

Diversity, Informant Consensus Factor and Cultural Significance Index of Wild Edible Plants in the Jaunpur region, Tehri Garhwal, Uttarakhand

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Received: 23 March 2023 / Accepted: 31 July 2023

Abstract. The wild edibles are essential not only for nutrition, medicine, fodder and fuel but also as potential source of income generation. The conventional use of wild edible plants is habitual in the remote and hill regions of the Uttarakhand state (India). The present study was carried out in a mountainous part of the Uttarakhand namely Jaunpur region situated in the district Tehri Garhwal. Extensive field surveys were conducted in the area to gather information (traditional knowledge on wild edible plants) from the inhabitants through questionnaire method. A total of 220 key informants including old aged farmers, shepherds, and vaidyas were surveyed. The present study resulted in documentation of a total 73 plant species (under 58 genera and 38 families) as source of wild edibles. Rosaceae (10 species) and Fabaceae (7 species) revealed as the most dominant families followed by Anacardiaceae, Moraceae and Rutaceae (4 species each). Majority of the recorded species belong to the tree habit (35% species) followed by herb (29%), shrub (29%), and climber (7%). The commonly used plant parts as source of wild edible in the area include fruits (59% species), leaves (24%), seeds (5%) and flowers (4%). Documentation of the traditional knowledge is much important because it provide alternative means to reduce hunger, poverty, and health issues especially in finding novel compounds (drug discovery).

Keywords: natural resources, NTFPs, food supplement, traditional knowledge, Jaunpuri dialect.

1. Introduction

The plant species which are neither domesticated nor farmed but are available in a wide range of natural habitats and utilized as food source by aboriginal peoples are known as wild edible plants (Dema & Dolkar, 2022). Throughout the world, the utilization of edible plants in the wild by aboriginal people for cooking food has played an essential role to fulfil the necessities and demands of human beings since ancient times (Agarwal & Chandra, 2021). The indigenous tribes and ethnic communities of remote areas mostly rely on natural sources for their basic needs. The diversity of wild edible plants in the vicinity provides diversification for family diets and food security among households (Bussmann & Sharon, 2006; Cavender, 2006;

Kunwar et al., 2006; Pieroni et al., 2007; Bajpai, et al., 2022). Most human plants sustenance is now dependent on a very small number of cultivated crops which also lead in the loss of the genetic diversity in agro-ecosystems. However, the utilization of the Non-timber forest products (NTFPs) including wild edible plants is still noteworthy in the various parts of the world (Prescott-Allen & Prescott-Allen, 1990). Several wild edible fruits have been determined to be more nutritious than those of the domesticated fruits under horticultural practice (Eromosele et al., 1991). Harvesting of wild edibles is common practice in the various traditions. The wild edible plants are often harvest from forests, croplands, wastelands, and roadsides ecosystems. Many ethnic communities and rural populations especially that of the underdeveloped nations are dependent on the NTFPs for their livelihood and extra income (Beluhan & Ranogajec, 2011).

Documentation of indigenous knowledge on medicinal plants, wild edible resources and traditional beliefs, as well as changes in cultural and socioeconomic conditions of tribal communities has attracted recent workers in India (Bhatia et al., 2018; Ballabha et al., 2013; Maikhuri et al., 2000; Gaur & Semwal, 1983; Negi, 1988; Negi & Gaur, 1994; Gaur, 1999). In addition to being a potential source of income, the wild edible plants are also essential for the socio-cultural, spiritual, traditional food, medicine, fodder, and overall well-being of rural inhabitants who are dwelling especially in mountainous areas (Gangwar et al., 2010; Kumari & Sahu, 2015). They are consumed to meet the protein, carbohydrate, fat, vitamin, and mineral requirements (Sundriyal & Sundriyal, 2001; Biswas et al., 2022). Uttarakhand, geographically and culturally diverse state, has a great potential in utilization of wild fruits for sustainable development and as a source of income to the residence living in the rural areas (Maikhuri et al., 1994; Samant & Dhar, 1997). *Aegle marmelos*, *Juglans regia*, *Myrica esculenta*, *Pyracantha crenulata*, *Pyrus pashia* and *Rhododendron arboreum* are the most popular wild edible plants among the inhabitants (Bhatt et al., 2000; Dhyani et al., 2007; Kala, 2007). Diverse range of edible plants is naturally available in adequate amounts, because of the unique geographical and climatic conditions (Saklani et al., 2011). In this study, we investigated the unexplored Jaunpur region (Tehri Garhwal, Uttarakhand, India) in order to reduce the knowledge gap on the traditional knowledge among different cultural groups of the Uttarakhand on wild edible plant resources.

