Forest Biodiversity and livelihood of tribal people in North Western Himalaya with special reference to Himachal Pradesh

Abstract: Forests are treasures gifted to mankind since times immemorial. In the Vedic era, the indigenous communities had a huge repository of knowledge pertaining to the utilization of plants and they relied on this vital comprehension for the welfare of society. This authentic knowledge of plants is vanishing among the people over the period of time due to growth and development in various human civilizations.Presently, the people living in close contact with nature aloof from the latest technologies, facilities and gadgets could practically experience the connect with the flora and fauna of the region.Thetribal communities have been a part of forests for centuries, together possessing immense knowledge about the biodiversity of an area. They not only know the usage and importance of each item of forest produce including trees, herbs and shrubs but also are aware of the side effects of excess usage of a medicinal plant.Non-timber forest products are important component of subsistence and livelihood of tribal communities living in and near forests. This is of particular significance in the state of Himachal Pradesh having 27.73% of geographical area under forest cover and predominantly inhabited by tribal people. Thetribes of Himachal Pradesh generally have their abode in the upper and middle level of the hills. Forestproductsparticularly the NTFP's can provide a sustainable economic boost to millions of people, especially, tribals living in and around forests of north-western Himalayan ranges, by using existing forest resources.

Keywords: Biodiversity, Livelihood, Forest, Tribal people, North Western Himalaya

Introduction

The Himalayan region covers approximately 2,400km and passes through eight countries which are Bangladesh, Bhutan, Afghanistan, China, Nepal, India, Pakistan, Myanmar (Chauhan*et al.*, 2023). It occupies about 18% of India's total geographical area. The north-western Himalayan region includes three Indian states viz., Jammu & Kashmir, Himachal Pradesh and Uttarakhand. It extends between$28^0$43'-$37^0$05' N latitude and

$72^0$40'-$81^0$02' E longitude covering an area of 33 million hectares. The Himalayan ranges situated in this region exhibit a diverse climate,vegetation and land use pattern. The North Western Himalaya is enriched with several unique and valuable biodiversity elements and is a rich repository of flora and fauna having a great diversity in the floristic pattern due to wide range of altitudinal variation.The state of Himachal Pradesh is situated in the Western Himalaya covering 5,550,890.60 ha land with altitude ranging from 350 m above mean sea level (msl) to 6816 m msl. The mountain ranges in the state include the Shiwaliks, Dhauladhar, Pirpanjal, Great Himalaya and the Zanskar. The climate varies from hot, sub- humid tropical in south-west to temperate cold-alpine and glacial in the northern and eastern high mountains. It is endowed with rich biodiversity representing the uniqueness of the region.Various studies have been carried out on ethno-botanical and ethno-medicinal aspects of floristic diversity in Himachal Pradesh (Uniyal and Chauhan, 1971; Uniyal and Chauhan, 1972;Chauhan, 1999; Saman*et al*., 2007;Sood and Thakur, 2004;Sood *et al*., 2011; Sood *et al.,* 2012;Kumar *et al.,* 2013; Kumar and Kumar, 2014;Thakur *et al.,* 2014; Kumar, 2016;Dogra *et al*., 2017;Kumar *et al*., 2018;Singhal and Kumar, 2018;Sharma, 2022).

Globally, it has been estimated that about 40% population depends directly on mountain resources for biodiversity, mineral resources, water, hydroelectricity, timber and recreation (Schild, 2008). Forests are the source of a range of ecosystem goods (food, fiber, fodder, medicine, fuels, timber and raw materials for industrial products) and services (purification of air and water, flood control, decomposition of wastes, soil fertility, pollination of crops and natural vegetation and aesthetics purposes). Forests constitute the major proportionof the land use in North Western Himalaya covering an area of about 1101, 2023 and 3486 thousand ha in Himachal Pradesh, Jammu & Kashmir and Uttarakhand respectively (Dar and Ahmad, 2016). The rural andtribal communities of North Western Himalayas closely interact with the forests to derive their economic livelihood and also for maintaining religious, cultural and spiritual identity. Forest resources have been identified as one of the key sources for sustenance and food security of tribal household(Bandey*et al.,* 2021).They have always played a significant role in survival and socioeconomic betterment of forest dwellers.The role of NTFP is particularly important in the Himalayan region, where a large proportion of the rural population depend on forests for meeting their basic needs (Joshi *et al*., 2018).The importance of commercial NTFPs for livelihood of rural and tribal people has been increasingly recognized in recent times.Agricultural production from tribal lands is not sufficient because it could just make the local populace capable of sustaining life but it couldn’t be an adequate resource for their economic wellbeing. Hence the tribal

communities largely depend on the collection of NTFPs. Tribal regions in Himalayas are sparsely inhabited in small settlements with high dependence of local people on adjoining forests for obtaining fuelwood,fibre,fodder, food and medicine (Pandey*et al.*, 2013). It has been estimated that many village communities derive about 10-50% of their income from the sale of forest products. Although, NTFPs do not assure a high or regular income for forest people (Ndoye*et al.*, 1998). The viewpoint of local communities considerably varies toward forest resources depending on the distance of forest as well as availability of resource and these resources serve as a buffer at the times of hardships (Neumann and Hirsch, 2000).

In the tropics, the NTFPs are the important source of livelihood to rural communities particularly for their food, fodder, medicine and raw materials for house construction as well as firewood consumption (Martin, 1995). Rural people depend on a wide variety of plant and animal products for their use as well as marketing. In last few decades the role of non-timber forest products (NTFPs) for sustainable development and poverty alleviation has received worldwide attention. There exists a huge potential of utilizing traditional knowledge inherited by tribal communities about the wild plant resources and management for achieving sustainable production of NTFPs (Gangwar and Ramakrishnan,1989, 1990;Phillips, 1993; Maikhuri*et al.*, 1994).The forest resources play a vital role in cottage industry, health security, food security, fodder/livestock security, agricultural support, bio-energy security, socio-cultural as well as socio economic security for local people in developing countries (Shit and Pati, 2012). The present study highlights the dependence of rural and tribalcommunities on forests and forest products in North Western Himalayan region.

Tribes of North Western Himalayas

Tribal people belong to economically backward areas which areinaccessiblehavingunfavourable geo-climatic conditions.They have very limited access to public services which reflects in poor health and education facilities as well as low human development attainmentsin tribal areas.Depending on their specific location and agro-climatic conditions, they can be categorised as nomadic pastoralists andsubsistencefarmers.They are mainly dependent on livestock rearing, agriculture and trading of NTFPs for their socio-economic welfare. The Himalayan tribal communities have established a great harmony with the nature by developing a cordial relation with the biological resources and diverse geo-climatic conditions. The North Western Himalayas include the states of Jammu and Kashmir, Himachal Pradesh and

Uttarakhand. The Gujjars and Bakarwals are the two unique ethnic groups in Indian-Administered Kashmir that rear flocks of sheep and goat between high and low altitudes, migrating from one place to another in western Himalayas. Tribes of Uttarakhand include the Tharus, the Jaunsaries, the Buxas, the Bhotias and the Rajis presenting great cultural and ethnic diversity (Kundu and Pal, 2018). Tribes of Himachal Pradesh includes the Gaddis, the Gujjars, the Kinnara or Kinnauras, the Lauhalas and the Pangwalasand some other smaller tribe groups like the Bhot/Bodh, the Beda, the Jad/Lamba/ Khampa, and the Swangla. The Kinnara or Kinnauras tribe inhabit the border district of Kinnaur. The main sources of the income of Kinnauras are agriculture, horticultureandtrade. The tribal inhabitants of LahaulandSpiti district of Himachal Pradesh are known as Lahaulas. Their main sources of economy are agriculture, horticulture,animalhusbandry,trade and several crafts. The people of Pangwal tribe inhabit the high-altitude regions of Chamba district in Himachal Pradesh. The main sources of their economy are village craft,agriculture and animal husbandry. Thus, majority of the Himalayan tribal population sustains itself through agriculture and animal husbandry. Poor road connectivity restricts access to basic public goods and servicesin tribal areas and creates high dependence of inhabitants on natural resources for livelihood.

