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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

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Abstract
The native communities of the Indian Himalayan Region are largely dependent on plant resources for their sustenance. Among the economically important plants, wild edibles are consumed as raw, roasted, boiled, fried, cooked or in the form of oil, spice and seasonal material i.e., jams and pickles. The local communities have rich knowledge base indigenous uses and traditional practices, but require proper documentation for their long time conservation. The present study is an attempt to assess the wild edibles of Pangi valley, located in Chamba District of Himachal Pradesh. Total 124 wild edibles, representing 68 genera and 41 families were recorded. Of these, 09 species were represented by trees, 33 shrubs, 77 herbs, 1 fern and 03 fungi. Of the total species, 63 species were native, 10 near endemic, 03 endemic and other are non-native to the Indian Himalayan Region. Various parts namely, whole plants, stem, rhizome, tuber, bark, aerial part, leaves, flowers, fruits, roots, etc. were used by tribal communities in various forms. Over utilization and habitat degradation may result in local extinction. Therefore, for the conservation of these species, studies on habitat ecology, development of conventional and *in vitro* propagation protocols; introduction in the natural habitats and awareness among the tribal communities have been suggested.

Keywords: Tribal communities, wild edibles, diversity, distribution, utilization pattern, nativity

Introduction
Himalayan Region is one of the youngest mountains and identified biodiversity hotspot of the world (Nyaupane *et al*., 2014). The Indian Himalayan Region (IHR) is one of the mega-diverse bio-geographic regions of India, stretches about 3,000 km in length and 220-300 km in width. It covers nearly 17% of the geographical area and 3.8% of India's population [1, 2]. The IHR supports about 8,000 flowering plants species [1, 2]. The region supporting diverse habitats provides varied ecological niches and microclimates not only for plants and animals, but also for human beings. It is a reservoir of biodiversity which is readily utilized by the rural and tribal communities as source of medicine, food (wild edible), fodder, fuel, timber, making agriculture tools, religious and various other purposes [1, 2]. The region is inhabited by a number of rural communities or groups, which are mostly dependent on the wild plant resources. Use of wild plants as a source of food is an important part of culture of native communities that live in the tribal areas. These wild edibles play an important role for the nutritional requirement of tribal population in remote parts of the country. Like other regions of the IHR, Pangi valley of Chamba district, Himachal Pradesh is also rich in medicinal, aromatic and wild edible plants wealth. The tribal communities residing in Pangi valley also use wild edible plants as source of food and depend on this resource to meet their food needs for sustenance. The cold and harsh climatic conditions and long freezing winters prevalent in cold arid zones enforced Tribal and Mongolian communities to search for wild edible plants as a source of food. Utilization of wild edible plants as food source by tribal communities residing in Pangi valley is more significant for them as they do not have year long easy access as well as normal availability and supply of other regular food resources in comparison to rural people residing in other regions [3, 4].

Different parts, such as tender shoots, leaves, stems and underground parts of these plants are being used as fresh or in dehydrated form. Some of the wild edible plants are placed to solar dehydration as emergency vegetables for prolonged winters. Because of intense sunlight, the leaves, roots and shoots are dehydrated under shade having adequate ventilation. August - September months are the period of solar dehydration because of quick and satisfactory dehydration occurs due to low humidity during this period. Low temperature allows products thus formed to be consumed during winters without spoilage. Also, tribal people consume different parts of wild edibles such as roots, leaves, stems, flowers, etc., either raw or in cooked form i.e., roasted, boiled, fried or as flavoring agent, oil, spice, pickles, jams or in the form of tea, juice etc. [5-9]. However, there is considerable change in life style as well as eating stuff and style of tribal communities, but still wild edibles form major part of their diet. Keeping in view, the potential of these edible plant species, it is very essential to promote wild edibles not only as source for livelihood sustenance, but also as a source of income generation for the tribal communities [5-9]. Today the knowledge regarding these wild edibles and their use remain restrained to these tribal communities especially only to older people10. The review of literature reveals that several studies have been carried out on wild edible plants across the IHR [5-7, 9-23, 24-26] and in Himachal Pradesh [5, 16, 18, 21, 22, 24], but in particular, none of the workers have investigated the wild edible plants of Pangi valley in Himachal Pradesh. Therefore, it is permitted to document the indigenous knowledge among tribal communities of the region regarding the invaluable and nutrient rich wild edible plant wealth and ensuring their long lasting existence. Considering the importance of invaluable edible plant wealth and gradually diminishing traditional knowledge related to their use, an attempt has been made to; (i) assess the diversity and distribution pattern of wild edible plants; (ii) analyze nativity and endemism; (iii) document the indigenous uses and traditional practices; and (v) suggest suitable management options.

Study area

Present study was conducted in Pangi Valley (latitudes; $33^0$04'56''N to $76^0$20'11''E longitude) of the Chamba district in Himachal Pradesh. Pangi valley is sandwiches between altitudinal range from 2,100-6,200 m amsl and total area 1601 km^2. The area is characterized by deep river valleys and steep mountain slopes typically exhibits temperate, sub-alpine, alpine climate and glaciers. Most of the area (approx. 68%) falls under sub-alpine and alpine-zones, which remain snow covered during winter months. The lowest temperature in Pangi Valley goes below the freezing point i.e., up to -10^0 C and the highest temperature was recorded around 35^0 C. The yearly rainfall is recorded between 200-400 mm [3-4]. Pangi valley is rich in biodiversity. The vegetation comprises of temperate coniferous evergreen and broad leaved deciduous forests, alpine scrubs and alpine herbs which support a large number of ecologically and economically important biodiversity elements including orchids. Pangi Valley, a sub-division of Chamba district is the remote high-altitude area and one of the most beautiful and unique valley in the North-western Himalaya. The river Chandra-bhaga (Chenab) flows through deep narrow gorge in the Pangi Valley. It originates from Baralacha glacier in Lahaul-Spiti district and enters in Pangi Valley near Karhu Nala. The valley covers Killar, Purthi, Sechu-Nala, Sach and Kumar-Parmar Forest Divisions and very well known for diverse habitats, climatic conditions and rich biodiversity. The villages in the valley are located between 2,100-3,500 m amsl. Roads are poor, with, few of them surfaced. The Saach Pass at an altitude of 4,500 m amsl is open for vehicular traffic between mid-June and October, but closed due to heavy snow fall during rest of the months of a year. The Valley is mostly inhabited by Pangwal and Bhoti communities belonging to mostly Hindu communities with a few Buddhists communities. The tribal people are called the "Pangwal." The high altitude villages of Pangi Valley are called Bhatories and their residents are referred to as "Bhots." These people are mostly Buddhists and have Tibet-Mongolian features. Adjoining hills of Pangi Valley towards the southern side are visited frequently by migratory pastoralist tribal Gaddis and nomadic Gujjars with their herds. These migrants go to higher altitudes in summer along with their herds for grazing. They also collect different parts of various wild edibles, medicinal and aromatic plants for their own use and trade. The tribal communities residing in Pangi valley also utilize wild edibles as food and depend on this resource to meet their food needs during lean period.

