

ETHNO-BOTANICAL STUDY OF MEDICINAL PLANTS OF PADDAR VALLEY OF JAMMU AND KASHMIR, INDIA

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Abstract

The Paddar Valley, historically known as *Sapphire Valley* situated in Kishtwar district, is a prime landmark in the Jammu region of J&K state and is known for its rich cultural and plant diversity because of diverse habitats such as rivers, streams, meadows and steep mountain slopes. The area is located in the dry temperate region comprising typical vegetation which disappears completely on the eastern slopes, dominated by a variety of economical species which play an important role in the rural life. The inhabitants are dependent on plant resources for food, fuel, timber, shelter, fodder/forage, household articles and traditional medicines in treating diseases like malaria, cancer, gastro-intestinal ailments, etc. This paper deals with the observations on traditional therapeutic application by the inhabitants of Paddar Valley. The ethno-botanical information on medicinal plants would not only be useful in conservation of traditional cultures and biodiversity but also community health care and drug development. Exploration survey in Paddar Valley has revealed that people collect and sell these medicinal species through local intermediaries / contractors to earn their livelihood. But the scientific cultivation and appropriate post-harvest management would improve employment opportunity and income of local farmers in the region.

Key words: Ethno-botanical; medicinal plants; Paddar valley; Jammu and Kashmir

Introduction

Herbal wealth comprising herbs and shrubs is an indispensable component of human lives since they provide diverse range of biochemical compounds required for metabolic activities (Cotton 1996; Buckingham 1999).

Western Himalayas are considered as a storehouse of herbal wealth supporting the vast network of traditional Indian System of Medicine. There is a wealth of information on the identity and distribution of different plant species of the region in the form of regional floras, reports of botanical expeditions, monographic accounts of families, genera and similar other publications. Ethno-botanical studies on medicinal plants are of paramount importance, particularly in the harsh climates like cold arid regions wherein modern system of medicine is not so developed. Such indigenous system of traditional knowledge conserves cultural and ecological diversity besides community healthcare and drug development. Ethno-botanical studies are also expected to provide new material for the ever-expanding pharmaceutical industry. Paddar Valley is the farthest corner of District Kishtwar, comprising 32 villages on south-eastern side touching its borders with Himachal Pradesh, Zaskar Valley of Ladakh and Marwah-Wadwan Valley. Paddar is known for blue diamond 'Sapphire' deposits and other forest products like kala zeera and guchhi. The area is drained by the Chenab river system which, flowing in from neighbouring Himachal Pradesh, enters the area through Paddar, the trans-Himalayan trekking trails leading to the Suru and Zaskar valleys of Ladakh pass amidst breathtaking mountain sceneries. Elevation range of the valley is 1500 to 4500 metres above mean sea level and between latitude 33° 15' 10"N to 33° 30' 10" N and longitude 76° 02' 10"E to 76° 25' 15" E. This area remains considerably under the clouds when monsoon attacks the plains. Average temperature during the working season of July to September remains around 5°C to 10°C during the day and almost minus 1-2°C during night.

The region provides a wide variety of plants (herbs, shrubs and trees) owing to its diversified landscapes. Every year, thousands of people undertake Machail pilgrimage along Bhot nala, a tributary of River Chenab. The local inhabitants largely depended upon the local flora for food and medicine. The information on these plant species is utilised to understand the human-plant relationship, as well as a guide for drug development under the assumption that a plant which has been used by indigenous people over a long period of time may have an allopathic application (Farnsworth, 1993). Due to the remoteness of the area and dearth of doctors, the 'hakims' resorted to different medicinal plants as a treatment to different diseases (Arshad, 1999; Shinwari, 2002). The decline in their cultural peculiarities and their traditional knowledge about the local floras are spontaneous and fast due to better facilities of transportation, communication and education. Thus, the present study was carried out as an ethno-botanical exploration to collect and document information on useful plant species (their local names) that find traditional use in the daily life of local inhabitants for medicines and healthcare.

