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Ethnobotanical Study of Medicinal Plants used to treat Human Ailments in Shopian Forest Range of Kashmir Himalayas

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Abstract
The Kashmir Valley is not only celebrated for its breathtaking natural beauty but also as a globally significant repository of medicinal plants. Its unique geography a temperate valley surrounded by towering mountain ranges fosters exceptional biodiversity. Diverse habitats, ranging from lush valley floors to alpine meadows and coniferous forests across varying altitudes and microclimates, create ideal conditions for a rich array of plant species. This botanical wealth includes hundreds of plants traditionally valued for their therapeutic properties, deeply embedded in the region's cultural fabric through systems like Ayurveda and Unani. The Shopian Forest Range hosts 50 medicinally significant plant species across 30 families, with Ranunculaceae, Asteraceae, and Lamiaceae being the most represented. Perennial herbs dominate the landscape, and roots/rhizomes are the primary parts used in therapies. Traditional knowledge, concentrated among elders (Hakeems), addresses ailments ranging from respiratory disorders to inflammatory conditions. However, this heritage faces erosion due to youth disengagement, habitat degradation, and commercialization without conservation.

Keywords: Shopian, Biodiversity, Ayurveda, Ailment, Conservation, Medicinal Plants

Introduction
Nestled within the majestic folds of the Himalayas, the Kashmir Valley is not only celebrated for its breathtaking natural beauty but also as a globally significant repository of medicinal flora (Ara and Naqshi, 1992) [1]. Its unique geography a temperate valley surrounded by towering mountain ranges fosters exceptional biodiversity. Diverse habitats, ranging from lush valley floors to alpine meadows and coniferous forests across varying altitudes and microclimates, create ideal conditions for a rich array of plant species. This botanical wealth includes hundreds of plants traditionally valued for their therapeutic properties, deeply embedded in the region's cultural fabric through systems like Ayurveda and Unani (Joshi, 2009) [5]. Historical texts and centuries old practices attest to the valley's role as a source of natural remedies (Khan *et al*, 2004) [6]. Estimates suggest the region harbors well over 600 plant species with documented ethnomedicinal uses, forming an invaluable resource for local healthcare and a vital genetic reservoir for modern drug discovery. This extraordinary potential makes Kashmir a critical focal point for ethnobotanical research and conservation efforts.

Among its varied landscapes, the Shopian forest range stands out as a repository of invaluable ethnobotanical knowledge. This area, characterized by rugged terrain and a dry temperate climate with many locales averaging elevations around 2057 meters has long been recognized for its abundant medicinal flora, which local communities have used for centuries to treat an array of ailments.

Historically, ethnobotanical investigations in Kashmir date back to the early twentieth century (Dar *et al*, 1984) [3]. Early studies in the Shopian region, notably the survey conducted between 2005 and 2007, documented approximately 20 key medicinal species across various botanical families (Beigh *et al*, 2003a) [2]. More recent research—the

ethnopharmacological study among tribal and rural folks of the Shopian forest area—has expanded upon these findings, documenting up to 32 plant species belonging to 24 families. Such updated data not only confirm the region's rich botanical diversity but also underscore the dynamic nature of traditional medicinal practices, which continue to evolve while retaining their ancestral roots.

Local reliance on these herbal remedies is driven by multiple factors: cultural preferences, limited access to modern healthcare facilities, and the proven efficacy of natural drugs. Indigenous knowledge in Shopian is imparted orally through generations, with experienced herbalists and community elders playing a pivotal role in preserving and transmitting this wisdom. However, this invaluable resource is under threat from unsustainable harvesting practices, habitat degradation, and growing anthropogenic pressures (Dhar, 2002) [4]. These challenges have sparked concerns about the long-term viability of the region's medicinal plant resources and emphasize the urgent need for systematic documentation and conservation strategies.

In parallel with growing environmental concerns, recent legislative measures implemented in line with international directives such as the Convention on Biological Diversity (CBD) and guidelines from the World Trade Organization (WTO)—have underscored the necessity of cataloging and safeguarding indigenous biological resources (WHO, 2002). The updated data emerging from recent surveys hold significant promise not only for augmenting the regional database of medicinal flora but also for steering the development of conservation policies and sustainable management practices that can protect these resources for future generations (Virendra, 2002) [10].