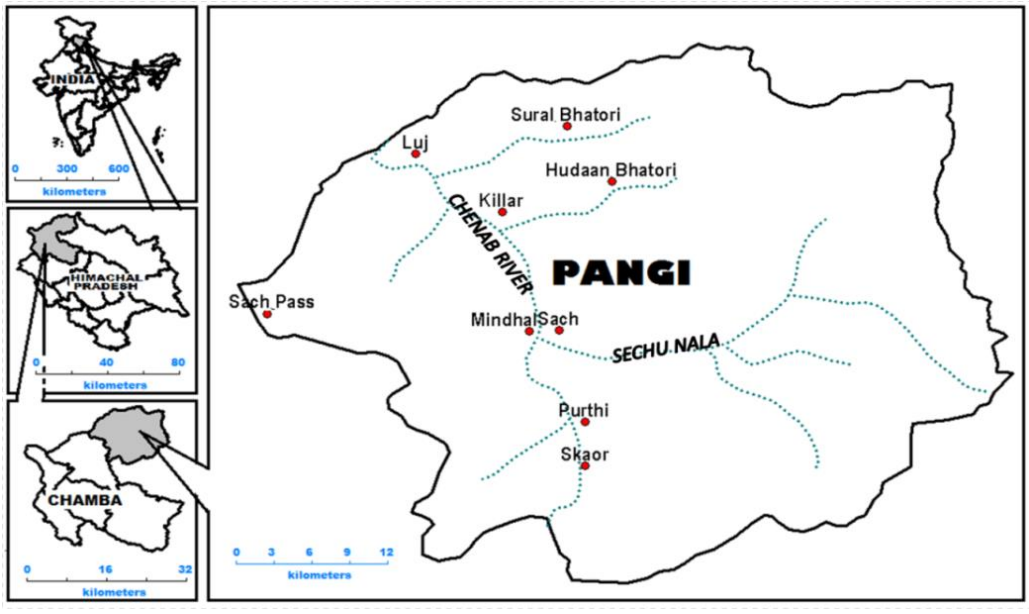


Fig 1: Map of Pangi Valley in Chamba District, Himachal Pradesh

Methodology

The present study was based on extensive and intensive surveys conducted from 2015 to 2018 in the Pangi valley tribal villages namely, Kuthal, Sach, Ghesal, Hillor, Sechu, Mohji, Chasak, Chasak-Bhatori, Hillu, Purthi, Than, Mindhal, Kumar, Parmar, Parmar-Bhatori, Luj, Dharwas, Sural, Sural-Bhatori, Punto, Kariyas, Hudan and Hudan-Batori were visited and surveyed time to time. The knowledgeable people were interviewed, and one among them was hired for survey and collection of the wild edible plants' samples from their natural habitats. The samples of each species were collected and for each species, information on altitudinal range, habit, habitat indigenous uses, traditional practices market value and frequency of utilization was generated. Interviews followed informal method and open ended rather than a strict questionnaire. The language used while interacting with the informants was the local dialect *viz*., Pangwali and Bhoti in certain cases, Hindi also. The samples of the wild edibles species were identified with the help of local and regional floras [26-31]. Also, information on indigenous uses was collected from the available literature [5-7, 9-23-25]. Index Kewensis, International Plant Name Index and The Plant List were followed for the nomenclature and nativity. The species restricted to the Indian Himalayan Region were considered as endemic and those with extended distribution to the neighbouring countries were considered as near-endemic.

Table 1: Profile of the informants of Pangi valley, Chamba District of Himachal Pradesh

S. No.	Name	Village	Gender	Age	Occupation
1.	Amar Nath	Kuthal	Male	35	Agriculture
2.	Moti Ram	Kuthal	Male	70	Local vaid
3.	Heer Chand	Kuthal	Male	75	Agriculture/Horticulture
4.	Amar Chand	Kuthal	Male	77	Local vaid
5.	Hans Raj	Kuthal	Male	45	Ayurveda Pharmacist
6.	Chhangu Ram	Kuthal	Male	68	Agriculture
7.	Sita Devi	Kuthal	Female	53	Agriculture
8.	Channi Ram	Kuthal	Male	77	Local vaid
9.	Lobh Chand	Sach	Male	55	Peon of veterinary
10.	Gur Diyal	Sach	Male	62	Agriculture
11.	Rusi Devi	Sach	Female	53	Agriculture
12.	Hello Devi	Sach	Female	30	Sach Panchayat Pradhan
13.	Bal Dev	Sach	Male	62	Agriculture/Horticulture
14.	Mahatam Chand	Sach	Male	50	Agriculture
15.	Chhangu Ram	Hillor	Male	62	Agriculture
16.	Devi Singh	Hillor	Male	42	Agriculture
17.	Butti Devi	Hillor	Female	39	Teacher
18.	Sant Ram	Mojhi	Male	70	Agriculture
19.	Dhani Ram	Mojhi	Male	60	Agriculture
20.	Sham Lal	Mojhi	Male	55	Agriculture
21.	Dhari Ram	Mojhi	Male	53	Agriculture
22.	Devi Chand	Mojhi	Male	53	Agriculture
23	Prem Lal	Mojhi	Male	60	Agriculture
24	LokNand	Hillor	Male	55	Agriculture
25	Jotu Ram	Hillor	Male	45	Agriculture
26.	Sun Vir	Hillor	Male	42	Agriculture
27.	Jhankhu Ram	Hillor	Male	62	Agriculture
28.	Sukh Devi	Hillor	Female	70	House Wife
29.	Nand Lal	Hillor	Male	85	Shopkeeper
30.	Sesar Chand	Hillor	Male	75	Compounder/Pharmacist
31.	Vishak Chand	Hillu	Male	75	Agriculture
32.	Ram Jeet	Hillu	Male	32	Agriculture
33.	ChhiringTashi	Hillu	Male	33	Agriculture
34.	Nand Lal	Chasak	Male	65	Local Vaid
35.	Lal Chand	Chasak	Male	63	Agriculture
36.	Nuri Devi	Chasak	Female	80	House Wife
37.	Lekh Ram	Shun	Male	60	Agriculture
38.	Devi Das	Shun	Male	55	Agriculture
39	Film Dei	Shun	Female	48	House Wife
40.	Amar Nath	ParmarBhatori	Male	62	Agriculture
41.	Dawa Ram	ParmarBhatori	Male	65	Agriculture
42.	Karam Lal	ParmarBhatori	Male	70	Agriculture
43.	Funchung	ParmarBhatori	Male	77	Buddhist (Amchii)
44.	Chhee Ching	ParmarBhatori	Male	79	Buddhist (Amchii)
46.	Dhiyan Singh	Luj	Male	55	Agriculture
47.	Amar Singh	Luj	Male	45	Agriculture
48.	Hans Raj	Luj	Male	44	Agriculture
49.	Mansa Ram	Luj	Male	65	Agriculture
50.	Dhiyan Chand	Hudan	Male	65	Agriculture
51.	Parmoli Devi	Sural	Female	72	House Wife
52.	Thulu Ram	Kawas	Male	58	Agriculture
53.	Karam Lal	Kawas	Male	45	Agriculture

54.	Amar Nath	Kawas	Male	58	Agriculture
55.	Ram Lal	Kawas	Male	65	Agriculture
56.	Jai Dass	Than	Male	48	Agriculture
57.	Man Dasi	Than	Female	52	House Wife
58.	Bansi Ram	Mindhal	Male	63	Agriculture
59.	HeerNand	Mindhal	Male	70	Agriculture
60.	Gulab Chand	Mindhal	Male	65	Agriculture
61.	Lekh Chand	Mindhal	Male	75	Agriculture
62.	Narender Kumar	Punto	Male	35	Pradhan Gram Panchayat
63.	Moti Ram	Ghesal	Male	65	Agriculture