Materials and Methods

An ethno-botanical survey of the Paddar valley has been carried out for the collection of specimen, traditional information and anthropological aspects. The practice of prescription and preparation of medicine by using local herbs has been observed at various locations in villages.

Regular exploration trips were made to the representative areas and different plant specimens were photographed, collected, dried, documented and were identified both by comparing them with herbarium specimen and with the help of flora of Jammu and other floras for confirmation (Stewart, 1967; 1982). First hand information on traditional knowledge related to plant resources, socio-economic and ethno-botanical information was recorded by interviewing the villagers, shopkeepers, timber dealers, local hakims and farmers, but priority was given to local elderly people and *Hakims* (Local health practitioners) who were the real traditional experts in the use of these medicinal plants. The information on local use of the plant species, their local names and parts used was recorded through discussions with the knowledgeable and elderly local people. They have been highlighted giving botanical names, local/common name(s), economic parts used, and prominent uses.

Results and discussion

The floral diversity of the valley has importance in traditional system of medicine due to its multifarious uses among the rural tribes. Local people are well versed in the use of plants for curing many ailments. Those associated with collection of medicinal plants from the forest areas generally sell them to the local practitioners, contractors or vendors to earn their livelihood. Information on important plant species with ethno-botanical importance has been presented in Table 1 and shown in Figures 1 (a-f) & 2 (a-f).

Table 1: Ethno-botanical plant species used as medicines in Paddar Valley (J&K)

Name of the species	Local name	Family	Official part used	Important uses
<i>Achillea millefolium</i> L.	Bergeur, Gandana	Asteraceae	Leaves	Leaf infusion against stomach-ache, cold and as tonic
<i>Aconitum heterophyllum</i> Wall.ex Royale	Patrees	Ranunculaceae	Roots	Used against diarrhoea, general weakness, impotency and fever
<i>Allium corolinianum</i> DC.	Praan, Gogcheegma	Amarylidaceae	Bulbs	Indigestion and in cooking pulses and vegetables by the nomads
<i>Angelica glauca</i> Edgew	Choru, Chohore	Umbelliferae	Roots	Roots as spice and condiment
<i>Aquilegia fragrans</i> Benth	Kalumb, Jangli kuth	Ranunculaceae	Roots	Cystitis, gout, eczema, psoriasis and blood sugar
<i>Arnebia euchroma</i> (Royale) Johnston	Ratanjot	Boraginaceae	Roots	Anti-inflammatory, eye-diseases, cuts & wounds, tooth ache, anti-microbial, antipyretic and ear ache
<i>Artemisia brevifolia</i> Wall.ex DC.	Moori, Joon, tarkha	Asteraceae	Leaves	Stomach-ache, intestinal worms, appetite stimulant
<i>Atropa accuminata</i> Royale	Jala kafal	Solanaceae	Root	Anti-asthmatic, anti-spasmodic, diuretic, tonic and aphrodisiac
<i>Berberis lycium</i> Royale	Daruahaldi, khawaray	Berberidaceae	Fruits, roots	Fruit extract against stomach-ache and diarrhoea, jaundice and liver diseases, roots extract called ' <i>Rasaunt</i> ' used as cooling agent and eye lotion
<i>Bergenia ciliata</i> (Hook f.Thomas) Engl.	Zakham-a-hayat, sapdotri	Saxifragaceae	Roots	Massage to cure body swelling, kidney stones, wound healing, cosmetics, etc.
<i>Bunium persicum</i> L	Kala zeera, sia zeera	Apiaceae	Seeds	Seed as spice, appetiser, reduces cholesterol, anxiety and depression, indigestion, dysentery, carminative, bronchitis, diseases of blood and ear, leprosy and convulsions.
<i>Codonopsis rotundifolia</i> Benth	Bibdi	Companulaceae	Fruit	Eaten as vegetable, roots are

