

Ethnomedicinal Wealth of Chinta Forest, Baderwah Forest Division, Jammu and Kashmir: Documentation and Conservation Perspectives

¹Pinki Manhas and ²Nazia Rasool

¹Associate Professor Govt. Degree College Akhnoor and ²Associate Professor, PSPS college for women Gandhi Nagar Jammu

Abstract:

The present study was conducted in Chinta Forest of the Baderwah Forest Division, Jammu and Kashmir, India, to document the ethnomedicinal plant wealth of the region and the associated traditional knowledge of the local communities. Extensive field surveys were carried out during the study period, and ethnomedicinal information was collected through structured questionnaires, personal interviews, and discussions with knowledgeable local inhabitants, including traditional healers (Hakims), elderly villagers, shepherds, and livestock owners. The study area is characterised by rich biodiversity owing to its varied topography, temperate climate, and diverse forest types.

A total of 132 plant species belonging to different taxonomic groups were inventorised for their ethnomedicinal uses. Herbs constituted the majority of the medicinal plants used by the local people, while comparatively fewer tree and shrub species were utilised. The recorded species were employed in the treatment of a wide range of ailments including skin diseases, stomach disorders, inflammation, fever, cough, wounds, joint pain, and various livestock diseases. Different plant parts such as leaves, bark, roots, fruits, seeds, flowers, and whole plants were used for the preparation of traditional remedies.

The study revealed that the indigenous knowledge of medicinal plants is mainly confined to elderly people and traditional healers who inherited this knowledge from their ancestors through oral tradition. However, many knowledge holders are reluctant to share their information because they consider it a valuable family asset. Furthermore, modernisation, improved healthcare facilities, increasing literacy, and easy access to government hospitals have considerably reduced dependence on traditional herbal medicines, resulting in the gradual erosion of this valuable cultural heritage.

The present investigation highlights the rich ethnomedicinal potential of Chinta Forest and emphasises the urgent need for systematic documentation, conservation of medicinal plant resources, and preservation of traditional knowledge before it disappears.

Keywords: Ethnomedicinal plants; Ethnobotany; Traditional knowledge; Chinta Forest; Jammu and Kashmir; Medicinal plant diversity; Herbal medicine; Biodiversity conservation.

Introduction

Ethnomedicinal plants have served as one of the oldest and most reliable sources of healthcare for human societies since ancient times (Pan *et.al.*2014). Indigenous communities across the world have developed extensive knowledge regarding the identification, collection, preparation, and utilisation of medicinal plants for the treatment of various human and animal ailments.(Beyene *et al* 2016). This traditional knowledge, accumulated over generations through observation and experience, forms an integral part of cultural heritage and plays a significant role in biodiversity conservation and primary healthcare (Yuan *et al* ,2016)

India is recognised as one of the world's megadiverse countries, possessing enormous floristic diversity and a rich tradition of indigenous medicinal systems such as Ayurveda, Unani, Siddha, and folk medicine.(Choudhuri,2007). The Himalayan region, particularly the Western Himalayas, harbours a remarkable diversity of medicinal plant species owing to its varied climatic conditions, altitudinal gradients, and diverse ecosystems (Badola and Aitken,2003) . Jammu and Kashmir is one of the important biodiversity hotspots where numerous medicinal plants are naturally distributed and continue to support the healthcare needs of rural communities.(Pant and Pant,2011)

Chinta Forest, situated in the Bhaderwah Forest Division of Jammu and Kashmir, is a biologically rich forest ecosystem characterized by rugged mountainous terrain interspersed with gently sloping village landscapes. The region experiences a temperate climate and supports diverse forest types. Deodar (*Cedrus deodara*) and Chir Pine (*Pinus roxburghii*) dominate the lower elevations, while Kail (*Pinus wallichiana*), Fir (*Abies pindrow*), and Spruce (*Picea smithiana*) occur at higher altitudes. Several species of oak (*Quercus* spp.) are widely distributed throughout the area. Herbs and shrubs are generally abundant in forest openings and less dense patches where sufficient sunlight reaches the forest floor, whereas dense conifer stands often have thick layers of pine needles that restrict undergrowth.

