



INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

Volume 2; Issue 4; 2024; Page No. 04-07

Received: 07-04-2024

Accepted: 18-05-2024

Wild plants used as a forest ecosystem service by the local inhabitants of the Sarkaghat and its adjacent of Himachal Pradesh to the subsistence of their livelihood

¹Rajni Kant, ²Devender Kumar and ³Kumar Ambrish

^{1,2}Sunrise University Bagad Rajput, Tehsil-Ramgarh, Alwar, Rajasthan, India

^{1,3}Botanical Survey of India Ministry of Environment, Forest & Climate Change, Govt. of India High Altitude Western Himalayan Regional Centre, UHF, Nauni Campus, Solan, Himachal Pradesh, India

DOI: <https://doi.org/10.5281/zenodo.12737232>

Corresponding Author: Rajni Kant

Abstract

The current plants research in Himachal Pradesh's Sarkaghat region intended to chronicle the area's economic plant resources and traditional knowledge. To explore the economic uses of plants, local communities, indigenous people, farmers, and competent forest department officials were contacted. The study discovered numerous valuable plant species of cultural, medical, and economic worth, including *Myrica esculenta*, *Rhododendron arboreum*, and *Dioscorea bulbifera*. Traditional knowledge connected with plant resources must be preserved for long-term development, biodiversity protection, and the well-being of people relying on these resources. Plant secondary metabolites, which play an important role in plant adaptation and defense, are becoming better understood. It is feasible to enhance sustainable agriculture by recognising and appreciating the value of these plant resources. The preservation of this one-of-a-kind environment is critical for maintaining ecological balance, saving endangered species, and preserving traditional knowledge about plant resources. The Sarkaghat area research emphasises the economic and cultural relevance of numerous plant species, emphasising the need of conserving traditional knowledge for the well-being of people and the region's sustainable development. In this paper only included highly economic plants those are used by local inhabitants for the subsistence of their livelihood.

Keywords: Himalaya, economic, traditional, biodiversity, inhabitants

1. Introduction

The Himalayan region is especially recognised for its diverse flora and fauna, and India is in fact famed for its tremendous biodiversity. The Himalayas are regarded as a vital repository of numerous plant and animal species, providing enormous ecological significance and adding to the nation's overall biodiversity. The vegetation in the Himalayan region is extraordinarily diverse and is significant from many angles. The Himalayas' lush forests, vivid flowers, and beautiful scenery all attest to their aesthetic splendor. From all over the world, travelers and nature lovers are drawn to this natural beauty. The Himalayan region is a wealth of therapeutic plants from a botanical perspective. Between 35,000 and 70,000 plant

species are said to be used as medicines worldwide. In India, 1,600 of these plant species are historically utilised as medicines. Systems of traditional medicine like Ayurveda, Siddha, and Unani heavily rely on these plants. The Himalayas are also acknowledged as one of the world's biodiversity hotspots. A region is referred to as a biodiversity hotspot if it has a very high concentration of endemic species and faces serious challenges to that biodiversity. Around 8,000 different blooming plant species can be found in the Himalayan region, with about 25.3% of them being indigenous. This shows that these species are only present in the Himalayas and nowhere else in the entire world.

It is crucial to maintain the biodiversity of the Himalayas

and safeguard its distinctive flora and wildlife. The goal of conservation activities in this area is to preserve the delicate environmental balance, protect endangered species, and sustain the priceless riches that the biodiversity of the Himalayas provides. In the Indian Himalaya, local populations and the forest have a very tight and interdependent interaction. The area's great biodiversity offers residents a variety of resources to meet their diverse needs. Out of the total 4, 22, 000 flowering plants reported from the world (Govaerts, 2001) [9], more than 50,000 are used for medicinal purposes (Schippmann *et al.*, 2002) [14].

