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An Ethnobotanical Assessment of the Flora in Rampur Forest Division, Shimla District, Himachal Pradesh: Traditional Uses, Threats, and Management Strategies

Dr. Prem Prakash,

Assistant Professor in Botany, Govt. College Solan, Himachal Pradesh

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ABSTRACT

This study focuses on the documentation and identification of the flora in the Rampur forest division of Shimla district, Himachal Pradesh, highlighting its ethnobotanical uses, traditional knowledge, cultural significance, prevailing threats and ongoing conservation efforts. Local floral diversity serve multiple uses, primarily medicinal, but their traditional uses also extend to food, fodder, fuel, and various cultural practices, often intertwined with magico-religious beliefs that that help in conservation. This heritage, however, is under severe threat from habitat degradation, over-exploitation, climate change, developmental projects, and the erosion of traditional knowledge due to modernization and diminishing intergenerational transfer. The study highlights the urgent need of the community engagement and various conservation strategies to safeguard both the flora and valuable indigenous knowledge systems. In the present study, 42 plant species ethnomedicinal plants belonging to 32 families and 40 plant species of other ethnobotanical uses belonging to 23 families were documented. All the 82 plants are arranged in alphabetical manner with botanical names, local names, family and their ethno botanical uses are documented in two tables.

Introduction:

Himachal Pradesh is a hilly state situated in the Indian Himalayan region, which is one of the youngest mountain systems in the World lying between 30.22' to 33.12' North latitudes and 75.47' to 79.04' East longitudes. The area of the state is 55,673 km^2 with almost mountainous elevations ranging from 350-6500 m above the mean sea level. Himachal Pradesh is renowned for its rich biological diversity, having approximately 3245 plant species, constituting about 7.32% of India's total flora (Bhardwaj *et al.*,2017). Shimla district of Himachal Pradesh is a critical biodiversity hotspot, elevating the importance of ethnobotanical studies and conservation efforts in this region (Singh & Thakur, 2014). Ethnobotanical information is paramount for the conservation of both biodiversity and cultural traditions. Wild plants are an integral component of Himalayan culture and traditions, contributing extensively to their economic sustenance and daily requirements (Rana, Bhatt, & Lal, 2019, Anchal Thakur *et.al.*, 2024).The systematic documentation of ethnobotanical knowledge is essential for the conservation and sustainable utilization of biological resources (Chauhan & Jisthu, 2024). Ethnobotanical flora and traditional knowledge of Himalayan region face multiple threats. Urban expansion, overharvesting, deforestation and climate change disrupt local ecosystems, reducing biodiversity. Lack of documentation

Corresponding author
Email: **:** peepeenegi5@gmail.com(Dr. Prem Prakash)

weakens the transmission of indigenous knowledge and the younger generations shift to modern medicine, ignoring the traditional practices. Invasive species threaten native flora, reducing their ecological and medicinal significance of the local flora (Jyoti *et. Al.,* 2023). Additionally, policy gaps and inadequate conservation efforts has accelerated the loss of traditional heritage. Sustainable practices, community involvement and government support are essential to preserving rich ethnobotanical legacy of region for future generations.

MATERIAL AND METHODS:

Study Area:

Shimla district is located at the longitude 77.00" and 78.19" East and latitude 30.45" and 31.44" North, with its headquarters in Shimla. The elevation of the district ranges from 300 m to 6,000 m. Shimla district has six forest divisions namely Shimla, Rohru, Chopal, Theog in Shimla forest circle and Rampur, Kotgarh in Rampur circle.

Rampur forest divisions of Rampur forest circle are situated in Shimla District of Himachal Pradesh. This tract lies in mid hill Himalayan region between Latitude 31.15'0" to 31.43'0" North and longitude 77. 30' 0" to 77. 57'30"East. The total geographical area occupied by this tract is1,00,318.1962 hactare which covers the area of Balhi, Nankhari, Rampur and Sarahan ranges of Rampur Forest Divisions. The tract is hilly with 820 m (Bhara Khad)-5690 m (Gushu Pushu) ridge. Rampur Bushahr {130 Km from Shimla) is headquater of the tehsil Rampur in Shimla district in Himachal Pradesh. The slopes vary from moderate to steep and very steep to precipitous which drain into the river Sutlej. The climatic temperate changes due to variation in altitude, tropical climate is found in sub- mountainous areas at the base of Sutlej valley to alpine in the upper reaches (Kapoor, 2008).

