

# Exploration of Ethnomedicinal Flora Used Against Various Human Ailments in Moist Temperate Himalayas of District Bagh, Azad Jammu and Kashmir

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**ABSTRACT:** Present studies have been carried out to access, document and describe the ethno-medicinal potential of three different sites of projected area. Structured, semi structured and open ended questionnaires as well as detailed oral interviews of local inhabitants were the methodology to gather valuable knowledge. A total of 34 ethnomedicinally important taxa belonging to 25 families were reported. Among them, 2 were Pteridophytes, 3 were Gymnosperms while the remaining 29 were Angiosperms. *Asteraceae* contributed a significant number of species (4 spp.), followed by *Pinaceae* (3 spp.), *Ranunculaceae*, *Aracaceae*, *Violaceae* and *Poaceae* (2 spp. each) while remaining 19 families represented single species. Regarding habit, 22 herbs, 7 shrubs and 5 trees were documented. Mode of administration of the medicinal flora was as, 27 plants were applied externally while 7 species had both internal and external applications. Majority of the reported taxa were used to cure multiple type of diseases e.g. 12 species for gastrointestinal disorders, followed by respiratory diseases (9 spp.), muscular malfunctions (6 spp.) and hepatic disorders (4 spp.). In addition, three plant species were used against skin problems, eye infections, fever and headache and urinogenital troubles, while two species each were used for cardiovascular and neruro malfunctions. Only one plant was used against snake bite.

**Keywords:** Himalayas, Ethno Medicinal, Taxa, Diseases, Habit, Flora

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## INTRODUCTION

The term ethnobotany was coined by J. W. Harshberger in 1895 for the first time, and is defined as human-plants interaction. Origin of this scientific discipline is as old as the first man used plants to fulfill his daily necessities and ethnobotanists are naturally interested in discovering how plants are being used by the indigenous human communities (Aumeerudy, 1996). Plants and other living organisms have great potential to cure human diseases. According to World Health Organization traditional medicine is an imperative contributor to health goals and has been encouraging its development through testing herbs poisonousness and refining tactics of herb gathering, drying and safeguarding (Shinwari and Qaiser, 2011). Mankind has constantly use the natural resources of remedial stuff to cure human diseases. The effort to cure the illnesses by means of traditional phyto-therapy has been made in all parts of the world (Abella et al., 2000 and Heinrich and Bremner, 2003). Presently, ethno-botanical

and ethno-pharmacological skills of certain nations are used in the treatment of a wide variety of diseases (Sheng-Ji, 2001; Uniyal et al., 2006; Hameed et al., 2011) including cancer, Acquired Immuno Deficiency Syndrome (AIDS), Alzheimer's disease, alcoholism, etc.

The ethnobotany in Azad Jammu and Kashmir (AJ&K) is going to be advanced with the passage of time and several potential studies have been acknowledged from different parts of AJ&K. Ch et al. (2013) carried out an ethnomedicinal inventory of Khahuta, and reported 45 plant species which are used indigenously as well as exported to other cities of Pakistan to manufacture drugs. They found the following medicinal plants which have the highest Fidelity Level (FL); *Senecio chrysanthemoides*, *Geranium wallichianum*, *Arnebia bethemii* and *Saussurea costus*. A study on diversity of medicinal plants was carried out in alpine pastures of district Bagh, by Shaheen et al. (2012). They have documented 71 plant species belonging to 22 plant families from which 70% had medicinal value. Mahmood et al. (2012) recorded 25

common medicinal plants belonging to 14 families from Kotli, Azad Kashmir. The primary source of indigenous medicines were herbs (56%), shrubs (28%) and trees (16%). Mahmood et al. (2011) conducted an ethnomedicinal survey from Neelum, Azad Jammu and Kashmir and recorded 40 species from 31 families which were used to treat various ailments like stomach problems, diarrhea, rheumatism, toothaches, small tumors, hepatitis and allergies. Bagh is one of the ten districts of AJ&K state which lies in the western Himalayas, with varying climatic

zones which exhibit rich floristic diversity (Anonymous, 2007). The total population of the district according to the 1998 census was 395,000, which is estimated to have increased up to 434,000 in 2013, with an annual growth rate of 2%. Most of the populace depend upon plant resources for their daily medication purposes. In present study, three different sites of this district namely Mehmood Galli, Lasdanna and Bankhori lying between 73° - 75° east and 33° - 36° north with altitudinal variations of 1500-3500 meters were ethnomedicinally investigated (Fig 1).