Results

Diversity and distribution pattern

Total 124 species (Angiosperms: 116; Gymnosperms: 04; Pteridophytes: 01 and Fungi 03) of the wild edible plants belonging to 40 families and 68 genera were recorded (Table 1). Out of total, 77 species of herbs, 33 shrubs, 10 trees, 01 fern and 03 fungi were recorded (Fig.1. and Table 2). The dominant wild edible families were Rosaceae (16spp.), followed by Polygonaceae (09 spp.), Alliaceae and Berberidaceae (07 spp., each), Apiaceae (06 spp.), Asteraceae, Fabaceae and Grsossulariaceae (05 spp., each), and Brassicaceae (04 spp.). Among the genera, *Allium* and *Berberis* (07 spp., each), *Ribes* and *Rosa* (05 spp., each), *Viburnum*, *Amaranthes*, *Cirsium*, *Arnebia*, *Codonopsis*, *Lonicera*, *Chinopodium*, *Malva*, *Plantago*, *Rheum*, *Rubus* and *Prunus* (03 spp., each) were the species rich (Table 2).

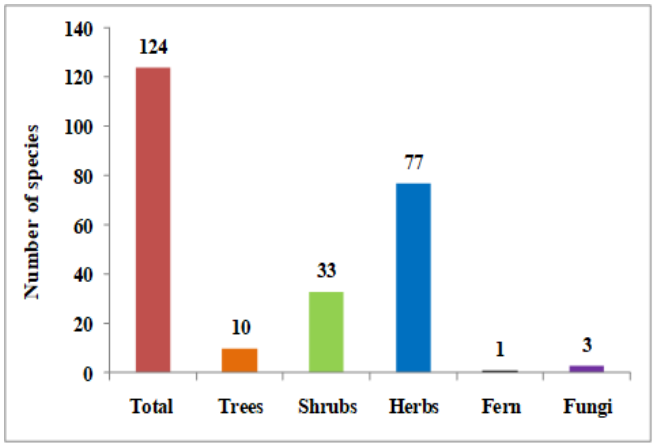


Fig 1: Distribution of wild edibles under different life form

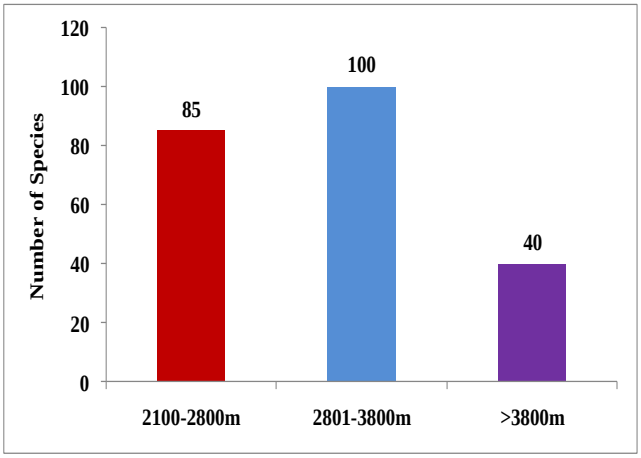


Fig 2: Altitudinal distribution of wild edibles in Pangi Valley of Himachal Pradesh

Altitudinal Distribution

Present study revealed that maximum 100 wild edibles (Herbs: 67; Shrubs: 27; Trees: 03 and Fungi: 03) were found within altitudinal range of 2800-3800m. Some notable wild edible species of this range were *Angelica glauca*, *Bergenia stracheyi*, *Carum carvi*, *Chaerophyllum reflexum*, *Dactylorhiza hatagirea*, *Ephedra gerardiana*, *Eremurus himalaicus*, *Rheum australe*, *Thymus linearis*, *Origanum vulgare*,*Urtica dioca*, etc. followed by 89 species (Herbs: 49; Shrubs: 23; Trees: 09; Fern: 01; Fungi: 03) in the altitudinal zone, 2100-2800m. Some notable wild edibles of, 2100-2800m were *Amaranthus hybridus*, *Bunium persicum*, *Corylus jacquemontii*, *Diplazium esculentum*, *Juglans regia*, *Rosa moschata*, *Rubus niveus*,*Crataegus songarica*, *Pinus gerardiana*, *Morchella esculenta*, *Fagopyrum esculentum*, *Fragaria nubicola*, *Berberis lycium*, *Cannabis sativa*, *Chenopodium album*, *Peziza vasiculosa*, *Geranium nepalense*, etc. and minimum 40 species of wild edibles (Herbs: 34; Shrubs: 05; Trees: 01) were found >3800m. Some notable wild edibles were *Allium humile*, *Allium seminovii*, *Agaricus campestris*, *Arnebia benthamii*, *Ephedra gerardiana*, *Rheum australe*, *Ribes glaciale*, *Rosa sericea* and *Viola biflora* (Table 2 & Fig.2.).

Habitat wise distribution of wild edibles

Of the total wild edibles, maximum (105 spp.) were found in dry habitat, followed by rocky (81 spp.), shady moist (69 spp.), degraded (57 spp.), bouldary (56 spp.), dry alpine slope (24 spp.), moist alpine slope (17 spp.) and riverine (08 spp.) habitats (Fig.3. and Table 2).

Nativity and endemism

Of the total wild edibles, 63 species were natives and remaining were non-natives to the Himalayan Region. 10 species were found to be near endemic and 03 species i.e., *Angelica glauca*, *Allium stracheyi* and *Codonopsis climatidea* were endemic to Indian Himalayan Region (Table 2 and Fig.3).

Utilization Pattern

Various parts namely, whole plants, stem, rhizome, tuber, bark, aerial parts, leaves, flowers, fruits, roots, etc. were used by the tribal communities. Amongst the parts used, leaves and fruits (44 spp., each) were used maximum, followed by roots (27 spp.), aerial parts (21 spp.), stems (16 spp.), seeds (12 spp.), flowers (11 spp.), whole plants (06 spp.) and bulbs (03 spp.) (Fig.3. and Table 2).

Out of total recorded species, 41 species were consumed in raw form, whereas 45 species were consumed in cooked form, i.e., roasted, boiled as vegetables, soup flavouring agents, etc. Maximum species (43 spp.) were used as ripe fruits, followed by vegetables (28 spp).

