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Ethnomedicinal plants of Chamba district, Himachal Pradesh, India

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Importance of medicinal plants in traditional healthcare practices provides clues to new areas of research and biodiversity conservation is now well known. However, information on the use of plants for medicinal purpose is lacking from many tribal areas of Himachal Pradesh. Keeping this in view, the present study was undertaken in a tribal dominated area of Chamba district, to look for the diversity of plant resources, used by local people for curing various ailments. Questionnaire surveys, field visits and participatory observations were planned to collect information about the uses of various plants. It was found that 50 plant species are being commonly used by local people to cure 26 diseases. In most of the cases, leaves (40%) followed by roots (24%) were used to cure many health problems. New medicinal uses of *Achyranthes bidentata*, *Cannabis sativa* and *Stellaria monosperma* were also reported for the first time.

Key words: Medicinal plants, Chamba district, Himachal Pradesh.

INTRODUCTION

From ancient periods, the native communities mainly depend on the endemic vegetation for their daily needs such as food, fodder and medicines for the different aliments. Documentation of traditional knowledge has provided many important drugs for the modern world (Fabricant and Farnsworth, 2001). The continuation of traditional knowledge is endangering as the transmission between the older and younger generations no longer exists (Kargioglu et al., 2008). Therefore, documentation of the traditional knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources (Muthu et al., 2006).

Chamba is the north-western district of Himachal Pradesh. It is situated between north latitude 32° 11′ 30″ to 33° 13′ 06″, and east longitude 75° 49′ 00” to 77° 03′ 30″ with an estimated area of 6,528 km^2. The territory is wholly mountainous with altitude ranging from 600 to 6,400 m. Gaddis and Gujjars are the two main tribal communities of the district (Figure 3). The Gaddis, a semi-nomadic tribe, are the sheep and goat rearers and Gujjars tribe inhabit Siunta, Banikhat and areas adjoining the plains of Himachal Pradesh. These nomads climb up the hills during summers and return to the plains in winters. These native people are the guardians of indigenous traditional knowledge associated with their surrounding biological resources. They have been using these resources for various purposes in their daily life for ages (Figures 4 and 5). Because of varied altitudinal gradients and climatic conditions, the district harbours rich plant diversity, which includes around 2,000 species of flowering plants (Singh and Sharma, 2006). Besides exploring floristic diversity and inventorization of plant resources of the district (Sharma and Singh, 1990, 1997), the documentation of traditional knowledge of the plants was also carried out by several workers (Dutt et al., 2011; Singh and Banyal, 2012).

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The present work is another endeavour to enhance such explorations and make addition to utilization of some of the plant species which are not recorded earlier from the study area. In addition, the present study is initiated from the area, with an aim to identify knowledgeable persons and document the knowledge on the utilization of medicinal plants.

MATERIALS AND METHODS

The study on the ethnobotanical evaluation of indigenous plants of the district Chamba was carried out during 2010 to 2012. Extensive field surveys were made to different localities covering Banikhat, Bhalai, Brangal, Brahmaur, Chamba, Chaurah, Chuari Khas, Dalhousie, Harsear, Holi, Saluni, Sinhunta and Tissa (Figure 2). A questionnaire was prepared and used as a tool for the collection of information. It was divided into two parts: demographic and ethnobotanical data. The first part included name, age and occupation and the second part contained questions about the pattern of medicinal plant resources being utilized (Figure 1).

Field survey

Prior to a visit to the research sites, the questionnaire was designed and pre-tested to find out if it actually worked. Revisions needed as a result of this pre-test were noted and undertaken in the following day of the visit. Key informants were identified from each of 200 households determined to be present in the villages in the district. Focus groups were held with key informants and others in each household. The traditional uses (including medicinal and other use) of plant resources were learned with both the questionnaire and through participatory techniques. Participation focused on learning how people were gathering plant materials. Informants were asked about their interest as local user of plants, collectors and traders of forest resources. Information on the market value of the plants was collected from local collectors, hakims and shopkeepers. For each plant species, the informants mentioned, were also asked about its abundance, distribution and population size. This was judged by comparing 20 years old records with the current situation. In addition, personal observations were made in the field to note any pertinent events which could help to explain the presence, and relative abundance based on the ecological characteristics of the species. The effect of current harvest on the status of each commercially valuable plant species was also studied by comparing 20 years old records with respect to the present population size and status. The effect of current harvest on the population size was finally judged based on the distance that local collectors travelled in the past as compared to the present.