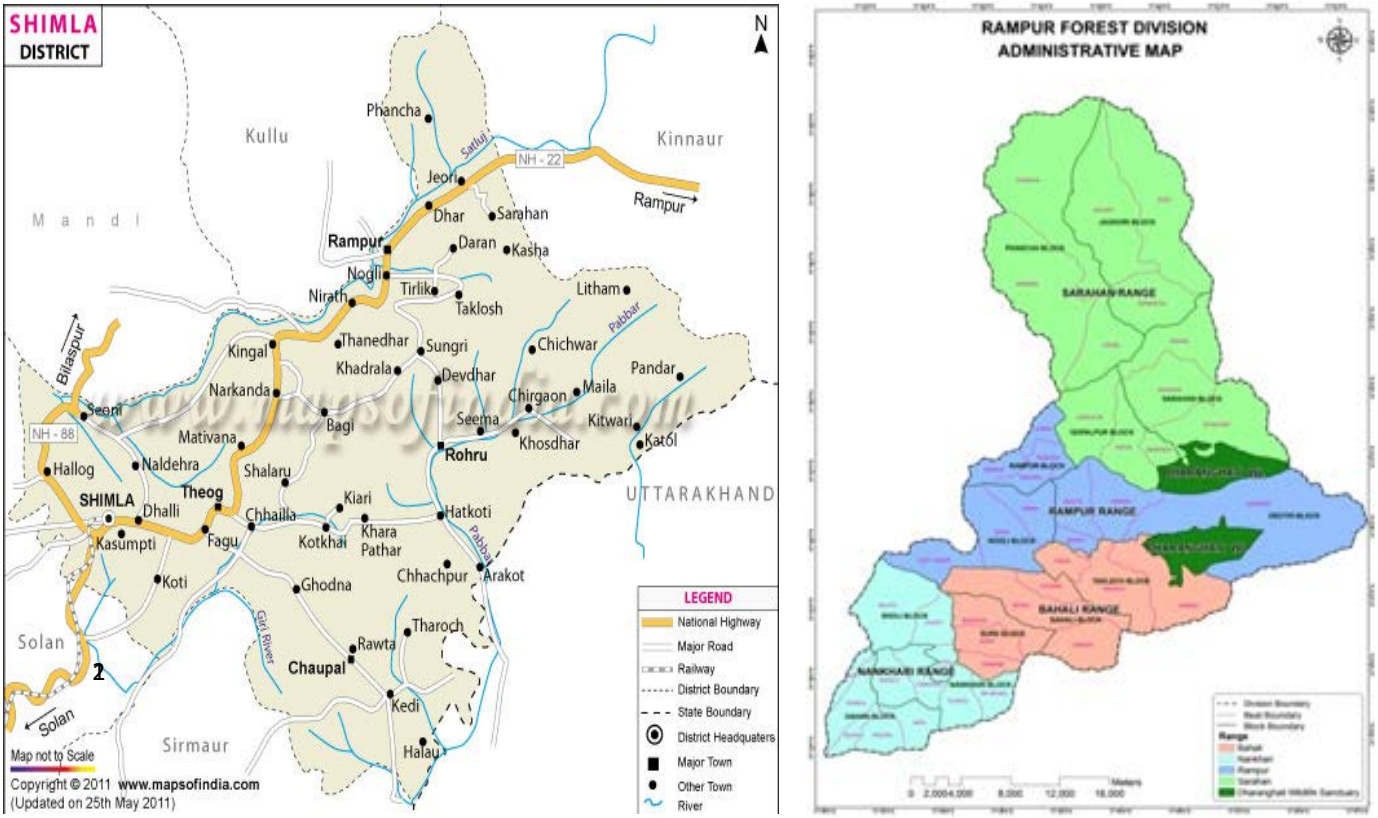

Fig. 1-2: Map of Shimla district and Rampur forest division (Forest Department H.P.)

