

Anthropological Study of EthnoMedicinal Plants in Baramulla District, Jammu and Kashmir , India

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Abstract

Background: The topography and weather conditions of Jammu and Kashmir has led the use of traditional medicinal plants for various ailments since ages. Jammu and Kashmir possess rich diversity in medicinal plants because of its geological, geographical, physiological, topographical and diverse climatic conditions. This study was conducted with the aim of documenting the knowledge associated with different medicinal plants in Baramulla District, Jammu and Kashmir , Northern India.

Methods: The study was conducted in Baramulla District, Jammu and Kashmir. The number of informants which were selected for the study was 399 (272 males and 127 females). Data were collected using semi-structured interviews and group discussions. The listing of medicinal plants found in the area was done, also calculated informant consensus factors (ICF), fidelity level (FL) and performed ranking and paired comparisons. The analysis of Data was done using descriptive statistics and using SPSS software.

Results: Overall, 21 medicinal plants were documented belonging to 20 families. Families Fabaceae and Solanaceae were the most important ones. Leaves of medicinal plants were most used as compared to flowers. The most used preparation method for preparation of traditional medicines was found boiling/cooking. The key informants were found most knowledgeable with the mean knowledge of (4.85) and general informants possess the mean knowledge of (2.98). Old age group people also had good mean knowledge of (4.91) as compared to young folks who had mean knowledge of (2.14). *Rosawebbianaw* was the most preferred medicinal plant for treating cough followed by *Punica granatum*. for treating jaundice.

Conclusions: Baramulla District possess a rich ethnomedicinal profile with great medicinal plant diversity and the traditional knowledge about use, preparation and application of these plants for various ailments. Though there are some factors which had led to the decrease or minimal use of these plants these factors include, agricultural expansion, urbanisation, modern education, use of allopathic medicines. Hence knowledge about the benefits of using traditional plants over allopathic medicines among the young generation need to be revived by the elders or through different studies which in turn will help to protect these plants and will ensure use of these plants in the district.

Keywords: Ailments treated, Traditional-knowledge, Traditional Medicinal plants, Baramulla District, Jammu and Kashmir, India

Introduction;

Before the advent of modern or allopathic medicines the traditional medicines were widely used by the past people [1-5]. The various different traditional system was in Practice in various parts of the world. There are various wild and cultivable plants which represent a specific culture, customs, traditional health care practices, rituals etc. and the importance of which has come through generations of experience and practices. There is a scientific analysis going on which validate the different aspects of indigenous traditional knowledge of different ethno-medicinal plants. The high-level scientific study shall pave way for the traditional medicines towards the social acceptability. The trade in various medicinal plants shall also be a source of income to many thus encourage the use of traditional medicinal plants [6-8].

There are various document evidences which show use of different traditional remedies and plants. In China plants were used in traditional remedies 7000–6000 years ago [8]. Other evidences show the same use of different plants by Egyptians, Hebrews, Babylonians and Syrians dating back to 1600 BC [9]. Due to easy availability, access, less side effects and low-cost traditional medicinal use in practice is going on large scale in various developing countries, like Bangladesh (90%), Myanmar (80%), India (80%), Nepal (75%), Pakistan (75%), Sri Lanka (65%) and Indonesia (60%). The demand for the ethno-medicinal plant is growing day by day and its trade has reached approximately US \$14 billion per year and growing at the rate of 15 to 25% annually. Kashmir region often referred as heavenly abode on earth, holds a rich diversity of medicinal plants spreading from valley floor through table lands (karewas) and dense forests up to the alpine peaks [10, 11].

