Ethnomedicinal uses of wild edible Angiosperms in Thachi Valley, Western Himalayas

Monika Thakur, Arti Sharma, Ruchika Devi, Nitesh Kumar

Correspondence

Monika Thakur[1], Arti Sharma[1,2*], Ruchika Devi[3], Nitesh Kumar[3]

[1]Department of Bio Sciences, Career Point University, Hamirpur 176041, Himachal Pradesh, India
[2]Faculty of Agriculture, Abhilashi University, Mandi 175045, Himachal Pradesh, India
[3]Deapartment of Biosciences, Himachal Pradesh University, Shimla 171005, Himachal Pradesh, India

*Corresponding Author: artijamwalsharma2016@gmail.com

Ethnobotany Research and Applications 32:17 (2025) - http://dx.doi.org/10.32859/era.32.17.1-21
Manuscript received: 15/06/2025 – Revised manuscript received: 06/11/2025 - Published: 09/11/2025

Research

Abstract

Background: Since the dawn of history, humans have depended on wild edible plants as a vital source of food and nutrition. In the present time, these plants have been neglected by the people, but rural people still rely on wild edible plants not only as food but also for their therapeutic properties.

Methods: Fieldwork was carried out with local informants and data was collected through focus group discussions, questionnaires, and interviews. Informant Consensus Factor (ICF) and Use Value (UV) were calculated to assess the cultural significance, medicinal relevance, and overall importance of wild edible plants in the daily lives of the local communities.

Results: It was found that 51 species of medicinal plants from 28 families were utilized to cure 52 ill-nesses in 10 different disease categories. The most widely utilized plant part was leaves, while the most prevalent life form was herbs (72%). The Informant Consensus Factor (ICF) values were recorded for skin disorders (0.73), respiratory disorders (0.79), sexual disorders (0.97), metabolic disorders (0.93), digestive disorders (0.75), ophthalmic disorders (0.97), infectious disorders (0.84), muscular and joint disorders (0.94), cardiovascular disorders (0.98) and nutritional deficiency disorders (0.97). With the greatest usage value (0.95), *Urtica dioica* demonstrated its nutritional as well as medicinal significance.

Conclusions: The study reveals that rural communities possess rich traditional knowledge and rely heavily on wild plants for food, medicine, and cultural practices. However, this heritage is under threat due to lifestyle changes and declining transmission of knowledge to younger generations.

Keywords: Biodiversity, Informant consensus factor, Traditional knowledge, Use value

Background

Western Himalayas boast an abundance of wild edible plants known for their therapeutic properties and immune-boosting potential. Prominent examples include *Emblica officinalis* Gaertn., *Berberis asiatica* Roxb. DC., *Viola odorata* L., *Bergenia ciliata* (Haw.) Sternb., *Ficus carica* L., *Plantago lanceolata* L., *Thymus serpyllum* L. etc. (Raghuvanshi *et al.* 2021). Many of these plants have been utilized in Ayurveda since ancient times, contributing to renowned formulations such as Triphala and

Chyawanprash (Varma *et al.* 2022). Besides their medicinal value, these plants contribute to the socio-economic welfare of local communities by providing medicine and other essential resources (Wagh *et al.* 2013). Himachal Pradesh, located in the Western Himalayas, features varied topography with elevations ranging from 350 to 7,000 meters above sea level. Due to economic challenges, many communities in this region depend heavily on local biodiversity to meet their daily needs, including food, medicine, fuel, and fodder (Khan *et al.* 2024). The rich traditional knowledge of the locals reflects centuries of interaction with wild edible plants, which they use not only in their daily diet but also in cultural and medicinal practices (Mandal *et al.* 2023). In recent years, there has been a growing global interest in wild edible plants due to their notable health-promoting properties. These plants are rich sources of antioxidants, essential vitamins, and diverse bioactive compounds that exhibit immune-enhancing, anti-inflammatory, antibacterial, anti-diabetic, and anti-aging activities (Sen *et al.* 2021). Traditional knowledge related to these plants also highlights their role in addressing food security, particularly during times of crisis. (Kumari *et al.* 2025). For instance, during the COVID-19 pandemic, people once again turned to wild plant resources for sustenance and health needs. However, despite this temporary resurgence, the overall use of wild foraged plants has been declining in recent decades due to changing lifestyles, market dependency, and reduced traditional knowledge transmission (Pieroni *et al*. 2020). So, despite the availability of the well-documented nutritional and medicinal benefits of wild foraged plants, these plants are not commonly used (Luczaj *et al*. 2012). Consequently, this shift has contributed to the gradual erosion of traditional ethnobotanical knowledge associated with these valuable plant species. Therefore, documenting and preserving this knowledge is essential to promote sustainable use and conservation of these natural resources (Thakur *et al.* 2024). Many studies have been done on the various locations of Western Himalayas but Thachi Valley also known as valley of God, located in the Mandi district of Himachal Pradesh is still not much explored for its traditional knowledge about the wild edible angiosperms. Local communities are primarily rural and agrarian, depending on subsistence agriculture, livestock rearing, and seasonal foraging of wild plant resources to supplement their diet and healthcare needs. The dominant ethnic groups in the study area include the Pahari people belonging to different castes who possess a rich repository of traditional ecological knowledge. This study aims to fill that gap by exploring the ethnomedicinal uses of wild edible angiosperms in the valley. Documenting this knowledge will not only aid in the conservation of valuable plant resources but also contribute to the promotion of sustainable development and food security in the region. Furthermore, this investigation aligns with broader efforts in ethnobotanical and ecological research, focusing on the role of biodiversity in improving health and livelihoods.

Materials and Methods

Study area

The current ethnomedical study was carried out in the Thachi Valley, a secluded and ecologically diverse area in the Himachal Pradesh district of Mandi, in the North Western Himalayas of India (Figure1). The Thachi Valley is situated between latitudes 31°29'N and 31°39'N and longitudes 77°08'E and 77°20'E. Its elevation ranges from roughly 1,500 to 3,100 meters above sea level (Kumar & Verma, 2019). The valley is a component of the Great Himalayan range and is located in the Inner Seraj region of Seraj. The climate of Thachi is temperate to sub-alpine, with moderate to heavy rainfall during the monsoon season and a lot of snowfall in the winter. There is a noticeable seasonal variation in the region, which affects the local communities' way of life as well as the vegetation. Numerous tiny streams and tributaries of the Beas River drain the area, adding to its abundant biodiversity. In terms of ecology, the Thachi Valley is home to a variety of wild edible angiosperms due to its dense forest cover, which includes mixed coniferous and broad-leaved forests. *Rhododendron arboreum* Sm., *Quercus leucotrichophora* A. Camus ex Bahadur., *Pinus wallichiana* A.B. Jacks., and *Cedrus deodara* Roxb.ex Lamb. are common forest species. The region belongs to the temperate forest zone of the Western Himalayas, which is renowned for its varied ethnobotanical resources and high plant endemism (Khan *et al.* 2024).Thachi is a perfect location for ethnobotanical research because of the valley's relative inaccessibility, which has contributed to the preservation of this traditional ecological knowledge.

