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Wild Edible Plant Resources of the Baspa Valley, Kinnaur, Himachal Pradesh, North Western Himalaya, India

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***Abstract*:** The study was conducted in the Baspa Valley of district Kinnaur, Himachal Pradesh to know the diversity, distribution and conservation status of wild edible plants. A total of 95 wild edible plants belonging to 41 families and 76 genera were recorded, out of this 38 species were native to the Himalayan Region and 11 species were native to the Himalayan and other biogeographical regions together. Two species, i.e., *Bergenia stracheyi* and *Pinus gerardiana* were endemic and 20 species were near-endemic to the Himalayan region. The 15 species are in various threat categories of the IUCN redlist and Conservation Assessment and Management Prioritization 2003 and 2010 list. Leaves and fruits were utilized in the majority of cases. Thirty-nine species were most preferred and commonly utilized however 58 species were utilized occasionally as per need and availability. Currently consumption of wild edible plants and the knowledge associated is declining due to a number of reasons. Therefore, conservation of natural habitats, frequent monitoring of populations and habitat, domestication through the development of cultivation techniques, awareness programmes for the conservation of plants, traditional knowledge and development of value addition products needed for food, nutrition and economic security of the region.

***Keywords*:** Baspa Valley, Conservation, Diversity, Kinnaur, Threat status, Wild edibles

Plants have been used by human beings as a source of food as well as medicine from time immemorial. The Indian Himalayan Region (IHR) is one of the world's richest biological diversity reserves. Due to wide variation in altitude, climate and ecological niche IHR supports approximately 47.06 % of flowering plants in India (Samant and Dhar 1997) of which 30% are endemic. This existing biodiversity is utilized by Himalayan communities for fulfilling daily household needs viz., food, fodder, fuel, timber, medicine, fiber, agricultural/household items and to perform various traditional rituals .Wild plants are the major source of food for rural and tribal communities residing in IHR and they often collect different parts of wild edible plants viz., roots, stems, leaves, flowers, fruits and seeds as per their seasonal availability. *Rhododendron arboreum, Bombax ceiba, Ficus palmata, Myrica esculenta, Zanthoxylum armatum, Ziziphus mauritiana, Diplazium esculentum, Indigofera heterantha, Bauhinia variegata*, *Morchella esculenta* and *Aegle marmelos* are some of the common examples of edible food plants of IHR (Lal et al 2018, Prasad and Sharma 2018 and Negi et al 2020). Due to limited income sources majority of people residing in IHR collects and consume wild edible plants as supplementary or substitute food and also market them as economic source (Prasad and Sharma 2018). Due to medicinal and curative properties, these plants are also used as protective foods (Sathyavathi and Janardhanan 2014) and in times of scarcity of fresh vegetables especially in winter the dried or preserved forms of these plants also act as an important source of supplementary food for tribal communities(Samant et al 2001). Instead of huge potential in local, national and international market, the use of these wild edible plants is limited to certain areas/communities. There is vast scope for enhancing the wide acceptability of wild edibles as an income generating source for the people of IHR and a potential plant resource for human consumption (Sen et al 2013). History also reveals that wild edible plants have helped people survive wars and natural disasters (Redzic et al 2010, Turner et al 2011). Although the usage of wild edible plants is diminishing very fast throughout the world there are many parts of the world too, where the communities are still using them for fulfilling their dietary needs (Ali-Shtayeh et al 2008) especially in those regions where vegetable cultivation is done in the small scale and market supplies are limited due to road connectivity and other climatic issues.

Like other Himalayan states, the state of Himachal Pradesh is also rich in edible plant resources. The rural and tribal people of Himachal Pradesh also utilize wild edibles to meet their food, nutritional and medicinal requirements. In Himachal Pradesh various studies have been conducted by different workers on wild edible plant diversity, distribution and consumption pattern (Rana et al 2012, Sen et al 2013, Sharma and Sood 2013, Singh et al 2014, Negi and Subramani 2015, Lata et al 2016, Thakur et al 2017, Sharma et al 2018 and Paul 2021) in North Western Himalaya of

India. The weather conditions of Kinnaur are very variable, and the region is also home to a wide variety of plants. However, a study on wild edible plants has not been undertaken in the Baspa Valley of district Kinnaur. Therefore, the present study has been conducted to assess diversity, distribution, and utilization patterns and conservation status to suggest management options for the conservation of wild edible plants.

