J. Soils and Crops 34 (1) 202-207, June 2024

ISSN 0971-2836 (Print)
ISSN 2582-2756 (Online)

# UTILIZATION PATTERN OF MEDICINAL PLANTS IN JAUNPUR RANGE OF MUSSOORIE FOREST DIVISION, UTTARAKHAND

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## ABSTRACT

**This research endeavor aims to document traditional plant-based knowledge among the inhabitants of the Jaunpur Range in the Mussoorie Forest Division in Uttarakhand Himalaya. Comprehensive field surveys were carried out in the research site from November 2021 to December 2022 to collect information on the villagers' use of the resources. 56 plant species from 36 families were found to be utilized as traditional medicine by the locals in this area throughout the study. Herbs accounted for the largest percentage of medicinal plant species (38%). Common medicinal plants comprised 66% of the total, whereas unusual plants comprised 34%. There was total 19 diseases recorded which were cured by 56 plant species. All of them are valuable medicinal resources that offer thorough details on the traditional applications of medicinal plants in the isolated regions of Jaunpur Range for the treatment of various ailments. The region not only rich diversity of therapeutic plant species but also presents a promising opportunity for local communities and farmers to harness their economic potential. These plant species, known for their medicinal properties, not only contribute to the well-being of individuals but also serve as a sustainable source of income for those cultivating and trading them. By tapping into the market demand for natural remedies and herbal products, the local population can not only improve their economic conditions but also promote the conservation and sustainable use of these valuable plant resources.**

**(Key words : Medicinal, Mussoorie, Uttarakhand, utilization)**

## INTRODUCTION

Numerous ethnic groups, each with its own traditional knowledge system, find their home in the Himalayas, which are also rich in biodiversity. Variations in species composition can be detected from east to west, as well as from low to high elevation, with secondary impacts from geology and soil (Champion and Seth, 1968). Since the land-to-people ratio is continually dropping and population is constantly growing in emerging nations like India, the only way to meet the demand for agricultural goods is to enhance productivity without sacrificing sustainability or the environment. A system can be considered sustainable if it enhances or preserves the quality of the soil, water, plants, and atmosphere (Yadav *et al.,* 2018). The majority of people in India are rural dwellers who rely on agriculture for their subsistence; thus, domestication and diversification would aid in the creation of revenue and lessen the overuse of natural resources in rural regions. (Mehta *et al.,*2022).

The plants and materials found in the environment have been a major source of human life for many basic requirements ever since the dawn of civilization. The conventional heritable knowledge that has been transmitted from generation to generation is the foundation of our current understanding of plant resources. In many isolated places or among some individuals, however, traditional knowledge on a wide range of subjects remained untapped. Furthermore, ecological management and conservation demand a combination of traditional knowledge and cutting-edge techniques due to the present trends of over-exploitation of resources and habitat deterioration (Dangwal *et al.,* 2010).

The Uttarakhand state's Garhwal and Kumaon Himalayas cover 5.5 % of the overall western Himalayan region, and several workers researched the plants of great economic importance in this part of the Himalaya. Sharma, *et al.,* 2010; Tiwari and Pandey, 2010). The study of medicinal plants and their traditional uses by indigenous communities or tribes in various parts of the state has gained more attention in the past few decades (Gangwar *et al.,* 2010; Gaur *et al.,* 2010; Nazir *et al.,* 2010; Pandey and Pandey, 2010; Sharma *et al.,* 2010). Since ancient times, a wide variety of plants have been utilised as traditional medicines to treat

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a wide range of illnesses (Pathak and Naithani, 2016; Chamoli and Saran, 2019). Gaur and Sharma, (2011); Dangwal and Sharma, (2011) discussed the traditional applications of the medicinal plants of Pauri Garhwal. Uttarakhand's natural medicinal plant distribution and usage patterns (Prasad and Tomar, 2020, Kumari *et al.,* 2021).