RESULTS

In all, the local community used 50 plant species, namely 23 herbs, 13 trees, 2 climbers and 12 shrubs for treating 21 diseases. The details of the plant used, its local name, plant part used, mode of preparation and number of persons using particular plant species during 1970 to 1975 and 2010 to 2012 are shown in Table 1. These plants are distributed in 39 families with Rosaceae having the maximum representation (5 species) while 31 families had minimum representation (one species each). In general, most plants are being used for curing fever, cold and cough. Among the plant parts, use of leaves (40%) is most common, followed by roots (24%) and fruits (20%). Resin and whole plant are rarely used (2%) (Figure 7).

Importantly, it is observed that, though, the Vaids are hesitant to disclose this knowledge in the presence of other villagers, as this knowledge provides them respect and recognition in the society, they are more open when interviewed in solitude, especially in the forests (Figures 4 and 5).

The survey revealed that the marketing of medicinal and aromatic plants in the area is in the hands of specific collectors and few local shopkeepers. In the study area, there are several regular collectors among the residents. They collect considerable quantities of medicinal and aromatic plants and supply them to various domestic trading centres of Himachal Pradesh. The study revealed that out of 50 plant species only four species have high market value and are collected in large amounts for sale. Among these plants, the highest price is paid for *Trillium govanianum* that occurs in between 2700 and 3000 m in the temperate regions of the district and is used for curing many reproductive disorders, besides it is one of the highly traded species. Its dried roots are sold at a rate of Rs. 2000/kg in the area (Figure 6). Another important plant of sub-tropical region is *Bacopa monnieri.* It is used by Chambali people for curing many nervous diseases and the juice of leaves is sold at a rate of Rs. 120/kg. These people also use the root and stem of *Jurinea macrocephala* (2600 to 2900 m) and *Tinospora cordifolia* (800 to 1500 m) for curing fever and jaundice. The plant is traded from the area and the dried roots fetch a price of Rs 50/kg. The prices of each species vary from year to year and also depend on demand and supply.

Some plants species in addition to their medicinal importance are of cultural and religious importance. *Achyranthes bidentata*, *Asparagus racemosus* and *T. cordifolia* are highly rated by the local people both for medicinal properties and cultural importance. In the study area, dried root, stem and whole plant are used in religious ceremonies called “Hawan”. Similarly, *Betula utilis* and *Cannabis sativa* are the most wanted after plant to be offered to Lord Shiva-a Hindu God. It can now be seen in the shops where it is for sale. These plants which are also socio-culturally important may be the ideal species for raising awareness and highlighting the importance of the plants in general.

The use of 10 plant species as *B. monnieri*, *Bergenia ligulata*, *Murraya koenigii* (Figure 9), *Rosa macrophylla* (Figure 10), *Ocimum sanctum* (Figure 11), *Phyllanthus emblica*, *T. cordifolia* (Figure 12), *T. govanianum, Viola canescens* (Figure 13) and *Zanthoxylum aromaticum* in 2010 to 2012 has increased as compared to their use in the past from 1970 to 1975. Similarly, *B. utilis, Crataegus oxyacantha, Hypericum oblongifolium* and *Viburnum mullaha* are no longer used in 2012. On the other hand, *Cedrus deodara, Desmodium elegans* (Figure 8), *Datura stramonium, Diplazium*

QUESTIONNAIRE FOR CONDUCTING THE ETHNOBOTANICAL STUDY

[A] Demographic Data

Name of Tehsil:..... Name of Village:.....Tribe:.....

Sr. No	Name	Age	Sex (Male/ Female)	Education	Occupation
1					
2					
3					
4					
5					

[B] MEDICINAL PLANT USES

1. Plant (Local/Vernacular name)
2. Plant identified as …… (Botanical name)
3. Habit of the plant (Tree/Shrub/Herbs/Climber/Creeper/Others)
4. Flowering and fruiting period ……..
5. Part(s) of plant used ……..
6. Nature of ailment treated ……...
7. Preparation method(s) ……..
8. Route of administration (i) External (ii) Oral (iii) Nasal (iv) Ear/eye
9. Response of the informant(s)/Patient(s)

(i) Effective /Good …… (ii) Fair..…… (iii) Poor ……..

