



## **Folkloric Medicinal Plant Diversity and status of Ethnobotanical knowledge Transfer over generation in and around Chail wildlife Sanctuary of Himachal Pradesh –India**

**<sup>1</sup>Arvind Bhardwaj, <sup>2</sup>Raj Kumar Verma, <sup>3</sup>Jai Chand Rana**

<sup>1</sup>ICFRE-Himalayan Forest Research Institute, Shimla – India. 171009. Email:

<sup>2</sup>ICFRE-Himalayan Forest Research Institute, Shimla – India. 171009. Email

<sup>3</sup>ICAR-National Bureau of Plant Genetic Resources, Pusa Campus, New Delhi – India 110012.

Email: [bhardwaj.arv21@gmail.com](mailto:bhardwaj.arv21@gmail.com)

### **ABSTRACT**

*Present study documents the use of folkloric medicinal plants from the Chail wildlife sanctuary situated in Western Himalayan region of India. Traditional botanical medicine is being practiced for the primary mode of healthcare by rural inhabitants. Field research was conducted in nine panchayats covering 119 village of the Chail sanctuary from 2011-2015. We sampled 209 interviewees between different age groups, using random sampling techniques and collected data through semi-structured interviews and participant-observation techniques. Voucher specimens of all cited botanic species were deposited at HFRI in Shimla. We recorded the folkloric uses of 61 medicinal plant species which are employed to ailments like gastro-intestinal problems, headache, toothache, joint pain, fever, respiratory tract related problems, ophthalmic, cuts, wounds, and to cure dermatological problems. Of these medicinal plants reported, the most common growth form was herbs (50.81%) followed by shrubs, trees. We document that several parts of individual plant species are used as medicine. There was significant correlation between the age of informants and their ethnobotanical knowledge. Due to changes in socioeconomics of the region as younger generations are migrating toward city folk plant use is decreasing. The involvement of younger generation with effective monitoring of the Government as well as non-governmental organizations will be the fundamental factor of in situ conservation of medicinal plants in this protected area.*

**Keywords:** *ethnobotany, folkloric uses; socioeconomics; traditional knowledge; Western Himalaya.*

Received 12.05.2017

Revised 01.06.2017

Accepted 14.06.2017

### **INTRODUCTION**

Plants and their constituents plays vital role in Western medicine, and are still considered an important source of novel compounds in the field of drug discovery [1]. About 35,000 and 70,000 plant species have been used for medicinal purposes in the world [2]. In recent years traditional knowledge has grown extensively in significance in view of its value to modern technology and herbal sectors. There are approximately 370 million indigenous peoples in the world; they represent the greater part of the world's cultural diversity and speak more than 4,000 of the world's almost 7,000 languages [3]. They own, occupy or use up to 22 per cent of the global land area, which includes 80 per cent of the world's biological diversity [4].

The folk medicines are known for their most affordable approach and easily accessible source of treatment in the primary health care system particularly in poorer countries and rural areas [5]. The ethnobotany provides a rich resource for natural drug research and development [6]. In many countries like Russia, Africa and few Asian and European countries folklorists, anthropologists and medical scientists are studying ethnomedicine [7]. There are about 2500 plant species in India which are known for ethnobotanical importance [8]; among them, 1748 ethnomedicinal medicinal plants are reported from Indian Himalayan Region (IHR) [9]. Himachal Pradesh state has a rich flora, the diversity of which is spread over its Shivalik belt, temperate forests, deep ravines, open grassy slopes and alpine pastures. Out of the 47, 000 plant species found in the country as many as 3245 species (7.32%) are available in the state of Himachal Pradesh [10]. Chail wildlife sanctuary is situated in the western Himalaya (Himachal Pradesh), India; representing the three climatic zones viz. tropical, subtropical and temperate in the

