

Some Promising Wild Edible Plants of Srinagar and its Adjacent Area in Alaknanda Valley of Garhwal Himalaya, India

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Abstract: The present communication deals with the ethnobotanical exploration, identification, concerns and future potentialities of the wild edible plant species consumed by the local people inhabiting in the hilly areas of Alaknanda valley that fall in the Uttarakhand state of India. A total of 55 plant species belonging to 35 families were recorded from the study area. Amaranthaceae, Lamiaceae and Moraceae were the dominant families with 4 species each, while Anacardiaceae, Fabaceae, Rosaceae and Rutaceae followed with 3 species and rest were represented by one species from each family. The four major life forms were herbs, shrubs, climbers and trees. Herbs made the highest proportion of the edible species (18) followed by trees (17), shrubs (13) and climbers (7). The plant species were divided into two classes - consumed as raw and prepared in to vegetables. 32 species belonged to the former category while the later was represented by 23 plants. [Journal of American Science 2010;6(4):167-174]. (ISSN: 1545-1003).

Keywords: Wild edible plants, Garhwal Himalaya, indigenous knowledge, local inhabitants.

1. Introduction

Millions of people in many developing countries do not have enough food to meet their daily requirements and a further more are deficient in one or more nutrients (FAO, 2004) and the same is true about India, the country with second largest human population on the earth.

Wild edible plants have played an important role in human life since time immemorial. In India most rural inhabitants depend on the wild edible plants to meet their additional food requirements. The diversity in wild plant species offers variety in family diet and contributes to household food security. Today, most human plant food is based on rather limited number of crops, but it is clear that in many parts of the world the use of wild plants is not negligible (Prescott-Allen and Prescott-Allen, 1990; Scherrer *et al.*, 2005; Bussmann *et al.*, 2006; Bussmann and Sharon, 2006; Kunwar *et al.*, 2006; Cavender, 2006; Pieroni *et al.* 2007). Sometimes the nutritional value of traditional wild plants is higher than several known common vegetables and fruits (Nordeide *et al.*, 1996; Sundriyal and Sundriyal, 2001; Orech *et al.*, 2007).

The Garhwal Himalaya region is the land of many beautiful holy places, valleys and hills. Most of the people of the Garhwal live in the villages. The area forms the middle and outer part of the Himalaya, which is rich in natural resources of which plant resources are prevalent. The forest resource plays an important role in the livelihood of the local communities. The rich plant diversity of the area is

utilized by the local inhabitants in various forms as medicine, food, fodder, fuel, timber, agricultural implements, etc. Among these, wild edible plants play an important role in food supplement during scarcity for local inhabitants. Because of small land holdings and subsistence agriculture, the local people collect many wild edible plants for food.

Many works have emphasized on the diversity and traditional uses of wild plants from this part of country (Gaur, 1977; Gaur and Semwal, 1983; Negi, 1988; Negi and Gaur, 1991, 1994; Samant and Dhar 1997; Maikhuri *et al.*, 2000; Kala, 2007; Dhyani *et al.*, 2007). Although much has been documented on ethnomedicinal and floristic aspects of plants of this area, little has been reported about the wild edible plant resources of Srinagar and its adjacent area. Keeping this in view, the present study was conducted as an attempt from the region to explore and identify the wild edible plant resources, and indigenous traditional knowledge about their utilization.

2. Materials and methods

To undertake the present study the area of Srinagar Garhwal was selected which falls in the subtropical zone of Garhwal Himalaya. Physiographically the area consists of hill slopes and valleys. The study was conducted between 30° 13' 09" - 30° 14' 22" N latitudes and 78° 45' 47" - 78° 51' 58" E longitudes (Figure 1) at the elevation of 535 -1500 m asl. The temperature in summer goes to 35° - 40° C and in winter less than 6° - 7° C due to