For generations, the local inhabitants have depended upon these forests for medicinal plants used in the treatment of various ailments affecting both humans and livestock. (Birhane *et al* 2011) Traditional healers (Hakims), despite lacking formal medical education, have acquired remarkable diagnostic skills and therapeutic knowledge through ancestral learning (Aryal *et al* 2016). However, rapid socio-economic changes, increased literacy, urbanisation, and improved accessibility to modern healthcare facilities have significantly reduced reliance on traditional herbal medicine. (Patwardhan and Patwardhan, 2005). Consequently, the valuable indigenous knowledge is gradually disappearing, particularly as younger generations show limited interest in learning these practices.(Dweba and Mearns, 2011)

Because of rapid erosion of traditional knowledge and increasing pressure on natural plant resources, there is an urgent need to document the ethno medicinal wealth of the region. The present study was therefore undertaken to document the ethno medicinal plant diversity of Chinta Forest, record their traditional uses, identify the plant parts utilized, and highlight the importance of conserving both medicinal plant resources and the associated indigenous knowledge for future generations.

Objectives:

1. **To document the diversity of medicinal plant species** and their traditional ethno medicinal uses recorded in the study area.
2. **To identify the plant parts most commonly used** (e.g., leaves, roots, bark, flowers, rhizomes, seeds) in traditional herbal medicine.

3. **To analyse the therapeutic applications of medicinal plants** for the treatment of various human ailments such as digestive disorders, respiratory diseases, skin infections, fever, wounds, urinary disorders, and inflammatory conditions.

Materials and Methods

The study was conducted in Chinta Forest, located in the Bhaderwah Forest Division of Doda district, Jammu and Kashmir, India. The region falls within the temperate zone of the north-western Himalayas and is characterized by diverse topography comprising rugged mountainous forests, valleys, and relatively plain village settlements. The forests support rich vegetation dominated by Deodar (*Cedrus deodara*) and Chir Pine (*Pinus roxburghii*) at lower elevations, while Fir (*Abies pindrow*), Spruce (*Picea smithiana*), and Kail (*Pinus wallichiana*) occur at higher elevations. Oak (*Quercus* spp.) is widely distributed throughout the study area. The understorey vegetation is more prominent in open and less dense forest patches where shrubs and herbs thrive.

Extensive field surveys were conducted during different seasons to ensure maximum representation of the medicinal flora. Forest areas, village surroundings, grazing grounds, agricultural fields, and forest margins were systematically explored. Plant specimens were collected, photographed, and identified using standard regional floras and taxonomic literature.

Ethnomedicinal information was collected through structured questionnaires, semi-structured interviews, and personal interactions with local inhabitants. Respondents included elderly villagers, traditional healers (Hakims), shepherds, farmers, and livestock owners possessing indigenous knowledge of medicinal plants. Information was gathered regarding local names of plants, plant parts used, methods of preparation, mode of administration, diseases treated, dosage, and availability of plant species.

The documented information was compiled and analysed to determine the diversity of medicinal plant species, their growth forms, plant parts utilized, and therapeutic applications. Plant species were classified into trees, shrubs, herbs, and climbers. The frequency of plant parts used and the ailments treated were also analysed.

A total of 132 ethnomedicinal plant species were documented during the investigation. The inventory included botanical names, family, plant parts used, and medicinal applications. The findings indicate that although traditional medicinal knowledge remains valuable, its transmission is declining due to increasing dependence on modern healthcare services. Therefore, proper documentation and conservation of both medicinal plant diversity and indigenous knowledge are essential to safeguard this important biological and cultural heritage for future generations.