Ethnobotanical Data Collection:

Comprehensive field excursions to the study area (Thachi Panchayat of Thachi valley) were conducted for two years so that plants could be collected in winter, spring, summer and rainy seasons (March 2023-March 2025). A total of 173 respondents (35 -70 years old) were selected to gather traditional knowledge about the wild edible angiospermic plants of the region. Out of 173 informants 21 were traditional healers, 40 were cattle herders, 50 were farmers, 40 were household women and 22 left were laymen. After conducting initial interviews, they were further asked to recommend other knowledgeable persons in their community or neighboring villages, ensuring that individuals with specialized or less visible knowledge were not missed. Thachi valley is socio-culturally diverse, yet the settlement pattern is strongly caste-based, with most villages being relatively homogeneous in their social composition. Typically, a particular village is inhabited predominantly by a single caste group, which creates a distinctive cultural landscape across the valley. The main caste groups found in Thachi Valley are Brahmins, Raj-puts, and Scheduled Castes. People were included from different age groups, genders and occupations to

ensure a broader and more representative understanding of plant uses. Individuals such as elders, midwives and farmers who were wilful to share their information and were comfortable with the interview and data collection process were preferred (Table 1). Distribution of informants across age groups (Figure 2) revealed that the most of them (72 individuals) belonged to the 55–70-year category. This group also reported the maximum number of ethnomedicinal uses (22 plant species) followed by 45-55 age group (16 plant species) and 35-45 age group (12 plant species), highlighting the crucial role of elderly individuals as the primary custodians of traditional knowledge.

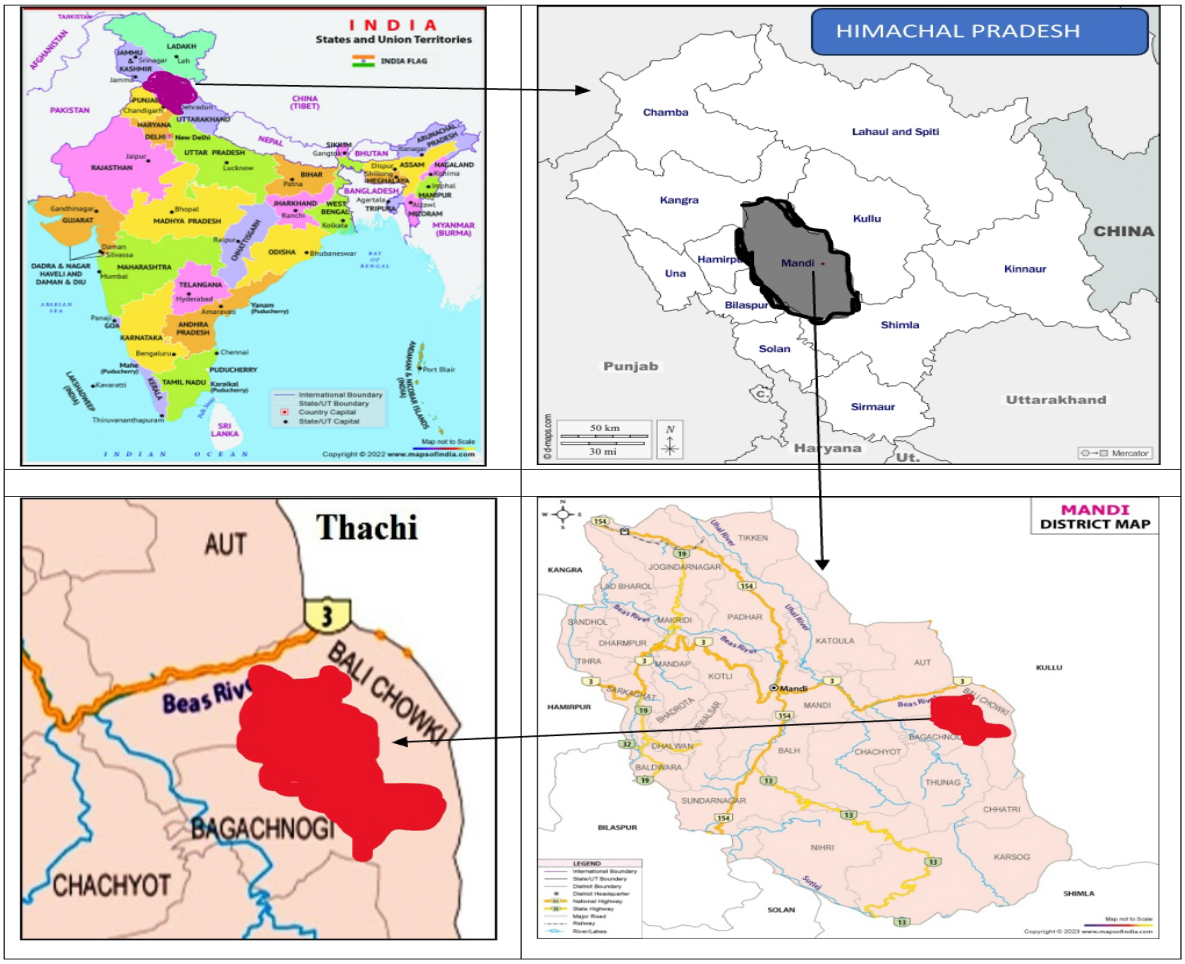

Figure 1. Location map of the study area (Thachi valley in Mandi district of Himachal Pradesh, India) Source: https://www.mapsofindia.com/

Plant samples were taken during field excursions. To document knowledge on local wild edible angiospermic plants, informal interviews were conducted with 65 residents. Additionally, information on the traditional uses of wild edible plants was obtained through structured questionnaires administered to 173 selected respondents, thereby recording their ethnobotanical knowledge. Major sections covered in the questionnaire were part of the wild edible plant used by the local people, habitat or time of collection, method of collection, storage of part used, indigenous or medicinal use of wild edible plant and method of crude drug formation from part used. Detailed ethnobotanical knowledge of the region was documented during the collection with the assistance of informed local participants. To get deeper insight into people's perceptions and beliefs about local wild edible plants and to collect diverse views in a relatively short period, six focus group discussions were carried out with a total of 60 participants as each group was constituted with 10 members. For carrying out focus group discussions, elderly people were involved as they have more knowledge about the ethnomedicinal importance of wild edible plants. Ethical considerations are essential in ethnobotanical research, so a written consent was taken from the Gram Pradhan of the local area for field visits, collection and photography of wild edible angiospermic plants in their local habitat (Figure-3). Plant samples were also taken for herbarium processing. The assistance of residents was sought for the gathering of plant samples (Jain & Rao, 1976). The botanical descriptions and identification of the plants were done at HFRI, Shimla, Himachal Pradesh and further confirmed by the Flora of Himachal Pradesh (Chaudhary & Wadhwa, 1984). The gathered plant specimens were placed in the Career Point University, Hamirpur, Botany Department's herbarium.

Table 1. Socio-demographic profile of informants.