heavy frost. Rainfall is less than 200 mm. Regular field surveys were made in the Alaknanda valley during the years 2008 and 2009 in different seasons i.e., rainy, winter and summer, to collect the wild edible plants. Identification of the specimens was done with the help of Garhwal University Herbarium (GUH) and works of Duthie 1906; Osmaston, 1927; Naithani, 1984-85 and Gaur, 1999. Ethnobotanical information on wild plants was collected by

interviewing local inhabitants based on a structured questionnaire to collect data on local plant names, uses, parts used and mode of utilization. To determine the authenticity of the information collected during field work, repeated verification of data from different informants was done. Thus, only the specific and reliable information cross-checked with informants has been incorporated in the present study.

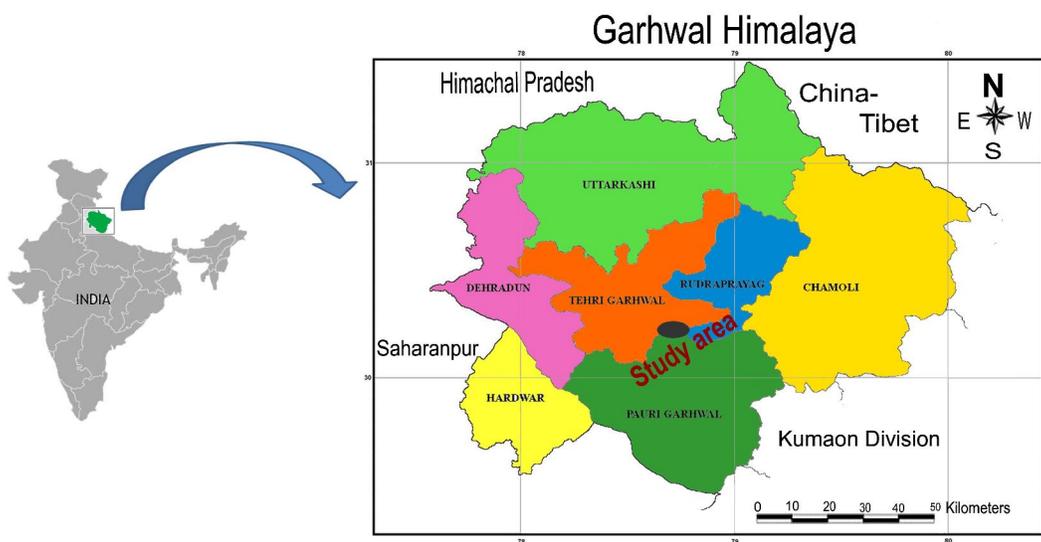


Figure1. Location map of the study area

3. Results and Discussion

The present investigation comprised of 55 species of plants belonging to 35 families. The botanical name, family, local name, parts used and mode of utilization for each species have been enumerated in Table 1. A total of 5 habitats (i.e. shady moist places, exposed slopes, road sides,

agricultural fields and forest edges) have been observed. The representation of species is maximum on road sides (37 species) followed by 32 species each in shady moist places and agricultural fields (Figure 2). Among all the species 34 are represented in 3 or >3 habitats, and the remaining restricted to 1 or 2 habitats only.