MATERIAL AND METHODS

Extensive and intensive surveys were carried out in Sapni, Barua, Shong, Chansu, Kupa, Kamru, Mone, Batseri, Themgarang, Rakcham and Chhitkul villages of Baspa valley of district Kinnaur of Himachal Pradesh. The study area lies between 31°11′48.13″ N – 31°30′17.16″ N latitudes and 78°06′03.71″ E – 78°52′41.75″ E longitudes (Fig. 1, 2). The elevation range of this valley is 1800 to 5480 m above mean sea level.The valley faces in the directions of northwest to southeast and the river Baspa flows middle of the valley. The valley has alpine, subalpine and temperate vegetation and forests are dominated by *Cedrus deodara,Betula utilis*, *Pinus wallichiana*, *Picea smithiana* and *Abies pindrow* communities and medicinal and aromatic plants, as well as other herbaceous species in sub-alpine and alpine regions. The population of the Baspa valley is approximately 14042 inhabitants comprising 3065 households. For the information collection on wild edible species, oral interviews, personal observations and conversations with locals were used. The locals verbally consented to the transmission of their traditional wisdom (Martin 1995, Collins et al 2006). From each village, knowledgeable persons were interviewed through semi-structured questionnaires. The knowledgeable tribal people were those who have been using wild edible plants for the last 30-40 years. One knowledgeable person was hired from each village for the collection of fresh samples of the wild edible species. The gathered samples were identified using regional using various sources (Nair 1977, Chowdhery and Wadhwa 1984, Polunin and Stainton 1984, Aswal and Mehrotra 1994, Dhaliwal and Sharma 1999 ,Singh and Rawat 2000). All identified species were listed and analyzed for diversity following Samant et al (1998). Index Kewensis and The World Flora Online were followed for nomenclature and nativity (Anonymous 1885) (https://www.worldfloraonline.org). Native species were those that originated or were first reported in the Himalayan region. Species endemism was determined based on species distribution. The species found only in the Himalaya have been regarded as endemic, while those found in adjacent countries were classified as near-endemic (Samant et al 1998 and Rana and Samant 2011).

RESULTS AND DISCUSSION

In the present study, 95 wild edible species belonging to 76 genera and 41 families were recorded from the Baspa valley of district Kinnaur and 86 species belong to angiosperms, 4 to gymnosperms, 2 to pteridophytes and 3 of fungus. These species represented trees (13 spp.), shrubs (21 spp.), herbs (56 spp.), climbers (2 spp.) and fungus (03 spp.). Among families, Rosaceae, Apiaceae and Polygonaceae were dominant families, represented by maximum species (14, 8 and 6 spp., respectively) followed by Asteraceae, Ericaceae and Grossulariaceae and Berberidaceae (04 spp., each), Panaceae and Elaeagnaceae (03 spp., each). Among the genera, *Ribes, Cotoneaster, Rubus, Berberis, Prunus, Utica, Pinus, Viola, Impatiens, Heraclium, Hippophae* and *Allium* were dominant

