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Research Paper

Ethnobotanical Explorations in the Balh Valley Region of North Western Himalaya

Botany

KEYWORDS : Ethnobotany, N. W. Himalaya, Pharmaceuticals, Traditional Knowledge, Medicinal Plants

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ABSTRACT

Balh Valley in the Mandi District of Himachal Pradesh (North Western Himalaya) is a rich repository of economic plants. Many local and indigenous communities in the Balh valley meet their basic needs from the products they manufacture and sell based on traditional knowledge. Rural communities in the region depend on plant resources mainly for herbal medicines, food, forage, construction of dwellings, making household implements, sleeping mats, and for fire and shade. The present work is based on the ethnobotanical survey of the region for the preparation of an inventory.

Introduction

The term ethnobotany was coined by John W. Harshberger in 1896 and was considered as the art of collection of useful plants by a group of people and the description of the uses of plants (Davis, 1995). The focus of ethnobotany is on how plants have been or are used, managed and perceived in human societies and includes plants used for food, fodder, medicine, divination, cosmetics, dyeing, textiles, for building, tools, currency, clothing, music, social life and rituals (Choudhary et al., 2008). Over the last century, ethnobotany has evolved into a specific discipline that looks at the people–plant relationship in a multidisciplinary manner, such as ecology, economic botany, pharmacology and public health. Herbal medicines are assumed to be of great importance in the primary healthcare of individuals (Sheldon et al., 1997) and communities in many developing countries. Indigenous knowledge of plant use has become recognized worldwide not only because of its intrinsic value but also because it has a potential instrumental value to science and conservation (Kunwar and Bussmann, 2008). Today, there are thousand-year-old indigenous knowledge based traditions and records of popular healing that have maintained their importance despite new developments and progress in the fields of chemistry, pharmaceuticals, and medicine. Indeed, interest in herbal drugs is increasing (Jain and Saklani, 1991). In recent years, because of the costs as well as serious side-effects of a number of modern drugs, attention has turned back to medicinal plants as a source for discovery of newer drugs with less cost and side-effects (Bhattarai, 1992).

The World Health Organization has estimated that over 80% population of the developing countries rely on traditional herbal medicines to sustain their primary health care needs (Farnsworth and Soejarto, 1991). India is represented by rich cultural traditions and natural biodiversity, and offers unique opportunities for drug discovery researchers. In India, there are over 17,500 species of higher plants, 64 gymnosperms, 1,200 pteridophytes, 2,850 bryophytes, 2,021 lichens, 15,500 fungi and 6,500 algae are reported (Sankaranarayanan et al., 2010). Of the estimated Indian floristic wealth, 7,500 are medicinal, 3,900 are edible, 700 are culturally important, 525 are used for fibre, 400 for fodder, 300 for pesticides and insecticides, 300 for gum, resin and dye and 100 provide incense and perfumes (Anon., 1994). For the Indian Himalayan region, a total of 1748 species of medicinal plants - 1020 herbs, 338 shrubs, 339 trees, apart from 51 pteridophytes have been listed (Kumar et al., 2011). In almost all traditional medicine systems, medicinal plants play a major role and constitute the backbone of traditional medicine. India has a rich heritage of traditional medicine and traditional healthcare systems have been flourishing for many centuries (Mukherjee, 2001).

Traditional knowledge on the utilization of plant resources in Himachal Pradesh has been documented by several workers (Uniyal and Chauhan, 1972; Brij Lal *et al.*, 1996; Chauhan, 1999; Singh and Kumar, 2000; Sharma and Chauhan, 2000; Sood *et al.,* 2001; Sharma *et al.,* 2003). Mandi district of Himachal Pradesh is well known region in the North Western Himalaya that has rich diversity of flora and fauna. Earlier notable contributions on Ethnobotanical explorations in Mandi District of Himachal Pradesh include: Singh, 1993; Singh, 1996; Singh, 1999; Sood and Thakur, 2004 and Rajasekaran and Singh, 2009. Inspite of the exhaustive work carried out in the state, no investigation has been carried out till date to document ethnobotanical information in the Balh Valley region of Himachal Pradesh. Hence, the present work has been undertaken for exploring the plant diversity and documentation of traditional knowledge on the utilization of these plant resources in the region.