Jammu and Kashmir is home to several valleys such as the Kashmir Valley, Tawi Valley, Chenab Valley, Poonch Valley, Sind Valley and Lidder Valley [12]. The Kashmir valley is 100 km (62 mi) wide and 15,520.3 km² (5,992.4 sq. mi) in area [13]. The Himalayas divide the Kashmir valley from the Tibetan plateau while the Pir Panjal range, which encloses the valley from the west and the south, separates it from the Punjab Plain of the Indo-Gangetic Plain.[14] Along the north-eastern flank of the Valley runs the main range of the Himalayas [15]. This valley has an average height of 1,850 metres (6,070 ft) above sea-level,[13] but the surrounding Pir Panjal range has an average elevation of 10,000 feet (3,000 m) [16]. The Jhelum River is the major Himalayan River which flows through the Kashmir valley [17]. The Tawi, Ravi and Chenab are the other important rivers flowing through the region [18]. There are records which reveal that about 1,748 medicinal plant species are found in Indian Himalayan Region (IHR) which forms a major part of Kashmir region [10,12]. Some historical facts and geographical observation have shown that, Jammu and Kashmir is inhabited by several ethnic groups [19-20], having distinct cultural and social identity and practice their own

knowledge of traditional herbal medicine from ages together [21]. This traditional knowledge and its principles have been inherited from one generation to another through the process of enculturation and hence needed to be documented immediately. There is a limited number of studies which have been carried out to document ethno medicinal use of different plant species in Kashmir region. The relation between human behaviour and plant communities are the objectives and targets of ethno botany and ethno medicine [19].

All these facts return to basic assumption which indicate that ethnic population are a reposition of knowledge of traditional medicine. Due to the rapid urbanization and industrial growth which directly affects the biodiversity of this region. The concern regarding the loss of native traditional knowledge and the possible extinction of medicinal plant resources of Kashmir, a need has been felt to review and document the studies carried on various traditional practices of use of native plants and herbs for various ailments/diseases in Kashmir. The present study was carried out to give an insight on the biodiversity particularly medicinal plant diversity, their procurement and uses in Baramulla district, Jammu and Kashmir, India. Above all this study will try to identify various plants of medicinal value found in the region besides it studies gaps in the current available knowledge of ethno medicine practiced in Kashmir valley especially in Baramulla district and a baseline for future research activities.

Materials and methods Description of the study area

The district Baramulla which derives its name from the city of Baramulla, was founded by Raja Bhimsina in 2306 BC. The city is called as the gate-way to the valley as it was located on the route to the Valley from Muzaffarabad, now in POK, and Rawalpindi, now in Pakistan. Baramulla district is one of the 20 districts in the Indian Union Territory of Jammu and Kashmir. Baramulla city is the administrative headquarters of the district. It is largest District in of Jammu and Kashmir in terms of both area and population [22].