	(Paddri)			aphrodisiac
<i>Colchicum leutum</i> Baker	Chingposh	Liliaceae	Corms	Rheumatism, gout, diseases of liver and spleen
<i>Dactylorhiza hetagirea</i> (D.Don) Soo	Salam panja, hathpanja	Orchidaceae	Roots	Round worms of stomach, inducing pus formation in boils
<i>Delphinium brunonianum</i> Wall.	Nirvisha, Changuathpa	Ranunculaceae	Whole plant	Diabetes
<i>Ephedra gegardiana</i> Wall.Ex Stapf	Tutfoor, Rachi, trudak	Ephedraceae	Twigs	Asthma, cardiac stimulant hay fever, rashes of allergic origin, respiratory disorder and sunburn
<i>Eremurus himailicus</i> Baker	Prezdar, Kaahlu (Paddri)	Asphodelaceae	Leaves, Roots	As leafy vegetable, even roots are cooked when young foliage is mature and not fit for eating
<i>Gentiana kurroo</i> Royale	Neel kanth, Tikta	Gentianaceae	Whole plant	Blood purifier, fever, cough, liver ailments and headache
<i>Geranium pretense</i> L.	Gugchuk, ringresh	Geraniaceae	Leaves	Diarrhoea and dysentery
<i>Hippophae rhamnoides</i> L.	Charma, tirku, buru	Elaeagnaceae	Fruits	Improvement of digestion, anti-oxidants, tumours, liver ailments, eye ailments, bronchial asthma, skin wrinkles and high cholesterol
<i>Hyoscyamus niger</i> L.	Bajerbhang, murg jawain	Solanaceae	Leaves, flowers	Nervousness, asthma, and whooping cough.
<i>Hyssopus officinalis</i> L.	Tengu, tyangu	Lamiaceae	Flowers	Substitute for saffron, in Tibetan medicine, liver and blood disorders
<i>Inula racemosa</i> Hook.f. royleana	Poshkarmool	Asteraceae	Roots	Anti-inflammatory, anti-pyretic, anti-asthmatic, antiseptic
<i>Juniperus communis</i> L.	Bethri, Dhoop	Cupressaceae	Flowers, fruits	Carminative, curing asthma, against swellings, tumours, warts, stimulant and diuretic
<i>Jurinea dolomiaea</i> (Royale) C.B. Clarke	Dhoop, guggal	Asteraceae	Roots	Dhoop making
<i>Lavatera cashmeriana</i> Cambess	Gursaunchal	Malvaceae	Roots	Roots recommended in respiratory complaints
<i>Morina Longifolia</i> Wall ex DC.	Kandmool, kim	Dipsacaceae	Roots	Wounds, incense, dhoops
<i>Onosoma hispidia</i> Wall.ex G.Don.	Ratanjot, ratmundi	Boraginaceae	Root	Rheumatism, heat disorders, hair treatment
<i>Picrorrhiza kurroo</i> Royale ex Benth	Kuru, kaur, Honglen	Scrophulariaceae	Flower, rhizomes	Fever, hepatoprotective, tonic to improve appetite, rheumatic arthritis
<i>Plantago depressa</i> Willd.	Van isabgol, chapach patri, Tharam	Plantaginaceae	Whole plant	Infusion against gastro-intestinal inflammation, dysentery and anti-diarrhoeal
<i>Podophyllum hexandrum</i> Royale	Bankakru, Rhodadari	Podophyllaceae	Rhizome, roots	Hepatic, stimulant, diarrhoea, purgative, liver ailments and cancer treatment
<i>Polygonatum verticillatum</i> L.	Salam dana, mishri, mitha-dodhu	Liliaceae	Roots	Appetiser, backache and menstrual troubles
<i>Ranunculus trichophyllus</i> Chaix.	Rengo	Ranunculaceae	Whole plant	Diarrhoea
<i>Rheum australe</i> Wall ex Weissn	Padshah, pambchalan,	Polygonaceae	Roots	Stomach-ache, cuts and wounds, muscular swellings and mumps, dye woollens
<i>Rheum webbianum</i> Royale.	Lachhu	Polygonaceae	Roots	Chronic diarrhoea, tender shoots and leaves as vegetable