Status and livelihood of Tribal people of North Western Himalayas

Globally, millions of people depend on forest resources for livelihood however dependency varies from place to place (Akhter *et al*., 2009). Tribal communities of North West Himalaya are closely associated with the forest as their livelihood is critically linked to the forest ecosystem.They are culturally as well as traditionally connected to the forests.Forests are extensively used for grazing, fuelwood collection, and numerous other subsistence needs by rural people. They have the potential to improve the living status of forest dwelling people, particularly tribal people, who are among the most disadvantaged groups. Forests produce a range of ecosystem goods and services which immensely contribute to the livelihood of the local people and generate employment as well as income.

Medicinal plants form an integral part of the life of most of the hill communities and inhabitants are known to collect these plants from natural habitat mainly for their own use or for trade (Samant *et al*., 2007). Majority of these are used in Ayurvedic, Unani and other Traditional systems of Medicines. In the Himalayan region, consumption of wild species as food has been reported high and round the year, particularly during the

lean period (Sundriyal and Sundriyal, 2004). Forest dwellers collect wild edible plants very frequently.Wild edible plants are crucial not only for their role as a source of food and nutrition but are also an integral part of the culture and traditions of the Himalayan societies (Joshi*et al.*, 2018). Several valuable works have been carried out to describe useful aspects of plant diversity in North Western Himalaya (Table 1). The nutritive value of wild edible fruit *Hippophaerhamnoides* L. was highlighted by Dhyani*et al.*(2007). Kala (2007) reported 23 cultivated food crops and 15 wild edible fruit species as the most preferred species by local people in different localities of the Uttarakhandstate.Kumar and Hamal (2009) recorded 50 edible plant species traditionally used by local inhabitants in Kishtwar High Altitude National Park, Jammu and Kashmir (Northwest Himalaya). Tiwari *et al*. (2010) recorded 55 plant species consumed as vegetables and as raw wild edibles by the local people in the hilly areas of Alaknanda Valley, Uttarakhand State.Wild edible fruit plants are not only the source of income for rural and tribal people but they also have traditionally occupied an important place in their health care, socio-cultural and spiritual life (Nisha and Rao, 2021). Most of the edible wild plants possess medicinal values. In addition to serving as source of nutrition, they also play important role in the treatment of several ailments. Many wild fruits such as *Punica granatum, Berberis asiatica, Solanum nigrum, Ficus auriculata* etc. are also known for their medicinal properties (Maikhuri *et al*., 1994). The local inhabitants of Kinnaur use the wild edible plants in raw or cooked form for maintaining their health, vitality and longevity. The different plant parts are consumed as a source of supplement of food, vegetables, spices, condiments, alcoholic beverages, according to their requirements and availability in nature. Further on the occasions of festivals, worships, weddings and other religious rituals special dishes and special drinks are traditionally prepared from the local plant-based resources.Thus, the locally available and commercially valuable natural resourcessupport the health care as well as nutrition and can significantly contribute to rural well-being through proper planning(Rasul*et al.*,2012).

Table 1: Forest Resources utilized by the tribal people of North Western Himalaya

Scientific Name	Family	Common Name/s	Region	Part/s used	Folk Uses	Reference/s
Abies spectabilis (D.Don.) Spach.	Pinaceae	Kolroi, Tosh	Himachal Pradesh (Kinnaur)	Leaves	Used for fever, asthma and bronchitis	Radha *et al.*, 2019;

Achillea millefolium L.	Asteraceae	Birnjasif, Gondana	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Leaves, Flowers, Whole plant	Used to cure toothache, high blood pressure, body pain, high feverand respiratory infection. It is stimulative, diuretic and haemostatic	Negi and Chauhan, 2009;Dutt *et al*., 2014;Radha *et al*., 2019
Abrus precatorius L.	Fabaceae	Ratti, Gunchi	Himachal Pradesh (Sirmour)	Leaves	Used for healing wounds	Radha *et al*., 2019
Acalypha indica L.	Euphorbiaceae	Kuph	Uttarakhand	Leaves	Used to cure ear problems	Sharma *et al.*, 2011
Achyranthes aspera L.	Amaranthaceae	Chirchira	Uttarakhand	Leaves, Roots	Used for sperm viability, boils, dysentery and dog bite	Sharma *et al*., 2011;Kumar *et al*., 2023
Achyranthes bidentata Blume	Amaranthaceae	Chirchita, Puthkanda	Himachal Pradesh (Chamba; Kinnaur)	Roots, Seeds, Leaves	The plant is astringent, diuretic and spasmolytic. It is also used for abdominal pain	Negi and Chauhan, 2009; Rani*et al*., 2013
*Aconitum heterophyllum*Wall. ex Royle	Ranunculaceae	Atish	Himachal Pradesh (Pangi, Chamba; Chhota Bhangal; Kinnaur)	Root	Used for diarhhoea, stomachache, fever and vomiting	Uniyal*et al*., 2006;Negi and Chauhan, 2009; Dutt*et al*., 2014
Aconitum violaceum Jacq. ex Stapf.	Ranunculaceae	Mitha patis	Himachal Pradesh (Kinnaur)	Roots	Used to cure cough in children	Negi and Chauhan, 2009
Acorus calamus L.	Acoraceae	Bacch	Uttarakhand	Roots	Used for diarrhoea and rib pain	Kumar *et al*., 2023
Aegle marmelos (L.) Correa	Rutaceae	Bael patra	Himachal Pradesh (Kangra), Uttarakhand	Fruit	Fruits are edible and used to cure dysentery, cholera, indigestion and stomach ache	Sharma *et al*., 2011;Supriya *et al*., 2022; Kumar *et al*., 2023
Aesculus indica (Colebr. ex Cambess) Hook.	Hippocastanaceae	Jungli khanor	Himachal Pradesh (Chhota Bhangal; Kinnaur)	Fruits, Seeds	Fruits and seeds are edible. Fruits are used forcuring excessive bleeding and pain during menses	Uniyal*et al*., 2006; Negi and Subramani, 2015
Ageratum conyzoides L.	Asteraceae	Fulnu	Himachal Pradesh (Kangra), Uttarakhand	Leaves	Used for healing wounds	Joshi and Pant, 2012; Supriya *et al.*, 2022
Ainsliaea aptera DC.	Asteraceae	Kandyari	Himachal Pradesh (Chhota Bhangal)	Roots	Prescribed for gastric problems	Uniyal*et al*., 2006