The use of organic chemicals and natural medicines for health and wellbeing has become more popular in recent years. This change can be ascribed to a number of things, such as the desire for healthier, more sustainable options, worries about the adverse effects of synthetic medications, and a resurgence of interest in conventional practises and treatments. Compared to their synthetic counterparts, organic substances like organic foods and herbal medications are frequently seen as being safer and healthier. Numerous individuals have the misconception that organic products are free of dangerous chemicals, pesticides, and genetically modified organisms (GMOs). They might also favour organic farming practises, which put sustainability, biodiversity, and healthy soils first. Natural treatments made from plants, herbs, and other organic sources have become more and more popular in the medical world. Natural substances have long been used in traditional medical systems including Ayurveda, traditional Chinese medicine, and Indigenous healing techniques for their medicinal benefits. These natural remedies are said to treat patients holistically and with fewer negative effects. It's common to think of using organic foods and medicines as a means to get back in touch with nature and improve general health. It supports the idea that the body has the innate capacity to heal it and that using natural treatments can aid and accelerate this process. Furthermore, the holistic approach of organic ingredients emphasises treating the underlying causes of illnesses rather than only treating their symptoms. It is important to note that while organic substances and natural medicines can have beneficial effects, it is still essential to exercise caution and seek professional advice. The efficacy and safety of natural remedies can vary, and interactions with other medications or medical conditions should be considered. As the interest in organic substances and natural medicines continues to grow, there is an increased emphasis on research, regulation, and quality control in this field. Efforts are being made to scientifically validate the traditional knowledge and practices associated with organic substances and integrate them into mainstream healthcare systems. Ultimately, the use of organic substances and natural medicines for health and well-being is a personal choice, and individuals should make informed decisions based on their own needs, preferences, and consultation with qualified healthcare professionals. The Himalayan vegetation ranges from sub-tropical deciduous to evergreen forests across the foothills to alpine meadows above the timberline (Singh & Attri, 2014) [16]. Many significant modern-day pharmaceuticals have been made possible by the documentation of traditional knowledge, particularly regarding the medicinal benefits of plants. (Anon, 1994, Cox & Ballick, 1994 and Fabricant &

Farnsworth, 2001) [1, 6, 8].

The absence of recorded information on the traditional uses of plants as medicine is a significant problem in the interior regions of the western Himalaya. The role of market economy in depletion of traditional knowledge has been well documented in many parts of Himalaya (Uniyal *et al.*, 2003) [19]. There hasn't been any prior research done by any researchers, notably for the evaluation of wild plants utilised as a source of livelihood or sustenance, however some employees have previously offered some fragmentary reports state (Collett, 1902; Chowdhery & Wadhwa., 1984; Rawat & Srivastava, 1986, Aswal & Mehrotra. 1994; Dhaliwal & Sharma, 1999; Singh & Rawat, 2000, Singh & Sharma, 2006, Chandrasekar & Srivatava, 2009; Kaur & Sharma, 2004; Jaryan *et al.*, 2012; Kumar *et al.*, 2018, Singh, 2018) [5, 6, 13, 2, 7, 18, 15, 3, 11, 12, 17].

Materials and Methods

The research work was carried out in the Sarkaghat and its adjacent area of Himachal Pradesh during the years 2020–2022. The Sarkaghat and its surrounding regions, including Ropri, Chel, Jhanjhel, Jodhan, Bheri, Sajao, Saddhot, Rissa, Cholthra, Nabahi were routinely surveyed as part of this study activity for the documenting of the area's economic plant resources. Several local fruit traders, indigenous (older household members and women), farmers, and knowledgeable forest department staff members were questioned throughout the course of this survey. To learn about the economic applications of these plants utilised by the local people, group discussions and other participatory techniques were also utilised. The forest department has granted the required authorization for the gathering and recording of plant specimens. Plants gathered throughout the survey period have been correctly treated in accordance with the recommended procedure outlined by Jain and Rao (1976) [10]. Other plant specimens were recognised by comparing them to verified specimens kept at the BSI, Dehradun. Some plant specimens were identified in the field.

Floristic Diversity and Description of the Study Area

One of the most significant natural resources is the forest. They are essential to every nation's social, cultural, historical, industrial, economic, and industrial growth as well as the preservation of its ecological balance. In addition to serving as a population's primary source of resources, forests also serve as vast reservoirs of biodiversity. The only source of pure air and the ability to sustain and enhance the moisture regime is forests. They make the streams perennial and reduce floods. They preserve the fertility of the soil by producing humus as well. A notably diversified flora and fauna are produced by the variety in the climatic and physical environment. The forests of the study areas are dominated by the *Pinus*, *Oak-Rhododendron*, *Olea*, *Dalbergia*, *Albizia*, *Carissa*, *Rubus*, *Lantana camara*, *Wendlandia heynei*, *Woodfordia fruticosa* and *Pyrus pashia*. The sustainability of the forest ecosystem is a crucial aspect of efforts to conserve the environment, and any degradation of the forests will have a negative impact on a number of systems, including water resources, agricultural biodiversity, the environment, climate, and human health, in addition to the subsistence lifestyles of tribal and other

communities living in and around forest areas. Soil, water, forests, and biodiversity protection play a crucial role in ensuring the wellbeing of both current and future generations. Extreme weather events like hailstorms, earthquakes, and cloudbursts are a significant environmental limitation. The area's ice and glacier cover is being impacted by global warming. Furthermore, it is challenging to measure and evaluate the harm brought on by these natural phenomena due to the area's inaccessibility. Other natural processes include mass wasting, excessive seismic activity, landslides, glacial lake outburst floods, erosion, and sedimentation are additional environmental barriers to the utilisation of natural resources. One of the main environmental restrictions is soil erosion, which leads to regular floods in the plains downstream and harm to infrastructure, agriculture, and human life.