[C] INFORMANTS DECLARATION

We, the above mentioned hereby willingly accepted to participate in this study with our full consent and declare that the information and knowledge provided to Savita Rani during the course of interview and discussion is to the best of our knowledge and is accurate and complete.

Dated: …….

Figure 1. Proforma usec in survey of medicinal plants.

esculentum and *Jasminum officinale* are constantly used till date.

DISCUSSION

Many of the plant species used by Vaids are of great importance and found in Ayurveda and Unani, the traditional health care systems of India (Dey, 1980; Kapoor, 1990; Chauhan, 2003). Information on their biological activity and chemical constituents is also available (Daniel, 2005; Kritikar and Basu, 1981). It is interesting to note that the use of *A. bidentata*, *C. sativa* and *Stellaria monosperma* for the described medicinal purposes seems to be restricted to this area, as the use of these plants for the said diseases could not be found in the literature scrutinized for the other parts of India as well as other parts of the world (Shinwari and Khan, 2000; El-Hilaly et al., 2003; Dey et al., 2009; Joshi and Joshi, 2006; Joshi et al., 2011; Yadav et al., 2006, 2010).

However, it is worthwhile looking into areas where a mixture of plants is used for curing diseases. *Picrorhiza kurrooa*, which local peoples use for stomach problems and leucoderma in Ayurveda. In Unani it is used for curing leucoderma and piles (Kritikar and Basu, 1981). It forms an important ingredient of medicine

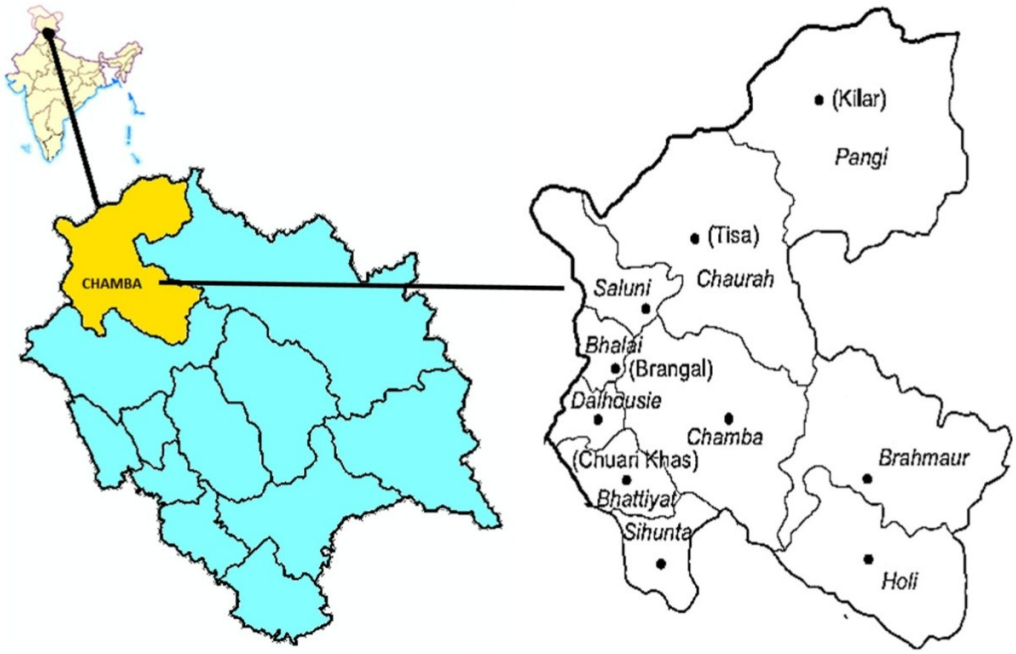

Figure 2. Map of the study area showing localities visited.