Ajuga bracteosa Wallich ex Benth	Lamiaceae	Neel-kanthi	Himachal Pradesh (Chhota Bhangal)	Leaves	Used for the treatment of mouth ulcer and breathing problems	Uniyal*et al*., 2006
Allium caesium Schrenk.	Amaryllidaceae	Dhum	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Leaves	Edible (used as chutney and also as condiment.)	Negi and Subramani, 2015;Prakash*et al*., 2020
*Allium humile*Kunth.	Amaryllidaceae	Pareeni	Himachal Pradesh (Pangi, Chamba)	Leaves	Good for digestion and also used as flavouring agent	Dutt*et al*., 2014; Prakash *et al.*, 2020
Allium semenovii Regel.	Amaryllidaceae	Shawan	Himachal Pradesh (Pangi, Chamba)	Whole Plant	Used as spice and vegetable	Dutt*et al*., 2014; Prakash *et al.*, 2020
Allium sativum L.	Amaryllidaceae	Lahasun	Himachal Pradesh (Kangra), Uttarakhand	Bulb	Used for curing diabetes, diarrhoea, gastrointestinal disorders, hypertension and strengthen immune system	Sharma *et al.*, 2011; Supriya *et al.*, 2022
Amaranthus spinosus L.	Amaranthaceae	Bhabri	Himachal Pradesh (Pangi, Chamba)	Stem, Leaves	Used as vegetable	Prakash *et al.*, 2020
Amaranthus viridis L.	Amaranthaceae	Jungali chaulayi	Himachal Pradesh (Sirmour)	Leaves, Roots	Used to cure skin infection	Radha *et al.*, 2019
Andrographis paniculata (Burm. f.) Nees	Acanthaceae	Kiryat, Kalmedh	Uttarakhand	Whole plant, Leaves	Used for curing dysentery, fever, worms and stomach complaints	Mathur and Joshi, 2013
*Anemone rupicola*Cambess	Ranunculaceae	Kakrya	Himachal Pradesh (Chhota Bhangal)	Leaves	Used for the treatment of ears with pus	Uniyal*et al*., 2006
Angelica glauca Edgew.	Apiaceae	Chaura	Himachal Pradesh (Chhota Bhangal; Chamba; Kinnaur)	Root, Umbels	Used for arthritis, cold, cough, fever and also as spice, snake repellent and carminative	Negi and Chauhan, 2009; Rani *et al.*, 2013; Dutt *et al*., 2014;Uniyal *et al*., 2006;Rana *et* al., 2019; Prakash *et al.*, 2020
Argemone mexicana L.	Papaveraceae	Satyanashi, Bharband	Himachal Pradesh (Kinnaur, Sirmour), Uttarakhand	Whole plant, Seeds	Used to cure malaria and digestive disorders	Sharma *et al.*, 2011; Radha *et al*., 2019
Arisaema flavum	Araceae	Jhamusha	Himachal Pradesh	Tubers,	Used for snakebite, stomach	Negi and Chauhan,

(Forssk.) Schott			(Kinnaur)	Fruits	diseases and for preparation of wine.	2009
*Arnebiabenthamii*Wall ex G. Don	Boraginaceae	Ratanjot	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Roots	Used for the treatment of wounds, cuts, burns, toothache, ear-ache, eye diseases and also as hair dye	Negi and Chauhan, 2009; Dutt*et al*., 2014
Artemisia absinthium L.	Asteraceae	Charmra	Himachal Pradesh (Chamba)	Leaves	Used for the treatment of wounds	Rani *et al.,* 2013
Artemisia brevifolia Wall.	Asteraceae	Nurcha, Sansei	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Flowering branches, Leaves	Good forasthma,worm expulsion, anaemia and diseases of brain	Negi and Chauhan, 2009; Dutt *et al*., 2014
Artemisia dracunculus Linn.	Asteraceae	Chamary	Himachal Pradesh (Kinnaur)	Flowers, Leaves	Used as appetizer, condiment, stomachic, stimulative, febrifuge and also for throat infection	Negi and Chauhan, 2009
*Artemisia sieversiana*Willd.	Asteraceae	Charmara	Himachal Pradesh (Chhota Bhangal)	Leaves	Used as abortifacient and also to cure pain and swelling of the wounds	Uniyal*et al*., 2006
Arundo domax L.	Poaceae	Rajal	Himachal Pradesh (Kinnaur)	Stem	Used for making walking sticks and also as support for climbing trees	Kumari and Saggoo, 2015
*Asparagus racemosus*Willd.	Asparagaceae	Saapaya	Himachal Pradesh (Chamba)	Roots	Used for stomach problems	Rani *et al.,* 2013
Avena fatua L.	Poaceae	Yukpa	Himachal Pradesh (Kinnaur)	Seeds	Used to cure stomach disorder and fever	Kumari and Saggoo, 2015
Bacopa monnieri (L.) Wettst.	Scrophulariaceae	Brahmi	Himachal Pradesh (Chamba)	Leaves	Used for nervous disorder and to enhance memory	Rani *et al.,* 2013
Bauhinia variegata L.	Fabaceae	Kachnar	Himachal Pradesh (Chamba; Kangra)	Bark, Flower buds	Used for wound healing, dysentery, haemorrhoids, snake poisoning, stomach problems, also used as vegetable	Rani *et al.,* 2013; Supriya *et al.,* 2022
*Berberis aristata*DC.	Berberidaceae	Kashmal	Himachal Pradesh (Chamba; Lahaul Spiti)	Roots, Fruits, Leaves,	Roots are used to cure eye infection, dysentery and piles. Fruits, leaves and flowers are	Singh and Chauhan, 2005; Rani *et al.,* 2013; Rana *et* al.,

				Flowers	edible	2019; Prakash *et al.*, 2020
Berberis asiatica Roxb. ex DC.	Berberidaceae	Chunchri, Kahamil, Kapacho	Himachal Pradesh (Chhota Bhangal;Pangi, Chamba; Kinnaur)	Roots, Fruits, Young shoots	Roots are used for diabetes and jaundice. Fruits are edible and also used as laxative. Young shoots are used to drive away the evil spirits.	Uniyal*et al*., 2006; Negi and Chauhan, 2009; Dutt*et al*., 2014
Berberis lycium Royle	Berberidaceae	Kasmal	Himachal Pradesh (Chamba; Chhota Bhangal)	Roots, Stem, Fruits, Leaves, Flowers	Used to cure gum problems and eye infections. Fruits, leaves and flowers are edible	Uniyal*et al*., 2006; Rani *et al*., 2013; Prakash *et al*., 2020
Bergenia ciliata (Haworth) Sternb.	Saxifragaceae	Sadpottar	Himachal Pradesh (Chhota Bhangal), Uttarakhand	Roots	Used for fever, dysentery and kidney stone	Uniyal*et al*., 2006; Kumar *et al*., 2023
Bergenia ligulata (Wall.) Engl.	Saxifragaceae	Shaprotri	Himachal Pradesh (Chamba)	Leaves	Used for cold	Rani *et al.*, 2013
Bergenia stracheyi (Hook f. & Thomas.) Engl.	Saxifragaceae	Laoo-patra, Shamlot	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Rhizome	Used to cure indigestion, fever, burns and jaundice	Negi and Chauhan, 2009;Dutt*et al*., 2014
Betula utilis D. Don.	Betulaceae	Bhojpatra	Himachal Pradesh (Chamba, Kinnaur	Bark, Leaves	Used for the treatment of urinary tract infection, wounds andalso as roofing material	Negi and Chauhan, 2009; Rani *et al*., 2013; Dutt *et al*., 2014; Rana *et* al., 2019
*Buniumpersicum*Boiss.	Apiaceae	Kalazira	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Seeds	Used for fever, cold, headache and also as spice and condiment.	Dutt*et al.*, 2014; Negi and Subramani, 2015; Prakash *et al*., 2020
Cannabis sativa L.	Cannabaceae	Bhang	Himachal Pradesh (Chamba; Chhota Bhangal), Jammu and Kashmir	Leaves, Seeds	Used for Joint pain, fever, depression, cholera, paralysis, dandruff, tumours, ulcers and also, for religious purposes	Uniyal*et al*., 2006; Rani *et al.*, 2013;Dar *et al*., 2020
Carica papaya L.	Caricaceae	Kharbuja	Himachal Pradesh (Kangra)	Fruit, Leaves, Stem bark	Used for the treatment of asthma, jaundice, bleeding piles, abortion, urinary tract	Supriya *et al*., 2022

