

Full Length Research Paper

Ethnobotanical notes on 30 medicinal polypetalous plants of district Kangra of Himachal Pradesh

Savita Rani^{1*}, J. C. Rana¹, S. M. Jeelani², R. C. Gupta² and Santosh Kumari²

¹National Bureau of Plant Genetic Resources Regional Station, Phagli, Shimla (HP) – 171 003, India.

²Department of Botany, Punjabi University Patiala (Punjab) -147 002, India.

Accepted 15 May, 2013

District Kangra is the most populous district, located on the South-Western end of the Himachal Pradesh, a hilly state of the Western Himalayas. The geographical area of district Kangra is 5,739 km², making 10.31% of the total area of the state. The importance of medicinal plants in traditional healthcare practices, providing clues to new areas of research and in biodiversity conservation, is now well recognized. However, information on the uses of plants for medicine is lacking from many interior areas of district Kangra. Keeping this in view, the present study was initiated in a tribal vicinity of district Kangra. The study aimed to look into the diversity of plant resources that are used by local people for curing various ailments. It was found that 30 polypetalous plant species are commonly used by local people for curing various diseases. In most of the cases (34.37%), leaves were used for curing the various health problems.

Key words: Ethnobotany, polypetalous medicinal plants, district Kangra, Himachal Pradesh.

INTRODUCTION

In India, more than 43% of the total flowering plants are reported to be of medicinal importance (Pushpangadan, 1995). Utilization of plants for medicinal purposes in India has been documented long back in ancient literature (Charak and Drdhabala, 1996). However, organized studies in this direction were initiated in 1956 (Rao, 1996) and of late, such studies are gaining recognition and popularity to preserve not only traditional knowledge but also deteriorating useful plant species. The people of the tribal areas are the repository of accumulated experience and knowledge about traditional uses of medicinal plants, but due to modern civilization invading these belts, knowledge about the use of traditional herbal wealth by tribals is vanishing rapidly. The information available on earlier work done in this direction from Kangra itself is evident from part of the studies made by Sharma and Lal (2005) while collecting ethnobotanical information on various plant species from different localities of Hamirpur, Kangra, Una and Bilaspur districts of Himachal Pradesh.

Uniyal et al. (2006) reported 35 plant species; out of which 15 polypetalous plant species from Chotta-bhawal are being used against various diseases. Uniyal et al. (2011) later on visited some other tribal localities as Salli, Boh, Rirkumar, Darini and Basa of district Kangra and collected 66 plant species consisting of 25 herbs, 23 trees, 10 climbers and 8 shrubs for treating 33 common diseases by the local people. The present study is another attempt to boost such investigations and make addition to utilization of some of the plant species which are not recorded earlier from the study area.

MATERIALS AND METHODS

The use of the traditional medicines is a widely accepted system by the tribals in district Kangra. In order to document the utilization of medicinal plants, a total of 25 field surveys were carried out from October, 2008 to July, 2012 in the area. The surveys were spread across seasons so as to get maximum information and also to cross

*Corresponding author. E-mail: savitarana3@rediffmail.com.

check the information provided by the local informants during the earlier visits. Surveys were conducted amongst the Masas, Gaddi, Brahmin, Rajput and Lohar communalities residing in different localities of district Kangra. During the initial surveys, friendly relations were developed with the village people and the sarpanch, and information on people having specialized knowledge on the uses of plants for curative purposes was gathered in this manner. Twenty such knowledgeable people who are locally called vairs were identified and interviewed in detail during subsequent surveys. Structured questionnaires, interviews and participatory observation were used to elicit information from the resource persons using standard methods (Martin, 1995; Reyes-Garcia et al., 2007). The information on scientific name, local name, plant part exactly used to cure and method of dosage of these plants has been provided in Table 1. The identification of the plants was done with the help of various 'Floras', such as 'The Flora of British India' (Hooker, 1879), 'Flora of Himachal Pradesh' (Chowdhery and Wadhwa, 1984), 'Flora of Kullu district' (Dhaliwal and Sharma, 1999) and 'Flora of Sirmour district' (Kaur and Sharma, 2004). The identifications were then confirmed by matching the plants with authenticated specimens available in the Herbaria of Forest Research Institute, Dehradun, India and Botanical Survey of India (Northern Circle), Dehradun, India. Voucher specimens have been deposited in the Herbarium, Department of Botany, Punjabi University, Patiala (PUN).