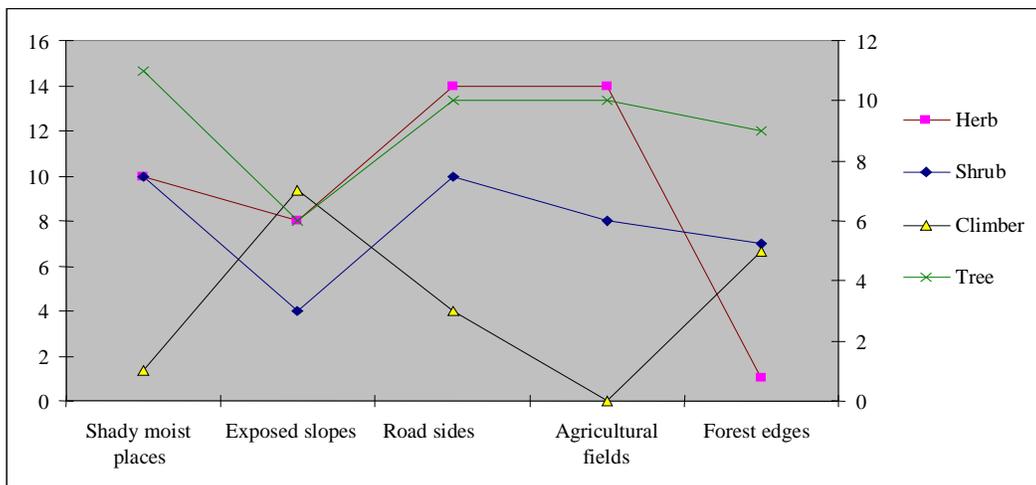


Figure 2. Life forms recorded in different habitats

The plant parts used were leaves, fruits, tubers, flowers and whole plants for food supplements. Herbs made the highest proportion of the edible species followed by trees, shrubs and climbers in descending order. The time and frequency of collecting various plants and plant parts varied from plant to plant depending upon their availability. Method of preparation and uses fall into categories like cooked and eaten as raw.

During the survey, it was observed that the villagers of the area have much faith in using the wild plants as food. The inhabitants of the area are dependent on forests for food up to much extent. They frequently visit forests to collect necessary foods and food supplements (Plate 1 Figure 3-8). Thus, these people have grouped the wild food plants into two categories- made in to vegetables and consumed as raw.

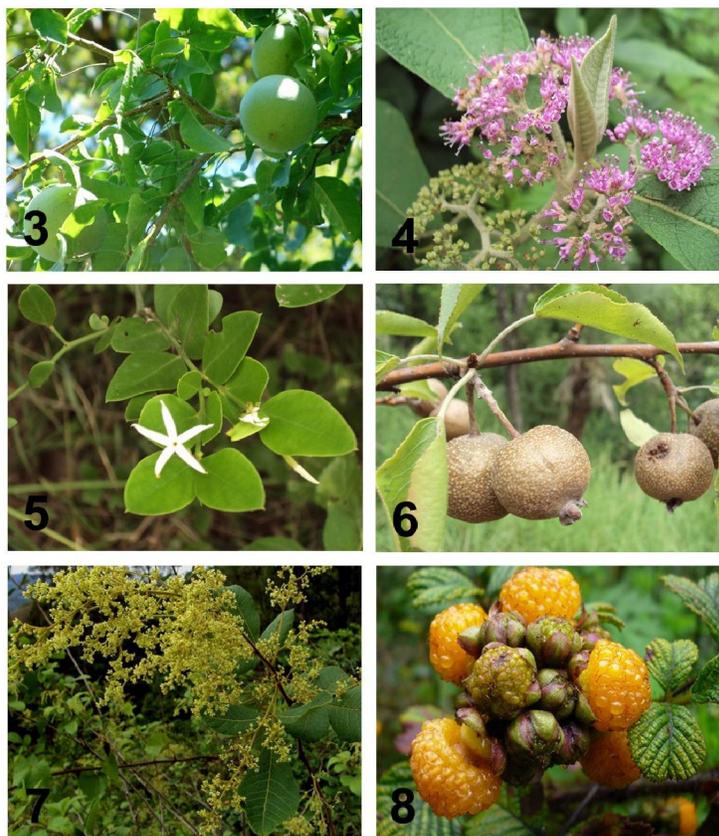


Plate.1 Some important wild edibles used in the study area. Figure 3. *Aegle marmelos* (L.) Correa. 4. *Callicarpa macrophylla* Vahl 5. *Carissa opaca* Stapf ex Haines 6. *Pyrus pashia* Buch.-Ham.ex D.Don 7. *Rhus parviflora* Roxb. 8. *Rubus ellipticus* Smith

The leaves of 18 species are used as vegetables (Figure 9). Species like *Cirsium wallichii*, *Dioscorea bulbifera*, *Gonatanthus pumilus*, *Pueraria tuberosa*, *Vigna vexillata*, etc. bear tuberous roots which provide sufficient minerals. The fruits of 32 species are eaten as raw and sometimes made in to salads or pickles.