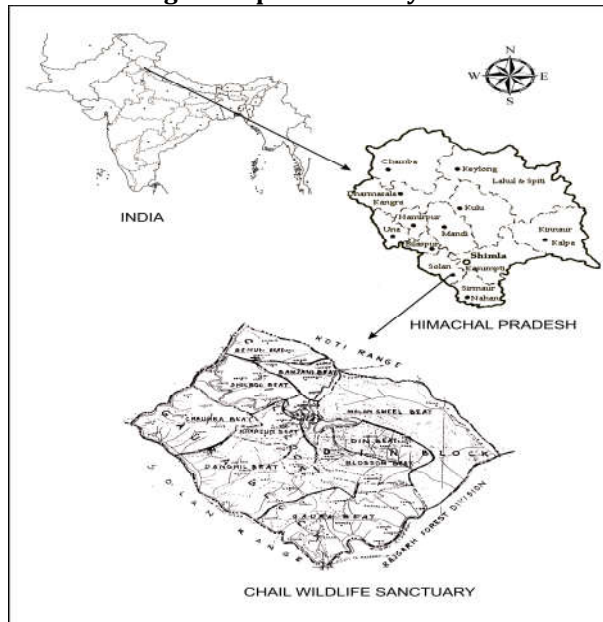
western Himalayan region where indigenous people are still relying on natural resources for their well being.

The younger generation regards indigenous knowledge as primitive and outdated and is thus not interested in it [11]. Modernization and development in human community is leading towards a less approach to traditional medicines. Understanding how the traditional knowledge of alternative medicine practices is affected in the modern context enables us to think of possible avenues for the future. So it was decided to undergo a community based survey between different age groups for knowing their present knowledge about folk medicines from their indigenous plant resources and assessing the scenario of interest of this knowledge among different age groups.

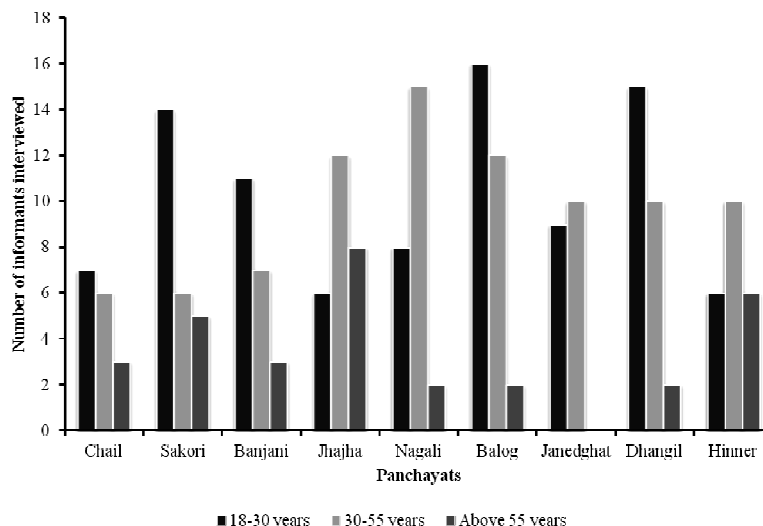
**MATERIALS AND METHODS**

Chail wildlife sanctuary is situated in the western Himalaya (Himachal Pradesh), India (Latitudes 30°57.128' - 30°59.719' N and longitude 77°10.914' - 77°14.077' E) between 900 m to 2275 m amsl (**Fig. 1**). Information on plants with folkloric uses was collected from among randomly selected 209 informants of different age groups (**Fig. 2**) living in nine panchayats in and around the study area. Inhabitants were interviewed about their dependence on the forest medicinal purposes. To help assure that the information was unbiased as possible, efforts were made to avoid the presence of other people during the interviews. Structured questionnaires were used to obtain information on age of the informant, medicinal plants, including the local name of the plant, name of the disease for which a particular plant was used, part of the plant used. The informants were also asked to show the plants in their natural habitat.