RESULTS

This study reveals that in the absence of modern health care facility, people in the tribal localities of district Kangra such as Chotta-bhangal, Bara-bhangal, Multan, Sali, Boh, Lohadhari, Triund and Dharmkot (Figure 1) mainly depend on plants for the treatment of common ailments. Based on the initial exploration survey and group discussions where emphasis was on identification of knowledgeable resource person, it was found that information on the medicinal uses of resource plants now seems to be confined to elderly people while younger generation is ignorant about the vast medicinal resources available in their surroundings. All the resource persons, such as charvahas, gujjars, vairs and hakeems, who could be contacted were in the age group of 50 years and were familiar with the medicinal plants growing in their vicinity. It was also observed that it was the domain of males with few females also rendering this service. Plants belonging to polypetalous group were used for curing various ailments numbered to 30 odd species, out of which 20 were herbs, 6 were shrubs and 4 were trees. These plants are distributed in 14 families with Berberidaceae, Brassicaceae, Caesalpinaceae, Caryophyllaceae, Geraniaceae, Malvaceae, Mimosaceae, Oxalidaceae, Papaveraceae, Ranunculaceae, Rosaceae, Rutaceae, Tiliaceae and Violaceae having the minimum representation (one species each). In most of the cases (34.37%), leaves were used for curing the problems followed by roots and fruits/seeds, but flowers, aerial parts and stem/bark the least used plant parts (Figure 2).

These plants were used for curing a total of 23 diseases ranging from simple headache to complicated

reproductive disorders. Even jaundice and kidney stones were treated by them. In general, most plants were used for curing gum troubles (4%), jaundice, piles and skin infections (3% each), followed by burn, cold and cough, fever, menstruation disorders, stomach ache, ulcers and joint pains (2% each) (Figure 3). It was also found that a single plant may be used for curing many ailments such as, *Aconitum heterophyllum*, *Aquilegia fragrans*, *Berberis ceratophylla*, *Cassia occidentalis*, *Capsella bursa-pastoris*, *Murraya koenigii*, *Ranunculus sceleratus*, *Thalictrum foliolosum* and *Thalictrum foetidum*. Though, majority of the plants are available in the vicinity of village forests, for some, which are found in the alpine and sub-alpine regions. *A. heterophyllum* that occurs above 3,500 m in the temperate to alpine regions of district Kangra is used for curing abdominal pain and fever and is one of the highly traded species. Its roots are sold at a rate of Rs. 1000/kg in the area. Few plant species such as *Berberis asiatica*, *B. ceratophylla*, *Berberis vulgaris*, *C. bursa-pastoris*, and *Prinsepia utilis* are very common in the village surroundings. All the three species of *Berberis* as *B. asiatica*, *B. ceratophylla* and *B. vulgaris* are used for curing disease piles along with other diseases such as *B. asiatica* for acidity, *B. ceratophylla* for diabetes and jaundice and *B. vulgaris* for sores. The root of both plants also yields a yellow dye while the fruits are eaten. *C. bursa-pastoris* also occurs in the open waste areas around the villages and its aerial parts are used as hemorrhages and menstruation disorders. The leaves of *Grewia glabra* are used for curing joint pains and *P. utilis* are used for arthritis. All these five species are presently not traded from the area. It was also found that people are hesitant to disclose their knowledge. It is this knowledge that provides them recognition in the society and hence they do not want to share it. In most of the cases, it was found that this knowledge has been orally transferred from one generation to the other and at each level a bit of it has been lost. The people themselves say that, compared to them, their forefather knew much more. It was also found that the local people are concerned about the degradation of medicinal plants in wild. Due to recent shift towards herbal medicines, the pressures on the resources have increased and the market is fast expanding. It is to be noted that nearly 150 medicinal plants are in heavy demand from Himachal Pradesh (Badola and Pal, 2003).