					infection, wounds and sore teeth	
Castanea sativa Mil.	Fagaceae	Mitha	Himachal Pradesh (Kinnaur)	Fruits	Fruits are edible	Negi and Subramani, 2015
Centella asiatica (L.) Urb	Apiaceae	Brahmi, Manduki	Uttarakhand	Leaves, Stem	Used for urinary problems, nervous disorders and skin diseases	Mathur and Joshi, 2013
Chaerophyllumvillosum Wall. ex DC.	Apiaceae	Tila	Himachal Pradesh (Pangi, Chamba)	Tuber, Roots	Used to cure stomach disorders. Roots are edible	Dutt*et al.,* 2014; Prakash *et al.,* 2020
*Cirsium wallichii*DC.	Asteraceae	Bursa	Himachal Pradesh (Chhota Bhangal)	Root	Used for gastric problems	Uniyal*et al*., 2006
*Codonopsisovata*Benth.	Campanulaceae	Katari	Himachal Pradesh (Pangi, Chamba)	Leaves	Good for eye diseases	Dutt*et al.,* 2014
Convolvulus arvensis Linn.	Convolvulaceae	Dhechigmendo	Himachal Pradesh (Lahaul Spiti)	Leaves, Flowers	Used to cure kidney pain	Singh and Chauhan, 2005
*Corylus jacquemontii*Decne.	Corylaceae	Thangi/Thangoli	Himachal Pradesh (Chamba)	Seeds	Used for muscular pain	Rani *et al.,* 2013
*Cotoneaster microphyllus*Lindl.	Rosaceae	Kadhor	Himachal Pradesh (Chamba)	Fruits	Used to treatskin diseases	Rani *et al.,* 2013
Crataegus oxyacantha L.	Rosaceae	Pinyath	Himachal Pradesh (Chamba)	Fruits	Fruits are used for curing anaemia	Rani *et al.,* 2013
Curcuma longa L.	Zingiberaceae	Haldar	Himachal Pradesh (Kangra), Uttarakhand	Rhizome	Used to cure skin disorders, Indigestion, injury, heart problems, gastrointestinal and respiratory diseases	Supriya *et al.,* 2022; Kumar *et al*., 2023
Cymbopogon distans (Steud.) Wats.	Poaceae	Kurcha	Himachal Pradesh (Kinnaur)	Leaves	Used for joint pain andinflammation	Kumari and Saggoo, 2015
Cynodon dactylon (L.) Persoon	Poaceae	Drub	Himachal Pradesh (Chhota Bhangal)	Aerial parts	Used to cure nasal bleeding	Uniyal*et al*., 2006
Dactylorhizahatagirea D. Don	Orchidaceae	Hathpanja, Salampanja	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Tubers	Used for diabetes, diarrhoea, dysentery, fracture and to check nose-bleeding	Negi and Chauhan, 2009; Dutt*et al.,* 2014
Datura stramonium Wall.	Solanaceae	Datura	Himachal Pradesh (Chamba)	Seeds	Used to cure pimples (Acne)	Rani *et al.,* 2013

*Delphinium brunonianum*Royle	Ranunculaceae	Loskar, Nirbisha	Himachal Pradesh (Kinnaur)	Leaves, Flowers	Used to cure dysentery and fever	Negi and Chauhan, 2009
Delphinium denudatum Wall. ex Hook. &Thoms.	Ranunculaceae	Losar	Himachal Pradesh (Kinnaur)	Roots	Used against toothache	Negi and Chauhan, 2009
Desmodium elegans DC.	Fabaceae	Kathi	Himachal Pradesh (Chamba)	Roots, Leaves	Used to treat cholera. Leaves are used as fodder	Rani *et al.,* 2013
Dioscoreadeltoidea Wall. ex Griseb.	Dioscoreaceae	Shingli-Mingli	Himachal Pradesh (Kinnaur)	Rhizome	Used for gastric complaints and also for washing wool and hair	Negi and Chauhan, 2009
Diplazium esculentum (Retz.) Sw.	Woodsiaceae	Kasror	Himachal Pradesh (Chamba)	Whole plant	Used for muscular pain	Rani *et al.,* 2013
Eleusine indica (L.) Gaertn.	Poaceae	Kangli	Himachal Pradesh (Kinnaur)	Whole plant	Used for curing dysentery, constipation and for making mats and ropes	Kumari and Saggoo, 2015
Ephedra gerardiana Wall. ex Stapf	Ephedraceae	Somlata	Himachal Pradesh (Kinnaur), Uttarakhand	Shoots	Used to treat asthma, hay fever and rashes	Negi and Chauhan, 2009
*Eucalyptus gigantea*Dehnh.	Myrtaceae	Safeda	Himachal Pradesh (Kangra)	Leaves, Bark	Used to cure bronchitis, throat infection, also as antiseptic, anti-inflammatory and insect repellent	Supriya *et al.,* 2022
Fagopyrum esculentum Moench	Polygonaceae	Ogala	Himachal Pradesh (Kinnaur)	Seeds, Roots	Seeds are edible. Root is used against rheumatic pain, lung diseases and typhoid	Negi and Chauhan, 2009
*Ferulajaeschkeana*Vatke	Apiaceae	Kurash, Jangli Hing	Himachal Pradesh (Pangi, Chamba, Kinnaur)	Rhizome	Used to heal wounds, cuts, boils and burns	Negi and Chauhan, 2009; Dutt*et al.*, 2014
*Fragaria nubicola*Lindley ex Lacaita	Rosaceae	Aakhe, Kida-bhumla	Himachal Pradesh (Chhota Bhangal)	Aerial parts	Aerial parts are used for fever.	Uniyal*et al*., 2006;
*Grewia optiva*Drummond ex Burret	Tiliaceae	Dhaman	Himachal Pradesh (Chhota Bhangal)	Leaves	Used for joint pain	Uniyal*et al*., 2006
Heracleum	Apiaceae	Poral	Himachal Pradesh	Flowers,	Used to cure headache	Negi and Chauhan,

