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TRADITIONAL USE PRACTICE OF WILD PLANTS AMONG THE LOCAL INHABITANTS IN THE DISTRICT BUDGAM, KASHMIR HIMALAYA

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Abstract

Traditional knowledge serves as the foundation for understanding the intricate connections between biological diversity and the language, cultural memory, ecological knowledge, and social values of local and indigenous communities. Ethnic communities have developed their own cultures, which manifest as taboos, norms, and traditional healthcare systems. To collect data for a comprehensive and systematic ethnobotanical survey in District Budgam, Kashmir Himalaya, semi-structured interviews, focus group talks, and field observations were used. A total of 60 medicinal plants belonging to 38 families have been collected from the study area. Most of them belong to Asteraceae (8 species) and Lamiaceae (7 species) followed by Polygonaceae (3 species). Leaves were the most utilized (32 % of uses) followed by roots (18%), whole plant (15%). In the current study, the most dominant life forms used in the treatment of various ailments were herbs (78%), followed by shrubs (10%). The most treated diseases are gastrointestinal problems (30 species), dermatological disorders (20 species). *Aconitum heterophyllum* had the greatest UV of 0.62 and *Ailanthus excelsa* had the lowest UV of 0.1 in the current study. In the current study, ten plants were listed on the IUCN Red List; one is critically endangered, six are endangered, and three are vulnerable. Existing patterns of medicinal plant use are influenced by societal acceptance, physical proximity, and market access. As a result, despite the abundance of therapeutic plants in the area, plants that are widely recognized and have higher utility values are favored. Conservation efforts should be prioritized, and swift intervention is required.

Key words: Ethnomedicine, Ethnic groups, Traditional knowledge, Vegetation, Budgam, Jammu and Kashmir

Introduction

Local people are the custodians of these natural resources. They have been living around the forests for generations even before these polices and laws came into existence, they have been conserving the forests for ages so that they can utilise the resources for their livelihood (S A H Andrabi L Puni 2011). Traditional knowledge has been passed down through generations, but factors such as cultural contact, land degradation, development activities, and deforestation have led to the migration of tribal populations from their ancestral lands, resulting in the gradual loss of this valuable knowledge (Farooq *et al.,* 2019). Urgent documentation is needed to conserve

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this invaluable ancestral information. Ethnobotanical surveys aim to explore how these plant resources are utilized in various aspects such as medicine, fuel wood, food, shelter, agriculture, timber, furniture, fodder, and religious ceremonies (Haq *et al*., 2021).

Herbal treatments have gained widespread popularity in East Asia, known for their high effectiveness and minimal side effects (Eddouks *et al*., 2014; Malik *et al*., 2019; Kangl *et al*., 2020). The diverse ethnic communities residing in the Himalayan region each possess unique indigenous healthcare systems, resulting in a wide variation in the applications of medicinal plants depending on their specific locations and environments (Khoja *et al*., 2021). Inhabitants of rural areas in the Himalayan region, particularly those residing near forests, heavily rely on forest resources for their healthcare needs, and this holds true for the Kashmir region as well. The Himalayan region of Kashmir is known for its abundant collection of medicinal plants (Singh 2002). The hilly and tribal regions of Kashmir have been largely overlooked in terms of data on the medicinal uses of plants (Jeelani 2013). Considering this, the present research aimed to address this gap and achieve the following objectives in the Kashmir Himalaya region: to thoroughly investigate the ethnobotanical use, plant resources utilized within the local communities and to identify the primary ailments treated and document the traditional methods employed for preparing the remedies. Finally, examine the conservation statuses of these recorded species. By focusing on these goals, the study aimed to shed light on the transmission of local plant knowledge and enhance our understanding of the patterns of plant utilization of resources in the Kashmir Himalaya.

Materials and methods

The current study was conducted in Budgam district of Jammu and Kashmir, situated between 34°01'12’ North Latitude and 74°46'48" East Longitude, as depicted in **Figure 1**. Data collection and plant sampling were conducted across 18 sites, namely Brenpathri, Nilnag, Jabbad, Gojjipathri, Nagbal, Yousmarg, Brenwar, Padshahtaar, Watkulu, Doodhpathri, Machipora, Kachkoor, Brass, Zagoo,Kharien, Ringzabal, Butkhod.

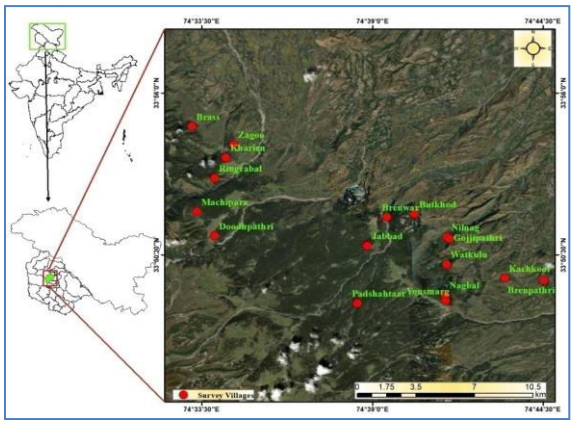

Figure 1. Study area map Jammu and Kashmir, India and name of villages in the map-surveyed villages in district Budgam.

