disorders, fever, fistula, headache, indigestion, insect stings, leprosy, migraine, pain in body, pimples & feckles on face, pneumonia, rheumatism, scabies, sores, spleen, syphilis, swell body, wounds); Edible

<i>Zingiber officinale</i> Rosc.	Adrak	H	Trop	Rh	Medicinal (Abortifacient, amenorrhea, asthma, bronchial disorders, cholera, constipation, diarrhoea, cough, insect stings, labour, phthisis, postnatal, scorpion sting, snake bite, throatache, Tuberculosis, scabies, puerperal fever, rheumatism); Edible
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**Abbreviations Used:** Afr=Africa; As=Asia; Am=America; Austr=Australia; Beluchist=Beluchistan; Cosmop=Cosmopolitan; Cult=Cultivated; et=And; Fr=Fruit; Flower=Fl; Subtrop=Subtropical; H=Herb; Ind=Indian; Or=Oriental; Pers=Persia; Reg=Region; S=Shrub; T=Tree; St=Stem; Sd=Seed; Wp=Whole Part; Lf=Leaf; Rt=Root; Tb=Tubber; Trop=Tropical; Occ=Occidentalis; Europ=Europe.

## Conclusion

The present study provides comprehensive information on the agro-biodiversity and Ethno-medicinal Uses of the species present in the Barmana region. Traditional practice of using plant resources has a long history and wide acceptability throughout world. The inhabitants of the region use various species to meet out their daily requirements. They use different plant parts in various forms to cater their daily needs.

In the present scenario conservation and sustainable utilization of biodiversity is great need all over the world. Therefore, documentation of information on agro-biodiversity and indigenous practices will help in conserving the knowledge. Such type of information in other parts of the IHR should be documented; so that a comprehensive database of the plants used for various purposes could be saved for the forthcoming generations.

## Acknowledgements

The authors are thankful to Dr. L.M.S. Palni, Director, G.B. Pant Institute of Himalayan Environment & Development, Kosi-Katarmal, Almora-263 643, Uttarakhand and heartily grateful to Dr. S.S. Samant, Scientist-‘E’ & Scientist In-charge, G.B. Pant Institute of Himalayan Environment & Development, Mohal-Kullu-175126, Himachal Pradesh. At last but not least, authors are thankful to all the local villagers for their kind cooperation during field survey.

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