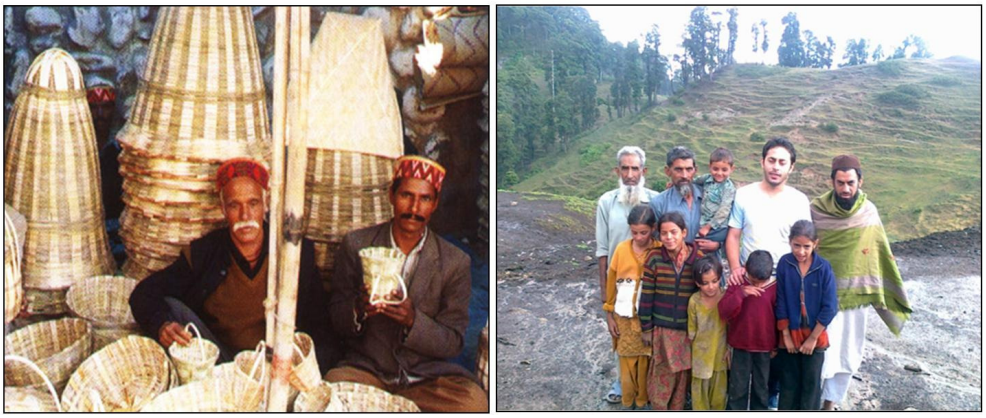

Figure 3. People of native tribes of district Chamba.

Figure 4. Medicated acupressure being practiced by vaid.

Figure 5. A traditional tool which is used in district Chamba to make floor of wheat.

Figure 6. Dried roots of *Trillium govanianum* (Nagchatri).

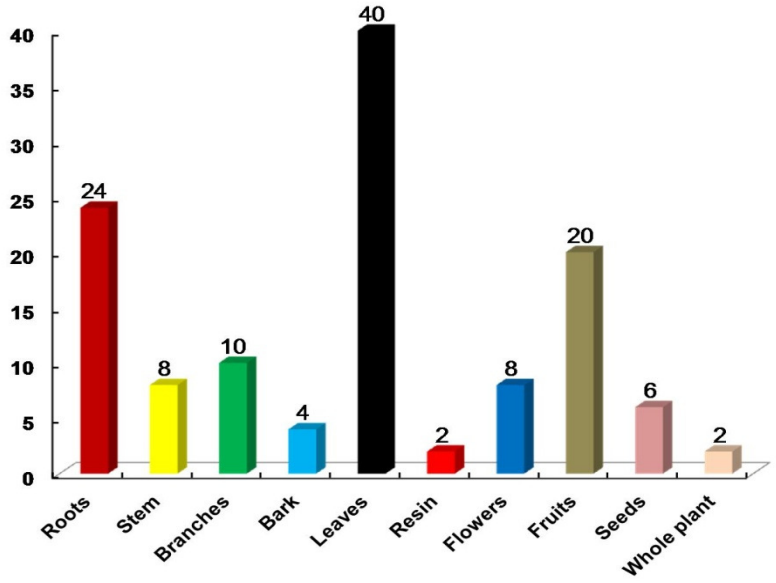

Figure 7. Medicinal and aromatic plant species by category of parts used in district Chamba.

Figure 8. *Desmodium elegans* DC.

Figure 9. *Murraya koenigii* Spreng.

Figure 10. *Rosa macrophylla* Lindl.

Figure 11. *Ocimum sanctum* L.

Figure 12. *Tinospora cordifolia* Miers.

"Arogyawardhini" which is used for treating hepatobiliary disorders (Kumar and Sharma, 1983) and of "Hepax" which is useful in pregnancy anaemia (Gupta and Nandyala, 1984). Use of *M. koenigii* for oral health care (Math and Balasubramaniam, 2004) and diabetes is well

Figure 13. *Viola canescens* Wall.

known (Kesari et al., 2005). It is valuable mentioning that during current study, some plants were found to be used for the treatment of a single disease, while many other plants had multiple therapeutic uses. These were invariably used for curing various diseases and for earning livelihood. The finding of the present study are in line with the reports available in the scientific literature reporting ethnobotanical studies to be important for exploring plants and human interaction to find alternate sources of income and treating any disease state in humans or animals (Trumble et al., 2004; Abdillahi et al., 2010; Saganuwan, 2010). However, it was also noticed that the reported plants are being severely grazed by the local livestock. Overgrazing causing destruction, as green parts are being removed and/or damaged due to trampling. Therefore, it became imperative to manage the grazing system and encourage the regeneration of medicinal plants (Goshi, 1997; Sher et al., 2010).