Against this backdrop, the present study aims to undertake a comprehensive ethnobotanical survey of the Shopian forest range. By employing systematic field methodologies and engaging directly with local communities, this study seeks to update the existing inventory of medicinal plant species and investigate the traditional knowledge systems associated with their use. The research is structured to examine (1) the diversity and distribution of medicinal plants across the forest range; (2) the ethnomedicinal practices and socio-cultural factors influencing their utilization; and (3) the current conservation status and potential strategies for sustainable management. In doing so, the study aspires not only to preserve a critical component of cultural heritage but also to contribute to the broader framework of biodiversity conservation and herbal healthcare integration.

In essence, this dissertation is designed to bridge the gap between traditional wisdom and modern conservation practice, ensuring that the rich ethnobotanical legacy of the Shopian forest range is both scientifically documented and sustainably conserved for the benefit of present and future generations.

Therefore, in this study, an attempt was made to document the ethno-medicinal use of some plant species used by the people of the Shopian forest range for the treatment of various ailments with following objectives:

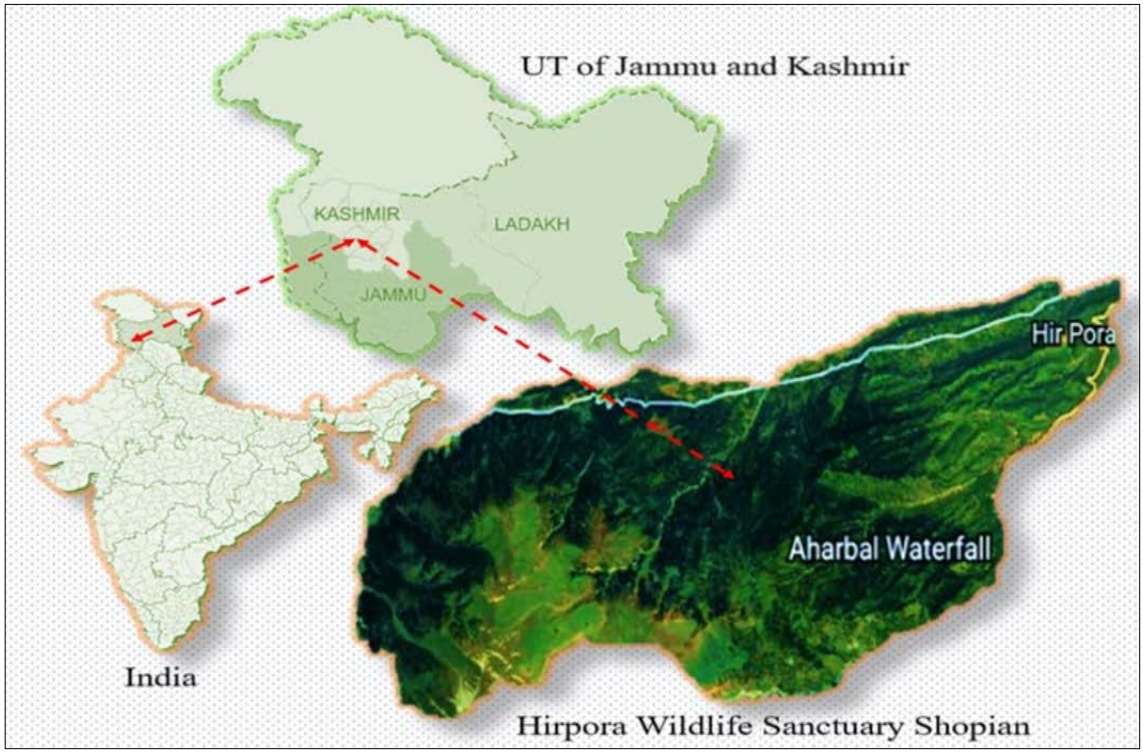
1. To document the traditional knowledge of medicinal plants in the Shopian forest range
2. To explore the significance of medicinal plants among local communities

Materials and Methods

Study Site: Shopian Forest Range, Kashmir Himalaya, India

1. Geographical Location and Administrative Setting

The Shopian Forest Range constitutes a distinct ecological and administrative unit within the Kashmir Himalaya, Jammu and Kashmir, India. Established as a district in 2007 (carved from Pulwama), Shopian occupies the Pirpanjal range. Its rugged terrain, dissected by valleys and forest cover, provides an ideal setting for biodiversity and ethnobotanical research.



