



Research Article

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Ethnobotanical study of medicinal plants used to treat human diseases in Daksum forest range of Kashmir Himalayas

Tahir Mushtaq¹, Jalib Hussain¹, Parvez Ahamd Sofi¹, Ishtiyak Ahmad Peerzada¹, Abdul Rashid Malik¹, Amerjeet Singh¹, M Iqbal Jeelani², Jauhar Rafeeq¹, Malik Masroor UL Haq¹, Peerzada Tabish Fayaz¹

¹ Division of Forest Products and Utilization, Faculty of Forestry, SKUAST-Kashmir, Benhama, Jammu and Kashmir-191202, India

² Division of Basic Sciences, Faculty of Forestry, SKUAST-Kashmir, Benhama, Jammu and Kashmir- 191202, India

ABSTRACT

Many societies around the world still rely on plants for their primary medical care, having long employed medicinal herbs in their traditional health systems. Worldwide, between 70 and 80 percent of people receive primary healthcare from medicinal plants. The WHO reports that both in industrialized and developing nations, ethno-medicine has managed to retain its standing. The Kashmir Himalayas in India are home to an enormous variety of therapeutic plants. The application of medicinal plants in the treatment of human diseases was the main focus of this study. Surveys were conducted throughout the research region to gather data. Since ancient times, medicinal plants have been a part of conventional medical systems, and many cultures still primarily rely on plants for healing. To gather accurate and reliable data, semi-structured interviews and group discussions were held with local communities, ideally in their native tongue. Interviews with 80 families comprising villagers, tribal members, and traditional healers were done during the study's duration. The majority of the data collection was in consultation with local specialists and tribal healers. Herbal medicine is a key part of the primary healthcare system in the area under investigation. It has been noted that various plant parts—leaves, entire plants, fruit, seeds, roots, flowers, rhizomes, bark, etc.—are used by people to treat various ailments. People in the study area treat a variety of diseases with a total of 42 species belonging to 30 families. Asteraceae was found to be the dominant family.

Keywords: Survey, Interview, Medicinal, Himalayas, Healthcare, Disease, Species.

INTRODUCTION

Kashmir Himalayas, one of the most beautiful parts of the Indian Himalayan Region harbors a large number of medicinal plants ^[1]. People have used plants to relieve suffering and illness since ancient times. The healing properties of various plant species, mostly medicinal plants, greatly influenced the creation and development of many herbal treatment methods. Medicinal plants have been widely used to treat a variety of infectious and non-infectious diseases. In fact, 25% of commonly used medicines contain compounds extracted from plants ^[2]. The scarcity of written records and rapid cultural changes result in the traditional oral transmission of information from generation to generation, resulting in important information being lost over time. However, medicinal herbs have gained wide recognition in the last two quarters as the belief in herbal medicine has grown because it has fewer side effects than allopathic medicine and meets the ever-increasing medical needs of mankind. The use of ethno-medicine is a safe and inexpensive treatment method for various diseases. Physical surveys of the study area were conducted at regular intervals during the flowering period (March-August) of most plants to determine the diversity of medicinal plants available. As a result of the research carried out, 42 plant species belonging to 30 different families were collected, some of which also have economic value. The study encourages local scientists and students to learn more about their rich natural environment and also develops a sense of responsibility to protect it, which only continuously increases its aesthetic value.

Medicinal plants have been used in traditional health systems for centuries, and many cultures around the world continue to rely on plants for their primary health care. Around 70–80% of individuals rely on medicinal herbs for their daily health care. In Kashmir Valley, medicinal plants are also a major source of revenue for thousands of families ^[3]. According to the WHO, ethno-medicine has maintained its reputation in all regions of developing countries as well as in industrialized countries ^[4]. That is why patients in developing countries like Bangladesh (90%), Myanmar (85%), India (80%), Nepal (75%), Sri Lanka (65%) and Indonesia (60%) strongly believe in it. India's herbal trade is estimated to be worth about US\$ 1 billion annually ^[5], of which 60% were raw and 30% finished products. The history of medicine and surgery goes back to the origins of humanity. India has several systems of traditional medicine, such as Ayurveda, Siddha, and Unani, which have survived for almost 3,500 years, mostly using herbal medicines.