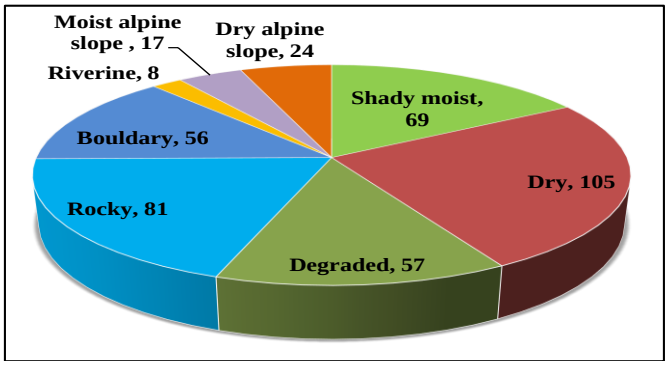


Fig 3: Habitat wise distribution of wild edibles in Pangi Valley of Himachal Pradesh

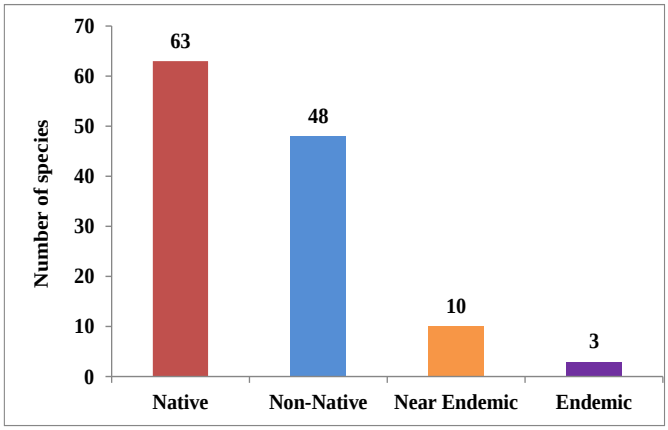


Fig 4: Nativity and endemism of wild edibles in Pangi Valley of Himachal Pradesh

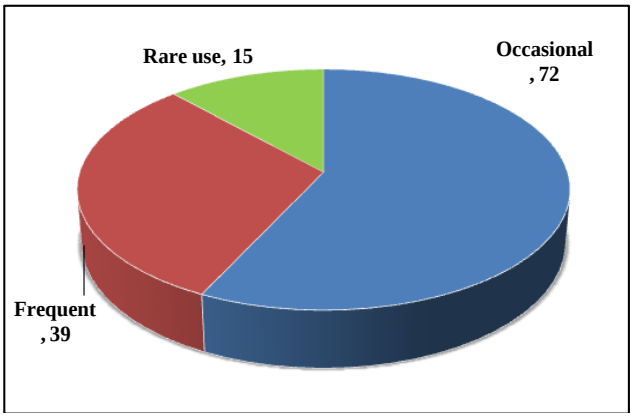


Fig 5: Frequency of use pattern of wild edibles in Pangi Valley, Himachal Pradesh

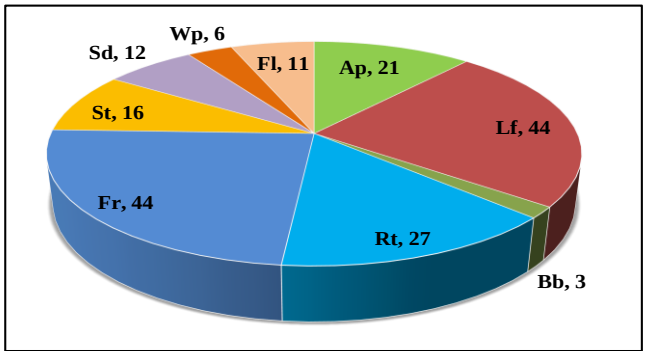


Fig 4: Statistics of plant parts used as food Pangi Valley of Himachal Pradesh

Abbreviations Used: Lf=Leaf; AP=Aerial part; Fr=Fruit; St=Stem; Rt=Root; Wp=Whole Plant; Fl=Flower; St=Stem, Tb=Tuber and Sd=Seed.

Utilization Pattern

Various parts namely, whole plants, stem, rhizome, tuber, bark, aerial parts, leaves, flowers, fruits, roots, etc. were used by the tribal communities. Amongst the parts used, leaves and fruits (44 spp., each) were used maximum, followed by roots (27 spp.), aerial parts (21 spp.), stems (16 spp.), seeds (12 spp.), flowers (11 spp.), whole plants (06 spp.) and bulbs (03 spp.) (Fig.3. and Table 2.).

Out of total recorded species, 41 species were consumed in raw form, whereas 45 species were consumed in cooked form, i.e., roasted, boiled as vegetables, soup flavouring agents, etc. Maximum species (43 spp.) were used as ripe fruits, followed by vegetables (28 spp).

Frequency use pattern of wild edibles

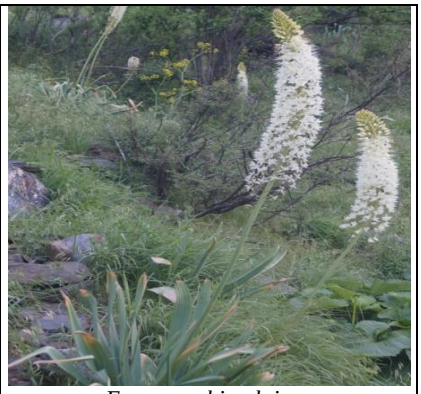
Of the total wild edibles, maximum 72 species were used occasionally, 39 species frequently and 15 species were used rarely (Fig.5. and Table 2.).

Corylus jaquemontii

Corylus jaquemontii (Seeds)

Morchella esculenta

		
Pinus gerardiana	*Pinus gerardiana* (Seeds)	*Allium semenovii*
		
Rheum australe	*Rheum austral (Bhussi)*	*Fragaria nubicola*
		
Fagopyrum esculentum (Thotha)	*Chaerophyllum reflexum*	*C. reflexum* (Rhizome)
		
Angelica glauca	*Mentha longifolia*	*Crataegus songarica*
		
Artemisia maritima	*Peziza vasiculosa*	*Berbaris aristata*
		
Diplazium esculentum	*Juglans regia*	*Rosa macrophylla*

 *Rosa webbiana*	 *Bunium persicum*	 *Eremurus himalaicus*
 *Thymus linearis*	 *Rubus niveus*	 *Dactylorhiza hatagirea*
 *Geranium wallichianum*	 *Bergenia stracheyi*	 *Malva parviflora*
 *Viburnum cotinifolium*	 *Silene vulgaris*	 *Cirsium falconeri*

Some important wild edible plants of Pangi valley, Chamba District of Himachal Pradesh

Table 2: Diversity, distribution, part used, nativity, endemism and indigenious uses of wild edibles in Pangi Valley of Himachal Pradesh