Demographic features			
		Number	**Proportion (%)**
Gender	Female	82	47.39
	Male	91	52.60
Age	35-45	32	18.49
	45-55	69	39.88
	55-70	72	41.61
Vocation	Farmer	53	30.63
	Tribal	61	35.26
	Civil employee	59	34.10
Education	Illiterate	49	28.32
	Matric	58	33.52
	Graduation	43	24.85
	Post Graduation	23	13.29

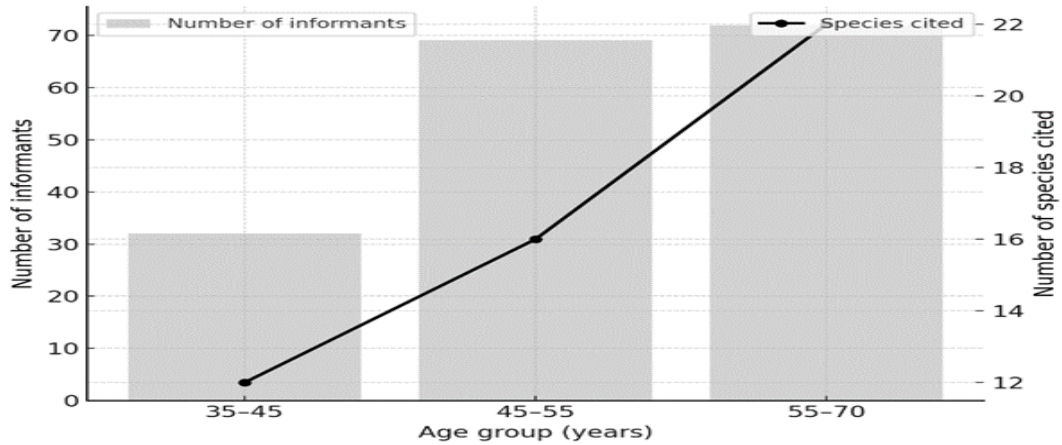

Figure 2:- Distribution of knowledge holders across age groups and number of plant species cited by each group

Data Analysis:

Extensive data analysis was conducted, utilizing various ethnobotanical tools such as informant consensus factor and use value.

1. Informant consensus factor (ICF)

It is characterized by the extent of diversity in the number of therapeutic plants employed by physicians to cure a particular ailment type (Ghorbani, 2005). It is calculated by:

$$ICF = Nur-Nt/Nur-1$$

Where Nur represents the number of references used for every ailment group and Nt signifies the number of herbs used as listed in Table 2 (Zhou *et al.* 2023). The ICF value falls within the range of 0 to 1, with higher values signifying a stronger accord among respondents regarding the use of specific floras (Ghorbani, 2005; Trotter & Logan, 2019; Umair *et al.*2017). The diseases and health problems documented during the study were categorized into illness groups following the framework of Cook (1995).

2. Use value (UV)

It serves as a useful instrument in evaluating the importance of local floras. It indicates the frequency of usage of particular floras among respondents, where Ui signifies the number of utilization recorded by every respondent, and Ut represents the total number of respondents (Bhat *et al.* 2012). It is measured by (Yaseen *et al.* 2015):

$$UV = Ui/Ut$$

The use value spans from 0 to 1 value, where elevated UV values signify increased significance of herbs, while less values suggest diminished significance (Agize *et al.* 2022; Mahmood *et al.* 2013; Sujarwo & Caneva, 2016).

Table 2. Information Consensus Factor: showing the insights of informants on various diseases

Illness group	Diseases	Number of References (Nur)	Number of species (Nt)	Informant Consensus Factor (ICF)
Skin disorder	Skin infection, Boils, Wound healing, Swelling, Edema, Eczema, Wart, Sores, Blisters, Cut, Rashes, Sunburn and freckles, Ringworms, Scabies, Psoriasis, Fungal and bacterial infection	110	30	0.73
Respiratory disorder	Cough, Cold, Asthma, Sore throat, Bronchitis, Respiratory diseases	99	21	0.79
Sexual disorder	Menstrual disorder, Vaginal discharge	87	3	0.97
Metabolic disorder	Diabetes, Blood purifier	94	7	0.93
Digestive disorder	Intestinal worms, Diarrhea, Indigestion and constipation, Stomach problems/Pain, Gastrointestinal problems, dysentery, Bacterial dysentery	105	26	0.75
Ophthalmic disorder	Eye conjunctivitis	79	3	0.97
Infectious diseases	Jaundice, Headache, Vomiting	108	18	0.84
Muscular and joint disorders	Arthritis, Rheumatism, Painful joints, Hepatic Pain	102	7	0.94
Cardiovascular disorder	Heart disease	69	2	0.98
Nutritional deficiency disorder	Gum bleeding, Scurvy, Hair loss	97	3	0.97

Results

In the present ethnobotanical investigation 51 plant species belonging to 28 families were documented to possess ethnomedicinal benefits. Botanical name, local name, family, habit, use value, and ethnomedicinal applications of each documented species are presented in Table 3. Rosaceae is the most dominant family represented by eight species followed by Asteraceae with five species. Polygonaceae is represented by three species while Ranunculaceae, Berberidaceae, Chenopodiaceae, Acanthaceae, Zingiberaceae, Fabaceae, Lamiaceae, Oxalidaceae, Plantaginaceae and Urticaceae are represented by two species. The remaining families are represented by a single species each, as illustrated in Figure 4.

Figure 3. Field photographs of some wild ethnomedicinal angiosperms in their natural habitat within the study area: a. *Gallium aparine* L. b. *Urtica urens* L. c. *Viola canescens* Wall.ex Roxb d. *Primula denticulata* Sm. e. *Fagopyrum esculentum* Moench. f. *Chenopodium giganteum* D. Don g. *Cotoneaster microphyllus* Wall. ex Lindl. h. *Aesculus indica* (Wall. ex Cambess.) Hook. I. *Amaranthus viridis* L. J. *Hedychium spicatum* Sm. k. *Prunella vulgaris* L. l. *Oxalis latifolia* Kunth

Table 3. Botanical name, vernacular name, family, habit, part used, methods of preparation, ethnomedicinal importance, use citation and use value of the documented wild edible angiosperms.

Botanical Name	Vernacular Name	Voucher no:	Family	Habit	Part(s) used	Mode of utilization	Method of Preparation and Administration	Use Citation (Ui)	Use Value (UV)
Aesculus indica (Wall. ex Cambess.) Hook.	Khanoor	CPUH 12201	Sapindaceae	Tree	Root, Seed, Leaves, Fruits,	Juice, oil, Decoction, Powder	5-10 ml of juice extract from the root used to drink daily to treat leucorrhea. Oil is made from the seed is massaged daily in the affected area of the skin. A decoction made from the leaves is used to drink daily 2 times a day until the cough cures. Dry fruit powder mixed with lukewarm water is used to drink daily to treat intestinal worms.	71	0.41
Amaranthus viridis L.	Salyara	CPUH 12202	Amaranthaceae	Herb	Leaves, Whole plant material, Seed	Decoction, Extract, Juice, Powder	A decoction made from the leaves is used in the treatment of leucorrhea. Extract from the whole plant material is used in lowering labour pain. Juice from the leaves and dried powder from the seeds are applied topically to treat fungal and bacterial infections.	95	0.54
Anaphalis triplinervis (Sims) C.B.Clarke	-	CPUH 12203	Asteraceae	Herb	Whole plant, Leaves	Decoction, Paste, Powder,	5-10 ml of decoction from the whole plant material is used for boils, colds, and coughs. On wounds, leaf paste is used to speed up the healing and 2-3 g of powder from whole plant material is mixed with lukewarm water and consumed two times a day for fever, acidity treatment and menstrual disorders.	80	0.46
Anemone obtusiloba D.Don	Sochla	CPUH 12204	Ranunculaceae	Herb	Root, Seed	Powder, Juice, Oil	Dried root powder is mixed with raw milk and is administered orally with an empty stomach in the treatment of	98	0.56