*Corresponding author:

Dr. Tahir Mushtaq

Division of Forest Products and Utilization, Faculty of Forestry, SKUAST-Kashmir, Benhama, Jammu and Kashmir- 191202, India

Email:

tahirmushtaq333@gmail.com

Indigenous knowledge supplemented and validated by the latest scientific insights can provide new holistic forms of sustainable development that are socially acceptable. Financial information about the use of plants was passed from generation to generation, orally or unpublished. In other words, plants are part of tribal life from birth to death. American botanist John William Harshberger coined the term ethnobotany in 1895 and defined it as "the study of plants used by primitive and indigenous peoples. India is a very diverse country with vast medicinal plant resources, using 2,500 species of plants of various compositions. About 8,000 medicinal production units consume about 2,000 tons of herbs every year, and more than 500 million people in the country benefit from the traditional health system of about 16,000 sq. km. It contains a huge number of economically important medicinal plants, some of which are endemic to the region [6]. Kashmir has a long history of using herbal medicines. The people of the region learned and practiced the medicinal use of plants. The medicinal use of plants by nomadic and nomadic tribes such as Gujjars and Bakerwals has been documented earlier [3,7]. However, regular and continuous monitoring of these species in the wild is mostly lacking because the available information is either qualitative [8] or ethno-botanical [9, 10]. Therefore, in this study, an attempt was made to document the ethno-medicinal use of some plant species used by the people of the Daksum region for the treatment of various diseases with following objectives

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

MATERIALS AND METHODS

The current study was carried out in Daksum forest range of district Anantnag, during the year 2023/2024. The details of the technique followed and methods used during the course of investigations are described below:

Study area

The beautiful valley of Kashmir is rich in medicinal plants that have been traditionally used to treat various diseases. The Union Territory of Jammu and Kashmir consists of 20 territories, with the two regions of Jammu and Kashmir offering a rich variety of terrain. The registered forest area of the state is about 21,000 square kilometres. Anantnag is one of the 20 districts of the state, located at an altitude of 5,300 meters amsl in the south and west direction and 53 kilometres from the summer capital, Srinagar. Nature has generously gifted the region with unparalleled beautiful places like Verinag, Kokernag, Achabal, Daksum, Pahalgam, and Betaab Valley. The climate of the region can be divided into six main two-month seasons. These include spring, summer, the rainy season, autumn, winter, and freezing cold, known locally as Sont, Retkol, Waharat, Harud, Wandh, and Sishur. The average minimum and maximum temperature vary from -11 degrees Celsius to 34 degrees Celsius and the annual rainfall in the form of rain and snow is about 1103 mm for about 70 to 80 days. The Daksum forest range is located 40 km from the district headquarters (Figure-1). It is located at an altitude of 2,438 meters amsl and is located between the coordinates of 33 degrees 36 minutes north latitude and 75 degrees 26 minutes east longitude. Often referred to as a hiker's

paradise, it is dotted with coniferous forests, bubbling streams, and hidden grasslands.



Figure 1: Map of the study area

Data collection

Field surveys and structured interviews were used to obtain the 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 ethno-medicinal aspects was also collected from local residents of the area. This was done mainly by transporting collected species to local experts, herbalists, and tribal healers. They were often involved in identifying plant species in the field and authenticating plant samples collected from habitats. During the survey, around 80 people/informants aged 45–95 were interviewed, most of whom have a respectable position in the community. Informants were asked in Hindi, 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 from 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.

Questionnaire

Scientific name	Local name	Family	Part used	Diseases treated

Sampling

Number of Forest ranges surveyed: 1 (Daksum Forest Range);

Total Number of blocks surveyed: 4 (Ahlan, Larnoo, Gadoole and Dandipora);

Number of informants interviewed in each Block: 20;

Total number of informants surveyed in the forest range: No. of district × No. of blocks × No. of informants from each block = 1×4×20 = 80 informants

RESULTS AND DISCUSSION

The research findings of the present investigations entitled “Ethnobotanical study of medicinal plants used to treat human diseases in Daksum forest range of Kashmir Himalayas” have been presented as under:

