



International Journal of Botany

ISSN: 1811-9700

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Less Known Wild Edible Plants Used by the Gujjar Tribe of District Rajouri, Jammu and Kashmir State

Abdul Rashid, V.K. Anand and Jawaid Serwar
Department of Botany, University of Jammu, Jammu and Kashmir-180006

Abstract: The present communication deals with the Ethnobotanical exploration, identification, concerns, conservational aspects and future potentialities of the wild edible plant species consumed by the Gujjar tribe inhabiting the hilly areas of district Rajouri, apart of Jammu and Kashmir State-India. A total of 57 plant species belonging to 33 families were reported from the region. Rosaceae and Polygonaceae were the dominant botanical families with 5 taxa each, whilst Rhamnaceae follow with 4 taxa. Violaceae is represented by 3 members. The four major reported life forms were shrubs, trees, herbs and climbers. Herbs make up the highest proportion of the edible species, followed by tree, shrubs and climbers. Execution of unplanned developmental activities and anthropogenic factors has resulted in a serious ecological imbalance and degeneration of the biodiversity in this region. The study also takes in to account the magnitude of various pressures, measures of mitigation, future scope and prospects of wild edible plants of this region.

Key words: Wild edibles, Himalaya, nomadic life style, ecological imbalance, cultivated plants

INTRODUCTION

Millions of the people in many developing countries do not have enough food to meet their daily requirements and a further more people are deficient in one or more micronutrients (FAO, 2004) and same is true about India, the country with second largest human population on this planet. In India most rural communities depend on the wild resources including wild edible plants to meet their food needs in periods of food crisis, as well as for additional food supplements. The diversity in wild plant species offers variety in family diet and contributes to household food security. Various publications provided detailed knowledge about the utilization of wild plants as food in specific location around the world. Studies conducted in Africa by Zemed (1997) showed that wild plants are essential components of many African diets, especially in period of seasonal food shortage. A study conducted by Wilson (1990) in Zimbabwe revealed that some poor household rely on wild fruits as an alternative to cultivated for quarter of all dry season's meals.

Pastor and Gustavo (2007) in their study conducted on wild edibles found that 57 wild edible plant species are consumed, in 118 different ways as a source of food by the Chorote people of Argentina. Lentini and Venza (2007) described the importance of 188 wild food plant species used popularly in the Sicily. This study also helped in the better understanding of potential and future prospects of wild edible plants of Sicily.

Javier *et al.* (2006) compiled and evaluated the ethnobotanical data available on the wild edible plants traditionally used for human consumption in Spain. A total of 419 wild plant species belonging to 67 families were discussed with respect to the part used, localization, method of consumption and harvesting time. This study showed that the reported wild edibles are the essential components of many Spanish diets especially during various traditional events and fairs. Victoria *et al.* (2006) described the cultural, practical and economic value of wild plants by applying a quantitative technique in the Bolivian Amazon and concluded that wild plants play an important role in the daily life of local inhabitants. A study conducted by Athena *et al.* (2006) on Paphos and Larnaca country side of Cyprus revealed that inhabitants of these areas subsisted primarily on pastoralism and agriculture and therefore preserves the traditional knowledge on wild edible plants. Ana and Mariana (2004) studied the pattern use and knowledge of wild edible plants in distinct ecological environments, from Northwestern Patagonia and found that knowledge and consumption of wild edible plant follow a pattern according to ecological conditions of the gathering environments, as well as the cultural heritage of the Paineo people. International Institute for Environment and Development (1995) noted in its report that many wild edibles are nutritionally rich and can supplement nutritional requirements, especially vitamins and micronutrients. Maundu *et al.* (1999) found that nutritional analysis of same wild food plants demonstrates

that in many cases the nutritional quality of wild plants is comparable and in some case even superior to domesticated varieties.