The discussions with local inhabitants revealed that the wild food plants are used as common household foods and make a substantial contribution to food security of the people of the area. Therefore, steps are needed to undertake extensive education about their importance and assess their nutritional value to serve as a direct or

indirect source of food to the local inhabitants. This may bring to light one or other new food plants from wild resources for ever increasing population of our country. Many of the wild food may not be freely available in future due to overexploitation, habitat destruction, regular forests fires and invasion of exotic plant species. Therefore efforts can be made to bring some of them under cultivation in order to maintain a continuous supply and help in their conservation.

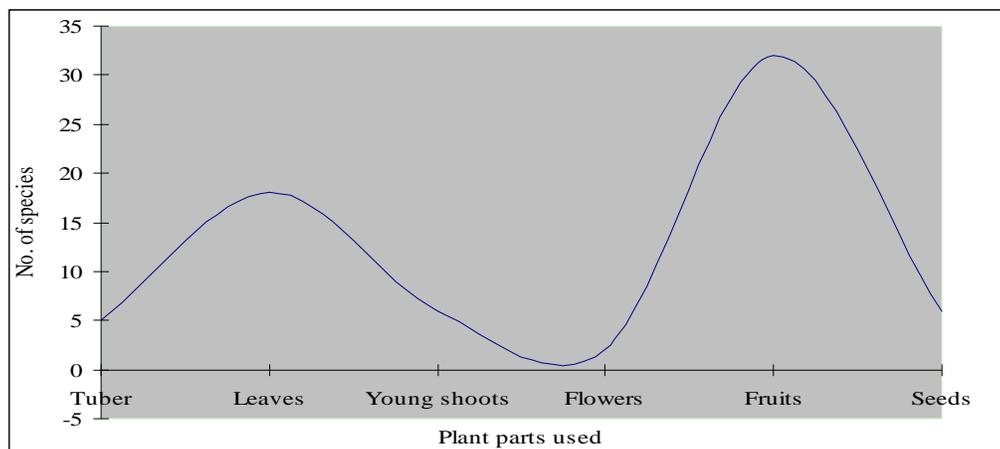


Figure 9. Number of species and plant parts used as wild edibles.

Table 1. List of some promising wild edible plants of Srinagar and its adjacent area in Alaknanda Valley of Garhwal Himalaya, India.

S. No.	Botanical names	Local Name	Family	Life Forms	Habitat (s)*	Plant parts and methods of use
1	<i>Adhatoda zeylanica</i> Medikus	Baisingu	Acanthaceae	Shrub	1,3	Young twigs and leaves made into vegetable.
2	<i>Aegle marmelos</i> (L.) Correa	Bel	Rutaceae	Tree	1,3,5	Fruit pulp is edible, made into juice.
3	<i>Alternanthera sessilis</i> (L.) DC.	Ghandugli	Amaranthaceae	Herb	1,3,4	Leaves used as vegetable.
4	<i>Amaranthus creuntus</i> L.	Chaulai	Amaranthaceae	Herb	1,3,4	Young shoots and leaves made into vegetable.
5	<i>A. viridis</i> L.	Jangli-chaulai	Amaranthaceae	Herb	3,4	Young seeds and leaves used as vegetable.
6	<i>Ampelocissus latifolia</i> (Roxb.) Planchon	Bhinura	Vitaceae	Climber	2,5	Fruits are edible.
7	<i>Berberis asiatica</i> Roxb. ex DC.	Kingore	Berberidaceae	Shrub	1,3,4,5	Fruits are edible.
8	<i>B. lycium</i> Royle	Kingor	Berberidaceae	Shrub	3,5	Fruits are edible and made into sauce.
9	<i>Bauhinia vahlii</i> Wight & Arn.	Malu	Caesalpiniaceae	Climber	2,3,5	Roasted seeds are edible.
10	<i>B. variegata</i> L.	Kurial,	Caesalpiniaceae	Tree	2,4,5	Young flowers cooked as vegetable.
11	<i>Bombax ceiba</i> L.	Semal	Bombaceae	Tree	1,3	Flower buds cooked as vegetable.
12	<i>Callicarpa</i>	Daiya	Verbenaceae	Shrub	2,3	Fruits are edible.

