



# Medicinal plants used against gynecological disorders by the local inhabitants of District Budgam, Kashmir Himalaya

Mohsina Niyaz, Syed Aasif Hussain Andrabi and Rayees Afzal Mir

## Correspondence

Mohsina Niyaz<sup>1</sup>, Syed Aasif Hussain Andrabi<sup>2\*</sup> and Rayees Afzal Mir<sup>2</sup>

<sup>1</sup>Department of life science, Glocal University Saharanpur-247121 (U.P) India

<sup>2</sup>School of Agricultural Science, Glocal University Saharanpur-247121 (U.P) India

\*Corresponding Author: dr.aasif@yahoo.com

**Ethnobotany Research and Applications 25:53 (2023)** - <http://dx.doi.org/10.32859/era.25.53.1-23>

Manuscript received: 16/03/2023 – Revised manuscript received: 04/05/2023 - Published: 05/05/2023

## Research

### Abstract

**Background:** Medicinal plants are an essential part of the human health care system and are used to treat a variety of gynecological issues. Due to low living standards, famine, and strenuous physical labor, rural women frequently experience gynecological issues, even while pregnant. The objective of this study was to document the indigenous knowledge of local flora indigenous knowledge on the treatment of various gynecological disorders in the district Budgam, Jammu and Kashmir.

**Methods:** To assess the medicinal plants' utility in the region, a quantitative analysis including the Use value (UV) and Family use value (FUV) was carried out. Key informants were interviewed through semi-structured interviews, as well as group discussions.

**Results:** A total of 51 medicinal plant species from 28 families are used to treat 33 distinct gynecological disorders. Among these families; Asteraceae was the dominant family (08 species). The leaves were the most commonly used part (34%). Herbs dominated all other life forms by (36 species). The most typical way to consume the medications was by decoction 39%, (32 species). According to the current study; the most prevalent disease addressed by the medicinal plants included is menstrual problems (36%). The Highest (UV of 0.65) were calculated for *Artemisia absinthium* while as the lowest (UV of 0.21) for *Celtis australis*. The highest family use value (FUV) was reported for Asparagaceae (0.50) while as the lowest FUV was calculated for Amaranthaceae (0.31). Locals continue to value herbal treatments as a trustworthy means of curing a variety of ailments.

**Conclusions:** The current study demonstrates that rural women frequently experience gynecological problems and depend on traditional medical care. The result also indicates that the local population is sensitive and careful about gynecological diseases. This study is providing a baseline for future pharmacological studies to discover new herbal drugs to treat a variety of gynecological issues.

**Keywords:** Traditional knowledge; Rural women; Ethnomedicine; Gynecological disorders; Kashmir Himalaya.

## Background

Therapeutic plants are still used as the primary healthcare system and play an important role in women's reproductive health in rural areas (Qureshi 2005). Gynecological disorder is one of the most serious reproductive health conditions. Gynecology is an important branch that deals with the treatment of women's ailments such as abortion, menstrual problems, menopausal syndrome, morning sickness, leucorrhea, anti-fertility, delivery problems, and so on (Jain 1991). Due to a lack of modern healthcare facilities, the remoteness of the area and a strong cultural belief in the efficacy of folk medicines, the traditional medicinal system serves as the primary provider of primary healthcare services in the tribal areas (Khattak *et al.* 2015).

The majority of the medicinal plants used in conventional treatments are gathered from the wild. Tribal people have a wealth of traditional medicinal knowledge based on surrounding flora for basic medical care (Rekka *et al.* 2013). The use of medicinal plants in everyday life has a long history and still has immense importance in aboriginal civilization (Rehman *et al.* 2019). In remote areas, therapeutic plants still play an important role (Qureshi *et al.* 2005) and are still used as the basic healthcare system. The traditional medicinal system acts as the principal supplier of primary healthcare services in the tribal areas because of the lack of modern healthcare facilities, the remoteness of the region, and a strong cultural belief in the efficacy of folk medicines (Bhattarai *et al.* 2010).

Indigenous societies have a long history of using herbal remedies in daily life and they continue to place a high value on them (Gurib-Fakim 2006). In rural areas, medicinal plants still play a significant role (Qureshi and Ghufraan 2005). Moreover, rural populations in the Kashmir Himalayan region frequently suffer from gynecological disorders as a result of malnutrition, subpar living conditions and strenuous physical labor during pregnancy. Due to the high cost of allopathic medicine and its negative side effects, rural communities use the therapeutic plant most frequently. Rural women consult with nearby midwives and indigenous healers because of their traditional way of life and the lack of an appropriate route to modern healthcare facilities. While there are numerous reports on ethno botanical and ethno medical knowledge available in the region (Haq *et al.* 2022; Haq *et al.* 2021), there is very little literature on Ethnogynaecology. Due to the lack of prior ethno ecological documentation, such traditional knowledge has not been previously reported from the study area. In order to preserve this priceless but quickly disappearing indigenous knowledge, the goal of this study was to compile a list of plant species that have been used to treat against various gynecological issues by rural female from Budgam district in Jammu and Kashmir. The findings of this study may make it simpler to recognize and select plant species that may be examined for their pharmacological profiles, making it feasible to obtain molecules or compounds that have significant medicinal properties.

## Materials and Methods

### Study Area

The District Budgam is centrally located District of the valley with coordinates 34° 1'12' N 74° 46' 48' E (Fig. 1) It is bounded by District Baramulla in the North-west, by District Srinagar in North-East and by District Pulwama in the South-East. The Pir Panchal range separates the District from Poonch District on its southwest side. The climate of Kashmir is generally salubrious and invigorating and varies with the altitude. The District extends to both mountainous and plain areas of varying heights and has an average altitude of 5281 feet (1610 meters) above sea level. The temperature varies from a low of -40°C in the winter to a high of 32°C in the summer (Aadil *et al.* 2021). The district has a total geographic area 1,370 sq km comprising of 510 villages. According to the 2011 census Budgam district has a population of 735,753. The literacy rate was 57.98%. Its population growth rate over the decade 2001-2011 was 24.14% (Haq *et al.* 2023a). The study area is inhabited by the local tribes Gujjar and Bakarwal. They also possess rich knowledge of important high altitude medicinal plants. Budgam district derives its name from one of its villages, which is its headquarter.

### Data Collection

Extensive surveys were conducted within the study area from May 2020 to August 2022 for the collection of medicinally important plants and the related traditional knowledge. Questionnaires were proposed in local language and face to face interaction and semi-structured interview patterns were followed during the study. The interviews were carried out in local language and all the recorded data was translated into English. Guided field trips to the forests area allow us to gather the best information and the identification, utilization of precious medicinal plant species. It was ensured to provide same questions to all the informants, so that essential information could be sourced (Martin, 2008). A total of 40 field visits were carried out in ten villages (Nagbal, Dragdol, Kanidajan, Dragad, Sakul, Singerwen, Doodhpathri, Barkha, Karag, Branwar, Zoogo). Given that the selected villages are mainly inhabited by Gujjar, Bakarwal, and Kashmiri, we employed a translator to improve data

collection. Bakarwal are nomads they visit the study area in the month of June and mostly exhibit the higher altitudes of the study area, Gujjar mostly live in the study area and visit the higher altitudes along with their livestock in summers, while as Kashmiris are the dominant population in the study area. The information collected was also cross checked with the available literature (Haq *et al.* 2023b). A proper consent was obtained verbally from all the informants prior to the interviews. Moreover, one individual from each indigenous community, who was well recognizable with the traditions and norms of the community, was taken as a guide in all the field surveys. The Code of Ethics of the International Society of Ethnobiology (available at <https://www.ethnobiology.net>, accessed on 28 May 2021) was followed during the whole study.