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;

Table 1. Description of some of the polypetalous plants used by people of district Kangra to cure different ailments/diseases.

S/N	Botanical name	Local name	Family name	Parts used	Disease/ailment	Mode of preparation
1	<i>Acacia catechu</i> (L.f.) Willd.	Khair	Mimosaceae	Bark	Asthma	Decoction is prepared by boiling nearly about 500 g bark in half glass of cow's milk with one teaspoon of sugar. One glass of this decoction is taken empty stomach daily early in the morning for 2 weeks.
2	<i>A. nilotica</i> Delile	Babul	Mimosaceae	Leaves	Burn	Paste prepared by grinding the leaves with mustard oil is applied on burns thrice a day till it cures.
3	<i>Aconitum heterophyllum</i> Wallich ex Royle	Patish	Ranunculaceae	Roots	Fever and abdominal pain	Dried roots are powdered and taken orally to cure Abdominal pain and fever.
4	<i>Argemone mexicana</i> L.	Kandayi	Papaveraceae	Seeds	Gum troubles	Dry powder of seeds applied on gums once a day reduces the gum troubles.
5	<i>Aquilegia fragrans</i> Benth.	Zadul	Ranunculaceae	Flowers, roots, and seeds	Headache, kidney stones, and jaundice	Dried flowers paste is applied on head for the relief headache. Roots are boiled in water for 2 to 3 h then this decoction is taken empty stomach daily early in the morning to help remove the kidney stones. Seeds are used for jaundice.
6	<i>Berberis asiatica</i> DC.	Chunchri	Berberidaceae	Flowers and roots	Acidity and piles	Fresh/dried flowers are boiled in water and filtered. The extract is taken in small doses. Dried roots powder taken with water cure piles
7	<i>Berberis ceratophylla</i> G. Don	Kshamal	Berberidaceae	Roots	Diabetes, piles and jaundice	Fresh roots are cut into small pieces and decoction is prepared. This is later filtered concentrated, dried in shade and small pills are made. For adults, 3 pills a day are recommended with the sap of bitter guard (locally called 'karella') to cure diabetes. These pills are also consumed with 'Kujja Mishri' (local sweet made out of sugar) and water to cure jaundice. Dried form of roots taken with water at night from cure piles.

Table 1. Contd.

8	<i>Berberis vulgaris</i> Royle	Kshamal	Berberidaceae	Roots	Oral health care (sore) and piles	Decoction of roots is prepared, concentrated, allowed to cool and applied twice a day to cure sores and piles
9	<i>Cassia fistula</i> L.	Kyar	Caesalpinaceae	Seeds	Jaundice	Decoction of seeds is prepared. After cooling for 5 to 10 min a glass of this is consumed empty stomach for a week, daily in the morning
10	<i>Cassia occidentalis</i> L.	Relu	Caesalpinaceae	Leaves	Teeth cleaning and gum troubles	Leaves are used for scouring teeth. Dried leaves
11	<i>Capsella bursa-pastoris</i> (L.) Medik.	Jangli sarsoo	Brassicaceae	Aerial part	Hemorrhages and menstruation disorders	An extract of the plant is taken for cure of hemorrhages and menstruation disorders
12	<i>Delphinium denudatum</i> Wall.	Salyan	Ranunculaceae	Roots	Ulcers	Roots powder is used for healing of ulcers and wounds in cattle
13	<i>Fragaria nubicola</i> Lindl.	Kida-bhumla	Rosaceae	Aerial parts	Fever	Decoction of plant is consumed twice a day for 5–6 days in the morning and evening to cure fever.
14	<i>Geranium wallichianum</i> D. Don	Ratanjot	Geraniaceae	Roots	Toothache	Dried powder of roots is applied on affected tooth to relief the toothache.
15	<i>Grewia glabra</i> Mast.	Dhaman	Tiliaceae	Leaves	Joint pains	Fresh leaves are boiled in water to prepare decoction which is further concentrated at low temperature. This paste is applied to cure joint pains.
16	<i>Malva parviflora</i> L.	Nasochal	Malvaceae	Aerial Parts	Abortion	Complete plant is boiled in water to prepare decoction. It is given repeatedly for a few days for abortion.
17	<i>Murraya koenigii</i> (L.) Spreng.	Gandla	Rutaceae	Fruit and branch	Health food and skin infection	Ripe fruits are consumed to increase stamina. Paste of gandla branch is applied as poultice twice a day for 2 to 3 days on the infected portion of the skin.
18	<i>Oxalis corniculata</i> L.	Khatti ambi	Oxalidaceae	Leaves	Leucorrhea	Leaf extract is put on batasha (candied sugar) which then is consumed early in the morning, empty stomach daily for 1 week.
19	<i>Prinsepia utilis</i> Royle	Bhekal	Rosaceae	Seeds	Arthritis	Seeds oil is extracted by expulsion and is warmed by heating. The warm oil is massaged on the affected parts at night.