Map of Shopian Forest Range in different layers

2. Topography and Landform

Characterized by high-altitude zones, steep slopes, and rocky outcrops, the landscape fosters diverse microhabitats. Elevational gradients and meandering streams create significant heterogeneity, supporting mixed deciduous and evergreen forests. This topographical complexity directly shapes plant distribution and local community interactions with medicinal resources.

3. Climate and Vegetation

A temperate Himalayan climate prevails, featuring distinct seasons prolonged cold winters, moderate summers, and substantial monsoonal rainfall (Singh, 1994) [8]. This regime sustains moist conditions conducive to rich vegetation. The synergy of climate and varied soils fosters a mosaic of plant communities, including endemic and economically vital medicinal species, underpinning traditional healthcare.

4. Methodological Framework

This study employed a multidisciplinary approach integrating ecological field surveys with ethnobotanical methods. Open-ended interviews, PRA techniques, and engagement with community elders and healers enabled qualitative and quantitative documentation of indigenous knowledge, ecological patterns, and conservation dynamics.

5. Data collection

Field surveys and structured interviews were used to obtain confidential information from traditional communities living in inaccessible habitats in the region. Plants were collected from different locations in the study area, and information related to various ethnomedicinal aspects was also collected from local residents of the area. This was done mainly by transporting collected species to local experts, herbalists, and tribes (Gujjars, Bakarwals). They were often involved in identifying plant species in the field and authenticating plant samples collected from habitats. During the survey, around 20 people/informants aged 45–95 were interviewed, most of whom have a respectable position in the community. Informants were asked in Urdu and Kashmiri about the traditional uses, distribution, growing season, and vernacular names of the plants. This useful information was recorded in the field book. The information collected by the above persons was further cross-checked with that of other knowledgeable persons and key informants (Hakeems). Almost all plants were collected during fruiting and flowering for almost 8 months. Individual plants were photographed with a digital camera to facilitate identification and habitat. Various tools, like knives, spatulas, and polythene bags, were used to collect plants and plant parts. This study contains information about the plants observed and collected under the following headings, one by one as botanical names, the family to which they belong, their local or vernacular names, the part of the plant used medicinally, and the diseases that it cures already mentioned.

6. Questionnaire

Scientific name	Local name	Family	Part used	Ailments treated

Results and Discussion

During this ethnobotanical study in the Shopian Forest Range, 50 medicinal plant species across 30 botanical families were documented as integral to traditional healthcare practices among local communities (Table 1). The dominant families were Ranunculaceae (8 species), Asteraceae/Compositae (6 species), and Lamiaceae (4 species) (Table 2). Other families like Valerianaceae, Violaceae, and Rosaceae contributed 2 species each, while 21 families were represented by a single species. Discussions and interviews with both old and young experts revealed that the attitude of the younger generation towards continuing the traditional medicine system was lacking because they perceived that there were fewer opportunities for immediate financial/monetary gain in that tradition. Low costs and its unlikely income are two reasons why young people do not want to engage in this profession now. This information can be useful to industry, including pharmacologists, physicians, chemists, botanists, and others, in the development of alternative therapies. This secret storehouse of information may prove useful in pharmacological studies to discover new therapeutic drugs. Also, the study shows that old traditional healers (Hakeems) have more knowledge about the use of ethno-medicinal plant species and their parts. Also, the availability of medicinal plants is drastically reduced due to various reasons, such as increased marketing pressure, lack of job opportunities, overexploitation, development works, population growth in the area, overgrazing of animals, and indiscriminate harvesting by unskilled collectors. Some medicinal plant species are also endangered. Traditional breeders do not use any conservation measures to ensure the sustainability of such plant resources. Efforts must be made to protect these natural resources and to domesticate selected plant species often used by botanists to avoid overexploitation that can cause extinction. The study reveals that leaf extracts were used as a remedy for various ailments in 34% of cases, followed by roots (23%), whole plant (12%), seeds (11%), rhizomes/tubers (10%), and fruits (7%). Latex and bark extracts also contribute (3%) to the treatment of various diseases in the study area (Figure-2). 7% 3% 10% 11% 12% The study also reveals that medicinal plants treat respiratory disorders (32%), Inflammatory ailments (28%), Digestives issues (22%) and skin diseases (18%) in the study area (Figure 3).