Figure 1. Map of district Bagh, AJ&K

## MATERIALS AND METHODS

Present up to date research work for collection, processing and compilation of ethnomedicinal data was started with numerous data collection field trips which were conducted in three potential territories of the study area. For the collection of ethnomedicinal knowledge from the study area, the following three methods were frequently

used which are also practiced by (Ibrar et al., 2007; Mahmood et al., 2011; Uysal et al., 2012).

### Field observations

During the field trips, direct observations were made at different sites of the study area, utilization of plant taxa and the way of their administration was recorded. All the ethnomedicinally used plants were collected during their flowering period.

### Questionnaires and oral interviews

The indigenous ethnomedicinal knowledge was collected from native people including local herbalists (Hakeems) by oral interviews, structured, semi structured, open ended questionnaires and guided field walks. During the survey, plant specimens which were reported as medicinal by indigenous people were also collected for further analysis.

### Lab investigations

In laboratory, the collected plant specimens were hard-pressed, dried and mounted on herbarium sheets. The identification was then made with the help of available floristic literature. Botanical names of the plant species were cited in alphabetical order followed by their common names, English names, flowering period, families, habit and habitats, part used, methods of usage against various human ailments etc. (Table 1).

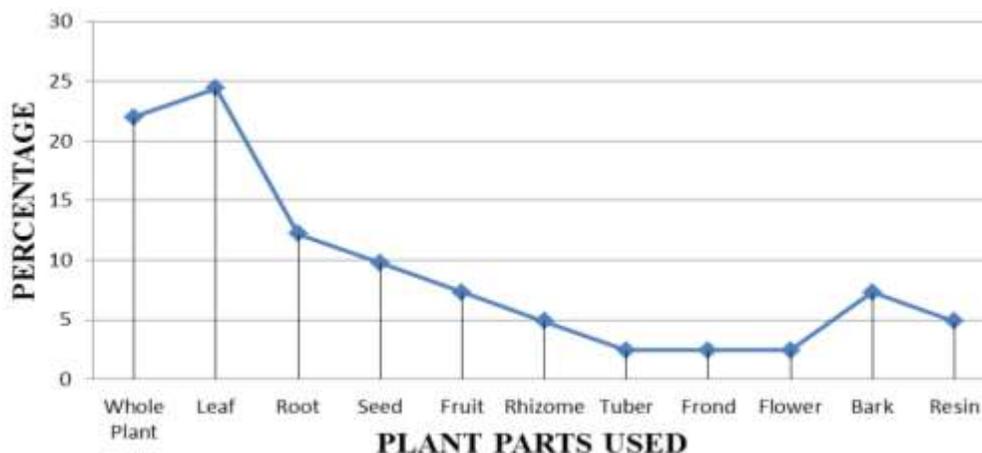
### Ethical rules

Since in the present investigation there was no human or animals involved, there was no ethical rules to be considered.