Table 1: Documented Medicinal Plants and Their Families, Parts Used, and Traditional Therapeutic Uses

S.No.	Name	Family	Part used	Medicinal importance					
1	Abies pindrow Royle.	Pinaceae	Leaf, bark	Used for cough, bronchitis, rheumatism, and wound healing.					
2	Achillea millifolium Linn	Asteraceae	Leaves and flower	Used as an anti-inflammatory, wound					

				healer, digestive aid, and for fever.					
3	<i>Achyranthes aspera</i> Linn. H	Amaranthaceae	Leaves	Treats asthma, cough, kidney stones, skin diseases, and snake bites.					
4	<i>Aconitium heterophyllum</i> Stapf.	Ranunculaceae	Root	Used for fever, diarrhoea, dyspepsia, and digestive disorders.					
5	<i>Aconogonon alpinum</i> Schur.	Polygonaceae	Stem	Used traditionally for diarrhoea and inflammation.					
6	<i>Acorus calamus</i> <i>calamus</i> Linn.	Acoraceae	Rhizome	Used for digestive disorders, memory enhancement, epilepsy, and cough.					
7	<i>Actaea spicata</i> L	Ranunculaceae	Root	Used for rheumatism, neuralgia, and inflammatory disorders.					
8	<i>Adhatoda vasica</i> Nees.	Acanthaceae	Leaves, roots	Effective against cough, asthma, bronchitis, and respiratory infections.					
9	<i>Adiantum venustum</i> Linn	Pteridaceae	Whole plant	Used for cough, fever, and urinary disorders.					
10	<i>Adonis aestivalis</i> Linn.	Ranunculaceae	Whole plant	Traditionally used as a cardiac tonic.					
11	<i>Aesculus indica</i> (Wall. Ex Camb.) Hook.	Sapindaceae	Wood, seed, leaves & twigs	Used for rheumatism, varicose veins, and inflammation.					
12	<i>Ageratum conyzoides</i> Linn.	Asteraceae	Whole plant	Used for wound healing, diarrhoea, fever, and skin infections.					
13	<i>Agrimonia eupatoria</i> Linn	Rosaceae	Whole plant	Used for diarrhoea, sore throat, liver disorders, and wound healing.					
14	<i>Ailanthus altissima</i> (Mill) Swingle.	Simaroubaceae	Whole Plant	Used against dysentery, diarrhoea, and intestinal infections.					
15	<i>Ajuga bracteosa</i> Benth	Lamiaceae	Whole Plant	Used for diabetes, hypertension, fever, and liver disorders.					
16	<i>Ajuga parviflora</i> Benth	Lamiaceae	Whole Plant	Used as an anti-inflammatory and antidiabetic herb.					
17	<i>Alliaria officinalis</i> Andrzej.	Brassicaceae	Leaf, Flower	Used for respiratory ailments and digestive disorders.					
18	<i>Allium cepa</i>	Amaryllidaceae	Bulb, leaf	Used for hypertension, diabetes, colds, and cardiovascular health.					