Data collection

To gather information about medicinally valuable plants and the associated traditional knowledge, comprehensive surveys were conducted in the research region from April 2019 to June 2020. A total of 432 informants, including men, women, and herbal healers known as "Hakeem's in the local context" spanning various age groups from 18 to 90 years, were selected to acquire knowledge about medicinal plant usage. Questionnaires were formulated in the local language, and face-to-face interactions and semi-structured interview techniques were employed during the study, prior to the interviews, the informants were provided with a brief group discussion to outline the study's objectives, and formal consent forms were completed by all participants (S A H Andrabi L Puni 2012).

Data analysis

The data collected through interviews with the informants was analyzed using two different quantitative indices viz. informant consensus factor (ICF) and use value (UV).

***Informant Consensus Factor* [ICF]**

The ICF (Informant Consensus Factor) method is a valuable tool for highlighting plants that hold cultural significance and exhibit consensus in their utilization among a community. It aids in identifying the variability of medicinal plants and determining specific plant taxa of interest. To analyze the ICF, diseases were categorized, allowing for the identification of additional ethno-pharmacological plant taxa. The ICF was calculated using the formula proposed by (Heinrich *et al.,* 1998), which tests the hypothesis of knowledge homogeneity:

ICF = (Nur - Nt) / (Nur - 1)
Nur represents the number of use-reports (citations) for each ailment category,
Nt represents the number of plant taxa employed for specific ailments (Gazzaneo *et al.,* 2005).

***Use value* [UV]**

The use value index is used to determine the relative value of each medicinal plant species used by the local population.

UV=Ui/N
Ui is the total number of use reports submitted by each informant
N is the total number of study participants (Phillips & Gentry 1993).

Results and discussion

Demographic status of the Informants

The informants selected for interviews in this study were predominantly residents of the study area. Semi-structured questionnaires were used to conduct interviews, engaging individuals

of various ages, genders, and occupational backgrounds, as described in (Jan *et al*., 2021); Wali *et al.,* 2019). A total of 432 respondents participated, with 236 being men and 196 being women, reflecting cultural limitations for female involvement. Prior to data collection, frequent visits were made to the study area to establish rapport and gain the cooperation of the local community. It was observed that male informants (236 individuals) had more experience in exchanging information compared to female informants (196 individuals). Most of the participants had limited formal education, with only a small number having completed secondary education and holding jobs. The main languages spoken in the area were Gujjar, Pahari, and Kashmiri. Informants were selected based on their traditional knowledge and expertise in using plants for medicinal purposes. Throughout the survey process, a constant dialogue was maintained with the local population to ensure the accuracy of traditional knowledge. The interviews followed the protocols outlined in (Haq *et al*., 2021 & Aziz *et al*., 2021). Prior to each interview, verbal prior informed consent was obtained, and the research adhered to the ISE (International Society of Ethnobiology) Code of Ethics (2006) (https://www.ethnobiology.net). Interviews were conducted in the respective native languages with the assistance of a translator. In compliance with the Nagoya Protocol and the agreement with local participants, the ethnicity of the participants and specific language information were not disclosed. During the interviews, both photographs and live plants were presented to the participants to aid in identification and to obtain local names.

Floristic characteristics of medicinal plants

A total of 60 medicinal plants from 38 distinct families were gathered from the study area. The Asteraceae family has the most species (8 species), followed by Lamiaceae (7 species), and Polygonaceae (3 species) [Figure 2]. Furthermore, the current study discovered that families had unequal distribution patterns, with 28 monotypic families, it agrees with earlier ethnobiological research from other Himalayan areas (Haq *et al.,* 2020). The Asteraceae family's dominance can be linked to its herbaceous life form, wide distribution, and abundance in the studied area, or it might be because members of this family are well renowned for having fragrant qualities and are widely distributed in nature (Tariq *et al.,* 2018; Shedayi *et al*., 2012). Asteraceae family members readily adapt to arid and dry conditions because of their wide biological range (Haq *et al.,* 2021; Khoja *et al.,* 2021). Asteraceae was found to be dominant in many biomes, primarily in open habitat ecosystems (Barreda *et al*., 2015).Several studies have concluded that the Asteraceae was also the most important or useful family in the surrounding areas of Pakistan and Kashmir Himalayas (Khoja *et al*., 2020; Mohammad *et al*., 2021; Awan *et al*., 2021).Likewise, (Tenzin *et al*., 2017) also reported Asteraceae as a dominant family in the Highlands of Gasa District, Bhutan.