2. Materials and Methods

2.1. Study Area

The Jaunpur block is situated in the hill region of the district Tehri Garhwal (Uttarakhand, India). Geographically, it lies between 30° 17' 18.9132" N to 30° 38' 24.9828" N Latitudes and 77° 56' 13.506" E to 78° 18' 38.484" E Longitudes and the elevation ranges from 300 to 3,022 m asl, encompasses an area of 592.17 km². This area is 41 km from the district headquarter New Tehri. It is bordered by Sahaspur block in the East, and Dehradun block in the south-west. Administratively, a total of 259 villages are situated across the Jaunpur block (eUttaranchal, 2023). *Jaunpuri*, a Northern Indo-Aryan dialect is spoken in the interior of the Jaunpur, however, Hindi language is more common in cities while Hindi-English mixed around the eco-tourism linked places especially in Kempty Fall, Dhanolti and Nag Tibba due to tourist intake from different parts of the country and world. Majority of the people followed Hindu religion in the region and belong to Garhwali culture and *Jaunpuriya* sub-cultural group.

The climate of the study region ranges from subtropical to temperate type. Nag Tibba is highest peak (3,022 m asl) in the Jaunpur which along with other peaks experience snow fall in the winter. Four seasons viz., summer, spring, rainy, and winter are distinct in the region. The weather remains pleasant throughout the year at mid and upper elevations. However, heavy rainfall, landslides, and even cloud burst (sometimes) cause havoc for the people during the rainy season. The evergreen conifer forests dominated by *Pinus roxburghii* (at the lower to mid elevations) and *Cedrus deodara* (at the higher elevation) are the most common vegetation in the area. The broad-leaved and conifer mixed forest stands also occur at the north facing slopes and along the valleys.

2.2. Methodology

The field work was carried out during the period 2021-2022. A pilot survey was conducted first to identify the villages where agricultural activities were common and finally, 23 representative villages viz., Thatyur, Teva, Ontal, Dhanolti, Syalsi, Thapla, Bhawan, Bhaim, Balondi, Kyari, Rautu-Ki-Bheli, Almas, Bangsil, Moldhar, Domasi, Mair, Gadeth, Banasari, Abali, Sabli, Bhal, Marara and Moriyana-top were selected. It was followed by the periodic visits to conduct meetings, interviews, and discussion with local inhabitants. A total of 220 key informants were chosen at random from 23 representative villages and a semi-structured questionnaire method was used to collect the information on wild edibles plants. The majority of informants were farmers by occupation followed by shepherds, teachers, vaidyas and priests (pujari). The plant specimens were collected, processed, and then identified with the help of regional Flora i.e., *Flora of the District Garhwal North West Himalaya* (Gaur, 1999) and herbarium i.e., GUH (Herbarium of the Department of Botany, H.N.B. Garhwal University,

Uttarakhand). The processed botanical specimens finally submitted to the herbarium of Department of Botany (H.N.B. Garhwal University, S.R.T. Campus, Badshahi Thaul). The current accepted botanical names of the plants are according to the POWO (2023).