Indigenous cultures' use of medicinal plants is important for maintaining biodiversity and traditional knowledge, as well as for advancing drug discovery and community health care. If it is believed that a plant that has been utilised by indigenous people for a long time has an allopathic purpose, the knowledge can be used to direct the creation of new drugs. By giving proper scientific names, colloquial names, and family names for future research, this study aims to catalogue the different plant species that are being used to cure common diseases in the Jaunpur Range of the Mussoorie Forest Division, Uttarakhand.

# MATERIALS AND METHODS

**Study site**

The study was done in the Jaunpur Range of Mussoorie Forest Division (30°27 13.9" N, 078°092 56.7" E) Uttarkashi from the North, Rudraprayag from the East, Puri Garhwal from the South, and Dehra Dun from the West are enclosing the districts. On the western boundary, it is divided by the Yamuna River from Jaunsar Pragana in the Dehra Dun district, while on the northern boundary, it is touched by the Bhagirathi, which rises in the Uttarkashi district from the Gangotri village.

**Field survey and data collection**

From November 2021 to December 2022, extensive field surveys were conducted at the research location to gather data on how the people used the resources. At the informant's house, in-person interviews in Hindi or Garhwali were conducted using standard questionnaires to collect data. The study is based on a botanical survey, the identification of medicinal plants, and the documentation of traditional medicines with the assistance and participation of local/rural peoples, farmers, traditional knowledge holders, and local healers to learn the local names and medicinal significance.

# RESULTS AND DISCUSSION

The present study compiles 56 ethno-medicinal plant species belonging to 36 families used by local people for their various ethno-medicinal purposes Table 1. Out of 36 families recorded, The most dominated families were Rosaceae (7 species) followed by Asteraceae, Lamiaceae, Rutaceae (3 species, each) Anacardieaceae, Berberidaceae, Moraceae, Pineaceae, Polygonaceae, Saxifragaceae, Smilacaceae, Zingiberaceae (2 species, each) Asphodelaceae, Bombacaceae, Dryopteridaceae, Fabaceae, Ericaceae, Gentianaceae, Juglandaceae, Linaceae, Malvaceae, Lythraceae, Meliaceae, Manisoermaceae, Myricaceae, Nyctaginaceae, Oleaceae, Phyllanthaceae, Oxalideaceae, Poaceae, Primulaceae, Rubiacea, Sapindaceae, Solanaceae, Urticaceae, Violaceae (1 species, each).

Within the documented species, herbs (37%) cover the maximum number of species followed by tree (31%), shrub (23%), climber (7%) and fern (2%) cover the minimum number of species. In the various formulations root (27%) were most used ingredient, followed by leaves (23%), bark (16%), stem (11%), seed (10%), fruit (8%) whole plant (3%), buds (2%).

There was total 19 diseases recorded which are cured by 56 plant species. The numbers of medicinal plant species were documented to Diarrhoea (7 spp., 13%), wound (7 spp.,13%), digestive disorder(5 spp., 9%),skin problem (5 spp., 9%), suppressed urination (3 spp.,6%), fever (3 spp.,6%), diabetes (3 spp.,6%), hair treatment (2spp.,4%), cattle eye treatment (2spp.,4%), insecticide (2spp.,4%), joint pain (2spp.,4%), gastric trouble (2spp.,4%), constipation (2spp.,4%), facilitated delivery (1spp.,2%), toothache (1spp.,2%), kidney stone (1spp.,2%) ,asthma (1spp.,2%), snake bite (1spp.,2%).

