



## Ethnobotanical Profiling of Vegetative Flora of Hajira Village Kalpur (Davigali) Union Council Banteeni District Poonch Azad Kashmir

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### Abstract

This research survey was originated with the aim to explore the knowledge of indigenous medicinal plants of Hajira village Kalpur (Davigali) District Poonch Azad Kashmir. The study was conducted from June 2022 to October 2022. The field trips were conducted and information was taken from the local people of selected area using structure and semi structured in individual and group discussion. Information was gathered on 30 plants belonging to 20 different families. Most of the plants have multiple local uses. Various quantities indices such as Family contribution, Mode of administration and plant parts were used to obtain the suitable information. Among families, the contribution of Rosaceae was highest (20%). In mode of administration extract, powder showed great contribution of 13% while contribution of leaves, fruits was 20% and in diseases category, 32 diseases were treated including antidiabetic (8%), Cancer and Urinary infection (7%). The present research provides valuable information on important medicinal flora of Hajira village Kalpur (Davigali) District Poonch Azad Kashmir. From the study, the area has diverse vegetation and has good potential for ethno botanical aspects.

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## Introduction

Ethnobotany is the systematic knowledge of plants in local culture and their application in traditional pharmaceutical industry (Jennings *et al.*, 2014). Humans meet their need by plants i.e. medicine, food, fuel, shelter and fodder for animals (Towns and Van-Andel, 2016). Ethnobotanical investigation on wild and domesticated plants has significant value in medicinal aspects (Sansanelli *et al.*, 2017; Faruque *et al.*, 2018). The main goal of ethnobotany is to document the new curative knowledge of threatened species and preserve them for future use (Ajaib *et al.*, 2014). The therapeutic plants extract has been applied for screening of new drugs to treat human diseases (Alarcon *et al.*, 2015; Ahmad *et al.*, 2017). Low economic condition of human population is the current demand for using medicinal plants instead of synthetic medicines (Aziz *et al.*, 2017). In addition, considerable potential of natural sources as compared to adverse and high cost effects of synthetic drugs (Hussain *et al.*, 2019).

Ethno-botany correlates the plants with indigenous people and their social and cultural environment. John Harshberger introduced ethnobotany firstly in 1896. Though, the ethnobotany began long, in ancient times (Mahmood *et al.*, 2011; Arshad *et al.*, 2014; Amjad *et al.*, 2014). Taxonomists, pharmacologists, ecologists, watershed and wild life managers are using indigenous medicinal information of plants to improve the affluence of a particular region besides listing the traditional or local uses (Ibrar *et al.*, 2007). In Pakistan for curative purposes number of plants are being used by local communities (Bibi *et al.*, 2008). According to Hocking, 84% of Pakistan's population is rely on traditional medicines for their primary health protection (Amjad *et al.*, 2015).

Since with the beginning of human development, there is a significant role of medicinal plants (Kayani *et al.*, 2014; Amjad *et al.*, 2017). The native and traditional knowledge of outmoded drugs are used in scientific discipline for several centuries (Baydoun *et al.*, 2015). By the rapid development in modern drugs and technique to cure health problem decline the

traditional knowledge, with the passage of time utilization of plants in modern medicine has increased but the traditional system still succeeds in the rural communities (Ahmed *et al.*, 2012). New studies and researches on the ethnobotany provide several ways for the invention of modern drugs (Amjad *et al.*, 2017). Unfortunately, only hakims are associated with medicinal plants, there must be a great attention to the ethnobotanical aspects of plants at government level (Shinwari *et al.*, 2000).

Azad Jammu & Kashmir is a hilly area having diverse climate, soil and habitat type naturally. Number of plants specifically present in this area which have medicinal importance while previous studies show specific culture of Azad Kashmir and people with lot of knowledge about local herbal plants (Ahmed *et al.*, 2009). Kalpur is situated at the east of city Hajira and it is one of the most prominent villages of Hajira District Poonch. This is the first effort in village Kalpur union council Banteeni to provide ethnobotanical uses of different plants by local people. Moreover, the area is abundant in useful plants because of its sustainable environment but this area is remained unfamiliar due lack of resources and knowledge. This study report examines the traditional knowledge on the utilization of the medicinal plants from the Hajira village Kalpur (Davigali) District Poonch Azad Jammu and Kashmir, Pakistan.

## Materials and methods

### Study area

Kashmir is a State that is governed by two countries: India and Pakistan. Pakistani administrated part is known as Azad Jammu and Kashmir (AJK). Hajira is the one of the developed city of District Poonch AJK. It is located at 33.45° to 59.99° north latitude and 73.53° to 59.99° east longitude. Kalpur is a village near Davi Gali and Davi Gali has historical background, Plangi fort is present here. It is located 8 km from Hajira, 12 kilometers from Banjonsa, and 32 km from Rawalakot an altitude of 5,480 feet (Fig. 1). Davi Gali has green grassy lands surrounded by pine forest and mountains. The name Devi Gali is linked to this area's history.



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

### *Vegetative survey*

In June 2022 many field trips were arranged to the area for collecting information about the local traditional uses of plants. The medicinal knowledge was collected from old knowledgeable people and local hakeems. Information on the local uses, recipes, etc, was gathered through open-ended questionnaires and by interviews. The distance between sampling points were 10 and 20 km within the hills. The information was considered reliable and reported when at least 10 interviewees attested to the name and usage of the plants.

### *Data collection*

Duration for collection of Plants was from June 2022 to October 2022. Total 30 informants were selected randomly contains 11 male and 19 females. The age of the informant fluctuated from 50 to 80 years. They comprised several Hakeems (Traditional doctors)

who were interviewed in order to record the local house hold recipes for the preparation of medicines. Detail of informants is provided in Table 1.