19	<i>Alnus nitida</i> Endl.	Betulaceae	Wood, bark	Used for skin diseases, burns, and inflammation.					
20	<i>Amaranthus caudatus</i>	Amaranthaceae	Seed, root	Used for anaemia, diarrhoea, and digestive disorders.					
21	<i>Amaranthus spinosus</i>	Amaranthaceae	Leaf, flower	Used for urinary disorders, dysentery, and inflammation.					
22	<i>Amaranthus viridus</i>	Amaranthaceae	Seed, root	Used for ulcers, constipation, and kidney disorders.					
23	<i>Anagallis arvensis</i> Linn	Primulaceae	Flower, leaf	Used for skin diseases and liver ailments.					
24	<i>Anaphalis nepalensis</i> (Spreng.) Hand-Mazz	Asteraceae	Flower, Leaf	Used for wound healing and fever.					
25	<i>Androsace rotundifolia</i> Haddow	Primulaceae	Flower, Leaf	Used traditionally for fever and inflammation.					
26	<i>Anemone rupicola</i>	Ranunculaceae	Shoot	Used in folk medicine for rheumatism.					
27	<i>Anemone obtusiloba</i> D. Don	Ranunculaceae	Leaf, Bark	Used for pain relief and inflammation.					
28	<i>Angelica glauca</i> Edgew	Apiaceae	Root	Used for indigestion, cough, bronchitis, and stomach disorders.					
29	<i>Arctium lappa</i> L.	Asteraceae	Root, Flower	Used as a blood purifier, diuretic, and for skin diseases.					
30	<i>Arenaria serpyllifolia</i> Linn.	Caryophyllaceae	Shoot	Used for urinary disorders and wound healing.					
31	<i>Arisaema flavum</i> (Forssk.) Schott	Araceae	Bulb	Used for snake bites, skin diseases, and rheumatism.					
32	<i>Aristida adscensionis</i> Linn.	Poaceae	Whole Plant	Used for fever and urinary complaints.					
33	<i>Astragalus chlorostachys</i> Lindl.	Fabaceae	Whole Plant	Used as an immune booster and tonic.					
34	<i>Aster falconeri</i> Hutch.	Asteraceae	Leaf	Used traditionally for fever and inflammation.					
35	<i>Berberis lycium</i> Royle	Berberidaceae	Shoot, Root	Used for diabetes, jaundice, eye diseases, and wound healing.					
36	<i>Berberis jaeschkeana</i> C.K. Schneid	Berberidaceae	Root, leaf	Used for liver disorders and infections.					
37	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Whole Plant	Used for kidney stones, ulcers, cough, and wounds.					

38	Bergenia stracheyi Wall.	Saxifragaceae	Root, Leaf	Used for urinary disorders and kidney stones.					
39	Betula utilis D.Don.	Betulaceae	leaf, Bark	Used for wound healing, skin diseases, and rheumatism.					
40	Bistorta amplexicaulis (D.Don) Greene	Polygonaceae	Whole Plant	Used for diarrhoea, bleeding, and wound healing.					
41	Brassica rapa subsp. Campestris(L.) A.R. Clapham	Brassicaceae	Seed	Used for digestive health and vitamin deficiency.					
42	Bupleurum falcatum Linn	Apiaceae	Flower, Seed	Used for liver disorders and fever.					
43	Bupleurum himalayense Kultz	Apiaceae	Flower, Seed	Used for inflammation and liver ailments.					
44	Caltha palustris L.	Ranunculaceae	Root	Used externally for skin diseases.					
45	Cannabis sativa Linn.	Cannabaceae	Whole Plant	Used for pain relief, nausea, epilepsy, and muscle spasms.					
46	Carduus edelbergii Rech.f.	Asteraceae	Whole Plant	Used traditionally for liver disorders.					
47	Cedrus deodara (Roxb. Ex Lamb.) G. Don	Pinaceae	Whole Plant	Used for arthritis, skin diseases, cough, and fever.					
48	Celtis australis Linn.	Cannabaceae	Whole Plant	Used for digestive disorders and wound healing.					
49	Cerastium glomeratum Thuill	Caryophyllaceae	Shoot	Used for skin inflammation.					
50	Chaerophyllum reflexum Lindl.	Apiaceae	Whole Plant	Used for digestive ailments.					
51	Chenopodium album L	Amaranthaceae	Seed, Leaf	Used as a laxative and for intestinal worms.					
52	Cicerbita macrorhiza Royle	Asteraceae	Whole Plant	Used for digestive disorders.					
53	Cirsium arvense (Linn.) Scop.	Asteraceae	Whole Plant	Used for liver diseases and bleeding disorders.					
54	Clinopodium vulgare L	Lamiaceae	Shoot	Used for cough, fever, wounds, and digestive disorders.					
55	Colchicum luteum Baker	Colchicaceae	Whole Plant	Used for gout, arthritis, and rheumatism.					
56	Colebrookia oppositifolia Sm.	Lamiaceae	Leaf, Root	Used for wounds, epilepsy, and skin diseases.					
57	Commelina benghalensis L.	Commelinaceae	Leaf, Fruit	Used for fever, diarrhoea, and eye disorders.					