Table 1: Table of Ethnobotanical Survey of Shopian Forest Range

S. No.	Scientific Name	Local Name	Family	Part Used	Ailments Treated For
1	*Anemone obtusiloba (D.Don)*	Rattan jog, Padar	Ranunculaceae	Roots, Seeds	Roots: Pounded roots mixed with milk for contusions; external blistering agent. Seeds: Induce vomiting/purging; seed oil for rheumatism.
2	*Thalictrum javanicum Bl.*	Mamiri	Ranunculaceae	Leaves, Stem, Roots	Leaves/stem: Haematuria. Roots: Diuretic, purgative, tonic.
3	*Caltha palustris Linn*	Bringua, Mamiri	Ranunculaceae	Whole plant, Buds, Leaves	Whole plant: Tinctures/infusions for ailments. Buds: Caution as capers. Leaves: Boiled to remove toxins.
4	*Aconitum heterophyllum*	Patrees, Atish	Ranunculaceae	Root tubers	Diarrhea, dysentery, fever, inflammation, skin disorders, cough, gastric issues, rheumatism, pediatric disorders (Shishu Bhaishajya).
5	*Aconitum Chasmanthum Stapf*	Benbalnag (Kas) Mohand Posh	Ranunculaceae	Rhizomes	Fever, rheumatism, cough/asthma, snake bites, abscesses, heart disease, pain, skin diseases, neuralgia.
6	*Adonis chrysocyathus Hk.*	Mohri (Pb)	Ranunculaceae	Rhizomes, Roots	Cardiovascular health, respiratory issues, anti-inflammatory, digestive health.
7	*Actaea spicata Linn*	Richhbhilara	Ranunculaceae	Root, Rhizome, Berries	Rheumatism, fever, asthma, skin complaints. Root: Homeopathy for neuromuscular issues.
8	*Cimicifuga foetida Linn*	Jiunti	Ranunculaceae	Roots, Rhizomes	Anti-inflammatory, antispasmodic, sedative, analgesic, detoxifying, respiratory health.
9	*Podophyllum hexandrum*	Van-wangun (Kash)	Berberidaceae	Rhizomes, Roots	Podophyllotoxin for cancer, antiviral, skin conditions, antimicrobial.
10	*Meconopsis aculeata Royle*	Gul-e-Nilam	Papaveraceae	Flowers, Leaves, Rhizomes.	Pain relief, bone healing, anti-inflammatory, respiratory/digestive health, fever, wounds, backache, renal pain.
11	*Corydalis govaniana Wall*	Bhutkeshi	Fumariaceae	Rhizomes, Roots	Pain relief, sedative, digestive health, anti-inflammatory.
12	*Viola serpens Wall*	Bunafsha	Violaceae	Leaves, Flowers, Buds	Diuretic, expectorant, anti-inflammatory, antipyretic, diaphoretic.
13	*V. odorata Lin*	Gulbanafsa, Bunafsha	Violaceae	Leaves, Flowers, Buds	Respiratory ailments, fever, digestive/skin/urinary issues, rheumatism, headaches.
14	*Lavatera kashmiriana*	Resha-Khutumi, Guli-i-khera	Malvaceae	Rhizomes, Roots, Flowers	Respiratory complaints, cold/mumps, abdominal/renal colic, antiseptic.
15	*Geranium wallichianum*	Koa-ashud	Geraniaceae	Leaves, Flowers	Backache, joint/kidney pain, anti-inflammatory, astringent, digestive aid.
16	*Skimmia laureola Hk.*	Ner pattar	Rutaceae	Leaves, Flowers, Buds	Anti-inflammatory, antimicrobial, analgesic, antispasmodic, antipyretic.
17	*Dictamnus albus Linn*	—	Rutaceae	Leaves, Flowers, Stem	Fever reduction, skin conditions, antiviral, antiseptic, anti-inflammatory.
18	*Geum clatum Wall*	Gogjimool	Rosaceae	Roots, Leaves, Flowers	Anti-inflammatory, antioxidant, astringent, digestive/respiratory aid, pain relief.
19	*Potentilla argyrophylla*	Dori Ghas	Rosaceae	Roots, Leaves, Flowers	Anti-inflammatory, astringent, digestive/respiratory aid, pain relief, menstrual health.
20	*Sambucus ebulus Linn*	Gandal, Gandhelu	Adoxaceae	Roots, Leaves, Fruits	Anti-inflammatory, antioxidant, diuretic, laxative, respiratory health, wound healing.
21	*Saxifraga ligulata Wall*	Zakhim-i-Hayat, Silphata	Saxifragaceae	Roots, Leaves, Flowers	Anti-inflammatory, diuretic, antioxidant, lithotriptic, digestive/respiratory aid.
22	*Valeriana wallichii Wall*	Mushkbala	Valerianaceae	Roots, Rhizomes	Sedative, anti-anxiety, anti-inflammatory, antispasmodic, cardiovascular/neurological health.
23	*Nardostachys jatamansi*	Jatamansi, Bhutijata	Valerianaceae	Roots, Rhizomes, Oil	Neurological/mental disorders, cardiovascular/liver health, diabetes, skin/digestive issues.
24	*Dipsacus inermis Wall*	Woppal haakh	Dipsacaceae	Roots, Leaves, Flowers	Bone/joint health, kidney/liver health, skin conditions, antimicrobial.
25	*Inula racemosa Hook*	Pushkar/Zanjabil-i-shami	Compositae	Roots, Rhizomes	Heart/respiratory/skin diseases, digestive health, fever, pain relief, liver/diabetes.
26	*Senecio jacquemontiana*	Hater-i-Mool	Compositae	Roots, Leaves, Flowers	Skin conditions, digestive/respiratory ailments.
27	*Jurinea macrocephala Bth*	Dhup, Gugal Dhup	Compositae	Roots, Leaves, Stem	Fever, stomachache/diarrhea, cough/cold.
28	*Artemisia spp. Linn*	Tethwan/Afsantin	Compositae	Roots, Leaves, Flowers	Malaria, hepatitis, cancer, inflammation, infections, diabetes, menstrual disorders.
29	*Saussurea costus*	Kuth/Koshtha	Compositae	Roots, Rhizomes	Asthma, ulcers, cough/cold, typhoid, hepatitis, arthritis, epilepsy, intestinal worms, skin diseases.
30	*Taraxacum officinale*	Handh	Compositae	Roots, Leaves, Flowers	Kidney disease, swelling, skin/hepatic issues, diabetes, hypertension, cancer.
31	*Arnebia benthamii*	Kehzaban	Boraginaceae	Roots, Leaves, Stem	Constipation, fever, cough, wounds, cardiac/fungal/urinary issues.
32	*Gentiana kurroo Royle*	Nilkanth	Gentianaceae	Rhizomes	Wounds, skin diseases, fever, liver/urinary disorders, migraine, leprosy, blood purification.
33	*Codonopis ovata Bth*	Ludut	Campanulaceae	Roots, Leaves	Digestive/respiratory/skin issues, cardiovascular/neurological health.
34	*Atropa belladonna Linn*	Mait brand, Ban tamnaku	Solanaceae	Roots, Leaves, Berries	Whooping cough, asthma, neuralgia, pupil dilation, nerve disorders.