The documented plants were categorised into common, uncommon and rare use categories on the basis of the total citation of particular use by the number of informants; ‘common use’, if >70% informants cited the same use; ‘uncommon’, if 5-25% informants cited a particular use while ‘rare use’, if only <5% informants cited specific use.

Informant consensus factor (ICF) is used to demonstrate the similarity of previously acquired knowledge about wild edible plants. Mathematically, the ICF was calculated by the formula given below:

$$ICF = \frac{Nur - Ntaxa}{Nur - 1}$$

For a specific use category, ‘Nur’ is the number of use reports, and ‘Ntaxa’ is the number of taxa used for a particular use category by all the informants. If the ICF value is zero (0), the usage information is not exchanged among informants, if the ICF value is one (1) the usage information is exchanged among informants (Heinrich et al., 1998).

The Cultural Significance Index (CSI) is used in the data set to calculate the relative importance of the utilization of each species. Mathematically, it is calculated by using the formula given below:

$$CSI = \sum_{u=u1}^{uNC} \sum_{i=i1}^{iN} UR \ ui / N$$

where; ‘NC’ is the total number of use categories (NC is equal to u1, u2....., uNC), U is the use category (u1, u2..... u). ‘N’ is the total number of local informants (i1, i2....., iN). ‘UR’ is the total number of use Reports. ‘N’ is the Total Number of Informants who provide information on wild edible plants (Tardio & Pardo-de-Santayana, 2008).

3. Results and Discussion

The present study resulted in documentation of 73 species belonging to 59 genera and 38 families as wild edible plants (Plate 1). These species are enlisted alphabetically in Table 1 along with relevant information like botanical name, family, local name, part used, etc. Among the total recorded species, 26 were trees (35%), 21 herbs (29%), 21 shrubs (29%), and 5 climbers (7%). Rosaceae (10 species) and Fabaceae (7 species) revealed as dominant families in term of species count, followed by Anacardiaceae, Moraceae, Rutaceae (4 species each), and

Berberidaceae (3 species). The inhabitants use specific plant part as wild edible sources viz., fruits (raw & ripened), leaves, flowers, tuber, etc. In this study, 59% species is reported as wild edible fruits, followed by leaves (24% species), seeds (5%) and flower (4%) (Fig. 1). Among the various uses, 43 uses fall under the category of ‘common use’ and 27 in ‘uncommon use’ category while 5 in ‘rare use’ category (Table 1).