*lanatum*Michx			(Kinnaur)	Leaves		2009
Hippophae salicifolia D.Don	Elaeagnaceae	Charma	Himachal Pradesh (Pangi, Chamba)	Fruits	Fruits are edible and used for makingjam and juice	Prakash*et al.*, 2020
Hypericum oblongifolium Hook.	Hypericaceae	Phiunli	Himachal Pradesh (Chamba; Sirmour)	Roots, Leaves, Flowers	Used to cure diarrhoea, skin allergy and animal diseases	Rani *et al.*, 2013; Radha *et al.*, 2019
Ipomoea carnea Jacq.	Convolvulaceae	Basunth	Himachal Pradesh (Kangra)	Leaves	Used for wound healing and possess antibacterial and anti-inflammatory activity	Supriya *et al.*, 2022
Juniperus macropoda Boiss.	Cupressaceae	Theleru	Himachal Pradesh (Kinnaur)	Berries	Used for cough, colic, diarrhoea, indigestion, pectoral affections and impotency	Negi and Chauhan, 2009
Jurinea dolomiaea Boiss	Asteraceae	Guggal dhoop	Himachal Pradesh (Pangi, Chamba)	Roots	Used for skin eruptions and cuts	Dutt*et al.*, 2014
Justicia adhatoda L.	Acanthaceae	Safed basunth	Himachal Pradesh (Kangra, Sirmour), Uttarakhand	Leaves	Used for dysentery, fever, cough, cold, bronchitis and asthma	Mathur and Joshi, 2013; Radha *et al.*, 2019; Supriya *et al.*, 2022
Mallotus philippensis (Lam.) Muell.-Arg.	Euphorbiaceae	Rohini	Uttarakhand	Fruits	Fruits are used as anthelmintic	Sharma *et al.*, 2011
*Malus baccata (*L.) Borkh. R	Rosaceae	Khontli	Himachal Pradesh (Kinnaur)	Fruits	Fruits are edible	Negi and Subramani, 2015
Malva parviflora L.	Malvaceae	Nasochal	Himachal Pradesh (Chhota Bhangal)	Aerial parts	Used for abortion	Uniyal *et al*., 2006
Melica persica Kunth.	Poaceae	Karvo	Himachal Pradesh (Kinnaur)	Whole plant	Used in religious ceremonies	Kumari and Saggoo, 2015
Mentha longifolia (Linn.) Hudson	Lamiaceae	Pudina	Himachal Pradesh (Kinnaur; Lahaul Spiti), Jammu & Kashmir	Leaves,Shoots	Used as antiseptic, carminative, stimulant and also for curing stomach disorder, wounds, body pain and vomiting	Singh and Chauhan, 2005; Negi and Chauhan, 2009; Dar *et al.*, 2020
*Mirabilis jalapa*L.	Nyctaginaceae	Raat ki rani	Himachal Pradesh (Chamba)	Roots	Used to cure cough and cold	Rani *et al.*, 2013

Morus alba L.	Moraceae	Toot	Himachal Pradesh (Kangra)	Fruits	Used to curesore throat, fever, lower blood pressure and improve eyesight	Supriya *et al.*, 2022
Murraya koenigii Spreng.	Rutaceae	Kadhi patta	Himachal Pradesh (Chamba; Kangra), Uttarakhand	Leaves, Branches	Used for blood purification, vomiting, kidney pain, hair growth, boils, burns, diarrhoea, dysentery, joint pain and gum problems	Sharma *et al.*, 2011; Rani *et al.*, 2013; Supriya *et al.*, 2022; Kumar *et al*., 2023
Origanum vulgare Linn	Lamiaceae	Maruwa	Himachal Pradesh (Pangi, Chamba)	Leaves	Used for curing chickenpox and fever	Dutt*et al.*, 2014
Oxyriadigyna(Linn.) Hill	Polygonaceae	Chucha	Himachal Pradesh (Kinnaur)	Leaves	Used for stomach disorder and also as pickles	Negi and Chauhan, 2009
Parthenocissus semicordata(Wall.) Planchon	Vitaceae	Amru bail	Himachal Pradesh (Chhota Bhangal)	Aerial parts, Root	Used against leucorrhoea, wounds and boils	Uniyal*et al*., 2006
Phytolacca acinose Roxb.	Phytolaccaceae	Ranshag, Ashlu	Himachal Pradesh (Chamba)	Leaves	Used to cure acne disease	Rani *et al.*, 2013
Picrorhiza kurroa Royle ex Benth	Scrophulariaceae	Karru	Himachal Pradesh (Chamba; Chhota Bhangal; Kinnaur), Jammu & Kashmir	Leaves, Roots, Rhizome	Used for cold, cough,fever, joint pain, stomach disorders, digestive problems and as blood purifier	Uniyal *et al*., 2006; Negi and Chauhan, 2009; Rani *et al.*, 2013; Dutt *et al.*, 2014; Dar *et al.*, 2020
*Pinus gerardiana*Wall. ex D.Don	Pinaceae	Neoza, Ree, Chilgoza	Himachal Pradesh (Pangi,Chamba; Kinnaur)	Nuts (Kernel)	Used in socio-religious beliefs; Kernels are edible and also used as carminative and expectorant	Negi and Chauhan, 2009; Dutt*et al.*, 2014; Negi and Subramani, 2015
Polygonatum cirrhifolium (Wall.) Royle	Liliaceae	Sobnyam	Himachal Pradesh (Kinnaur)	Leaves	Used as tonic and vegetable	Negi and Chauhan, 2009
Polygonatumverticillatum(L.) All	Liliaceae	Salam mishri	Himachal Pradesh (Chhota Bhangal)	Roots	Used to curespermatorrhaea and piles	Uniyal*et al*., 2006
*Prunus armeniaca*L.	Rosaceae	Chuli	Himachal Pradesh (Kinnaur)	Fruits, Kernels	Fruits are edible and kernel oil is used for curing rheumatic pain	Negi and Chauhan, 2009; Negi and Subramani, 2015