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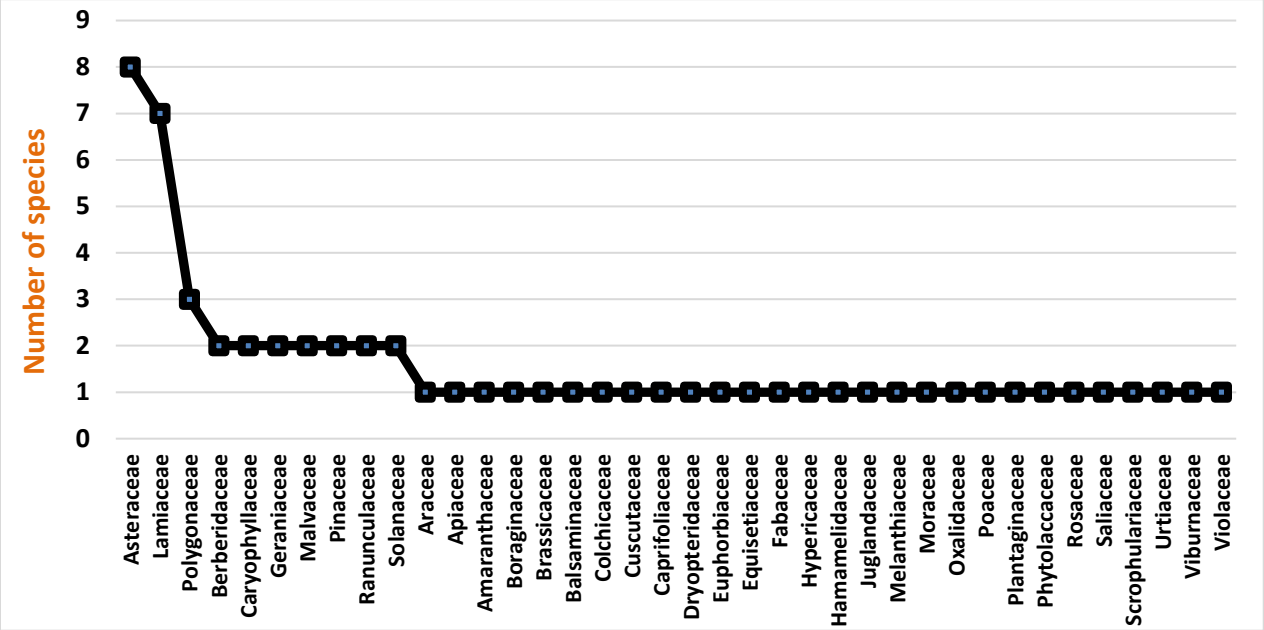

Figure 2. Distribution of documented ethnobotanical species in various families in the study area

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Table 2: Ethnobotanical use of the reported plants, their description, IUCN status and use value.

Botanical Name	Common Name	Life form	Part used	Preparation	Administration	Disease treated	Other uses	IUCN status	Ui & UV
Aconitum heterophyllum (Ranunculaceae)	Patris	H	L	r	I	Abdominal pain, Skin disease	Vegetables	E	271 (0.62)
Artemisia moorcroftiana (Asteraceae)	Teethwan	H	Wp	I	I	Abdominal pain, intestinal worms	Fodder.	L C	101 (0.23)
Acorus calamus (Araceae)	Vai	H	R	R	I	Stomachache, abdominal pain, Diarrhea	-------	V	254 (0.58)
Aconitum violaceum (Ranunculaceae)	Mohand	H	F	P	E	Snake and scorpion bites	Vegetables	E	44 (0.1)
Ajuga parviflora (Lamiaceae)	Jain-a-adam	H	L	pa/p	I E	Diuretic, Diarrhea, Wounds	Fodder.	L C	145 (0.33)
Angelica glauca (Apiaceae)	Choud	H	Rh	P	I	Stomachache	Rodenticide and Fodder.	E	84 (0.19)
Artemisia absinthium (Asteraceae)	Teethwan	H	AP	D	I	Abdominal pain, intestinal worms, indigestion	Fodder.	L C	247 (0.57)
Arnebia benthamii (Boraginaceae)	Khazaban	H	L	I	I	Enhance lactation cough & cold, dry throat	Tea.	E	163 (0.37)
Berberis lyceum (Berberidaceae)	Kaw dach	S	Wp	i, pa	I	Bronchitis, Skin problems	Fruits, fuel wood, fodder.	L C	169 (0.39)
Bistorta amplexicaulis (Polygonaceae)	Manchrai chai	H	R	I	I	Rheumatic, whitening of tongue, Stomach problems	Tea, fodder.	L C	125 (0.28)
Cichorium intybus (Asteraceae)	Heand	H	L	c	I	Typhoid, blood purifier.	Vegetables, fodder	L C	218 (0.5)
Conyza Canadensis (Asteraceae)	Shalut	H	L	I	I	Indigestion, stomach gas	Fodder.	L C	158 (0.36)