Descriptions of Some of the Most Important Plants

1. *Myrica esculenta* Buch.-Ham. ex D. Don

Family- Myricaceae

It is typically referred to as kaphal. Since the majority of the tree's parts are used as remedies in the traditional Ayurvedic and Yunani medical systems, the tree is extremely significant. The tree's bark has long been used as an antibacterial, a wash for foul wounds, a remedy for seafood poisoning, and an external plaster for rheumatism.

2. *Rhododendron arboreum* Smith.

Family- Ericaceae

It is commonly known as Burash. Flowers are eaten raw or made into juice to cure stomach diseases.

3. *Diplazium esculentum*

Retz. Family-Athyriaceae

It is frequently referred to as Lingar. Rhizomes are stored in granaries to protect them from insects and other vermin. Young fronds are used as green vegetables, as well as in salads and vegetable cooking.

4. *Dioscorea bulbifera* L.

Family- Dioscoreaceae

It is typically referred to as taradi. Vegetables are cooked with tubers. After being dried and powdered, the tubers are applied to ulcers and used for piles, diarrhoea, and syphilis.

5. *Bauhinia variegata* L.

Family- Fabaceae

It is commonly called Karale. Flowers and their immature buds are utilised as vegetables. The root is carminative, the bark is used to cure diarrhoea, the root-bark is combined with curd to treat haemorrhoids, and its paste may be combined with dried ginger and used internally to treat goitres.

6. *Cedrus deodara* (Roxb. ex D. Don) G. Don

Family- Pinaceae

It is commonly called Deodar. The Deodar oil has antiseptic properties and is used to skin conditions such as sores, wounds, and ulcers. It is also used as an insecticide and to treat headaches, fever, piles, and urogenital illnesses.

7. *Phanera vahlii* (Wight & Arn.) Benth.

Family- Fabaceae

It is commonly called Taur. Due of its many applications, the inhabitants of the Western Himalayas consider taur to be a multifunctional plant. It provides the local population with an excellent supply of food, fodder, fuel, fibre, medicine, and materialist is used to make "plate" or "dunu." The large leaves of this plant provide a valuable source of income for the local population since they are frequently used to make platters, which are used to serve food at all social gatherings.

8. *Phoenix sylvestris* (L.) Roxb.

Family- Areaceae

It is commonly called Khajare. The fibrous leaves are woven into mats, brooms, fans, baskets, bags, and other items. The leaf-derived fibre is easy to acquire, supple, bleaches well, and is superbly suited for paper-making. The rope-like, fibrous leaf petioles are pounded and twisted. It is source of income for local inhabitants.

9. *Dendrocalamus hamiltonii* Nees & Arn. ex Munro

Family- Poaceae

Dendrocalamus hamiltonii is called as magar, locally available variety of multipurpose bamboo; which is mainly cultivated as wood substitute, fodder and edible shoots used for making pickles. Furniture and handicraft manufacturers frequently use bamboo in their products. It is used to create a variety of ornamental things, including chairs, tables, shelves, cabinets, baskets, mats, and lampshades. Bamboo is a desirable material for eco-friendly and fashionable furniture designs due to its aesthetic appeal, robustness, and sustainability.

10. *Toona ciliata* M. Roem.

Family-Meliaceae

The wood is easy to work with, red in colour, and quite valuable. Furniture, wood paneling, and the creation of doors and windows all made considerable use of it.

11. *Tectona grandis* L. f.

Family- Lamiaceae

The tree is commonly known as sagwan. It is utilised for a variety of building tasks, including the creation of poles, beams, trusses, columns, roofing, doors, window frames, flooring, planking, panelling, and stairs. Sagwan is one of the greatest wood for building furniture, windows, and doors for homes.