Family/Taxa	Local Name	Habitats	Altitudinal range (m)	Life Form	Nativity	Parts used	Indigenous uses and traditional Practices	Frequency of use
Alliaceae								
Allium caesium Schrenk.	-	VII, VIII	3500-4300	H	Afr As Temp	Ap, Rt	Used as condiment.	Rare
A.carolinianum DC.	-	II, VIII	2200-3800	H	Reg Himal	Ap, Rt	Fresh leaves used as a flavouring agent in food.	Rare
A. humile Kunth.	Farn	I, II, VIII	3000-4000	H	Reg Himal	Lf	Fresh leaves used as a flavouring agent in food.	Rare
A. przewalskianum Regel	-		3700-3900	H	Tibet Occ	Bb	Fresh leaves used as a flavouring agent in food.	Rare
A. semenovii Regel	Shuan	VII, VIII	3500-4500	H	Reg Himal As	Lf	Fresh leaves in summer and dry leaves in winter used as a flavouring agent in food.	Frequent
A. stracheyi Baker	-	II, VIII	3000-4500	H	Reg Himal	Bb, Lf	Used as condiment.	Rare
A. wallichii Kunth.	-	I, II, IV, V	2600-3300	H	Reg Himal	Bb, Lf	Fresh shoot and leaves in summer and dry leaves in winter used as a flavouring agent in food.	Rare
Adoxaceae								
Viburnum cotinifolium D.Don	Rajhal	I, II, III, IV	2400-3600	Sh	Reg Himal	Fr	Ripe Fruits edibles	Frequent
V. grandiflorum Wall.	Talanj	I, II, III, IV	2700-3600	Sh	Reg Himal	Ap	Ripe Fruits edibles	Frequent
V. nervosum D. Don	Talanj	I, II, III, IV	2700-3300	Sh	Reg Himal	Lf	Ripe Fruits edibles	Frequent
Amaranthaceae								
Amaranthus cruentus L.	Bhabri	II	3000-3900	H	Southern Mexico	St, Lf	Fresh shoot and leaves used as vegetable in summer and dry used as vegetable in winter and dry roasted seed mixed with curd or milk or honey used as food.	Frequent
A. hybridus L.	Bhabri	II	2100-2600	H	Am Bor	Sd, Lf	Fresh shoots and leaves used as vegetables in summer and dry used as vegetable in winter and dry roasted seeds mixed with curd or milk or honey used as food.	Frequent
*A. spinosus*L.	Bhabri	II	3000-3600	H	Reg Trop	St, Lf	Fresh shoots and leaves used as vegetable in summer and dry used as vegetable in winter and dry roasted seeds mixed with curd or milk or honey used as food.	Frequent
Apiaceae								
Angelica glauca Edgew. **	Choura	I, IV, V	2000-3000	H	Reg Himal	Rt	Dry roots used as flavouring agent in food and root powder used for snakes repelents.	Occasional
Bupleurum candolii Wall.ex DC.	Nimla	II, IV, V, VII, VIII	2400-4000	H	Reg Himal	Sd	Used as condiment.	Rare
Carum carvi L.	Gurnu or Gyaju	I, II, IV, V	3000-3500	H	Europe Oriens As Bor	Sd, Fr, Rt, St	Seeds are most widely used food additive, tea making, popular spice and flavoring agent in food.	Frequent
Bunium persicum (Boiss.) B.Fedtsch.	Kala Zeera	I, II, IV, V	2100-3200	H	East Mediter South As	WP	Seeds are most widely used food additive, tea making popular spice and flavoring agent in food.	Frequent
Chaerophyllum reflexum var. *acuminatum* (Lindl.) Hedge &Lamond	Tila	I, II, IV, V	2100-3500	H	Reg Himal	Rt, St	Fresh roots directly eaten with milk as high nutrition food.	Frequent
C. villosum Wall.ex DC.	Harda	I, II, IV, V	2100-3500	H	Reg Himal	Rt, St	Fresh roots directly eaten with milk as high nutrition food.	Frequent
Asteraceae								
Artemisia maritima L.	Sehsi	II, IV, V, VIII	2500-3800	H	Europe Reg Caucas Sibir	Lf, Sd	Fresh and dry leaves extract directly taken.	Occasional
Cirsium falconeri (Hk.f.) Petrak.	Kantta	II, III, IV	2700-4300	H	Reg Himal	Rt, St	Roots and stems directly taken as food.	Occasional
C. wallichii DC.	Kantta	II, III, IV	2100-2500	H	Reg Himal	Rt, St	Roots and stems directly taken as food.	Occasional
C. verutum (D.Don) Spreng.	Kantta	II, III, IV	3000-3700	H	Reg Himal	Rt, St	Roots and stems directly taken as food.	Occasional
Myriactis nepalensis Less.	-	I, III, IV	2100-2800	H	Reg Himal As Centr	Lf, Ap	Fresh leaves used as vegetable.	Frequent
Balsaminaceae								
Impatiens sulcata Wall.*	Halu	I, III, IV, V	2100-4000	H	Reg Himal	Sd, AP	Leaves and seeds are eaten as raw.	Occasional
Berberidaceae								
Berberis aristata DC.	Kiamal	I, II, III, IV, V, VI	2100-3000	Sh	Reg Himal Ind Or	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional

B. lycium Royle	Kiamal	I, II, III, IV, V, VI	2100-2500	Sh	Reg Himal	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
B. chitria Buch.-Ham.ex Lindl.	Kiamal	I, II, III, IV, V, VI	2100-3000	Sh	Nepal	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
B. jaeschkeana C.K. Schneid.*	Kiamal	I, II, III, IV, V	2700-4000	Sh	Reg Himal	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
B. kunawurensis Royle*	Kiamal	I, II, III	2600-3200	Sh	Reg Himal	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
B. pachyacantha Bien.ex.Koehne*	Kiamal	I, II, III, IV	2800-3640	Sh	Reg Himal	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
B. vulgaris L.	Kiamal	I, II, III, IV	2100-3300		Amer Europe	Lf, Fl, Fr	Fruits, leaves and flowers are directly eaten.	Occasional
Boraginaceae								
Arnebia benthamii (Wall. ex G.Don) I.M.Johnst.	Ratanjot	II, VIII	3300-4000	H	Reg Himal	Ap, Rt	Used for making pickles and food coulouring agent.	Occasional
A. euchroma (Royle) I.M. Johnston	Ratanjot	II, VIII	3200-4100	H	Reg Himal Turkestan	Rt, Ap	Used for making pickles and food coulouring agent.	Occasional
A. guttata Bunge	-	II, VIII	3500-4500	H	Reg Himal	Rt, Ap	Used as a food coulouring agents.	Occasional
Brassicaceae								
Capsella bursa-pastoris L. Medik.	-	I, II, IV, V	2000-3900	H	Reg Temp	Ap	Leaves and flower directly eaten.	Occasional
Cardamine hirsute L.	Halma	I	2500-3200	H	Reg Temp et Subtrop	Lf	Flavouring in salads and raw cooked as vegetable.	Occasional
Lepidium apetalum Willd.	-	I, II	2100-2600	H	Reg Himal	Lf	Young leaves used as green vegetable.	Occasional
Nasturtium officinale R.Br.	-	I, VI	2100-2500	H	Ind Or China	Ap	Young leaves used as green vegetable.	Occasional
Cannabaceae								
Cannabis sativa L.	Bhang	I, II, III, IV, V	2000-3200	H	As Centr Reg Himal Bor Occ	Sd	Roasted seeds of bhang and seeds of local wheat mixed and eaten.	Frequent
Humulus lupulus L.	-	I, II, III	3000-3500	H	Europe Am Bor	Fl	Used for making local alcohol called pattar.	Occasional
Caryophyllaceae								
Silene vulgaris (Moench) Garcke	Ghantoli	II, IV	2400-3000	H	Europe Afr Bor Reg Himal	Ap	Young leaves used as green vegetable.	Frequent
Campanulacae								
Codonopsis clematidea (Schrenk) C.B.Cl.	-	I, II, V	3000-4100	H	RegH imal	Rt	Roots eaten either row or cooked.	Occasional
C. ovata Benth.	-	I, II, V	3400-4500	H	Reg Himal	Rt	Roots eaten either row or cooked.	Occasional
C. viridis Wall.	-	I, II, V	2500-3300	H	Reg Himal	Rt	Roots eaten either row or cooked.	Occasional
Capparaceae								Occasional
Capparis spinosa L.	-	II, IV	3000-3700	H	Reg Himal	Lf, Fr, Fl	Leaves and fruits used as vegetable, flower buds used as flavouring agent and ripe fruits eaten as row.	Occasional
Caprifoliaceae								
Lonicera angustifolia Wall. ex DC.	-	I, II, III	2700-3500	Sh	Reg Himal	Fr	Ripe Fruits are eaten.	Occasional
L. caerulea L.	-	II, IV,V	2800-3500	Sh	Europe As	Fr	Ripe Fruits are eaten.	Occasional
L. quinquelocularis Hard.	Bakhur	I, II, III	2100-2300	Sh	Reg Himal	Fr	Ripe Fruits are eaten.	Occasional
Chenopodiaceae								
Chenopodium album L.	Kuna	I, II, V	3000-4000	H	Europe	St, Lf, Fr	Young leaves used as green vegetable.	Frequent
C. foliolosum (Moench) Asch.	-	II, III, IV	2100-3600	H	Reg Bor Astr Iran	Lf	Young leaves used as green vegetable.	Frequent
C. botrys L.	-	II, III, IV	2500-3500	H	Reg Bor Temp	Lf	Young leaves used as green vegetable.	Frequent
Convolvulaceae								
Convolvulus arvensis L.	-	II, IV, V	2100-2600	H	Geront Temp	Sd	Seeds eaten as raw as well as fried.	Occasional
Corylaceae								
*Corylus jacqemontii*Decne.	Thangi, Thangoli	I, II, III, IV, V, VI	2100-3000	T	Reg Himal	Sd	Seeds and seeds oil are edibles and dry fruits known for its high nutritional value.	Frequent
Elaeagnaceae								