Study Area

The Balh Valley, also Known as Sunder Nagar Valley, lies in Mandi district of Himachal Pradesh (Fig. 1) situated in the lap of North Western Himalaya at an altitude of 800 m above sea level. This is broad open valley which stretches from Gutker in the North to Sundernagar in the South, Baggi in the East and Gulma in the West, covering about 25 villages. The economy of the region is predominately agrarian as about 80% of the total population is dependent on agriculture and activities allied to it, for earning their livelihood. The soil found in this valley is loam in texture and light grey to brown in colour. The main crops are sugarcane, maize, wheat, ginger and paddy in the region. Dairy farming, mixed farming, horticulture and animal husbandry are some of the main occupations of the villagers living in the valley.

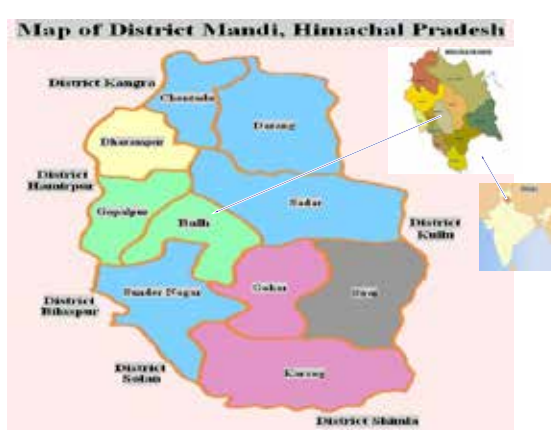


Fig. 1: Map of District Mandi, Himachal Pradesh showing Study Area (Balh Valley)

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Methodology

The present study was conducted during 2011-2012 in various villages of Balh Valley in Mandi district of Himachal Pradesh. The Ethnobotanical information on local uses of collected plant species was obtained using structured questionnaire based on Performa designed by Jain and Goel (1995) from the respondents of different age groups ranging from 22-82 yrs. A total of 20 respondents from the study area were interviewed in the present survey. Several villagers, old and experienced people and local medicinemen were repeatedly interviewed to verify the information gathered on indigenous uses of important plant species. While interviewing, the specimen materials have been shown to the informants for verification so that the plant specimens have been properly identified by the people who provided the information pertaining to those plants. The plant collections were identified and authenticated using regional floras and various revisionary and monographic works of Hooker (1872-1897), Collett (1902), Chowdhury and Wadhwa (1984), Polunin and Stainton (1984), and Chauhan (1999). The collected voucher specimens were deposited in the herbarium section of Botany Department, Abhilashi Institute of Life Sciences, Ner Chowk, Mandi (H.P). A total of 50 plant species have been recorded and enumerated with their voucher numbers, family name, vernacular name, part/s used, and Ethnobotanical uses.

Results and Discussion

The present study reveals that the plant diversity of ethnobotanical importance in the study area comprises of 48 species belonging to 35 families (Table 1) including 14 trees, 19 shrubs, 13 herbs and 2 climbers of which 45 species belong to Dicots and 3 species to Monocots. In all, 33 spp of the plants inventoried were used medicinally (68.75%), 24 spp as edible (50%), 17 spp for material culture (35.42%), 12 spp for fodder (25%), 8 spp for fuelwood (16.67%), 7 spp as sacred (14.58%), 4 spp for fencing (8.33%) and 3 spp as ornamental (6.25%) as shown in Fig. 2. The present study also highlights the occurrence of predominant families: Lamiaceae (4 Spp); Brassicaceae, Rutaceae (3 spp each); Amaranthaceae, Anacardiaceae, Apiaceae, Fabaceae, Moraceae, Rosaceae, Urticaceae (2 spp each). Commonly occurring medicinally important plants are used to treat various diseases like anaemia, body pain, body swelling, burning sensation, cold, cough, diabetes, digestive problem, furuncle, gum bleeding, gynaecological disorder, insect bite, jaundice, joint pain, kidney disorder, liver disorder, male sexual problem, moles, mouth ulcer, nausea, pimples, respiratory problems, stomach problems of animals, stones (antilithic), throat infection, tonsils, toothache, for enhancing lactation, to remove foreign particle from eye, as anthelmintic, blood purifier, hair oil, memory enhancer, narcotic and in cuts and wounds healing (Table 1).