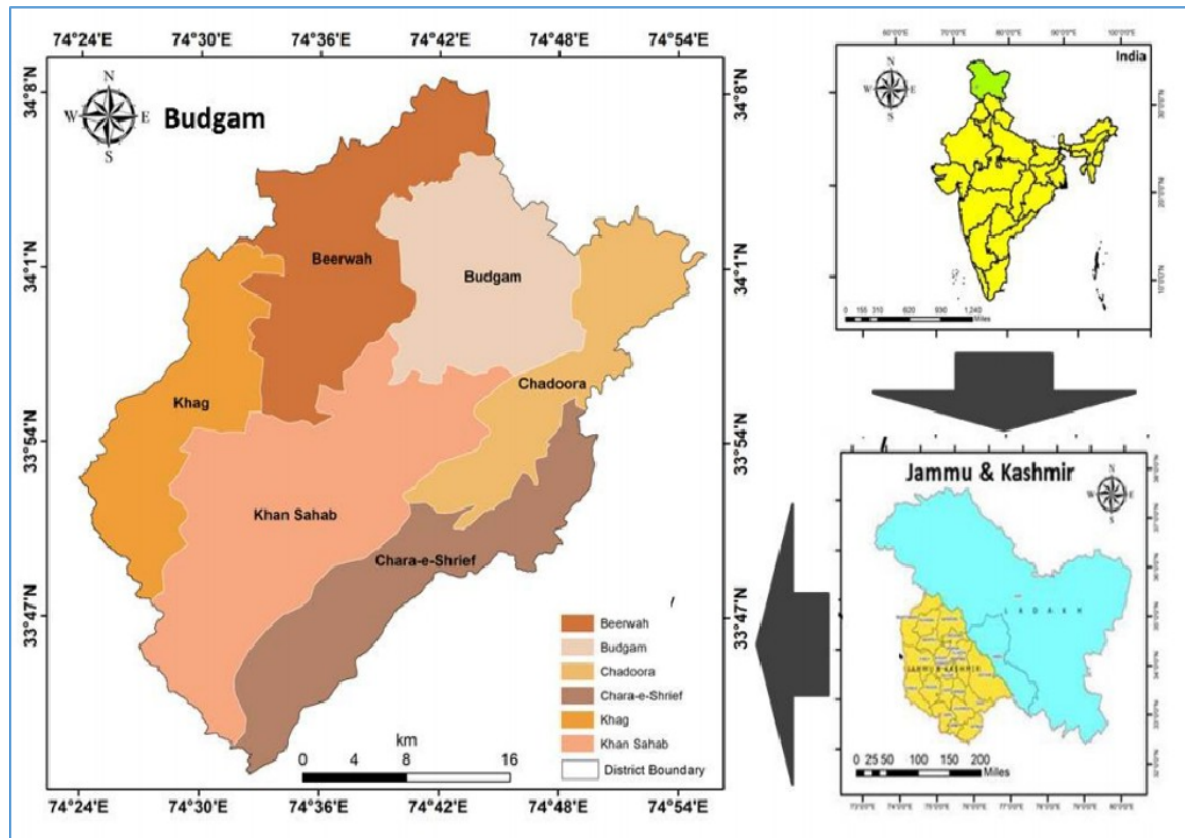


Figure 1. Map of Budgam, Jammu and Kashmir, India

#### Data analysis:

The data collected through interviews with the informants was analyzed using two different quantitative indices viz. i) use value (UV), use frequency (Fq) and Family use value (FUV). The relationship between ethnogynecological disease treated and plant species was performed using cluster analysis (Haq *et al.* 2021).

#### Species Use Value (UV) and Use Frequency (Fq)

Using the usage value, it was possible to determine the relative importance of the recorded taxa (UV), (Phillips *et al.* 1994). It was calculated through the following formula:

$$UV = \sum U/n$$

Where U denotes the quantity of reports made by informants for a specific plant taxon and n is the total number of informants who took part in the study. A species that was not mentioned by any of the informants has a UV value of 0, while a species that was mentioned by every informant has a UV value of 1.

To determine the relative significance of different medicinal plant taxa used for various human-associated illnesses, a quantitative index frequency (%) was employed for the use frequency (Fq). This is derived by multiplying the use value reported by the informants by 100 and which is expressed in a percentage.

**Family Use Value (FUV)**

FUV helps in the identification and representation of the utility value of a certain family of medicinal plants that are employed as part of the local area's medicinal flora. The Hoffman and Gallaher formula is used to calculate the family use value (Nadaf *et al.* 2019):

$$FUV = \sum UVs / ns$$

Where ns are the total number of plant taxa identified in the family and UVs is the species usage value of the plants mentioned by informants.

**Results and Discussion****Demographic characteristics of the respondents:**

A total of 120 informants (46 men and 74 women) were interviewed. Data was collected from three ethnic groups Gujar (34.17.84%), Bakarwal (31.76%) and Kashmiri (37.50%) among which herders accounted for (26.35%) followed by Cultivator/agricultural laborer (16.89%), Skilled/semi-skilled worker (8.33%), Hakeem (traditional healers) (13.33%), Housewives (19.17%), Shopkeepers (10%) and Govt. Employees (17.50%). The age of the informants varies from 18 to 95 years. The most important ethnomedicinal knowledge holders were old people (32.50%) followed by middle aged (24.17%) and young (14.17%). The overall education level was poor, young people have higher education than the older ones. Most of the informants were uneducated (35.83%), whereas (25.83%) had primary education, (20.00%) had secondary education only a few informants had higher education (.08%). Urdu, Kashmiri, Pahari and Gujar are the four different types of languages spoken in the study area. All the ethnic groups follow Islamic faith (Table 1).

Table 1. Demographic status of the respondents.

Demographic features	Number of people	Percentage (%)
Administrative Region	120	100
Education		
Illiterate	55	45.84
Primary education	32	26.67
Secondary education	22	18.34
Higher education	11	9.17
Age group		
(18-26 years)	16	13.33
(27-42 years)	25	20.83
(43-60 years)	32	26.67
(61- 75+ years)	47	39.17
Profession		
Herders	29	24.17
Hakeem (traditional healers)	17	14.17
Skilled /semi-skilled workers	14	11.67
Cultivator/agricultural labor	11	9.17
Govt. employees	9	7.50
Housewives	32	26.67
Shopkeepers	8	6.67
Gender		
Male	46	38.33
Female	74	61.67
Religion		
Islam	120	100

**Plant composition and distribution**

The ethnomedical survey resulted in the collecting of 51 medicinal plants used to treat gynecological disorders belonging from 28 families. There was an uneven distribution of medicinal plants among the families and most of the medicinal plants belonged to Asteraceae was the dominant family (N=8) of the total reported taxa followed by Lamiaceae (N=6), Rosaceae (N=6) and Liliaceae and Apiaceae (6% each) while as the remaining family only contribute one or two species each) (Fig. 2). The dominance of the Asteraceae can be explained by the fact that

members of this family are known for their aromatic qualities and are widely distributed in nature. It is also possible that this family's herbaceous life form, widespread distribution, and richness in the study area are contributing factors (Tariq *et al.* 2018; Mir *et al.* 2022). Meanwhile, because of the extensive ecological amplitude, the Asteraceae family members quickly adapt to arid, dry habitats and can acclimatize to them (Haq *et al.* 2021b).

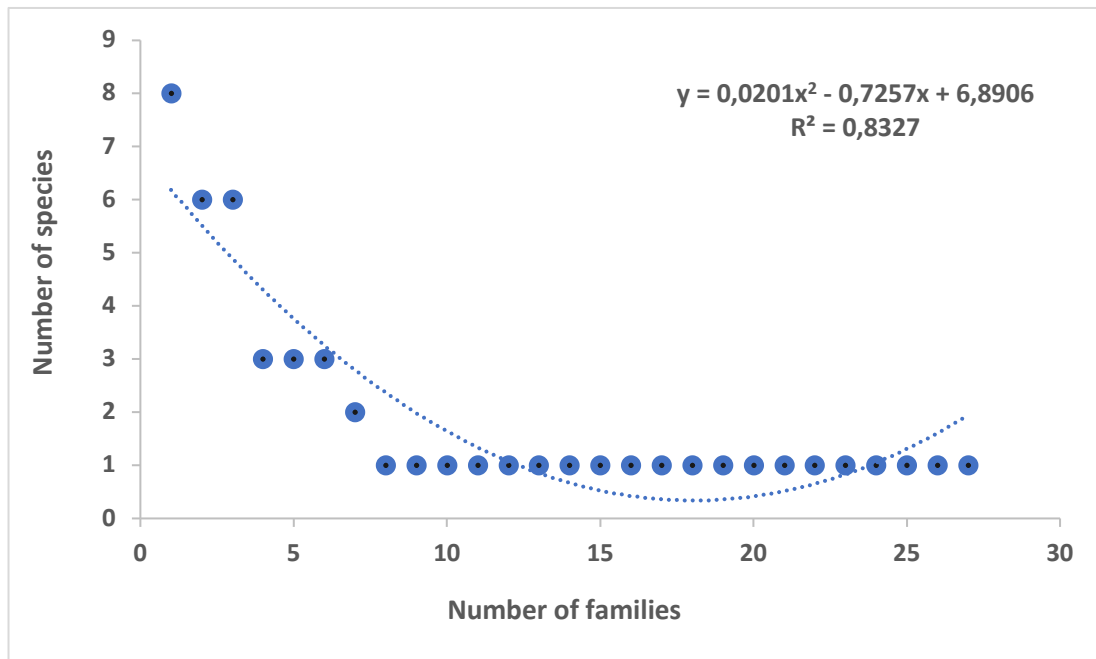


Figure 2: Species family relationship of the documented plant resources from district Budgam of Jammu and Kashmir

Table 2. List of the plant used for treatment of different gynecological disorders in the District Budgam, Jammu and Kashmir.