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Colchicum luteum (Colchicaceae)	Vir-kum-poash	H	C&Se	I	I	Back pain, Bronchitis, fever, constipation	-------	V	64 (0.14)
Chenopodium album (Amaranthaceae)	Gunhar	H	Wp	i, pa	I E	Joint pain, lice, hair fall	Vegetables, fodder.	L C	175 (0.4)
Cuscuta reflexa (Cuscutaceae)	Kukliport	H	Ap	Pa	I E	Testicles, hair fall	------	L C	223 (0.51)
Capsella bursa pastoris (Brassicaceae)	Kralmond	H	L&Se	Pa	I E	Anti-inflammatory, skindiseases, wounds	Vegetables, fodder	L C	254 (0.58)
Cedrus deodara (Pinaceae)	Deodar	T	S	Pa	E	Toothache, foot and mouth disease	Fuel wood and timber.	L C	226 (0.52)
Cynodon dactylon (Poaceae)	Drub	H	Wp	I	I	Oligomenorrhea, Amenorrhea	Fodder.	L C	125 (0.28)
Datura stramonium (Solanaceae)	Datur	H	S	I	I E	Bronchitis, frost bites	Rodenticide.	L C	54 (0.12)
Dipsacus inermis (Caprifoliaceae)	Wapalhaakh	H	L	I	I	Tightening of blood Vessels, body weakness	Vegetables, fodder.	L C	241 (0.55)
Diplazium maximum (Dryopteridaceae)	Longdi	F	Wp	i,d	I	Diuretic anti-microbial	Vegetables.	L C	221 (0.51)
Euphorbia wallichii (Euphorbiaceae)	Herbi	H	L,S& La	i&pa	I E	Skin diseases abdominal cramps cholera	------	L C	44 (0.1)
Equisetum arvense (Equisetiaceae)	Gandamgud	F	Wp	j, pa	I	Kidney stones UTI infection	Tooth cleaning	L C	96 (0.23)
Ficuscarica (Moraceae)	Anjeer	T	F,S& La	Pa	I E	Skin diseases, Tonsillitis	Fruits and fuel wood.	L C	212 (0.49)
Geranium wallichianum (Geraniaceae)	Ratanjog	H	R	p,d	I E	Joint pain, general weakness, acidity	Dye, tea and fodder.	L C	215 (0.49)
Geranium pratense (Geraniaceae)	Ratanjog	H	R&L	P	I	Joint pain, diarrhea	Tea and fodder.	L C	235 (0.54)

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Herniaria hirsute (Caryophyllaceae)	Chilk	H	L	I	I	Dizziness	Tea.	L C	75 (0.17)
Hypericum perforatum (Hypericaceae)	Chai kul	H	L	I	I	Diarrhea	Tea and fodder	L C	49 (0.1)
Impatiens glandulifera (Balsaminaceae)	Trul	H	L	Pa	I	Joint pain	Seeds are eaten as fresh.	L C	76 (0.17)
Isodon rugosus (Lamiaceae)	Shulekhat	S	L	I	I	Fever, stomachache, Diarrhea	Fuel wood.	L C	126 (0.29)
Indigofera heteranth (Fabaceae)	Zand	S	R	R	I	Stomachache	Firewoodbaskets, making	L C	46 (0.1)
Lavatera cachemiriana (Malvaceae)	Junglesoucha l	H	Fl	D	I	Bronchitis	Fodder. Flowersjam.	L C	112 (0.25)
Lamium album (Lamiaceae)	Zakhmedawa	H	Wp	Pa	E	Wounds	Fodder	L C	48 (0.12)
Juglans regia (Juglandaceae)	Doon	T	F	Pa	E	Arthritis	Seeds, cleanteeth, firewood, timber.	L C	206 (0.47)
Mentha arvensis (Lamiaceae)	Pudina	H	L	P	I	Asthma, diarrhea.	Salad and Spices.	L C	174 (0.4)
Malva neglecta (Malvaceae)	Souchal	H	Wp	I	I	Stomach cramps, Diarrhea	Vegetables and Fodder	L C	61 (0.14)
Oxalis corniculate (Oxalidaceae)	Chokchrey	H	Wp	P	I	Diarrhea, abdominal pain	Salad.	L C	151 (0.34)
Podophyllum hexandrum (Berberidaceae)	Wanwangun	H	L&F	Pa	I	Diarrhea, constipation	Fruits are eaten raw.	E	242 (0.56)
Pinus wallichiana (Pinaceae)	Kayur	T	Rh	Pa	E	Wound healing &skin problems	Fuel wood and timber.	L C	164 (0.37)
Prunella vulgaris (Lamiaceae)	Kalyuth	H	Wp	I	I	Fever, constipation, sore throat	Vegetables and fodder	L C	225 (0.52)