Table 1. Ethnobotanical Uses of Plants in Balh Valley

Botanical Name with Voucher No.	Family	Vernacular Name	Part/s Used	Use/s
Achyranthes aspera L. (ETH-508)	Amaranthaceae	Puth Kanda	Stem, Roots	Ash of dried and burnt stem taken with honey daily in the morning for curing cough. 5g powdered dried roots prescribed twice daily for kidney disorders. Crushed roots taken in a piece of cloth, dipped in warm water and immediately applied on affected part of the body to relieve pain/swelling.
Aegle marmelos (L.) Correa (ETH-544)	Rutaceae	Bil, Bilpatra	Whole plant, Fruits, Leaves	Fruits edible. Pulp of fruits used for candy which is considered effective for curing jaundice and digestive problems. Plant is sacred; leaves are offered to appease lord Shiva.
Agave americana L. var. marginata Trel. (ETH-546)	Agavaceae	Ram Vaan	Whole Plant, Leaves	Planted for field border fencing. Leaves used for making ropes.
Ajuga bracteosa Wall. ex Benth. (ETH-515)	Lamiaceae	Neel Kanthi	Leaves	4-5g powdered dry leaves prescribed twice daily for diabetes. Fresh leaves chewed to cure throat infection, mouth ulcer and toothache.
Asparagus adscendens Roxb. (ETH-539)	Asparagaceae	Sansarpali	Whole plant, Roots, Fruits	Whole plant is sacred and used in various ceremonies, e.g. marriages, birthdays, religious worshipping, etc. Powdered roots prescribed for curing male sexual problems. Dried powdered fruits and roots prescribed for increasing lactation after delivery.
Bauhinia variegata L. (ETH-549)	Fabaceae	Karalae	Whole plant, Branches, Wood, Flower buds, Petals and Bark	Tree planted for ornamental purposes. Branches used as fodder and wood as fuel. Flower buds and petals used as vegetable and Flower buds also pickled. Bark used for preparation of local wine.
Berberis lycium Royle (ETH-522)	Berberidaceae	Kashmale	Whole plant, Fruits, Leaves, Flowers, Roots, Thorns	Fruits edible. Leaves, flowers and fruits used to prepare 'chutney'. Plant used as fuelwood. Roots used to prepare dye for colouring (yellowing) clothes and also for decorating 'vedika' in marriage ceremonies. Its thorn used for piercing ear and nose to wear ornaments by the ladies.
Boehmeria macrophylla Hornem. (ETH-511)	Urticaceae	Chamarayala	Leaves, Branches	Leaf juice applied over cuts to stop bleeding. Leaves and branches used as bedding material for cattle.
Broussonetia papyrifera (L.) Vent. (ETH-526)	Moraceae	Daberu, Jungli Toot	Leaves and Branches	Leaves and branches used as excellent fodder for cattle to enhance lactation.
Cannabis sativa L. (ETH-540)	Cannabaceae	Bhang	Leaves, Fibers	Crushed leaves applied to cure insect bites and also to relive burning sensation caused by touching the leaves of 'Bichhu Buti' (Urtica spp). Leaves also used as narcotic. Fibers used for preparation of various household articles like baskets, mats and shoes ('Pulahein').