OBJECTIVES:

1. To Assess the diversity and availability of ethnobotanical plants and to investigate traditional ethnobotanical knowledge by documentation of the flora
2. To identify and analyze threats to plant species and to develop the various conservation strategies

Methodology:

A large number of plant collections were made randomly from the different geographical localities of the Rampur forest division with four ranges (Rampur, Sarahan, Bahli and Nankhari) during Febuary, 2022-December, 2024.

The Standard procedures were adopted for the collection,

identification and classification of the plants. The diagnostic features of the plants were noted and their photographs were taken in the field. Herbarium mounts of these plants were also prepared for record and identification. The morphological details of species were noted and the specimens were identified with the help of illustrations and descriptions available in authentic journals, monographs, manuals and books. Nomenclature has been updated from the WFO Plant List (wfoplantlist.org).

The information was gathered by frequent visits to the study area and conducting interviews, group discussions, and field observations. The informants were asked to share the knowledge about common name of local plant species, life forms, plant parts used and mode of its application. The further information was also obtained from many floristic accounts of Himachal Pradesh Viz. Flora Simlensis by Collett (1902, 1921), Flora of Lahaul and Spiti by Aswal and Mehrotra (1994), Flora of Kullu by Dhaliwal and Sharma (1999), Flora of Great Himalayan National Park by Singh and Rawat (2000), Flora of Sirmaur by Kaur and Sharma (2003), Flora of Chamba by Singh and Sharma (2006). In addition, In addition information were taken from 'Flora of Bushahr Himalaya' (Nair, 1977),'Flora of Himachal Pradesh' in 3 volumes (Chowdhery and Wadhawa, 1984) and Flowers of Himalaya by Polunin & Stainton (1984).

Results and discussion:

The flora of the region is a crucial source of traditional medicine where many species used to treat various human ailments by traditional preparations of leaves, roots, stems, bark, fruits, flowers, rhizomes, and seeds (Chauhan *et. Al.*, 2016). These traditional treatments address a wide range of ailments, including asthma, fever, skin infections, respiratory issues, joint pain, and digestive problems. They are also used for wound healing, jaundice, urinary infections and headaches etc.

Table 1: Ethno medicinal Plants of Rampur Forest Divisions:

Sr. No.	Botanical Name	Common Name	Family	Parts Used	Ailment treated
1.	*Aconitum chasmanthom*	Patish, Atish	Ranunculaceae	Root	Used against **fever and diarrhea, antidote of** snake and scorpion bites.
2.	*Aconitum heterophyllum*	Mithi Patish	Ranunculaceae	Root	Used to treat fever, diarrhea, and respiratory issues. It›s also an anti-inflammatory, analgesic, and anthelmintic.
3.	*Acorus calamus*	Barian/Bach	Acoraceae	Rhizome	*Used to treat asthma, cancer, depression, diabetes, headache, stomach ulcers*, and insectide
4.	*Ainslaea aptera*	Sathjalori	Asteraceae		Traditionally used for stomach-ache relief and as a diuretic.
5.	*Angelica glauca*	Chora	Apiaceae	Whole plant	Used to treat rheumatism, fever, asthma, bronchitis, cancer, and reproductive problems
6.	*Artimisia nilagirica*	Siski	Asteraceae	Whole plant	Used against skin diseases, nervous disorders, epilepsy, and inflammation.
7.	*Asparagus adscendens*	Sufed Musli	Asparagaceae	Root	Act as tonic, aphrodisiac, and to supports overall health.
8.	*Berberis lycium*	Rasaunt (Kashmal)	Berberidaceae	Root	It has anti-cancer, anti-inflammatory, antidiabetic, antioxidant, antibacterial, analgesic and hepato-protective effects.
9.	*Bergenia ligulata*	Pathar Tor	Saxifragaceae	Whole plant	Used for *kidney stone relief, urinary tract health, and detoxification.*