Botanical name (Abbreviation)	Family	Common name	Life form	Part used	Preparation	Administration	Disease treated	UR s	UV	Fq, %	Source
<i>Amaranthus viridis</i> L. (Ama-vir)	Amaranthaceae	Liss	Herb	Seed, Leaves, Whole plant	The Decoction of seed is prepared by boiling for 10-15 minutes. The fresh leaves are cooked in oil for 10-15 minutes. The whole plant is soaked in water over night.	The extract is taken orally for 2-4 days.	Dysmenorrhea, Curb labor pain, Leucorrhea	36	0.3	30	W
<i>Chenopodium album</i> L. (Che-alb)	Amaranthaceae	Konh	Herb	Seed, Leaves	The Decoction of seed and leaf is extracted to obtain juice.	Leaf juice (5gm) along with turmeric and black salt is taken twice daily.	Oligomenorrhea Amenorrhea	38	0.31	31.6	W
<i>Coriandrum sativum</i> L. (Cor-sat)	Apiaceae	Daniwaal	Herb	Seed, Leaves	The Decoction of seed dust (2gm) is taken with milk early morning. The Infusion of leaves is prepaid by soaking leaves overnight.	Taken orally for 2-7 days.	Menorrhagia Contraceptive	60	0.5	50	C
<i>Daucus carota</i> L. (Dau-car)	Apiaceae	Gaazir	Herb	Seed, Fruit	The decoction of seed is extracted by boiling for 10-15 minutes.	The extraction of seed is given for pregnant women for 3 days at the initial stage to induce abortion.	Induce abortion, Dysmenorrhea.	55	0.45	45.8	C
<i>Foeniculum vulgare</i> Mill. (Foe-vul)	Apiaceae	Baidyaan	Herb	Seed	The Decoction of seed is prepaid by boiling for 5-10 minutes.	The extract is taken for 2-5 days early in the morning The powder 2 tablespoons) is taken	Treats infertility Lactation Menopause hot flashes Dysmenorrhea	61	0.50	50.8	C

## Ethnobotany Research and Applications

					The seed is crushed into powder.	along with milk for 3-5 days.					
<i>Polygonatum biflorum</i> (Walt.) Ell. (Pol-bif)	Asparagaceae	Salapmesri	Herb	Rhizome	The rhizome is semi crushed and soaked in water for 3-4 days.	The extract is taken orally for one week.	Leucorrhoea	47	0.39	39.1	W
<i>Polygonatum cirrhifolium</i> Mill. (Pol-cir)	Asparagaceae	Salapmesri	Herb	Rhizome	The dried rhizome is eaten as raw.	The extract is taken orally.	Leucorrhoea	65	0.54	54.1	W
<i>Polygonatum verticillatum</i> (L.) All. (Pol-ver)	Asparagaceae	Salapmesri	Herb	Rhizome	The rhizome is semi crushed and soaked in water for 3-4 days.	About 15 ml infusion of rhizomes of white flowered plant is taken by women in empty stomach for 15 days.	Leucorrhoea	70	0.58	58.3	W
<i>Achillea millefolium</i> L. (Ach-mil)	Asteraceae	Pahel-glass	Herb	Aerial part, Whole plant, Leaves	The infusion is prepared by soaking aerial part for 1-2 days. The whole plant is dried and crushed into powder. The Decoction is prepared by boiling fresh leaves for 10-15 minutes.	The extract is taken orally in the early morning for 2-3 days. The 2 tablespoons of powder are mixed with a glass of water and taken orally. The extract is taken orally for 2-4 days.	Menopause, hot flashes, Leucorrhoea, Oligomenorrhoea	45	0.37	37.5	W
<i>Artemisia absinthium</i> L. (Art-abs)	Asteraceae	Tethwan	Herb	Whole plant, Leaves	The whole dried plant is soaked into water and kept overnight. The Decoction of fresh leaves is prepared by boiling for 10-15 minutes.	The extract is taken for 4-5 days. The extract is taken orally in the morning.	Induce labor pain, Amenorrhoea, Oligomenorrhoea, Conceive pregnancy.	78	0.65	65	W
<i>Calendula officinalis</i> L. (Cal-off)	Asteraceae	Hameshbahr	Herb	Flower	Dried flower is boiled in water until extraction is obtained. Then drink.	The extraction is taken orally for 1-2 days. The juice of the flowers (2 tablespoons) is taken twice a day.	Dysmenorrhoea, Oligomenorrhoea	34	0.28	28.3	W

## Ethnobotany Research and Applications

					The infusion is prepaid by soaking flower for 5-10 days.						
<i>Centaurea iberica</i> Trevir. ex Spreng. (Cen-ibe)	Asteraceae	Krech	Herb	Leaves	The dried Leaves are boiled in water and then crushed and fried in oil.	The extract is taken along with rice for twice a day.	Lactation	41	0.34	34.1	W
<i>Cichorium intybus</i> L. (Cic-int)	Asteraceae	Kaw-hand	Herb	Leaves, Fruit	Unripe fruits are sliced after peeling and cooked along with ground coconut carnal, green chili, onion and sufficient quantity of salt. Taken along with rice. The leaves are crushed into powder.	Taken along with rice. The powder as taken orally.	Amenorrhea	72	0.6	60	W
<i>Conyza bonariensis</i> (L.) Cronq. (Con-bon)	Asteraceae	NA	Herb	Whole plant, Leaves	The Decoction is prepaid by boiling the whole plant for 15-20 minutes.	(5ml) decoction mixed with water given to women for continuous 21 days in empty stomach to treat menorrhagia.	Menorrhagia, Dysmenorrhea	43	0.35	35.8	W
<i>Conyza canadensis</i> (L.) Cronq. (Con-can)	Asteraceae	Shallut	Herb	Leaves Root Whole plant	The Decoction of leaves is extracted by boiling fresh leaves for 10-15 minutes. The Infusion is prepaid by grinding dried root.	(Two tablespoons) is taken twice a day for 3 days to control excessive menstruation. The extract obtained by infusion is taken orally to relief from dysmenorrhea	Menorrhagia Dysmenorrhea	38	0.31	31.6	W
<i>Taraxacum officinale</i> F.H.Wigg (Tar-off)	Asteraceae	Hand	Herb	Leaves, Whole plant	The leaves are cooked in oil and black pepper.	The extract is taken along with rice.	Post-partum weakness, Cracked nipples	73	0.60	60.8	W
<i>Berberis lyceum</i> Royle. (Ber-lyc)	Berberidaceae	Kawdech	Shrub	Bark Root	Dried bark is soaked in water	The extract is taken orally for 1-2 weeks.	Gonorrhoea Amenorrhoea	51	0.42	42.5	W



## Ethnobotany Research and Applications

					and kept overnight for 2-3 days.						
<i>Arnebia benthamii</i> Wall ex. G.Don (Arn-ben)	Boraginaceae	Khahzabaan	Tree	Leaves	The Infusion of leaves is taken twice a day.	The extract is taken orally.	Lactation	54	0.45	45	W
<i>Celtis australis</i> L. (Cel-aus)	Cannabaceaea	Brimij	Tree	Fruit	Decoction of fruit(15ml) is given for 7-10 days	The extract is taken along with one cup of milk early in the morning.	Amenorrhea Oligomenorrhea	30	0.25	25	C
<i>Cascuta reflexa</i> Roxb. (Cas-ref)	Convolvulaceae	Kukli-poot	Climber	Whole plant	The Decoction is prepaid by boiling the whole plant and kept overnight.	The extraction is taken orally for 2-3 days.	Contraceptive	51	0.42	42.5	W
<i>Trigonella foenum-graecum</i> L. (Tri-gra)	Fabaceae	Meth	Herb	Seed, Whole plant	The Decoction is prepaid by boiling the whole plant for half an hour. The seed is crushed into powder.	The extract is taken orally in the early in the morning. The powder is taken with one cup of milk for twice a day.	Amenorrhea Lactation Uterus infection	70	0.58	58.3	C
<i>Geranium wallichianum</i> D.Don (Ger-wal)	Geraniaceae	Ratanjog	Herb	Root	The Decoction of roots is prepaid by boiling for half an hour. The fresh juice of the root Powder is prepaid.	The extract is given with milk for twice a day. (Two tablespoon full) is slightly warmed and is given twice daily in Leucorrhoea.	Curb delivery pain Weakness after delivery Leucorrhoea	56	0.46	46.6	W
<i>Juglans regia</i> L. (Jug-reg)	Juglandaceae	Doon	Tree	Fruit	The Decoction of fresh fruit is prepaid. A Poultice of the fresh fruit is prepaid. The fresh fruit is eaten as raw.	The juice is taken orally for 2-5 days. The extract is applied for the breast cracking.	Amenorrhea, Breast cracking, Lactation	62	0.51	51.6	C
<i>Ajuga bracteosa</i> Wall. ex Benth (Aju-bra)	Lamiaceae	Jaane-adam	Herb	Leaves	The Decoction of fresh leaves is	The extract is taken orally along mixed with milk and is given	Leucorrhoea	47	0.39	39.1	W

## Ethnobotany Research and Applications

					prepaid for 10-15 minutes.	for twice a day for 3-5 days to cure leucorrhoea.					
<i>Isodon rugosus</i> (Schrad. ex Benth.) (Iso-rug)	Lamiaceae	Sulikath	Shrub	Leaves	The fresh leaves are chewed.	The extract is given orally for 2-7 days.	Fertility	50	0.41	41.6	W
<i>Mentha arvensis</i> L. (Men-arv)	Lamiaceae	Pudina	Herb	Leaves, Aerial portion	The fresh leaves are crushed into Powder. The Decoction is prepaid by boiling aerial part for 10-15 minutes.	The powder is taken orally for 2-4 days. The decoction is taken after cooling for 2-7 days.	Dysmenorrhoea, Contraceptive	61	0.50	50.8	W
<i>Nepeta cataria</i> L. (Nep-cat)	Lamiaceae	Brair-ghass	Herb	Whole plant Leaves	The Infusion is prepaid by soaking whole plant for 2-5 days. The fresh leaves are Cooked in oil.	The extract is taken orally for 2-7 days. The extract obtained is taken along with rice.	Amenorrhoea, Vomiting during pregnancy	45	0.37	37.5	W
<i>Origanum vulgare</i> L. (Ori-vul)	Lamiaceae	Baber	Herb	Whole plant Leaves	The Decoction is prepaid by boiling fresh leaves for 10-15 minutes.	The extract is taken orally for 2-5 days.	Amenorrhoea, Dysmenorrhoea	55	0.45	45.8	C
<i>Salvia sclarea</i> L. (Sal-scl)	Lamiaceae	Buder-tunde	Herb	Whole plant, Leaves	The Decoction is prepaid by boiling the whole plant for half an hour. The leaves are crushed into Powder.	The extract is given orally after cooling. The powder is mixed with water and taken for 2-5 days.	Menopause hot flashes Dysmenorrhoea Induce labor pain	46	0.38	38.3	W
<i>Allium cepa</i> L. (All-cep)	Liliaceae	Gaend	Herb	Bulb	Fresh juice (2 spoons) is taken for 2-7 days. Bulb is crushed into paste.	Fresh juice is taken orally to regularize menstrual flow. Paste is applied topically.	Oligomenorrhoea , Prolapse of uterus, Post-partum pain	38	0.31	31.6	C
<i>Allium sativum</i> L. (All-sat)	Liliaceae	Rohan	Herb	Bulb	The juice is extracted from bulb.	The juice is taken orally. The paste is used topically.	Conception and fertility, Inflammation of vagina	49	0.40	40.8	C