Folk medicine is still used by the locals to treat common ailments, and the current study offers enough evidence to conclude that the study area's traditional uses of locally grown medicinal plants are still in use. A portion of the population in Tehri Garhwal district that is less well-off economically also gathers medicinal herbs from the forests for trade as a source of income. Numerous species of medicinal plants exhibit restricted geographic ranges, low population densities, and sluggish development rates (Nautiyal *et al.,* 2002).Indigenous people still possess a great deal of traditional knowledge about how to use different plant species. This is particularly true in mountainous regions like the Himalaya because of the terrain's limited accessibility and relatively slow rate of development (Farooquee *et al.,* 2004). According to the Convention on Biological Diversity, via their traditional ways of life, indigenous people are essential to the growth and maintenance of the environment. According to Glowka *et al.* (1997), a country must safeguard its traditional knowledge and customs on the use of biological variety.In the Uttarakhand Himalayan area, Ram Prakash (2014) conducted research on the traditional usage of 111 medicinal plants. Of these, a small number of plants included in the current study have been discovered to have comparable purposes for healing ailments. During the survey, it was also observed that some residents of this area completely rely on these plants for food, fruits, and healthcare due to their accessibility and lack of adverse effects when compared to packaged foods and contemporary medications. Chauhan *et al.* (2016) also studied the traditional and ethnobotanical applications of medicinal trees; several of the species were similar to those in the current study. Certain ethnomedical applications of plants were found to be comparable among common species, and several other uses were also documented.

**Table 1. Medicinal plants of Jaunpur range and their uses**

| Sl.No. | Scientific Name | Sanskrit name | Local Name | Family | Hb | Dist. | Parts use | Uses |
|---|---|---|---|---|---|---|---|---|
| 1. | *Aloe vera* | Ghartkumari | Aloevera | Asphodelaceae | H | C | Lv | Fresh aloe on the face may assist to clear acne. Gel uses as shampoo.Drink as a juice for good digestion. |
| 2. | *Artemisia nilagirica* | Damanaka, | Tilpaat | Asteraceae | S | C | - | - |
| 3. | *Azadirachta indica* | Nimba | Neem | Meliaceae | T | UN | Lv | Leave use as insecticide and boiled leave water used for hair fall treatment.chew neem twigs instead of using toothbrushes. Skin treatment and also used for birth control and to cause abortions. |
| 4. | *Bauhinia variegata* | Kanchanara | Guiral | Fabaceae | T | C | Brk, Bu | The plant's bark is used to cure diarrhoea as an astringent. Its blossom and buds are used as a vegetable and are given to diarrhoea patients. |
| 5. | *Berberis asiatica* | Daruharidra | Kingoda | Barberieaceae | S | C | Brk , Rt | Stem bark and root juice use in eye infection and fever. |
| 6. | *Bergenia ciliata* | Pashanbheda | Pashanbheda | Sexifragaceae | H | UN | Rt | Root is tonic and used in fever, diarrhoea, and pulmonary affections and also used for urinary diseases. |
| 7. | *Bergenia stracheyi* | Pashanbheda | Pashanbheda | Saxifragaceae | H | C | Rh | To treat bladder and kidney stones, fresh rhizome is removed, properly washed, split into pieces, and chewed. |
| 8. | *Boerhaavia diffusa* | Punarnava | Kummar | Nyctaginaceae | H | C | Lv, Rt | Leaf extract use in eye disease and root chewed as tonic. |
| 9. | *Bombax ceiba* | Shaalmali | Semal | Bombacaceae | T | UN | St, fr | Gum from stem in diarrhoea, vegetable, decoction of fruit is given in suppressed urination. |
| 10. | *Bragaria indica* | - | Kiphaliya | Rosaceae | H | C | Lv | Gastritis, ulcers, and diabetes are all treated using leaf extract. |
| 11. | *Cedrus deodara* | Devadaru | Devodar | Pinaceae | T | UN | Sd | Seed oil use for treatment of joint pain. |
| 12. | *Cynodon dactylon* | Durva | Doob | Poaceae | H | C | WP | The plant's juice is used as an astringent to stop bleeding cuts and wounds. In dysentery, diarrhoea, and general debility, root and leaf decoctions are utilised. |
| 13. | *Diplazium esculentum* | - | Lingura | Dryopteridaceae | Fn | UN | St | It is mainly used for vegetables and use as constipation treatment. |
| 14. | *Emblica officinalis* | Amalaki | Avola | phyllanthaceae | T | UN | Fr | Fruit is one of the important constituents of the "triphala" |
| 15. | *Ficus palmata* | - | Bedu | Moraceae | T | C | Lt | Cuts and wounds are healed by milky latex. |
| 16. | *Ficus religiosa* | Plaksa | Pepal | Moraceae | T | C | Brk | On cuts, wounds, and skin problems, pulverised bark mixed with turmeric powder is used externally. |
| 17. | *Gentiana kuroo* | Trayanthi, | Triman | Gentianaceae | H | UNC | Rt | The root decoction is being used to treat fever and is considered blood purification and demulcent. |