Table 1. Contd.

20	<i>Ranunculus diffusus</i> DC.	Jaldhar	Ranunculaceae	Leaves	Joint pain	Powdered form of leaves is taken with milk at bed time.
21	<i>Ranunculus hirtellus</i> Royle	Goodi	Ranunculaceae	Roots	Reproductive disorder	Roots of plant are crushed with cow's urine to make a paste. The paste is applied at the base of thumb. If the swelling is on the right testes then the paste is applied at the base of left hand thumb and vice versa. The paste should not be kept for more than 20 min and is applied only once.
22	<i>Ranunculus muricatus</i> L.	Jaldhar	Ranunculaceae	Rhizome	As deworming agent	Powdered rhizome is mixed with wheat flour and dalda ghee and then used as deworming agent in cattle.
23	<i>Ranunculus sceleratus</i> L.	Jal-dhaniya	Ranunculaceae	Leaves and root	Urinary disorder and skin diseases	Powder form of leaves and roots is taken with water daily for few days.
24	<i>Rubus niveus</i> Thunb.	Khiradi	Rosaceae	Fresh root tips	Menstruation disorders	Fresh root tips are used for curing excessive bleeding during menstrual cycle. The root tips are made into a paste with water and small pills are made. One pill per day, preferably with butter made from buffalo milk, is taken empty stomach in the morning for 7 days. The original rootstock of the plants is avoided.
25	<i>Stellaria media</i> (L.) Villars	Khukawa	Caryophyllaceae	Seeds and leaves	Skin infections	About 20 dry seeds per day are given to the children to cure skin infections. Leaf paste of the plant is also applied on wounds caused by burns.
26	<i>Thalictrum foliolosum</i> DC.	Barmot	Ranunculaceae	Roots	Stomach pain and gastric trouble	Dried root powder mixed with <i>Thymus linearis</i> in equal proportion is taken regularly to cure stomach pain and gastric trouble.
27	<i>Thalictrum foetidum</i> L.	Pilijari	Ranunculaceae	Roots	Boils and ulcers	Paste of the fresh roots is used to cures boils and ulcers
28	<i>Viola biflora</i> L.	Banaksha	Violaceae	Leaves	Throat problem	Leaves decoction is given for curing sore throat
29	<i>Viola canescens</i> Wall. ex Roxb.	Banaksha	Violaceae	Flowers	Cold and cough	Fresh flowers are boiled in water and decoction is Prepared which is used as tea to cure fever, cough and cold

Table 1. Contd.