**Fig. 1: Map of the study area**



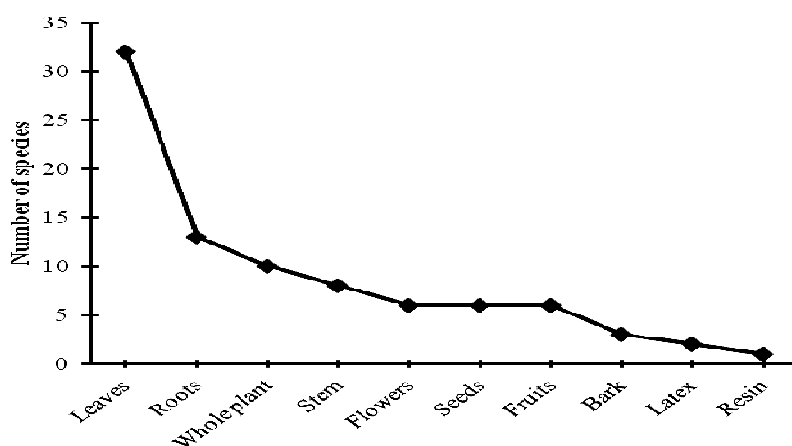
**Fig. 2: Study participants interviewed (Age groups: 18-30; 30-55; 55 above years)**



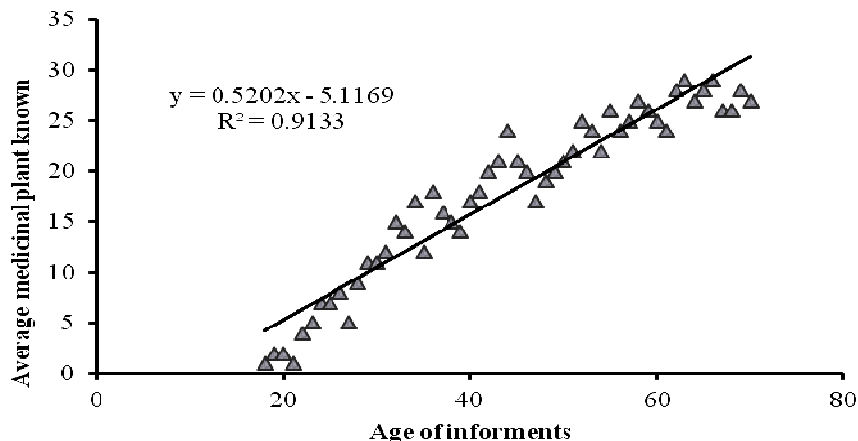
## RESULTS AND DISCUSSION

Plant diversity is one of the major resources fulfilling the needs of pharmaceutical industry. There are more than 7800 medicinal drug manufacturing units in India, which consume about 2000 tonnes of herbs annually. Almost 70% of modern medicines in India are derived from natural sources. According to WHO, 80% of the world population depends on herbal medicines for their health care, especially in developing countries [12]. Utilization of herbal products is increasing in developed countries also. The plant resources are under various threats for their survival due to over exploitation, urbanization, habitat destruction, increased demand of herbal material in pharmaceutical industries and climate changes [13]. The selected study area shows great indigenously important medicinal floral diversity; in this study, the ethnobotanical information on 61 traditionally used medicinal plants have been collected along with their botanical name, local name, life form, parts used and their uses (Table 1) through interviews and discussions with elderly knowledgeable people, herbal healers and local vaid or family heads of different sex, age and educational groups of different villages situated around the Chail wildlife sanctuary (Fig. 2). As far as the plant parts are concerned, 'leaves' are most abundantly used followed by roots, whole plant and stems; plant latex and resins are least used (Fig. 3). The ethnobotanical studies showed that there was difference in ethnobotanical plant knowledge between different age groups. There was significant correlation between the age of informants and their ethnobotanic knowledge. The older person knows more ethnobotanic plants than youngsters (Fig. 4). Previously researchers and ethnobotanists from the adjoining areas had reported 32 wild plants from Sirmaur district [14], which was being used as folk medicine. Also ethnomedicinal uses of 27 wild plant species used by indigenous villagers residing in remote areas of district Sirmaur (H.P.) has been reported [15]. Regarding the ethnobotanical use of different plants, the older person knows more plants than youngsters like any other traditional societies in Africa [16]. It was also observed that the younger generation is lacking interest in practicing the traditional system of medicines hence a significant decline of indigenous knowledge was observed among the different age groups.