							skin blemishes. The juice of the root is ophthalmic. Oil extracted from the seed is used in the treatment of rheumatism.		
Berberis asiatica Roxb. ex DC.	Kashmal/Simli	CPUH 12205	Berberidaceae	Shrub	Root	Extract	2-3 ml of extract made from the root is used as an eye drop in the treatment of eye swelling and redness. 10-15ml decoction of the root is used to drink daily twice a day to cure piles and gastric disorders.	79	0.45
Bergenia ciliata (Haw.) Sternb.	Pashanbhed/Saubli	CPUH 12206	Saxifragaceae	Herb	Rhizome, Leaves	Paste, Powder	Paste made from the rhizome is applied to the skin for three to four days to treat burns and wounds. This paste is mixed with honey and consumed to treat diarrhoea, cold, cough, and fever. Dried leaf powder is inhaled during heavy sneezing. Consuming rhizome twice for 4-5 days helps in paralyzing the intestinal worms.	66	0.38
Berberis jaeschkeana C.K.Schneid.	-	CPUH 12207	Berberidaceae	Shrub	Rhizome	Juice	Juice from the rhizome is used to treat enteric infections especially bacterial dysentery.	101	0.58
Cannabis sativa L.	Bhang	CPUH 12208	Cannabinaceae	Shrub	Root, Whole plant material	Decoction, Paste, Juice	A decoction made from the root is used to drink daily to treat joint pain. Paste made from the root is mixed with butter is applied on the skin to treat skin burns. The juice prepared from the whole young plant when consumed twice daily, is traditionally used to treat asthma, diabetes, and skin scars.	81	0.46
Capsella bursa-pastoris (L.) Medik.	Batua/Sopdu	CPUH 12209	Brassicaceae	Herb	Whole plant material	Extract	An extract prepared from the whole plant is applied as a massage on a daily basis to alleviate swelling	73	0.42

							associated with nephritis. Tea prepared from the dried herb is used as a remedy against haemorrhages of the stomach, uterus, and more especially the kidneys.		
Chenopodium album L.	Bathua	CPUH 12210	Chenopodiacea e	Herb	Leaves, Aerial part	Powder, Juice, Decoction	Powder derived from the dried leaves is dusted topically to treat irritation on the skin. 3-4 ml of juice made from leaves is applied to the skin daily to treat burns. A decoction of aerial parts (5-10 ml) mixed with alcohol is rubbed on the body affected by arthritis and rheumatism for 3-4 weeks.	105	0.60
Chenopodium giganteum D. Don	Bathu	CPUH 12211	Chenopodiacea e	Herb	Leaves	Juice	Juice from the leaves is used to drink daily for 3-4 days to cure indigestion and constipation.	69	0.39
Cotoneaster microphyllus Wall. ex Lindl.	Sopdu	CPUH 12212	Rosaceae	Shrub	Fruit	Paste	Raw fruits are eaten for irregular menstruation and in diseases of bile malfunction. Fruits are used to make a paste and mixed with mustard oil and applied to the skin to treat inflammation.	109	0.63
Dicliptera bupleuroides Nees	Siuga	CPUH 12213	Acanthaceae	Herb	Leaves	Paste, Extract	The paste made from the fresh leaves is applied three times a day in the treatment of skin diseases like eczema. Extract of the leaves is used as ear drops.	55	0.31
Daphne oleoides Schreb.	-	CPUH 12214	Thymelaeaceae	Shrub	Leaves, Aerial Part, Roots	Paste	Paste made from the leaves is used in the treatment of skin damage and ulcers. The aerial parts prepared as a poultice is used against rheumatism, lumbago to reduce fever and for wound healing. Roots are mashed and used to treat malaria.	63	0.36

Fagopyrum esculentum Moench.	Fafra	CPUH 12215	Polygonaceae	Herb	Leaves, Whole plant material	Decoction, Extract	Decoction prepared from the leaves is drunk twice a day to treat ulcers and haemostasis. Leaf extract is applied to wounds to promote rapid healing. Whole plant is used traditionally to treat hypertension, diabetes, and gum bleeding.	77	0.44
Ficus carica L.	Khasra/Fagu	CPUH 12216	Moraceae	Tree	Fruit, Leaves	Paste	2-3 fruits are used daily to treat constipation. To heal a wart, two to three drops of sap are applied. A paste of its leaves and bark are applied to wounds, boils, and inflammations. Dry fruit is thought to aid in the removal of intestinal worms when consumed in the morning on an empty stomach.	93	0.53
Fragaria vesca L.	Nunu	CPUH 12217	Rosaceae	Herb	Root, Berries	Decoction, Paste,	Root decoction is used to treat diarrhoea. Paste made from the stalk is used to treat wound healing. The berries are used to be eaten for liver and kidney complaints.	110	0.63
Galium aparine L.	Kashusha	CPUH 12218	Rubiaceae	Herb	Whole plant material, Aerial part, Leaves	Infusion, Paste, Decoction	An infusion made from the whole plant is used to treat insomnia and has a calming effect. Paste made from the aerial parts is applied as a poultice to sores and blisters. Decoction made from the fresh leaves is applied to the face with a soft cloth or sponges to treat sunburn and freckles.	99	0.57
Galinsoga parviflora Cav.	Tagdu	CPUH 12219	Asteraceae	Herb	Flower, Leaves, Whole plant	Decoction, Paste, Infusion	The plant is rich in vitamin C and helps in the prevention of scurvy. Flower decoction helps in the enhancement of children's memory. Paste made from the leaves is used to speed up the healing of wounds. Infusion from	89	0.51

							the whole plant helps to treat yellow fever, hepatic pain, and painful joints.		
Hedychium spicatum Sm.	Balachra	CPUH 12220	Zingiberaceae	Herb	Rhizome	Paste, Powder, Decoction	Paste made from the rhizome is used as a poultice to treat acne and pain. Rhizome powder mixed with warm water when taken twice a day helps to cure stomach pain, fever, vomiting, diarrhoea, and inflammation. Decoction made from the rhizome is helpful in indigestion.	108	0.62
Indigofera cassioides Rottler ex DC.	Kathi	CPUH 12221	Fabaceae	Shrub	Root, Flowers, Leaves	Decoction, Juice, Extract	Tribal women prepare a decoction from the root as a tonic which is consumed after delivery. Flower juice is used to treat diabetes. 4-6 ml of extract from leaves is used to drink daily until the cough is cured. Leaf juice helps in the management of liver issues and inflammation.	61	0.35
Micromeria biflora (Buch.-Ham. ex D.Don) Benth.	-	CPUH 12222	Lamiaceae	Herb	Leaves and stem	Powder, Infusion	3-5 grams of powder made from the stem is mixed with lukewarm water and used to treat stomach disorders and a variety of ailments. Infusion from leaves is used to cure coughs and colds.	59	0.34
Oxalis corniculata L.	Malori	CPUH 12223	Oxalidaceae	Herb	Leaves, Stem, Whole plant material	Paste, Juice	The leaf paste is put on the head to cure headaches. Crushed leaves are used to stop bleeding from cuts. 1-2 spoons of juice made from the whole plant is used to drink daily to treat digestive problems and scurvy. Leaf and stem pastes are applied to the skin to treat warts and swelling.	62	0.36
Oxalis latifolia Kunth	Trikhada	CPUH 12224	Oxalidaceae	Herb	Leaves, Whole plant material	Tea, Juice, Paste	Tea made from the leaves helps to reduce the discomfort from fevers. Juice made from the leaves is used to	112	0.64