30	<i>Viola serpens</i> Wall.	Banfsa	Violaceae	Leaves	Cold and cough	Decoction is prepared which is given orally twice a day
----	----------------------------	--------	-----------	--------	----------------	---

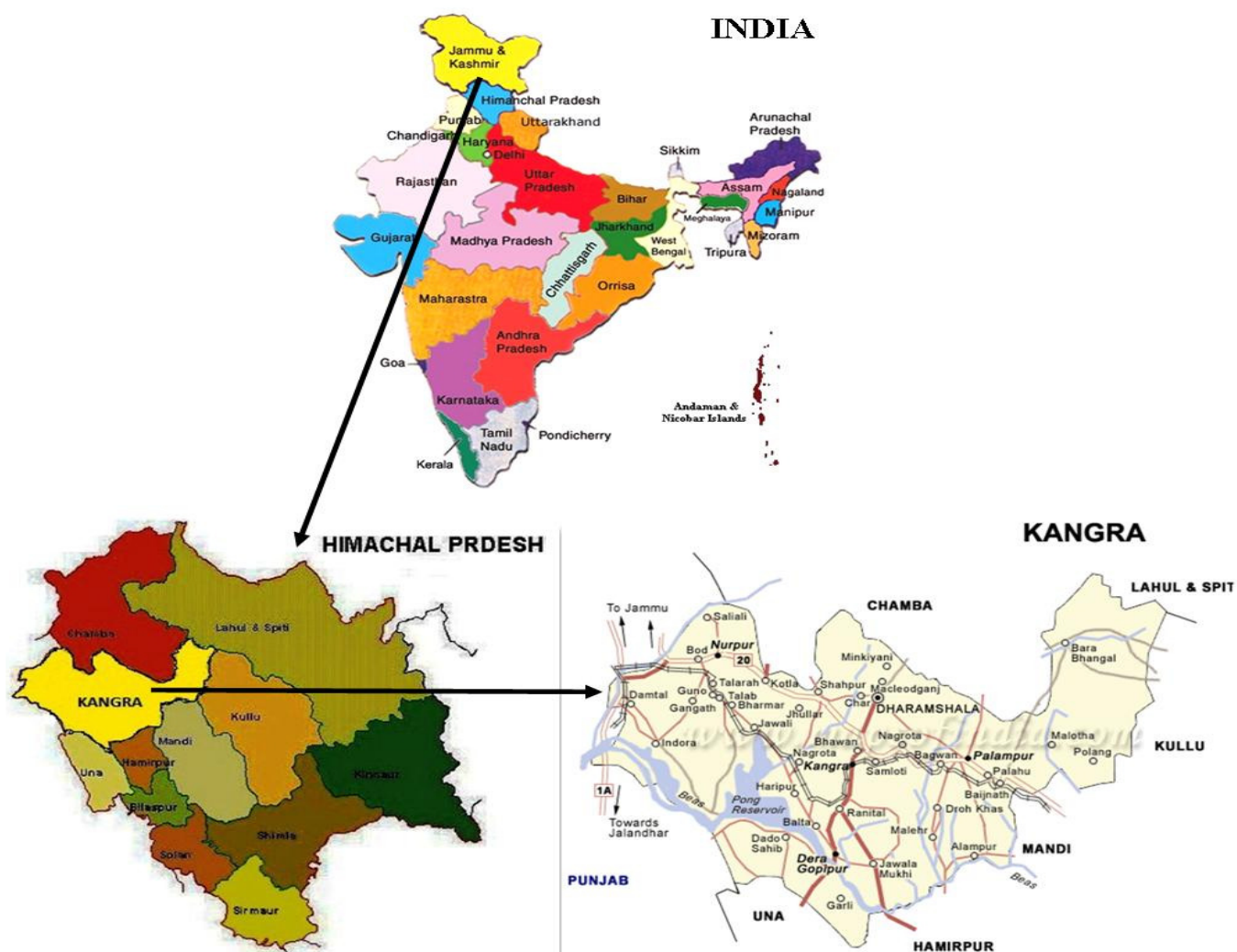


Figure 1. Map depicting the study area.