35	*Picrorhiza kurroa*	Kutki	Scrophulariaceae	Roots, Rhizomes	Constipation, skin/fever, liver/asthma, TB, allergies, neuralgia.
36	*Verbascum thapsus*	Shal-a-lut/Geedar tamaku	Scrophulariaceae	Leaves, Flowers, Roots	Pulmonary issues, asthma, diarrhea, migraines.
37	*Pedicularis spp.*	Mishran	Orobanchaceae	Herb, Roots, Leaves	Muscle/nerve pain, respiratory/digestive issues, fever, anxiety.
38	*Plectranthus rugosus*	Chhichri	Lamiaceae	Leaves, Roots, Flowers	Inflammation, pain, respiratory/skin issues, bronchitis, hepatitis.
39	*Thymus serpyllum Linn*	Javaind/Ajwain	Lamiaceae	Leaves, Flowers, Stem	Antiseptic, antispasmodic, diuretic, digestive/respiratory aid.
40	*Salvia moorcroftiana*	Kali-jari	Lamiaceae	Stem, Leaves, Seeds	Anti-inflammatory, antibacterial, analgesic, respiratory/skin health.
41	*Prunella vulgaris Linn*	Kal-vioth/Ustakhdus	Lamiaceae	Leaves, Flowers, Stem	Wound healing, antiviral, antioxidant, immune support.
42	*Polygonum polystachyum*	Tsokalador/Khatu saag	Polygonaceae	Roots, Stem, Leaves	Anti-inflammatory, antioxidant, diuretic, antimicrobial.
43	*Phytolacca acinosa*	Hapatchur/Lubarsaag	Phytolaccaceae	Roots, Leaves, Berries	Anti-inflammatory, antiviral, diuretic, laxative, vermifuge.
44	*Cannabis sativa Linn*	Bhang	Cannabaceae	Leaves, Flowers, Seeds	Pain relief, anti-inflammatory, appetite/mood enhancement, seizure/nausea control.
45	*Dioscorea deltoidea*	Yam	Dioscoreaceae	Tubers	Steroid synthesis, gastrointestinal/anti-inflammatory/immune health.
46	*Iris kemaonensis Wall*	Krisham	Iridaceae	Rhizomes, Flowers	Anti-inflammatory, antioxidant, antimicrobial, cardiovascular/cancer prevention.
47	*Orchis latifolia Linn*	Salab-misri	Orchidaceae	Root tubers	Aphrodisiac, digestive/respiratory health, urinary issues, hypolipidemic.
48	*Ephedra gerardiana Wall*	Soma	Ephedraceae	Stems, Roots	Asthma, rheumatism, heart/urinary disorders, allergies.
49	*Adiantum venustum Don*	Kalijanth, Pari-i-siyaohan	Pteridaceae	Rhizomes, Fronds	Cough, fever, muscle/joint pain, urinary disorders.
50	*Morchella esculenta*	Kan-guchh/Guchhi	Discomycetes	Fruiting body	Antioxidant, anti-inflammatory, immune support, cancer; traditional use for stomach aches, coughs, wounds.