Elaeagnus conferta Roxb.	-	I, II	2100-2600	Sh	Ind Or	Fr, AP, Lf, Sd	Fruits are edible and used for making juice, jam and dried leaves utilized for making tea.	Occasional
E. parvifoia Wall. ex Royle	-	I, II	2100-3000	Sh	Japan	AP, Lf,	Fruits are edible and used for making juice, jam and dried leaves utilized for making tea.	Occasional
E. rhamnoides (L.) A.Nelson	-	II, III, IV	2800-3500	Sh	Europe As Temp	Lf, Fr	Fruits are edible and use for making juice, jam and dried leaves utilized for making tea.	Occasional
Hippophae salicifolia D.Don	Charma	II, III, IV	2100-2800	T	Reg Himal	Lf, Fr	Fruits are edible and used for making juice, jam and dried leaves utilized for making tea.	Frequent
H. tibetana Schltdl.	Charma	II, III, IV	3000-3800	Sh	Europe As Temp	Lf, Fr	Fruits are edible and used for making juice and jam.	Frequently
Ericaceae								
Rhododendron anthopogon D.Don	-	I, II, VII, VIII	3000-4300	Sh	As Bor Reg Himal	Lf	Leaves used for making tea.	Occasional
Geraniaceae								
*Geranium wallichianum*D.Donex Sweet	-	I, II, III, IV	2100-3500	H	Reg Himal	Rt	Roots used for making tea.	Occasional
G. nepalense Sw.	Lalijar	I, II, III, IV	2100-3500	H	Reg Himal	Rt	Roots used for making tea.	Occasional
Grossulariaceae								
*Ribes alpestre*Royle ex Decne.	-	I, II, III, IV	2200-3600	Sh	Europe Afr Bor Reg Himal	Fr	Fruits are edible.	Occasional
R. glaciale Wall.	-	IV, V, VI, VII, VIII	2400-4000	Sh	Reg Himal	Fr	Fruits are edible.	Occasional
R. himalense Royle ex Decne	-	I, II, III, IV	2400-3000	Sh	Europe Afr Bor Reg Himal	Fr	Fruits are edible.	Occasional
R. nigrum L.	-	I, II, III, IV	3000-4000	Sh	Europe Afr BorReg Himal	Fr	Fruits are edible.	Occasional
*R. orientale*Desf.	-	I, II, III, IV	2100-3600	Sh	Reg Himal	Fr	Fruits are edible.	Occasional
Juglandaceae								
Juglans regia L.	Tharo, Akhrot	I, II, III, IV, V, VI	2100-2800	T	As Occ Reg Himal	Fr	Dry fruits and essential oil are edible and flowers used as green vegetable.	Frequent
Lamiaceae								
Origanum vulgare L.	Marua, Jangli ajwain	II, III, IV, V	2100-3500	H	Europe As et Afr Bor	Lf	Leaf used as condiment.	Frequent
Mentha longifolia L.	Manshoii	I, II, III, IV, V	2100-4000	H	Reg Bor Temp	Ap	Leaf used as condimentand chattni.	Frequent
Thymus linearis Benth.	Sunauni	II, III, IV, V	2500-4000	H	Reg Himal Pakistan	Ap	Leaf used as condiment.	Frequent
Leguminosae								
Cicer microphyllum Benth.	Jagli Matter	II, III	2400-2800	H	Reg Himal As	Fr	Fruits used as edibles.	Occasional
Hedysarum cachemirianum Baker	-	II, VIII	2800-3800	H	Reg Himal	Wp	Fruits are edibles.	Occasional
Medicago falcata L.	-	II, III	2800-4500	H	Geront Bor Temp	Fl, Ap	Leaves used as vegetables.	Occasional
M. lupulina L.	-	II, III	3200-3900	H	Geront Bor Temp	Fl, Ap	Leaves used as vegetable.	Occasional
Trifolium repens L.	Malori	I, II, III	2100-3600	H	Europe As Temp	AP	Leaves used as vegetable.	Occasional
T. pretense L.	Malori	I, II, III	2100-2500	H	Reg Himal	Ap	Leaves used as vegetable.	Occasional
Trigonella emodi Benth.	Methughaa	II, III, IV	2100-3200	H	Reg Himal	Ap	Leaves used as vegetable.	Occasional
Malvaceae								
*Malva neglecta*Wall.	Suchal	II, III, IV, V	2100-2800	H	Europe As Bor	Lf	Leaves used for green vegetable.	Occasional
M. parviflora L.	Suchal	II, III, IV, V	2500-2800	H	Europe As Bor	Lf	Leaves used for green vegetable.	Occasional
M. verticillata L.	-	II, III, IV, V	2500-3500	H	Europe As Bor	Lf	Leaves used for green vegetable.	Occasional
Orchidaceae								
Dactylorhiza hatagirea (D.Don) Soo	Hathpanja	I, II, IV, V	2800-4000	H	Reg Himal	Rt	Tubers eaten.	Occasional
Plantaginaceae								
Plantago depressa Willd.	-	II, IV, V, VIII	3100-3850	H	Sibir	Lf	Young leaves eaten as row and cooked.	Occasional
P. asiatica ssp. *erosa* (Wall.)Z.Yu Li	-	II, IV, V	2100-2700	H	Europe As et Am Bor	Lf	Young leaves eaten as row and cooked.	Occasional
P. himalaica Pilger.*	-	II, IV, V	2800-3200	H	Reg Himal	Lf	Young leaves eaten as row and cooked.	Occasional
Poaceae								Occasional