Kapoor, 1989). Information on their biological activity and chemical constituents is also available (Daniel, 2005; Kritikar and Basu, 1981). However, it is worth looking into areas where a mixture of the plants is used for curing diseases. *A. heterophyllum* that is used by the Kangri people for curing fever and abdominal pain is mentioned in Ayurveda for curing stomach ache and fever. It is one of the main ingredients of “Ativishadi churna”, “Chandraprabha vati” and “Amritarishta” ayurvedic medicines. In Unani system of medicine, it is an important ingredient of “Sufuf habib” which is used for curing piles

and also of “Majun jograj guggal” that is used against arthritis (Thakur et al., 1989). *B. asiatica* and *Berberis lyceum* are used in Ayurveda and Unani for treating eye disorders (Kritikar and Basu, 1981). The vaids categorically mentioned the efficacy of flower bud, flower and inflorescences. They avoided the use of flower of inflorescence where flower bud was the required part and avoided the use of flower bud or flower when inflorescence was the desired part. Use of *Murraya koenigii* for oral health care (Math and Balasubramaniam, 2004) and diabetes is well known (Kesari et al., 2005).

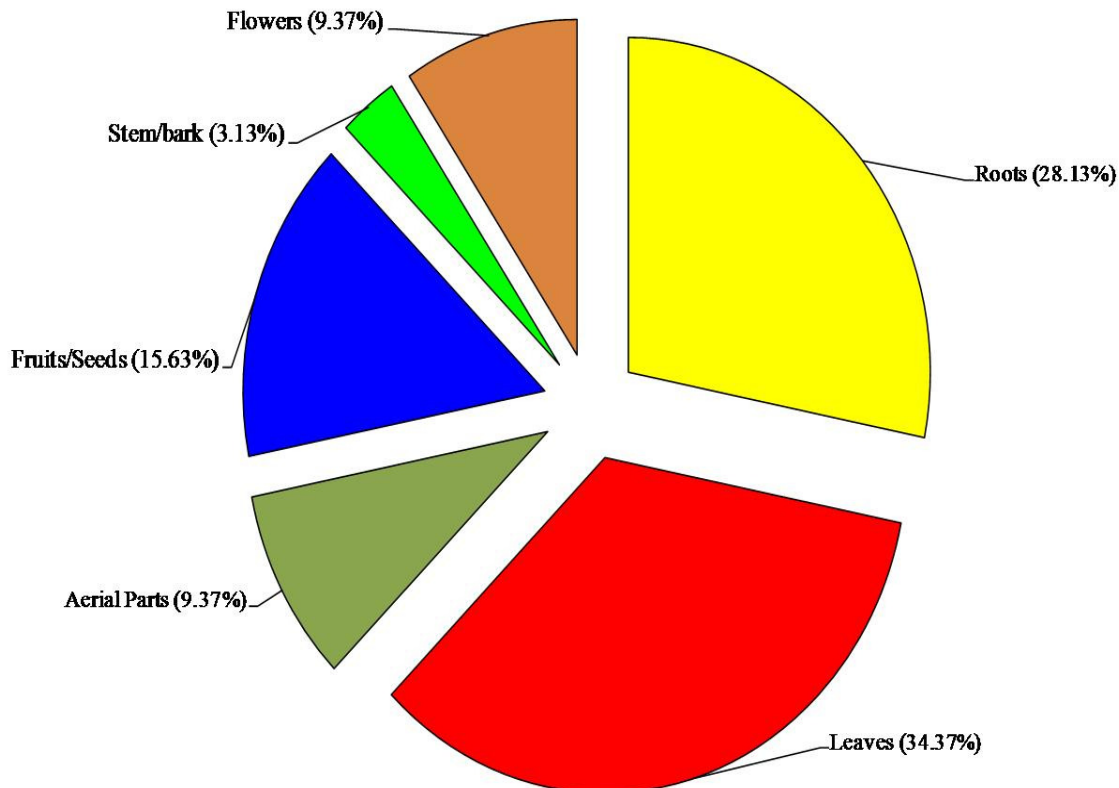


Figure 2. Statistics of plant parts used in ethnobotany by Kangra people.