Conclusions

The present study suggests to introducing some management measures to be taken jointly with the participation of local communities, via village administrative council, etc., in order to conserve medicinal plant resources from becoming extinct. The foremost important thing is to give awareness and training to local communities on multidimensional basis about sustainable exploitation of medicinal plant wealth in hillside management for plant resources. Finally, the present study, also recommends scientific validity and toxicity tests of the reported medicinal plants used for the treatment of different livestock ailments in traditional medicine.

ACKNOWLEDGEMENTS

The authors greatly thank the local communities for their

Table 1. List of ethnomedicinal plants used by the tribal communities from Chamba District, Himachal Pradesh.

S/N	Botanical and Family name of the plant	Local name	Parts used	Disease/ Ailment	Mode of preparation	Number of people using the particular plant in 2010-2012 (% Frequency)	Number of people using the particular plant in 1970-1975 (% Frequency)
1	*Achyranthes bidentata* Blume (Amaranthaceae)	Puthknda	Whole plant	Abdominal pain	The roots, seeds and leaves are used in the form of juice and powder taken with water once a time to cure abdominal pain and dried form of whole plant is used in religious purposes called "Hawan".	65 (32.50)	154 (77.00)
2	*Angelica glauca* Edgew. (Apiaceae)	Chura	Roots	Arthritis	Roots in powdered form taken with water at night time are prescribed to arthritis patients.	4 (2.00)	35 (17.50)
3	*Artemisia absinthium* L. (Asteraceae)	Charmra	Leaves	Wound	Freshly leaves crushed and applied on cuts.	7 (35.00)	40 (20.00)
4	*Asparagus racemosus* Willd. (Asparagaceae)	Saapaya	Branches and roots	Stomach problems	Branches are used for religious purposes and dried form of roots taken with water at once to cure stomach problems.	43 (21.50)	120 (60.00)
5	*Bacopa monnieri* (L.) Wettst. (Scrophulariaceae)	Brahmi	Leaves	Nervous tiredness	Juice of leaves taken up early in morning to increase memory power and cure any nervous tiredness.	150 (75.00)	98 (49.00)
6	*Bauhinia variegata* L. (Ceaslpiniaceae)	Kachnar	Flower buds	Stomach problem	The juice of the flowers taken once a day to cure stomach problems. Young flowers bud are used as food material and making traditional recipe.	58 (29.00)	175 (87.50)
7	*Berberis aristata* DC. (Berberidaceae)	Banhaldi	Roots	Piles	Dried powdered form of roots taken with water once in a day to cure piles.	9 (4.50)	67 (33.50)
8	*Berberis lycium* Royle (Berberidaceae)	Kasmal	Roots, stem	Gum problems	Tender stems are used to brush the teeth and roots are chewed to kill bacteria from teeth.	6 (3.00)	60 (30.00)
9	*Bergenia ligulata* (Wall.) Engl. (Saxifragaceae)	Shaprotri	Leaves	Cold	Leaves are used for tea preparation to cure cold.	50 (25.00)	16 (8.00)
10	*Betula utilis* D. Don (Betulaceae)	Bhuj ptra	Resin and Leaves	Urinary tract infection	The decoction of leaves prepared and taken early in morning to cure urinary infection Resin is used for making tea and leaves are used for religious ceremonies.	-	14 (7.00)
11	*Cannabis sativa* L. (Cannabaceae)	Bhang	Leaves and bark	Joint pain	Leaves paste applied along with cow urine to joint pain Leaves are used for religious purposes and bark is used for making of ropes.	90 (45.00)	140 (70.00)
12	*Cedrus deodara* G.Don (Pinaceae)	Deor	Resin	Indigestion	Resin from the tree is mixed with salt and feeded to sheep and goats to help in their proper digestion.	90 (45.00)	90 (45.00)

Table 1. Contd.