**Fig. 3: Number of plants parts used for disease curing**



**Fig. 4: The relationship of age of informant and number of medicinal plants recognized**



**CONCLUSIONS**

Indigenous people, particularly from the older age groups maintain a great depth of knowledge on the subject of medicinal plants. Medicinal plants still play a key role in the primary healthcare of the local people in the study area. Due to difficult geography of the most of the villages in study area and unavailability of Western medicine as well as a strong cultural belief in the power of folk medicines, the inhabitants still rely on this type of medication. Although these folk healthcare practices have been in place for centuries, they are at risk of being lost to future generations. This is due to changes in socioeconomics of the region as younger generations are migrating toward city. In some villages (Jhaja, Bad, etc), people have started to conserve medicinal plants by domesticating them in home gardens green houses, but these efforts make up only a small portion of measures necessary to conserve these species. The involvement of younger generation with effective monitoring of the Government as well as non-governmental organizations will be the fundamental factor of *in situ* conservation of medicinal plants in this protected area.

**Table 1: Folkloric plants used to treat different ailments by the indigenous people of Chail**

Sr. No.	Botanical Name	Habit	Local Name	Part Used	Folkloric medicinal uses
1	<i>Acacia catechu</i> Willd.	Tree	Khair	Bark	The bark of the tree is used in traditional medicine for sore throats and diarrhoea.
2	<i>Achyranthes aspera</i> Linn	Herb	Puttakanda, Latjera, Chirchita	Leaves, Roots and Seeds.	Paste is made from leaves and used for insect bite. Dried roots are powdered and given to cure cough. A fine powder is made from its roots which are given with warm water or honey to cure cough. It is also given for curing Piles disease. Seeds have nutritious qualities. It is also used as abortifacient and also given in case of vomiting.
3	<i>Aerva sanguinolenta</i> (L.) Blume	Herb	Cholai, Chayi	Whole Plant	Plant extract has diuretic and anti-inflammatory properties. It also given in Jaundice. Thin paste of its leaves is used to heal wounds.
4	<i>Ageratum conyzoides</i> Linn.	Herb	Nila fulnu, Nili buti.	Leaves	Fresh leaf are applied on the cuts over skin to check bleeding from wounds.
5	<i>Ainsliaea aptera</i> DC	Herb	Karua ghas, Chirika-bhat	Flowers, Whole Plant	Leaf extract is used to cure stomach ache.
6	<i>Albizia lebeck</i> (L.) Benth.	Tree	Amaltash, Fali.	Seeds, Resin.	Oil extracted from seed has antibacterial properties which are applied on wound to check infection.
7	<i>Argemone maxicana</i> Linn	Herb	Kandayi, Bharbhand	Root	Root is given in worm infection in stomach and jaundice.
8	<i>Artemisia vestita</i> Wall. ex DC.	Herb	Chamvar	Leaves	Leaf paste applied on cuts and wounds for healing.
9	<i>Asparagus racemosus</i> Willd.	Herb	Stawar, Sansarmul, Satmuli, Jhirna.	Leaves, Roots, Whole plant.	Thin paste of leaves applied on cuts and wounds. Used as liver tonic and diuretic Astringent.
10	<i>Bauhinia variegata</i> Linn.	Tree	Karalu, Kachnar.	Flowering buds, Root, Bark.	Bark is used to cure skin diseases due to antibacterial properties present in this plant.
11	<i>Berberis chitria</i> Edwards	Shrub	Kasmal, Rasaut	Roots.	Rasaut is an extract of roots which is used to cure eye infections.
12	<i>Berberis lycium</i> Royle	Shrub	Kashmal, Kashwale	Tender Shoot	Tender shoots chewed for curing skin diseases and as blood purifier.
13	<i>Bergenia ciliata</i> (Haw.) Sternb.	Herb	Daklabbu, Patharchatta, Pashan-bhed	Rhizome, Leaves, Flowers.	Used to cure kidney stones. Decoction of rhizome is used to cure fever and joint pain.
14	<i>Boenninghausenia albiflora</i> (Hook.) Meisn.	Shrub	Pissumar	Leaves	Paste from its leaves used in wound healing.
15	<i>Butea monosperma</i> (Lam.) Taub.	Tree	Dhak, Plash	Leaves, Bark	Leaf juice is given in glycosuria. Powdered bark is given in menstrual disorders.
16	<i>Cannabis sativa</i> Linn.	Herb	Bhang	Leaves, Seeds	Resin extracted from leaves has analgesic properties.