					Dried bulb is crushed into powder and mixed with mustard oil to make paste.						
<i>Notholirion thomsonianum</i> (Royle) (Not-tho)	Liliaceae	Salamisri	Herb	Bulb	The bulb is crushed into Powder.	The powder (1 spoon) is given with one cup of milk early in the morning.	Uterine tonic	56	0.46	46.6	W
<i>Malva sylvestris</i> L. (Mal-syl)	Malvaceae	Gur-soxal	Herb	Aerial portion, Whole plant Flower	The Decoction of aerial part is prepaid by boiling. The whole plant is Cooked in oil and black pepper. The Infusion is prepaid by soaking flower in water over night.	The extract (1 tablespoonful) is given twice in a day. The extract is taken along with rice. The extract 10-15ml) is taken twice a day.	Uterus postpartum Recovery, Weakness during pregnancy, Vaginal itching	58	0.48	48.3	W
<i>Ficus carica</i> L. (Fic-car)	Moraceae	Anjeer	Tree	Fruit	A decoction of fruit is extracted on boiling for 10-20 minutes. The fresh fruit is eaten as Raw.	Fresh juice of fruit (two tablespoons) is given to nursing mothers to increase the flow of breast milk.	Lactation Aphrodisiac	57	0.47	47.5	C
<i>Oxalis corniculata</i> L. (Oxa-cor)	Oxalidaceae	Chuk-chin	Herb	Leaves	The leaves are chewed orally. The leaves are Cooked in oil. The Decoction of leaves is prepaid by boiling for 15-20 minutes.	The extract is taken along with rice. The extract is taken orally after cooling for 2-7 days.	Vomiting during pregnancy, lactation	43	0.35	35.8	W
<i>Papaver somniferum</i> L. (Pap-som)	Papaveraceae	Khash-khash	Herb	Seed	The seed is crushed into Powder.	The powder is taken with one cup of milk early in the morning.	Weakness during pregnancy, Growth of fetus	55	0.45	45.8	C
<i>Pinus wallichiana</i> A.B. Jacks. (Pin-wal)	Pinaceae	Kayar	Tree	Seed Leaves	The seed is crushed into powder and mixed	The paste (1 table spoonful) mixed with water is given 7-10	Gonorrhoea, Leucorrhoea	60	0.5	50	W

					with ghee to make paste. The Decoction of leaves is prepaid by boiling leaves for 15-20 minutes.	days continuously to treat gonorrhoea.  The extract is taken orally for one week early in the morning.					
<i>Plantago major</i> L. (Pla-maj)	Plantaginaceae	Bod-gul	Herb	Leaves, Fruit	The Infusion of fresh fruit is obtained by crushing into powder. The Decoction is prepaid by boiling fresh leaves for 1-0-15 minutes).	The fresh fruit powder is taken along with one cup of milk for 2-5 days.	Menorrhagia Gestational edema	54	0.45	45	W
<i>Cynodon dactylon</i> (L.) Pers. (Cyn-dac)	Poaceae	Dramun	Herb	Leaves, Whole plant	The fresh leaves are crushed into powder. The whole plant is sun dried for 5-10 days and crushed into powder.	(2 tablespoons) of powder is taken along with one cup of milk for 3-5 days. The powder extract mixed with hot water to drink orally.	Oligomenorrhoea Amenorrhoea	43	0.35	35.8	W
<i>Persicaria hydropiper</i> (L.) Delabre (Per- hyd)	Polygonaceae	Marxangan-ghass	Herb	Leaves, Whole plant, Aerial portion, Root	The Decoction of fresh leaves is prepaid on boiling for 10-15 minutes. The Infusion is prepaid by soaking aerial part for 2-3 days and kept overnight. The root is crushed into Powder.	The extract is taken orally for 2-5 days early in the morning.	Delivery pain, Menorrhagia, Induce abortion	46	0.38	38.3	W
<i>Portulaca oleraceae</i> L. (Por-ole)	Portulacaceae	Nuner	Herb	Leaves, Whole plant	The Infusion of leaves is prepaid by soaking them in water and kept overnight. The Decoction of whole plant is	The extraction obtained is taken along with water for one week only.	Menorrhagia Uterine infection	71	0.59	59.1	W

					prepaid by boiling for 10-20 minutes.						
<i>Adiantum capillus-verneris</i> L. (Adi-cap)	Pteridaceae	Gawtheer	Herb	Leaves	The Decoction is prepared by boiling fresh leaves for 10-15 minutes.	The extract is taken orally after cooling for 2-3 weeks.	Dysmenorrhoea, Contraceptive.	38	0.31	31.6	W
<i>Ziziphus jujube</i> Mill. (Ziz-juj)	Rhamnaceae	Brai	Tree	Fruit	The Decoction of fruit is prepaid by boiling for 5-10 minutes.  The fruit is crushed into Powder.	The extraction of fruit is taken orally twice in a day. The extraction of powder is taken along with water for 2-5 days.	Lactation Leucorrhoea	50	0.41	41.6	W
<i>Cydonia oblonga</i> Miller. (Cyd-obl)	Rosaceae	Bomxonth	Tree	Fruit	The fresh juice is extracted by boiling for 10-20 minutes.	The juice is taken twice a day.	Menorrhagia Leucorrhoea	56	0.46	46.6	C
<i>Fragaria nubicola</i> Lindl. (Fra-nub)	Rosaceae	Ishtabur	Herb	Rhizome Leaves	The Decoction of fresh rhizome is prepaid by boiling in water. Leaves are crushed along with water and kept outside for night.	The extract of rhizome is taken orally. The extract is taken early in the morning.	Menorrhagia Lactation	38	0.31	31.6	W
<i>Prunus amygdalus</i> Batsch. (Pru-amy)	Rosaceae	Badaam	Tree	Leaves	The Decoction of fresh leaves is prepaid by boiling for 10-20 minutes.	The extract is taken orally for 2-3 weeks.	Fertility	40	0.33	33.3	C
<i>Prunus persica</i> (L.) Batsch (Pru-per)	Rosaceae	Chenun	Tree	Flower, Leaves	The infusion of flower is obtained by crushing into powder. The Decoction of fresh leaves is obtained by boiling for 15-20 minutes.	The extraction of powder is taken orally for 2-5 days.	Oligomenorrhoea , Vomiting during pregnancy	56	0.46	46.6	C

## Ethnobotany Research and Applications

<i>Rubus niveus</i> Thunb. (Rub-niv)	Rosaceae	Chaanch	Shrub	Root, Fruit	The roots are crushed into Powder. The fresh fruit is eaten as raw.	The powder is mixed with one cup of milk and given for 2-7 days.	Menorrhagia Leucorrhea	47	0.39	39.1	W
<i>Aesculus indica</i> Wall. ex Cambess. (Aes-ind)	Sapindaceae	Haan-doon	Tree	Fruit	Fresh juice of fruit is given to women to reduce Dysmenorrhea.	The fresh juice is taken orally to treat Menorrhagia and dysmenorrhea.	Dysmenorrhea Menorrhagia	37	0.30	30.8	W
<i>Urtica dioica</i> L. (Utr-dio)	Urticaceae	Soi	Herb	Leaves, Whole plant	The Infusion is prepaid by soaking leaves for 2-3 days and kept overnight.	The extract is taken orally twice a day.	Oligomenorrhea Antifertility agent Leucorrhea	51	0.42	42.5	W

### Life form of medicinal flora

In the present study, herbs were dominant life form 70% (36 species) followed by trees 20% (10 species), and shrubs 8% (4 species) (Fig. 3). Herbs were used often, which may be related to their ease of access from neighboring forests, which also suggested that there were many herb species available for use as medicine in natural habitats. An extremely high concentration of bioactive and other secondary metabolites is present in both annual and perennial herbs and these compounds have been found to be more efficient in treating seasonal illnesses (Panday *et al.* 2007; Wink 2015; Abdullah *et al.* 2020). In addition to producing a number of active compounds and serving as sinks for secondary metabolites, leaves directly participate in photosynthesis, which has the potential to produce a wide range of medically useful molecules (Yousuf *et al.* 2020).