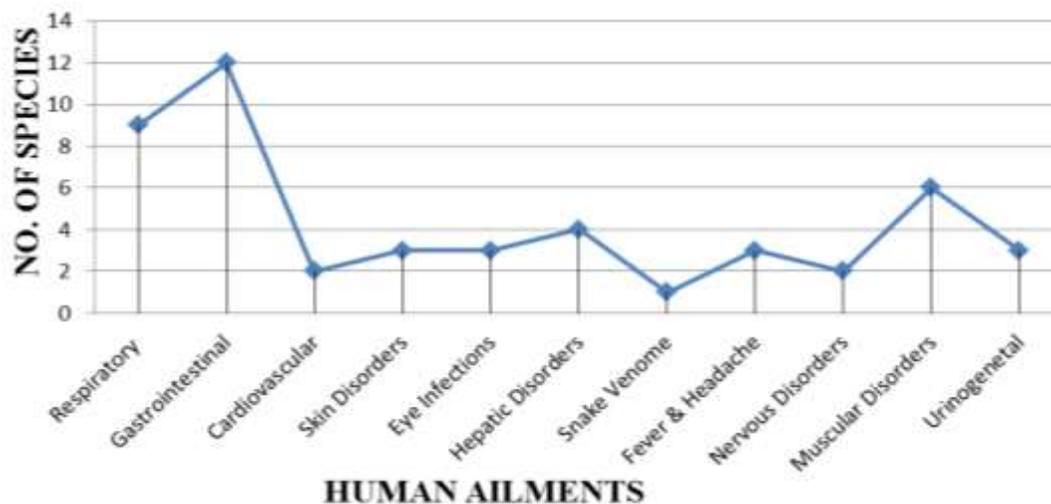
## RESULTS

Moist temperate Himalayan belt of AJ&K state is rich in ethnomedicinal phytodiversity, which is used to cure various human ailments by local inhabitants. The present study deals with the exploration of these plant resources of three main sites of the respective area. All the recorded plant species are arranged alphabetically and their botanical name, local name, English name, flowering period, family, part used and way of consumption by local

people against various diseases are listed (Table 1). In current research work, a total of 34 ethnomedicinally used wild plant species belonging to 25 families were documented. Of them, two species belonged to Pteridophytes, three were Gymnosperms while the remaining 29 were angiosperms. *Asteraceae* contributed a significant number of species (4 spp.), followed by *Pinaceae* (3 spp.), *Ranunculaceae*, *Aracaceae*, *Violaceae* and *Poaceae* (2 spp. each) while 19 families represented single species each. The study revealed that indigenous people have more familiarity about the medicinal usage of herbaceous plants which were dominant in the investigated area represented by 22 species followed by seven trees and five shrubs (Table 1). Different parts of single plant taxa were employed to treat several human diseases e.g. leaves of plants were highly used (24.39%), followed by whole plant (21.95 %), root (12.19 %), seed (9.75%), fruit and bark (7.31 % each) while remaining five parts were occasionally used (Figure 2). Recorded ethnomedicinal flora of the investigated area is used to treat various diseases of the native people. Mode of administration was as, 27 plants were applied externally while 07 species have both internal and external application. Majority of the reported taxa were used to cure multiple type of diseases e.g. 12 species for gastrointestinal disorders, followed by respiratory diseases (09 spp.), muscular malfunctions (06 spp.) and hepatic disorders (04 spp.). In addition, three plant species were used against skin problems, eye infections, fever and headache and urinogenital troubles each respectively while two species each were administrated for cardiovascular and nervous disorders. Only one plant was used against snake bite (Figure 3).



**Figure 2.** Showing percentage of plant parts used against various human diseases in Mehmood Galli, Lasdanna and Bankhori sites of district Bagh, AJ&K



**Figure 3.** Showing human ailments treated by number of plant species recorded from Mehmood Galli, Lasdanna and Bankhori sites of district Bagh, AJ&K

**Table 1.** Showing botanical names, common names, English names, flowering period, family and mode of usage of medicinal plants recorded from Mehmood Galli, Lasdanna and Bankhori sites of district Bagh, AJ&K