Carissa congesta Wight (ETH-538)	Apocynaceae	Kharnu	Fruits, Leaves, Branches, Whole plant, Thorns	Fruits edible. Leaves used as fodder. Branches used for fencing purposes to protect the cultivated fields from grazing animals. Whole plant used as fuel. Its thorn used to draw out thorns from the skin by local inhabitants working in the fields and also for piercing ear and nose to wear ornaments by the ladies.
Celtis australis L. (ETH-518)	Ulmaceae	Khidak	Fruits, Wood, Leaves	Fruits edible. Wood used for construction purposes, for making agricultural implements and also as fuel. Leaves used as fodder.
Centella asiatica (L.) Urb. (ETH-550)	Apiaceae	Brahmi	Leaves	Leaves edible. 5g powdered dried leaves prescribed twice daily alongwith sugar for enhancing memory. Oil extracted from leaves applied for nourishing hairs. 2-3 leaves chewed thrice daily for curing tonsils or throat infection.
Colebrookea oppositifolia Sm. (ETH-509)	Lamiaceae	Gandusa	Flower buds	Flower buds chewed for curing gum bleeding.
Cryptolepis buchananii Roem. & Schult. (ETH-525)	Asclepiadaceae	Tarnu	Latex	Latex applied for removing the moles from the face or other parts of the body and also for curing hardened swollen furuncle (locally called as 'jar').
Daucus carota L. (ETH-551)	Apiaceae	Gajar	Roots	Roots are edible. Roots cooked as vegetable and also used as salad for improving eyesight. Juice of roots considered refreshing and effective for better digestion.
Debregeasia salicifolia (Roxb. ex D. Don) Rendle (ETH-519)	Urticaceae	Siyaru	Fruits, Leaves	Fruits chewed to relieve toothache. Leaves used as fodder.
Dendrocalamus hamiltonii Nees & Arn. ex Munro (ETH-537)	Poaceae	Bans	Stem, Leaves	Stem extensively employed for building works and for making baskets. Stem also used as bier for carrying corpse to funeral ground for performing last rites. Leaves used as fodder.
Duranta erecta L. (ETH-527)	Verbenaceae	Duranta	Whole plant	Grown as hedge plant. Also used for fencing purposes.
Ehretia acuminata R. Br. (ETH-514)	Boraginaceae	Punya	Whole Plant, Wood	Plant is sacred. Wood used as useful timber for furniture and construction purposes.
Eruca vesicaria (L.) Cav. subsp. sativa (Mill.) Thell. (ETH-545)	Brassicaceae	Taramira	Whole plant, Seeds	Whole plant used as fodder. Seeds constitute excellent cattle feed for enhancing lactation.
Ficus auriculata Lour. (ETH-532)	Moraceae	Traimbal	Fruits, Leaves, Latex	Ripe fruits edible. Unripe fruits cooked as vegetable. Leaves used as fodder. Latex applied to cure cuts and wounds.
Juglans regia L. (ETH-516)	Juglandaceae	Akhrot, Khod	Kernels, Bark, Wood, Fruits	Kernels edible. Bark used for scouring teeth and colouring the lips. Wood considered excellent for construction and furniture. Fruits worshipped as symbolic to deity in the local festival ('Sair').
Justicia adhatoda L. (ETH-505)	Acanthaceae	Basuti	Branches, Leaves	Branches used as bedding material for cattle. Leaves used for ripening of fruits like Banana, Mango, etc. Poultice of its leaves alongwith leaves of Vitex negundo ('Bana') and Dalbergia sissoo ('Shisham') applied to cure joint pain. Also, 15-20 ml decoction of leaves given twice a day for cough.
Kalanchoe pinnata (Lam.) Pers. (ETH-531)	Crassulaceae	Patthar Chatt	Leaves	Leaves consumed raw or in the form of 'chutney' to cure stones (antilithic). Leaves also eaten alongwith 'siddoo' (local food item) for easy digestion.
Lepidium sativum L. (ETH-523)	Brassicaceae	Halae	Seeds	Seeds are kept beneath eye lid to remove any foreign particle from eye. A pinch of seeds are taken with warm milk to cure anaemia.
Mallotus philippensis (Lam.) Muell. Arg. (ETH-506)	Euphorbiaceae	Khambal	Branches, Wood, Fruits, Stem	Branches with leaves used as bedding material for cattle. Wood used as fuel. Red dye is extracted from fruits. 5-8g of its fruit powder taken daily as anthelmintic. Stem used for scouring teeth.
Mangifera indica L. (ETH-521)	Anacardiaceae	Aam	Fruits, Wood, Leaves	Fruits edible and also used for making pickle, jam, candy, 'chutney' and 'amchur'. Wood used for furniture and also as fuel. Leaves used in various ceremonies for performing religious rituals.
Mentha spicata L. (ETH-536)	Lamiaceae	Basumbari	Leaves	Leaf juice prescribed for digestive problems. Leaves used for preparing 'chutney'.
Murraya koenigii (L.) Spreng. (ETH-507)	Rutaceae	Gandhelu	Leaves, Stem, Wood	Decoction of leaves prescribed to cure digestive problems. Leaves also used for flavouring curries. Stem used for scouring teeth and wood as fuel.
Nasturtium officinale W. T. Aiton (ETH-541)	Brassicaceae	Chhuch	Aerial parts	Aerial parts used as vegetable ('Sag') and also as fodder.