*Prunus cerasoides*D.Don	Rosaceae	Pajja	Himachal Pradesh (Chhota Bhangal)	Stem bark	Used for joint pain	Uniyal*et al*., 2006
*Prunus cornuta*Wall.	Rosaceae	Jammu	Himachal Pradesh (Chamba)	Fruits	Used to cure anemia	Rani *et al.,* 2013
Pyrus pashia Buch.-Ham. ex D.Don	Rosaceae	Kainth	Himachal Pradesh (Kangra)	Fruits	Used for the treatment of throat infection, mouth boils, respiratory, cardiovascular and gastrointestinal ailments	Supriya *et al.,* 2022
Pteridium aquilinum (L.) Kuhn	Dennstaedtiaceae	Kinus	Himachal Pradesh (Chamba)	Roots	Used to cure abdominal edema	Rani *et al.,* 2013
*Rheum australe*D. Don.	Polygonaceae	Chukeriketodhi	Himachal Pradesh (Chhota Bhangal;Pangi,Chamba; Kinnaur)	Leaves, Tubers	It is edible and also used for fracture,cold, cough and piles	Uniyal*et al*., 2006; Negi and Chauhan, 2009;Dutt*et al*., 2014
*Rheum moorcroftianum*Royle	Polygonaceae	Pawan	Himachal Pradesh (Pangi, Chamba)	Roots	Good for digestion problems	Dutt*et al.,* 2014
Rhododendron arboreum Smith	Ericaceae	Brah	Himachal Pradesh (Chhota Bhangal, Sirmour)	Flowers	Used for cold, fever, cough and nasal bleeding	Uniyal*et al*., 2006; Radha *et al.,* 2019
*Rubia manjith*Roxb. ex Fleming	Rubiaceae	Manjith	Himachal Pradesh (Kinnaur)	Leaves	Used to heal cuts	Negi and Chauhan, 2009
*Rubus ellipticus*Sm.	Rosaceae	Akhan	Himachal Pradesh (Chamba)	Fruits	Used for indigestion	Rani *et al.,* 2013
*Rubus niveus*Thunb.	Rosaceae	Khiradi	Himachal Pradesh (Chhota Bhangal)	Roots	Used to cure menstrual disorder	Uniyal*et al*., 2006
*Rumex hastatus*D.Don	Polygonaceae	Almoru	Himachal Pradesh (Chhota Bhangal)	Leaves	Used to stop nasal bleeding	Uniyal*et al*., 2006
Rumex nepalensis Sprengel	Polygonaceae	Albar	Himachal Pradesh (Chhota Bhangal), Jammu & Kashmir	Leaves, Roots	Used to cure wounds, headache, stomach and abdominal pain	Uniyal*et al*., 2006; Dar *et al.,* 2020
Salix alba L.	Salicaceae	Chirand	Himachal Pradesh (Chamba)	Seeds	Used to cure scabies, eczema, joint pain and also used against dandruff	Rani *et al.,* 2013

Saussurea lappa (Decne) Sch. Bip.	Asteraceae	Kuth	Himachal Pradesh (Kinnaur)	Roots	Used for nausea and indigestion	Negi and Chauhan, 2009
Saussurea costus (Falc.) Lipsch.	Asteraceae	Kuth	Himachal Pradesh (Chhota Bhangal), Jammu & Kashmir	Roots, Leaves	Used to cure joint pain	Uniyal *et al.*, 2006; Dar *et al.*, 2020
Saussurea obvallata (DC.) Edgew.	Asteraceae	Bhramkamal	Himachal Pradesh (Kinnaur)	Whole plant	Used for magico-religious purposes	Negi and Chauhan, 2009
*Selinumtenuifolium*Wall. ex Clarke.	Apiaceae	Bhootkeshi, Matoshal	Himachal Pradesh (Chhota Bhangal; Pangi, Chamba)	Roots, Umbels.	Used to cure knee pain and swelling after delivery of women	Uniyal*et al*., 2006; Dutt*et al.*, 2014
Setaria etalica (L.) P. Beauv.	Poaceae	Yarka cha	Himachal Pradesh (Kinnaur)	Seeds	Used to cure fever, headache and to increase lactation of cattle	Kumari and Saggoo, 2015
Sinopodophyllumhexandrum(Royle)	Podophyllaceae	Bankakri	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Roots, Fruits	Used to cure cancer, cough, headache, cuts, wounds, fever, ulcer and abdominal pain	Negi and Chauhan, 2009; Dutt*et al.*, 2014
*Stellaria monosperma*Buch.-Ham. ex D.Don	Caryophyllaceae	Kokuwa	Himachal Pradesh (Chamba)	Leaves	Used for skin diseases	Rani *et al.*, 2013
*Swertia chirata*C.B.Clarke	Gentianaceae	Charayta	Himachal Pradesh (Chamba; Chhota Bhangal)	Leaves	Used for skin irritation	Uniyal*et al*., 2006; Rani *et al.*, 2013
*Taxus baccata*Thunb.	Taxaceae	Barhami	Himachal Pradesh (Chamba)	Leaves, Bark	Used to cure cancer	Rani *et al.*, 2013
Terminalia arjuna Wight & Arn.	Combretaceae	Arjun	Uttarakhand	Bark	Used against pneumonia and asthma	Sharma *et al.*, 2011; Joshi and Pant, 2012
Terminalia chebula Retz.	Combretaceae	Harad	Himachal Pradesh (Kangra)	Fruits	Used for cough, gastrointestinal disorders and possesses antibacterial, antiviral, chemo- preventive and radio protecting activity	Supriya *et al.*, 2022
*Thalictrum foliolosum*DC.	Ranunculaceae	Barmot	Himachal Pradesh (Chhota Bhangal)	Roots	Used to cure stomach pain and gastric trouble	Uniyal*et al*., 2006

Thymus linearis Benth.	Lamiaceae	Ban ajwain, Sanauni, Tumro	Himachal Pradesh (Pangi, Chamba; Kinnaur)	Flower, leaves	Used as anti-spasmodic, antiseptic, as condiment and to cure stomach disorder, cough, cold and high fever	Negi and Chauhan, 2009; Dutt*et al.*, 2014; Prakash *et al.*, 2020
Tinospora cordifolia Miers	Menispermaceae	Gloe	Himachal Pradesh (Kangra, Chamba), Uttarakhand	Stem, Whole plant	Used against skin diseases, jaundice, constipation,pneumonia, fever, cold, anaemia, inflammation, digestive problems and enhances immune system	Rani *et al.,* 2013; Supriya *et al.,* 2022; Kumar *et al*., 2023
Trillium govanianum (D.Don.)	Trilliaceae	Nagchatri	Himachal Pradesh (Chamba)	Roots	Used to cure arthritis, menstrual and reproductive disorders	Rani *et al.,* 2013; Rana *et* al., 2019
Urtica dioica L.	Urticaceae	Ain	Himachal Pradesh (Chamba)	Leaves	Used forskin diseases and also as vegetable	Rani *et al.,* 2013; Prakash *et al.,* 2020
*Valeriana jatamansi*D.Don	Valerianaceae	Mushkbala	Himachal Pradesh (Chamba)	Roots	Used to cure stomach ache, and also as incense (‘dhoop’)	Rani *et al.,* 2013
Verbascum thapsus Linn.	Sambucaceae	Botiy-chi	Himachal Pradesh (Kinnaur; Lahaul Spiti)	Whole plant, Leaves, Flowers	Used to ward off evil spirits. Leaves and flowers are used to cure vomiting	Singh and Chauhan, 2005; Negi and Chauhan, 2009
Viburnum mullaha Buch.-Ham. ex D.Don	Caprifoliaceae	Tilhanj	Himachal Pradesh (Chamba)	Roots Fruits	Roots used to cure cold and cough. Fruits are edible	Rani *et al.,* 2013; Rana *et* al., 2019
*Viola canescens*Wall.	Violaceae	Banaksha	Himachal Pradesh (Chamba)	Flower	Used for cold and cough	Rani *et al.,* 2013
Viola pilosa Blume	Violaceae	Vanaksa	Himachal Pradesh (Chhota Bhangal)	Flowers	Used to cure fever,cough and cold	Uniyal*et al*., 2006
Vitex negundo L.	Lamiaceae	Bana	Himachal Pradesh (Chamba; Kangra; Sirmour)	Leaves, Stem	Used for cold, cough, fever, ulcer, joint pain, boils, toothache, sprain and inflammation	Rani *et al*.,2013; Radha *et al.*, 2019; Supriya *et al.*, 2022
Withania somnifera (L.) Dunal	Solanaceae	Ashwagandha	Uttarakhand	Fruits, Roots	Used as immune enhancer, stress resistant and also for joint pain	Kumar *et al*., 2023
Zanthoxylum armatum	Rutaceae	Trimiria	Himachal Pradesh	Stem, Bark,	Used to cure toothache, gum	Rani *et al*.,2013;