13	*Corylus jacquemontii* Decne.(Corylaceae)	Thangi/Thangoli	Seed	Muscular pain	Daily 1-2 seeds nut are eaten to relief muscular pain.	55 (27.50)	118 (59.00)
14	*Crataegus oxyacantha* L. (Rosaceae)	Pinyath	Fruits	Anemia	3-4 fruits eaten daily, considered increasing the hemoglobin content.	--	17 (8.50)
15	*Cotoneaster microphyllus* Lindl. (Rosaceae)	Kadhor	Fruits	Skin disease	Fruits are made into a paste and mixed with sarson (*Brassica*) oil and applied on the skin against irritation.	5 (2.50)	15 (7.50)
16	*Desmodium elegans* DC. (Fabaceae)	Kathi	Roots, leaves	Cholera	The juice of the root, sometimes combined with the bark juice of *Bauhinia malabarica*, is used in the treatment of cholera. Leaves used as fodder.	25 (12.50)	25 (12.50)
17	*Datura stramonium* Wall. (Solanaceae)	Datura	Seeds	Acne	Making Paste of seeds with rose water and applied once in a day to cure pimples.	20 (10.00)	20 (10.00)
18	*Diplazium esculentum* (Retz.) Sw. (Woodsiaceae)	Kasror	Stems	Muscular pain	Decoction of whole plant is prepared taken at night time to cure muscular pain and used to prepare pickles and also used as vegetable.	30 (15.00)	30 (15.00)
19	*Ficus palmata* Roxb. (Moraceae)	Phakura	Fruits and leaves	Anemia	Fruits are eaten daily to help to increase the level of hemoglobin. Leaves are used for packing purposes. The whole plant is also used as fuel and fodder.	15 (7.50)	10 (5.00)
20	*Grewia robusta* Burch. (Tiliaceae)	Dhaman	Bark, leaves	Appetite enhancer	Decoction of the leaves taken early in morning to increase appetite. Bark used for making ropes and leaves used as fodder.	35 (17.50)	149 (74.50)
21	*Hypericum oblongifolium* Hook. (Hypericaceae)	Phiunli	Roots, flowers	Animal diseases	Against animals diseases.	--	16 (8.00)
22	*Jasminum officinale* L. (Oleaceae)	Swain	Leaves and stems	Acnes	Juice of leaves applied once a day to cure acnes. Leaves and stems are used in the marriage ceremonies as aesthetic value.	15 (7.50)	15 (7.50)
23	*Jurinea macrocephala* DC. (Asteraceae)	Guggal	Roots and leaves	Fever	Dried powdered form of roots taken with water at night time to cure fever and used in ceremonial and ritual purposes.	47 (23.50)	70 (35.00)
24	*Malva neglecta* Wallr. (Malvaceae)	Sonchal	Leaves	Cough and cold	Decoction of fresh leaves use to cure cough and also used as vegetable for constipation treatment.	10 (5.00)	20 (10.00)
25	*Mirabilis jalapa* L. (Nyctaginaceae)	Raat ki Rani	Roots	Cough and cold	Dried form of roots is used to cure cough of animal.	4 (2.00)	32 (16.00)
26	*Morus serrata* Wall. (Moraceae)	Krum	Fruits and leaves	Stomach problems	Fruits are used against to stomach problems and leaves used as fodder.	5 (2.50)	30 (15.00)
27	*Murraya koenigii* Spreng. (Rutaceae)	Kadhi Pata	Leaves and branches	Gum problems	As Flavouring agents in food and branches used for cleaning of teeth.	140 (70.00)	120 (60.00)

Table 1. Contd.