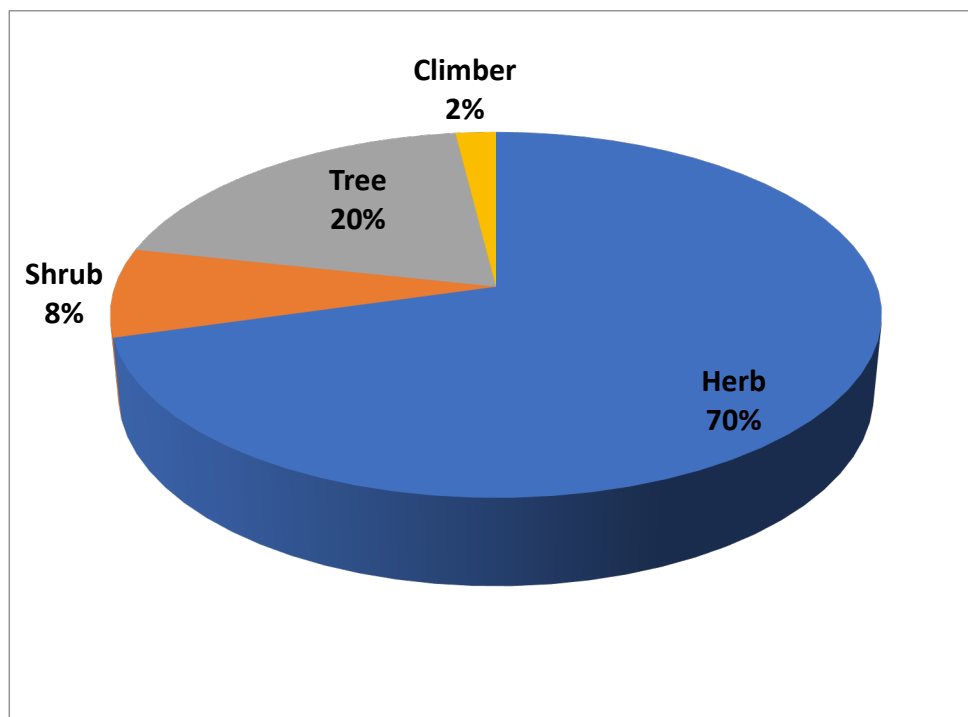


Figure 3. Percentage distribution of species according to their life form.

### Plant part used

Plant part used such leaves, fruits, seeds, flowers, roots, bark, rhizomes, and oil seeds were utilized to treat a variety of illnesses. The leaves were the main part used N=28 (34%), Aerial part N=4 (5%), whole plant N= 18 (19%), Root N= 4 (5%), Fruit N=10 (12%), Seed N=8 (10%), Bulb N=3(4%), Flower N=4 (5%), Rhizome N= 4 (5%), followed by Bark N=1 (1%) (Fig. 4). The variety of plant taxa used in medical administration can be seen in how they are used. It was discovered that the locals in the research region employed a variety of plant parts, including barks, roots, rhizomes, bulbs, leaves, seeds, flowers, fruits, or even the entire plant, as a drug or medicine. The majority of plant parts were used to treat various illnesses, and the prepared samples were typically kept in glass bottles or other containers as home-made dry powders that were made by crushing well-dried plant components; during the off-season or during severe snowfalls, they are difficult to obtain from the forests or surrounding areas. The high concentration of bio-active chemicals in herbs may be the cause for their use (Giday *et al.*2009). Also, most herbs grow in home gardens and on the sides of roads, making them readily available for collection in the wild (Abdullah *et al.* 2021; Haq *et al.* 2020; Kayani *et al.*2014). This was further corroborated by the PCA distribution (Fig. 5) in the biplot, which indicated a significant difference in a grouping of plant parts, the leaves were separated in the PCA distribution from the rest of the plant parts. Similar multivariate analysis was reported by (Hassan *et al.* 2022; Khoja *et al.* 2022) from Kashmir Himalayas. Other studies which have shown similar hierarchical clustering, multidimensional scaling, and relationships in Ethnobotany investigations include (Khoja *et al.* 2022b) from Kashmir Himalayas, (Haq *et al.* 2021, 2022) from Trans Himalayas.





juice, poultice, raw and infusion). The most common and viable strategies of preparations include using raw, drying the plants, crushing the min to powder, then boiled to obtain decoction, tea and infusion, other preparations include extract, juice, and paste (Table 2). The plant preparations were often stored in glass bottles or other containers and used in off-seasons or during heavy snowfall in winters. The least frequent method of administration from the locations under investigation was found to be using the herbs as raw medication (N=5, 6%) of the Kashmir Himalaya (Segawa *et al.* 2007; Rokaya *et al.* 2012). The most popular way of preparing herbs was extraction in hot or cold water, and oral administration was frequently used instead of topical or other types of administration (Shah *et al.* 2015; Umair *et al.* 2019), (Fig. 6).

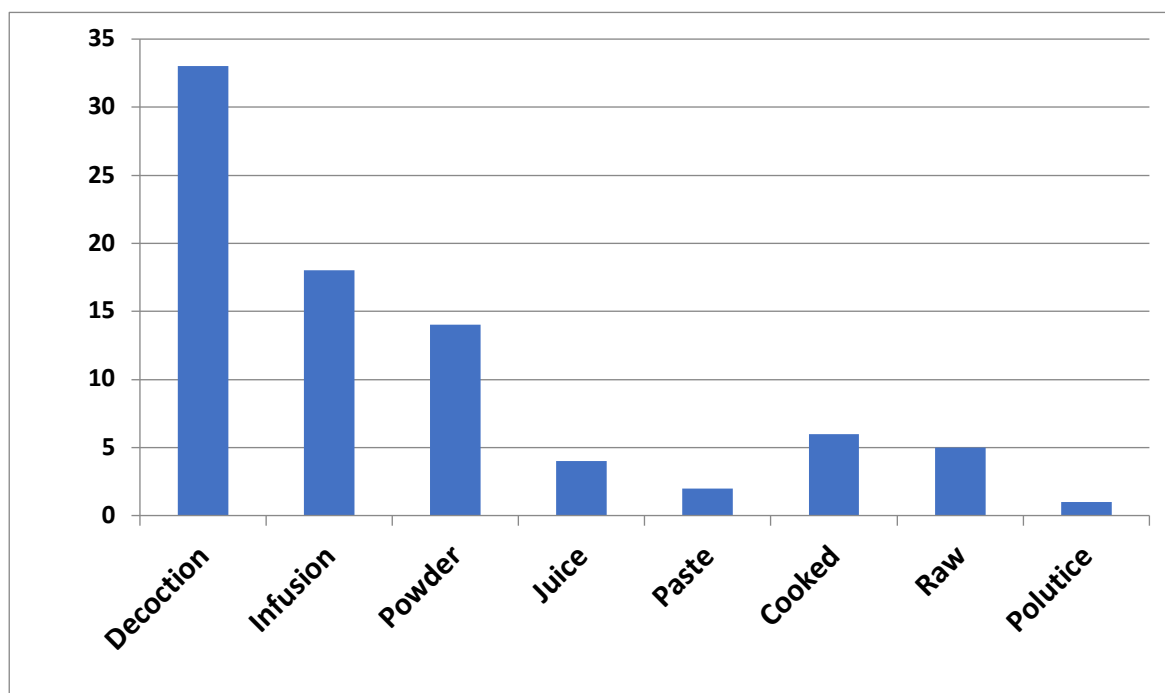


Figure 6. Number of different plant parts used in the study area.

#### Disease treated:

Present study revealed that menstrual disorders (36%) is the dominant disease which is treated using quoted medicinal herbs followed by leucorrhea (15%), Lactation (11%), fertility, pre- and post-delivery disorders (8% each), Pregnancy (7%), Contraceptive (5%), Uterus disorders (4%), Vaginal disorders (3%), Abortion (2%) and Aphrodisiac (1%) (Fig. 7). It is important to note that sometimes higher doses from the medicinal herbs can cause serious effects. This is why one needs to be careful while using these medicinal herbs at home (Bang *et al.* 1989; Wasserheit *et al.* 1989).

Based on Sorensen's similarity index, the Cluster Analyses indicated substantial clusters of ethogynecological illnesses (Fig. 8). In terms of disease-specific plant use, nearly one-third of the total species pool was used to combat menstrual issues; Cluster 1 included the species used to treat menstrual disorders; (mens.cycl) *Adiantum capillus-verneris*, *Aesculus indica*, *Amaranthus viridis*, *Calendula officinalis*, *Celtis australis*, *Chenopodium album*, *Cichorium intybus*, *Coriandrum sativum*, *Cydonia oblonga*, *Conyza bonariensis*, while the remaining two-thirds of the species clustered out and were dispersed among the remaining 10 disease types; Contraceptive (Cont); *Adiantum capillus-verneris*, *Cascuta reflexa*, Leucorrhea (Leuc); *Cydonia oblonga*, *Ajuga bracteosa*, Fertility (Fert); *Allium sativum*, *Foeniculum vulgare*, Pre-Delivery & Post Delivery (Pre.deli); *Oxalis corniculata*, *Geranium wallichianum*, Vaginal disorder (Vagi.disco); *Malva sylvestris*, Abortion (Abor); *Artemisia absinthium*, Lactation (Lact); *Centaurea iberica*, *Arnebia benthamii*, Aphrodisiac (Aphr); *Ficus carica*, Uterus disorder (Uter.disco); *Notholirion thomsonianum*, *Portulaca oleraceae*, Pregnancy (Preg); *Oxalis corniculata*, *Papaver somniferum*. Similar classifications were found in previous studies, i.e., Asif *et al.* (2021) reported five groups of wild plants from tribal communities in the tehsil of Karnah (Jammu and Kashmir), India. Haq *et al.* (2020) classified the wild plants of district Reasi into four plant usage groups; Haq *et al.* (2022a) from Western Himalayas. Rivera *et al.* (2007) reported eight major clusters while evaluating the ethno uses of plant species in the mountains of Castilla-La Mancha (Spain).