17	<i>Carissa opaca</i> Stapf ex Hanes	Shrub	Garna	Twigs	Twigs are used for brushing teeth and to cure various dental ailments.
18	<i>Cassia floribunda</i> Collad.	Tree	Chokar, Panwar	Seeds	Seed oil is used in various skin diseases; crushed seeds are taken with warm water or tea to cure cough and headache.
19	<i>Catharanthus roseus</i> Linn.	Shrub	Sadabahar	Roots, Leaves	Used in fever. Decoction of roots and leaves prescribed against hypertension and diabetes.
20	<i>Cirsium wallichii</i> DC.	Herb	Kdelu, Bhruce	Root, Stem	Roots are eaten for dry cough. Peeled stem eaten raw.
21	<i>Cissampelos pareira</i> Linn.	Herb	Putandu	Roots	Used to cure various women's ailments
22	<i>Colebrookea oppositifolia</i> Smith	Shrub	Gadus	Leaves	Paste made from leaves is applied on wounds and sores. Dry leaves used as an adulterant for tobacco.
23	<i>Cotinus cogygria</i> Scop.	Tree	Tung.	Fruit, Wood	Fruits edible and considered good for gastrointestinal disorders.
24	<i>Cuscuta reflexa</i> Roxb./ <i>C. pentagona</i> Engelm.	Herb	Amarbel, akashbel	Whole Plant	Extract is given for Osteoporosis, alopecia
25	<i>Cynoglossum wallichii</i> var. <i>glochidiatum</i> (Wall. ex Benth.) Kazmi	Herb	Kuru, Lichkuru,	Whole Plant	Paste of aerial parts is applied on cuts and wounds.
26	<i>Euphorbia helioscopia</i> Linn.	Herb	Dudhli	Whole Plant. Leaves	White resin is applied on fresh cuts for quick healing.
27	<i>Fumaria parviflora</i> Lam.	Herb	Pit-Papra, Van-sulpha	Whole Plant	Plant extract is prescribed in Jaundice. Thick paste is used to heal boils and wounds.
28	<i>Geranium wallichianum</i> Sweet	Herb	Bhanda	Root	Decoction is given to expel kidney stones.
29	<i>Hedera nepalensis</i> K. Koch	Shrub	Dakari	Fruits, Leaves, Whole Plant	Leaves and berries are consumed raw to cure cough and bronchitis.
30	<i>Heliotropium indicum</i> Linn.	Herb	Hathi soond	Leaves	Leaf extract is given in skin and eye infections
31	<i>Impatiens sulcata</i> Wall.	Herb	Binchi	Leaves	Paste of leaves applied on affected parts of skin.
32	<i>Jacaranda mimosifolia</i> Linn.	Tree	Jacaranda	Leaves, Whole Plant	Leaf juice applied for healing wounds.
33	<i>Jasminum humile</i> Linn.	Shrub	Jasmine	Leaves, Flowers	Poultice of flowers good against headache. Leaf paste applied for healing wounds and boils.
34	<i>Justicia adhatoda</i> Linn	Herb	Bansa, Basuti, Vasaka	Bark, Leaves, Roots.	Whole plant is used to cure various diseases like chest infections, asthma, bronchitis, cough, rheumatism etc. Twigs are used for brushing teeth.
35	<i>Lespedeza juncea</i> var. <i>sericea</i> (Thunb.) Lace & Hemsley	Shrub	Katua	Leaves	Leaves are crushed over the fresh cuts on skin.
36	<i>Leucas mollissima</i> Wall.	Shrub	Khapru	Leaves	Poultice of fresh leaves applied to cure sores, headache, wounds and bites of poisonous insects.
37	<i>Malaxis muscifera</i> (Lindl.) Kuntze	Herb	Jeevak	Roots	Root is used for treating dysentery, fever and general debility
38	<i>Malvastrum coromandelianum</i> (Linn.) Garcke	Herb	Kharenti	Leaves	Paste of leaves used in skin inflammation.
39	<i>Melia azedarach</i> Linn.	Tree	Bakain, Darek, Dainkan	Leaves	Leaf paste applied for healing wounds and suppuration of boils.
40	<i>Ocimum sanctum</i> Linn.	Shrub	Tulsi	Leaves	Decoction of leaves given in common cold.
41	<i>Oxalis corniculata</i> Linn.	Herb	Khatli, Changeri	Leaves	Leaves chewed raw for mouth ulcers
42	<i>Parthenium hysterophorus</i> Linn.	Herb	Congress grass	Roots	Decoction made from its root is given to check dysentery.
43	<i>Peristrophe bicalyculata</i> (Retz.) Nees	Herb	Gajar ghas	Twigs, Leaves	Paste of leaves applied as antiseptic. Poultice of its twig with white egg applied for healing fractured bone.
44	<i>Pistacia chinensis</i> Bunge subsp. <i>Integririma</i> (J.L. Stewart) Rech.	Tree	Kakdo	Leaf galls, Twigs	Swollen leaf galls used as anti asthmatic, expectorant