Agrahar-Murugkar and Subbulakshmi (2005) studied the nutritive value of wild edible fruits, berries, nuts, roots and spices consumed by the Khasi tribes of India. They concluded that the wild plants eaten by Khasi tribe are a good source of nutrients and considering their low cost and easy availability, need to be popularized and recommended for commercial exploitation. Maikhuri (1991) studied the nutritional value of some lesser known wild food plants and their role in tribal nutrition. Rawat *et al.* (1994) reported some common wild fruits of Garhwal Himalaya, Saka *et al.* (1992) also conducted similar type of study. Sundriyal and Sundriyal (2001) described the wild edible plants of Sikkim Himalaya. Again Sundriyal and Sundriyal (2004) studied the dietary uses of wild edible plant resources in the Sikkim Himalaya, India and concluded that wild edible plants are greatly valued throughout the Himalayan region and serve as an important source of food for indigenous communities. Rakesh *et al.* (2004) found that wild edibles are playing an important role in the rural development in the Central Himalayan Mountains of India. The study also concludes that many wild fruits are richer in nutritional composition than cultivated fruits of the region. Parvathi and Kumar (2002) studied the chemical composition and utilization of the wild edible vegetable Athalakkai (*Momordica tuberosa*). Anjula *et al.* (2007) discussed the collection of 373 species of wild relatives of crop plants representing 120 genera and 48 families under a special plant biodiversity project during 1999-2005 from India. The study revealed many aspects of the collected plants including distribution, life form, economic types, threats, concerns and future potentialities. A study conducted by Debarata (2002) on the wild food plants of Midnapore, West Bengal showed that 31 wild edible plants species are frequently consumed during the flood and droughts.

Significant work in the field of ethnobotany has been done in past 3-4 decades in the Himalayan State of Jammu and Kashmir by many workers including Abrol and Chopra (1962), Gupta *et al.* (1982), Kachroo and Nahvi (1976), Kiran *et al.* (1999) and Kaul *et al.* (1987). Although much has been published on the ethnomedicinal and economic aspects of plants of this State, however there is not even a single concrete report about the wild edible plant resource of Jammu and Kashmir State. Rajouri is one of the hilly districts of Jammu and Kashmir State, bounded by District Poonch in North, District Jammu in South, Udhampur in East and Mirpur (Pakistan) in the West. The district lies between 30°-50' N to 33°-30' N longitude and 74° E to 74°-10' E latitude covering an area of 2630 km²

with an altitudinal range from 370 m to 6000 m. Rajouri has two regions which characteristic topography and climate i.e., the temperate and subtropical regions, former included northern part of the district comprising of Thanamandi, Darhal, Budhal and some part of Rajouri and the latter comprising areas of Nowshera, Kalakote and Sunderbani. District Rajouri has diverse relief and rainfall patterns showing general gradient in relative relief from North to South followed by general decrease in rainfall in the same lineament. These physiographic diversities have resulted in a rich diversity of plant species. Gujjar tribe constitutes the major proportion of local population. They are the tribal race of Jammu and Kashmir State leading a nomadic life, who graze their herds of sheep, goats and cattle from South of the Pir Panjal to alpine pastures of the greater Himalayan ranges in North, using mainly the forest resources to fulfill their needs like food, fodder, forage, shelter, fuel wood, tools, fibers and medicines. Gujjar tribe living in this region depends considerably on the wild edible products of forests and they have accrued considerable knowledge in this field of potential interest. The people of Gujjar tribe are logistically as well as economically dependent on the plant resources for the fulfillment of their daily needs. A scientific study of wild edible plants is important for pin pointing the potential sources which could be utilized at the time of scarcity or during normal days or cultivated as a source of food materials for an ever increasing population. Keeping this in view the present study was conducted as the first ever attempt from the region to explore and identify the wild edible plant resource, to record the indigenous traditional knowledge of utilization and to assess various threats and conservational aspects of the reported wild plant resource consumed by the Gujjar tribe.

MATERIALS AND METHODS

Seven study sites densely inhabited by the Gujjar tribe were selected in seven different tehsils of District Rajouri, based on vegetation cover and altitudinal variations. Thirty informants of different age group from each site were interviewed from April 2004 to February, 2007. The selection criterion for informants was the reliability and depth of knowledge each one of them had. In general the best informants were the older men and women who were alive at times when their culture was subjected to fewer inputs from contemporary society. The criterion employed for the ethnobotanical data was that at least three informants from each selected site had to report identical data regarding a particular wild edible plant species. Interviews were performed in an open ended fashion and lasted in two sessions of 3 h

duration each, one in the morning and one in the evening. It is the time these tribal gather the wild edible plants and prepare their food. The obtained data were recorded in field books and photographs of the specific preparations were taken. The plant material was collected, dried and was used for making the Voucher Specimen deposited with the Herbarium of Jammu University. Interviews were designed to identify levels of present use of wild edible plants. Informants were specifically asked whether plant foods are used today and if so, the relative frequency of use. The field interviews were supplemented with group discussions with tribal, market surveys and field observations. Also various threats to the vegetation of study area were recorded.