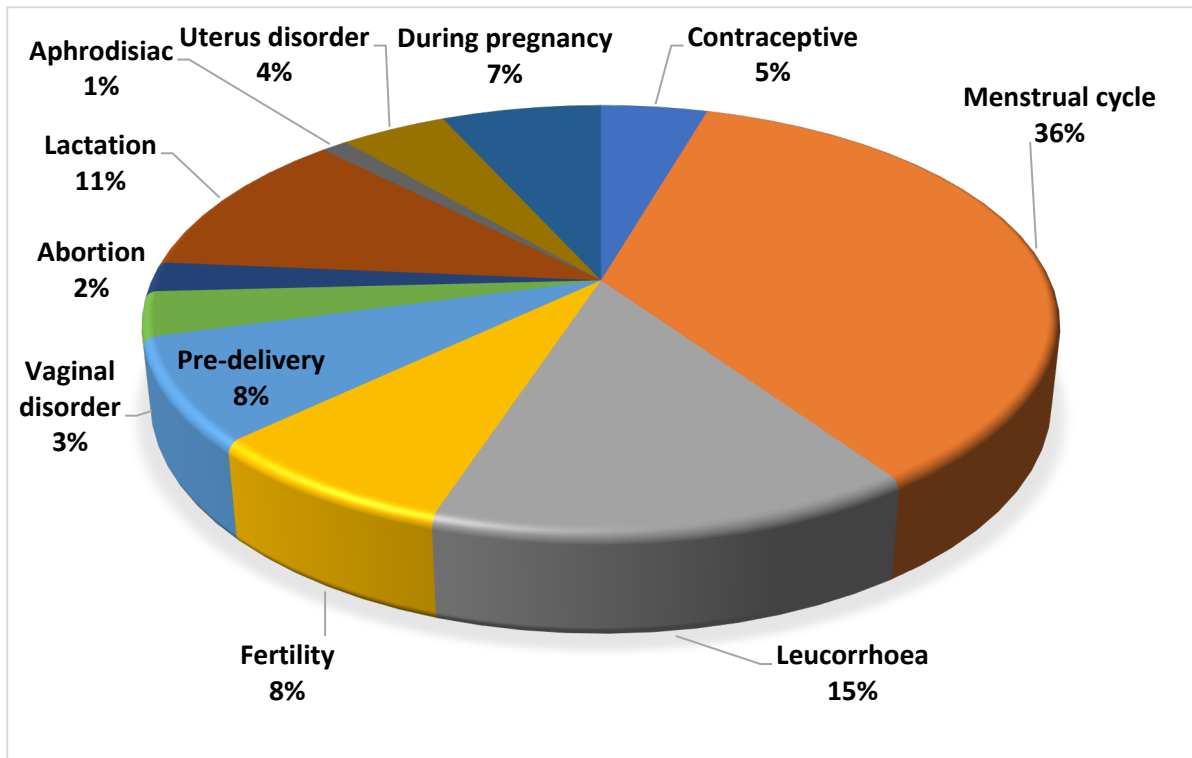


Figure 7. Percentage of disease categories treated.

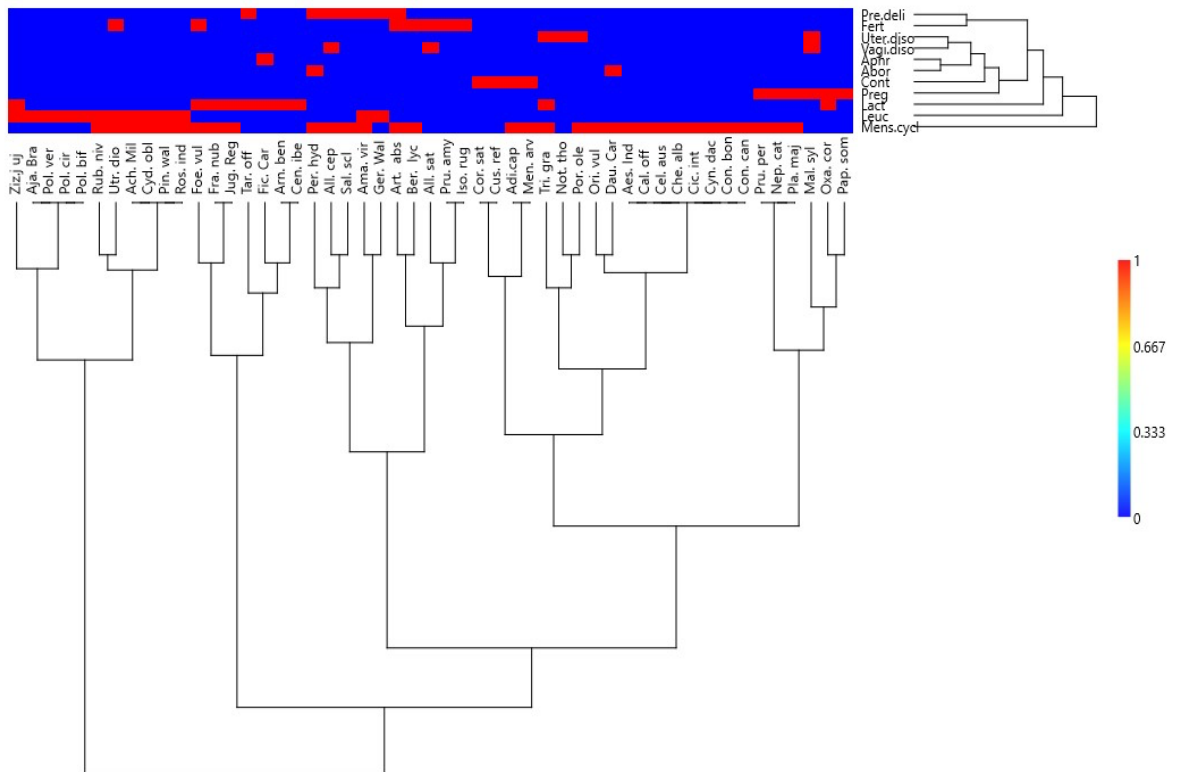


Figure 8. Cluster diagram of the different ethogynecological diseases based on plant usage pattern.

### Family use value (FUV)

Family use value represents the most biological significant plant family of any particular region. In this study, the use value of families represented by more than 1 large Taxon where calculated and listed in (Table 3). The highest family use value (FUV) was reported for Asparagaceae (0.50) while as the lowest FUV was calculated for Amaranthaceae (0.31). Asteraceae and Apiaceae have a family use value of (0.48) followed by Lamiaceae (0.41) while as Rosaceae and Liliaceae (0.39 each). These taxa are of high value in traditional medicine and therefore, they were also mentioned by large number of informants. Pteridaceae, Sapindaceae, Boraginaceae, Berberidaceae, Cannabaceae, Convolvulaceae, Poaceae, Moraceae, Geraniaceae, Juglandaceae, Malvaceae, Oxalidaceae, Polygonaceae, Papaveraceae, Plantaginaceae, Fabaceae, Rhamnaceae, Portulacaceae, Urticaceae, where recorded as monotypic families and where represented by only one plant taxa in the study area. Although the Asteraceae family is represented by the highest number of plant taxa (8) employed for herbal formulations, it has an FUV of 0.48, and the representative taxa under this family were *Achillea millefolium*, *Artemisia absinthium*, *Calendula officinalis*, *Centaurea iberica*, *Cichorium intybus*, *Conyza anadensis*, *Taraxacum officinale* (Bhat *et al.*2021 ;Khoja *et al.* 2022; Nadaf *et al.*2019).

Table 3. Family use value FUV of the documented species from the district Budgam.

Family Name	Species	Total use reports (URs)	Use value (UV)	Family use value (FUV)
Asteraceae	<i>Achillea millefolium</i> , <i>Artemisia absinthium</i> , <i>Calendula officinalis</i> , <i>Centaurea iberica</i> , <i>Cichorium intybus</i> , <i>Conyza bonariensis</i> , <i>Conyza Canadensis</i> , <i>Taraxacum officinale</i> .	424	3.5	0.48
Lamiaceae	<i>Ajuga bracteosa</i> , <i>Mentha arvensis</i> , <i>Nepeta cataria</i> , <i>Origanum vulgare</i> , <i>Salvia sclarea</i> , <i>Isodon rugosus</i> .	304	2.5	0.41
Rosaceae	<i>Cydonia oblonga</i> , <i>Fragaria nubicola</i> , <i>Prunus amygdalus</i> , <i>Rosa indica</i> , <i>Rubus niveus</i> , <i>Prunus persica</i> .	287	2.36	0.39
Liliaceae	<i>Allium cepa</i> , <i>Allium sativum</i> , <i>Notholirion thomsonianum</i> ,	143	1.17	0.39
Asparagaceae	<i>Polygonatum verticillatum</i> , <i>Polygonatum cirrhifolium</i> , <i>Polygonatum biflorum</i> .	182	1.51	0.50
Apiaceae	<i>Coriandrum sativum</i> , <i>Daucus carota</i> , <i>Foeniculum vulgare</i> .	176	1.45	0.48
Amaranthaceae	<i>Amaranthus viridis</i> , <i>Chenopodium album</i> .	74	0.61	0.31