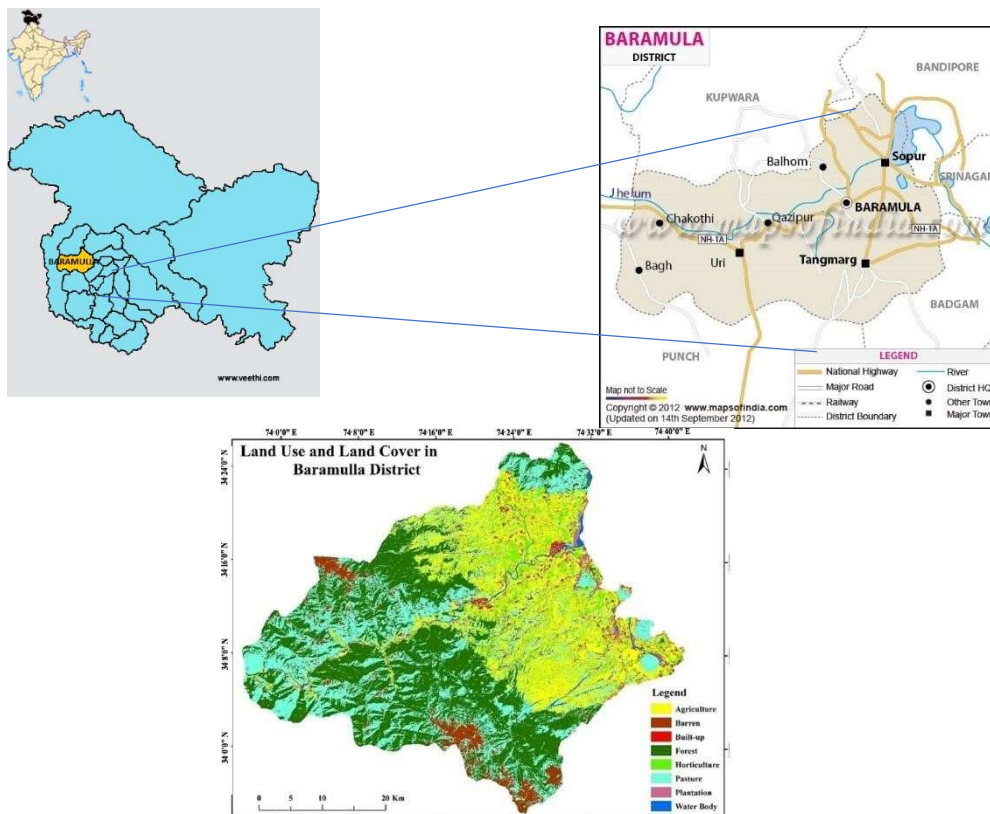


Figure 1: Map of Baramulla District, Jammu and Kashmir, India

The districthead quarter of Baramulla town lies between $34^{\circ}11'53''$ N and $74^{\circ}21'50''$ E (Figure 1) at a height of 1850 m (6069 ft.) MSL. Baramulla is surrounded by District Kupwara in the North and Northeast, Srinagar & Budgam Districts lie in the east and southeast and has Line of control towards the west. The most famous, lofty Pir-Panjal ranges cover District Baramulla from south and southwest and separates this District from Poonch District of Jammu province. The District Covers an area of 2072.42km^2 , comprising of 544 villages [23]. According to census 2011, Baramulla had population of 1,008,039 of which male and female were 534,733 and 473,306 respectively. According to the ration card portal of Jammu and Kashmir Baramulla district had 205,946 households. The tehsil wise households are Uri (21,757), Baramulla (43,984), Pattan (30,394), Tangmarg (27,720), Sopore (45,196), Rohama (14,396), Boniyar (8,766), Kunzer (7,313).

Administratively, the district is divided into 08 tehsils, which include Uri, Baramulla, Pattan, Tangmarg, Sopore, Rohama, Boniyar & Kunzer. District Baramulla covers large forest area and becomes an important resource. Forests are spreading over an area of 2,963 sq. km and the district has 71% area under

forests. The various communities inhabiting district like Gujjars, Bakarwals and Pahari's constitute a significant proportion of the district. Our earth is blessed with diverse group of vegetation. The varying biodiversity is beneficial for mankind. Humans depend on plants and their products from ancient times. The Report on State of the World's Plant 2016 revealed that there are an estimated 3, 91, 000 species of vascular plants and among these 3, 69, 000 are flowering plants. The report also reports that an estimated 20, 617 endangered plant species tests have been performed and represent a quarter of all Red List species, but only about 5% of all plants [23-28].

Sample size and informant selection

Six Tehsils (small administrative units), i.e., Uri, Baramulla, Tangmarg, Sopore, Rohama, Boniyar (Figure. 1), were selected from a total of 8 Tehsils based on the recommendations of local elders, local authorities, presence of traditional healers, vegetation cover and agro-climatic conditions. A total of 399 informants (272 males and 127 females) were selected in different age classes. Twenty herbal healers (key informants) were selected purposefully, whereas 379 general informants were selected randomly. To ensure a representative sample for the six tehsils, sample size was determined using Cochran's sample size formula as presented by Bartlett et al. [31]: $n = N/1 + N(e)^2$,

where n is the research sample size, N total number of households in all six selected Tehsils, e is the maximum variability or margin of error of 5% (0.05), whereas 1 is the probability of the event occurring. As a result, we got a total sample size of: $n = 161,819/1 + 161,819(0.05)^2$, or $n = 399$.

The sample size of each tehsil was determined based on the proportion of the number of households (HH) in the respective tehsils. For example, total household number of Uri was 21757, yielding a number of 54 ($n = 21757 \times 399 / 161819$). The same calculation was used for the other tehsils resulting in Baramulla (HH= 43984, $n = 108$), Tangmarg (HH= 27720, $n = 68$), Sopore (HH= 45196, $n = 111$), Rohama (HH= 14396, $n = 36$), Boniyar (HH= 8766, $n = 22$).