							drink on an empty stomach to provide some relief from urinary tract infections. Paste made from the whole plant is used as a poultice to treat cuts, rashes and skin infections.		
Oenothera rosea L'Hér. ex Aiton	-	CPUH 12225	Onagraceae	Herb	Leaves, Flower	Paste	Paste from the leaves and flowers has been used topically to heal wounds and skin irritations.	78	0.45
Plantago lanceolata L.	Safed Isbagol	CPUH 12226	Plantaginaceae	Herb	Leaves, Seed	Powder, Decoction	Dried leaves ground into a powder, dusted over the inflamed wounds, help in the treatment of damaged tissue. Decoction prepared from the seeds is used to drink daily to kill the parasitic worms. Crushed leaves mixed with raw salt can be consumed for 3-4 weeks to treat arthritis.	41	0.23
Plantago major L.	Chasha	CPUH 12227	Plantaginaceae	Herb	Whole plant, Leaves	Paste, Infusion	Paste made from the whole plant is used as a poultice to treat infectious wounds and decoction from the entire plant is a good remedy for diabetes. An infusion made from the fresh leaves is used to treat kidney pain.	111	0.64
Primula denticulata Sm.	Gungo	CPUH 12228	Primulaceae	Herb	Whole plant material, Leaves, Root	Decoction, poultices	Decoctions made from the whole plant are consumed for 2-3 weeks to relieve asthma. 5-7 ml of the extract from roots and leaves are ingested for 4 to 5 days to relieve cough and cold symptoms. Crushed leaves are used to make poultices that are applied to joints or muscles to relieve swelling.	107	0.61
Prunus armeniaca L.	Chuli	CPUH 12229	Rosaceae	Tree	Fruits, Kernal	Paste, Oil	Paste made from finally grounded kernels when applied on the affected area and left overnight it soothe and heal rashes. Oil extracted from	117	0.67

							kernels is traditionally massaged onto joints to relieve pain from arthritis and reduce stiffness. Take 2-3 dry fruits before the meal to help stimulate digestion.		
Prunella vulgaris L.	Kalza	CPUH 12230	Lamiaceae	Herb	Leaves, Flower	Tea, Juice	Tea made from the leaves is used to treat migraine or fever. Juice from the leaf and flower is used to treat sore throats, intestinal infections, and diarrhoea.	64	0.36
Pyrus pashia Buch.-Ham. ex D.Don	Kainth	CPUH 12231	Rosaceae	Tree	Fruits, Flowers, Leaves, Bark, Root	Juice, Extract	Juice from the flowers mixed with honey is consumed daily for one week to treat constipation. Leaf extract is traditionally used as a hair tonic to prevent hair loss and strengthen hair roots. The bark and roots are used to prepare herbal remedies for treating sore throat and reducing fever.	51	0.29
Potentilla atrosanguinea G.Lodd.	Dora	CPUH 12232	Rosaceae	Herb	Leaves, Stem, Whole Plant	Juice, Decoction	Juice from the leaves and stems is used to treat the inflammation of the body and joints. Decoction from the whole plant is used as a mouth wash to treat infected gums.	136	0.78
Phytolacca acinosa Roxb.	Jhrka	CPUH 12233	Phytolaccaceae	Herb	Root	Decoction, Paste	Decoction made from the root is used internally for urinary disorders and abdominal pain. Paste made from the roots is used to treat boils, carbuncles, and sores.	108	0.62
Prinsepia utilis Royle	Bhekal	CPUH 12234	Rosaceae	Shrub	Seed	Paste	The paste made from the seed cake is used to treat eczema, ringworm, and other skin diseases.	72	0.41
Rhododendron arboreum Sm.	Murah, Buransh	CPUH 12235	Ericaceae	Tree	Flowers	Juice, Squash	4-5 flower petals roasted in ghee are used to treat dysentery. Juice made from flowers is used to drink daily to treat diabetes and heart disease.	142	0.83

							Squash made from the flowers is used to eat daily and helps in getting relief from mental retardation.		
Rubus ellipticus Sm.	Aakhe	CPUH 12236	Rosaceae	Shrub	Fruits, Roots, Bark	Juice, Paste, Decoction	Juice made from the roots is used to drink twice daily for the treatment of fever and gastrointestinal problems. Root paste is applied to wounds to speed up healing. Eating 5-10 fruits daily helps improve digestion due to its high fibre content. A decoction made from the inner bark helps in controlling the vaginal discharge.	88	0.50
Rumex hastatus D. Don	Khati-Meethi	CPUH 12237	Polygonaceae	Herb	Leaves, Whole Plant Material	Juice	The juice extracted from the leaves is applied to the scabies-affected area for two to three hours every day before taking a bath to cure the condition. The whole plant material is used to treat various skin problems.	92	0.53
Rosa braunii R.Keller	Kuji	CPUH 12238	Rosaceae	Shrub	Bark, Leaf, Flowers	Infusion, Paste, Decoction, Extract	An infusion made from the bark is used as a blood purifier. Leaf paste is used externally to speed up the healing of wounds. Decoction of flowers is used to cure constipation and diarrhoea. Flower extract is used for the treatment of eye and skin diseases.	97	0.56
Ranunculus laetus Wall. ex Hook.f. & Thomson	Chohla	CPUH 12239	Ranunculaceae	Herb	Leaves, Flower	Decoction, Juice	Decoction prepared from the leaves is used to treat abdominal inflation. Flower juice is used as eye drop for the treatment many diseases of the eye including conjunctivitis.	106	0.61
Roscoea alpina Royle	Titlu	CPUH 12240	Zingiberaceae	Herb	Rhizome	Powder	Powder made from the rhizome is mixed with other herbs and with	74	0.42

							proper doses of honey is used to treat coughs and cardiac diseases. Rhizome powder mixed with orange rind powder is used in the treatment of bronchitis and asthma.		
Rumex nepalensis Spreng	Malori	CPUH 12241	Polygonaceae	Herb	Leaves	Juice, Paste	Juice prepared from the leaves helps in soothing the irritation caused by *Urtica dioca*. Leaf paste is applied topically to relieve headaches and also used for its astringent qualities.	114	0.65
Solena amplexicaulis (Lam.) Gandhi	Gal Kakdu, Jangli Kheera	CPUH 12242	Cucurbitaceae	Climber	Root, Leaves, Whole plant material	Extract, Decoction, Juice	Root extract helps to treat anorexia and digestive issues. A decoction made from the roots and leaves helps in treating asthma. The crushed leaf is applied as a bandage to treat inflammation on the skin. Juice prepared from whole plant is traditionally used to cure jaundice.	94	0.54
Sonchus brachyotus DC.	Dudhlu	CPUH 12243	Asteraceae	Herb	Whole plant material	Decoction	Decoction made from the whole plant is used to cure skin inflammation, stomach problems and ulcers.	82	0.47
S*onchus oleraceus* L.	Puyanu	CPUH 12244	Asteraceae	Herb	Aerial part, Flowers, Leaves	Infusion, Extract, Paste	Infusion made from the aerial part taken orally to treat digestive disorders. 5-10 ml of flower extract mixed with 4-5 drops of lemon juice taken twice a day to reduce fever. Leaf paste is used as an antiseptic on wounds and swellings.	112	0.64
Stellaria media (L.) Vill.	Badyala	CPUH 12245	Caryophyllacea e	Herb	Leaves, Whole plant material	Decoction, Powder	Decoction prepared from the leaves is used to treat respiratory diseases. Dry leaf powder is dusted on infected skin to treat dermal infection. Leaves are used as bandages to treat deep wounds, to stop bleeding and lessen	133	0.76

