



Ethno-botanical survey for wild plants in fringe villages around Shimla Water Catchment Sanctuary, Himachal Pradesh, India

Dipika Rana^{1*} and Haseeb Ul Rashid Masoodi²

¹Himalayan Forest Research Institute, Panthaghati, Shimla-171009 (H.P.), INDIA

²Forest Research Institute, Dehradun, Uttarakhand, INDIA

*Corresponding author. E-mail:dipikahfri@gmail.com

Received: June 25, 2014; Revised received: September 23, 2014; Accepted: November 30, 2014

Abstract: In this study an ethno-botanical survey was carried out in the fringe villages located at the periphery of Shimla Water Catchment Sanctuary. As the sanctuary area is not completely fenced the villagers have an access inside the sanctuary. An attempt was made to prepare a document of important flora and information from local community about their ethnic uses. The indigenous knowledge of local traditional uses was collected by personal interviews during field trips. Plants with their correct nomenclature were arranged by family name, vernacular name, part use, ethno-botanical remedies and uses. Plants having uses in medicine, ornamental, fodder and many other were studied. The study was entirely focused on revealing the medicinal potential possessed by the plants growing wild in this area and their sustainability for the betterment of mankind.

Keywords: Catchment, Ethno-botanical, Fringe village, Sanctuary

INTRODUCTION

Himachal Pradesh is a hilly state situated in the Western Himalaya in India with an altitude ranging from 350m to 7000m above mean sea level and covers an area of 55,673 sq. km. This hilly state comprises a good

heritage of ethno-botanical flora and natural wealth in the North Western Himalayan region between 30°22'44"N to 33°12'44"N latitude and 75°45'44" E to 79°04'20" E longitude. A popular tourist destination, Shimla is often referred to as the "Queen of Hills" a term coined by the British. In 1864, Shimla was declared the summer capital of the British rule in India. Nature has bestowed this state with a very rich botanical wealth and a large number of diverse plants. From time immemorial, the indigenous communities, all over the world, have been depending upon the ambient natural resources for their sustenance.

Regarding the earlier publications, the state of Himachal Pradesh has been extensively explored floristically by various workers (Atkinson (1882), Hooker (1872-1897), Collett (1902)), with emphasis on taxonomy. Studies on diversity of medicinal and aromatic plants in different regions of the state have also been known, viz. Kangra valley Ahluwalia, (1952); Uniyal and Chauhan, (1971), Kullu Rastogi, (1960);

Dobriyal *et al.* (1997), Chamba (Gupta, 1961, 1971); Shabnam (1964). Verma *et al.* (2012) conducted studies on ethno-medico-botany of Kunihar forest division of Solan district and reported 195 species as

medicinal and aromatic plants used by the local inhabitants for curing various diseases. Account of 25 ethno-medicinal plants of Kanag hill, Shimla has been given by Verma *et al.* (2012). Comparatively, information pertaining to folk and ethno-botanical practices is scanty for Shimla in general and Shimla Water Catchment Sanctuary in particular.

Hence, an attempt has been made to document the precious indigenous wisdom on the multifaceted usage of plants from Shimla Water Catchment Sanctuary with a view not only to conserve it from being lost irreversibly from growing anthropogenic pressures but also for using them as valuable clues for social forestry endeavors and sustainable management of species as well as their habitats.

MATERIALS AND METHODS

Shimla Water Catchment Sanctuary derives its name from hydrological functions it is performing from past 120 years. The sanctuary lies in between the altitudes of 1850 m -2750 above msl and is drained by a number of seasonal streams which eventually converge into perennial streams. The sanctuary has an area of 1020.32 ha and lies between 31° 05' to 31° 75' N latitude and 77° 12' to 77° 15' E longitudes. The climate of Shimla is predominantly cool during winters and moderately warm during summer. Temperatures typically range from -6°C to 31 °C over the course of a year. Monthly precipitation varies between 15mm in November to 434 mm in August. There are no villages inside the sanctuary, but on the periphery there are 10

Table 1. Ethno-medicinal uses of some wild plants of area in and around Shimla Water Catchment Sanctuary.