28	*Ocimum sanctum* L. (Lamiaceae)	Tulsi	Leaves, seeds	Cold and cough	Leaves are used for preparation of tea to cold and cough and for religious purposes.	190 (95.00)	150 (75.00)
29	*Picrorhiza kurroa* Royle ex Benth. (Scrophulariaceae)	Kour	Roots	Stomach problems	Dried roots used in the powered form to cure the stomach ache.	20 (10.00)	15 (7.50)
30	*Phyllanthus emblica* L. (Euphorbiaceae)	Amla	Fruit and young Branches	Hair problems	Fruits used as food, dried fruits grind and used for cleaning hairs.	190 (95.00)	120 (60.00)
31	*Phytolacca acinosa* Roxb. (Phytolaccaceae)	Ranshag, Ashlu	Leaves	Acne	Juice of fresh leaves apply on skin once a day after that faces wash with water. Young tender leaves are used for the preparation of vegetable.	15 (7.50)	20 (10.00)
32	*Prunus cornuta* Wall. (Rosaceae)	Jammu	Fruit	Anemia	Increase hemoglobin content and purify blood.	4 (2.00)	13 (6.50)
33	*Pteridium aquilinum* (L.) Kuhn (Dennstaedtiaceae)	Kinus	Roots	Abdominal edema	Roots are tied to the abdomen in the morning. Note that the patient should not touch water the previous day. Leaves are cooked and eaten as vegetable. Roots are used as soap to wash the cloths and shawls.	20 (10.00)	10 (5.00)
34	*Rosa macrophylla* Lindl. (Rosaceae)	Gulabri	Flowers	Cold and cough	Petals are boil nearly 1-2 hours prepared decoction which is used against cold and cough.	90 (45.00)	65 (32.50)
35	*Rubus ellipticus* Sm.(Rosaceae)	Akhan	Fruit	Indigestion	Fruits are used to cure indigestion.	43 (21.50)	124 (62.00)
36	*Rumex dentatus* Wall.(Polygonaceae)	Jangli palak	Root	Poison	Dried form of roots is used against any type of poison.	32 (16.00)	135 (67.50)
37	*Rumex hastatus* Link ex Meisn.(Polygonaceae)	Katimithi	Leaves	Foot disease	Fresh leaves crushed and applied on infected area to cure foot disease of animal.	3 (1.50)	38 (19.00)
38	*Salix alba* L. (Salicaceae)	Chirand	Seeds	Dandruff	Oil is extracted by grinding the seeds and used in scabies and eczema and applied on the joints for relief. Ladies mixes the oil in the sarson oil and use against the dandruff.	6 (3.00)	18 (9.00)
39	*Smilax aspera* L. (Smilacaceae)	Dadrund	Leaves and Fruits	Nerve tonic	Fruits are eaten and leaves are used as fodder.	10 (5.00)	30 (15.00)
40	*Stellaria monosperma* Buch.-Ham. ex D.Don (Caryophyllaceae)	Kokuwa	Leaves	Skin disease	Juice of leaves taken early in morning to cure skin disease.	5 (2.50)	30 (15.00)
41	*Swertia chirata* C.B.Clarke (Gentianaceae)	Charayta	Leaves	Skin irritation	To cure all kind of skin irritations and itching.	7 (3.50)	21 (10.50)
42	*Taxus baccata* Thunb. (Taxaceae)	Barhami	Leaves and bark	Cancer	Tea is prepared from the leaves and bark of plant. Used for all kind of diseases. The plant is considered as having the cancer treatment properties. Leaves are also used in the roofs of the houses as waterproof medium.	6 (3.00)	23 (11.50)

Table 1. Contd.

43	*Tinospora cordifolia* Miers (Menispermaceae)	Gloe	Stem	Jaundice and Constipation	Dried stem grind well and nearly 2 gm power taken with water at early in morning to cure jaundice and constipation. Dried stem are also used for religious purposes called "Hawan".	50 (25.00)	30 (15.00)
44	*Trillium govanianum* Wall. (Trilliaceae)	Nagchatri	Roots	Reproductive disorder	Dried form of root taken with cow milk in early morning to cure menstrual and reproductive disorder.	56 (28.00)	20 (10.00)
45	*Urtica dioica* L. (Urticaceae)	Ain	Leaves	Skin diseases	Decoction of the dried leaves taken once a week to cure skin disease and also eaten as vegetable.	23 (11.50)	54 (27.00)
46	*Valeriana jatamansi* D.Don (Valerianaceae)	Shamak, Mushakwaa	Roots	Stomach ache	Decoction of roots cure stomach ache as well as it is added in dhoop for incense, roots are used for business purposes.	5 (2.50)	29 (14.50)
47	*Viburnum mullaha* Buch.-Ham. ex D.Don (Caprifoliaceae)	Tilhanj	Fruits	Cold and cough	Dried root power cure cold and cough.	--	5 (2.50)
48	*Viola canescens* Wall. (Violaceae)	Vanksha	Flowers	Cold and cough	Used along with dalchini, mithisaunf and laung and taken orally to relief from cold and cough.	70 (35.00)	50 (25.00)
49	*Vitex negundo* L. (Lamiaceae)	Bana	Branches, leaves	Cold and cough	Prepared the decoction of leaves which used against cold and cough.	50 (25.00)	165 (82.50)
50	*Zanthoxylum aromaticum* Miq. (Rutaceae)	Trimiria	Branches	Gum problems	Young branches used to cleaning of teeth and cure gum problems.	170 (85.00)	110 (55.00)

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