### *Identification and preservation*

The plants were collected, dried, preserved, and identified and confirmed in the Herbarium of Botany Department, University of Poonch Rawalakot. The voucher specimen has been submitted in the Herbarium Department of Botany, University of Poonch Rawalakot. The plants have been arranged alphabetically, showing their scientific and local names and local uses in Table 2.

## **Result and discussion**

### *Demographic data*

According to the data the ratio of female and male informants were 63.3333% and 36.6667% respectively (Table 1).

**Table 1.** Demographic information of the respondents.

Sr. No	Age group	Gender	No. of informants	Percentage%
1	50+	Male	1	3.3333%
		Female	4	13.3333%
2	60+	Male	5	16.6667%
		Female	5	16.6667%
3	70+	Male	5	16.6667%
		Female	10	33.3333%
Total		Male	11	36.6667%
		Female	19	63.3333%

The informants were classified into three major groups on the basis of age, i.e., informants of 50 or 50+ years (16.6667%), 60 or 60+ years (33.3333%), 70 or 70+ years (50%). During the interview, it was detected that indigenous knowledge about the use of medicinal plants was more dominant in illiterate folks.

#### Documentation of medicinal plants

Plant species collected in the current study was used in treatment of various infections by the native population of the area. Table 1 represents the demographic data of selected area informants whereas Table 2 providing information about 30 medicinal plants that belong to 21 families used for

the treatment of 20 diseases. Current research is a struggle to account the ethnobotanical data on the basis of highly used medicinal plants with high rate to cure different diseases and their selection for searching of various bioactive compounds to treat these ailments.

#### Family contribution

Rosaceae (6 species) is the predominant family according to number of species tailed by Pinaceae (3 species) and Moraceae, Asteraceae and Lamiaceae (2 species) while Juglandaceae, Ebenaceae, Punicaceae, Apiaceae, Amaranthaceae, Polygonaceae and remaining all other family contributed by one species towards species contribution.

**Table 2.** Medicinal plants description and their part use and disease categories.

Sr no	Local name	Scientific name	Family	Parts used	Medicinal uses
1	Akhroot	<i>Juglans regia</i>	Juglandaceae	Fruit, leaves	Reduce risk of heart disease and cancer, improve brain health, and control uric acid, anti-diabetic.
2	Alubukhara	<i>Prunus domestica</i>	Rosaceae	Leaves, Fruit, Bark	relieve constipation, Lower Blood sugar, improve bone health, healing wound.
3	Amlook	<i>Diospyrus kaki</i>	Ebenaceae	Leaves, Fruit	Treatment of hypertension, constipation.
4	Arwari	<i>Prunus persica</i>	Rosaceae	Fruit, Bark	Regulates blood sugar, prevents cancer, heals and enhance skin, promote hair growth.
5	Cheer	<i>Pinus roxburgai</i>	Pinaceae	Resin, Cone	Healing wound, Cone is used for the treatment of fungal infection.
6	Darona	<i>Punica granatum</i>	Punicaceae	Fruit, Bark	Lower level of blood pressure, fight against cancer, reduce joint pain, improve memory, fight against cancer, treat sore throats, urinary diseases, stomach related messes, skin issues
7	Derak	<i>Melia azzadirchta</i>	Meliaceae	Leaves	For skin treatment, anti-malarial.
8	Deyar	<i>Cedrus deodara</i>	Pinaceae	Wood, bark	Treat fever, urinary disorder, and diabetes.
9	Dhanya	<i>Coriandrum sativum</i>	Apiaceae	Leaves, Seed	Treatment of Stomach pain, constipation, Gas, skin disease, and source of calcium.
10	Ganhaar	<i>Amaranthus viridis</i>	Amaranthaceae	Leaves, seed	Utilized as vegetables, saag. Crushed seed are blended in with rice water to control feminine cycle.
11	Halfari	<i>Rumax obtusifolius</i>	Polygonaceae	Leaves, Roots	The leaves are utilized as cure in the treatment of rankles. A tea produced using the roots has been utilized in the treatment of jaundice treatment of jaundice, whooping cough, boils and bleeding.
12	Hand	<i>Taraxacum officinale</i>	Asteraceae	Leaves	Reduce the pain of joints, Heart diseases; reduce stomach sensation, skin treatment and antidiabetic.
13	Jand	<i>Ziziphus nummularia</i>	Rhamnaceae	Root, Bark	Used for cold, diarrhea, dysentery indigestion.
14	Kach mach	<i>Solanum nigrum</i>	Solanaceae	Fruit, leaves	Used against dysentery and fever. Used for virginal infections.
15	Kangi	<i>Achellea melifolium</i>	Asteraceae	Whole plant	Used as anti-diabetic, anti-inflammatory, blood tonic agent, urinary diseases, jaundice, piles, cleaning wounds, vaginal infection, allergy, anti-cancer.
16	Kankoli	<i>Elaeagnus parvifolia</i>	Elaeagnaceae	Fruit, Seed	Locally it is utilized as cardiovascular energizer, against diabetic, antipyretic, diuretic, likewise helpful to control hypertension. Vitamin C rich fruit is edible.
17	Khoobani	<i>Prunus armaniaca</i>	Rosaceae	Seed and Fruit	Used for asthma, constipation, infertility, vaginal infections.
18	Khroon	<i>Morus alba</i>	Moraceae	Fruits leaves.	Treatment of Dizziness, liver and kidney disorders,