During the study, a total of 42 medicinal plants belonging to 30 different families were found to be effective medicines used by the local people in their daily lives for the treatment and cure of various diseases. All plant species are arranged alphabetically, followed by their genus, local name, part used, and their uses in the treatment of various diseases (Table 1). A maximum number of medicinal plants was recorded in two families, namely Asteraceae (7 species) and Lamiaceae (3 species), followed by Berberidaceae, Malvaceae, Polygonaceae, and Ranunculaceae (2 species each), while all other families had only one species (Figure 2). Most of the plants collected were herbs-38 (Figure 3). Medicines were used in various forms, such as powder, paste, powder, decoction, juice, and infusion. Paste was most commonly used, followed by decoction, broth, infusion, powder, juice, and latex. The results also show that the inhabitants of the region used them through various preparation methods to treat various diseases such as rheumatism, urinary diseases, warts, fever, colds, headaches, hair loss, indigestion, toothache, cancer, wound healing, etc. Many factors have been found to influence the use of herbs, such as season and familiarity with other species. It was also revealed that a large part (75%) of folk medicine information came from people over 55 years old, while a small part (25%) came from 35-55 year-olds. 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.

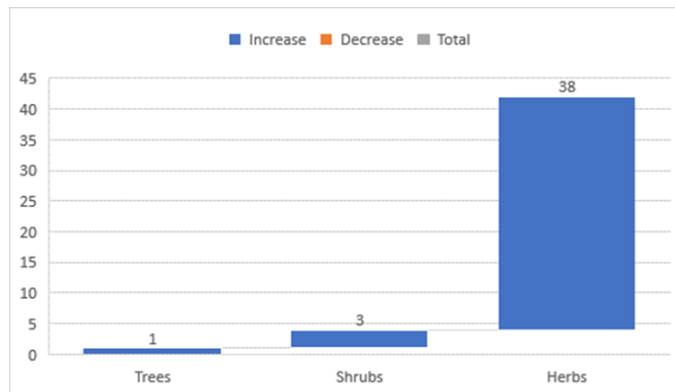


Figure 3: Distribution of species according to their life-form

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 also 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 4).

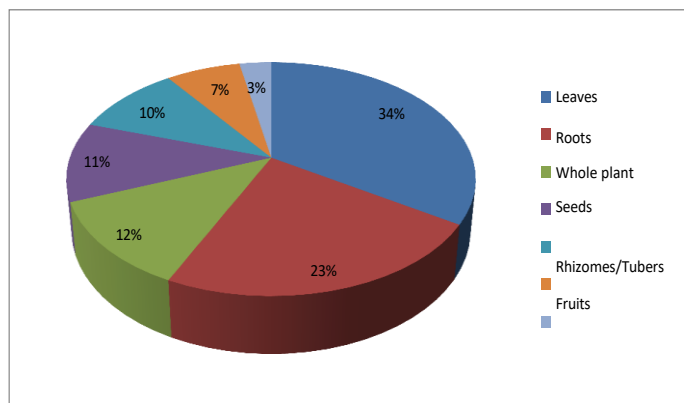


Figure 4: Pie chart showing various plant parts used as a remedy for various diseases in the study area