							tumours. Asthma is treated with a decoction made from the entire plant.		
Strobilanthes wallichii Nees	Pachda	CPUH 12246	Acanthaceae	Herb	Leaves	Juice	Juice prepared from leaves used to treat intermittent fever.	84	0.48
Taraxacum officinale F.H.Wigg.	Dudhli	CPUH 12247	Asteraceae	Herb	Leaves, Flower	Extract, Paste, Decoction	Intake of 4-5 ml of flower extract mixed with 5-10 drops of lemon juice for 4-5 days (twice a day) help in lowering the fever. Leaf paste is applied externally to wounds twice daily for a week. Decoction of the inflorescence is taken daily until the blisters are cured.	103	0.59
Trifolium pratense L.	Barseem	CPUH 12248	Fabaceae	Herb	Flower	Juice, Decoction	Juice made from the flowers is used on the affected area of the skin for 5–10 days, which helps in reducing the inflammation on the skin, such as eczema, psoriasis, and rashes. A decoction made from the flowers helps maintain urinary health and prevent urinary tract infections.	120	0.69
Urtica dioica L.	Bichhu Butti	CPUH 12249	Urticaceae	Herb	Root, Stem, Leaves	Decoction, Juice, Extract	5-10 ml decoction made from the root is used to drink daily to expel the parasitic worms. Stem juice is used as a tonic to lower the body temperature. Leaf extract is used to treat menstrual disorders and jaundice. Crushed leaves are used as a poultice to treat boils and blisters.	165	.95
Urtica urens L.	Kukas, Bichhu buti	CPUH 12250	Urticaceae	Herb	Leaves	Tea	Dried leaves are used to prepare tea, which helps in allergy relief or to support the immune system.	162	0.93
Viola canescense Wall.ex Roxb	Banaska	CPUH 12251	Violaceae	Herb	Flowers, Whole Plant Material	Powder, Decoction, Extract, Poultice	Dried flower powder mixed with lukewarm water is used to drink daily to help the body get rid of excess water (diuretic). It is used as a natural	157	0.90

							laxative to ease digestive issues, especially in cases of bilious disorders. A decoction of dried flowers is consumed to reduce fever and restore health during illnesses. Extract made from the flowers is used as a syrup to get relief from cough and sore throat. A poultice made from the whole plant is applied to alleviate headaches and calm nervousness.		

Discussion

Thachi Valley, located in the North Western Himalayas of Himachal Pradesh, harbors a rich diversity of medicinal plant species. Despite being relatively under documented, the region is home to numerous plants traditionally used for medicinal, culinary, and other ethnobotanical purposes.

In the present ethnobotanical survey, 51 plant species belonging to 28 different families were recorded through interviews with local informants. These species were reported to be used in the treatment of 52 ailments, grouped into 10 major disease categories. The study further revealed that the majority of knowledge holders were in the age group of 50 to 70 years, highlighting the crucial role of elderly individuals as primary custodians of traditional medicinal knowledge (Figure 2). Information gathered during the present study also revealed that the elderly people of the area have a great belief and faith in these wild edible plants for the treatment of various diseases and despite of availability of modern medical facilities they still use these plants for the treatment of various ailments in their day-to-day life.

As presented in Table 3, *Urtica dioica* exhibited the highest use value (UV = 0.95) followed by *Viola canescens* (0.90) and *Rhododendron arboreum* (0.83). Highest use value of *Urtica dioica* indicates its significant therapeutic and nutritional importance in the local community. As, the plants of *U. dioica* are easily available in the locality its leaves are very often cooked as vegetable and local people believe that it enhances the immunity. The plant is rich in various nutritional components and secondary metabolites which again strongly supports its widespread use among the local people. Several previous studies and reviews document *U. dioica's* high protein and mineral content and identify phenolics, flavonoids and fatty acids that show antioxidant and anti-inflammatory activity (Adhikari *et al.* 2015; Rutto *et al.* 2013; Taheri *et al.* 2022). *Pyrus pashia* had the lowest use value (UV = 0.29) indicating a more restricted spectrum of application which could be brought about by the plant's traditional knowledge not being passed down from one generation to the next (Ouma, 2022).

A quantitative analysis of respondents' agreement about the use of medicinal plants for a range of illnesses was conducted using the quantitative ethnobotanical indices (Kefifa *et al.* 2020; Faruque *et al*. 2018). The study documented a wide range of medicinal plant applications across ten ailment categories, supported by strong informant consensus (Table 2) which confirms that wild edible angiospermic plants have high medicinal value (Samant *et al.* 2007). Uniyal *et al.* (2006), has also documented that wild edible plants found in the western Himalayas are highly medicinal and are used by the local people for the treatment of various types of diseases. Highest ICF values were observed in sexual and ophthalmic disorders (0.97) followed by cardiovascular (0.98), nutritional deficiency (0.97), metabolic (0.93), and muscular/joint disorders (0.94). The analysis of plant parts used (Figure 5) in traditional medicine indicates that leaves are the most frequently utilized part, with the highest usage count of over 30 instances. The prominence of leaves suggests their accessibility, ease of preparation, and perceived therapeutic efficacy in local healing practices. This is followed by whole plant material and fruit, which also show significant use. Other commonly used parts include the root and flower, while bark, aerial parts, kernel, and stem are less frequently used. Berries and rhizomes show minimal use.

The analysis of life forms of medicinal plants, as shown in Figure 6, shows that herbs are the most dominant life form with 36 species, likely due to their medicinal, nutritional, and ecological value, as well as ease of collection and abundance in diverse habitats. Shrubs follow with nine species, reflecting moderate presence and importance in traditional uses. Trees (five species) are fewer, possibly due to selective documentation or lower occurrence. Climbers are least represented (one species), suggesting limited availability or usage in the study area.

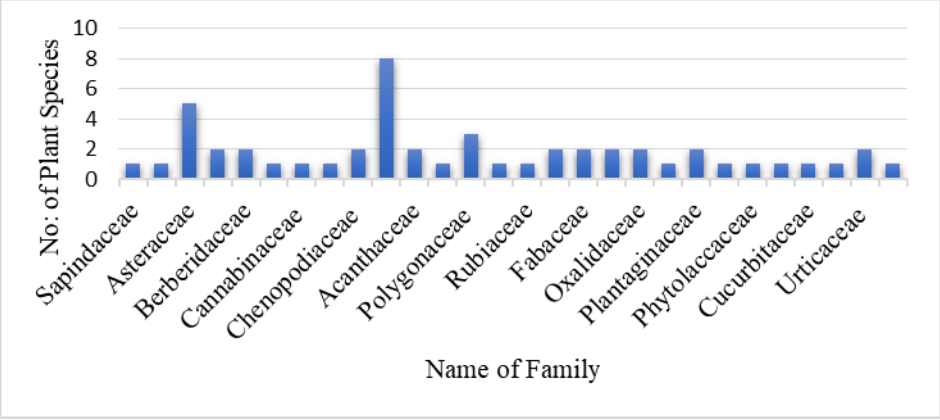

Figure 4. Relative contribution of different plant families recorded in the ethnobotanical study