Botanical Name	Common Name	English Name	Flowering Period	Family	Human Ailments
<i>Abies pindrow</i>	Tung	Silver fir	April-Sep.	Pinaceae	Dried leaf and bark crushed into powder which is used against cough, cold and asthma.
<i>Aesculus indica</i>	Ban Khor	Horse chestnut	May-July	Sapindaceae	Seed oil is used to treat skin allergy.
<i>Cedrus deodara</i>	Deodar	Himalayan Cedar	Sep-Nov.	Pinaceae	Resin proved to be vital in smoothening cracked skin while dried bark and seeds are used to cure fever and dysentery.
<i>Lonicera quinquelocularis</i>	Puth	Honey suckle	Apr-July	Caprifoliaceae	Leaves soaked in water; liquor is then used as the refresher of eye infection.
<i>Persea duthiei</i>	Breen	Bay tree	Apr-May	Lauraceae	Fresh leaf extract is administered orally to cure dysentery.
<i>Pinus wallichiana</i>	Rair, Kail	Blue pine	Feb-April	Pinaceae	Orally administrated resin is the killer of colon worms.
<i>Quercus baloot</i>	Rheen	Oak	July-Oct.	Fagaceae	Quercus fruit is essential against diarrhea and gonorrhoea.
<i>Berberis lycium</i>	Simblo	Berber	April -June	Berberidaceae	Root and shoot bark soaked in water, then liquor is administrated before breakfast and is used as a blood purifier and anti-diabetic.
<i>Indigofera heterantha</i>	Jandi	Himalayan indigo	May-July	Leguminoceae	Young leaves are chewed to treat mouth infection and ulcer.
<i>Rosa brunonii</i>	Tarnari	Musk Rose	May-July	Rosaceae	Flower extract i.e. Araq is used to relief eye problems e.g. burning, infection etc.
<i>Sarcococca saligna</i>	Bansathra	-	Sep-March	Buxaceae	Fresh leaf extract is antipyretic and calmative.
<i>Viburnum grandiflorum</i>	Guch	-	Sep-October	Capparidaceae	Dried flower crushed into powder which is a blood purifier.
<i>Achilla millefolium</i>	Kangi	Yarrow	July-Sep.	Asteraceae	Extract of whole plant is tonic and use to treat cold, cough and flue.
<i>Adiantum venustum</i>	Kakwa	Himalayan maidenhair	-	Pteridiaceae	Decoction made of root and fronds is beneficial to cure yellow fever in the area.
<i>Anaphalis nepalensis</i>	Chiki	Angelica roots	-	Asteraceae	Juice made from whole plant is use at skin which prevents skin from harms of solar radiations.

<i>Anemone vitifolia</i>	Jari	Vine leave <i>Anemone</i>	May-July	Ranunculaceae	Fresh root extract is used to cure dysentery and headache caused by heat stroke.
<i>Arisaema flavum</i>	Sapboti	Cobra Lily	June-August	Araceae	Paste made from tuber of this plant is proved to be essential against snake bite.
<i>Arisaema jacquemontii</i>	Hathbis	Jacquemont's Cobra-Lily	June-July	Araceae	Fruit and rhizome of this plant is poisonous but a small quantity is administrated against nervous disorders in the area.
<i>Bergenia ciliata</i>	Zakhmehyat	Bergenia	Mar-July	Saxifragaceae	Crushed rhizome is used to treat alimentary canal infections as well as muscular disorders.
<i>Cynodon dactylon</i>	Khabal	Devil grass	-	Poaceae	Juice made from whole plant is essential for dysentery and muscular pain.
<i>Digitaria ciliaris</i>	khaa	blanket crabgrass	-	Poaceae	Whole plant roasted in oil and then placed on fracture and cover by bandage can externally relief pain.
<i>Dryopteris stewartii</i>	-	Wood fern	-	Dryopteridaceae	Vegetable of whole plant is used to cure stomach ulcer in the area.
<i>Fragaria nubicola</i>	Budmewa	Wild strawberry	Apr-June	Rosaceae	Fruit is essential against stomach ulcers while dried leaf powder is a wound antiseptic
<i>Geranium nepalensis</i>	Ratanjoot	Nepalese cucumber	July-Sep.	Geraniaceae	Root powder is used against urinary infection and backache.
<i>Impatiens edgeworthii</i>	Mushk Boti	Edge worth balsam	June-Oct.	Balsaminaceae	Extract made from whole plant is used to treat gout and arthritis in human being.
<i>Myriactis nepalensis</i>	-	-	April-June	Asteraceae	Pickle made from leaves of this plant is carminative in nature.
<i>Prunella vulgaris</i>	Chikal	-	June-Sep.	Lamiaceae	Seeds of Chikal are antipyretic, laxative, tonic and diuretic. Dried seeds are administrated orally to cure cough.
<i>Rumex hastatus</i>	Hulla	Curle sock	July-Sep.	Polygonaceae	Decoction made from root and leaves of this herb is used to cure jaundice (Hepatitis B).
<i>Saxifragara androsacea</i>	-	Saxifrage	May-Sep.	Ranunculaceae	Leaves are anti rheumatic while seeds are used against cold, cough and asthma.
<i>Swertia paniculata</i>	Chirayta	Chiretta	July-August	Gentianaceae	Dried leafy powder is used to cure various eye disorders.
<i>Taraxacum officinale</i>	Hund	Dandelion	April-Sep.	Asteraceae	Kidney and liver disorder are treated by dried powder made from leaves and roots of this plant.
<i>Urtica dioica</i>	Kairi	Sting nettle	May-Oct.	Urticaceae	Decoction of the whole plant is astringent and anti-hermitic.
<i>Viola biflora</i>	Banafsha	Violet	Mar-June	Violaceae	Chest infection is cured by decoction made from the whole plant.
<i>Viola odorata</i>	Banafsha	Sweet violet	Mar-May	Violaceae	Dried powder is used to treat cough, flue and jaundice.