RESULTS AND DISCUSSION

Gujjar Tribe constitute the major segment of the population of study area and live in environment characterized by defined area with specific food habits, language, cultural homogeneity, a unified social organization and a unique way of nomadic life style. The rich biological diversity of the area is managed and utilized by Gujjars in a variety of ways. Edible wild plants are common food resources among this tribe. Barks, flowers, roots, fruits, leaves, twigs, young shoots, seeds and tubers are primary foods or secondary condiments to dishes prepared from domesticated cultivars. Gujjars are an important tribe in biodiversity of Jammu and Kashmir State. The study area i.e., District Rajouri is a rich repository of floral wealth and this has inevitably made a deep impact on these tribals and also the physical features of land may be considered partly responsible for their unique food habits of being mainly dependent on wild plant species. Their staple food is maize, pulses, wheat, occasionally rice and wild available fruits and vegetables. For centuries, Gujjars have used indigenous wild plants to satisfy their requirements for energy and essential nutrients. Gujjars keep the herds of buffalo and goats for milk, sheep for wool and meat and horses for carriage. It has been observed that the traditional cultures of Gujjars including their knowledge and use of wild edible plants are rapidly changing through contact with other cultures. Also the documentation and conservation of their traditional indigenous knowledge about the plants is of great significance in the light of food problem likely to be faced in the near future for ever growing human population.

The recorded 57 plants belongs to 33 families. Rosaceae and Polygonaceae were with difference, the most frequently encountered botanical families with 5 taxa each, whilst Rhamnaceae follow with 4 taxa. Violaceae is

represented by 3 members, other 29 families have less representation between one to three members. There are mainly four types of growth forms including shrubs, trees, herbs and climbers Lesser known wild edible plant species reported during the course of study with their botanical names arranged alphabetically, local name, family, part used and preparation are shown in the Table 1. Herbs make up the highest proportion of the edible species, followed by tree, shrubs and climbers in descending order. The edible plants are consumed in many different ways, some of them need only washing of the part or no washing and some other imply a more or less complex preparation process. Major components of the reported species are used as fruits. Some species yield edible flowers, while other's fleshy stems are eaten. Many of them are used in salads, another major proportion of the collected plants are cooked and used as vegetables. Regarding the collection and use of the edible plants, most of the fruits and seeds are collected and immediately used by children. Such foraging activities provide essential supplies of vitamins and minerals to the children. On the other hand collection and preparation of leafy edibles are limited to the women and young girls. The dishes prepared from these are, consumed by all groups of the population. Plants like *Morchella* and *Dioscorea* are gathered by shepherds, from forests while they are with their herds of sheep and goats. The time and frequency of harvesting varies from plant to plant depending upon the availability of edible plant/part, which in turn vary from place to place. In addition to food value, many of the identified species are marketable and provide opportunity to supplement household income. Some of the already marketed plants are *Amaranthus viridis*, *Diospyros lotus*, *Emblica officinalis*, *Juglans regia*, *Mangifera indica*, *Morchella* sp., *Murraya koenigii*, *Punica granatum* and *Viola biflora*. Wild edible plants are facing threats in their natural habitats from various human activities. The level of impact varies from place to place. Five major factors threatening wild edible plants are: Overgrazing and overstocking, expansion of agricultural land, forest cuttings for construction and technology, over exploitation of forest product i.e., fuel wood etc and uncontrolled fire settings. Increasing demand for arable land by the burgeoning human population has resulted in shrinkage of grazing land and hence overstocking happened. Also the unplanned construction activities and over exploitation of forest resources are leading to a serious ecological imbalance in the study area. Uncontrolled fire settings are another significant threat to the wild edible species of the region. Interview responses indicate that local Gujjars traditionally in very rare circumstances used to practice

Table 1: Less known wild edible plant used by the Gujjar tribe of district Rajouri Jammu and Kashmir State-India