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| 18. | *Grewia optiva* | Dhanvanah, | Bheemal | Malvaceae | T | C | Brk,Lv | Use in digestive, bark juice facilated delivery and hair wash.Boiled leaves paste used for cure joint pain. |
| 19. | *Hedychium perforatum* | - | Coli-phulya | Zingiberaceae | H | C | Sd | Minor burns, wounds, skin irritation, and nerve discomfort can all be treated using oily formulations of the plant. |
| 20. | *Hedychium spicatum* | Gandhamulika | Kapoorkachri | Zingiberaceae | H | UN | Rh | Rosted powder of rhizome given in asthma, seed belived to cause abortion |
| 21. | *Indigofera heterantha* | | Saakina | Rosaceae | H | C | Flb | Its buds are used as a vegetable and cure to digestive disorder |
| 22. | *Inula cappa* | Pushkaramula | - | Asteraceae | H | C | Rt | The root is used in the preparation of "Sur" |
| 23. | *Juglans regia* | Akshota | Akhrot | Juglandaceae | T | C | Brk | Itching, scrofula, and broken bones are treatable with bark paste. |
| 24. | *Mangifera indica* | Aamra | Aam | Anacardieaceae | T | C | Lv | Hiccups and throat affections are relieved by inhaling the fumes from burning leaves. |
| 25. | *Mentha longifolia* | - | Pudina | Lamiaceae | H | C | Lv | Leaves juice used in vomiting and indigestion. |
| 26. | *Mohonia borealis* | - | Khoru | Berberidaceae | S | UN | Fr | Berries are diuretic and demulcent in dysentery. |
| 27. | *Murraya koenigii* | - | Kadipatta | Rutaceae | T | C | Lv, Rt and Brk | Leave, bark and root use as an insecticide. |
| 28. | *Myrica esculenta* | Katphala, | Kaphal | Myricaceae | T | UN | Brk, fr | Bark use to gastric trouble and fruit eat for good digestion. |
| 29. | *Myrsine Africana* | Vidanga | Banwan | Primulaceae | S | UN | Fr | Fruit is anthelmintic |
| 30. | *Nyctanthes arbor-tristis* | Parijata | Kurri | Oleaceae | T | C | Lv | Juice of leave useful in sciatica and chronic fever. |
| 31. | *Ocimum tenuiflorum* | Tulasî, | Tulsi | Lamiaceae | S | C | Lv | Leaves used to cure fever common cold, sore throat and headaches. |
| 32. | *Origanum vulgare* | Maruvaka | Ban tulsi | Lamiaceae | H | UN | Sd, Lv | Volatile oil from the seed is given in colic hysteria and diarrhoea. |
| 33. | *Oxalis corniculate* | Amlapatrika, | Bhilmori | Oxalideaceae | H | C | Lv | - |
| 34. | *Pinus roxburghii* | Sarala | Chir | Pineaceae | T | C | Wd | Resin used in cuts and wounds |
| 35. | *Potentilla fulgens* | kanthamuna | Bajradantti | Rosaceae | H | UN | Lv, stem and Rt | Fresh leaves are pounded and applied to abscesses and root and stem to snake bites. |
| 36. | *Prinsepia utilis* | - | - | Rosaceae | S | C | Rt | Root paste is administered to cuts and wounds after it has been heated at a low temperature in an earthen pot. |
| 37. | *Pyrus pashia* | - | Mole | Rosaceae | T | C | Fr | Ripened fruit are used for digestive disorder and use for cattle eye injuries. |
| 38. | *Reinwardtia indica* | - | Phiyoli | Linaceae | H | C | Lv | Leave use for wound and cut. |
| 39. | *Rhododendron - arboreum* | Kurvak | Buraas | Ericaceae | T | UN | Fr | Flower juice and squash are used to cure diabetes. |