Data collection

The listing of ethno-medicinal plants was done based on the information got from the elders and healers from the respective tehsils (Table 2). Ethnobotanical data were collected in Baramulla District, Jammu and Kashmir following the methods used by [33, 33]. Semi-structured interviews were employed to obtain information on medicinal plant use, involving method(s) of preparation, routes of administration, plant parts used, threats to and conservation of these medicinal plants, based on the method adopted by Martin [32]. Interviews were undertaken based on a checklist of questions prepared in English and then translated into Kashmiri and Urdu. Also, the guided field walks were made to make notes on local name(s), preparation, parts used, diseases treated and all other relevant

information on the respective plant species. At the same time, some specimens from the wild and in home gardens were also collected.

A brief group discussion with key informants was organized to record the status, threats and conservation status of the plants used in traditional medicine. Information obtained during the discussion was carefully recorded and analysed as indicated by Martin [32].

Specimen collection and identification

Plant species were identified in the field and in the herbarium, using taxonomic literature [34]. Plant specimens (with their local name, collection number, date of collection, collector's name, location and description of the plant) were pressed, dried, labelled and taken to elders and healers for further identification.

Data analysis

Comparison analysis of medicinal plant knowledge between different social groups was done using SPSS (version 20) software. T test was carried out to compare medicinal plant knowledge between gender groups (married and single) and healing experience (key and general informants). Furthermore, Microsoft Excel Spreadsheet (2010) was used to compute percentages and sums and to tabulate and draw graphs.

If different plants were prescribed for similar ailments, informants were asked to indicate their preference for a certain ethno medicinal plant against specific ailment. Hence, preference ranking was done for the most important plants used to cure specific disease using Martin's method [32]. Each informant attributed values to their preferred plant against certain illnesses.

In order to evaluate the reliability of the information obtained, informants were contacted at least twice for the same topics, and correctness of information was checked and consolidated. If the second idea of the informant differed from the original information, it was rejected as irrelevant information. Only the relevant ones were retained and statistically analysed following the method adopted from Alexiades [35].

Participant agreement on plant use as traditional remedies against groups of ailments was done following [36] using the formula:

$$ICF = \frac{Nur - Nt}{Nur} - 1,$$

where Nur is the number of use reports for a certain illness group, and Nt is the number of plants used for a specific ailment category by all informants.

To analyse the importance of plants for a given remedy, fidelity level was calculated using the following formula:

$$FL = \frac{Ip}{Iu} \times 100,$$

where I_p is the number of respondents who independently mentioned the use of the specific plant for the same illness, and I_u is the overall number of respondents who cited the plant for any ailment in general [37].

Results Socio- demographic characteristics of respondents

The informants in the study area covered informants from different age groups, knowledgeable elders, males/females and youngsters, and from different educational levels. The majority of the informants in the study area were males (68.18%), whereas 31.82% were females. Informant age ranged from 21 to 31 years (31.82%), informant from the age group of 31 to 41 years (21.05%), informant from the age group of 41 to 51 years (16.29%), informant from the age group of 51 to 61 years (15.29%), informant from the age group of 61 to 71 years (12.78%), informant from the age group of 71 to 81 years (2.76%). All informants were Kashmiri belonging to different tehsils of Baramulla district. The informants who were having bachelor's degree level of education were (37.34%), high school informants (29.82%), illiterate informants (32.83%). The key informants were (5.01%) and the general informants were (94.99 %).

A two-tailed independent sample t test comparison of medicinal plant knowledge between male and female informants in the study area showed that there was a knowledge difference between them. The mean value for males was (3.26) whereas for females it was 2.98 (Table 1). Significant difference between key and general informants was observed in mean number of medicinal plant known and used in the study area: key informants were more knowledgeable (4.85) than general informants (2.98).

There was a significant medicinal plants knowledge difference between age groups in the study area (Table 1). Besides, there was also a significant medicinal plant knowledge difference between different education levels

Parameter	Category	N	Mean	Standard Deviation
Sex	Male	127	3.26	1.249
	Female	272	2.98	1.304
Age Group	21-31	127	2.14	1.132
	31-41	84	2.86	.920
	41-51	65	3.00	.984
	51-61	61	3.95	.939

	61-71	51	4.37	.799
	71-81	11	4.91	.302
Educational Level	Bachelor's Degree	149	2.92	1.260
	High School	119	2.97	1.238
	Illiterate	131	3.33	1.344
Healing Experience	Key Informant	20	4.85	.366
	Simple Informant	379	2.98	1.254

(Table 1).