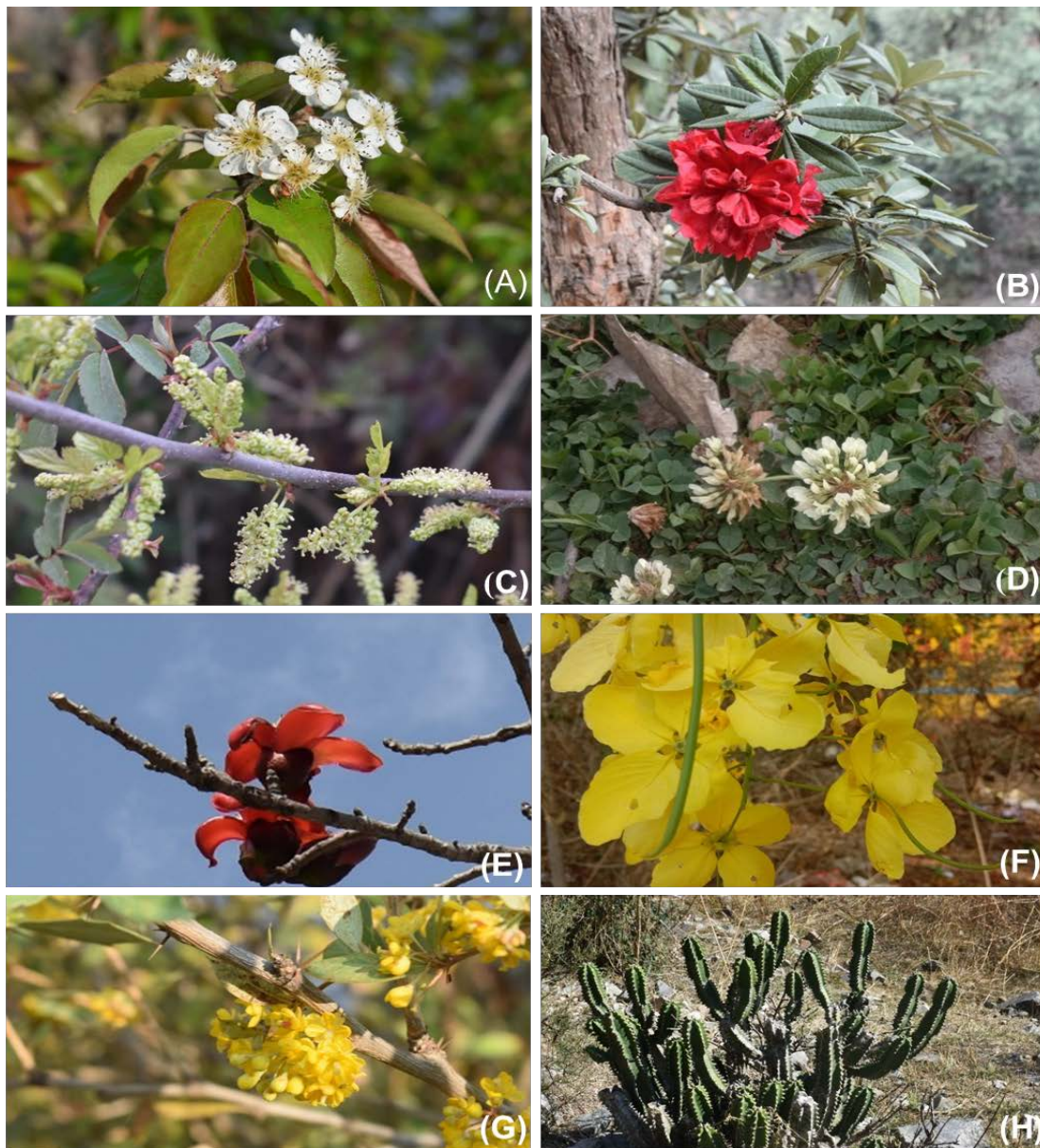


Plate 1. Wild edible plants of Jaunpur region (Tehri Garhwal): (A) *Pyrus pashia*, (B) *Rhododendron arboreum*, (C) *Morus alba*, (D) *Trifolium repens*, (E) *Bombax ceiba*, (F) *Cassia fistula*, (G) *Berberis asiatica*, and (H) *Opuntia elatior*

Table 1. List of wild edible plants of Jaunpur region (Tehri Garhwal, Uttarakhand, India).