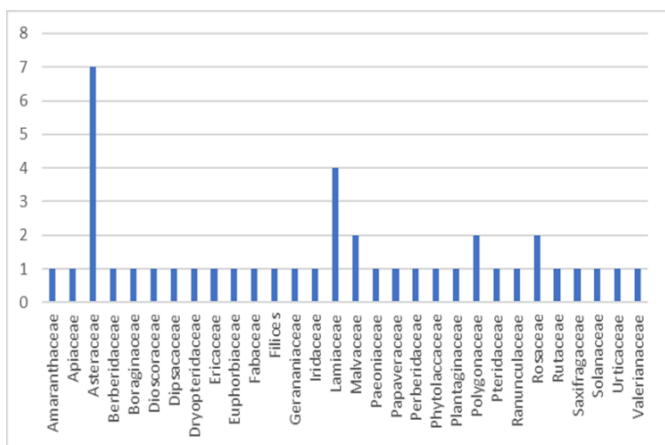


Figure 2: Distribution of species among families

Table 1: Taxonomic evaluation of medicinal plants in Daksum forest range

S. No.	Botanical Name	Family	Common Name	Part Used	Diseases Treated
1	<i>Achillea millefolium</i> L.	Asteraceae	Pahal Gasseh	Leaves, Rhizome	Toothache, kidney disorders, Headache
2	<i>Aconitum heterophyllum</i> Wall.	Ranunculaceae	Patris	Roots, Seeds	Tonsillites, Ascites, Cough, Headache
3	<i>Adiantum venustum</i> D. Don.	Pteridaceae	Gautheer	Whole Plant	Jaundice, Hair tonic, Chest inflammation, Urinary disorders
4	<i>Ajuga brateosa</i> L.	Lamiaceae	Jan-e-Adam	Whole herb	Burns, Boils, Blood purifier, Rheumatism
5	<i>Arnebia benthamii</i> Forss k.	Boraginaceae	Kah-Zaban	Whole plant	Increasing lactation, Hair loss, Fever, Blood purifier
6	<i>Artemesia absinthium</i> L.	Asteraceae	Tethwan	Whole herb	Liver infection, Stomach pain, Worm infection
7	<i>Asplenium trichomanes</i> L.	Filices	Dumtuli	Roots, leaves	Hairproblems, bronchitis disorders, Insect bites, worms
8	<i>Bergenia ciliata</i> (Haw.) Stern b.	Saxifragaceae	Zakhm-e-Hayat	Leaves, Roots	Boils, Earache, Asthma, Internalinjury and Kidney stones
9	<i>Berberis lyceum</i> L.	Berberidaceae	Chonfal/Kawdach	Roots, Leaves, Fruits	Indigestion, Constipation, Jaundice and Typhoid
10	<i>Beta vulgaris</i> L.	Amaranthaceae	Chowgander Haakh	Leaves, Roots	Antitumor, Diabetes
11	<i>Chrysanthemum cinerariifolium</i> Sch.	Asteraceae	Pyrethum	Seeds	High blood pressure, Fever, Cold, Chest pain and Head lice
12	<i>Coriandrum sativum</i> L.	Apiaceae	Daniwal	Seeds	Muscle pain, Jaundice, Palpitation, Hairfall
13	<i>Datura stramonium</i> L.	Solanaceae	Datur	Leaves, Seeds	Asthama, Rheumatism, Tooth ache and Baldness
14	<i>Dioscorea deltoidea</i> Wall.	Dioscoraceae	Kraeth	Leaves, tubers, rhizome	Ophthalmic infections, Rheumatism, Birth control and Snake bites
15	<i>Dipsacus inermis</i> Wall.	Dipsacaceae	Wopal Haakh	Leaves	Sore throat, Bath after delivery
16	<i>Dryopteris filixmas</i> L.	Dryopteridaceae	Vaeni	Whole plant	Kidney and gallstones, Menstrual bleeding, Wounds
17	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Gur Sochal	Leaves, Fruits, Root, Latex	Boils, Cancer, Cholera, Indigestion and Constipation
18	<i>Fragaria nubicola</i> L.	Rosaceae	Youngtosh	Rhizome, Fruit	Tonsillites, Fever, Menstruation
19	<i>Geranium wallichianam</i> Oliv.	Gerananiaceae	Rattan jot	Roots	Peptic ulcers, Toothache, Joint pains and wound healing
20	<i>Iris cashmiriana</i> Baker.	Iridaceae	Mazar mund	Whole plant, Rhizome	Rheumatism, Joint pains, Respiratory problems, Rodent repellent and Eczema
21	<i>Jurinea macrocephala</i> Royle.	Asteraceae	Dhup	Roots, whole plant	Boils, Rheumatism, Eye infections and Fever
22	<i>Lavatera cashmiriana</i> Cambess.	Malvaceae	Sozposh	Leaves, Flowers	Skin irritation, Sore throat and Common cold
23	<i>Malva sylvestris</i> L.	Malvaceae	Sotsal	Leaves, Seeds	Cough and fever, Increasing eye sight, Constipation and Wound healing
24	<i>Mentha arvensis</i> L.	Lamiaceae	Pudhna	Leaves	Indigestion, Constipation, Abdominal pain and Diarrhoea
25	<i>Paeonia emodi</i> Wall.	Paeoniaceae	Midood-e-Saleeb	Roots, Flowers	Hysteria, Convulsions, Uterine diseases and Diarrhea
26	<i>Papaver somniferum</i> L.	Papaveraceae	Khash Khash	Fruits, Seeds	Pain reliever, Cancer, Fever and Insomnia
27	<i>Phytolacca acinosa</i> L.	Phytolaccaceae	Paddar Haakh	Roots, Leaves	Boils and Sores, Urinary disorders and Odema
28	<i>Picrorhiza kurroa</i> Royle.	Plantaginaceae	Coad, Kutki	Roots, Rhizome, Fruits	Bronchial asthma, Dyspepsia, Liver infections, Scorpien stings and Snake bites
29	<i>Podophyllum hexandrum</i> Royle.	Perberidaceae	Wanwangun	Roots, Leaves, Fruits	Jaundice, Hearing loss, Boils and Ovarian Cancer
30	<i>Prunella vulgaris</i> L.	Lamiaceae	Kalvuth	Whole herb, Leaves	Rheumatism, Body pain, Headache and Internal bleeding
31	<i>Rheum emodi</i> Wall.	Polygonaceae	Pambchallan	Roots, Rhizome	Healing boils, Wound healing, Ulcer healing and Teeth cleaning
32	<i>Rhododendron arboretum</i> Sm.	Ericaceae	Gaggar Bang	Flowers, Leaves	Headache, Respiratory disorders, Menstrual disorders, Removal of striking bones in the throat
33	<i>Rosa webbiana</i> wall.	Rosaceae	Jangli gulab	Fruits	Fever, sore throat, used in kehwa for being warm in winters
34	<i>Rumex acetosa</i> L.	Polygonaceae	Obej	Leaves	Cancer, Stomach problems, Skin Sores and Stings of Nettles
35	<i>Saussurea costus</i> (Falc.) Lipsch.	Asteraceae	Kuth	Roots	Worm infections, Joint pains, Dysentery, Arthritis and Stomach ache
36	<i>Senecio graciliflorus</i> (Wall.)DC.	Asteraceae	Mongol	Leaves, Flowers	Fever, Chest pain, Increasing appetite, Indigestion and Stomach ache
37	<i>Skimmi alaureola</i> Franch.	Rutaceae	Ganeh Pattar	Leaves	Smallpox, Nasal tract cleanliness, Cold and Headache