### Use value (UV)

The use value UV is used to determine the relative importance of medicinal plants. The value ranges between 0-1. Medicinal plants with maximum use reports have highest use value while as medicinal plants with minimum use reports have lowest use value. In the present study the highest UV of 0.65 were calculated for *Artemisia absinthium* and the lowest UV of 0.21 for *Celtis australis* (Figure 9). A total of 90% of the local respondents were of the opinion that all the plants mentioned by them were employed for self-healthcare. Usually, the highest URs were the most significant, popular and valuable plant taxa employed as medicine by the inhabitants. The highest use report reflects a higher demand of these medicinal plants in curing various diseases, thus increasing the surplus demand of these medicinal plants, which becomes the main cause of extinction in their natural habitat (Aadil *et al.*2021). Similar results were reported by (Aadil *et al.* 2021a; Khoja *et al.* 2022) from Kashmir Himalayas. Therapeutic plants for which the use value (UV) is high due to their frequent distribution in the research area and the inhabitants are well known for their medicinal value (Haq *et al.* 2023)

### Novelty and Future Impacts

This study was compared with previously published literature of neighboring areas and distant areas of utilization of medicinal plants for ethogynecological disorders (Quershi *et al.* 2009; Mir *et al.* 2022; Khan *et al.* 2015; Aziz *et al.* 2018). The comparative study between previously reported medicinal plants showed that some medicinal plants have the same or different medicinal uses, while some were documented for the first time and others were not previously documented. The 4 species including all the three species of *Polygonatum cirrhifolium*, *Polygonatum*

*biflorum* used to treat leucorrhea, *Urtica dioica* for leucorrhea and fertility and *Isodon rugosus* for fertility. These species were reported for the first time to cure gynecological diseases (Table 2). Many ethnomedical studies have similar medicinal uses of therapeutic plants for the treatment of various ailments all over the globe. This study adds some new therapeutic plant uses, which may provide baseline data for phytochemical and pharmacological screening for the detection of new drugs in future studies. The discovery of drugs from therapeutic plants links an interdisciplinary approach to joining ethnomedical, pharmacological, botanical, and natural methods. However, any medicinal plants in this study area are not subjected to detailed pharmacological screenings.

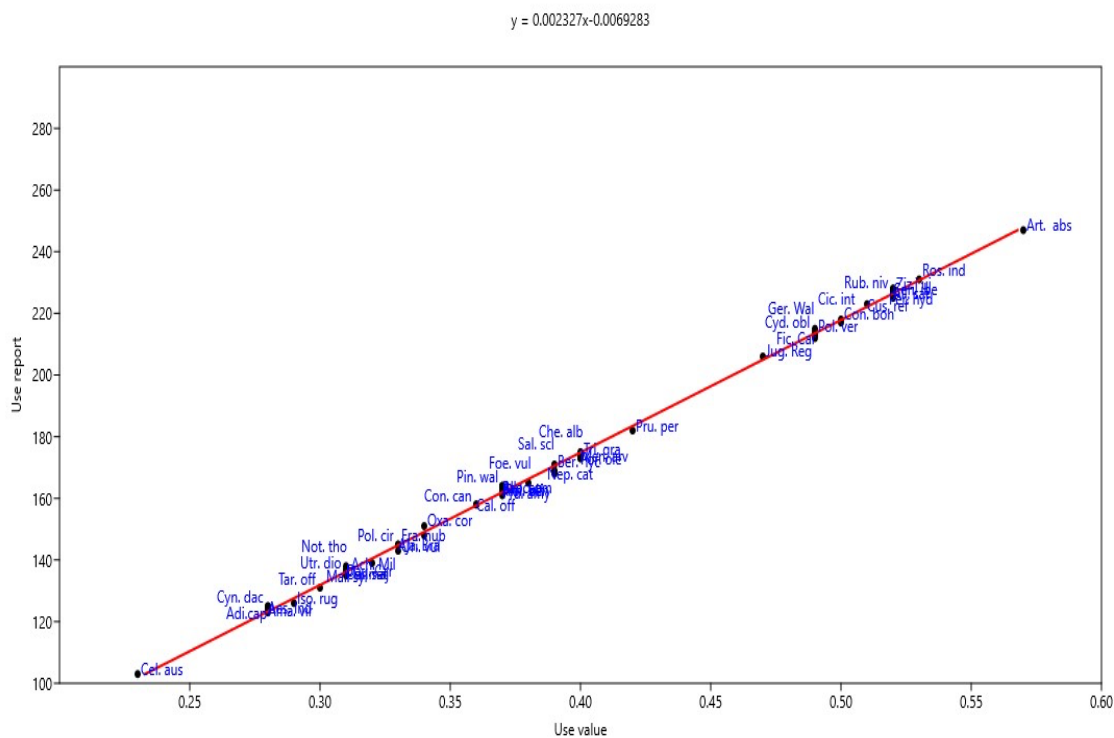


Figure 9. Relationship between Use value (UV) and Frequency of citation (FC). The full plant names are presented in Table 2.

## Conclusion

A total of 51 plant species have been documented to cure various types of gynecological disorders in the current study. The Asteraceae family was the most dominant, and its leaves are commonly used to treat gynecological disorders. The most common ailment category treated with 33 therapeutic plants in the study area was menstrual problems. The most commonly used methods for preparing herbal remedies were reported to be decoction and infusion, followed by powder, which is consistent with other studies. *Celtis australis* had the highest use value (0.65) and *Artemisia absinthium* had the lowest use value (0.21). Due to their closer association with local flora, older women are more likely to be familiar with their medical uses. For upcoming gynecological clinical and pharmacological trials, this survey creates a baseline. It is necessary to conduct extensive clinical and pharmaceutical tests to determine the bioactive components for the treatment of gynecological disorders.

## Declarations

**Ethics approval and consent to participate:** All the participants provided prior informed consent before the interviews.

**Consent for publication:** Not applicable-no personal data is included in this manuscript.

**Availability of data and materials:** The data used to support the findings of this study are available from the corresponding author upon request.

**Competing interests:** The authors declare that they have no competing interests.

**Author's contributions:** Mohsina Niyaz: Visualization, Methodology, Formal analysis, writing original draft. Syed Aasif Hussain Andrabi and Rayees Afzal Mir: Visualization, Supervision, Writing-review & editing.

## Acknowledgements

Thanks are due to the local people of Budgam for sharing the ethnobotanical information and cooperating during the surveys and interviews. The authors are thankful to those who directly or indirectly helped during the study.

## Literature cited

- Aadil A, Andrabi SAH. 2021. Wild edible plants and fungi used by locals in Kupwara district of Jammu and Kashmir, India. *Pleione* 15(2):179-189.
- Abdullah A, Andrabi SAH. 2021a. An approach to the study of traditional medicinal plants used by locals of block Kralpora Kupwara Jammu and Kashmir India. *International Journal of Botany Studies* 6(5):1433-1448.
- Abdullah A, Mir RA, Andrabi SAH. 2020. The pteridophytes of Kupwara (Block Kralpora) Jammu and Kashmir. *Indian Fern Journal* 37: 76-84.
- Amujoyegbe OO, Idu M, Agbedahunsi JM, Erhabor JO. 2016. Ethno medicinal survey of medicinal plants used in the management of sickle cell disorder in Southern Nigeria. *Journal of Ethnopharmacology* 185:347-360.
- Arshad AS, Bibi G, 2012. Ethnomedicinal uses of plant resources in Gilgit-Baltistan of Pakistan. *Journal of Medicinal Plants Research* 6(29):4540-4549.
- Asif M, Haq SM, Yaqoob U, Hassan M, Jan HA. 2021. Ethnobotanical study of indigenous knowledge on medicinal plants used by the tribal communities in tehsil "Karnah" of District Kupwara (Jammu and Kashmir) India. *Ethnobotany Research and Applications* 21:1-14.
- Aziz MA, Khan AH, Adnan M, Ullah H. 2018. Traditional uses of medicinal plants used by Indigenous communities for veterinary practices at Bajaur Agency, Pakistan. *Journal of Ethnobiology and Ethnomedicine*, 14(1):1-18.
- Aziz MA, Khan AH, Ullah H, Adnan M, Hashem A, Abd\_Allah EF. 2018. Traditional phytomedicines for gynecological problems used by tribal communities of Mohmand Agency near the Pak-Afghan border area. *Revista Brasileira de Farmacognosia* 28(4):503-511.
- Bang RA, Baitule M, Sarmukaddam S, Bang AT, Choudhary Y, Tale O. 1989. High prevalence of gynecological diseases in rural Indian women. *The Lancet* 333(8629):85-88.
- Bhattarai S, Chaudhary RP, Quave CL, Taylor RS. 2010. The use of medicinal plants in the trans-himalayan arid zone of Mustang district, Nepal. *Journal of Ethnobiology and Ethnomedicine* 6(1):1-11.
- Dutt HC, Bhagat N, Pandita S. 2015. Oral traditional knowledge on medicinal plants in jeopardy among Gaddi shepherds in hills of northwestern Himalaya, J&K, India. *Journal of ethnopharmacology*, 168:337-348.
- Giday M, Asfaw Z, Woldu Z. 2009. Medicinal plants of the Meinit ethnic group of Ethiopia: an ethnobotanical study. *Journal of Ethnopharmacology* 124(3):513-521.
- Gurib-Fakim A. 2006. Medicinal plants traditions of yesterday and drugs of tomorrow. *Molecular aspects of Medicine* 27(1):1-93.
- Haq SM, Calixto ES, Yaqoob U, Ahmed R, Mahmoud AH, Bussmann RW, Mohammed OB, Ahmad K, Abbasi AM. 2020. Traditional usage of wild fauna among the local inhabitants of Ladakh, Trans-Himalayan Region. *Animals* 10(12):2317.
- Haq SM, Waheed M, Khoja AA, Amjad MS, Bussmann RW, Ali K. 2023b. A cross-cultural study of high-altitude botanical resources among diverse ethnic groups in Kashmir Himalaya, India. *Journal of Ethnobiology and Ethnomedicine* 19:12. doi: 10.1186/s13002-023-00582-8.
- Haq SM, Singh B. 2020. Ethno botany as a science of preserving traditional knowledge: Traditional uses of wild medicinal plants from District Reasi, J&K (Northwestern Himalaya), India. *Botanical Leads for Drug Discovery* 277-293
- Haq SM, Khoja AA, Lone FA, Waheed M, Bussmann RW, Casini R, Mahmoud EA, Elansary HO. 2023. Keeping Healthy in Your Skin - Plants and Fungi Used by Indigenous Himalayan Communities to Treat Dermatological Ailments. *Plants* 12:1575.
- Jain SK. 1991. *Dictionary of Indian Folk Medicine and Ethnobotany*. Deep Publication, New Delhi, India.