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Phyllanthus emblica L. (ETH-510)	Phyllanthaceae	Amla	Fruits	Fruits edible and also pickled. 5-10g powdered dried fruits taken daily as blood purifier. Fruits form one of the important constituents of 'Triphala' which is prescribed to cure digestive problems.
Pistacia integerrima J. L. Stewart (ETH-533)	Anacardiaceae	Kakade	Fruits, Wood, Galls	Fruits edible. Wood used for construction purposes. Decoction of galls ('Kakadsinghi') prescribed for cough, cold and respiratory problems.
Prunus cerasoides D. Don (ETH-552)	Rosaceae	Paja	Fruits, Branches	Fruits edible. Branches used for religious worshipping in various ceremonies.
Rubus ellipticus Sm. (ETH-530)	Rosaceae	Aakhe	Fruits, Whole plant	Fruits edible. Whole plant used for fencing purposes.
Rumex hastatus D. Don (ETH-542)	Polygonaceae	Khatti malori	Whole plant, Leaves	Plant used as fodder. Leaves used to prepare 'chutney'.
Salvia coccinea Buc'hoz ex Etl. (ETH-548)	Lamiaceae	Ram Tulsi	Whole plant, Leaves	Plant grown for ornamental purposes. Decoction of leaves prescribed for curing cold.
Silene conoidea L. (ETH-517)	Caryophyllaceae	Takali	Aerial parts	Aerial parts used as vegetable ('Sag'). Also used as fodder.
Spinacia oleracea L. (ETH-529)	Chenopodiaceae	Palak	Aerial parts, Leaves	Aerial parts used as vegetable ('Sag'). Leaf juice considered effective against digestive disorders and nausea.
Solanum virginianum L. (ETH-547)	Solanaceae	Dhufanu	Fruits	Slightly warmed fruits cut into two pieces and applied over pimples for early recovery.
Syzygium cumini (L.) Skeels (ETH-535)	Myrtaceae	Jamun	Fruits, Seeds, Wood	Fruits edible and prescribed to cure liver disorders. 5-10g powdered dried seeds taken twice daily for curing diabetes. Wood used for furniture works and also as fuel.
Taraxacum officinale F. H. Wigg. (ETH-513)	Asteraceae	Rakhi	Latex, Whole Plant, Roots	Latex applied for healing of wounds. Plant also used as fodder. Powdered dried roots prescribed for kidney disorders.
Tinospora cordifolia (Willd.) Hook. f. & Thomson (ETH-524)	Menispermaceae	Gloe	Stem, Leaves	5-8g powdered dried stem prescribed twice daily for liver disorders. Stem also used for performing sacrificial fire ('havan') during religious ceremonies. 10ml decoction of its leaves and stem prescribed twice daily as anthelmintic.
Trigonella foenum-graecum L. (ETH-543)	Fabaceae	Methi	Seeds, Leaves, Twigs	4-5g roasted powdered seeds taken with water twice daily to cure digestive problems. Leaves and tender twigs used as vegetable ('sag'). Seeds used as a condiment for flavouring pickles and food preparations.
Verbascum thapsus L. (ETH-520)	Scrophulariaceae	Jungli tamakhu	Aerial parts	Aerial plant parts given to cure stomach problems of animals.
Viola canescens Wall. ex Roxb. (ETH-534)	Violaceae	Banaksha	Flowers	Decoction of flowers prescribed to cure cough and cold.
Woodfordia fruticosa (L.) Kurz (ETH-528)	Lythraceae	Dhavae	Leaves	Dried powdered flowers prescribed to cure gynaecological disorders.
Zanthoxylum armatum DC. (ETH-512)	Rutaceae	Tirmira	Leaves, Fruits, Stem, Wood	Leaves used as a condiment in the preparation of local dish called 'Patrodu'. Tender leaves and fruits chewed to cure mouth ulcer. Stem used for scouring teeth and wood for making pestles.