Results and Discussion

In India's rural and tribal communities, wild edible plants have long played a significant role in terms of sociocultural, spirituality, and health. The use of medicinal plants in the form of traditional medical systems is one of the oldest, richest, and most diversified cultural traditions in India. Plants are priceless, fantastic, and traditional sources of cures for numerous ailments in the form of remedies. Plant secondary metabolites are molecules that play no basic function in the maintenance of life processes in plants, but are necessary for the plant to interact with its environment for adaptation and defense. However, we are just now beginning to comprehend the critical function they play in

plant growth and development. Secondary metabolites (e.g., carbohydrates, lipids, and amino acids) are synthesised in higher plants from primary metabolites. The plant species emphasised in the Western Himalayas or especially in the present study area have a complex tapestry of traditional usage and cultural importance. They contribute to the well-being of local communities by supplying medicinal cures, food, materials, and employment opportunities. Preserving and comprehending this traditional knowledge is critical for long-term development, biodiversity protection, and the well-being of communities who rely on these precious plant resources.

Acknowledgments

The authors are thankful to the Director, Botanical Survey of India, Kolkata for providing the necessary facilities and to the staff of the forest Department of Himachal Pradesh and local inhabitants of Sarkaghat for their kind co-operation during this survey work.

Conclusion

Forests are vital natural resources, crucial for societal, cultural, historical, and economic growth, as well as ecological balance. They support biodiversity, regulate water cycles, and maintain soil fertility, essential for agricultural sustainability. The diverse flora, including species like *Pinus* and *Rhododendron*, offer traditional medicinal benefits and cultural significance to communities in regions such as the Western Himalayas. Sustainable management is critical to mitigate environmental challenges such as soil erosion and extreme weather events. Preserving traditional ecological knowledge associated with plants not only supports biodiversity conservation but also sustains local livelihoods by providing food, medicine, materials, and economic opportunities. This ensures the resilience of ecosystems and contributes to long-term sustainable development and the well-being of current and future generations.

References

1. Anon. *Ethnobotany and the search for new drugs*. John Wiley and Sons; c1994.
2. Aswal BS, Mehrotra BN. *Flora of Lahul-Spiti – A Cold Desert in North-West Himalaya*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c1994.
3. Chandrasekar K, Srivastava SK. *Flora of Pin Valley National Park*. Kolkata: Botanical Survey of India; c2009.
4. Chowdhery HJ, Wadhwa BM. *Flora of Himachal Pradesh – Analysis*. 3 vols. Calcutta: Botanical Survey of India; c1984.
5. Collett H. *Flora Simlensis*. London: W. Thacker and Co; c1902.
6. Cox PA, Balick MJ. The ethnobotanical approach to drug discovery. *Sci Am*; c1994. p. 82-87.
7. Dhaliwal DS, Sharma M. *Flora of Kullu District (Himachal Pradesh)*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c1999.
8. Fabricant DS, Farnsworth NR. The Value of Plants Used in Traditional Medicine for Drug Discovery. *Environ Health Perspect*. 2001;109:69-75.
9. Govaerts R. How many species of seed plants are there? *Taxon*. 2001;50:1085-1090.
10. Jain SK, Rao RR. *A handbook of field and herbarium methods*. New Delhi: Today and Tomorrow's Printers and Publishers; c1976.
11. Kaur H, Sharma M. *Flora of Sirmour (Himachal Pradesh)*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c2004.
12. Kumar A, Dogra KS, Srivastava SK, Kant R, Kharkwal K. Vegetation types and floral composition of Himachal Pradesh, Western Himalaya: An overview. *Phytotaxonomy*. 2018;17:123-127.
13. Rawat GS, Srivastava SK. Recently introduced exotics in the flora of Himachal Pradesh. *J Econ Taxon Bot*. 1986;8(1):17-20.
14. Schippmann U, Leaman DJ, Cunningham AB. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues. In: *Biodiversity and the ecosystem approach in agriculture, forestry and fisheries Satellite event on the occasion of the Ninth regular session of the commission on genetic resources for food and agriculture*. Rome: Interdepartmental working group on biological diversity for food and agriculture; c2002.
15. Singh H, Sharma M. *Flora of Chamba District (Himachal Pradesh)*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c2006.
16. Singh P, Attri BL. Survey on traditional uses of medicinal plants of Bageshwar Valley (Kumaun Himalaya) of Uttarakhand, India. *Int J Conserv Sci*. 2014;5(2):223-234.
17. Singh PB. *Flora of Mandi District, Himachal Pradesh: North West Himalaya*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c2018.
18. Singh SK, Rawat GS. *Flora of Great Himalayan National Park – Himachal Pradesh*. Dehra Dun: Bishan Singh Mahendra Pal Singh; c2000.
19. Uniyal SK, Awasthi A, Rawat GS. Developmental processes, changing lifestyle and traditional wisdom: analyses from western Himalaya. *Environ*. 2003;23:307-312.

Creative Commons (CC) License

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.