S. No.	Botanical name	Family	Local name	Part used	Folk uses
1.	<i>Achyranthes aspera</i> Linn	Amaranthaceae	Puth-kanda	Leaves. Roots. Seeds	Powdered roots mixed with honey given for cough and hemorrhoids. Root paste consumed to check bleeding after abortion. Leaf paste applied to heal bites of poisonous insects, wasp, and bees. Seeds considered highly nutritious.
2.	<i>Adhatoda vasica</i> Nees	Acanthaceae	Basuti, Vasaka	Whole Plant, Leaves, Roots.	Crushed plant impart specific flavor to local wine. Leaves and roots useful in asthma, bronchitis, cough, rheumatism and as insecticide.
3.	<i>Ainsliaea aptera</i> DC	Asteraceae	Chiri-ka- bhat	Flowers. Whole Plant.	Flowers consumed for their nectar. Plant employed for fodder purposes.
4.	<i>Arisaema tortuosum</i> Schott	Araceae	Kira-aloo	Whole Plant.	Plant used for its insecticidal and pesticidal properties.
5.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Satawar	Tuberous roots, Leaves.	Decoction of leaves applied to check skin eruptions. Plant given as fodder. Powdered roots (2-3g) consumed with milk for enhancing vigour and vitality.
6.	<i>Berberis lycium</i> Royle	Berberidaceae	Kashmal	Tender Shoot. Fruits.	Ripe fruits edible. Tender shoots chewed for curing skin diseases and as blood purifier.
7.	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Pashan- bhed	Rhizome, Leaves, Flowers.	Decoction of rhizome prescribed to cure fever and swollen joints. Leaves kept to check fever. Flowers used for pickling and culinary preparations.
8.	<i>Bidens pilosa</i> Linn.	Asteraceae	Badi- gumbri	Flowers, Whole Plant.	Flowers used for ornamental purposes. Plant used as fodder for enhancing milk production in domestic animals.
9.	<i>Boenninghausenia albiflora</i> Hook.s	Rutaceae.	Pissumar	Aerial Plant Parts	Aerial plant parts good for healing wounds.
10.	<i>Cannabis sativa</i> Linn.	Cannabinaceae	Bhaang	Leaves	Crushed leaves mixed with milk, sugar and dry fruits used in the preparation of 'ghota' on the day of Shivratri and distributed as 'prasadam' to devotees visiting the temple.
11.	<i>Capsella bursa-pastoris</i> (L.) Moench.	Brassicaceae	Seksi	Leaves	Plant used for its insecticidal properties.
12.	<i>Celtis australis</i> Linn.	Ulmaceae	Khidak	Roots, Young Branches	Paste of root applied on cuts and wounds. Young branches relished by cattle.
13.	<i>Delphinium denudatum</i> Wall. ex Hook	Ranunculaceae.	Nirbisi.	Whole Plant.	Plant juice applied on cuts for immediate relief and healing. Plant grown for its ornamental value.

Table 1. Contd.

14.	<i>Diplazium esculentum</i>	Athyriaceae	Lingdi	Whole plant	Cooked as vegetable
15.	<i>Fragaria indica</i> Andr.	Rosaceae	Aakhe	Friut	Ripe fruits edible.
16.	<i>Geranium wallichianum</i> Sweet	Geraniaceae	Bhanda	Root	Decoction of roots considered good for expelling kidney stones.
17.	<i>Hedera helix</i> Linn.	Araliaceae	Dakari	Fruits, Leaves, Whole Plant	Leaves and berries taken orally as an expectorant to treat cough and bronchitis and cultivated as an ornamental plant.
18.	<i>Hypericum cernuum</i> Roxb.	Hypericaceae	Suchi	Seed	Seeds used for flavoring curries. Seed oil massaged for quick relief of rheumatism.
19.	<i>Impatiens sulcata</i>	Balsaminaceae	Neeru ghas	Whole plant	Grounded to make paste and applied on eruptions of skin
20.	<i>Inula cuspidata</i>	Asteraceae	Poshkar.	Fresh Root.	Decoction of fresh roots (5-10ml for 5 days) empty stomach to expel worms
21.	<i>Jasminum grandiflorum</i> Linn.	Oleaceae	Chameli	Leaves, Flowers.	Leaves chewed for healing mouth ulcer and gum infection. Oil from flowers used in skin disorders, headache and eye ailments.
22.	<i>Jasminum humile</i> Linn.	Oleaceae	Jasmine	Leaves, Flowers	Leaf paste applied for healing wounds and boils. Poultice of flowers good against headache.
23.	<i>Juglans regia</i>	Juglandaceae	Akhrot	Bark	The root bark is used for the cleaning of teeth and prevent it from decaying.
24.	<i>Malva verticillata</i> Linn.	Malvaceae.	Shotli	Leaves, Whole Plant.	Aerial parts especially leaves, consumed as vegetable. Plant grown for ornamental purposes.
25.	<i>Morchella esculenta</i>	Fungi	Gucchii	Whole plant	Edible
26.	<i>Plantago tibetica</i>	Plantaginaceae	Isabgol		Medicine to treat constipation
27.	<i>Prinsepia utilis</i> Royle	Rosaceae	Bhekal	Fruit, Seed	Ripe fruits eaten. Seed oil used for massaging rheumatic joints.
28.	<i>Quercus leucotrichophora</i> Camus.	Fagaceae	Ban	Seed	Decoction of seeds (10ml, thrice daily) given for checking dysentery and diarrhoea.
29.	<i>Ranunculus laetus</i> Linn.	Ranunculaceae	Changer	Leaves	Leaves consumed as vegetable.
30.	<i>Rhododendron arboreum</i>	Ericaceae	Brass	Flowers	Flowers used to make juice
31.	<i>Rosa moschata</i> Mill.	Rosaceae	Jangli gulab	Whole Plant	Plant known for its ornamental value.
32.	<i>Rubus ellipticus</i> Sm.	Rosaceae	Aakhe	Fruit	Ripe fruits edible.
33.	<i>Rubus niveus</i> Wall.	Rosaceae	Aakhe	Fruits	Ripe fruits edible
34.	<i>Rumex hastatus</i> Don.	Polygonaceae	Khatmith	Aerial parts	Aerial parts refreshing and eaten raw. Also, given as fodder to cattle.
35.	<i>Rumex nepalensis</i> Spr.	Polygonaceae	Jugli palak	Leaves	Fresh leaves cooked as vegetable.