Botanical name	Family	Local name	Part used and preparation
<i>Amaranthus caudatus</i> Linn.	Amaranthaceae	Chaleri, Ghanar	Leaves and Twigs are cooked as vegetable
<i>Berberis aristata</i> DC.	Berberidaceae	Gruch, Akhray	Fruits are eaten.
<i>Berberis lycium</i> Royle	Berberidaceae	Simbul, Kambli	Fruits and fleshy shoots are eaten
<i>Carissa spinarum</i> Linn.	Apocynaceae	Granda	Fruits are eaten
<i>Capsella bursa-pastoris</i> (L.) Medik	Brassicaceae	Chmso	Leaves and shoots are cooked as vegetable
<i>Celtis australis</i> Linn.	Ulmaceae	Khrikh	Fruits are eaten
<i>Chenopodium album</i> Linn.	Chenopodiaceae	Bathua	Leaves are cooked as vegetable
<i>Dioscorea belophylla</i> Voigt., Ex. Haines	Dioscoreaceae	Tarar	Raw Tubers are consumed
<i>Diospyros lotus</i> Linn.	Ebenaceae	Amlok	Fruits are eaten
<i>Diplazium esculentum</i> (Retz) Sw.	Athyriaceae	Kandor, Ksror	Young fronds are cooked as vegetable
<i>Diplazium frondosum</i> (Clarke) Christ.	Athyriaceae	Jatla Kandor	Young leaves and fronds are cooked as vegetable
<i>Elaeagnus umbellata</i> Linn.	Elaeagnaceae	Kunkoli	Fruits are eaten
<i>Emblica officinalis</i> Geartn.	Euphorbiaceae	Ambla	Fruits used in pickle and eaten
<i>Fagopyrum dibotrys</i> (D. Don.) Hara.	Polygonaceae	Phopra	Shoots and leaves cooked as vegetable
<i>Ficus palmata</i> Forssk.	Moraceae	Kamari, Phagwari	Fruits are eaten
<i>Fragaria nubicola</i> Lindely.	Rosaceae	Jal barnun, kunchi	Fruits are eaten
<i>Grewia optiva</i> Drummm. exBurret.	Tiliaceae	Dhaman	Fruits are eaten
<i>Juglans regia</i> Linn.	Juglandaceae	Akhor	Fruits are eaten
<i>Mangifera indica</i> Linn.	Anacardiaceae	Amb	Fruits are eaten
<i>Malva sylvestris</i> Linn.	Malvaceae	Sonchal	Leaves are cooked as vegetables
<i>Morchella esculenta</i> Linn.	Helvellaceae	Pat Gochi	Fructification is a delicacy vegetable
<i>Mentha longifolia</i> Linn.	Lamiaceae	Pudina	Leaves used as flavoring agent.
<i>Morus alba</i> Linn.	Moraceae	Toot	Fruits are eaten
<i>Morus nigra</i> Linn.	Moraceae	Sia Toot	Fruits are eaten
<i>Murraya koenigii</i> Spring	Rutaceae	Karri Patta	Leaves are used as flavoring agent
<i>Nasturtium officinale</i> R. Br.	Brassicaceae	Chohh	Leaves are cooked as vegetables
<i>Oxalis acetosella</i> Linn.	Oxalidaceae	Khatti Imbal	Whole plant is cooked as vegetable
<i>Oxalis corniculata</i> Linn.	Oxalidaceae	Khatti Hulli	Whole plant is cooked as vegetable
<i>Phoenix acaulis</i> Rosb. ex Buch. Ham.	Arecaceae	Khajuri	Fruits are eaten
<i>Plantago lanceolata</i> Linn.	Plantaginaceae	Charnchi Pattar	Leaves are cooked as vegetables
<i>Podophyllum hexandrum</i> Royle ex camb.	Podophyllaceae	Ban kakri	Fruits are eaten
<i>Polygonum amplexicaule</i> D. Don.	Polygonaceae	Masloon	Roots soup is used as Tea substitute
<i>Potamogeton perfoliatus</i> Linn.	Potamogetonaceae	Chalasang	Young shoots are cooked as vegetable
<i>Prunus armeniaca</i> Buch-Han	Rosaceae	Hari, Swari	Fruits are eaten
<i>Punica granatum</i> Linn.	Punicaceae	Druny	Fruits are eaten
<i>Pyrus pashia</i> Buch. Ham. ex. D. Don	Rosaceae	Batangi	Fruits are eaten
<i>Rhododendron arboreum</i> Sm.	Ericaceae	Lal Hardul	Flower are edible and used to make drinks
<i>Rhododendron campanulatum</i> D. Don	Ericaceae	Hardul	Flower are edible and used to make drinks
<i>Rosa indica</i> Linn.	Rosaceae	Palwari	Fleshy shoots are edible
<i>Rubus fruticosus</i> Smith.	Rosaceae	Pakana, Chanch	Fruits are eaten
<i>Rumex acetosa</i> Linn.	Polygonaceae	Panjali Hulli	Leaves are cooked as vegetable
<i>Rumex maritimus</i> Linn.	Polygonaceae	Kali Hulli	Leaves are cooked as vegetable
<i>Rumex nepalensis</i> Linn.	Polygonaceae	Hulla	Leaves are cooked as vegetable
<i>Solanum nigrum</i> Linn.	Solanaceae	Kachmach	Fruits are eaten
<i>Solanum pseudocapsicum</i> Linn.	Solanaceae	Mirchala	Fruits used as colouring agent in various dishes
<i>Solena heterophylla</i> Linn.	Cucurbitaceae	Kakhari	Fruit edible
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamun	Fruit edible
<i>Taraxacum officinale</i> Weber ex Wiggers	Asteraceae	Hand	Whole plant is cooked as vegetable
<i>Viburnum grandiflorum</i> Wall.ex.D.C.	Caprifoliaceae	Kuch Gauch	Fruit are eaten
<i>Viola betonicifolia</i> J.E.Smith	Violaceae	Banaksha	Flowers are eaten and soup is used as Tea substitute
<i>Viola biflora</i> Linn.	Violaceae	Pila Banfsha	Flowers are eaten and soup is used as Tea substitute
<i>Viola pilosa</i> Wall.	Violaceae	Banaksha	Flowers are eaten and soup is used as Tea substitute
<i>Zanthoxylum armatum</i> DC.	Rutaceae	Timru	Fruits are aromatic and mouth freshener
<i>Zizyphus jujuba</i> (L.) Gaertn.	Rhamnaceae	Beri	Fruits are eaten
<i>Zizyphus nummularia</i> W. and A.	Rhamnaceae	Jerh beri	Fruits are eaten
<i>Zizyphus oxyphylla</i> Edgew.	Rhamnaceae	Broien	Fruits are eaten
<i>Zizyphus sativa</i> Gaertn.	Rhamnaceae	Beri	Fruits are eaten