					inflammation.
19	Kiker	<i>Robinia pseudocacia</i>	<i>Fabiaceae</i>	Leaves, Flower, bark	The flowers are antispasmodic, aromatic, diuretic, and laxative. The leaf juice inhibits viruses.
20	Morpankh	<i>Thuja orientales</i>	<i>Cupressaceae</i>	Whole plant	Leaves used to treat a cough, fever, and headache. Oil is used for painful joints and muscles to increase blood circulation, reducing pain. Has antibacterial and anti-fungal properties.
21	Phagwara	<i>Ficus palmate</i>	<i>Moraceae</i>	Fruit, Leaves, Bark	It is utilized in the treatment of abdominal diseases and illnesses of lungs. Utilized in different sicknesses, for example gastrointestinal issues, hypoglycemia, growth, ulcer, diabetes.
22	Podina	<i>Mentha peprita</i>	<i>Lamiaceae</i>	Leaves	Past of leaves applied over joints relive pain, fresh juice with honey relieve cough and sore throat, used for the treatment of stomach pain.
23	Rair	<i>Pinus wallichaina</i>	<i>Pinaceae</i>	Resin, wood	The plant resin is utilized as a disinfectant and diuretic. Wood of <i>P. wallichiana</i> is valuable for cough, ulceration.
24	Rose	<i>Rosa indica</i>	<i>Rosaceae</i>	Leaves	Treatment of diarrhea, inflammation of mouth, oil used to treat dry skin.
25	Saib	<i>Malus pumila</i>	<i>Rosaceae</i>	Fruit, Root	Cure cancer, weight management, asthma and diabetes.
26	Sufaida	<i>Populus alba</i>	<i>Salicaceae</i>	Leaves ,inner bark	Lower back pain, treatment of arthritis, reduce fever, and relieve pain of menstrual cramps.
27	Sumbol	<i>Berberis lysium</i>	<i>Berberidaceae</i>	Whole plant	Healing wound, treatment of jaundice, diabetes.
28	Tangi	<i>Pyrus pashia</i>	<i>Rosaceae</i>		The juice of the fruit is utilized in the treatment of diarrhea, management of gastrointestinal, respiratory, and vascular complications.
29	Thoom	<i>Allium satiuam</i>	<i>Amaryllidaceae</i>	Leaves ,fruit	Lowering blood sugar and cholesterol, regulating blood pressure, effective against infections.
30	Timber	<i>Tectona grandis</i>	<i>Lamiaceae</i>	Leaves, Seed	Improves digestion, improve memory, cure fever, thirst and heart diseases.

Maximum quantity of species showed by these families showed that the area under study is rich in biodiversity and the native people have considerable

information of herbal medication prepared by these medicinal plants.

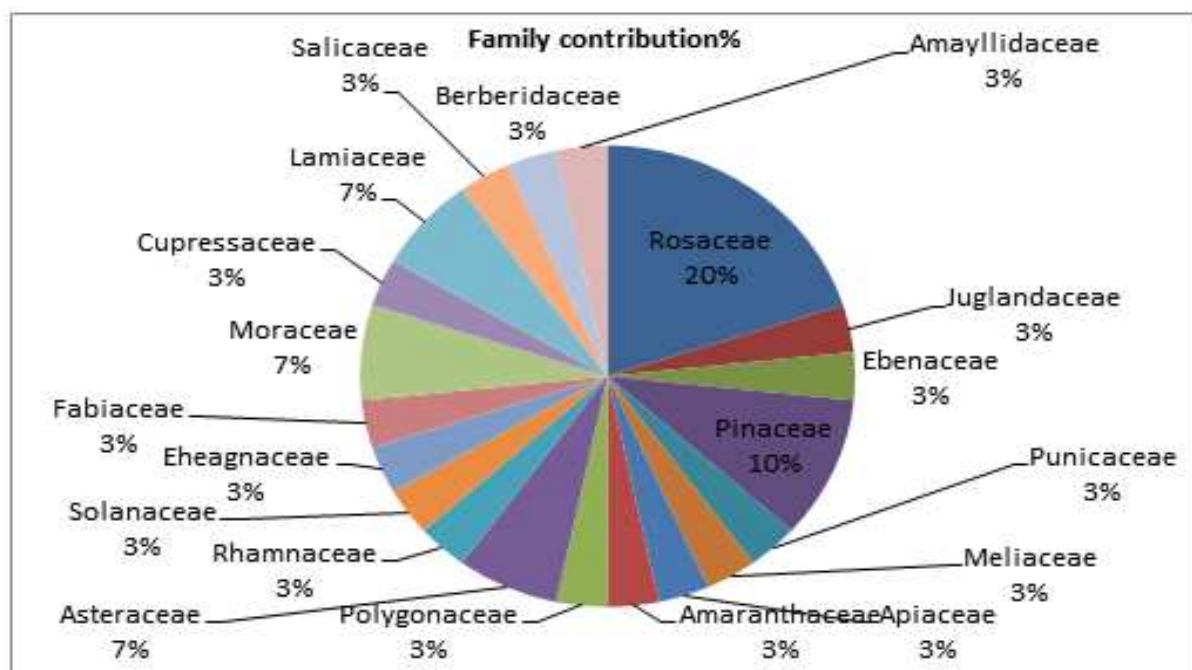


Fig. 2. Family contribution to number of species within area.

Maximum family contribution is 20% by family Rosaceae followed by Pinaceae 10% and Moraceae, Asteraceae and Lamiaceae (7%) and all other species contribute 3% (Fig. 2). Rosaceae is largely described to possess significant bio-active constitute therefore contributing to the high use for medical remedies the results are match with findings of (Kidane *et al.*,

2018; Abbas *et al.*, 2017; Ashfaq *et al.*, 2019; Shaheen *et al.*, 2017; Akhtar *et al.*, 2013).