Table 1. Contd.

36.	<i>Smilax aspera</i> Linn.	Liliaceae	Bragh bel	Shoot, Root	Young shoots cooked as a vegetable and also pickled. Pieces of roots added in the preparation of soups.
37.	<i>Sonchus asper</i> (L.) Hill	Asteraceae	Didhi	Latex	Latex applied for quick healing of wounds, cuts and considered antiseptic.
38.	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Phulke	Whole plant.	Plant consumed as a vegetable.
39.	<i>Taraxacum officinale</i> Wigg.	Asteraceae	Kadavi	Leaves, Latex	Leaves consumed as vegetable; its decoction prescribed against irritating bowels. Latex applied for quick healing of wounds.
40.	<i>Taxus baccata</i> L. subsp. wallichiana	Taxaceae	Rakhal	Leaves	Leaves are collected for the production of 'Taxol' which is used for the cure of cancer. The bark is also used for preparation of tea.
41.	<i>Thalictrum foliolosum</i>	Ranunculaceae	Chirata	Whole plant	Juice of leaves in skin infections.
42.	<i>Thymus vulgaris</i> Roxb.	Lamiaceae	Ban- ajwain	Leaves, Flowers, Whole Plant.	Poultice of leaves and flowers applied to check headache. Plant grown for ornamental purposes.
43.	<i>Vicia hirsuta</i> (L.) Koch	Fabaceae	Choti Kaer	Aerial Plant Parts, Seed	Aerial parts cooked as vegetable. Seeds also eaten.
44.	<i>Viola serpens</i> Wall	Violaceae	Banapsha	Flowers	Flowers eaten as such for irritating throat and also for flavouring tea.
45.	<i>Vitex negundo</i> Linn.	Verbenaceae	Bana, Suro	Leaves	Leaf paste applied to heal swollen rheumatic joints.
46.	<i>Zanthoxylum alatum</i> Roxb.	Rutaceae	Tirmir	Leaves, Fruit, Branches	Fruits edible and used for flavoring curries. Tender leaves used for making chutney. Branches used for brushing teeth. Wood used for making walking sticks.

villages in the vicinity of the sanctuary. In practical terms only Chharabra, Kufri and Dhalli situated towards its north, east and west respectively have a significant impact on the sanctuary. Reconnaissance survey was undertaken and personal interviewing during field trips was done with local people in the fringe villages of the sanctuary was undertaken to know the indigenous and traditional uses of the plants. The specimens with their correct nomenclature were arranged by family name, vernacular name, part use, ethno-botanical remedies and uses. Plants having uses in medicine, ornamental, fodder etc. were studied.

RESULTS

Traditional knowledge provides useful leads for scientific research, being the key to identify those plants which have high economic value and requires conservation in near future, thereby emphasizing the

need for such studies. The reasons of the wide use of forest products may be many like lack of modern communications, poverty, ignorance and unavailability of modern health facilities etc. thereby, most people especially rural people are still forced to practice traditional medicines for their common day ailments. The list of villages located at the periphery of the sanctuary area which were relocated in the past was generated. Table1. The results in context to the ethno-botanical survey showed that 46 plants of ethno-botanical uses were present in and around the sanctuary area. The majority of plants belonged to family Asteraceae (5 spp.), Rosaceae (5 spp.), Ranunculaceae (3 spp.), Liliaceae, Oleaceae, Rutaceae, Polygonaceae (3 spp.) and others (1 spp. each).