10.	*Cannabis sativa*	Bhang	Cannabaceae	Leaves	It is commonly used as a recreational drug. Commonly use for multiple sclerosis and nerve pain. It is also used for nausea, vomiting and migraine.
11.	*Centella asiatica*	Brahmi	Apiaceae	Leaves	It has skin-healing, anti-aging, and cognitive-enhancing properties. It supports circulation, and reduces inflammation.
12.	*Dactylorhiza hatagirea*	Salam Panja	Orchidaceae	Roots	Used as an *aphrodisiac, expectorant,* antimicrobial *and nervine tonic*
13.	*Dioscorea detoidea*	Shingli Mingli	Dioscoreaceae	Tuber	Used for gastrointestinal and urogenital disorders, diarrhea, abdominal pain, wounds, intestinal worms, and anaemia.
14.	*Ephedra* spp.	Bhutshur	Ephedraceae	Root	*Use to treat colds, fever, headaches, congestion, coughing and diabetes.*
15.	*Gerardiana heterophylla*	Bichhubuti	Urticaceae	Leaves	**Used to treat Diabetes,** rheumatism, tuberculosis, headache, joint pain, **urinary tract Infections and enlarged prostate.**
16.	*Hedychium spicatum*	Jangali Haldi, Kapurkachri	Zingiberaceae	Rhizome	Act as anti-arthritic, appetizer, antiseptic, cardiac stimulant, carminative, cough and diarrhoea.
17.	*Heracleum candicans*	Patlain	Asteraceae	Root	Used to treat skin conditions, external tumours, ailments like backache, joint pain, and snakebites.
18.	*Hippophae rhamnoides*	Seabuck thorn	Elaeagnaceae	Seeds/ Leaves	Used for treat coughs, asthma, indigestion, and skin diseases. It also improves vision; reduce the effects of cancer and chemotherapy.
19.	*Leycestera formosa*	Piralu	Caprifoliaceae	Roots	Used to treat measles, jaundice, rheumatic pain, asthma and irregular menstruation
20.	*Mallotus phillipinensis*	Kemal	Euphorbiaceae	Root	Useful in treatment of digestive, respiratory, psychological, excretory, reproductive, and skin disorders
21.	*Morchella esculenta*	Guchhi	Morchellaceae	Fruiting body	Used for stomach problems, wound healing, and as a general body tonic
22.	*Myrica nagi*	Kaphal	Myricaceae	Fruit	Used to treat several ailments such as *asthma, chronic bronchitis, ulcers, inflammation, anemia, and diarrhea.*
23.	*Origanum vulgare*	Ban Tulsi	Lamiaceae	Whole plant	Act as carminative, diuretic, diaphoretic, tonic, bronchitis, Cough and bone fractures
24.	*Phytolacca acinosa*	Jharka, Jalga	Phytolaccaceae	Leaves and tender shoots	Used for treating eye disorders, joint pain, body aches, swelling, sores, and edema. It has also antiviral, anti-inflammatory, antifungal, and anti-tumor effects.