- Jan HA, Wali S, Ahmad L, Jan S, Ahmad N, Ullah N. 2017. Ethnomedicinal survey of medicinal plants of Chinglai valley, Buner district, Pakistan. *European Journal of Integrative Medicine* 13:64-74.
- Kaingu CK, Oduma JA, Kanui TI, 2011. Practices of traditional birth attendants in Machakos District, Kenya. *Journal of Ethnopharmacology* 137(1):495-502.
- Kayani S, Ahmad M, Zafar M, Sultana S, Khan MPZ, Ashraf, MA, Hussain, 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.
- Khattak NS, Nouroz F, Rahman IU, Noreen S, 2015. Ethnoveterinary uses of medicinal plants of district Karak, Pakistan. *Journal of Ethnopharmacology* 171:273-279.
- Khan RU, Mehmood S, Muhammad A, Mussarat S, Khan SU. 2015. Medicinal plants from flora of Bannu used traditionally by northwest Pakistan women's to cure gynecological disorders. *American-Eurasian Journal of Agricultural & Environmental Sciences* 15(4):553-559
- Khoja AA, Haq SM, Majeed M, Hassan M, Waheed M, Yaqoob U, Bussmann RW, Alataway A, Dewidar AA, Al-Yafsri, et al. 2022. Diversity, Ecological and traditional knowledge of pteridophytes in the western Himalayas. *Diversity*. 14:628.
- Khoja AA, Andrabi SAH, Mir RA. 2022a. Traditional medicine in the treatment of gastrointestinal diseases in northern part of Kashmir Himalayas. *Ethnobotany Research and Applications* 23:1-17.
- Khoja AA, Andrabi SAH, Mir RA, Bussmann RW. 2022b. Ethnobiological uses of plant species among three ethnic communities in the administrative (Kupwara) of Jammu and Kashmir-India: A cross cultural Analysis. *Ethnobotany Research and Applications* 24:1-22.
- Kiringe JW, 2005. Ecological and anthropological threats to ethno-medicinal plant resources and their utilization in Maasai communal ranches in the Amboseli region of Kenya. *Ethnobotany Research and Applications* 3:231-242.
- Lawal IO, Amao AO, Lawal KO, Alamu OT, Sowunmi IL, 2013. Phytotherapy approach for the treatment of gynecological disorder among women in Ido Local Government Area of Ibadan, Oyo State, Nigeria. *Journal of Advanced Scientific Research*,4(3):41-44.
- Mir TA, Jan M, Khare RK. 2021. Ethnomedicinal application of plants in Doodhganga Forest Range of district Budgam, Jammu and Kashmir, India. *European Journal of Integrative Medicine* 46:101366
- Marwat SK, Rehman FU, 2011. Medicinal folk recipes used as traditional phytotherapies in district Dera Ismail Khan, KPK, Pakistan. *Pakistan Journal of Botany* 43(3):1453-1462.
- Martin JG. *Ethnobotany (Methods Manual)*. Chapman and Hall, London, 2008.
- Muthu C, Ayyanar M, Raja N, Ignacimuthu S, 2006. Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu, India. *Journal of Ethnobiology and Ethnomedicine*,2(1):1-10.
- Pandey AK, Tripathi YC. 2009. Ethnobotany and its relevance in contemporary research. *Journal of Medicinal Plants Studies* 5(3):123-129.
- Patel PK, Patel MK, 2012. Ethogynecological uses of plants from Gujarat, India. *Bangladesh Journal of Plant Taxonomy*,19(1):93-94.
- Qureshi RA, Ghufuran MA, 2005. Medicinal value of some important roses and allied species of Northern Area of Pakistan. *Pakistan Rose Annual*, pp.24-29.
- Qureshi RA, Ghufuran MA, Gilani SA, Zaheer Y, Ghulam A, Aniqah B. 2009. Indigenous medicinal plants used by local women in southern Himalayan regions of Pakistan. *Pakistan Journal of Botany*.41(1):19-25.
- Rahman IU, Afzal A, Iqbal Z, et al. 2019. Historical perspectives of ethnobotany. *Clinics in Dermatology* 37(4):382-388.
- Rahman AHMM. 2014. Ethno-gynecological study of traditional medicinal plants used by Santals of Joypurhat district, Bangladesh. *Biomedicine and Biotechnology* 2(1):10-13.

Rekka R, Muruges S, Prabakaran R, Tiruchengode ND, 2013. Plants used by Malayali tribes in ethnogynaecological disorders in yercaud hills, southern eastern ghats, Salem district, Tamil Nadu. *Reporter* 3:190-192.

Rokaya MB, Münzbergová Z, Timsina B, Bhattarai KR. 2012. *Rheum australe* D. Don: A review of its botany, ethnobotany, photochemistry and pharmacology. *Journal of Ethnopharmacology* 141:761-774.

Sadeghi Z, Mahmood A. 2014. Ethno-gynecological knowledge of medicinal plants used by Baluch tribes, southeast of Baluchistan, Iran. *Revista Brasileira de Farmacognosia* 24(6):706-715.

Segawa P, Kasenene JM, 2007. Medicinal plant diversity and uses in the Sango bay area, Southern Uganda. *Journal of Ethnopharmacology*,113(3):521-540.

Shah A, Bharati KA, Ahmad J, 2015. New ethnomedicinal claims from Gujjar and Bakerwals tribes of Rajouri and Poonch districts of Jammu and Kashmir, India. *Journal of Ethnopharmacology* 166:119-128.

Shah S, Khan S, Bussmann RW, Ali M, Hussain D, Hussain W, 2020. Quantitative ethnobotanical study of Indigenous knowledge on medicinal plants used by the tribal communities of Gokand Valley, District Buner, Khyber Pakhtunkhwa, Pakistan. *Plants*,9(8):1001.

Shrestha PM, Dhillon SS. 2003. Medicinal plant diversity and use in the highlands of Dolakha district, Nepal. *Journal of Ethnopharmacology* 86(1):81-96.

Subash AK, Augustine A, 2012. Hypolipidemic effect of methanol fraction of *Aconitum heterophyllum* wall ex Royle and the mechanism of action in diet-induced obese rats. *Journal of Advanced Pharmaceutical Technology & Research* 3(4):224.

Tarafder CR, 1983. On two less known and unknown edible plants used by the tribals in Hazaribagh district of Bihar. *Folklore Calcutta*,24(4):88-89.

Tariq A, Adnan M, Iqbal A, Sadia S, Fan Y, Nazar A, Mussarat S, Ahmad M, Olatunji OA, Begum S, Mazari P, Ambreen B, Khan SN, Ullah R, Khan AL. 2018. Ethnopharmacology and toxicology of Pakistani medicinal plants used to treat gynecological complaints and sexually transmitted infections. *South African Journal of Botany* 114:132-149.

Telefo PB, Lienou, LL, Yemele MD, Lemfack MC, Mouokeu C, Goka CS, Tagne SR, Moundipa FP, 2011. Ethno pharmacological survey of plants used for the treatment of female infertility in Baham, Cameroon. *Journal of Ethnopharmacology* 136(1):178-187.

Umair M, Altaf M, Bussmann RW, Abbasi AM, 2019. Ethnomedicinal uses of the local flora in Chenab riverine area, Punjab province Pakistan. *Journal of Ethnobiology and Ethnomedicine* 15(1):1-31.

Wasserheit JN, Harris JR, Chakraborty J, Kay BA, Mason KJ. 1989. Reproductive tract infections in a family planning population in rural Bangladesh. *Studies in Family Planning*.20:69-80.

Wink M, 2015. Modes of action of herbal medicines and plant secondary metabolites. *Medicines* 2(3):251-286.

Yousuf S, Haq SM, Rasool A, Zulfajri M, Hanafiah MM, Nafees H, Tasneem S, Mahboob M. 2020. Evaluation of Antidepressant Activity of Methanolic and Hydroalcoholic Extracts of *Acorus Calamus* L. Rhizome through Tail Suspension Test and Forced Swimming Test of Mice. *Journal of Traditional Chinese Medical Sciences* 7(3):301-307.