*Mode of administration*

Mode of administration of herbal medicinal plants was grouped into twenty classes (Fig. 3). The most frequent method of herbal remedies preparation was



extract and extract, powder (13%) followed by extract and juice (10%), Juice and oil infusion (7%),) and remaining (juice, decoction), (Decoction), (Extract, paste), (infusion, paste) and all other also

contributed 3% towards total mode of administration. The current results are match with findings of Ahmad *et al.*, 2017; Shaheen *et al.*, 2017; Akhtar *et al.*, 2013).

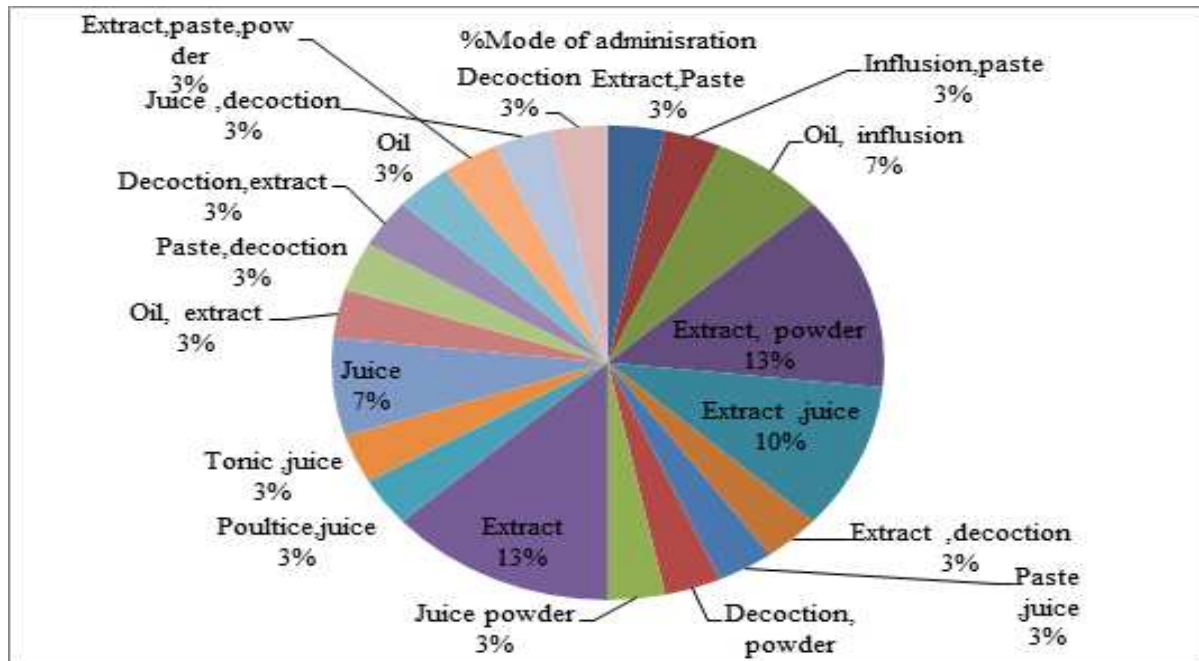


Fig. 3. Mode of administration to herbal medicine preparation.

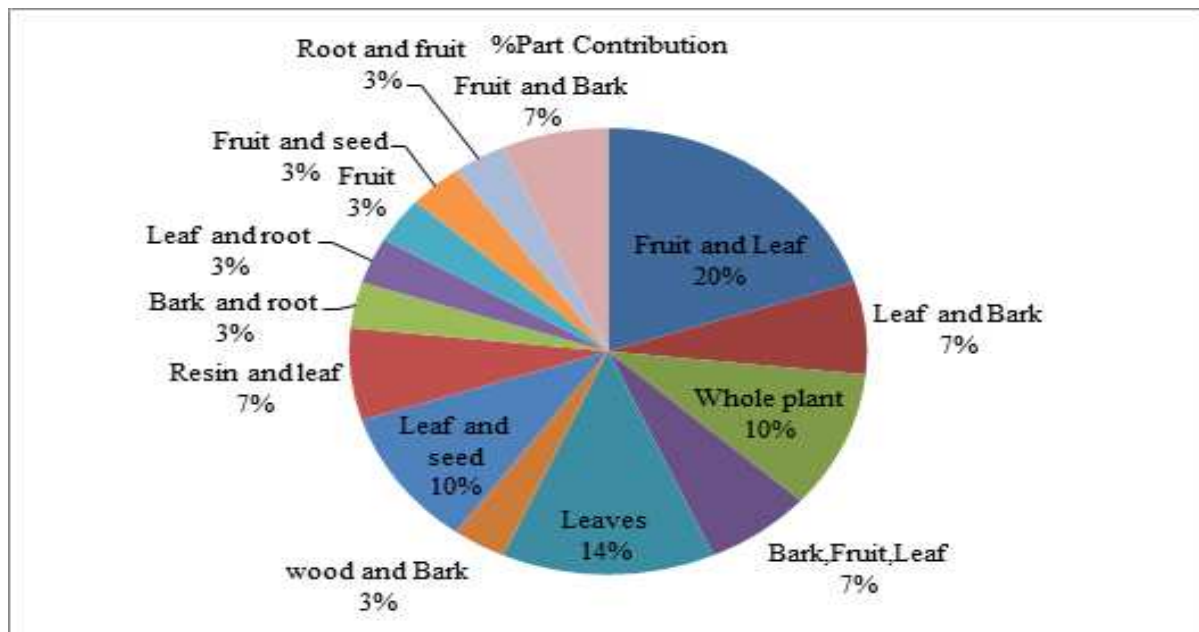


Fig. 4. Plants parts contribution (%) in herbal preparation.