Medicinal plant diversity, their habitats and growth form Overall, 21 medicinal plants belonging to 20 plant families, were documented to be used by the people of Baramulla District.

People in Baramulla District collect medicinal plants from different sources, including from the wild, home gardens, crop field, riversides and roadsides. Out of 21 medicinal plants, 8 (38%) were gathered from natural vegetation, 5 (23.8%) from home gardens, 6 (28.6%) from crop fields and 2 (9.5%) from riverside.

plant parts, mode of preparation and administration In Baramulla

District, various plant parts—including leaf, stems, roots, bulbs, seeds, fruits, bark, latex and whole plants—are used in traditional medicine. The most widely used plant parts were leaves which accounted (33%, 7 species) followed by roots (29%, 6) (Figure. 2).

Traditional medicines in Baramulla District are prepared from fresh or dry, and both fresh and dry plant parts. The highest number, i.e., 14 (66%) of remedial plants, were prepared fresh followed by both fresh and dried (4, 19%) and dry (3, 14%). Local people, including the healers of the study district, agreed that traditional medicines are prepared through different methods. Most are prepared by cooking/boiling (8, 38%) followed by extract formation (4, 19%) (Figure 3).

S. No	Taxon Name	Local Name	Family	Altitude Range; Flowering Phenology	Part(s) Used	Method of Preparation	Ethnomedicinal Uses
1	<i>Aconitum heterophyllum</i> [6-8, 38, 39, 40]	Paewakh	Ranunculaceae	2,400–4,500 m Flowering: April-May	Root	Crushing or directly consumed	Antidote For Snake Bites, To Treat Headache And Cough.
2	<i>Artemisia absinthium</i> [6-8, 38, 40]	Tethwan	Asteraceae	1,500-2,100 m. Flowering: June onwards	Leaves	Boiling/cooking	Obesity, Diabetes, Liver Infection
3	<i>Coriandrum sativum</i> [6-8, 40]	Danival	Apiaceae	500-800 m Flowering: April-May.	Seeds	Boiling/cooking	Hair Fall
4	<i>Cannabis sativa</i> [68, 39, 40]	Bhang	Cannabaceae	2000-2500m Flowering: May-July	Leaves, seeds and stem	Boiling/cooking	Ear-Ache, Blood Purifier, Scabies and Piles
5	<i>Cedrus deodara</i> [6-8, 38, 40]	Divdar	Pinaceae	1,500–3,200 m Flowering: May-July.	Stem, Bark	Crushing and pounding	Skin Rashes and External Ulcers