<i>Saussurea simpsoniana</i> (Field. & Gardn.) Lipsch	Yogi padshah, Jogi phool	Asteraceae	Whole plant	Asthma, gynaecological problems
<i>Saussurea costus</i> Clarke	Kuth, Kuste Himid	Asteraceae	Roots	Asthma, bronchitis, cough, dental troubles, dysentery, hysteria, heart problems and menstruation trouble
<i>Saussurea obvallata</i> Wall.Ex CB Clarke	Jogi gag, Pangehi	Asteraceae	Bracts	Cough and respiratory problems
<i>Sedum ewersii</i> Ledeb.	Shrolu, aggjadi, Shurupa	Crassulaceae	Shoots and leaves	Dysentery, healing of wounds and burns by gujjars
<i>Swertia cordata</i> (Wall ex G.Don)	Chirayata, Tikta	Gentianaceae	Whole plant	Stomach-ache, antipyretic, cough, joint pains, leucoderma
<i>Tanacetum dolichophyllum</i> (Kitam.)	Lidd guggli	Asteraceae	Leaves, flowers, roots	Intestinal worms, roots as incense
<i>Taraxacum officinale</i> Wigg.	Handri, Sanma, zear-gulay	Asteraceae	Roots, flowers	Tonic, stimulant, laxative, stomach disorders, indigestion and intestinal worms, roots and leaves as vegetable, flowers in making alcoholic drink
<i>Thermopsis inflata</i> Cambess	Lamo	Papilionaceae	Whole plant	Remove water from the body
<i>Thymus serpyllum</i> L.	Van jawain, marchi,	Lamiaceae	Whole plant	Whooping cough, epilepsy, suppression of urine and menstrual catarrh, tea substitute, roots used in havan
<i>Valeriana jatamansi</i> Jones	Mushkbala	Valerianaceae	Roots	Tranquiliser and sedative action, in perfumes
<i>Viola serpens</i> Blume	Banfsha	Violaceae	Whole plant	Cough and cold



Figure 1a. *Bunium persicum* L.



Figure 1b. *Arnebia euchroma* (Royale) Johnston



Figure 1c. *Inula racemosa* Hook.f. Royaleana.



Figure 1d. *Codonopsis rotundifolia* Benth



Figure 1e. *Onosoma hispidia* Wall.ex G.Don.



Figure 1f. *Rheum australe* Wall ex Weisss



Figure 2 a. *Aquilegia fragrans* Benth.



Figure 2b. *Aconitum heterophyllum* Wall.ex Royale



Figure 2 c. *Ephedra gegendiana* Wall.Ex Stapf



Figure 2 d. *Hyssopus officinalis* L.



Figure 2 e. *Morina longifolia* Wall ex DC.



Figure 2 f. *Picrorrhiza kurroo* Royale ex Benth

Such types of ethno-medico-botanical surveys have also been conducted in different agro-ecological regions by Kapoor and Sarin (1963); Kachroo et al. (1977); Chauhan (1997); Sharma (1998); Sharma and Rana (1999); Chaurasia et al. (1999); Vidarathi (1997; 2003); Singh and Chauhan (2005), and Gupta (2011) who have all documented the different plant species of ethno-botanical importance in different regions.

Over-exploitation of these species has not only degraded the local vegetation and the disappearing of natural beauty but also endangered certain species, and one has to travel miles to find them. The direct causes such as cutting of forests for commercial and subsistence purposes and indiscriminate grazing, as well as indirect causes such as insecure land tenure, poverty and population growth, were the most vital factors affecting the local flora. Harsh climatic and high altitude conditions and inaccessibility are the factors which force the people to depend on wild flora for healthcare. There is a negligible attitude towards the cultivation of these herbs. Some of these plants are only found to grow in the forest and grassy slopes and very few find place in the people's home gardens. Therefore, there is a dire need for the protection of this wealth of nature before it disappears from this planet. Moreover, this type of study would be essential for regeneration, conservation and reforestation of this niche area. The altitudinal variation in vegetation was also observed in the zone. The present study disclosed that the growing season was too small starting from April up to September only. The bottlenecks in enhancing the livelihood of the people by using traditional knowledge included inaccessibility of the area, lack of processing and adequate storage after harvest, legal restrictions due to forest legislations, inadequate market and assured prices.