25.	*Picrorhiza kurrooa*	Karoo	Plantaginaceae	Roots	Used to treat various digestive, liver, and immune-related issues.
26.	*Pinus wallichiana*	Kailcons	Pinaceae	Cones/resin of stem	*Used in the treatment of* fever, cough cold, bone fracture, *kidney and bladder complaints.*
27.	*Pistacia integerrima*	Kakarsinghi	Anacardiaceae	Fruit	Used for rheumatic pain, analgesic, *diarrhoea* and antipyretic effects
28.	*Podophyllum emodii/hexandrum*	Bankakri	Berberidaceae	Rhizome	Used for treatment of cancers, warts, and condylomas.
29.	*Polygonatum verticilatum*	Salam Mishri	Asparagaceae	Leaves	*It increase the physical strength,* acts as aphrodisiac, rejuvenative, and nervine
30.	*Potentilla fulges*	Bajardanti	Rosaceae	Roots	Used to treat diabetes, gastric issues, and oral health.
31.	*Rheum emodi*	Rewandchini	Polygonaceae	Whole plant	Used as a laxative, tonic, and diuretic, anticancer, antioxidant, anti-inflammatory as well as for treating indigestion and menstrual disorders.
32.	*Rhododendron arboreum*	Cheo (Brass)	Ericaceae	Leaves	Treatment of *diarrhea, irritation, detoxification, bronchitis, fever and asthma.*
33.	*Rhododendron companulatum*	Saranger	Ericaceae	Flower	Flower juice used in *body aches and throat pain.*
34.	*Salvia moorcroftiana*	Thuth	Lamiaceae	Flower	Used to treat coughs, dysentery, colic, boils, and skin issues
35.	*Saussurea lappa*	Kuth	Asteracee	Roots	Use as anticancer, antiulcer, hepatoprotective, anti-viral, anticonvulsant and to treat respiratory disorders.
36.	*Swertia chirata*	Chiryata	Gentianaceae	Flower	Used to cure various ailments such as *fever, vomiting, digestive disorders, jaundice, heart diseases and diabetes.*
37.	*Taxus wallichiana*	Rakhal	Taxaceae	Leaves	Taxus is key source of paclitaxel (taxol), which is used in the treatment of various cancers. Also used it to treat common cold, cough, fever, pain, bronchitis, asthma, and epilepsy.
38.	*Thumus serphyllum*	Banajwain	Lamiaceae	Seeds, leaves	Used for the treatment of rheumatism, menstrual disorders, eczema gastrointestinal and respiratory pathologies.
39.	*Tinospora cordifolia*	Gloe	Menispermaceae	Leaves	*Used* for treatment of diabetes, high cholesterol, allergic rhinitis (hay fever), upset stomach, gout, jaundice and lymphoma.
40	*Valeriana hardwickii*	Nihani	Valerianaceae	Root stock	Useful as a diaphoretic, stimulant, cephalic tonic, antihelmenthic, sedative, diuretic and aphrodisiac.
41	*Valeriana wallichii*	Mushbala	Valerianaceae	Root stock	Used to treat cough, asthma, insomnia, epilepsy, hypertension, and psychosomatic disorders.

42	*Viola serpens*	Banafsha	Violaceae	Flower	It acts as antipyretic demulcent, diaphoretic (sweat-inducing), antiseptic, cooling agent, emetic, emollient, expectorant, purgative and diuretic.

Other Ethnobotanical Uses:

The ethnobotanical knowledge is not merely a component of traditional healthcare for the people of the region, but a holistic system supporting overall survival, cultural system, and economic resilience.

Table 2: Other Ethnobotanical uses of Flora in Rampur forest division:

S.No.	Botanical Name	Local Name	Family	Non medicinal uses
1.	*Acacia catechu*	Khair	Fabaceae	Katha extracted from heartwood.
2.	Acer caesium	Maple	Sapindaceae	Used for gun butts and furniture
3.	*Aesculus indica*	Khanor	Sapindaceae	Wood for household purposes, fruit used to feed for cattle
4.	Ailanthus excelsa		Simaroubaceae	It is fast-growing species used as fuel
5.	*Albizzia lebbek*	Siris	Fabaceae	Wood used for furniture, leaves used for fodder
6.	Alnus nitida	Kunish (Alder)	Betulaceae	Used for slope stabilization in hills, leaves for fodder, buds eaten as vegetable
7.	*Arundinaria falcata*	Nirgal, Ringal	Poaceae	Used for basket making.
8.	*Asplenium polypodioides*	Lingar	Aspleniaceae	Used as vegetable in young stage
9.	*Bauhinia vahlli*	Majaup, taur	Fabaceae	Leaves for making umbrella plate and used as fodder
10.	Betula utilis	Bhojpatra	Betulaceae	Bark of stem and branches used for wrapping, and roofing.
11.	*Bombax ceiba*	Semul	Malvaceae	Wood used to make matchsticks, leaves for fodder
12.	*Cedrela toona*	Darle	Meliaceae	Wood used for furniture, leaves for fodder
13.	*Celtis australis*	Khirak	Cannabaceae	Wood used to make toys and churn sticks and leaves for fodder.
14.	Cornus capitata	Khagsa	Cornaceae	Leaves as fodder, fruits are eaten.
15.	*Cornus macrophylla*	BhutiaBadam	Cornaceae	Fruits are eaten.
16.	*Cupressus torlusa*	Saru (Himalayan Cypress)	Cupressaceae	Wood used as timber and needles for incense
17.	*Dalbergia sissoo*	Shisham	Fabaceae	Used for timber and furniture.
18.	Debrigevsia hypoleuca	Siaru	Urticaceae	Leaves used as fodder
19.	*Fraxinus floribunda*	Ash	Oleaceae	Used to make agriculture implements.
20.	*Grewia optiva*	Beul	Malvaceae	Inner bark yields fiber used in rope making, leaves used as fodder
21.	*Jacaranda mimosae*	Gulmohar	Bignoniaceae	Ornamental tree
22.	Melia azaderach	Darek, Bakain	Meliaceae	Leaves for fodder
23.	*Murraya koenigii*	Gandhela	Rutaceae	Leaves are used as kari patta
24.	*Picea smithiana*	Rai (spruce)	Pinaceae	Wood used to make air-craft frames and packing cases