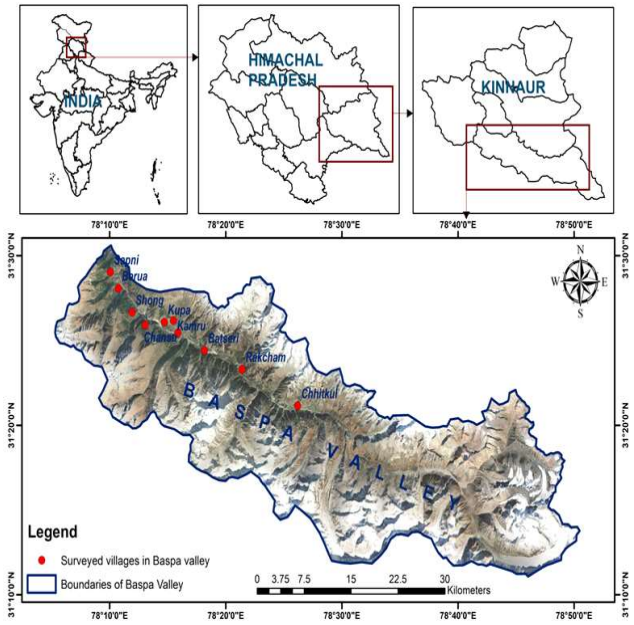

Fig. 1. Baspa valley in Kinnaur district of Himachal Pradesh

Fig. 2. General view of Baspa valley, Kinnaur, Himachal Pradesh

genera. The 38 species were native to the Himalayan region, 11 species native to the Himalayan region and other bio-geographical regions collectively, and the remaining species were not native to the Himalayan region.*Bergenia stracheyi* and *Pinus gerardiana* were endemic and 20 species were near-endemic to the Himalaya (Table 1). Total 39 species were the most preferred and commonly utilized by local tribal communities collected from forest, bounds of agriculture fields and orchards. Besides this, 58 species were also utilized occasionally by tribal communities as per need and availability. Various parts of these plants such as fruits, leaves, stems, flowers, rhizomes, roots, etc., are eaten in either raw or cooked form *i.e.*, boiled, roasted, fried, as flavoring agent or spices, juice, tea etc. (Fig. 3). Amongst the parts used, leaves were the most edible part (34 spp.), followed by fruits, seeds, roots and flowers (Fig. 4).

Amongst the edible species reported eleven species fall under various threat categories. *Dactylorhiza hatagirea* is critically endangered; *Angelica glauca, Dioscorea deltoidea, Podophyllum hexandrum*, *Taxus wallichiana* are endangered and the remaining six species, *Bergenia stracheyi*, *Allium stracheyi, Bunium persicum*, *Ferula jaeschkeana*, *Rhododendron anthopogon* and *Rheum australe* are vulnerable (Ved et al 2003, Anonymous 2010). As per the IUCN Red List, *Angelica glauca, Dactylorhiza hatagirea* and *Taxus wallichiana* are Endangered, (Thomas and Farjon 2011, Ved et al 2015, Chauhan 2022); *Pinus gerardiana* is Near Threatened (Farjon 2013).

The extreme cold and tough geographical condition of the Baspa valley enforces the tribal people to depend on these plants. *Pinus gerardiana, Prunus mira*, *Prunus armeniaca*, *Bhunium persicum, Carum carvi* and *Morchellla esculenta* are the major species having huge market potential also contributes significantly in improving economic conditions of locals. *Pinus gerardiana* is multipurpose tree which contributes significantly in improving livelihood of Kinnaura tribal communities. Locals inhabitants uses Chilgoza as part of various social obligations and also earn money INR 1,500–1,800/ kg by selling the Chilgoza nuts locally and use it for fulfilling their daily household needs (Lata et al 2020). Currently local inhabitants of Kinnaur are also earning INR 1200-1800/ltr by selling seeds oil of Chuli and Bemi in local market. In addition, local women folk also earn INR 1000/-1500/ltr locally by selling traditional liquors (Chul Rak, Regu Rak) obtained from fruits of Chuli and Bemi (Lata et al 2021). The local inhabitants collect Kala-jeera and Mako-jeera during the period June-July from forest and sold in the local market at prices of Rs. 2000/kg and Rs. 500/kg, respectively (Paul 2021; Klate et al. 2023).