*Plants parts contribution*

The significant contribution of plant parts towards preparation of herbal medicines are shown in Fig. 4. Results showed that fruit and leaves, whole plant and leaves contributed more to medication. Maximum

part contribution is followed by 20% (fruits and leaves) and 14% (leaves), 10% (Whole plant), (leaf, seeds) and 7% (Bark, fruit, leaf), (leaf, bark), (Fruit, bark), (Resin, leaf) While remaining contributed 3% in herbal remedy.

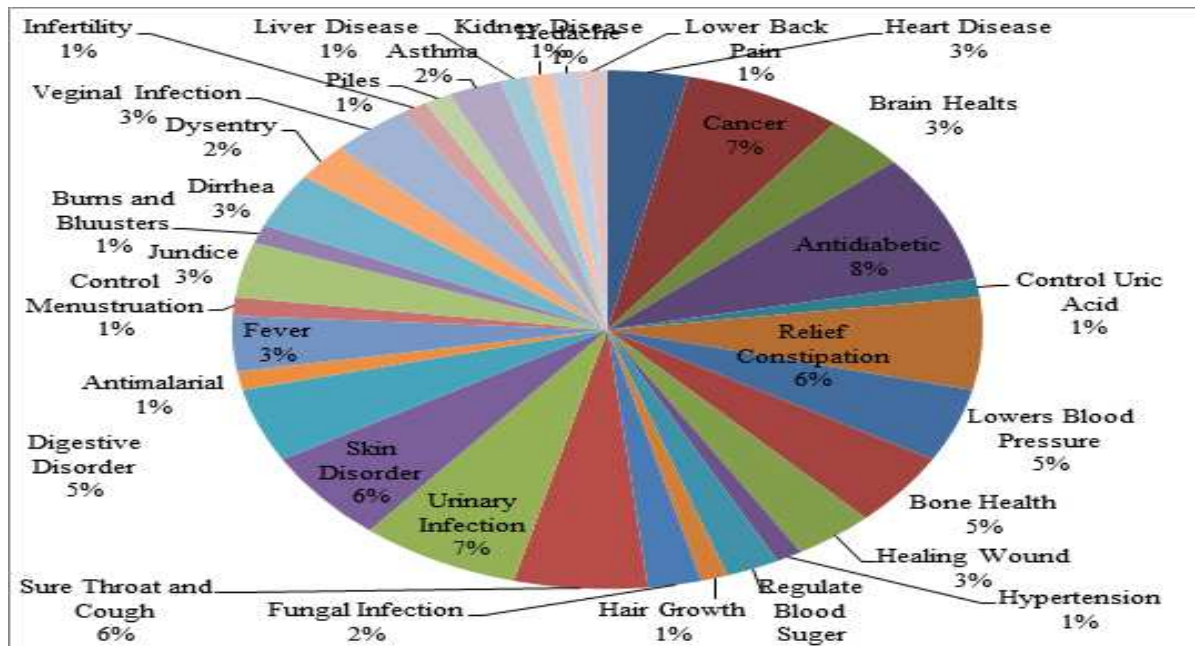


Fig. 5. Number of disease treated by selected plants.

The current outcomes are matched with findings of (Ahmed *et al.*, 2017; Shaheen *et al.*, 2017; Abbas *et al.*, 2017; Akhtar *et al.*, 2013; Hussain *et al.*, 2006).

#### Diseases categories

Data related to diseases categories mentioned in Fig. 5. Result showed that there were 32 diseases categories were assembled. The diseases category includes antidiabetic (7 species), Cancer and Urinary infection (6 species) Constipation, Skin diseases and sore throats (5 species) and Heart diseases, Brain health, hypertension, Blood pressure, Malaria, fever etc. were treated. In this study, the maximum figure of plants was used in antidiabetic followed by cancer. A schematic representation of diseases category concluded by vegetative flora of Kalpur (Davigali) Hajira District Poonch AJK showed significance of area vegetation in Ethnobotany. Similar results were reported by (Malik *et al.*, 2019; Kayani *et al.*, 2014).

#### Conclusion

The current study depicted the significance of pharmaceutical flora, with reference to their curative and indigenous uses. This survey provides useful information on different plant parts used for curing of various illnesses or diseases. It is determined that the studied flora is rich in ethno botanical potential. People of the area are not much aware of about the

medicinal wealth present in there this is because of illiteracy. Ethno botanically important area should be replenished by reforestation, establishment of home botanical gardens, conservation of natural resources, minimizing over grazing and harvesting for various purposes. Besides, the way of life of the native people is directly and indirectly relies on plant natural resources.

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#### Author's contributions

TR supervise and design experiment, AA do experiment and wrote the final manuscript, MS interpret the results, AM Planning , SN Analyzing, DH preparing final draft. RMB revise, all authors have read and permitted the published version of the manuscript.

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**Conflicts of Interest**

The authors declare there are no conflicts of interest.

**References**

**Abbas Z, Khan SM, Alam J, Khan SW, Abbasi AM.** 2017. Medicinal plants used by inhabitants of the Shigar Valley, Baltistan region of Karakorum range-Pakistan. *Journal of ethnobiology and ethnomedicine* **13(1)**, 1-15.