58	<i>Convolvulus arvensis</i> Linn.	Convolvulaceae	Whole plant	Used as a laxative and for fever.					
59	<i>Conyza canadensis</i> Linn.	Asteraceae	Flower, leaf	Used for diarrhoea and urinary disorders.					
60	<i>Coriandrum sativum</i>	Apiaceae	Seed, Fruit	Used for indigestion, diabetes, and anxiety.					
61	<i>Corydalis govaniana</i> Wall.	Papaveraceae	Bark, Leaf	Used for pain, fever, and liver disorders.					
62	<i>Cotoneaster affinis</i> Wall.ex. Lindl.	Rosaceae	BK, LF	Used for digestive complaints.					
63	<i>Crataegus songarica</i> Kock.	Rosaceae	Seed, Fruit	Used for cardiovascular disorders.					
64	<i>Cucumis sativus</i> Linn.	Cucurbitaceae	Seed, Fruit	Used for hydration, skin care, and digestive health.					
65	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Seed, Fruit	Used for prostate disorders and intestinal worms.					
66	<i>Cynoglossum lanceolatum</i> Forssk	Boraginaceae	Whole Plant	Used for wounds and inflammation.					
67	<i>Cynodon dactylon</i> Pers.	Poaceae	Leaf	Used for diabetes, wounds, urinary disorders, and bleeding.					
68	<i>Cydonia oblonga</i> Mill.	Rosaceae	Seed, fruit	Used for diarrhoea, ulcers, and sore throat.					
69	<i>Datura stramonium</i> Linn.	Solanaceae	Whole Plant	Used (under strict medical supervision) for asthma and pain.					
70	<i>Debregeasia salicifolia</i> Forssk.	Urticaceae	Flower, fruit, stem	Used for wounds and fractures.					
71	<i>Desmodium elegans</i> DC.	Fabaceae	Leaf	Used for fever and digestive disorders.					
72	<i>Dicliptera roxburghiana</i> Nees	Acanthaceae	Whole Plant	Used for wounds and skin diseases.					
73	<i>Dioscorea deltoidea</i> Wall. Ex kunhdioscoreaceae	Dioscoreaceae	Trunk, bark	Source of diosgenin; used for inflammation and hormonal medicines.					
74	<i>Dipsacus inermis</i> wall.	Caprifoliaceae	Root	Used for bone healing and rheumatism.					
75	<i>Duchenea indica</i> Focke.	Rosaceae	Fruit	Used for skin diseases and fever.					
76	<i>Euphorbia wallichii</i>	Euphorbiaceae	Stem	Used externally for skin diseases and warts.					
77	<i>Fagopyrum dibotrys</i> D. Don	Polygonaceae	Whole Plant	Used for lung diseases and inflammation.					
78	<i>Ficus palamata</i> Forssk.	Moraceae	Leaf	Used for constipation, diabetes, and respiratory ailments.					