	<i>macrophylla</i> Vahl					
13	<i>Capsella bursa-pastoris</i> (L.) Medikus	Tuntkya	Brassicaceae	Herb	2,3,4	Young plants used as pot herb.
14	<i>Carissa opaca</i> Stapf ex Haines	Karaunda	Apocynaceae	Shrub	1,3,4,5	Fruits are edible
15	<i>Catunaregam spinosa</i> (Thunb.) Tirvengadam	Maindul	Rubiaceae	Tree	1,5	Ripe fruits are eaten after roasting or cooked, leaves are cooked as vegetable.
16	<i>Celastrus paniculatus</i> Willd.	Malkauni	Celastraceae	Climber	2,3,5	Unripe fruits are boiled and cooked as vegetable.
17	<i>Celosia argentea</i> L.	Gadria	Amaranthaceae	Herb	1,3,4	Leaves are cooked as vegetable.
18	<i>Celtis australis</i> L.	Khareek	Ulmaceae	Tree	1,3,4	Fruits are edible.
19	<i>Chenopodium album</i> L.	Bathua	Chenopodiaceae	Herb	1,3,4	Leaves are used as pot-vegetable.
20	<i>Cirsium wallichii</i> DC.	Kandara	Asteraceae	Herb	2,3,4	Tuberous roots are edible after peeling off outer coat and cooked as vegetable.
21	<i>Cleome viscosa</i> L.	Jakhya	Cleomaceae	Herb	1,4	Seeds are used as condiments.
22	<i>Coccinia grandis</i> (L.) Voigt	Kaduri	Cucurbitaceae	Climber	2,3	Unripe fruits and young shoots are cooked as vegetable and made into pickles.
23	<i>Cordia dichotoma</i> Forst.	Lisora	Rutaceae	Tree	2,5	Fruits are edible and made into pickles; young leaves are cooked as vegetable.
24	<i>Dioscorea bulbifera</i> L.	Genthi	Dioscoreaceae	Climber	2,5	Tubers are cooked as vegetable.
25	<i>Duchesnea indica</i> (Andrews) Focke	Bhium-kaphal	Rosaceae	Herb	2,3,4	Fruits are edible.
26	<i>Ficus auriculata</i> Lour.	Timla	Moraceae	Tree	1,3,4	Fruits are eaten raw and cooked as vegetable.
27	<i>F. palmata</i> Forsk.	Bedu	Moraceae	Tree	1,3,4	Fruits are edible.
28	<i>F. semicordata</i> Buch.-Ham. ex J.E. Smith	Khaina	Moraceae	Tree	2,4,5	Ripened fruits are eaten raw and unripe fruits are made into vegetables.
29	<i>Gonatanthus pumilus</i> (D.Don) Engler & Krause	Ban-pindalu	Araceae	Herb	2,3	Tuberous roots and leaves are cooked as vegetable.