<https://doi.org/10.1186/s13002-017-0172-9>

**Abbasi AM, Khan MA, Shah MH, Shah MM, Pervaz A, Ahmad M.** 2013. Ethnobotanical appraisal and cultural values of medicinally important wild edible vegetables of Lesser Himalayas-Pakistan. *Journal of ethnobiology and ethnomedicine* **9(1)**, 1-13.

<https://doi.org/10.1186/1746-4269-9-66>

**Abbasi AM, Shah MH, Li T, Fu X, Guo X, Liu RH.** 2015. Ethnomedicinal values, phenolic contents and antioxidant properties of wild culinary vegetables. *Journal of Ethnopharmacology* **162**, 333-345.

<https://doi.org/10.1016/j.jep.2014.12051>

**Afolayan AJ, Jimoh FO.** 2009. Nutritional quality of some wild leafy vegetables in South Africa. *International journal of food sciences and nutrition* **60(5)**, 424-431.

<https://doi.org/10.1080/09637480701777928>

**Ahmad KS, Hamid A, Nawaz F, Hameed M, Ahmad F, Deng J, Akhtar N, Wazarat A, Mahroof S.** 2017. Ethnopharmacological studies of indigenous plants in Kel village, Neelum valley, Azad Kashmir, Pakistan. *Journal of ethnobiology and ethnomedicine* **13(1)**, 1-16.

<https://doi.org/10.1186/s13002-017-0196-1>

**Ahmad MS, Sultana, Fazl-i-Hadi S, Hadda TB, Rashid S, Zafar MM, Khan MA, Khan MPZ, Yaseen G.** 2014. An Ethnobotanical study of Medicinal Plants in high mountainous region of Chail valley (District Swat-Pakistan). *Journal of ethnobiology and ethnomedicine* **10(1)**, 1-18.

<https://doi.org/10.1186/1746-4269-10-36>

**Ahmed MJ, Akhtar T.** 2016. Indigenous knowledge of the use of medicinal plants in Bheri, Muzaffarabad, Azad Kashmir, Pakistan. *European Journal of integrative Medicine* **8(4)**, 560-569.

<https://doi.org/10.1016/j.eujim.2016.01006>

**Ahmed MJ, Murtaza G.** 2015. A study of medicinal plants used as ethnoveterinary: harnessing potential phytotherapy in Bheri, district Muzaffarabad (Pakistan). *Journal of ethnopharmacology* **159**, 209-214.

<https://doi.org/10.1016/j.jep.2014.11016>

**Ahmed SS, Hussain SZ.** 2008. Ethnomedicinal survey of plants from salt range of Pakistan. *Pakistan Journal of Botany* **40**, 1005-11.

**Ajaib M, Haider SK, Zikrea A, Siddiqui MF.** 2014. Ethnobotanical Studies of Herbs of Agra Valley Parachinar, Upper Kurram Agency, Pakistan. *International Journal of Biology and Biotechnology* **11(1)**, 71-83.

**Ajaib M, Khan Z, Khan NH, Wahab M.** 2010. Ethnobotanical studies on useful shrubs of district Kotli, Azad Jammu & Kashmir, Pakistan. *Pakistan Journal of Botany* **42(3)**, 1407-1415.

**Akhtar N, Rashid A, Murad W, Bergmeier E.** 2013. Diversity and use of ethno-medicinal plants in the region of Swat, North Pakistan. *Journal of ethnobiology and ethnomedicine* **9(1)**, 1-14.

<https://doi.org/10.1186/1746-4269-9-25>

**Alarcón R, Pardo-de-Santayana M, Priestley C, Morales R, Heinrich M.** 2015. Medicinal and local food plants in the south of Alava (Basque Country, Spain). *Journal of ethnopharmacology* **176**, 207-224.

<http://dx.doi.org/10.1016/j.jep.2015.10022>

**Amjad MS.** 2015. Ethnobotanical profiling and floristic diversity of Bana Valley, Kotli (Azad Jammu and Kashmir), Pakistan. *Asian Pacific Journal of Tropical Biomedicine* **5(4)**, 292-299.

[http://dx.doi.org/10.1016/S2221-1691\(15\)30348-8](http://dx.doi.org/10.1016/S2221-1691(15)30348-8)