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| 40. | *Rhus parviflora* | - | Tungla | Anacardiaceae | T | C | Lv, St | Burn wood ash used in abdomen for supressed urination and leaf juice use for cholerae. |
| 41. | *Rubia cordifolia* | Manjistha | Manjith | Rubiacea | Cl | UN | Rt, St | a valuable red dye is extracted from the root and the stem. Root is tonic and astringent. |
| 42. | *Rubus ellipticus* | - | Hisar | Rosaceae | S | C | Rt, St | Root use for diarrhoea treatment and root powder use for stomach ache and root also used for alcohol production. |
| 43. | *Rubus niveus* | | Kali hissar | Rosaceae | S | UN | - | - |
| 44. | *Rumex hastatus* | - | | Polygonaceae | H | C | Lv | On wounds and injuries, leaf extract is used. |
| 45. | *Rumex nepalensis* | - | Kholiya | Polygonaceae | H | C | Lv | On cuts and wounds, leaves paste is administered. |
| 46. | *Sapindus mukorossi* | | Reetha | Sapindaceae | T | Un | Sd | Used for removing lice from the scalp and also used as hair cleanser. |
| 47. | *Skimmia laureola* | - | Kedarpatti | Rutaceae | S | UN | - | - |
| 48. | *Smilax aspera* | - | Ram – datun | smilacaceae | Cl | UN | - | - |
| 49. | *Smilax parviflora* | - | Ram – datum | smilacaceae | Cl | UN | - | - |
| 50. | *Solanum nigrum* | Kakamachi, | - | Solanaceae | H | C | WP | To treat jaundice, the whole plant's juice is taken orally. |
| 51. | *Taraxacum officinale* | Dugdhapheni | Kadvighass | Asteraceae | H | C | Lv | The leaves are beneficial to digestion. |
| 52. | *Tinosporas inensis* | Amrta | Giloy | Manisoermaceae | Cl | C | Lv | Boiled leave water used for dengue fever. |
| 53. | *Urtica dioca* | Vrscikali | Kandali | Urticaceae | S | C | Lv,Sd | Leaf extract believed to stop baldness and roots in various skin ailments. seed oil is both edible and useful for treating skin problems. |
| 54. | *Viola canescens* | - | Banaspa, | Violaceae | H | C | WP | The blossoms are boiled in water to form a decoction, which is then used to make tea to treat coughs, colds, and fevers. |
| 55. | *Woodfordia fruiticosa* | Subhiksha | Dhalua | Lythraceae | S | C | Fl, Rt | Over burn scars, root paste is used. Flowers are chewed thrice a day for a month to improve semen quality. |
| 56. | *Zanthoxylum armatum* | Tejohva | Timaru | Rutaceae | S | C | St, Fr and Brk | Fruits, seeds, and bark used as aromatic tonic in dyspepsia and fever, tender twinges are used to brush teeth and fruit and seed powder use for toothache. |

**Abbreviations**: H= Herb; S= Shrub; T= Tree; Cl= Climber; C= Common; UC= Uncommon; Hb= Habit; Dist= Distribution; Lv= Leaves; Sd= Seeds; Rh= Rhizomes; Fl= Flowers; Fr= Fruits; WP= Whole plant; Brk= Bark; Rt= Roots; St = Stem; Flb= Flower buds; Lt= Latex; Fern = Fn; wood = Wd; Gr= Grass and - = no information.

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**Rec. on 01.01.2024 & Acc. on 17.01.2024**