Table 2: Full Distribution of Species Among Families

Family	Number of Species	Example Species	Key Uses
Ranunculaceae	8	*Aconitum heterophyllum, Cimicifuga foetida*	Fever, rheumatism, anti-inflammatory
Compositae (Asteraceae)	6	*Artemisia spp., Saussurea costus*	Malaria, asthma, skin diseases
Lamiaceae	4	*Thymus serpyllum, Prunella vulgaris*	Respiratory, anti-inflammatory, wound healing
Valerianaceae	2	*Valeriana wallichii, Nardostachys jatamansi*	Sedative, neurological disorders
Violaceae	2	*Viola serpens, Viola odorata*	Respiratory, anti-inflammatory
Rutaceae	2	*Skimmia laureola, Dictamnus albus*	Fever, antimicrobial
Rosaceae	2	*Potentilla argyrophylla*	Digestive, anti-inflammatory
Scrophulariaceae	2	*Picrorhiza kurroa, Verbascum Thapsus*	Liver disorders, asthma
Berberidaceae	1	*Podophyllum hexandrum*	Cancer, skin conditions
Papaveraceae	1	*Meconopsis aculeata*	Pain relief, bone healing
Fumariaceae	1	*Corydalis govaniana*	Sedative, pain relief
Malvaceae	1	*Lavatera kashmiriana*	Respiratory, antiseptic
Geraniaceae	1	*Geranium wallichianum*	Joint/kidney pain, anti-inflammatory
Adoxaceae	1	*Sambucus ebulus*	Anti-inflammatory, wound healing
Saxifragaceae	1	*Saxifraga ligulate*	Kidney stones, anti-inflammatory
Dipsacaceae	1	*Dipsacus inermis*	Bone/joint health
Boraginaceae	1	*Macrotomia benthamii*	Fever, cardiac issues
Gentianaceae	1	*Gentiana kurroo*	Skin diseases, blood purification
Campanulaceae	1	*Codonopsis ovata*	Digestive, neurological health
Solanaceae	1	*Atropa belladonna*	Asthma, nerve disorders
Orobanchaceae	1	*Pedicularis spp.*	Muscle/nerve pain, anxiety
Polygonaceae	1	*Polygonum polystachyum*	Anti-inflammatory, diuretic
Phytolaccaceae	1	*Phytolacca acinose*	Anti-inflammatory, laxative
Cannabaceae	1	*Cannabis sativa*	Pain relief, anti-inflammatory
Dioscoreaceae	1	*Dioscorea deltoidei*	Steroid synthesis, immune health
Iridaceae	1	*Iris kemaonensis*	Antimicrobial, cardiovascular health
Orchidaceae	1	*Orchis latifolia*	Aphrodisiac, respiratory health
Ephedraceae	1	*Ephedra gerardiana*	Asthma, allergies
Pteridaceae	1	*Adiantum venustum*	Cough, urinary disorders
Discomycetes (Fungi)	1	*Morchella esculenta*	Immune support, antioxidant
Total (30 Family)	50species		