- Amjad MS, Arshad M, Qureshi R.** 2015. Ethnobotanical inventory and folk uses of indigenous plants from Pir Nasoora National Park, Azad Jammu and Kashmir. *Asian Pacific Journal of Tropical Biomedicine* **5(3)**, 234-241.  
[http://dx.doi.org/10.1016/S2221-1691\(15\)30011-3](http://dx.doi.org/10.1016/S2221-1691(15)30011-3)
- Amjad MS, Arshad M, Saboor A, Page S, Chaudhari SK.** 2017. Ethnobotanical profiling of the medicinal flora of Kotli, Azad Jammu and Kashmir, Pakistan: Empirical reflections on multinomial logit specifications. *Asian Pacific journal of tropical medicine* **10(5)**, 503-514.  
<https://doi.org/10.1016/j.apjtm.2017.05.008>
- Amjad MS, Arshad M.** 2014. Ethnobotanical inventory and medicinal uses of some important woody plant species of Kotli, Azad Kashmir, Pakistan. *Asian Pacific Journal of Tropical Biomedicine* **4(12)**, 952-958.  
<http://dx.doi.org/10.12980/APJTB.4.201414B381>
- Ashfaq S, Ahmad M, Zafar M, Sultana S, Bahadur S, Abbas N.** 2019. Medicinal plant biodiversity used among the rural communities of arid regions of northern Punjab, Pakistan.
- Azeem A, Zeb A, Umer S, Ali G, Khan Y.** 2020. Ethnobotanical studies of Tatta Pani Valley, Kotli, Azad Jammu and Kashmir (AJK) Pakistan. *Journal of Herbal Medicine* **8(3)**, 14-20.  
<https://doi.org/10.22271/plants>
- Aziz MA, Adnan M, Khan AH, Shahat AA, Al-Said MS, Ullah R.** 2018. Traditional uses of medicinal plants practiced by the indigenous communities at Mohmand Agency, FATA, Pakistan. *Journal of ethnobiology and ethnomedicine* **14(1)**, 1-16.  
<https://doi.org/10.1186/s13002-017-0204-5>
- Baydoun S, Chalak L, Dalleh H, Arnold N.** 2015. Ethnopharmacological survey of medicinal plants used in traditional medicine by the communities of Mount Hermon, Lebanon. *Journal of ethnopharmacology* **173**, 139-156.  
<https://doi.org/10.1016/j.jep.2015.06.052>
- Bernal JJ, Mendiola A, Ibáñez E, Cifuentes A.** 2011. Advanced analysis of nutraceuticals. *Journal of pharmaceutical and biomedical analysis* **55(4)**, 758-774.  
<https://doi.org/10.1016/j.jpba.2010.11.033>
- Bibi S, Husain SZ, Malik RN.** 2008. Pollen analysis and heavy metals detection in honey samples from seven selected countries. *Pakistan Journal of Botany* **40(2)**, 507-516.
- Campbell MJ, Hamilton B, Shoemaker M, Tagliaferri M, Cohen I, Tripathy D.** 2002. Antiproliferative activity of Chinese medicinal herbs on breast cancer cells in vitro. *Anticancer research* **22(6C)**, 3843-3852.
- Cox PA.** 2000. Will tribal knowledge survive the millennium *Science* **287(5450)**, 44-45.  
<https://doi.org/10.1126/science.287.5450.44>
- Faruque MO, Uddin SB, Barlow JW, Hu S, Dong S, Cai Q, Li X, Hu X.** 2018. Quantitative ethnobotany of medicinal plants used by indigenous communities in the Bandarban District of Bangladesh. *Frontiers in pharmacology* **9**, 40-44. from District Sialkot, Pakistan. *Journal of Applied Pharmacy* **3**, 212-220.  
<https://doi.org/10.3389/fphar.2018.00040>
- Gerique A.** 2006. An introduction to ethnoecology and ethnobotany: Theory and methods. Integrative assessment and planning methods for sustainable agroforestry in humid and semiarid regions. *Advanced Scientific Training. Loja. Journal of pharmaceutical and biomedical analysis* **55(4)**, 75-79.
- Gomez-Beloz A.** 2002. Plant use knowledge of the Winikina Warao: the case for questionnaires in ethnobotany. *Economic Botany* **56(3)**, 231-241.  
[https://doi.org/10.1663/00130001\(2002\)056\[0231:P UKOTW\]2.0.CO;2](https://doi.org/10.1663/00130001(2002)056[0231:P UKOTW]2.0.CO;2)
- Hocking GM.** 1958. Pakistan medicinal plants I. *Qualitas Plantarum et Materiae Vegetables* **5(1)**, 145-153.  
<https://doi.org/10.1007/BF01099867>

- Husain SZ, Malik RN, Javaid M, Bibi S.** 2008. Ethnobotanical properties and uses of medicinal plants of Moirgah biodiversity park, Rawalpindi. *Pakistan Journal of Botany* **40(5)**, 1897-1911.
- Hussain F, Islam M, Zaman A.** 2006. Ethnobotanical profile of plants of Shawar Valley, District Swat, Pakistan. *International Journal of Biology and Biotechnology* **3(2)**, 301-307.
- Hussain S, Hamid A, Ahmad KS, Mehmood A, Nawaz F, Ahmed H.** 2019. Quantitative ethnopharmacological profiling of medicinal shrubs used by indigenous communities of Rawalakot, District Poonch, Azad Jammu and Kashmir, Pakistan. *Revista Brasileira de Farmacognosia* **29**, 665-676.  
<https://doi.org/10.1016/j.bjfp.2019.06.008>
- Ibrar M, Hussain F, Sultan A.** 2007. Ethnobotanical studies on plant resources of Ranyal hills, District Shangla, Pakistan. *Pakistan Journal of Botany* **39(2)**, 329.
- Ikram AU, Zahra NB, Shinwari ZK, Qaiser M.** 2015. Ethnomedicinal review of folklore medicinal plants belonging to family Apiaceae of Pakistan. *Pakistan Journal of Botany* **47(3)**, 1007-1014.
- Ishtiaq M, Mahmood A, Maqbool M.** 2015. Indigenous knowledge of medicinal plants from Sudhanoti district (AJK), Pakistan. *Journal of ethnopharmacology* **168**, 201-207.  
<https://doi.org/10.1016/j.jep.2015.01.054>
- Islam M, Ahmad I, Akhtar N, Alam J, Razzaq A, Mohammad K, Mahmood T Qamar S.** 2021. Medicinal plants resources of Western Himalayan Palas Valley, Indus Kohistan, Pakistan: Their uses and degrees of risk of extinction. *Saudi Journal of Biological Sciences* **28(5)**, 3076-3093.  
<https://doi.org/10.1016/j.sjbs.2021.02.051>
- Jamila F, Mostafa E.** 2014. Ethnobotanical survey of medicinal plants used by people in Oriental Morocco to manage various ailments. *Journal of ethnopharmacology* **154(1)**, 76-87.  
<https://doi.org/10.1016/j.jep.2014.03.016>
- Jennings HM, Merrell J, Thompson JL, Heinrich M.** 2015. Food or medicine? The food-medicine interface in households in Sylhet. *Journal of ethnopharmacology* **167**, 97-104.  
<https://doi.org/10.1016/j.jep.2014.09.011>
- Jordan SA, Cunningham DG, Marles RJ.** 2010. Assessment of herbal medicinal products: challenges, and opportunities to increase the knowledge base for safety assessment. *Toxicology and applied pharmacology* **243(2)**, 198-216.  
<https://doi.org/10.1016/j.taap.2009.12.005>
- Kayani S, Ahmad M, Zafar M, Sultana S, Khan MPZ, Ashraf MA, Hussain J, Yaseen G.** 2014. Ethnobotanical uses of medicinal plants for respiratory disorders among the inhabitants of Gallies-Abbottabad, Northern Pakistan. *Journal of ethnopharmacology* **156**, 47-60.  
<https://doi.org/10.1016/j.jep.2014.08.005>
- Khan MA, Khan MA, Mujtaba G, Hussain M.** 2012. Ethnobotanical study about medicinal plants of Poonch valley Azad Kashmir. *Journal of animal plant Science* **22**, 493-500.
- Khan SA, Khan MA, Hussain M, Mujtaba G.** 2010. An Ethnobotanical Inventory of Himalayan Region Poonch Valley Azad Kashmir (Pakistan). *Pakistan Journal of Botany* **42(3)**, 1407-1415.
- Kidane L, Gebremedhin G, Beyene T.** 2018. Ethnobotanical study of medicinal plants in ganta afeshum district, eastern zone of tigray, northern Ethiopia. *Journal of ethnobiology and ethnomedicine* **14(1)**, 1-19.  
<https://doi.org/10.1186/s13002-018-0266-z>
- Mahmood A, Mahmood A, Tabassum A.** 2011. Ethnomedicinal Survy of Plants from District sailkot.  
<https://doi.org/10.21065/19204159.3.212>