6	<i>Dioscoreadeltoidea</i> [40]	Kraeth	Discoreaceae	450-3100 m. Flowering: May-July.	Leaf	Boiling/cooking	ophthalmic Infections, Urinary Infections
7	<i>Datura stramonium</i> [38, 39, 40]	Datur	Solanaceae	50-2200m Flowering: July-Sept.	Seeds	Boiling/cooking	Rheumatism, Frost Bite, Toothache, Tonic, Birth control
8	<i>Ficus carica</i> [6, 38, 40]	Anjeer	Moraceae	. 5,420 m Flowering: MayAugust.	Stem, milky	Crushing and pounding	Insect Bite and Warts. Birth Rate Control, Latex, Fruit Pulp
9	<i>Juglans regia</i> [6-8,]	Daankul	Juglandaceae	3,000-4,000 m Flowering: March-April	Leaf, Bark	Boiling/cooking	Tooth Infection, Scrofula, Rickets And Leucorrhoea
10	<i>Malva sylvestris</i> [68, 38, 40]	Sotal	Malvaceae	2500-3500 m Flowering: AprilJune	seeds	Boiling/cooking	Cough, Fever, Eye Sight
11	<i>Papaver somniferum</i> [6, 40]	Kashkhas	Papaveraceae	585- 2056m Flowering: AprilJune	Fruit Dry	Chewing	Cough, Diarrhoea
12	<i>Phytolaccaacinososa</i> [8, 39, 40]	Brand	Phytolaccaceae	1500-3000m. Flowering: JuneSept.	Root	Boiling/cooking	Narcotic Effect, Sedative
13	<i>Portulaca oleracea</i> [8, 40]	Nuner	Portulacaceae	2000-2800 m. Flowering: MarchJune	leaves	Boiling/Cooking	For Liver Inflammation, Cough, Extract Of Whole Plant Is Taken. For Burns Crushed Plant Is Applied On Affected Area
14	<i>Punica granatum</i> [68, 40]	Daankul	Punicaceae	2000 m-2500m Flowering: January-February	Seed	Crushing and pounding	Jaundice and Anaemia
15	<i>Rosa webbiana</i> [6, 7, 38, 40]	Gulab	Rosaceae	1500 m - 4000 m. Flowering: May-July	Flowers	Extract	Cough and Colds.
16	<i>Rumexacetosa</i> [6, 7, 39]	Obej	Fabaceae	2100-4100 m Flowering: AprilJune		Extract	For Stomach Problems, Whole Plant Is Eaten As Vegetable. For sting of nettles, leaves are rubbed on affected part to get relief.
17	<i>Taraxacum officinale</i> [6-8, 39, 40]	Hand	Asteraceae	1600-2400; Flowering: MayJuly	Roots	Boiling/Cooking	Back Pain, Common Cold, Chest Infection
18	<i>Trigonella foenumgraecum</i> [6-8, 40]	Meth	Fabaceae	1300-1400m. Flowering: JanApr.	Seeds	Boiling/Cooking	Back Pain
19	<i>Urtica dioica</i> [6-8, 38]	Soi	Urticaceae	1000-2500 m. Flowering: August-September.	Leaves and Roots	Boiling/Cooking	Rheumatism
20	<i>Viola odorata</i> [7, 40]	Bunufsha	Violaceae	1800-2600; Flowering: May-July	Leaves,	Extract	Seeds And Flowers Respiratory Problems
21	<i>Vitis vinifera</i> [6, 7, 38]	Daech	Vitaceae	1700-2100; Flowering: AprilMay	Leaves	Extract	Skin Rashes, Sores, Eruptions