45	<i>Prinsepia utilis</i> Royle	Shrub	Bhekal	Seed	Seed oil used for massaging rheumatic joints.
46	<i>Punica granatum</i> Linn.	Tree	Dsru, Anar	Fruits, Seeds	Dried seeds sold as 'anardana for chutney preparation. Powdered rind of fruit (2-3g, 30-45 days) taken with luke warm water empty stomach for diabetes.
47	<i>Ricinus communis</i> Linn.	Shrub	Arind	Leaves, Seeds	Paste of leaves is applied on fresh cuts. Oil is extracted from their seed which is given to check constipation.
48	<i>Salix tetrasperma</i> Roxb.	Tree	Biyunsh	Flower, Leaves	Flowers used against gastrointestinal problems. Extract of leaves applied against skin rashes.
49	<i>Salvia</i> <i>coccinea</i> Buc'hoz ex Etl.	Herb	Ban ltulsi	Leaves	Decoction of leaves is given in cold
50	<i>Scutellaria repens</i> Ham.	Herb	Maidah	Whole Plant	Plant used for ornamental purposes. 2-3g powdered dried plant given with luke warm water to check bleeding of nose.
51	<i>Solanum</i> <i>virginianum</i> Linn.	Herb	Kantkari	Fruits, leaves	Used for Cold, Fever, Asthma, migraine.
52	<i>Sonchus asper</i> (L.) Hill	Herb	Dudhi	Latex	Latex applied on wounds and cuts.
53	<i>Syzygium cumini</i> (L.) Skeels	Tree	Jamun	Fruits, Bark	Considered as antidiabetic. Stem bark is chewed to cure mouth ulcers.
54	<i>Taraxacum</i> <i>officinale</i> (L.) Weber ex F.H.Wigg.	Herb	Kadavi	Leaves, Latex	Latex applied for quick healing of wounds.
55	<i>Tinospora cordifolia</i> (Willd.) Miers	Shrub	Gloen	Stem, leaves	Decoction of stem is taken in weakness, arthritis.
56	<i>Valeriana jatamansi</i> Jones	Herb	Jatamansi	Roots	Root powder is given for various heart diseases and high blood pressure; roots is applied on wounds.
57	<i>Viburnum mullaha</i> Buch.- Ham. Ex D.Don.	Tree	Bodra	Twigs	Twigs are used for brushing teeth, it is considered good in case of pyorrhoea and other gum problems.
58	<i>Viola canescens</i> Wall.	Herb	Banapsha	Flowers	Decoction of flowers is given in cold and chest congestion.
59	<i>Vitex negundo</i> Linn.	Shrub	Bana	Leaves	Leaf paste is applies on the inflammations occurred on skin, it is also recommended for rheumatic pains.
60	<i>Woodfordia</i> <i>fruticosa</i> (Linn.) Kurz	Shrub	Dhai	Flowers	Die is obtained from its flowers, dried flowers considered good against piles and dysentery.
61	<i>Zanthoxylum</i> <i>armatum</i> DC.	Shrub	Timir	Fruit, Branches	Fruits are used as mouth fresheners. Branches used for brushing teeth. Wood used for making walking sticks.