This usage of wild edible plants is gradually declining due

Fig. 3. Some wild edible plants of Baspa Valley in Kinnaur district

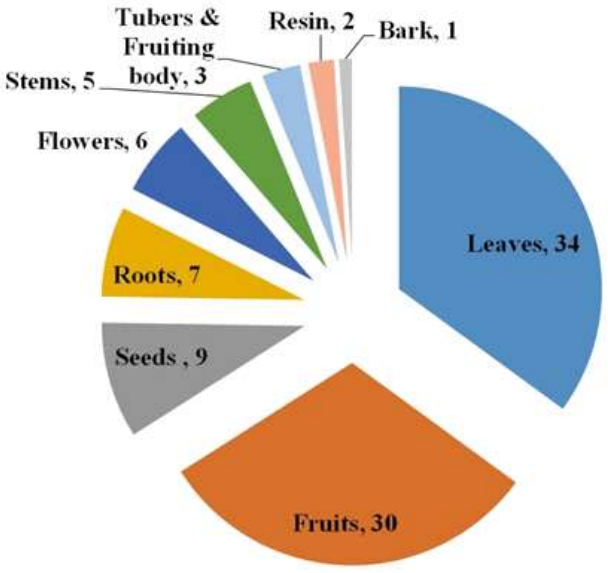

Fig. 4. Part used of wild edible plants of Baspa Valley in Kinnaur district

Table 1. Diversity, local name, indigenous uses and life form of wild edible plants of Baspa Valley, Kinnaur, Himachal Pradesh, North Western Himalaya, India

Taxa	Family	Local Name	Life form	Parts used	Indigenous uses	Nativity
Aesculus indica (Wall. ex Cambess.) Hook.*	Sapindaceae	Knor	Tree	Seeds	Seeds flour is used for preparation of roti.	Reg Himal
Agaricus campestris L.	Agaricaceae	Chatri, Mo	Fungus	Fruiting body	Eaten as vegetable.	--
Alliaria petiolata (M. Bieb.) Cavara & Grande	Brassicaceae	--	Herb	Leaves	After boiling leaves are roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Eurasia
Allium humile Kunth	Amaryllidaceae	Kuthae, Jungli Pyzai	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable. Dried leaves are also used as spice in food items.	Ind Or
Allium stracheyi Baker	Amaryllidaceae	Kuthae, Jungli Pyzai	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Himal
Angelica glauca Edgew.	Apiaceae	Chora, Sapal	Herb	Roots	Root powder is used as a spice in food items. Root is also used to cure stomach related problems.	Reg Himal
Arisaema jacquemontii Blume*	Araceae	Jamashang	Herb	Tubers	After fermentation tubers used for preparation of traditional alcoholic beverage 'Jamashang'.	Reg Himal
Artemisia scoparia Waldst. & Kitam	Asteraceae	--	Herb	Stem	Decoction of the stem used to cure hair related problems.	Europe Oriens Ind Or
Berberis aristata DC.*	Berberidaceae	Chutrum	Shrub	Fruits	Riped fruits are eaten. Decoction of roots also used to cure eye problem.	Reg Himal
Berberis asiatica Roxb. ex DC.	Berberidaceae	Chutrum	Shrub	Fruits	Riped fruits are eaten. Decoction of roots also used to cure eye problem.	Reg Himal
Berberis lycium Royle*	Berberidaceae	Chutrum	Shrub	Fruits	Riped fruits are eaten. Decoction of roots also used to cure eye problem.	Reg Himal
Bergenia stracheyi (Hook.f. & Thomson) Engl.**	Saxifragaceae	Rachukanang	Herb	Leaves	Leaves are chopped and mixed with gram flour and spices by adding water and eaten as pakoras by frying in oil.	Reg Himal Mexico Amer
Bistorta affinis (D.Don) Greene *	Polygonaceae	Susilang	Herb	Seeds	Raw seeds are eaten.	Reg Himal
Bunium persicum B.Fedtsch	Apiaceae	Kala-jeera	Herb	Seeds, Tubers	Decoction of the seeds used to cure stomachache. Seeds also used as spice in food items. Root tubers eaten after proper cleaning.	Persia
Cannabis sativa L.	Cannabaceae	Sulfa	Herb	Leaves	Leaves are mixed with gram flour and spices by adding water and eaten as pakoras by frying in oil.	As Centr Reg Himal Bor Occ
Capsella bursa-pastoris (L.) Medik.	Brassicaceae	Tiskan	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Temp
Cardamine impatiens L.	Brassicaceae	--	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Europe As
Carum carvi Linn	Apiaceae	Mako zeera	Herb	Leaves, Seeds, Roots	Decoction of the seeds used to cure stomachache, leg pain and leukorrhea. Seeds also used as spice in food items.	Europe As Bor

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Table 1. Diversity, local name, indigenous uses and life form of wild edible plants of Baspa Valley, Kinnaur, Himachal Pradesh, North Western Himalaya, India