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Plantago major (Plantaginaceae)	Boddgul	H	Wp	D	I E	Rheumatic, dysentery, insect sitting	Vegetables and fodder	L C	136 (0.31)
Parrotiopsis jacquemontiana (Hamamelidaceae)	Pouh/posh	S	S&L	Pa	E	Joint Pain, wounds	Fuelwood and basket making	L C	44 (0.1)
Phytolacca acinosa (Phytolaccaceae)	Braand	H	F &L	I	I	Bronchitis, rheumatic	Vegetables	L C	48 (0.12)
Rubus ulmifolius (Rosaceae)	Gounch	S	Wp	I	I E	Bronchitis, diarrhea	Fruits and fuelwood.	L C	50 (0.11)
Rumex nepalensis (Polygonaceae)	Abij	H	L&R	I	I E	Back pain, skindiseases	Vegetables and fodder	L C	87 (0.2)
Rheum webbianum (Polygonaceae)	Pambchalan	H	R	Pa	E	Skin diseases, wounds.	Vegetables and fuelwood.	V	252 (0.58)
Salix alba (Saliaceae)	Kashir veer	T	L	pa&j	E	Burst of pus, stomach problems	Fodder, tooth cleaning, firewood	L C	86 (0.19)
Salvia moorcroftiana (Lamiaceae)	Gulkan	H	R	P	E	Skin diseases	-------	L C	94 (0.21)
Stellaria media (Caryophyllaceae)	Nick haakh	H	Wp	I	I	Itchy skin, pulmonary diseases	Vegetables and fodder	L C	51 (0.11)
Saussurea costus (Asteraceae)	Kouth	H	R	D	I	Joint problems	-------	C E	257 (0.59)
Solanum nigrum (Solanaceae)	Kambai	H	F &L	I	I	Abdominal pain, Jaundice	Fruits and vegetables	L C	52 (0.12)
Senecio chrysanthemoides (Asteraceae)	Bough	H	L	i&pa	I E	Skin rashes,stomach problems, urine disorders	Fodder	L C	43 (0.09)
Tussilago farfara (Asteraceae)	Wattpan	H	R	D	I	Abdominal pain	--------	L C	48 (0.11)

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Taraxacum officinale (Asteraceae)	Heand	H	Wp	D	I	Stomach cramps	Vegetables and fodder	L C	131 (0.3)
Trillium govanianum (Melanthiaceae)	Trupatri	H	R	P	I	Intestinal Worms	Vegetables	E	126 (0.29)
Thymus linearis (Lamiaceace)	Javind	H	L	I	I	Stomach cramps, snake bite	Tea	L C	245 (0.56)
Urtica dioecia (Urtiaceae)	Soi	H	R	P	I	Rheumatic, Urineinfection	Vegetable	L C	136 (0.31)
Viburnum grandiflorum (Viburnaceae)	Kilmish	S	F &R	r&i	I	Bronchitis, Stomachache	Fruits and fuel wood	L C	54 (0.12)
Verbascum Thapsus (Scrophulariaceae)	SarfeMakai	H	A p	P	I	Bloat burns	Fuel wood	L C	84 (0.19)
Viola odorata (Violaceae)	Bun poush	H	Fl	R	I	Bronchitis, fever	Flowers jam	L C	96 (0.22)

H= Herb, **S**= Shrub, **T**= Tree, **F**= Fern, **I**= Internal, **E**= External, **Wp**= Whole plant, **R**= Roots, **L** =Leaves, **F**= Fruits, **Rh**= Rhizome, **Ap**= Ariel part, **Fl**= Flower, **S**=Stem, **Se**= Seed, **La**=Latex, **C**=Croam, **LC**= Least Concern, **E**=Endangered,**CE**= Critically, **V**=vulnerable, **r**= Raw, **i**=Infusion, **p**=Powder, **pa**=Paste, **d**=Decoction, **c**= Cooked, **j**=Juice.

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Life form of medicinal plants

In the current study the most dominant life forms used in the treatment of various ailments were herbs (47 species,78%), followed by Shrubs (6 species, 10%), trees (5 species, 8%), and ferns (2 species, 3%) [Figure 3]. The reason behind the use of herbs might be due to the presence of high content of bio-active compounds in them and their medicinal action is more effective than other forms of plant (Adnan *et al.,* 2021). The plants from the study area were employed in a variety of ways, including topically and orally, depending on the condition being treated. Herbs are most frequently employed for therapeutic purposes in the study location, presumably because they are simple to gather, abundant, and very effective at treating ailments when compared to other life-forms (Aadil *et al*., 2021; Hussain *et al*., 2019). The higher use of herbs for medicinal purposes in the study area may be due to their ease of collection, greater abundance and high effectiveness in the treatment of ailments in comparison to other life forms (Haq *et al.,* 2021).