79	Gentiana kuroo Royle.	Gentianaceae	Leaf	Used for fever, liver disorders, and digestive problems.					
80	Geranium nepalense Sweet.	Geraniaceae	Root	Used for diarrhoea and wound healing.					
81	Geranium wallichianum D. Don. Ex. Sweet	Geraniaceae	Root	Used for dysentery and inflammation.					
82	Hedra nepalensis K. Koch	Araliaceae	Leaf	Used for cough, bronchitis, and asthma.					
83	Hypericum oblongifolium Choisy.	Hypericaceae	Root, leaf	Used for wound healing and infections.					
84	Hypericum perforatum Linn.	Hypericaceae	Whole Plant	Used for depression, anxiety, and wound healing.					
85	Impatiens sulcata Wallich.	Balsaminaceae	Seed	Used for skin diseases and inflammation.					
86	Lamium album Linn.	Lamiaceae	Whole Plant	Used for menstrual disorders and diarrhoea.					
87	Lotus corniculatus Linn.	Fabaceae	Above part	Used as a mild sedative in folk medicine.					
88	Mentha arvensis	Lamiaceae	Whole Plant	Used for indigestion, cough, and cold.					
89	Mentha longifolia	Lamiaceae	Whole Plant	Used for stomach disorders and respiratory diseases.					
90	Origanum vulgare L.	Lamiaceae	Flower, Leaf	Used as an antimicrobial, antioxidant, and digestive aid.					
91	Oxalis corniculata L.	Oxalidaceae	Whole Plant	Used for diarrhoea, fever, and scurvy.					
92	Picea smithiana (Wall.) Boiss	Pinaceae	Whole Plant	Used for cough, wounds, and rheumatism.					
93	Pinus wallichiana A. B. Jackson	Pinaceae	Root, Leaf, Bark	Used for respiratory disorders and wound healing.					
94	Plantago major	Plantaginaceae	Whole Plant	Used for wounds, ulcers, cough, and inflammation.					
95	Pleurospermum brunonis (DC)C.B. Clarke	Apiaceae	Root	Used for fever, cough, and digestive disorders.					
96	Populus cilita Wall.ex Royle	Salicaceae	Bark	Used for fever, rheumatism, and inflammation.					
97	Potentilla biflora Willd. Ex Schlecht.	Rosaceae	Root, Flower	Used for diarrhoea and wound healing.					

98	<i>Prunella vulgaris</i> L.	Lamiaceae	Flower, Leaf	Used for sore throat, hypertension, and inflammation.					
99	<i>Prunus domestica</i> L.	Rosaceae	Whole Plant	Used for constipation and digestive health.					
100	<i>Rabdopsia rugosa</i> wall.	Lamiaceae	Stem	Used for stomach disorders and fever.					
101	<i>Ranunculus arvensis</i> L.	Ranunculaceae	Flower, shoot	Used externally for rheumatism (toxic if misused).					
102	<i>Ranunculus laetus</i> Wall. Ex. Hook	Ranunculaceae	Leaf	Used externally for pain and skin diseases.					
103	<i>Raphanus sativus</i> L.	Brassicaceae	Whole Plant	Used for liver disorders, cough, and digestion.					
104	<i>Rhododendron anthopogon</i> D.Don	Ericaceae	Flower, Leaf	Used for cough, cold, and digestive disorders.					
105	<i>Rhododendron arboretum</i> Sm.	Ericaceae	Bark, leaf	Used for diarrhoea, dysentery, and heart health.					
106	<i>Rhodiola wallichiana</i> (Hook.)	Crassulaceae	Root	Used as an adaptogen to combat stress and fatigue.					
107	<i>Robinia pseudoacacia</i> Linn.	Fabaceae	Leaf, flower	Used for digestive disorders and mild inflammation.					
108	<i>Rosa brunonii</i> Lindl., Ros.	Rosaceae	Fruit	Used as a mild laxative and tonic.					
109	<i>Rosa webbiana</i> Wall. Ex Royle	Rosaceae	Fruit	Used for vitamin C supplementation and digestive disorders.					
110	<i>Salix alba</i> L.	Salicaceae	Bark, leaf	Source of salicin; used for pain, fever, and arthritis.					
111	<i>Saxifraga flagellaris</i> Willd.	Saxifragaceae	Flower, Leaf	Used for kidney stones and urinary disorders.					
112	<i>Sedum ewersii</i> Ledeb.	Crassulaceae	Leaf stem	Used for wound healing and burns.					
113	<i>Silene conoidea</i> L.	Caryophyllaceae	Whole Plant	Used for urinary disorders.					
114	<i>Solanum nigrum</i> L.	Solanaceae	LF, FR, WP	Used for liver disorders, ulcers, and skin diseases.					
115	<i>Sonchus arvensis</i> L.	Asteraceae	Whole Plant	Used as a diuretic and anti-inflammatory.					
116	<i>Sorbaria tomentosa</i> (Lindl)	Rosaceae	Stem	Used for wounds and fever.					
117	<i>Spiraea canescens</i> D.Don.	Rosaceae	Bark, Stem	Used for fever and inflammation.					
118	<i>Taraxacum officinale</i> Wigg.	Asteraceae	Whole Plant	Used for liver diseases, kidney disorders, and digestion.					