The region should be developed with special interest to the rare availability and high value herbs in comparison with the cultivation of un-economical food crops and shift in the production and marketing of medicinal plants in an organised manner. Therefore, all efforts made to conserve the threatened herbal species and promotion of their cultivation either *in-situ* or *ex-situ* by the coordinated efforts of the research and development organisations would go a long way in improving the socio-economic status of and in preserving the traditional knowledge and resources of this region.

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References

1. Arshad, M., Akram, S. (1999). Medicinal plants of University of Arid Agriculture, Rawalpindi. *Hamdard Med.*, **42**:46-49.
2. Buckingham, J. (1999). *Dictionary of Natural Compounds*. Chapman and Hall, U.K: 14-20.
3. Chauhan, N.S. (1997). Ecological and Ethnobotanical studies on the flora of Spiti, Himachal Pradesh. Ph.D Thesis submitted to Department of Biosciences, Himachal Pradesh University, Shimla, (HP) India, 254p.
4. Chaurasia, O.P., Brahma, S., Sreen, S.K. (1999). Ethno-medico-botany survey of Nubra Valley. *Journal of Economic and Taxonomic Botany* **23** (1): 167-172.
5. Cotton, C.M. (1996). *Ethnobotany: Principles and Applications*. John Wiley and Sons Ltd., Chichester, England.
6. Farnsworth, N.R. (1993). Ethnopharmacology and future drug development: The North American experience. *J. Ethnopharmacol.*, **38**: 145-152.
7. Gupta, Arun (2011). Ethnobotanical studies on Gaddi Tribe of Bharmour area of Himachal Pradesh. Ph.D Thesis Dr.YSP University of Horticulture & Forestry, Nauni, (Solan) India, 155p.
8. Kachroo, P., Sapru, B.L., Dhar, U. (1977). Flora of Ladakh. Bishen Singh Mahinder Pal Singh, Dehradun, 172 p.
9. Kapoor, S.K., Sarin Y.K. (1963). Flora of Trikuta hills (Shri Vaishno Devi Shrine) with special reference to the distribution pattern of minor forest products. Bishen Singh Mahinder Pal Singh, Dehradun, 267 p.
10. Sharma, B.D., Rana, J.C. (1999). Traditional uses of plants of Himachal Pradesh. *Journal of Economic and Taxonomic Botany* **23** (1): 173-176.
11. Sharma, P.K. (1998). Ethnobotanical studies on Gaddies- A tribal community in district Kangra (HP).M.Sc. Thesis Dr.YSP University of Horticulture & Forestry, Nauni, (Solan) India, 108 p.
12. Shinwari, Z.K., Gilani, S.S., M. Akhlaq. (2002). Sustainable harvest of medicinal plants at Bar and Shinakii valleys, Gilgit. Consultancy Report: WWF-P.
13. Singh, V., Chauhan, N.S. (2005). Traditional practices of herbal medicines in the Lauhal Valley, Himachal Himalayas. *Indian Journal of Traditional Knowledge* **4** (2): 208-220.
14. Stewart, R.R. (1967). Checklist of plants Swat state, Northwest Pakistan. *Pak. J. For.*, **4**(2): 457-528.
15. Stewart, R.R. (1982). History and exploration of plants in Pakistan and adjoining areas, National Herbarium, NARC, Islamabad.
16. Vidarathi, O.P. (1997). Wild and cultivated plants of Jammu, Kashmir and Ladakh, Directorate of Social Forestry, Jammu and Kashmir.
17. Vidarathi, O.P. (2003). Medicinal plants of plains and hills. Mansi Prakashan, Panjthirithi, Jammu, Jammu and Kashmir.