DC.			(Chamba; Kangra; Sirmour)	Seeds, Fruits	problems, fever and cardiovascular disorders	Radha *et al.*, 2019;Supriya *et al.*, 2022

Conclusion

Livelihood-based extraction of forest resources is a common practice in every state of India, particularly,in the hilly states of Himalayan region. Himalayais enriched with the wealth of natural resources, but due to the high population density there is higher rate of extraction of these valuable resources. Forests constitute the major share in the land use of North Western Himalayan region. The tribal people of North West Himalaya are dependent on forests and various forest produce for sustaining life. These products include fruits, vegetables, pulses and cereals for nutrition, fodder for domestic animals, wood for fuel, timber for construction purposes, medicinal plants for healthcare management and plant fibres for making cloth. However, due to the excessive use, these forests have come under heavy pressure for meeting the demand of ever-increasing populations. Therefore, appropriate strategies for sustainable extraction of these forest resources are required so that they can be conserved for future generations. Scientific documentation of diversity, distribution and economic importance of different species can play significant role in the conservation and sustainable use of such plant resources.

References

Akhter, S., Shawkat, M. S. I., Parvez, M. R. and Alamgir, M. 2009. Impact of forest and non-forest villagers on Ukhia and Inani forest Range under Cox's Bazar (South) forest division, Bangladesh. Proceedings of Pakistan Academy Sciences: 46(1), 13–22.

Banday, M., Islam, M.A., Pala, N.A., Rashid, M., Ahmad, P.I., Rather, M.M. and Raja, R. 2021. Livelihood Security and Forest Resource Extraction by Forest Fringe Communities in Indian Himalayan Region. In: Kumar, M., Pala, N.A. and Bhat, J.A. (Eds.), Diversity and Dynamics in Forest Ecosystems. Apple Academic Press.

Chauhan, H.K., Gallacher, D., Bhatt, A. and Bisht, A.K. 2023. The Himalayas: A climate change laboratory. *Environmental Development*, 45 (2023): 100814.

Chauhan, N.S. 1999. *Medicinal and Aromatic Plants of Himachal Pradesh*. Indus Publishing Company, New Delhi.

Dar, M.D. and Ahmad, S. 2016. Current Status and Prospects of Fuel Wood Species in North-western Himalayan Region–A Review. *Annals of Agri-Bio Research,*21 (2): 164-167.

Dar, S.A., Gulzar, N., lone, I.M., Bhat, H.M.2020. Ethnomedicinal plants used by tribal community of district Pulwama with special references to tehsil Tral, Jammu and Kashmir – India. International Research Journals, 11(1) 1-8.

Dhyani, D., Maikhuri, R.K., Rao, K.S., Kumar, L., Purohit, V.K., Sundriyal, M. and Saxena, K.G. 2007. Basic nutritional attributes of *Hippophae rhamnoides* (Seabuckthorn) populations from Uttarakhand Himalaya, India. *Current Science*, 92(8): 1148-1152.

Dogra, K.S., Kumar, R., Kumar, S. and Sharma, R. 2017. Ethnic Plants Used in Funeral Pyre and Need for Their Conservation in Himachal Pradesh". *Journal of Non-Timber Forest Products* 24(1): 33-37.

Dutt, B., Nath, D., Chauhan, N. S., Sharma, K. R. and Sharma, S. S. 2014. Ethno-medicinal plant resources of tribal Pangi valley in district Chamba, Himachal Pradesh, India. *International Journal of Bio-resource and Stress Management*, 5(3): 416-421.

Gangwar, A.K. and Ramakrishnan, P.S. 1989. Cultivation and use of lesser known plants of food value by tribals in north-east India. *Agriculture, Ecosystem and Environment*, 25(2-3):253-267.

Gangwar, A.K. and Ramakrishnan, P.S. 1990. Ethnobiological notes on some tribes of Arunachal Pradesh, northeastern India. *Economic Botany*, 44: 94-105.

Joshi, B. and Pant, S.C. 2012. Ethnobotanical study of some common plants used among the tribal communities of Kashipur, Uttarakhand. *Indian Journal of Natural Products and Resources*, 3(2): 262-266.

Joshi, S.K., Ballabh, B., Negi, P.S. and Dwivedi, S.K. 2018. Diversity, distribution, use pattern and evaluation of wild edible plants of Uttarakhand, India. *Defence Life Science Journal*, 3(2): 126–135.

Kala, C.P. 2007. Prioritization of cultivated and wild edibles by local people in the Uttaranchal hills of Indian Himalaya. *Indian Journal of Traditional Knowledge*, 6(1): 239- 243.

Kumar, M., Rajpoot, A., Rajput, R., Sharma, J., Kumar, U., Kouser, M. and Kumar, V.P. 2023. An Ethnobotanical Study to Document the Indigenous Knowledge of Buksa Tribe of Uttarakhand, India. Advances in Research, 24(1): 38-53.

Kumar, S. 2016. Ethnobotanical Uses of Some Medicinal Plants of District Mandi, Himachal Pradesh (India). *J. Biol. Chem. Chron. 2(1)*:34-37.

Kumar, S. and Kumar, P. 2014. Medicinal Plant Diversity in Tungal Valley of District Mandi, Himachal Pradesh (India). *Asian Journal of Advanced Basic Sciences* 2(3): 103-108.

Kumar, S. and Hamal, I.A. 2009. Wild Edibles of Kishtwar High Altitude National Park in Northwest Himalaya, Jammu and Kashmir (India). *Ethnobotanical Leaflets* 13: 195-202.

Kumar, S., Priya, B. and Thakur, K. 2018. Some Traditional Herbal Remedies in Sunder Nagar Tehsil of District Mandi (H.P.). *CPUH-Research Journal* 3(2): 155-159.

Kumar, S., Raj, H. and Sharma, J. 2013. Ethnobotanical Explorations in the Balh Valley Region of North Western Himalaya. *International Journal of Scientific Research* 2(7): 40-44.

Kumari, K. and Saggoo, M.I.S. 2015. Traditional and Ethnomedicinal uses of some grasses (Poaceae) of Kinnaur, Himachal Pradesh, India. *Annals of Plant Sciences*, 4(10): 1195-1198.

Kundu, S. and Pal, T. 2018. Cultural, Ecologyand Resource management: A Geographical Study on Raji tribe of Uttarakhand. *International Journal of Research and Analytical Reviews*, 5(2): 1160-1168.