DISCUSSION

India has a rich heritage of use of plants as medicines

and Indian system of medicines utilizes 80% of the material derived out of plants. In India, there are at least 2,500 plant species having great medicinal value and most of them are growing wild. Out of these 750 plant species form the ingredient of 14,000 published recipes of Ayurveda, Sidha and Unani medicines (Dey, 1980; Kapoor, 1989). Information on their biological activity and chemical constituents is also available (Daniel, 2005; Kritkar and Basu, 1981). Use of *Murraya koenigii* for oral health care (Math and Balasubramaniam, 2004) and diabetes is well known (Kesari *et al.*, 2005). Verma *et al.*, 2012 have listed 25 ethno-medicinal plants of Kanag hill in Shimla region. In other studies it was reported that in the high altitude Himalayan areas, root is the most widely used plant parts (Sharma *et al.*, 2004; Uniyal *et al.*, 2002, 2006) root, leaf and whole plant are used in majority of the cases.

Conclusion

It can be concluded from the study that documentation of this knowledge is a novel information from the area of fringe villages around Shimla Water catchment Sanctuary, Himachal Pradesh, India about the plants that are being used by the people living at the fringe villages. Thus, the present documentation not only highlights the uses of plants but also focuses on future conservation vis-à-vis providing leads for the betterment of human society.

ACKNOWLEDGEMENTS

The authors are thankful to rural people of the villages for providing valuable information and their co-operation during exploration trips.

REFERENCES

- Ahluwalia, K.S. (1952). Medicinal plants of Kangra valley. *Indian Forester*. 78(4): 181-194.
- Atkinson, E.T. (1882). *Economic Botany of the Himalayan Region*. Cosmo Publ., New Delhi.
- Collett, H. (1902). *Flora Simlensis*. Thacker Spink and Co. Calcutta and Shimla, Reprinted (1971). B.S.M.P.S. Dehradun.
- Daniel, M. (2005). Medicinal Plants: Chemistry and Properties. Science Publishers, USA. p 266.
- Dey AC (1980). Indian Medicinal Plants Used in Ayurvedic Preparations. Bishen Singh and Mahendra Pal Singh, Dehradun.
- Dobriyal, R.M., Singh, G.S., Rao, K.S. and Saxena, K.G. (1997). Medicinal plant resources in Chhakinal watershed in north-western Himalaya. *J. Herbs Spices & Medicinal Plants* 1997, 5: 15-27.
- Gupta, R. (1961). Flora of Lam Dal. *Indian Forester*. 87(5): 316-324.
- Gupta, R. (1971). Medicinal and aromatic plants of Bhandal ranges, Churah forest division, Chamba district, Himachal Pradesh. *J. Bomb. Nat. His. Soc.* 68: 791-803.
- Hooker, J.D. (1872-1897). *The Flora of British India*, Vol. I-VIII. Lalit Mohan Basu, Allahabad
- Kapoor, L.D. (1989). Handbook of Ayurvedic Medicinal plants. CRC, USA.
- Kesari, A.N., Gupta, R.K. and Watal, G. (2005). Hypoglycemic Effect of *Murraya koenigii* on Normal and Alloxan-Diabetic Rabbits. *J. Ethnopharmacol.* 97(2):247-251.
- Kritkar, K.R. and Basu, B.D. (1981). Indian Medicinal Plants, vol I, II III and IV (second reprint) IBD, Dehradun.
- Rastogi, M.A. (1960). Medicines from the wild. A case study of the Great Himalayan Park. *The Indian Magazine of Her People and Culture*.74-75.
- Shabnam, S.R. (1964). Medicinal Plants of Chamba. *Indian Forester*.90: 50-63.
- Sharma, P.K., Chauhan, N.S. and Brij, L. (2004). Observations on the traditional phytotherapy among the inhabitants of Parvati valley in western Himalaya India. *J. Ethnopharmacol.*, 92:167-176.
- Thakur, R.K., Puri, H.S. and Hussain, A. (1989). Major medicinal plants of India. CIMAP, Lucknow.
- Math, M.V. and Balasubramaniam, P. (2004). Curry Leaves. *Brit. Dental J.*, 197:519.
- Uniyal, S.K., Awasthi, A., Rawat, G.S. (2002). Traditional and ethnobotanical uses of plants in Bhagirathi valley (western Himalaya). *IJTK*. 1(1):7- 19.
- Uniyal, S.K., Singh, K.N., Jamwal, P., Brij, L. (2006). Traditional use of medicinal Plants among the Tribal communities of Chhota Bhangal, Western Himalaya. *J. Ethnobiol. Ethnomed.* 2:14.
- Uniyal, M.R. & Chauhan, N.S. (1971). Medicinal plants of Uhal valley in Kangra Forest Division. *H.P. J. Res. Ind. Med.* 6(3): 287-299.
- Verma, R., Prakash, V. and Kumar, D. 2012. Ethno-medicinal uses of some plants of Kanag hill in Shimla, Himachal Pradesh, India. *Int. J.RAP*. 3(2): 319-322.