Setaria viridis (L.) P.Beauv.	-	II, IV, V	2800-3700	H	Cosmop	Sd	Seeds cooked or eaten with rice.	Occasional
Polygonaceae								
Fagopyrum acutatum (Lehm.) Mansf.exK. Hammer *	Bhesa	I, II, III	2100-2800	H	Reg Himal China	Lf, Sd	Leaves used as green vegetable and flour of seeds used for making local dish thotha which is eat with aloo curry.	Frequent
F. esculentum Moench.	Fhoon	I, II, III, VIII	2100-4200	H	Europe As Bor	Wp	Leaves used as green vegetable and flour of seeds used for making local dish thotha which is eat with aloo curry.	Frequent
Oxyria digyna (L.) Hill	-	II, IV, V	3000-4800	H	Reg Bor	Lf, St	Leaves eaten as vegetable.	Occasional
Persicaria alpina (All.) H.Gross	Chuodh	I, II, III, IV, V, VII, VIII	2100-3500	H	Reg Himal	St, Rt	Leaves and roots eaten directlty.	Rare
P. wallichii Greuter&Burdet**	Gor- Chuodh	I, IV, V, VI	3500-3800	H	Ind Or (Indian Subcontinent, As Trop)	St, Rt	Leaves and roots eaten directlty.	Rare
Rheum australe D. Don*	Pawain	I, II, III, IV, V, VII, VIII	3000-4200	H	Reg Himal	Lf, St	Dry leaves and shoots mixed with seeds of wheat, (Rheum part, 40% and Wheat part, 60%), flour of mixture used for making local dish bhusoii, which is eaten with ghee and aloo curry.	Frequent
R. spiciforme Royle	Chukri	I, II, III, IV, V, VII, VIII	3000-5000	H	Reg Himal	Lf, St	Shoot eaten directly as salad.	Rare
R. webbianum Royle*	Chukri	I, II, III, IV, V, VII, VIII	2200-4100	H	Reg Himal	St	Shoots eaten directly as salad.	Rare
Rumex acetosa L.	Amri	I, II, III, IV, V, VII, VIII	2100-4000	H	Europe As Bor	Ap	Leaves and shoots used for flavouring agent in green vegetable and directly eaten.	Rare
Rosaceae								
Cotoneaster microphyllus Wall. ex Lindl.	Ban Siaua	II, IV, V	2500-2800	Sh	Reg Himal	Fr,Lf,Rt	Fruits are edible.	Occasional
Crataegus songarica K. Koch	Pingyat	I, II, III, IV, V	2100-3000	T	As Aus	Fr	Fruits are edible and used for local wine making.	Frequent
Fragaria nubicola Lindl. ex Lacaita	Ancholu	I, II, IV ,V	2100-4000	H	Europe California	Fr, Rt	Fruits edible and roots used for making tea.	Frequent
F. vesca L.	Ancholu	I, II, IV ,V	2100-2300	H	Reg Temp	Fr, Rt	Fruits edible and roots used for making tea.	Frequent
Rubus cochinchinensis Tratt.	Kantyas	II, IV, V	2100-2700	Sh	Europe	Fr	Fruits are edible.	Frequent
R. niveus Thunb.	Kantyas	II, IV, V	2200-3500	Sh	Reg Himal	Fr	Fruits are edible.	Frequent
Rosa macrophyllus Weihe&Nees	Kantyas	II, IV, V	2100-3000	Sh	Reg Himal	Fr	Fruits are edible.	Frequent
Potentilla atrosanguinea G. Lodd. ex D.Don	-	II, VII, VIII	3000-3600	H	Reg Himal Bur	Lf	Md (Healing of wounds)	Occasional
Prunus armeniaca L.	Cheer	I, II, III	2100-2800	T	Reg Caucas	Fr, Sd	Fruits and seeds are edible.	Frequent
P. cerasoides D.Don	Loyara	I, II	2100-2700	T	Reg Himal	Fr	Fruits are edible.	Frequent
P. cornuta (Wall. ex Royle) Steud.	Jammu	I, II, III	2200-3000	T	Europe As Bor	Fr	Fruits are edible.	Frequent
Rosa moschata Herrm.	Kuja	I, II, IV, V	2100-2700	Sh	Oriens	Fr	Fruit part also called rose hip are edible, seeds used for tea making.	Occasional
R. foliolosa Nutt.exTorr. & A.Gray	Gulab	I, II, IV, V	2100-3500	Sh	Japan	Fr	Fruit part also called rose hip are edible, seeds used for tea making.	Occasional
R. macrophylla Lindl.	Gulab	I, II, IV, V	2100-3200	Sh	Reg Himal China	Fr	Fruit part also called rose hip are edible, seeds used for tea making.	Occasional
R. sericea Lindl.	Gulab	II, IV, V, VII, VIII	2100-3800	Sh	Reg	Fr	Fruit part also called rose hip are edible, seeds used for tea making.	Occasional
*R. webbiana*Wall.exRoyle	Gulab	II, IV, V, VII, VIII	2100-3500	Sh	Reg Himal	Fr	Fruit part also called rose hip are edible, seeds used for tea making.	Occasional
Saxifragaceae								
Bergenia ciliata (Haw.) Sternb.	Shapdochi	I, IV, V	2100-2500	H	Reg Himal China Burma	Rt, Lf	Dried leaves used for making tea.	Occasional
B. stracheyi (Hk.f. &Th.) Engl.	Shapdochi	I, IV, V, VII, VIII	3000-4000	H	Reg Himal	Rt, Lf	Dried leaves used for making tea.	Occasional
Ulmaceae								
Celtis tetrandra Roxb.	Khadak	I, II, IV, V	2100-2800	T	As Tem China	Fr	Fruits are edible.	Frequent
Urticaceae								
Urtica dioica L.	Aahan	I, II, III, IV, V	2100-2800	H	Reg Bor Temp	Lf	Leaves used as green vegetable.	Frequent
U. hyperborea Jacq. ex Wedd.	-		3300-4600	H	Reg Himal	Lf	Leves used as green vegetable and soup.	Occasional
Xanthorrhoeaceae								

Eremurus himalaicus Baker	Piyau	I, III, IV, V	2100-3200	H	Reg Himal Russia Eukraine, China	Ap, Rt	Tender shoots eaten as a vegetable and in later stage, the roots used as vegetable.	Occasional
Gymnosperms								
Ephedraceae								
Ephedra gerardiana Wall. ex Stapf.*	Dharchiyu	II, VII, VIII	2400-4500	Sh	Reg Himal China	Fr	Ripe fruits eaten.	Occasional
E. intermedia Schrenk&C.A.Mey.	Chiyau	II, VII, VIII	3000-4300	Sh	Reg Himal China	Fr	Ripe fruits eaten.	Occasional
Pinaceae								
*Pinus gerardiana*Wall.ex. Lamb.	Miri, Chilgoza, Neoja	I, II, IV, V	2100-3000	T	Reg Himal	Fr	Dry seeds edible, oil rich in carbohydrates and proteins.	Frequent
P. wallichiana A. B. Jacks.	Chii or Kail	I, II, IV, V, VI, VII, VIII	2100-3936	T	Reg Himal	Fr	Seeds are edible.	Rare
Pteridophytes								
Athyriaceae								
Diplazium esculentum (Retz.) Sw.	Kisrod or Lingdu	I, IV, V	2100-2700	Fn	As Amer	Ap	Aeriel parts used as vegetable.	Occasional
Fungi								
Morchellaceae								
Morchella esculenta (L.) Pers.	Bhunt or Gucchhii	I, III, IV,V	2100-3200	Fi	Reg Himal Amer	Wp	High nutritional value, eaten as vegetable.	Occasional
Agaricaceae								
Agaricus campestris Michael Kuo.	Hoor	I, II, III, IV, V	2100-4000	Fi	Reg Himal Amer	Wp	High nutritional value, eaten as vegetable.	Occasional
Pezizaceae								
Peziza vesiculosa Bull.	Khori or Knifdu	I, III	2100-3000	Fi	Reg Himal Europe	Wp	High nutritional value, eaten as vegetable.	Rare