119	<i>Taxus wallichiana</i> Zucc	Taxaceae	Leaf stem Bark	Source of anticancer compounds (taxanes); also used in traditional medicine.					
120	<i>Tenacetum dolichophylla</i> (Kitam)	Asteraceae	Whole Plant	Used for fever and digestive disorders.					
121	<i>Thalictrum javanicum</i> Blume.	Ranunculaceae	Whole Plant	Used for fever and infections.					
122	<i>Thymus linearis</i> Benth	Lamiaceae	Whole Plant	Used for cough, cold, digestive disorders, and as an antiseptic.					
123	<i>Trifolium pratense</i> Linn.	Fabaceae	Above part	Used for menopausal symptoms and skin disorders.					
124	<i>Trifolium repens</i> Linn.	Fabaceae	Above part	Used for cough and wound healing.					
125	<i>Trigonella corniculata</i> Linn.	Fabaceae	Above Part	Used for diabetes and digestive disorders.					
126	<i>Tulipa stellata</i> Sibth	Liliaceae	Bulb	Traditionally used as an ornamental with limited medicinal use.					
127	<i>Urtica dioica</i> L	Urticaceae	Leaf	Used for arthritis, anaemia, urinary disorders, and allergies.					
128	<i>Valeriana jatmansi</i> Jones	Caprifoliaceae	Root	Used as a sedative, anxiolytic, and for insomnia.					
129	<i>Verbascum thapsus</i> L.	Scrophulariaceae	Leaf	Used for cough, bronchitis, asthma, and sore throat.					
130	<i>Viburnum cotnifolium</i> Wall. Ex dcadoxaceae.	Adoxaceae	leaf	Used for muscle cramps and pain relief.					
131	<i>Viburnum foetens</i> Decne	Adoxaceae	Seed, Leaf	Used for fever and digestive disorders.					
132	<i>Viola odorata</i> L.	Violaceae	Flower, Leaf	Used for cough, sore throat, fever, and skin diseases.					

Results and Discussion

A total of **132 medicinal plant species** belonging to **58 families** were documented during the present investigation. The recorded species represented a rich diversity of angiosperms, gymnosperms, and pteridophytes, highlighting the floristic richness and ethnomedicinal importance of the study area. The documented information included botanical name, family, plant part(s) used, and medicinal applications.

Among the recorded families, **Asteraceae** was the dominant family with the highest number of species, followed by **Rosaceae**, **Lamiaceae**, **Fabaceae**, **Ranunculaceae**, **Apiaceae**, **Amaranthaceae**, **Pinaceae**, **Brassicaceae**, **Polygonaceae**, **Saxifragaceae**, and several other families represented by one or a few species. The predominance of Asteraceae and Lamiaceae reflects their wide ecological distribution and long-standing

importance in traditional herbal medicine. Species belonging to these families are well known for their abundance of bioactive compounds such as flavonoids, terpenoids, phenolics, and essential oils that contribute to their medicinal properties.

Analysis of the plant parts used revealed that **leaves were the most frequently utilized plant part**, either alone or in combination with other parts such as flowers, roots, bark, stems, seeds, fruits, rhizomes, bulbs, and whole plants. Whole plants constituted another major category of medicinal resources, followed by roots and bark. Leaves are widely preferred because they are readily available, can be harvested sustainably without destroying the plant, and contain a high concentration of secondary metabolites responsible for therapeutic activity. In contrast, the use of roots, rhizomes, and bark, although common in species such as *Aconitum heterophyllum*, *Angelica glauca*, *Berberis lycium*, *Bergenia stracheyi*, *Valeriana jatamansi*, and *Taxus wallichiana*, may threaten natural populations if harvesting is not properly managed.