30	<i>Grewia optiva</i> J. R. Drummond ex Burret	Bheemal	Tiliaceae	Tree	1, 3,4	Fruits are edible.
31	<i>Mentha arvensis</i> L.	Pudina	Lamiaceae	Herb	2	Leaves are made into sauce and dried leaves are used as condiments.
32	<i>M. longifolia</i> (L.) Hudson	Pudina	Lamiaceae	Herb	2	Leaves used for flavoring and also made into sauces.
33	<i>Moringa oleifera</i> Lam.	Sunara	Moringaceae	Tree	1,3,4	Leaves, flowers and fruits are cooked as vegetables.
34	<i>Morus serrata</i> Roxb.	Sahtoot	Moraceae	Tree	1, 3	Fruits are edible.
35	<i>Murraya koenigii</i> (L.) Sprengel	Kari-patta	Rutaceae	Shrub	1,3,4,5	Ripened fruits are edible and leaves are used to flavor the dishes (<i>curries</i>).
36	<i>Ocimum americanum</i> L.	Tulsi	Lamiaceae	Herb	1,3,4	Leaves made into sauce.
37	<i>Opuntia elatior</i> Miller	Nagfani	Cactaceae	Shrub	1,3,4	Fruits are edible.
38	<i>Ougeinia oojeinensis</i> (Roxb.) Hochreutiner	Sandar	Fabaceae	Tree	1,4,5	Flowers are boiled and much sought after mixed with cooked rice and millets.
39	<i>Oxalis corniculata</i> L.	Chilmori	Oxalidaceae	Herb	1,2,3,4	Leaves taken as salad and cooked as vegetable
40	<i>Perilla frutescens</i> (L.) Britton	Bhangjeera	Lamiaceae	Herb	1,4	Leaves are cooked as vegetable. Seeds are used as spices and condiments.
41	<i>Phoenix humilis</i> Royle	Khajoor	Arecaceae	Tree	2,5	Young shoots and ripened fruits are edible.
42	<i>Phyllanthus emblica</i> L.	Aunmla	Euphorbiaceae	Tree	1,3,5	Ripened fruits are edible and made into sauce.
43	<i>Physalis divaricata</i> D.Don	Damphu	Solanaceae	Herb	1,3,5	Fruits are edible.
44	<i>Pueraria tuberosa</i> (Roxb. ex Willd.) DC.	Siralu	Fabaceae	Climber	2,5	The tuberous roots are eaten raw and the older ones are boiled and cooked as vegetable.
45	<i>Pyrus pashia</i> Buch.-Ham. ex D.Don	Melu	Rosaceae	Tree	2,4,5	Fruits are edible.

46	<i>Rhus javanica</i> L.	Dampghela	Anacardiaceae	Shrub	2,5	Fruits are edible and made into sauce.
47	<i>R. parviflora</i> Roxb.	Tungla	Anacardiaceae	Shrub	1,3,4,5	Ripened fruits are edible.
48	<i>Rubus ellipticus</i> Smith	Hinsalu	Rosaceae	Shrub	1,3,4	Fruits are edible.
49	<i>Rumex hastatus</i> D.Don	Almora	Polygonaceae	Herb	1,3,4	Leaves are eaten raw as salad and also used as condiments.
50	<i>Solanum nigrum</i> L.	Makoi	Solanaceae	Herb	2,3,4	Young shoots and leaves are cooked as vegetable. Ripened fruits are edible.
51	<i>Spondias pinnata</i> (L.f) Kurz	Amara	Anacardiaceae	Tree	2,5	Fruits are made into sauce and pickles. Seeds are edible.
52	<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	Tree	1,3,4	Fruits are eaten raw or with salt and mustard oil.
53	<i>Urtica dioica</i> L.	Kandali	Urticaceae	Shrub	1,2,3,4	Young branches and leaves used as delicious pot herb
54	<i>Vigna vexillata</i> (L.) A. Richard	Machali	Fabaceae	Climber	1,2	Tubers are eaten raw after peeling off the outer coat, and also cooked as vegetable. Seeds are edible.
55	<i>Ziziphus mauritiana</i> Lam.	Ber	Rhamnaceae	Shrub	1,2,4	Fruits are edible.

* 1= Shady moist places, 2= Exposed slopes, 3= Road sides, 4= Agricultural fields, 5= Forest edges.

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05/03/2010