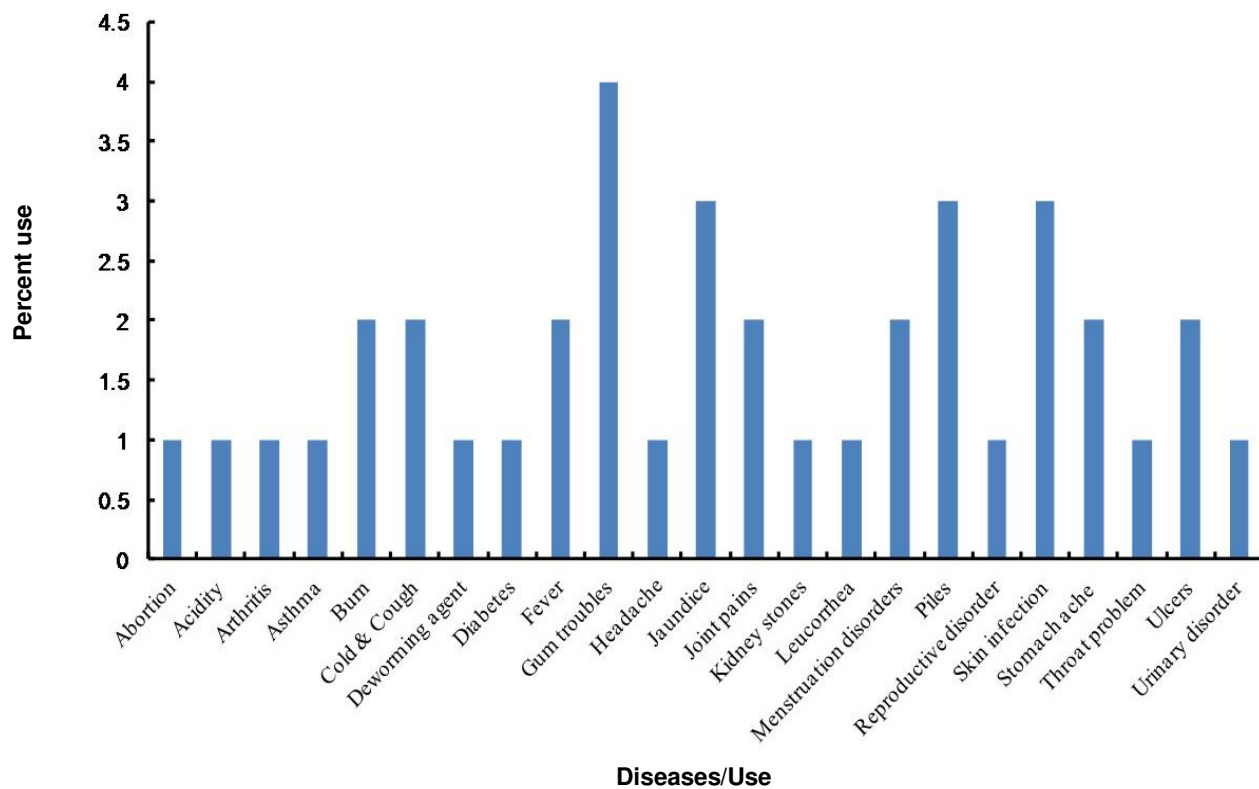


Figure 3. Diseases cured by the plants in the study area.

However, in the present study area, though people are aware of it, it is seldom used. Detailed analyses and validation of these may provide clues for pharmaceuticals and nutraceuticals. Thus, there is spatial variation in the use of plant species. This diversity of knowledge calls for further scientific research.

Interestingly, while in most of the high altitude Himalayan areas, root is the most widely used plant parts (Sharma et al., 2004; Uniyal et al., 2002, 2006); here, leaf and fruit are used in majority of the cases, as has also been reported for the Lahaul valley (Singh and Brij, 2008). This in fact is a positive note as uprooting of the plant is avoided and also the output in terms of leaf and fruit is more.

Conclusion

It can be concluded from the study that tribal peoples of district Kangra inherit a rich traditional knowledge and documentation of this knowledge has provide novel information from the area. They still depend on the plants for medicinal purposes and are very much concerned about their degradation in wild as they now have to travel even more far to collect these plants. The incoming of roads and coming up of the area as an important tourist destination has allured the younger generation towards market economy, this certainly will have larger implications. Thus, the present documentation of traditional knowledge will help in its conservation vis-a-vis providing pharmacological leads for the betterment of human society.