Taxa	Family	Local Name	Life form	Parts used	Indigenous uses	Nativity
Cassiope fastigiata (Wall.) D.Don*	Ericaceae	Tishur	Herb	Flowers	Flowers are dried and used in salted tea preparation. Decoction of flowers also used to cure stomach related problems.	Reg Himal
Cedrus deodara (Roxb. ex D. Don) G Don*	Pinaceae	Kyalbang	Tree	Resin	Resin chewed for stronger gums.	Reg Himal
Celtis australis L.	Ulmaceae	Kharak, Kru	Tree	Fruits	Riped fruits eaten.	Europe As Temp Ind Or
Chaerophyllum villosum Wall. & DC	Apiaceae	--	Herb	Roots	Roots are eaten.	Reg Himal
Chenopodium album L.	Chenopodiaceae	Bathua	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Temp et Trop
Cicer microphyllum Royle ex Benth.	Fabaceae	--	Herb	Seeds	Seeds are eaten.	Soongar Reg Himal Bor Occ
Cirsium wallichii var. *glabratum* (Hook. f.) Wendelbo*	Asteraceae	Tee cho	Herb	Roots	After boiling in water roots are eaten.	Reg Himal
Cotoneaster bacillaris Wall. ex Lind*	Rosaceae	--	Shrub	Fruits	Ripe fruits are eaten.	Reg Himal
Cotoneaster microphyllus Wall. ex Lindl.	Rosaceae	--	Shrub	Fruits	Ripe fruits are eaten.	Reg Himal
Cotoneaster nummularius Fisch.& C.A.Mey.	Rosaceae	--	Shrub	Fruits	Ripe fruits are eaten.	Afr Bor Oriens
Cousinia thomsonii C.B.Clarke*	Asteraceae	Tee cho	Herb	Roots	After boiling in water roots are eaten.	Reg Himal
Cuscuta reflexa Roxb.	Convolvulaceae	Amarbel	Climber	Stem	Decoction consumed to cure blood related problems.	Ind Or
Dactylorhiza hatagirea (D.Don.) Soo*	Orchidaceae	Salampanja	Herb	Roots	Tubers eaten to cure sexual debility.	Europe Afr Bor Oriens Reg Himal
Dioscorea deltoidea Wall.ex Griseb.	Dioscoreaceae	Singli-Mingli	Climber	Tubers	Tubers boiled and fried in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	As Trop
Diplazium esculentum (Retz.) Sw.	Dryopteridaceae	Lingad	Herb	Curled fronds	Fronds are chopped into small pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Himal
Dipsacus inermis Wall.	Dipsacaceae	Tis kan	Herb	Leaves	Leaves eaten as vegetable.	Reg Himal
Elaeagnus parvifolia Wall. ex. Royle	Elaeagnaceae	Ral, Ralla	Shrub	Fruits	Riped fruits eaten.	Japan
Equisetum arvense L.	Equisetaceae	Kinang, Paccu	Herb	Fertile Stem	Young shoots edible.	--
Eremurus himalaicus Baker*	Liliaceae	Yam Kan	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Himal
Fagopyrum acutatum Mansf. ex. K Hammer	Polygonaceae	Jungli Olgo Kan	Herb	Leaves	The leaves are cut into smaller pieces and roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Himal China
Ferula jaeschkeana Vatke	Apiaceae	Kedmo, Sapal	Herb	Roots	Root powder used as spice in food items. Root also used to cure stomach related problems.	Himal Bor Occ Turkestan
Fragaria nubicola (Lindl. ex Hook.f.) Lacaita	Rosaceae	Babashoch	Herb	Fruits	Riped fruits eaten.	Ind Or Sikkim

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Table 1. Diversity, local name, indigenous uses and life form of wild edible plants of Baspa Valley, Kinnaur, Himachal Pradesh, North Western Himalaya, India