Sr.	Botanical name	Family	Local name	Life forms	Part used	Edible usage*	CSI
1.	<i>Aegle marmelos</i> (L.) Corrêa.	Rutaceae	Bel	Tree	Fruits	¹ Fruits pulp eaten raw; ² fruit juice as refreshing drink	0.15
2.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Chualai	Herb	Leaves	¹ Young leafy stems cooked as vegetable	0.17
3.	<i>Amaranthus tricolor</i> L.	Amaranthaceae	Chualai	Herb	Leaves	¹ Young leafy stems cooked as vegetable	0.16
4.	<i>Arenaria serpyllifolia</i> L.	Caryophyllaceae	---	Herb	Leaves	² Leafy twigs cooked as vegetables	0.27
5.	<i>Bauhinia purpurea</i> L.	Caesalpiniaceae	Guiral	Tree	Flower buds	² Flower buds cooked as vegetable; as pickles	0.03
6.	<i>Berberis aristata</i> DC.	Berberidaceae	Kingore	Shrub	Fruits	¹ Raw and mature fruits are eaten	0.03
7.	<i>Berberis asiatica</i> Roxb. ex DC.	Berberidaceae	Kilmora	Shrub	Fruits	¹ Raw and mature fruits are eaten	0.15
8.	<i>Berberis lycium</i> Royle	Berberidaceae	Rasaut	Shrub	Fruits	¹ Raw and mature fruits are eaten	0.02
9.	<i>Bergera koenigii</i> L.	Rutaceae	Gandela	Shrub	Leaves	¹ Leaves are utilized for flavouring curries	0.10
10.	<i>Bombax ceiba</i> L.	Bombacaceae	Semal	Tree	Flower buds	¹ Flower buds are consumed as a vegetable	0.30
11.	<i>Brucea javanica</i> (L.) Merr.	Anacardiaceae	Deshmeel	Shrub	Fruits	² Ripened fruits are eaten	0.35
12.	<i>Cannabis sativa</i> L.	Cannabinaceae	Bhang	Shrub	Seeds, Leaves	¹ Young leaves cooked as snacks (Pakori); Mature fruits ground to Chutney; Female inflorescence use in preparation of Bhang Ghota	0.68
13.	<i>Carissa carandas</i> L.	Apocynaceae	Karaunda	Shrub	Fruits	¹ Ripened fruits are edible	0.10
14.	<i>Carissa spinarum</i> L.	Apocynaceae	Karaunda	Shrub	Fruits	¹ Ripened fruits are eaten	0.33
15.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Kirala	Tree	Flower buds	² Flower bud are consumed as a vegetable	0.05
16.	<i>Chenopodium album</i> L.	Chenopodiaceae	Baithu	Herb	Leaves	¹ Leafy twigs cooked as vegetable	0.82
17.	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Kaduri	Climber	Fruits	¹ Fruit juices as refreshing drink	0.34
18.	<i>Cornus capitata</i> Wall.	Cornaceae	Bhamora	Tree	Fruit	¹ Ripened fruit edible	0.58
19.	<i>Cucumis maderaspatana</i> L.	Cucurbitaceae	Ban-Kakhri	Climber	Fruits	² Fresh fruits are eaten as vegetable	0.28
20.	<i>Dioscorea melanophyma</i> Prain & Burkill	Dioscoreaceae	Geithi	Climber	Tuber	³ Tuber is cooked as vegetable	0.36
21.	<i>Diplazium esculentum</i> (Retz.) Sw.	Athyriaceae	---	Herb	Fronds/ Fiddlehead	³ Fronds are cooked as a vegetable; in preparation of pickle	0.05
22.	<i>Elaeagnus parvifolia</i> Wall.	Elaeagnaceae	Giwain	Shrub	Fruits	² Ripened fruits are eaten	0.30
23.	<i>Elsholtzia flava</i> (Benth.) Benth.	Lamiaceae	---	Herb	Seed	³ Mature seeds eaten	0.32
24.	<i>Fagopyrum cymosum</i> (Trevir.) Meisn.	Polygonaceae	Kandya	Herb	Leaves	¹ Stem with young leaves cooked as vegetable	0.24