fire settings to enhance the growth of tender grass, control of flies, ticks and snakes. However, now a days some individuals set fire to expand agricultural land and to get charcoal. As to the conservation state, most of the wild species in the areas have no protection. Especially the low land vegetation, which is the potential

source of wild edibles, is now shrinking. Nevertheless, very few economic tree species like *Diospyros lotus*, *Emblica officinalis*, *Juglans regia*, *Grewia optiva*, *Morus alba*, *Mangifera indica* and *Punica granatum* are now managed by some farmers in their farmland as agroforestry plants. This shows that such management of

and acquisition of economic benefits from species might promote local peoples interest in conservation and maintenance at such important wild edibles.

CONCLUSION

The result of study revealed that knowledge about the edibility, habitat distribution, harvesting time and uses of wild edible plant species is still maintained among the people of Gujjar tribe in the study area. The preservation of knowledge appears to be the result of continued reliance of this tribe on the wild edible plants. Analysis of the result showed that most of the wild edible species are used by children, young girls and women folk of the tribe. Utility of these plant by younger members of the tribe ensure, the maintenance of indigenous knowledge associated with the species. However the decline in use of plants may gradually lead to the fading away of indigenous knowledge associated with these plants. The results also revealed that wild edibles are also under growing pressures from various anthropogenic factors. Thus public awareness and community based management need to be encouraged at all levels.

Wild plants are an important source of food for Gujjar tribe of District Rajouri, the nutritive value of collected plant species seems to be good as the tribals attribute their health, vitality and longevity to the consumption of the wild edible plants. To date there has been no systematic study about the wild edibles consumed by Gujjars. Therefore an attempt has been made to catalogue the local knowledge of wild edible plants used by the Gujjar tribe of District Rajouri. Also this study contributes to the database of traditional indigenous knowledge of plants of the country, which have not been documented earlier. The findings suggest further investigation into nutritional profiles, processing methods, cultivation techniques, conservational studies and pharmacological properties of the reported plant species.

ACKNOWLEDGMENTS

Authors are highly thankful to Prof. Amitabh Mattoo, Hon'ble Vice Chancellor University of Jammu for the financial and moral support he extended for this research. Authors are grateful to Prof. A.K. Wakhlu, Head of the Department of Botany for providing the necessary facilities. Thanks are also due to Dr. Pankaj Kumar Sahni Dr. (Mrs.) Krishan Anand, Miss. Anju Singh and Mr. Sikander Pal for their technical assistance and suggestions. Contribution of the informants of Gujjar tribe, who contributed to this study by revealing their valuable traditional knowledge is highly acknowledged.

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