Taxa	Family	Local Name	Life form	Parts used	Indigenous uses	Nativity
Gaultheria trichophylla Royle	Ericaceae	--	Shrub	Fruits	Riped fruits eaten.	Reg Himal
Girardinia diversifolia (Link) Friis	Urticaceae	Bogthor, Khorgya	Herb	Leaves	The leaves are cut into smaller pieces and boiled in water by adding salt, chilly, onion and garlic, seed paste of wild apricot and eaten as vegetable.	Ind Or Malaya
Heracleum candicans Wall. ex DC.	Apiaceae	Poryal	Herb	Shoots	Tender shoots eaten with curd.	Reg Himal Ind Or As Trop
Heracleum pinnatum C.B. Clarke	Apiaceae	Hungshuli	Herb	Shoots	Young shoots eaten as vegetable.	Reg Himal
Hippophae salicifolia D.Don*	Elaeagnaceae	Surch, Surchu	Shrub	Fruits, Leaves	Riped fruits are eaten and juice is also prepared. Dried fruits and leaves also used for preparation of tea.	Reg Himal
Hippophae tibetana Schltdl.	Elaeagnaceae	Surch, Surchu	Shrub	Fruits, Leaves	Riped fruits are eaten and juice is also prepared. Dried fruits and leaves also used for preparation of tea.	Europe As Temp
Impatiens glandulifera Royle.	Balsaminaceae	Ticktoc	Herb	Seeds	Seeds edible.	Reg Himal
Impatiens sulcata Wall.*	Balsaminaceae	Ticktoc	Herb	Seeds	Seeds edible.	Reg Himal
Indigofera heterantha Wall. ex Brandis	Fabaceae	Kasting	Shrub	Flowers	Eaten as vegetable.	Reg Himal
Juglans regia L.*	Juglandaceae	Ka	Tree	Nuts/Seeds	Nuts edible and seed paste also used for preparation of salted tea.	As Occ Reg Himal
Lectuca dolichophylla Kitam.	Asteraceae	--	Herb	Leaves	Eaten as vegetable.	Reg Himal
Lepidium latifolium L.	Brassicaceae	Tis kan	Herb	Leaves	Eaten as vegetable.	Europe As Bor Oriens
Malus baccata (L.) Borkh.	Rosaceae	Khontli	Tree	Fruits	Riped fruits eaten.	Reg Himal As Bor
Malva verticillata L.	Malvaceae	--	Herb	Leaves	Leaves eaten as vegetable.	Europe As et Afr Bor
Medicago falcata L.	Ericaceae	--	Herb	Leaves	Tender leaves used as vegetable.	Geront Bor Temp
Mentha longifolia (L.) L.	Lamiaceae	Horsemint	Herb	Leaves	Leaves used for preparation of tea.	Reg Bor Temp
Morchella esculenta Fr.	Morchellaceae	Rangmoch, Zangmoch	Fungus	Fruiting body	Fruiting bodies is properly cleaned and roasted in oil by adding spices. Soup is also prepared form it which is used to cure body weakness, loss of appetite and leg pain.	--
Nasturtium officinale R.Br.	Brassicaceae	Bolku	Herb	Leaves	The leaves are cut into smaller pieces and fried in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Ind Or China
Origanum vulgare L.	Lamiaceae	Ban ajwain	Herb	Leaves	Leaves used for preparation of tea and chutney.	Europe As et Afr
Oxalis corniculata L.	Oxalidaceae	Indian sorrel, Khatti-mithi	Herb	Leaves	Leaves used for preparation of chutney.	Amphig Temp et Trop
Oxyria digyna (L.) Hill	Polygonaceae	Shupchu	Herb	Leaves	Eaten raw or cooked.	Reg Bor Alp et Arct
Phytolacca acinosa Roxb	Phytolacaceae	Zorbo	Herb	Leaves	The leaves are cut into smaller pieces and fried in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Himal, China

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Table 1. Diversity, local name, indigenous uses and life form of wild edible plants of Baspa Valley, Kinnaur, Himachal Pradesh, North Western Himalaya, India