38	<i>Taraxacum officinale</i> L.	Asteraceae	Handh	Roots, Leaves	Back pain, Cold, Chest infections, Bone fractures and mosquito repellent
39	<i>Thymus linearis</i> Benth.	Lamiaceae	Jangli ajwain	Aerial parts	Gastrointestinal problems, respiratory problems, hookworm, headache, toothache
39	<i>Trigonella foenum graecum</i> L.	Fabaceae	Meth	Seeds, Leaves	Blood sugar control, Sore throat, Painful menstruation, Fever and Breast enlargement
41	<i>Urtica dioica</i> L.	Urticaceae	Soi	Roots, Leaves	Cysts of feet and hands, Hair stimulant, Stomach pain, Blood clotting and alleviates anxiety and nervousness during menses in females
42	<i>Valeriana wallichii</i> DC.	Valerianaceae	Mushk-e-Bala	Roots, Rhizome	Sleeping disorders, Swellings, Pain In Rheumatic joints, Muscular spasms and Painful menses

CONCLUSION

Medicinal plants have made an important contribution to the creation and development of many herbal therapies and they significantly promote human health. They are widely used in home medicine and by practitioners of traditional medicine, especially in developing countries where public health services are limited. The Kashmir Himalayas have an exceptionally diverse flora and have been considered a valuable quarry for medicinal plants. From the study, it can be concluded that Anantnag's Daksum region is rich in various medicinal plants and herbal resources. Most of the plants used for various medicinal purposes are considered very important and are widely used in the region to treat many diseases. Most of the plants are already on the endangered list, and a special and sincere effort is needed to prevent the extinction of these important plant resources. At the grassroots level, academic institutions need to further explore this area. Information on species commonly grown in vegetable gardens and backyards, such as Mentha species Papaver species Coriander sp., etc., must be passed on to high school students. The importance of conservation, economic use, current status, and uses of medicinal plants should be emphasized by organizing information programs at different levels in the locality.

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Conflict of interest

There is no conflict of interest.

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