Abbreviations used: T= tree; Sh= shrub; H=Herb; Fn= Fern; Fi=Fungi, RegHimal= Himalayan Region; As= Asia; Afr= Africa; Austr= Australia; Amer= America; Trop= Tropical; Bor= Borealis; Occ= Occidentalis; Argent= Argentina; Temp= Temperate; Cosmop= Cosmopolitan; N. Calid= North Calidonia; Mediter= Mediterranean; Calif=California; Subtrop=Subtropical; Geront= Gerontia; Cult= Cultivated; Amphig= Amphigaea; Min= Minor; Centr= Central; Arct= Arctic; Alp= Alpine; Philipp= Philippin; Afghan= Afghanistan; Turkist= Turkistan; et= And; Polynes= Polynesia; Madag= Madagascar; Pacif= Pacific; Lf= Leaf; Bk= Bark; Wp= Whole Plant; Fl= Flower; Fr= Fruit; Sd= Seed; Wd= Wood; Inf= Inflorescene; St= Stem; Frd= Frond; AP=Aerial part; Rh= Rhizome; *= Near Endemic; **= Endemic; I=Shady moist; II=Dry; III=Degraded; IV=Rocky; V=Bouldary; VI= Riverine; VII=Moist alpine slope and VIII=Dry alpine slope.

Indigenous uses and traditional practices of wild edibles

Wild edibles are consumed as raw, roasted, boiled, fried, cooked or in the form of oil, spice and jams and pickles. Tribal communities have their own unique traditional ways of utilizing exclusive plant wealth of region. Most of the wild edibles have medicinal values. They not only serve as nutritional source, but also help in curing various ailments, thereby, serving dual purpose for the tribal communities of Pangi valley. Different parts of wild edibles are utilised in different seasons. For instance fresh leaves were eaten in summer and dry leaves in winter. Among the notable wild edibles, Fresh and dry leaves of *Allium seminovii* were used as a flavouring agent in food, also used in curing stomach disorders during pregnancy. Fresh and dried shoot and leaves of *Amaranthus* species as vegetable and dry roasted seeds mixed with curd or milk or honey as source of food, also for curing diarrhoea, leucorrhoea and skin diseases. Dry roots of *Angelica glauca* as flavouring agent and root powder for curing dysentery, stomach problems, vomiting and snake repellent. Seeds of *Carum carvi* used as spice and tea making, which also help to control fever, cold, cough, constipation and fat control and average market price of seeds is about 1000-1500/Kg. Seeds of *Bunium persicum* used as spice and tea making which also help to control fever, cold, cough, constipation and fat control and average market price of seeds is 4000-5000/Kg. Fresh roots of *Chaerophyllum reflexum* var. *acuminatum* were directly *eaten* with milk as high nutritional food and roots are *used* for stomach complaints, and seeds infusion used in body pain and average market price of rhizomes is 500-600/Kg. Fresh and dry leaves of *Artemisia maritima* use for tea making, which helps to infection control, insecticide, aromatic, gems killing, essential oil and stomach pain. Fruits, leaves and flowers of *Berberis* spp. are directly eaten and also used for snake bite, boils, eye complaints, dysentery, malaria, stomach diseases and jaundice. Seeds of *Corylus jacqemontii* use as source of dry fruits and seeds oil has high medicinal value and nutritional value dry fruit and Average market price of dry fruit is about 1200-1500/Kg. Dry fruits and essential oil of *Juglans regia* were eaten, flowers were used as green vegetables, also help in frost bite, rheumatism, sores of toes, toothache, after traditional processing of oil, remaining product called Mathinii which is rich source of nutrition for locals during winter and average market price of dry fruit is about 1000-1500/Kg. Leaves of *Mentha longifolia* used as condiment and for making Chattni also used as carminative and digestion. *Pinus gerardiana* seeds are highly nutritious dry fruits and used for dressing of wounds, ulcer, rheumatism, antisepetic, cold, cough, influenza. Average market price of dry fruit is about 2500-3000/Kg. Leaves of *Fagopyrum acutatum* & *F. esculentum* used as green vegetables and flour of seeds used for making local dish 'Thotha' which is eaten with aloo curry and helps in curing heart problems and diabetes. Dry leaves and shoots of *Rheum australe* were mixed with seeds of wheat (Rheum part 40% and Wheat part 60%) and flour of mixture is used for making local dish called 'Bhusoii' eaten with ghee and aloo curry, also helps in abdominal pain, appetizer, asthma, bronchitis, fever, laxative, eye diseases, piles, skin diseases, sprain, swelling, ulcer and wounds. Dried leaves of *Bergenia* species were used for making tea and roots for treating gall bladder stone and kidney stone. Aerial parts and roots of *Eremurus himalaicus* helps in constipation and digestion, in early stage aerial parts eaten as vegetable and in later stage the roots also used as vegetable.

Discussion

Like other parts of the Indian Himalayan Region, the Pangi valley supports representative, natural, unique, ecologically and economically important species, mostly representative species of Great Himalayan Range. The Himalayan ecosystems provide various services to the mankind. Among the provisioning services, the wild edibles play an important role for the food security of native communities. The IHR is rich in edible plants and supports 675 wild edible plants[7]. This nutrient rich edible plant wealth is fully utilized by the inhabitants of IHR especially by those belonging to remote and tribal areas. The tribal communities of Pangi valley utilize wild edible plants as food, raw, roasted, vegetables and cooked or boiled. In view of the importance of wild edibles for the food security of tribal communities, the present study was conducted, and provides detailed information on diversity, distribution pattern, nativity, endemism, indigenous uses and traditional practices of wild edibles in Pangi Valley, Chamba district of Himachal Pradesh. Occurrence of 124 species of wild edibles in the area shows high importance for the tribal communities. Occurrence of 63 native 10 near endemic and 03 endemic species revealed high conservation value of the area. Use of various plant parts in dietary system revealed that these species are highly valuable for tribal communities. Sustainable use of these species would help in maintaining their population in the area. The present study has highlighted the dependence of tribal communities on wild edible plants as food sources, medicinal and supplement. These wild edible plants also act as source of food and rich nutrition for Shepherds and Gaddis from lower Himalaya who visit this region during June to September. The wild edibles also have high medicinal properties. These properties increase the potential of these wild edibles not only as food source or supplement but also as source of income generation for tribal communities. But, traditional knowledge and practices regarding these wild edibles have remained restricted to these tribal communities especially only to old tribal people. In view of this, present study documented the diversity, distribution pattern, indigenous uses and traditional practices of wild edibles of Pangi valley.

Conclusion

In view of above, taking into account the incredible importance of this unique plant wealth, sheer dependence of tribal communities on these wild edibles as food or supplement in time of scarcity or adverse climatic conditions and day by day disappearing indigenous knowledge, overexploitation, habitat degradation, changing environmental condition and traditional practices, there is a need for conservation and management of this wealth by the local inhabitants, NGOs, Central and State Government Organizations, and proper documentation of indigenous knowledge and traditional practices. Investigation of nutraceuticals of edible parts, study on the population ecology of the important wild edibles, formulation and dissemination of proper information compendium based on appropriate evaluation of nutrient and economic potential of these edible plants; education and awareness programs regarding sustainable utilization of these species for the tribal communities; and development of conventional and in vitro propagation protocols of wild edibles for mass multiplication and their establishment and maintenance in the in situ and ex situ conditions are recommended.

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