Taxa	Family	Local Name	Life form	Parts used	Indigenous uses	Nativity
Pinus gerardiana Wall.ex D.Don**	Pinaceae	Neoza, Ree	Tree	Seeds	Raw and roasted seeds are eaten as dry fruit. Garlands prepared from seeds used to express love and respect to relative, guest and deities. Seed paste also used for preparation of salted tea.	Reg Himal
Pinus wallichiana A.B. Jacks	Pinaceae	Lim	Tree	Resin	Resin chewed for stronger gums.	Reg Himal
Plantago depressa Willd.	Plantaginaceae	--	Herb	Leaves	Tender leaves are eaten as vegetable.	Sibir
Polygonum molle D. Don	Polygonaceae	--	Herb	Stem	Tender stem edible.	Reg Himal
Prunus armeniaca L.	Rosaceae	Chul	Tree	Fruits	Fruits are eaten raw or after drying in sun. Fruits used for the preparation of traditional alcoholic beverage Rak or Arak' which is generally consumed by locals in marriages and festive occasions and also used for worshipping deities. Fruits eaten with 'Sattu' by preparing special dish 'Chul Phanting'. Seeds paste boiled with rice by adding salt and eaten as 'Remo thukpa'. Garlands prepared from seeds used to express love and respect to relative, guest and deities.	Reg Caucas
Prunus cornuta (Wall. ex Royle) Steud	Rosaceae	Krun	Tree	Fruits	Riped fruits eaten.	Ind Or
Prunus mira Koehne	Rosaceae	Reg	Tree	Fruits	Fruits are eaten raw. Fruits used for the preparation of traditional alcoholic beverage Regu Rak' which is generally consumed by locals in marriages and festive occasions and also used for worshipping deities. Seeds paste boiled with rice by adding salt and eaten as 'Remo thukpa'. Garlands prepared from seeds used to express love and respect to relative, guest and deities.	China
Pyrus pashia Buch.-Ham. ex D.Don	Rosaceae	Kainth	Tree	Fruits	Riped fruits eaten.	Reg Himal
Ramaria abietina(Pers) Quel.	Gomphaceae	Chayen	Fungus	Fruiting body	Fruiting bodies is properly cleaned and roasted in oil by adding spices.	--
Rheum australe D.Don	Polygonaceace	Aarch, Archa, Chuchi	Herb	Leaves	Used for making chutneys.	Reg Himal
Rhododendron anthopogon D.Don	Ericaceae	Peek Saimanang, Mutik	Herb	Flowers	Used for preparation of tea.	Ind Or Reg Himal Zeylan
Ribes alpestre Wall. ex Decne.	Grossulariaceae	Cho Shoch	Shrub	Fruits	Riped fruits eaten.	Europe Afr Bor Reg Himal China
Ribes glaciale Wall.	Grossulariaceae	Rang shoo	Shrub	Fruits	Riped fruits eaten.	Reg Himal
Ribes himalense Royle ex Decne	Grossulariaceae	Khali Shoch	Shrub	Fruits	Riped fruits eaten.	China