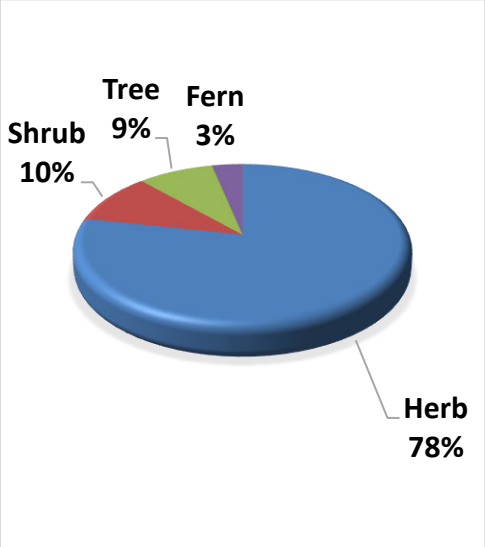

Fig.3 Percentage contribution of documented species in various growth form

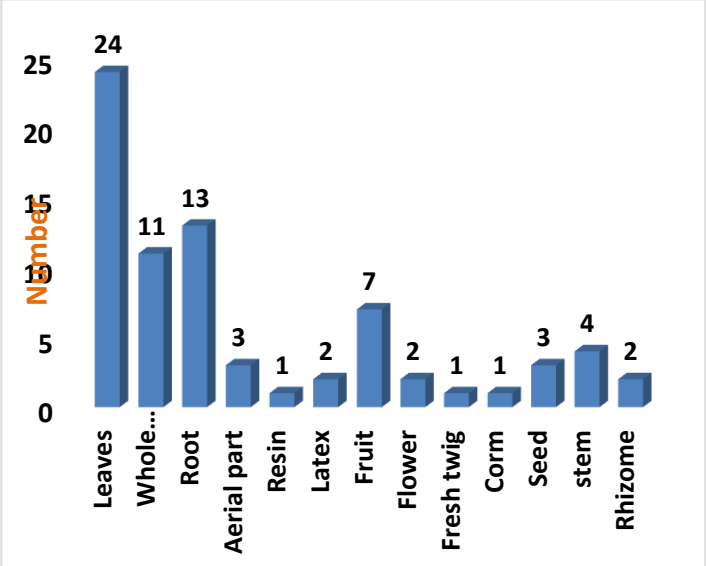

Fig 4. Distribution of documented species in various plant parts used

Traditional use categories

The most common use of plants was for medicine (52%) followed by food (28%), fodder and fuel wood (8% each), and cultural and timber (2% each) [Table 2]. Medicine is used for various diseases; food is used in terms of vegetables (*Dipsacus inermis, Cichorium intybus, Taraxacum officinale* and *Stellaria media*), fruits (*Ficus carica, Viburnum grandiflorum, Podophyllum hexandrum*and *Berberis lycium*), salad (*Mentha arvensis*), herbal tea (*Bistorta amplexicaulis, Herniaria hirsuta, Hypericum perforatum, Geranium wallichianum*), Jam (*Viola odorata, Lavatera cachemiriana).*While as most of the plant species are used as fodder (*Senecio*

chrysanthemoides, Rumex nepalensis, Malva neglecta, and *Lamium album),* while as few species are used for fuelwood and timber (*Salix alba, Parrotiopsis jacquemontiana, Pinus wallichiana, Cedrus deodara* and *Juglans regia).* This suggests that the high-altitude plant resources are significant in all facets of life for those who reside in remote areas, especially in terms of providing for their fundamental needs in terms of food, shelter, livelihoods and healthcare. Several other studies also reported similar results from other Himalayan regions like (Haq *et al.,* 2020) from District Reasi, Northwestern Himalaya, (Tali *et al.,* 2019)from Kashmir Himalayas (Haq *et al*.,2021) and from high-altitude Trans Himalaya. People often prefer to use traditional medicine because it is widely available locally, less expensive, has few perceived side effects, its accessibility, and simplicity in administration, and there is a growing importance of medicinal plants commonly used in folk medicine (Giday *et al*., 2003). However, many species may fail to pass clinical testing due to their toxicity and biocompatibility issues.

Plant part used

Leaves were the most utilized (32 % of uses) followed by Roots (18%), Whole plant (15%), Fruit (9%), Stem (5%),Arial part and Seeds (4% each), latex, Rhizome and Flower (3%), Resin, Fresh twig and corm (1% each)were determined to be the most widely used plant parts [Figure 4]. Leaves might have the potential to be a source of valuable drugs in addition to food. The presence of alkaloids in them explains why they are often employed as a remedy in traditional medicine so efficiently (Haq *et al.*, 2021). Like the current study, previous investigations claimed that leaves were the primary component (Giday *et al.,* 2003; Shah *et al*., 2016). The fact that leaves are the primary site of photosynthesis and other metabolic processes and hence generate most secondary metabolites may explain why leaves are so widely used (Verpoorte *et al.,* 2002; Ghorbani 2005; Cakilcioglu *et al.,* 2010). Additionally, compared to other plant parts, leaves are simpler to harvest and make into medicines. Additionally, because the entire plant is not uprooted, leaf eating has been recognized to be a sustainable method of harvesting therapeutic portions, and as a result, its use helps to preserve medicinal plant species (Giday *et al.,* 2003).

Mode of preparation

In this investigation, the most prevalent method of remedy preparation was Infusion (24 species) followed by paste (18 species), powder (11 species), decoction (9 species), raw (5species), juice (2 species) and cooked (1 species) [Figure 5]. Because the indigenous population thinks, infusions are more potent than any other form and because the mountain water used in the decoction is thought to have therapeutic qualities, infusions are frequently made, creating a synergistic effect. Other researchers (Naveed *et al.,* 2013; Okali *et al.,* 2007) have similarly reported the highest use of decoctions. All herbal remedies used in the current study were administered orally. According to our research, ethnic groups in numerous Kashmir Himalayan regions and other regions of the world consume herbal medicine orally (Mahmood *et al*., 2012; Khoja *et al*., 2021).