## REFERENCES

1. Hamilton, A.C. (2004). Medicinal plants, conservation and livelihoods. *Biodiversity and Conservation*, 13:1477–1517.
2. Farnsworth, N.R. & Soejarto, D.D. (1991). *The Conservation of Medicinal Plants*. Akerele O, Heywood V, Synge H, editor. Cambridge University Press, UK, p.25–51.
3. Harrison, D.K. (2007). *When Languages Die: The Extinction of the World's Languages and the Erosion of Human Knowledge*. Oxford University Press, UK: Available at: [https://www.cs.swarthmore.edu/~meeden/cogs1/s07/Harrison\\_2007\\_ch7.pdf](https://www.cs.swarthmore.edu/~meeden/cogs1/s07/Harrison_2007_ch7.pdf)
4. United Nations Development Programme (UNDP). (2011). *Human Development Report 2011: Sustainability and Equity – A Better Future for All*. Palgrave Macmillan, New York, USA. Available at: [http://hdr.undp.org/sites/default/files/reports/271/hdr\\_2011\\_en\\_complete.pdf](http://hdr.undp.org/sites/default/files/reports/271/hdr_2011_en_complete.pdf)
5. Prakash, P. & Gupta, N. (2005) Therapeutic Uses of *Ocimum sanctum* Linn (Tulsi) with a Note on Eugenol and Its Pharmacological Actions: A Review. *Indian Journal of Physiology and Pharmacology*, 49:125-131.
6. Farnsworth, N.R. (1990) *The Role of Ethno Pharmacology in Drug Development*. Ciba Foundation Symposium 154. *Bioactive Compounds from Plants*. John Wiley & Sons, Baffins Lane, Chichester (England), p.2-21.
7. Vedavathy, S. (2003). Scope and importance of traditional medicine. *Indian Journal of Traditional Knowledge*. 2(3):236-239.
8. Jain, S.K. (1991). *Dictionary of Indian Folk Medicine and Ethnobotany*. Deep Publications, New Delhi. India, pp.154.
9. Samant, S.S., Dhar, U. & Rawal, R.S. (1998). Biodiversity status of a protected area in West Himalaya: Askot Wildlife Sanctuary. *The International Journal of Sustainable Development and World Ecology*, 5(3):194-203.
10. Verma, L.R. (2000). *Natural Resources and Development in Himalaya*. MPH Malhotra Publishing House, New Delhi, India, pp.285.

11. Zobolo, A.M., & Mkabela, Q.N. (2006). Traditional knowledge transfer of activities practised by Zulu women to manage medicinal and food plant gardens. *African Journal of Range and Forage Science*, 23(1):77-80.
12. Verma, S. & Singh, S.P. (2008). Current and future status of herbal medicines. *Veterinary World*, 1(11):347-350.
13. Kalita, P.C. & Borthakur, S.K. (2012). A study on the biodiversity of Madankamdev and its adjoining areas on the north of river Brahmaputra, Assam, India. *Phytotaxonomy* 12:136-144.
14. Thakur, S. (2011). Medicinal plants used by tribal inhabitants of Sirmour district, Himachal Pradesh. *Indian Journal of Scientific Research*, 2(4):125-127
15. Kumar, S., Naugraiya, M.N. & Patil, G. (2013). Review: Environmental benefits of live fence and their role in biodiversity conservation. *Life Science Leaflets*, 3:6-16.
16. Fekadu, F. (2001). *Ethiopian Traditional Medicine: Common Medicinal Plants in Perspective*, Sioux City, IA (USA), pp.149.

#### **CITATION OF THIS ARTICLE**

A Bhardwaj, R K Verma, J Chand Rana. Folkloric Medicinal Plant Diversity and status of Ethnobotanical knowledge Transfer over generation in and around Chail wildlife Sanctuary of Himachal Pradesh –India. *Bull. Env. Pharmacol. Life Sci.*, Vol 6 [8] July 2017: 64-70