25.	<i>Ficus auriculata</i> Lour.	Moraceae	Timla	Tree	Fruits	² Immature fruits are cooked as vegetables; ¹ Ripened fruits are edible	0.05
26.	<i>Ficus palmata</i> Forssk.	Moraceae	Bedu	Tree	Fruits	¹ Ripened fruits are edible	0.07
27.	<i>Ficus racemosa</i> L.	Moraceae	Gular	Tree	Fruits	¹ Ripened fruits are edible	0.02
28.	<i>Flacourtia indica</i> (Burm. f.) Merrill	Flacourtiaceae	Kandai	Shrub	Fruits	¹ Ripened fruits are eaten	0.03
29.	<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita	Rosaceae	Gand-Kaphal	Herb	Fruits	¹ Raw fruits are edible; ² Fruit juice as refreshing drink	0.05
30.	<i>Fumaria indica</i> (Hauskn.) Pugsley	Fumariaceae	Pit-Papra	Herb	Leaves	¹ Eaten as vegetable	0.49
31.	<i>Grewia optiva</i> J.R. Drumm. ex Burret	Tiliaceae	Bhimal	Tree	Fruits	² Ripened fruits are eaten	0.09
32.	<i>Indigofera tinctoria</i> L.	Fabaceae	Neel	Herb	Leaves, pods	² Eaten as Vegetables	0.49
33.	<i>Juglans regia</i> L.	Juglandaceae	Akhrot	Tree	Fruits	¹ Ripened fruits are eaten	0.32
34.	<i>Medicago polymorpha</i> L.	Fabaceae	---	Herb	Leaves	² Eaten as vegetable	0.08
35.	<i>Moringa oleifera</i> Lam.	Moringaceae	Sunara	Tree	Leaves	² Fresh leafy parts eaten as vegetable	0.16
36.	<i>Morus alba</i> L.	Moraceae	Seh Toot	Tree	Fruits	¹ Ripened fruits are eaten	0.24
37.	<i>Murraya paniculata</i> (L.) Jack	Rutaceae	Machula	Shrub	Fruits	¹ Ripened fruits are eaten	0.86
38.	<i>Myrica esculenta</i> Buch. -Ham. ex D. Don	Myricaceae	Kaphal	Tree	Fruits	¹ Ripen fruits are eaten	0.26
39.	<i>Opuntia cochenillifera</i> (L.) Mill.	Cactaceae	Nagphani	Shrub	Fruits	² Fresh fruits are eaten	0.08
40.	<i>Opuntia elatior</i> Mill.	Cactaceae	Nagphani	Shrub	Fruits	² Fresh fruits are eaten	0.06
41.	<i>Phoenix loureiroi</i> Kunth	Arecaceae	Khajoor	Tree	Fruits	² Ripen fruits are eaten	0.05
42.	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Amla	Tree	Fruits	¹ Fruits are eaten; preparation of pickles	0.20
43.	<i>Physalis divaricata</i> D. Don	Solanaceae	Damriya	Herb	Fruits	² Ripened fruits are eaten	0.41
44.	<i>Pinus roxburghii</i> Sarg.	Pinaceae	Chir	Tree	Seed	¹ Mature seed are edible	0.86
45.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J.L.Stewart) Rech.f.	Anacardiaceae	Khairk	Tree	Fruits	³ Dried raw fruits are eaten	0.03
46.	<i>Potentilla fulgens</i> Wall. ex Hook.	Rosaceae	Bajradanti	Herb	Fruits	² Ripened fruits are eaten	0.22
47.	<i>Prinsepia utilis</i> Royle	Rosaceae	Bhainkal	Shrub	Fruits	² Ripened fruits are used as vegetable	0.04
48.	<i>Prunus cerasoides</i> D. Don	Rosaceae	Payain	Tree	Fruit	¹ Ripened fruits are eaten	0.88
49.	<i>Prunus persica</i> (L.) Batsch	Rosaceae	Aaru	Tree	Fruits	¹ Ripened fruits are eaten	0.51
50.	<i>Pyrus pashia</i> Buch.-Ham ex D. Don	Rosaceae	Melu	Tree	Fruits	¹ Ripened raw are eaten	0.23