- Malik RN, Husain SZ, Nazir I.** 2010. Heavy metal contamination and accumulation in soil and wild plant species from industrial area of Islamabad, Pakistan. *Pakistan Journal Botany* **42(1)**, 291-301.
- Muhammad IC, Khan MA.** 2008. An ethnomedicinal inventory of plants used for family planning and sex diseases in Samahni valley, Pakistan **3**, 212-220.
- Muhammad SA, Muhammad A, Malik ZH.** 2013. An overview of human-plant interaction in Nikyal rangeland district Kotli Azad Jammu and Kashmir. *African Journal of Plant Science* **7(12)**, 571-576.  
<https://doi.org/10.5897/AJPS2013.1104>
- Ong HG, Kim YD.** 2014. Quantitative ethnobotanical study of the medicinal plants used by the Ati Negrito indigenous group in Guimaras Island, Philippines. *Journal of ethnopharmacology* **157**, 228-242.  
<https://doi.org/10.1016/j.jep.2014.09.015>
- Pei S.** 2002, December. Ethnobotany and modernisation of traditional Chinese medicine. In Paper at a Workshop on Wise Practices and Experiential Learning in the Conservation and Management of Himalayan Medicinal Plants, Kathmandu, Nepal 15-20s.
- Qureshi RA, Ghufra MA, Gilani SA, Sultana K, Ashraf M.** 2007. Ethnobotanical studies of selected medicinal plants of Sudhan Gali and Ganga Chotti hills, district Bagh, Azad Kashmir. *Pakistan Journal of Botany* **39(7)**, 2275-2283.
- Sansanelli S, Ferri M, Salinitro M, Tassoni A.** 2017. Ethnobotanical survey of wild food plants traditionally collected and consumed in the Middle Agri Valley (Basilicata region, southern Italy). *Journal of ethnobiology and ethnomedicine* **13(1)**, 1-11.  
<https://doi.org/10.1186/s13002-017-0177-4>
- Shah GM, Abbasi AM, Khan N, Guo X, Khan MA, Hussain M, Tahir AA.** 2014. Traditional uses of medicinal plants against malarial disease by the tribal communities of Lesser Himalayas Pakistan. *Journal of ethnopharmacology* **155(1)**, 450-462.  
<https://doi.org/10.1016/j.jep.2014.05.047>
- Shaheen H, Qaseem MF, Amjad MS, Bruschi P.** 2017. Exploration of ethno-medicinal knowledge among rural communities of Pearl Valley; Rawalakot, District Poonch Azad Jammu and Kashmir. *PLoS one* **12(9)**, e0183956.  
<https://doi.org/10.1371/journal.pone.0183956>
- Shinwari MI, Khan MA.** 2000. Folk use of medicinal herbs of Margalla hills national park, Islamabad. *Journal of Ethno pharmacology* **69(1)**, 45-56.  
[https://doi.org/10.1016/S0378-8741\(99\)00135-X](https://doi.org/10.1016/S0378-8741(99)00135-X)
- Sujarwo W, Keim AP, Caneva G, Toniolo C, Nicoletti M.** 2016. Ethnobotanical uses of neem (*Azadirachta indica* A. Juss.; Meliaceae) leaves in Bali (Indonesia) and the Indian subcontinent in relation with historical background and phytochemical properties. *Journal of Ethnopharmacology* **189**, 186-193.  
<https://doi.org/10.1016/j.jep.2016.05.014>
- Towns AM, Anzel TV.** 2016. Wild plants, pregnancy, and the food-medicine continuum in the southern regions of Ghana and Benin. *Journal of Ethnopharmacology* **179**, 375-38.  
<https://doi.org/10.1016/j.jep.2016.01.005>