The documented medicinal uses showed that the recorded species were employed to treat a broad spectrum of human ailments. A large proportion of plants were used for the treatment of **respiratory disorders**, including cough, cold, asthma, bronchitis, and sore throat. Notable examples include *Adhatoda vasica*, *Mentha arvensis*, *Mentha longifolia*, *Thymus linearis*, *Verbascum thapsus*, *Viola odorata*, and *Hedera nepalensis*. Several species, including *Acorus calamus*, *Angelica glauca*, *Coriandrum sativum*, *Taraxacum officinale*, and *Prunus domestica*, were reported for digestive disorders such as indigestion, diarrhoea, constipation, dyspepsia, and stomach ailments.

Many plants were also traditionally used for **inflammatory conditions, rheumatism, arthritis, and wound healing**. Species such as *Achillea millefolium*, *Cedrus deodara*, *Colchicum luteum*, *Salix alba*, *Plantago major*, *Bergenia ciliata*, and *Betula utilis* were frequently employed because of their anti-inflammatory and analgesic properties. In addition, several species including *Berberis lycium*, *Ajuga bracteosa*, *Trigonella corniculata*, *Allium cepa*, and *Cynodon dactylon* were reported for the management of diabetes and associated metabolic disorders.

A number of plants possessed specialized medicinal importance. *Taxus wallichiana* is recognized as a valuable source of anticancer taxanes, while *Dioscorea deltoidea* provides diosgenin, an important precursor for steroidal pharmaceuticals. *Hypericum perforatum* is traditionally used for anxiety and depression, *Valeriana jatamansi* serves as a sedative and anxiolytic, and *Rhodiola wallichiana* functions as an adaptogenic herb that enhances resistance to physical and mental stress. These findings demonstrate that the medicinal flora of the study area includes species of both traditional and modern pharmacological significance.

The study further revealed that several medicinal plants, including *Aconitum heterophyllum*, *Angelica glauca*, *Gentiana kurroo*, *Taxus wallichiana*, and *Dioscorea deltoidea*, are high-value Himalayan medicinal species that have experienced increasing harvesting pressure due to commercial demand. Their conservation and sustainable utilization are therefore essential to maintain both biodiversity and traditional healthcare practices.

Overall, the results indicate that the local communities possess extensive indigenous knowledge regarding the medicinal value of native plant species. The diversity of plant families, the wide range of plant parts utilized, and the treatment of numerous disease categories highlight the continued dependence of rural populations on plant-based healthcare. Proper documentation of this traditional knowledge is essential for biodiversity conservation, sustainable utilization of medicinal plants, and future pharmacological research.

Summary and Conclusion:

The present study documented **132 medicinal plant species belonging to 58 families**, highlighting the rich floristic diversity and ethnomedicinal heritage of the study area. The findings revealed that **Asteraceae** was the dominant family, followed by Rosaceae, Lamiaceae, Fabaceae, Ranunculaceae, and Apiaceae, reflecting their ecological abundance and medicinal significance. Leaves were the most commonly used plant part, followed by whole plants, roots, bark, flowers, and seeds, indicating both sustainable harvesting practices and dependence on underground plant parts for certain valuable species. The documented plants were traditionally used to treat a wide range of ailments, including respiratory disorders, digestive problems, inflammatory diseases, skin infections, diabetes, liver disorders, and wounds, demonstrating the broad therapeutic potential of the local medicinal flora. Several species, such as *Taxus wallichiana*, *Aconitum heterophyllum*, *Angelica glauca*, *Gentiana kurroo*, and *Dioscorea deltoidea*, were identified as high-value Himalayan medicinal plants with considerable pharmacological importance but are increasingly threatened by overexploitation and habitat degradation. The study confirms that indigenous communities possess extensive traditional knowledge that continues to support primary healthcare. Therefore, systematic documentation, conservation of threatened species, sustainable harvesting practices, and scientific validation of traditional remedies are essential to preserve this valuable ethnomedicinal heritage and promote its contribution to biodiversity conservation, rural livelihoods, and future drug discovery.

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