ACKNOWLEDGMENTS

The authors are grateful to the University Grants Commission, New Delhi under the DRS SAP II and ASIST programmes. Additional support was provided by the UGC under the Dr. D.S. Kothari Post-Doctoral Fellowship Scheme [Award Letter No. F.4-2/2006 (BSR)/13-880/2013(BSR)] to Dr. Syed Mudassir Jeelani. Thanks are also due to the Head, Department of Botany, Punjabi University, Patiala, for necessary laboratory facilities. We are also highly thankful to the Director Botanical Survey of India, DehraDun for their help in the identification of the plant species.

REFERENCES

- Badola HK, Pal M (2003). Threatened medicinal plants and their conservation in Himachal Himalayas. *Indian Forester* 129(1):55-68.
- Charak, Drdhabala (1999). The Charak Samhita explained by K. Sastri and G.N. Chaturvedi. 22nd revised edition. In Sastri R, Uapadhayaya Y, Pandeya GS, Gupta B, and Misra B (eds.), Chaukhamba Bharti Academy, Varanasi.
- Chowdhery HJ, Wadhwa BM (1984). Flora of Himachal Pradesh: Analysis. Vols. 1-3. Botanical Survey of India. Calcutta p 860.
- 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.
- Dhaliwal DS, Sharma M (1999). Flora of Kullu District (Himachal Pradesh). Bishen Singh Mahendra Pal Singh, Dehra Dun, India.
- Hooker JD (1879). The Flora of British India. Vol. 2. L. Reeve and Co., Ashford, Kent, England pp. 78-99.
- Kapoor LD (1989). Handbook of Ayurvedic Medicinal plants. CRC, USA.
- Kaur H, Sharma M (2004). Flora of Sirmaur. Bishen Singh Mahendra Pal Singh, Dehra Dun, India.
- Kesari AN, Gupta RK, Watal G (2005). Hypoglycemic Effect of *Murraya koenigii* on Normal and Alloxan-Diabetic Rabbits. *J. Ethnopharmacol.* 97(2):247-251.
- Kritikar KR, Basu BD (1981). Indian Medicinal Plants, vol I, II III and IV (second reprint) IBD, Dehradun.
- Martin GJ (1995). Ethnobotany: A methods manual. Chapman and Hall, London.
- Math MV, Balasubramaniam P (2004). Curry Leaves. *Brit. Dental J.* 197:519.
- Pushpangadan P (2005). CBD, WTO and the biodiversity Act of India. *J. Ethnopharmacol.* 17:2-12.
- Rao RR (1996). Traditional knowledge and sustainable development key role of ethnobiologists. *J. Ethnopharmacol.* 8:14-24.
- Reyes-Garcia V, Marti N, Mcdade T, Tanner S, Vadez V (2007). Concepts and Methods in Studies Measuring Individual Ethnobotanical Knowledge. *J. Ethnobiol.* 27(2):182-203.
- Sharma PK, Chauhan NS, Brij L (2004). Observations on the traditional phytotherapy among the inhabitants of Parvati valley in western Himalaya India. *J. Ethnopharmacol.* 92:167-176.
- Singh KN, Brij L (2008). Ethnomedicines Used Against Four Common Ailments by the Tribal Common Ailments by the Tribal Communities of Lahaul-Spiti in Western Himalaya. *J. Ethnopharmacol.* 115:147-159.
- Thakur RK, Puri HS, Hussain A (1989). Major medicinal plants of India. CIMAP, Lucknow.
- Uniyal SK, Sharma V, Jamwal P (2011). Folk Medicinal Practices in Kangra District of Himachal Pradesh, Western Himalaya. *Hum. Ecol.* 39:479-488.
- Uniyal SK, Singh KN, 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 SK, Awasthi A, Rawat GS (2002). Traditional and ethnobotanical uses of plants in Bhagirathi valley (western Himalaya). *IJTK.* 1(1):7-19.