51.	<i>Rhamnus virgata</i> Roxb.	Rhamnaceae	Chodelu	Tree	Fruits	¹ Fruits are eaten as vegetable	0.40
52.	<i>Rhododendron arboreum</i> Sm.	Ericaceae	Burans	Tree	Flowers	¹ Flowers are used to prepare juice, sauce, jam, jellies and refreshing drinks	0.92
53.	<i>Rubia manjith</i> Roxb. ex Flem.	Rosaceae	Manjith	Climber	Leaves	¹ Leaves are eaten as a vegetable	0.23
54.	<i>Rubus ellipticus</i> Sm.	Rosaceae	Hinsar	Shrub	Fruits	¹ Ripened fruits are eaten	0.06
55.	<i>Rubus niveus</i> Thunb.	Rosaceae	Anchu	Shrub	Fruits	¹ Ripened fruits are eaten	0.14
56.	<i>Rubus paniculatus</i> Sm.	Rosaceae	Kala-Hinsar	Shrub	Fruits	¹ Ripened fruits are eaten	0.17
57.	<i>Rumex nepalensis</i> Spreng.	Polygonaceae	---	Herb	Leaves	¹ Young twigs and leaves cooked as vegetable	0.15
58.	<i>Searsia parviflora</i> (Roxb.) F.A.Barkley	Anacardiaceae	Tungla	Shrub	Fruits	¹ Ripened fruits are eaten	0.28
59.	<i>Silene conoidea</i> L.	Caryophyllaceae	Tumriya-ghas	Herb	Fruits, leaves	² Leaves are eaten vegetable	0.14
60.	<i>Solanum nigrum</i> L.	Solanaceae	Makoi	Herb	Fruits	² Fruits are eaten as vegetable	0.50
61.	<i>Spondias pinnata</i> (L.f.) Kurz	Anacardiaceae	Amara	Tree	Fruits	² Fruit processed for pickles	0.16
62.	<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Jamun	Tree	Fruits	¹ Ripened fruits are eaten	0.09
63.	<i>Terminalia bellirica</i> (Gaertner) Roxb.	Combretaceae	Bahera	Tree	Fruits	³ Ripened fruits kernels are eaten	0.07
64.	<i>Trifolium repens</i> L.	Fabaceae	Tipatiya	Herb	Leaves	¹ Young leaves are eaten as vegetable	0.57
65.	<i>Trigonella emodi</i> Benth.	Fabaceae	Ban-Methi	Herb	Leaves	² Leaves are eaten as vegetable	0.02
66.	<i>Urtica dioica</i> L.	Urticaceae	Kandali	Herb	Leaves	¹ Young twigs and leaves are eaten as vegetable	0.56
67.	<i>Viburnum grandiflorum</i> Wall. ex DC.	Caprifoliaceae	Thakla	Tree	Fruits	² Fruits are eaten as vegetable	0.22
68.	<i>Vicia hirsuta</i> (L.) Gray	Fabaceae	Kura	Herb	Seeds	² Seeds are eaten as vegetable	0.27
69.	<i>Vicia sativa</i> L.	Fabaceae	Kurphali	Herb	Leaves	¹ Leaves are eaten as vegetable	0.07
70.	<i>Vigna vexillata</i> (L.) A. Rich.	Fabaceae	Machali	Climber	Tuber	² Tuber cooked as a vegetable	0.17
71.	<i>Woodfordia fruticosa</i> (L.) Kurz.	Lythraceae	Dhuala	Shrub	Flower	² Flowers are used as a refreshing drink	0.70
72.	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Timroo	Shrub	Fruits	¹ Fresh fruits are used in making Chutney	0.34
73.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Ber	Shrub	Fruits	¹ Ripened fruits are eaten	0.20

Note: 1 = Common use, 2 = Uncommon use, 3 = Rare use; CSI = Cultural significance index.

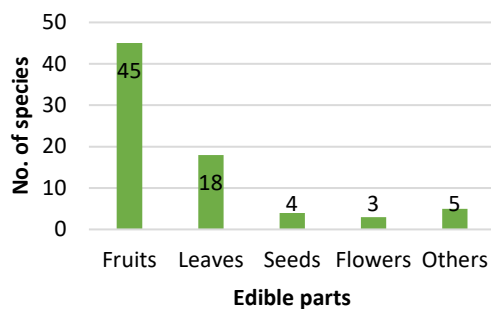


Figure 1. Plant parts used as wild edibles

Table 2. Cultural importance and use categories of wild edible plants in the study area.