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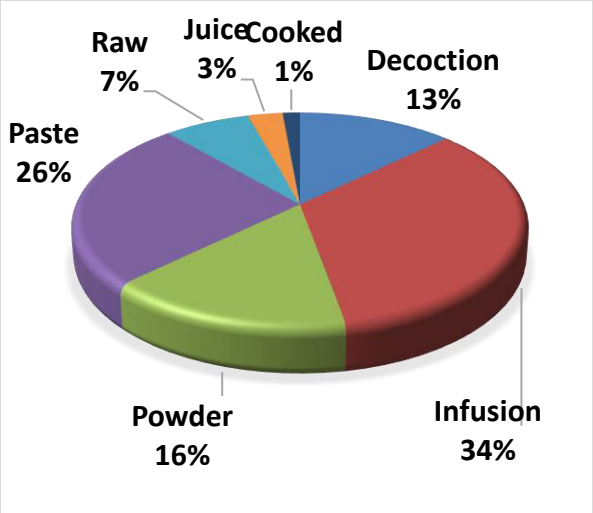

Figure 5. Percentage contribution of documented species in various herbal recipes

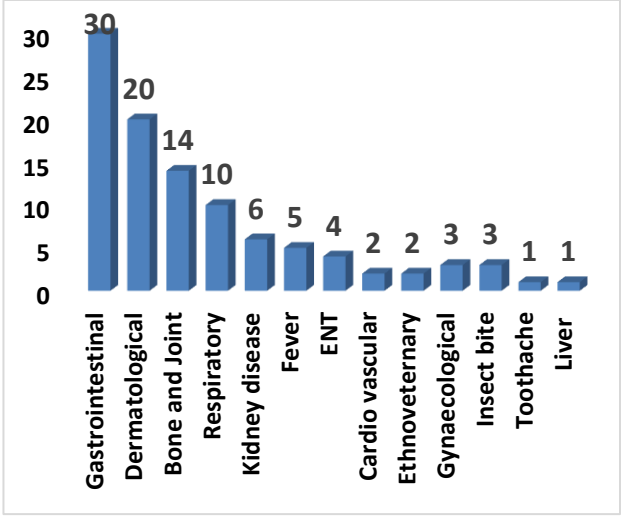

Figure 6: Distribution of documented species in various disease categories

Disease categories

The most commonly treated diseases are Gastrointestinal problems (30 species), Dermatological disorders (20 species), Orthopaedic (14 species), Respiratory problems (10 species), kidney disease (6 species each), Fever (5 species), ENT (4 species), Gynecological and insect bite (3 species each), Cardio vascular and ethnoveterinary (2 species each), while as the remaining disease groups were each treated by a single plant species. Most plant species have been utilized to treat gastrointestinal issues, and then followed by dermatological diseases [Figure 6]. According to earlier study from the Indian subcontinent, this application distribution is consistent such as Kaur *et al.,* 2020; Miya *et al*., 2020; Monigatti *et al.,*2013) reported from Peru.

Informant Consensus Factor (ICF)

The ICF indicates the agreement among participants on the utilization of plants for a particular disease category, and it highlights taxa that have healing potential for specific major purposes. It has been observed that different ailment categories depended on the availability of the plant taxa in the investigated area. In the present study, we have grouped all types of illnesses based on human-system-associated disorders into 11 categories, which are presented in [Table 3]. The results of the ICF values ranging from 0.97 to 1.00, where values near 1 represent a high rate of informant consensus for plant taxa employed against an illness category, whereas an ICF value close to 0 indicates a very low degree of agreement among the respondents for treatment of ailment. Basically, ICF can be employed to test the homogeny, or consistency, of a respondent's knowledge about a particular remedy for a disease category. Liver and Dental (ICF = 1.0 each) although the number of taxa used is only one in both cases had the maximum consensus between the informants, followed by Orthopedic disorder (ICF=0.99), Ethnoveterinary (ICF=0.99), Dermatological disorder (ICF=0.98), Gastrointestinal disorder (ICF=0.98), Kidney disorder (ICF

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= 0.98), Insectbite (ICF= 0.97) was found to have low consensus agreements between the participants, recorded during the study. As mentioned in [Table 3], ICF values for different ailment categories are relatively high, and this indicates that the exchange of knowledge among the participants for the utilization of medical taxa is high, which also proved the apparent efficacy of the recorded taxa. Similar results were reported by Haq *et al*., 2021; Aadil *et al*., 2021).

Table 3: Value of informant consensus factor (ICF) for different categories of diseases.