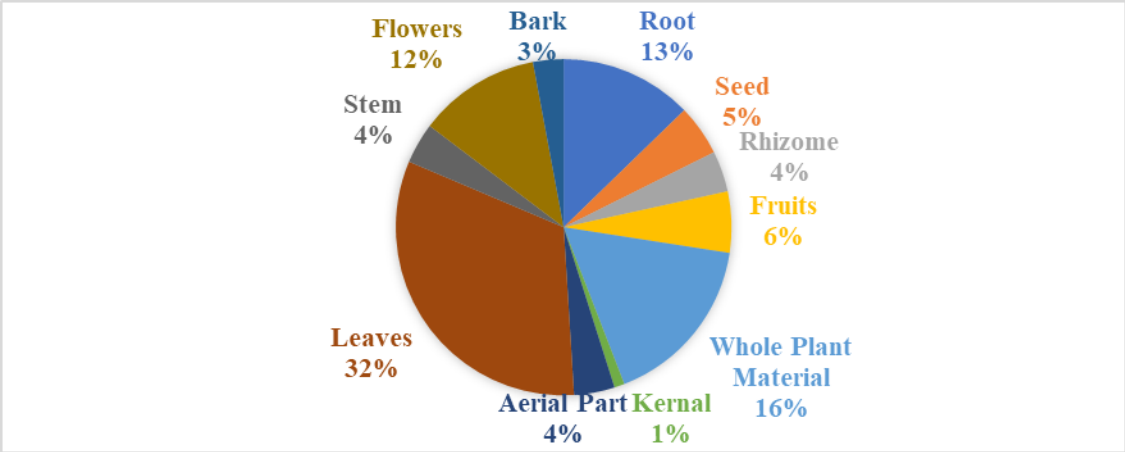

Figure 5. Percentage distribution of plant parts used in the ethnobotanical study

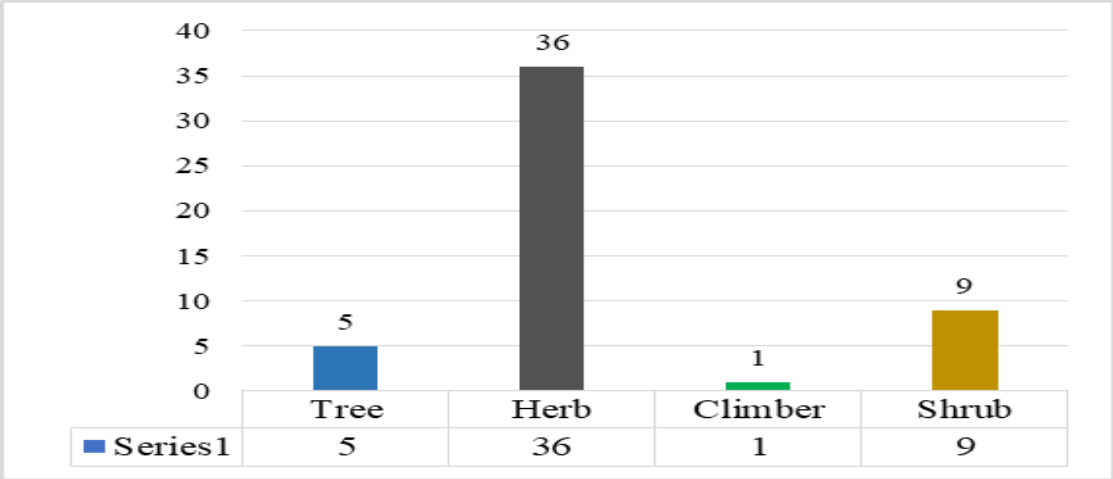

Figure 6. Life form diversity of wild edible angiosperms recorded during the ethnobotanical study

Conclusion

In line with previous findings from the Western Himalayas, the ethnomedicinal study of wild edible angiosperms in the Thachi Valley emphasizes the area as a significant storehouse of traditional knowledge (Malik *et al.* 2015; Raghuvanshi *et al.* 2021). With high ICF values highlighting their therapeutic potential in areas including metabolic, sexual and cardiovascular problems, these plants have dual uses as food and medicine. However, modernization and changes in lifestyle are posing a growing danger to this cultural inheritance. Therefore, it is imperative that this knowledge be preserved and incorporated into larger biodiversity and public health projects for future generations by immediate documenting, protection and sustainable use.

Declarations

List of abbreviations: N (Total informants), Nur (Number of use citations), Nt (Number of taxa), UV (Use value), ICF (Informants Consensus Factor).

Ethics approval and consent to participate: All participants provided their informed con-sent beforehand.

Consent for publication: To research traditional knowledge, several ethical and legal guide-lines were followed. All participants provided their free and informed consent, agreeing to share their knowledge and permitting its publication.

Data and material Availability: The datasets and materials used in this study are available from the author upon reasonable request.

Conflict of interest: The authors confirm no conflict of interest.

Funding: Not applicable.

Authors' contributions: Monika Thakur carried out field surveys, data recording and pre-pared the manuscript and Arti Jamwal Sharma read, edited, and approved the final manuscript. Ruchika Devi and Nitesh Kumar helped in reviewing, revising and drafting the manuscript. All authors read and approved the final manuscript.

Acknowledgements

We extend our heartfelt gratitude to the ethnic communities and traditional herbalists of Thachi Valley in the North Western Himalayas for their invaluable contributions to data collection and their continued support for this research. Sincere thanks to the staff of HFRI for their support and help at the time of identification of the plants.

Literature cited

Adhikari BM, Bajracharya A, Shrestha AK. 2015. Comparison of nutritional properties of Stinging nettle *(Urtica dioica)* flour with wheat and barley flours. Food Science and Nutrition 4(1):119-124. doi: 10.1002/fsn3.259.

Agize M, Asfaw Z, Nemomissa S, Gebre T. 2022. Ethnobotany of traditional medicinal plants and associated indigenous knowledge in Dawuro Zone of Southwestern Ethiopia. Journal of Ethnobiology and Ethnomedicine 18(1): 1-21. doi: 10.1186/s13002-022-00546-4

Chira AB, Kadmi Y, Badraoui R, Aouadi K, Alhawday F, Boudaya M, Jamoussi K, Kallel C, El Feki A, Kadri A, Saoudi M. 2025. GC-MS/MS Analysis and Wound Repair Potential of *Urtica dioica* Essential Oil: In silico Modeling and In vivo Study in Rats. Current Pharmacy and Biotechnology 26(4):591-607. doi: 10.2174/0113892010304346240619061848.

Bhat P, Hegde G, Hegde GR. 2012. Ethnomedicinal practices in different communities of Uttara Kannada district of Karnataka for treatment of wounds. Journal of Ethnopharmacology 143(2): 501-514. doi:10.1016/j.jep.2012.07.003.

Chowdhery HJ, Wadhwa BM. 1984. Flora of Himachal Pradesh. Botanical Survey of India, Calcutta Vol.1-3: 1-866.

Cook ML. 1995. The future of US agricultural cooperatives: A neo-institutional approach. American Journal of Agricultural Economics 77(5):1153-1159. doi:10.2307/1243338

Devkota HP, Paudel KR, Khanal S, Baral A, Panth N, Adhikari-Devkota A, Jha NK, Das N, Singh SK, Chellappan DK, Dua K, Hansbro PM. 2022. Stinging nettle (*Urtica dioica* L.): Nutritional composition, bioactive compounds, and food functional properties. Molecules 27(16):5219. doi: 10.3390/molecules27165219.

Faruque MO, Uddin SB, Barlow JW, Hu S, Dong S, Cai Q, Li X, Hu X. 2018. Quantitative eth-nobotany of medicinal plants used by indigenous communities in the Bandarban District of Bangladesh. Frontiers in Pharmacology 9: 40. doi: 10.3389/fphar.2018.00040.