Table 3: Fidelity Level of Medicinal Plant found in the area

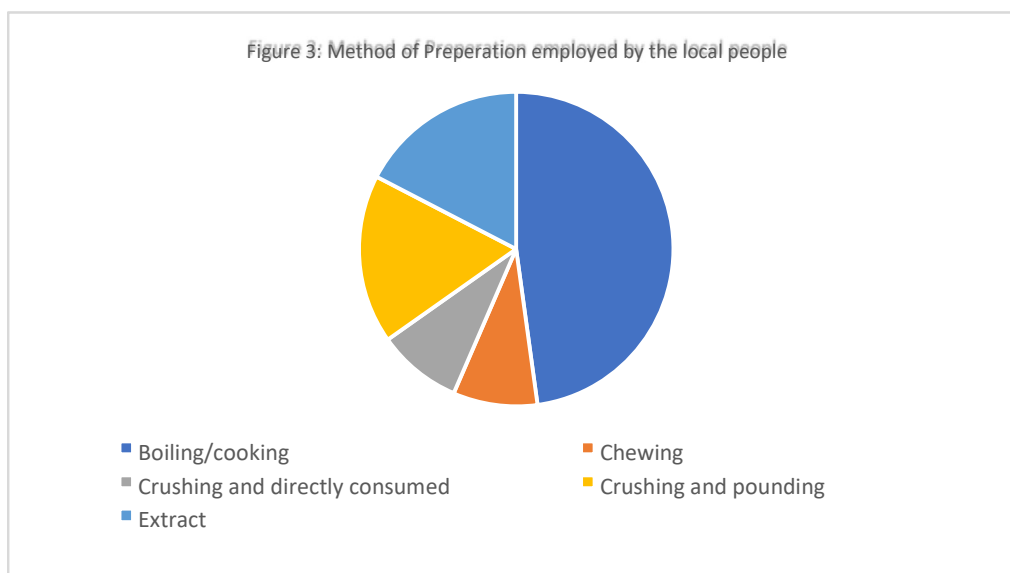
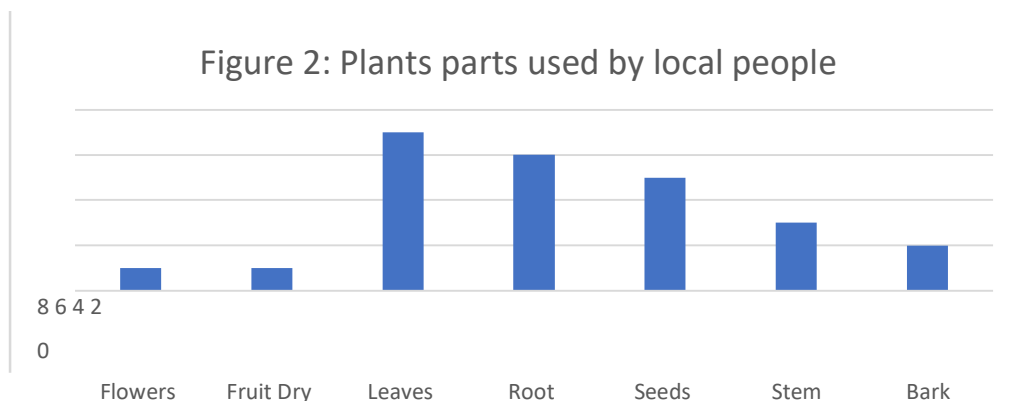
Taxon Name	Local Name	Main Ailment Treated	IP	IU	FL = $\frac{IP}{IU} \times 100$,	Rank
<i>Rosa webbiana</i>	Gulab	Cough	256	257	99.6109	1
<i>Punica granatum</i>	Daankul	Jaundice	205	206	99.5146	2

<i>Dioscoreadeltoidea</i>	Kraeth	Ophthalmic	86	87	98.8506	3
<i>Taraxacum officinale</i>	Hand	Anaemia	256	260	98.4615	4
<i>Aconitum heterophyllum</i>	Paewakh	anti-emetic, and antiinflammatory.	201	205	98.0488	5
<i>Malva sylvestris</i>	Sotal	Cough	205	210	97.619	6
<i>Portulaca oleracea</i>	Nuner	Cough	172	178	96.6292	7
<i>Juglans regia</i>	Doan kul	Tooth Infection	98	102	96.0784	8
<i>Cedrusdeodara</i>	Divdar	Skin	171	180	95	9
<i>Ficuscarica</i>	Anjeer	Insect Bite	174	184	94.5652	10
<i>Trigonella foenumgraecum</i>	Meth	Back Pain	253	268	94.403	11
<i>Phytolaccaacinoso</i>	Brand	Narcotic	157	167	94.012	12
<i>Viola odorata</i>	Bunufsha	Respiratory	185	197	93.9086	13
<i>Vitis vinifera</i>	Daech	Skin	156	167	93.4132	14
<i>Papaver somniferum</i>	Kashkhas	Cough	201	220	91.3636	15
<i>Cannabis sativa</i>	Bhang	Blood Purification	187	205	91.2195	16
<i>Rumexacetosa</i>	Obej	Skin	114	125	91.2	17
<i>Coriandrum sativum</i>	Danival	Hair Fall	98	108	90.7407	18
<i>Datura stramonium</i>	Datur	Tooth Ache	160	187	85.5615	19
<i>Urtica dioica</i>	Soi	Rheumatism	156	185	84.3243	20
<i>Artemisia absinthium</i>	Tethwan	Diabeties	201	256	78.5156	21

Table 4: Informant consensus factor for Eight categories of ailments

Ailment	No of plant species	Citations	ICF = $\frac{Nur - Nt}{Nur - 1}$,	Rank
Insect Bite and Warts.	2	273	0.996323529	1
obesity	2	95	0.989361702	2
liver inflamation	2	87	0.988372093	3
birth control	2	85	0.988095238	4
Indigestion, Constipation	3	145	0.986111111	5
Cough and Colds.	6	301	0.983333333	6

ophthalmic	2	32	0.967741935	7
skin related	6	105	0.951923077	8



Discussion

The high number of men respondents as compared to female respondents in the study area might be due to the fact that traditional healers usually prefer to pass their indigenous medicinal plant knowledge to other men. A diverse set of plant species is used by the people of Baramulla District for medicinal purposes. The main medicinal plants found in the district were documented by this study.