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Taxa	Family	Local Name	Life form	Parts used	Indigenous uses	Nativity
Ribes orientale Desf.	Grossulariaceae	Cho Shoch	Shrub	Fruits	Riped fruits eaten.	Reg Himal
Ribes rubrum L.	Grossulariaceae	Ralashoo	Shrub	Fruits	Riped fruits eaten.	
Rosa macrophylla Lindl.*	Rosaceae	Rose, Lama uh.	Shrub	Fruits	Riped fruits eaten.	Reg Himal, China
Rubus niveus Thunb.	Rosaceae	Roksoch	Shrub	Fruits	Riped fruits eaten.	Reg Himal
Rubus ellipticus Sm.	Rosaceae	Hinsar, Choshoch	Shrub	Fruits	Riped fruits eaten.	Ind Or
Rubus fruticosus Hegetschw.	Rosaceae	Blackberry, Chosho	Shrub	Fruits	Riped fruits eaten.	Europe
Rumex nepalensis Spreng.	Polygonaceae	Jungli Palak	Herb	Leaves	Tender leaves eaten as vegetable.	As Occ Ind Or Malaya AfrAustr
Silene vulgaris (Moench) Garcke	Caryophyllaceae	Shoshor	Herb	Leaves	Leaves are roasted in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Europe, Temp Asia and Northern Africa
Podophyllum hexandrum Royle	Berberidaceae	Bankakdi	Herb	Fruits	Riped fruits eaten.	Ind Or As Trop
Solanum nigrum L.	Solanaceae	Black Night Shade, Makoi	Herb	Fruits	Riped fruits eaten.	Trop Geront
Sorbus lanata (D.Don) S.Schauer	Rosaceae	Bolu	Tree	Fruits	Riped fruits eaten.	Reg Himal
Taraxacum officinale F.H.Wigg.	Asteraceae	Bitterwort, Kan	Herb	Leaves	Tender leaves and flowers are chopped into small pieces and fried in oil by adding salt, chilly, onion and garlic and eaten as vegetable.	Reg Temp Bor et Austr
Taxus wallichiana Zucc.	Taxaceae	Sang cha	Tree	Bark	Bark is boiled in water by adding salt, milk and butter and taken as salted tea 'Cha Cha'.	Reg Himal
Thymus linearis Benth.	Lamiaceae	Ban Ajwain	Herb	Leaves	Used for preparation of tea and chutney.	Europe As et Afr BorHispan
Urtica dioca L.	Urticaceae	Bichu-buti, Choya	Herb	Leaves	The leaves are cooked in water by adding salt and paste of wild apricot.	Reg Bor Temp
Urtica hyperborea Jacq. ex Wedd.	Urticaceae	Bichu-buti, Choya	Herb	Leaves	The leaves are cooked in water by adding salt and paste of wild apricot.	Reg Himal
Viburnum cotinifolium D. Don*	Caprifoliaceae	Sussu, Tustus	Shrub	Fruits	Riped fruits eaten.	Reg Himal
Viola biflora L.	Violaceae	Banaksha	Herb	Flowers	Flowers eaten to cure fever.	Reg Bor Temp
Viola serpens Wall. ex Ging.	Violaceae	Banaksha	Herb	Flowers	Flowers eaten to cure fever.	Reg Himal

Abbreviations used: **= Endemic; ***= Near endemic; Reg=Region; Himal=Himalayan; Amer=America; Bor=Boreal; Temp=Temperate; Centr=Central; As=Asia; et=And; Trop= Occ=Occidentalis; Or=Oriental; Caucas=Caucasus; Ind=Indian; Afr=Africa; Trop=Tropical; Amphig=Amphigaea; Alp=Alpine; Arct=Arctic; Geront=Gerontia; Sibir=Siberia; Austr=Australia

lack of usage knowledge among younger generation as they are showing more interest in tourism and horticulture and in most of the areas the traditional knowledge and practice of these species has been remained restricted only to the elder people. Currently, continuously changing climatic conditions coupled with anthropogenic factors such as unsustainable harvesting practices, construction of hydropower projects, roads, buildings, tourism activities and horticultural expansion affecting natural population of wild edible plants. Along with these modernizations, westernization, migration of local inhabitants in cities for education of children and jobs etc., are also contributing towards the lesser utilization of edible wild plants.

Baspa valley represents a rich diversity of wide edible

plant plants which has huge potential in supplementing the food requirements of local inhabitants and reducing the susceptibility to food insecurity especially during drought and other adverse calamitic conditions. The climatic conditions of Baspa valley is harsh and the majority of the area of valley remains disconnected with outside world especially during winter time due to heavy snow fall. Due to which locals do not have year-round access as well as consistent availability and supply of food resources like other parts of the state hence people are forced to utilize these available wild plants in dried or preserved forms when fresh vegetable and fruits are not available.

CONCLUSIONS

Present study provides detailed information on diversity, indigenous uses, distribution pattern, threat status and utilization pattern of wild edible plants used by inhabitants of Baspa Valley. Inventory of 95 wild edible species belonging to 14 families and 76 genera, mostly represented by herbs indicated unique utilization pattern. These wild plants contribute significantly in supplementing the food requirements of local inhabitants in tough climatic conditions especially in winters when entire area is covered with snow. The usage of endemic (2 species) and near endemic (20 species) and threatened plants (15 species) also shows high conservation value. Therefore, population assessment, habitat monitoring, development of sustainable harvesting methods, awareness and field demonstration programmes on sustainable harvesting methods for inhabitants, development of cultivation techniques through conventional and in vitro methods, establishment of germplasm banks, evaluation of nutraceutical potential and value addition for livelihood support suggested for conservation and sustainable management suggested.

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