Ghorbani A. 2005. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, north of Iran:(Part 1): General results. Journal of Ethnopharmacology 102(1): 58-68. doi: 10.1016/j.jep.2005.05.035.

Jain SK. Rao RR. 1976. A Handbook of Field and Herbarium Methods. Today and Tomor-rows Printers and Publisher, New Delhi. India.

Kefifa A, Saidi A, Hachem K, Ouammi, L. 2020. An ethnobotanical survey and quantitative study of indigenous medicinal plants used in the Algerian semi-arid region. Phytotherapie 18(3-4): 204-219. doi:10.3166/phyto-2018-0077.

Khan S, Masoodi TH, Pala NA, Islam MA, Raja A, Rizvi SZ. 2024. Cultural significance of Western Himalayan wild food plants. Ecological Frontiers 44(3): 500-506. doi:10.1016/j.chnaes.2023.07.011.

Kumar A, Verma RK. 2019. Floristic diversity in alpine pasture of Thachi, District Mandi, Himachal Pradesh. Environmental Ecology 37 (4B) : 1589-1594.

Kumari A, Joshi R, Yadav SK. 2025. Prospects and potential for sustainable food and nutritional security in North Western Himalayan region. Indian Journal of Plant Genetic Resources 38(02):145-154. doi: 10. 619 49/0 976 -1926 . 2025.v38i 02.02.

Luczaj L, Pieroni A, Tardio J, Pardo-de-Santayana M, Soukand R, Svanberg I, Kalle R. 2012. Wild food plant use in 21st century Europe: the disappearance of old traditions and the search for new cuisines involving wild edibles. Acta Societatis Botanicorum Poloniae 81(4):359-370. doi:10.5586/asbp.2012.031.

Mahmood A, Mahmood A, Malik RN, Shinwari ZK. 2013. Indigenous knowledge of medic-inal plants from Gujranwala district, Pakistan. Journal of Ethnopharmacology 148(2): 714-723. doi: 10.1016/j.jep.2013.05.035.

Malik ZA, Bhat JA, Ballabha R, Bussmann RW, Bhatt AB. 2015. Ethnomedicinal plants traditionally used in health care practices by inhabitants of Western Himalaya. Journal of Ethnopharmacology 172:133-144. doi: 10.1016/j.jep.2015.06.002.

Mandal SK, Saha S, Saha S. 2023. The importance of wild edible plant and macro-fungi diversity to attain food security for the tribes of eastern India—a quantitative study. Frontiers in Sustainable Food Systems 7:1198187. doi: 10.3389/fsufs.2023.1198187

Ouma, A. 2022. Intergenerational learning processes of traditional medicinal knowledge and socio-spatial transformation dynamics. Frontiers in Sociology 7: 661992. doi: 10.3389/fsoc.2022.661992

Pieroni A, Vandebroek I, Prakofjewa J, Bussmann RW, Paniagua-Zambrana NY, Maroyi A, Torri L, Zocchi DM, Dam ATK, Khan SM, Ahmad H, Yeşil Y, Huish R, Pardo-de-Santayana M, Mocan A, Hu X, Boscolo O, Soukand R. 2020. Taming the pandemic? The importance of homemade plant-based foods and beverages as community responses to COVID-19. Journal of Ethnobiology and Ethnomedicine 16(1):75. doi: 10.1186/s13002-020-00426-9.

Raghuvanshi D, Dhalaria R, Sharma A, Kumar D, Kumar H, Valis M, Kuca K, Verma R, Puri S. 2021. Ethnomedicinal plants traditionally used for the treatment of jaundice (icterus) in Himachal Pradesh in Western Himalaya - a review. Plants 10(2),:232. doi: 10.3390/plants10020232.

Rutto LK, Xu Y, Ramirez E, Brandt M. 2013. Mineral properties and dietary value of raw and processed stinging nettle (*Urtica dioica* L.). International Journal of Food Science 2013(1):857120. doi: 10.1155/2013/857120.

Samant Pant S, Singh M, Lal M, Singh A, Sharma A, Bhandari S. 2007. Medicinal plants in Himachal Pradesh, north western Himalaya, India. The International Journal of Biodiversity Science and Management 3(4):234-251. doi: 10.1080/17451590709618177.

Sen TD 2021. The role of wild food plants of Himachal Pradesh in boosting immunity to com-bat COVID-19. Journal of Scientific Research in Medical and Biological Sciences 2(2): 23-62. doi: 10.47631/jsrmbs.v2i2.238

Taheri Y, Quispe C, Herrera-Bravo J, Sharifi-Rad J, Ezzat SM, Merghany RM, Shaheen S, Azmi L, Prakash Mishra A, Sener B, Kılıç M, Sen S, Acharya K, Nasiri A, Cruz-Martins N, Tsouh Fokou PV, Ydyrys A, Bassygarayev Z, Daştan SD, Alshehri MM, Calina D, Cho WC. 2022. *Urtica dioica*-derived phytochemicals for pharmacological and therapeutic applications. Evidence-based Complementary and Alternative Medicine 2022(1):4024331. doi: 10.1155/2022/4024331.

Thakur N, Kumar N, Kumar S, Sharma D. 2024. Indigenous traditional knowledge of riparian medicinal flora utilized by ethnic communities along the Beas River in Himachal Pradesh, India. Ethnobotany Research and Applications 27: 1-22. doi:10.32859/era.27.32.1-22

Trotter RT, Logan MH. 2019. Informant consensus: a new approach for identifying potentially effective medicinal plants. In Plants and Indigenous Medicine and Diet 91-112.

Umair M, Altaf M, Abbasi AM. 2017. An ethnobotanical survey of indigenous medicinal plants in Hafizabad district, Punjab Pakistan. PLoS One 12(6): e0177912. doi: 10.1371/journal.pone.0177912.

Uniyal SK, Singh KN, Jamwal P, Lal B. 2006. Traditional use of medicinal plants among the tribal communities of Chhota Bhangal, Western Himalaya. Journal of Ethnobiology and Ethnomedicine 20:14. doi: 10.1186/1746-4269-2-14.

Varma K, Kuttappan S, Joseph G, Jude S, Amalraj A. 2022. Ayurvedic Formula-tions and Their Clinical Uses. In Chemistry, Biological Activities and Therapeutic Applications of Medicinal Plants in Ayurveda, ed. A. Amalraj, S. Kuttappan, and K. Varma, The Royal Society of Chemistry: 374-390. doi: 10.1039/9781839166211-00374

Wagh VD, Patil SV, Surana SJ, Wagh KV. 2013. Medicinal plants used in preparation of polyherbal ayurvedic formulation Chyawanprash. Journal of Medicinal Plants Research 7(38):2801-2814. doi: 10.5897/JMPR11.1608

Yaseen G, Ahmad M, Sultana S, Suleiman Alharrasi A, Hussain J, Zafar M, Shafiq-Ur-Rehman. 2015. Ethnobotany of medicinal plants in the Thar Desert (Sindh) of Pakistan. Journal of Ethnopharmacology 163: 43-59. doi: 10.1016/j.jep.2014.12.053.

Zhou H, Zhang J, Kirbis BS, Mula Z, Zhang W, Kuang Y, Huang Q, Yin L. 2023. Ethnobotanical study on medicinal plants used by Bulang people in Yunnan, China. Journal of Ethno-biology and Ethnomedicine 19(1): 38. doi: 10.1186/s13002-023-00609-0.