The people in Baramulla District obtained different medicinal plants from various sources from cultivating in home gardens to wild areas. Ethnobotanical studies in different parts of Kashmir [6-8,38] showed that most of the remedial plants were gathered from the natural vegetation.

After calculating the fidelity level of medicinal plants Most reported plant species was *Rosa webbiana* and the least reported is *Artemisia absinthium*. This might be due to easy availability to local people and their abundance.

Also it was found that medicinal plants leaves were highest used as compared to other plants. The leaves were followed by roots, stem, seeds, bark and least used were flowers.

The method of preparation of medicines from different medicinal plants showed that boiling/cooking is most used method of preparation. This method of preparation is followed by extract, crushing and pounding, and least is chewing.

There was a significant knowledge difference in mean number of medicinal plants mentioned by male or female informants in Baramulla District. As could be expected, key informants were more knowledgeable than general informants (Table 1). This could be attributed to their years' long experience and high level of secrecy in using medicinal plants. A similar result was also reported by Giday et al. [41]. The significant difference observed between age groups shows that the knowledge of youngsters on traditional medicinal plants was low compared to that of adults and elders (Table 1). This is an indication of the decline of traditional plant knowledge in Baramulla District. Factors such as, formal health service, modern education and the oral transmission might explain this lower knowledge level. In addition, the better knowledge of older people might be the result of their long contact and experience with plants and associated therapeutic uses. The same results were reported in different parts of Ethiopia [42] in that young people have less knowledge compared to their elders. The observed significant difference in mean number of medicinal plants reported among different education levels in the study area shows that illiterates and informants who only had minimum formal education were more knowledgeable (Table 1). This indicates that illiterates hold more knowledge than more educated respondents. This might be due to the negative impact of modern education on traditional medicine knowledge.

During group discussions, key informants confirmed that a number of medicinal plant species are indeed disappearing in their environment due to both natural and anthropogenic factors. Most informants in Baramulla District recommended planting of medicinal plants as the best approach to conserve and protect herbal medicines, followed by soil and water conservation, bringing in protected areas and raising awareness of local people on conservation issues. Home gardens in Baramulla District (could) have a vital role in conserving medicinal plant species. The rich diversity of remedial plants in home garden was obtained by cultivating and protecting a mixture of annual and perennial herbs and woody perennials. Cultivating useful plants in home gardens and protecting and conserving wild natural setting (in situ) is crucial to guarantee future access to herbal medicine for maintaining the primary healthcare system of rural

communities but also to be able to provide materials for new chemical lead discovery through laboratory investigation.

Conclusions

There is the rich diversity of medicinal plants found in the Baramulla District. There is also a rich traditional knowledge about preparation and application found among the people of the district about these medicinal plants. Overall, 21 plant species were documented to treat different ailments. Moreover, secrecy, oral-based knowledge transfer and reluctance of young generations to acquire medicinal plant knowledge erode the local indigenous knowledge systems. The urbanisation has also adversely affected the use of traditional medicines because of easily accessible allopathic and modern medical facilities. The abundance of these modern facilities has place the use of traditional on the verge of extinction. Local communities should be actively involved in conservation and management of remedial plant resources and their indigenous knowledge in their locality. The local people in Baramulla District have to be encouraged to cultivate multipurpose plants such as *Taraxacumofficinale*, *Portulacaoleracea*, *Ficuscarica*, *Coriandrumsativum* and *Malvasylvestris*. These multipurpose plants can easily be used as vegetables on routine basis. There is also a need for development of priority areas for community-managed forest (park) establishment in the district for the conservation of forests in general and medicinal plants in particular.

Abbreviations

SPSS: Statistical Package for the Social Sciences
ICF: Informant consensus factor
HH: Household.
MSL: Mean Sea Level
FL: Fidelity Level

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