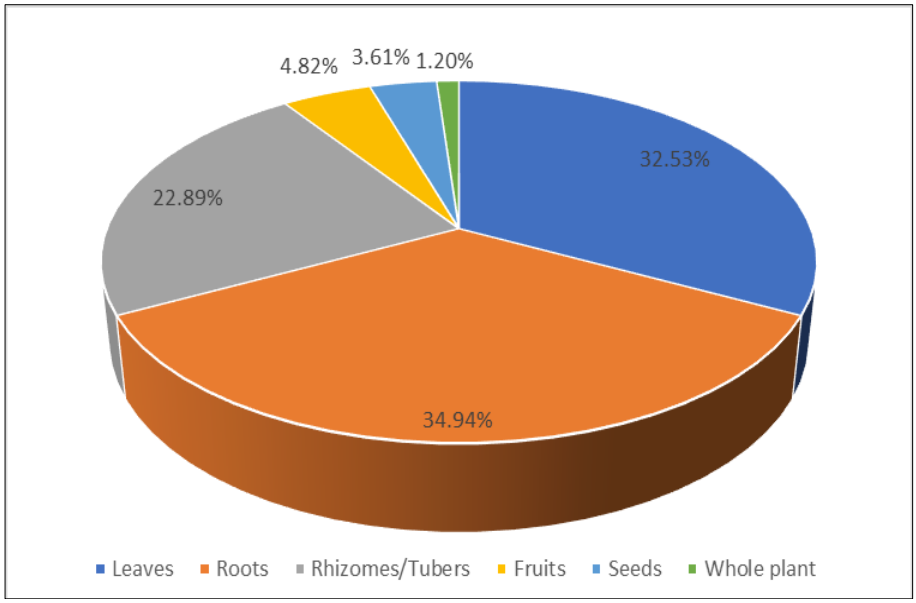


Fig. 2: Pie chart showing various plant parts used as a remedy for various diseases in the study area.

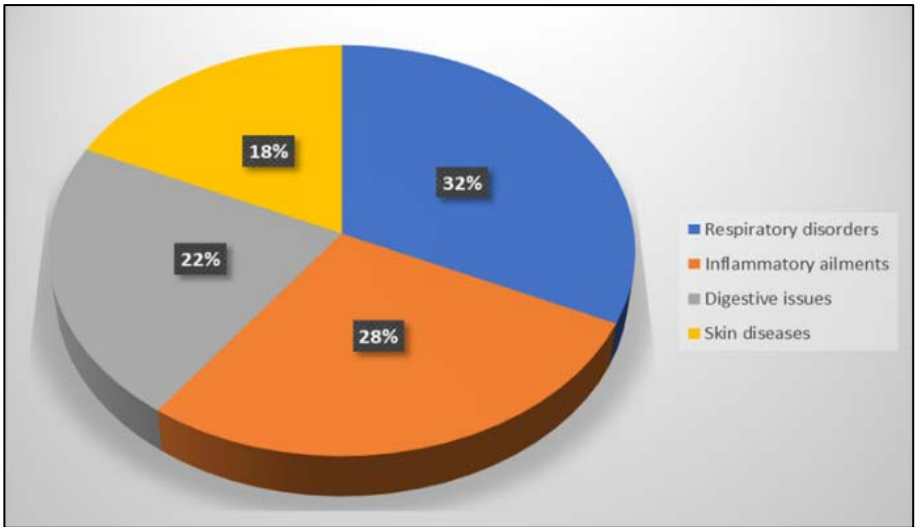


Fig 3: Pie chart showing diseases treated by medicinal plants in the study area

Summary and Conclusions

The Shopian Forest Range hosts 50 medicinally significant plant species across 30 families, with Ranunculaceae, Asteraceae, and Lamiaceae being the most represented. Perennial herbs dominate the landscape, and roots/rhizomes are the primary parts used in therapies. Traditional knowledge, concentrated among elders (Hakeems), addresses ailments ranging from respiratory disorders to inflammatory conditions. However, this heritage faces erosion due to youth disengagement, habitat degradation, and commercialization without conservation. Shopian's ethnobotanical legacy bridges ancestral wisdom and modern healthcare. Collaborative effort, government, academia, and communities can transform Jammu & Kashmir into a sustainable herbal hub. Preserving this knowledge is not merely conservation also safeguarding a cultural identity and a lifeline for future drug discovery.

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