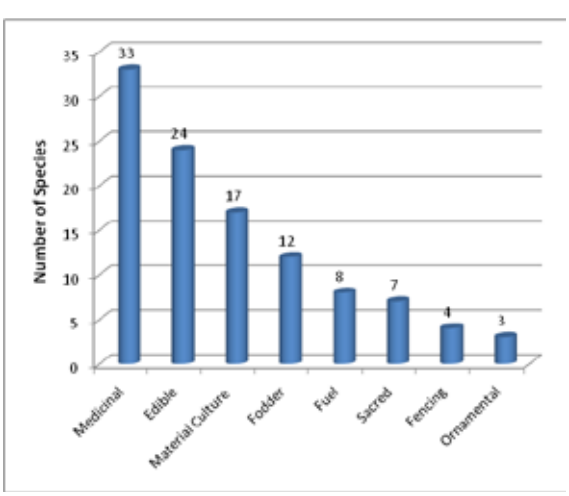


Fig. 2: Different Ethnobotanical Uses of Plants in Balh Valley of N.W. Himalaya.

The observations of present study showed that in addition to the medicinal uses, local inhabitants of Balh valley also exploit the available plant resources for several other purposes viz., edible (eaten raw or as vegetable, condiment, pickle, etc.), material culture, fodder, fuel, sacred, fencing and ornamental. Various categories of material culture include use of plants for construction, furniture, agricultural implements, household articles, ripening of fruits, preparation of local wine, scouring teeth, making ropes, dye, bedding material for cattle, etc. It is clear from the present work that there is a rich wealth of traditional knowledge in the region which needs to be explored for the welfare of mankind.

Conclusion

The present study reveals that local inhabitants of Balh Valley region of N.W. Himalaya are dependent upon the plant resources for various purposes like medicine, food, material culture, fodder, fuel, sacred, fencing and ornamental purposes. Despite extensive development in the field of pharmaceuticals and medicine, local people still believe in herbal based healthcare system. Keeping in view the medicinal uses of recorded plant species, findings of the present investigation can be exploited as

a basis for selecting plants for future phytochemical and pharmaceutical studies. It is obvious from the foregoing account that the rural populace in Balh Valley region of N.W. Himalaya have a rich knowledge of natural resources and utilization of these plants resources is still an integral part of their socio-cultural sustenance.

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