Maikhuri, R.K., Semwal,R. L., Singh,A. and Nautiyal, M.C. 1994. Wild fruits as a contribution to sustainable rural development: a case study from the Garhwal Himalaya. The International Journal of Sustainable Development and World Ecology, 1(1): 56-68. DOI:10.1080/13504509409469861

Martin, G. J. 1995. *Ethnobotany: A methods manual*. Chapman and Hall, London.

Mathur, A. and Joshi, H. 2013. Ethnobotanical Studies of the Tarai Region of Kumaun, Uttarakhand, India. *Ethnobotany Research & Applications* 11: 175-203.

Ndoye, O., Ruiz-Perez, M. and Eyebe, A. 1998. The markets of non-timber forest products in the humid forest zone of Cameroon. Rural Development Forestry Network Paper 22c, Winter 1997/98.

Negi, P.S. and Subramani, S.P. 2015. Wild edible plant genetic resources for sustainable food security and livelihood of Kinnaur district, Himachal Pradesh, India. *International Journal of Conservation Science*, 6(4): 657-668.

Negi, V.M. and Chauhan, N.S. 2009. Medicinal and Aromatic Plants Wealth of a Tribal District Kinnaur in Himachal Himalayas.*The Indian Forester*, 135(6): 838-852. DOI: 10.36808/if/2009/v135i6/645

Neumann, R.P. and Hirsch, E. 2000. *Commercialisation of non-timber forest products: review and analysis of research.* Center for International Forestry Research, Indonesia.

Nisha and Rao, P. B. 2021. Diversity of some important wild edible plants of Kumaon Uttarakhand. A review. *Agric. Rev.*, 42(4): 371-380.

Pandey, R., Harrison, S. and Gupta, A. K. 2013. Resource availability versus resource extraction in forests: Analysis of forest fodder system in forest density classes in lower Himalayas, India. *Small Scale Forestry*. DOI: 10.1007/s11842-013-9253-3

Phillips, O. 1993. The potential for harvesting fruits in tropical rainforests: New data from Amazonian Peru. Biodiversity and Conservation 2:18-38.

Prakash, O., Samant, S.S., Yadava, A.K., Kumar, V., Dutt, S. and Singh, A. 2020. Diversity, distribution and indigenous uses of wild edible plants used by the tribal community (Pangwal) in Pangi valley, Chamba of Himachal Pradesh, North- Western Himalaya. *International Journal of Chemical Studies* 2020; 8(3): 2424-2437. DOI: https://doi.org/10.22271/chemi.2020.v8.i3ai.9573

Radha, Puri, S. and Kumar, S. 2019. An ethnobotanical study of wild medicinal plants used by migratory shepherds – A tribal community of Western Himalayas. *Asian Journal of Pharmaceutical and Clinical* Research, 12(4): 137-144. DOI:10.22159/ajpcr.2019.v12i4.31130

Rana, D., Bhatt, A. and Lal, B. 2019. Ethnobotanical knowledge among the semi-pastoral Gujjar tribe in the high altitude (Adhwari's) of Churah subdivision, district Chamba, Western Himalaya. *Journal of Ethnobiology and Ethnomedicine*, 15(1):10.https://doi.org/10.1186/s13002-019-0286-3

Rani, S. Rana, J. C. and Rana, P. K. 2013. Ethnomedicinal plants of Chamba district, Himachal Pradesh, India. *Journal of Medicinal Plants Research*, 7(42): 3147-3157. DOI: 10.5897/JMPR2013.5249

Rasul, G., Choudhary, D., Pandit, B.H. and Kollmair, M. 2012. Poverty and livelihood impacts of a medicinal and aromatic plants project in India and Nepal: an assessment. *Mt Res Dev*., 32: 137–49.

Samant, S. S., Pant, S., Rana, M.S. and Lal, M. 2007. Medicinal plants in Himachal Pradesh, north western Himalaya, India. *International Journal of Biodiversity Science and Management*, 3(4): 234–251.

Schild, A. 2008. The case of hindu kush Himalaya-ICIMOD's position on climate change and mountain systems. *Mt. Res. Dev.,* 28 (3/4): 328-331.

Sharma, J., Gairola, S., Gaur, R.D. and Painuli, R.M.2011. Medicinal plants used for primary healthcare by Tharu tribe of Udham Singh Nagar, Uttarakhand, India. *Int. J. Med. Arom. Plants*, 1(3): 228-233.

Sharma, R. 2022. Study of ethno-medicinal plant of Himachal Pradesh. *Spectrum of Emerging Sciences*, 2 (1): 29-35.

Shit, P. K. and Pati, C. K. 2012. Non-timber forest products (NTFPs) for livelihood security of tribal communities: A case study in Paschim Medinipur district, West Bengal. *Journal of Human Ecology*, 40(2), 149–156. DOI:10.1080/09709274.2012.11906533

Singh, V. and Chauhan, N.S. 2005. Traditional practices of herbal medicines in the Lahaul valleys, Himachal Himalayas. Indian Journal of Traditional Knowledge, 4(2): 208-220.

Singhal, P. and Kumar, S. 2018. Herbal Medicines Used for the Treatment of *Diabetes Mellitus* in Paonta Sahib Tehsil of District Sirmour, Himachal Pradesh (India).*Sci. and Cult.* 84 (7–8) 268-271.

Sood, S.K. and Thakur, S. 2004. *Ethnobotany of Rewalsar Himalaya*. Deep Publications.

Sood, S.K., Kumar, S., Bassi, S.K. and Rana, J.C. 2012. *Ethnobotany of the Heritage Region of Shiwalik Himalaya.*Anamika Publishers & Distributors, Delhi.

Sood, S.K., Kumar, S. Dogra, K.S. and Sharma, R. 2011. Alien Plants Distribution and Ecology in the Temple-Courtyards of Himachal Pradesh (N.W. Himalaya). *Himachal Pradesh University Journal*, pp 1-11.

Sundriyal, M. and Sundriyal, R.C. 2004. Wild edible plants of Sikkim Himalaya: Marketing, value addition and implications for management. *Economic Botany* 58(2):300-315.

Supriya, K., Chauhan, K. and Sagar, A. 2022. Survey of Ethnobotanical Medicinal Plants Used by Gaddi Tribal Community in Village Bandi District Kangra, Himachal Pradesh (India). *International Journal of Science and Research*, 11(1): 622-628. DOI: 10.21275/SR22112131915

Thakur, K.S., Kumar, M., Bawa, R. and Bussmann, R.W. 2014. Ethnobotanical Study of Herbaceous Flora along an Altitudinal Gradient in Bharmour Forest Division, District Chamba of Himachal Pradesh, India. *Evidence-Based Complementary and Alternative Medicine*, 2014: 946870. http://dx.doi.org/10.1155/2014/946870

Tiwari, J.K., Ballabha, R. and Tiwari, P. 2010. Some Promising Wild Edible Plants of Srinagar and its Adjacent Area in Alaknanda Valley of Garhwal Himalaya, India. *Journal of American Science*, 6(4): 167-174.

Uniyal M.R. and Chauhan, N.S. 1971. Medicinal Plants of Uhal Valley in Kangra Forest Division, H.P. *J. Res. Ind. Med.* VI (3): 287-289.

Uniyal M.R. and Chauhan, N.S. 1972. Commercially important Medicinal Plant of Kullu Forest Division, Himachal Pradesh. *Nagarjun* XV(ll): 28-32.

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