## DISCUSSION

It is accurately understood that the existing ethnomedicinal pharmacology is as aged as human creature. A variety of medicinal plants have been in use of populace from the time immemorial. The origin of customary medicinal system was traced back from medicinal system of Greeks which was adopted by the Arabs and later they spread it to the subcontinent and Europe. Two oldest reported written records on the medicinal plants of Indo-Pak were Rigveda (4500-1600 B.C) and Ayurveda (2500-600 B.C.) respectively (Ahmad, 2002). With the passage of time, the use of medicinal

plants by local inhabitants of any area has increased and became advanced. Currently all over the world the medicinal plants are used with great interests and are active participants in the trade and economy of any country. Scientifically the discipline is recognized worldwide and many research works have been completed so far. A lot of work has been published from Pakistan and especially from AJ&K state also. With reference to district Bagh limited number of medicinal plant studies were carried out by Shaheen et al. (2012) and Qureshi et al. (2007) etc. Three investigated sites namely Mehmood Galli, Lasdanna and Ban Khori are purely hilly areas which were explored ethnomedicinally for the first time during the current study.

People of respective area are not much advanced as they are living traditionally and are dependent on ethnomedicines. They prefer to treat themselves through plants. Aged people of the investigated areas and especially housewives are well equipped with indigenous medicinal knowledge. New generation is not paying much interest to conserve this endangered expensive treasure as a result of which it is at the verge of extinction. The present study report the ethnomedicinal use of 34 plant species belonging to 25 families from moist temperate Himalayan belt of district Bagh, AJ&K. Plant species belonging to family *Asteraceae* were mostly used by the local inhabitants. The results are in accordance to study of Samreen et al. (2016) and this is not surprising since *Asteraceae* is one of the largest families of flowering plants and is the most abundant in this region (Shaheen et al., 2012). Herbs were acknowledged as the prime source of medication which may be attributed to humid climate of the area that facilitates the expansion of herbaceous flora. These findings are in accordance with other studies conducted somewhere else in temperate zone, reporting herbs as the most dominant and ethnomedicinally important plants (Shaukat et al., 2012 and Khan et al., 2012). The most commonly used plant part was the leaves followed by whole plant, roots, seeds, fruits and bark while rest of the parts were infrequently used. The greater use of leaves and whole plant for the purpose of medicine is also reported by (Qureshi et al., 2009; Qaisar et al., 2013 and Ajaib et al., 2014) in their studies respectively. In addition, all plants are singly used for vocal and internal application in treating various diseases including gastrointestinal disorders, respiratory diseases, muscular malfunctions hepatic disorders, skin problems, eye infections, fever and headache, urinogenital troubles, cardiovascular and nervous disorders. This study is in agreement of Qureshi (2012).

## CONCLUSION AND RECOMMENDATION

The gathered information is based on structured, semi structured questionnaires as well as on direct field interviews of local inhabitants, which have a long experience with the usage of these plants to treat various types of diseases. The comprehensive recording of approved doses, administrations and relevant way of consumption is expected to lead in the development of new or alternative drugs through further works on phytochemistry, ethnopharmacology, herbal medicines, toxicity and clinical research. There is an immense need to formulate policies for sustainable utilization of these

natural plant resources as well as to conserve this endangered expensive treasure.

## Competing interests

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

## Authors' Contribution

SS carried out ethnobotanical survey in moist temperate Himalayas of District Bagh, Azad Jammu and Kashmir. RS and UH helped in editing the manuscript and in multivariate data analysis. SK and SMFA provided assistance during the field survey. All the authors have read and approved the final manuscript.

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