Utilized Category/Sub-categories	Number of Species	Use report (UR)	Mean UR	CSI	ICF
Vegetables	16	386	24.1	1.75	0.96
Vegetable (cooked)	16	322	20.1	1.46	0.95
Vegetable (raw)	5	128	25.6	0.58	0.96
Vegetables (preserved)	3	18	6	0.08	0.88
Fruits	43	524	12.1	2.38	0.91
Fruit (raw)	39	286	7.3	1.3	0.86
Fruit (processed)	8	132	16.5	0.6	0.94
Chutney	2	56	28	0.25	0.98
Beverages	7	124	17.7	0.56	0.95
Seeds (cooked)	3	276	92	1.25	0.99

Note: **CSI** = Cultural significance index; **ICF** = Informant consensus factor.

Most of the respondents were aware (i.e. common use) about the wild edible fruit bearing species like *Myrica esculenta*, *Phyllanthus emblica*, *Aegle marmelos*, *Juglans regia*, *Ziziphus mauritiana*, *Syzygium cumini*, *Terminalia bellirica*, *Rubus* spp., *Rubia manjith*, *Pyrus pashia*, *Ficus* spp. Among these fruits of *M. esculenta*, *P. emblica* and *A. marmelos* are extracted from the wild in huge amounts to self-use and sell in the local market as source of extra income in the area. All the observed uses can be categorised into 4 main use classes viz., vegetables, fruits, chutney, and beverages. The vegetable further divided into three sub-classes viz., cooked, raw, and preserved. The informant consensus factor (ICF) was 0.88 for preserved vegetables, 0.95 for cooked, while 0.96 for raw vegetables (Table 2). The highest ICF value was recorded for chutney (0.98), and cooked seeds (0.99) uses, whereas the lowest (0.86) for raw fruits.

The maximum cultural significance index (CSI) was recorded for *Rhododendron arboreum* (0.92) followed by *Prunus cerasoides* (0.88), *Murraya paniculata* (0.86), *Pinus roxburghii* (0.86), *Chenopodium album* (0.82), *Woodfordia fruticosa* (0.70), *Cannabis sativa* (0.68) and *Cornus capitata* (0.58). Species like *Berberis lycium*, *Ficus racemosa*, *Trigonella*

emodi, *Bauhinia purpurea*, *Berberis aristata*, *Flacourtia indica*, and *Pistacia chinensis* subsp. *integerrima* showed lower CSI comparatively in the area (Table 1).

4. Conclusions

The present study has provided the traditional knowledge of one of the important cultural groups (i.e. *Jaunpuri*) of Uttarakhand (India) on the wild edible plants. The area is rich in plant diversity and the inhabitants use this diversity in various forms including timber, fuelwood, fodder, NTFs (e.g. medicine, wild edible, fiber, oil, spice, etc.). They use wild edibles plants for income generation and as supplementary food (taste, nutrition, energy, etc.). However, the traditional knowledge on plants is being decreasing among young ones due to modernization and market alternatives. As a result, there is a current need to preserve traditional knowledge for future generation and to protect plant diversity through awareness programme and documentation.

Apart from the various anthropogenic factors (e.g., uncontrolled grazing by domestic cattle, over extraction of NTFPs, road construction, forest fire, etc.), the natural factors (e.g. heavy rain, cloud burst, land slide, climate change, etc.) are influencing the diversity pattern of the plant species in the area. The heavy extraction of stem (*Zanthoxylum armatum*), fruits (*M. esculenta*, *P. emblica*, *A. marmelos* and *T. bellirica*), flower (*R. arboreum*) and root (*Berberis* spp.) by locals for earning purpose affecting population structure and natural regeneration several species in the study area particular and other parts of the Indian Himalaya.

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