25.	*Pinus roxburghii*	Chil (Chirpine)	Pinaceae	Produces timber wood, also yields resin
26.	Populous ciliata	Pahari Pipal (poplar)	Salicaceae	wood for packing cases, Leaves for fodder
27.	*Prunus armeniaca*	Chuli (Wild apricot)	Rosaceae	Fruit is edible and produces firewood
28.	Prunus cornuta	Paja	Rosaceae	Fruit are eaten by birds.
29.	Prunus cornuta	Paja	Rosaceae	Fruit are eaten by birds.
30.	Pyrus pashia	Kainth	Rosaceae	Fruits are edible
31.	*Quercus dilatata*	Mohru	Fagaceae	Wood is used to make agricultural Implements/Fuelwood
32.	*Quercus leucotrichophora*	Ban	Fagaceae	Leaves for fodder
33.	*Quercus semicarpifolia*	Kharsu	Fagaceae	Leaves for fodder
34.	Robinea pseudoacacia	Robinia	Fabaceae	leaves for fodder; wood as fuel
35.	*Rosa paniculattus*	Kala anchu, akhi	Rosaceae	Fruits are edible
36.	*Salix alegans*	Binus	Salicaceae	Leaves for fodder, twigs for basket making
37.	*Sarcococca saligna*	Tiliari	Buxaceae	Leaves eaten by goat and musk deer
38.	*Terminalia belerica*	Behra	Combretaceae	Medicinal fruits, fuelwood as timber.
39.	*Ulmus wallichiana*	Impol, Marn	Ulmaceae	Leaves as fodder
40.	*Zizyphus mauritiana*	Ber	Rhamnaceae	Fruits are edible, leaves for fodder

In the present study, 42 plant species ethnomedicinal plants belonging to 32 families were documented, with the highest representation from the Asteraceae family (4 families) (Table-1). 40 plant species of other ethnobotanical uses belonging to 23 families were noted, with the highest numbers belonging to Rosaceae and Fabaceae (5 families each) (Table-2). All the 82 plants are arranged in alphabetical manner with botanical names, local names, family and their ethno botanical uses are documented in two tables.

Conclusion:

The Rampur forest division of Shimla district in Himachal Pradesh represents a rich repository of ethnobotanical wealth, characterized by much diversity of flora and profound indigenous knowledge systems. This study has highlighted the multiple uses of the local flora for their medicinal applications, food security, fodder provision, fuel, timber, crafts, and various other aspects of daily subsistence and cultural life. This ethnobotanical knowledge is not only a cultural heritage but a vital survival mechanism for the local communities.

However, ecological pressures such as habitat degradation, urbanization, over-exploitation, biological invasion, and climate change create severe threat to this natural and cultural heritage. Simultaneously, due to modernization, changing lifestyles and the lack of intergenerational transfer of wisdom, the traditional knowledge associated with these plants is undergoing rapid erosion. This decline would be irreversible loss if not urgently addressed.

There is urgent need of rigorous scientific documentation, community engagement, sustainable resource management and culturally sensitive conservation strategies. By prioritizing these actions, the region can safeguard both its unique floristic diversity and the irreplaceable indigenous knowledge that has been ensured continued well-being of the people of the region.

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