Disease categories	**Aliments**	**No. ofUsereports (Nur)**	**No. of taxa(Nt)**	ICF
Gastrointestinal disorder	Abdominal pain, Intestinal worms, Acidity, Diarrhea, Dysentery, Constipation, Cholera, Abdominal cramps, Stomach pain, Indigestion	2688	29	0.98
Dermatological disorder	Skin disease, Wounds, Burst of pus, Anti-microbial, Hair fall, lice, Skin rashes, Frost bites, Boils, Itchy skin	1603	21	0.98
Respiratory disorder	Pulmonary disease, cough & cold, Asthma, Bronchitis	545	11	0.98
Orthopedic (MSDs)	Rheumatic, Back pain, Joint pain, Anti-inflammatory, Arthritis, weakness	1352	14	0.99
Kidney disorder	Urine disorder, Diuretic, Testicles, Kidney stones	337	5	0.98
Fever	Fever, Typhoid, Dizziness	363	6	0.98
ENT(Ear,Nose,Throat)	Tonsillitis, dry throat, whitening of tongue, sore throat	271	4	0.98
Dental disorder	Toothache	118	1	1
Gynecological disorder	UTI, Lactation, Oligomenorrhea, Amenorrhea	292	4	0.98
Ethnoveterinary	Bloat, Foot & mouth disease	192	2	0.99
Liver disorder	Jaundice	35	1	1
Cardiovascular disorder	Blood purifier, Tightening of blood vessels	226	2	0.99
Insect bite	Snake & scorpion bite, insect sitting, snake bite	197	3	0.97

Use Value (UV)

A tool for evaluating the relative importance of medicinal plants in a certain area is the use value index. It has a valueof 0-1. The medicinal plants with the most usage reports have a high use value, whereas those with the fewest have a low use value. *Aconitium heterophyllum* had the greatest UV of 0.62 and *Ailanthus excels* had the lowest UV of 0.1 in the current study Table 2]. Locally *Aconitum heterophyllum* is frequently found in the higher altitudes; it's widely utilised

because of its various medicinal properties. We shouldn't ignore therapeutic plants with low use values either because failing to pass on this information to future generations could lead to their extinction. Just as we cannot ignore medicinal plants with high use values, we should also not ignore medicinal plants with low use values (Wali *et al.,* 2021). Additionally, it is not accurate to say that medicinal plants with poor therapeutic benefits are less important; rather, it suggests that the availability of these plants may be restricted or that the knowledge of them may be in danger (Chaudhary *et al.,* 2006; Mahmood *et al*., 2013). Due to their extensive distribution and widespread knowledge of their medicinal benefits among the local populace, medicinal plants have a high UV in the researched region (Aadil *et al.,* 2021).

Conservation of medicinal plants:

Even while several issues, including habitat degradation, population pressure, and a growing reliance on herbal medicine as a source of revenue, posed a serious threat to the conservation of medicinal plants, cultural norms and beliefs served to encourage their preservation. In the current study ten plant taxa are included on the IUCN Red List; of these, one species is critically endangered, six are endangered, and three are vulnerable (Table 2). Over 80 percent of participants indicated that there was a decrease in the quantity of wild medicinal plants, with 20 percent stating they were not aware of the trend and the remaining respondents stating that the situation pertaining to medicinal plants remained unchanged. Of those who provided information, the majority (75%) stated that unsustainable harvesting practices, particularly early collection to meet market demand, were the main cause of the natural population decline. When it comes to endangered species overharvesting of subsoil components or entire plants should be avoided as this practice diminishes the plant's wild population (Asif *et al.,* 2021; Haq *et al*., 2020). Due to overexploitation, habitat destruction from anthropogenic threats like urbanization and mining, as well as the negative effects of climate change in the study area, there are likely more threatened medicinal plant species than were identified in our study (Muluye and Ayicheh, 2020; Abebe and Chane Teferi, 2021). There will be a shortage of species if medicinal plants are continuously used without conservation measures, especially for endangered species (Astutik *et al.,* 2019). Recently, there has been a great urgency for the conservation of medicinal plants, and numerous governments have increased their efforts in this regard (Shah *et al.,* 2016). For instance, Brummitt *et al.,* (2015) found that 22–30% of 7000 plant species were either threatened or near-threatened after randomly evaluating their status in relation to the Red List criteria. According to (Chi *et al*., 2017), medicinal plants are more susceptible to threats than non-medicinal plants because of the effects of harvesting their parts.

4. Conclusion

The goal of this research was to find potential therapeutic plants in the Budgam District of Jammu & Kashmir. We identified 60 medicinal plants from 38 families that were used by local communities for varied ethnobotanical purposes including medicinal. Native populations continue to rely on medicinal plants for their fundamental medical needs, but they are also

concerned about the loss of natural flora. Most plant species have been used to cure digestive disorders, followed by dermatological diseases. According to our findings, there is more indigenous knowledge among the elderly than among the younger generations, because traditional knowledge of plant species is vanishing at an alarming rate due to the changing lifestyles of younger generations, shifting viewpoints within *ethnic communities, and growing industrialization, there may be a knowledge gap. To support this traditional knowledge, we suggest that high usage value *Artemisia absinthium, Taraxicum officinale, Ficus carica* species be used in future phytochemical and pharmacological studies. Thus, to improve our understanding of the patterns of plant utilization and to implement the necessary conservation measures to safeguard these flora treasures, it is imperative that we document the valuable uses of plants and the associated local knowledge. Failure to do so could result in the extinction of a sizable number of medicinally significant plants in the wild.

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