

Underutilized Fruit Varsity of Kashmir Valley

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Introduction

Biodiversity is considered essential for food security and nutrition for the entire world. The traditional knowledge of dietary food practices has long history in relation to human nutrition. Wild edible plants have been the mainstay of human diet for centuries. The North Himalayan region has its own unique combination of living species, habitats and ecosystems, which together make up its diversity rich resource. While speaking strictly about plant diversity, two regions of the country are termed as hot spots. These are – Western Ghats and the North Eastern Himalayan regions. In all living organisms the species is the single most useful unit to use in diversity assessment. Species richness and the relative abundance of different species is another criterion to measure the degree of diversity. The number of endemic species also reflects into account while assessing the richness of diversity. The North Himalayan region of India comprising eight states namely Jammu and Kashmir, Uttarakhand, Himachal Pradesh and parts of Punjab, Haryana, Rajasthan, Delhi and Uttar Pradesh has vast physiographical variations, which have been represented in five agro climatic zones. North Himalayan region is one of the richest reservoir of genetic variability and diversity of different fruit crops that is various kinds of fruits. The diversity for fruit crops of this region has mainly been managed by local farmers. Considerable diversity exists among the regional fruit crops species including variation in plant type, morphological and physiological characteristics, reactions to diseases and pests, adaptability and distribution. Apart from the nutritional value, many regional fruit crops are used for medicinal purposes, and income generating and poverty alleviation programme in the rural areas.

Scope of Underutilized Fruit Crops



- In Kashmir region, there are marshy and marginal lands, which are unfit for supporting cultivation of high input demanding crops. Such lands can easily be put to use for growing low input crops in order to diversify the present day agriculture, which is so inevitable in view of the increasing population pressure and fast depletion of natural resources as well as the growing and changing human needs in the region.
- The average productivity of the fruit crops is just half of the national productivity. As grain farming is proving un-remunerative in the undulating topography of hilly tracts, which is deprived of irrigation facilities, despite government of India's has been putting forth endeavors to uplift the region, vast potential remains unexploited. It becomes possible to exploit the untapped potential of the region through location specific horticulture and subsequently expanding the area under fruit crops. Production of UUF C can also be increased through adoption of scientific technologies.
- Apart from nutritive value, underutilized fruit crops are particularly more important for medicinal properties and famous for the retentive value in Ayurvedic medicine. Mostly people are familiar with the medicinal properties of locally grown fruit crops.

Publicity of underutilized fruit crops

Publicity of underutilized fruit crop cultivation and conservation is hence essential. Most of the indigenous fruits have only a few specified varieties. Therefore, their improvement and development of ideal propagation methods and agro-techniques should also be adopted. Being local crops and harvested from the wild or found in the home gardens, they are easily available and thereby provide food security to the people. Underutilized crops are components of mixed cropping systems, whether on terraces, agro forestry systems or home gardens. Besides, underutilized crops are integrated into the farming system and are better suited to harsh conditions than domesticated commercial crops. Since an uncertainty of climate is prevalent, a certain level of resilience can be built through increased agrobiodiversity. If one crop, or one variety, fails due to unforeseen events, others might be available to provide food or income instead.

Diversification of Underutilized Fruit Crops

Kashmir valley being rich in plant diversity, has a very large number of non-traditional or underutilized fruit crops. Different agro-ecological/phyto-geographical regions hold rich diversity in both the cultivated and the wild fruit crops. In view of its importance

from the context of diversity conservation the region is one of the hot-spot of the world. Diversity among species of underutilized fruit crops in the Kashmir region is discussed below.

Table 1 Underutilized fruit crops of Kashmir valley

Fruit Crop	Species
Pistachio nut	<i>Pistacia vera</i> , <i>P. atlantica</i>
Fig	<i>Ficus carica</i> , <i>F. palmate</i> , <i>F. hispida</i> , <i>F. foreolata</i> , <i>F. nemoralis</i> , <i>F. odorata</i>
Mulberry	<i>Morus indica</i> , <i>M. serrate</i> , <i>M. laevigata</i>
Loquat	<i>Eriobotrya angustissima</i> , <i>E. dubia</i> , <i>E. bengalensis</i>
Quince	<i>Cydonia oblonga</i> Mill.

Distribution of Underutilized fruit crops in Kashmir valley

Kashmir is bestowed with all the temperate fruit crops which are widely grown in all the parts of the valley. Apart from the major fruit crops viz. Apple, Pear, Walnut, Cherry, Almond etc. few minor or underutilized fruit crops are also found growing in the valley upto some extent which includes Fig, Loquat, Pistachio nut, Quince, Mulberry, Blackberries etc. These underutilized fruit crops are generally grown in homesteads or waste lands of all the districts of the valley. These crops can be used commercially or for local consumption because of their high nutritional value and economic return. These crops can be consumed as table purpose as well as processing for value addition. These crops represent genetic diversity of temperate fruit crops in the valley and therefore conservation of these underutilized fruit crop is important.

Few underutilized fruit crops of Kashmir valley

Pistachio nut (*Pistacia vera* L.)

Pistachio nut is an exceedingly delectable and valuable nut fruit crops. It is a small deciduous tree belongs to family Anacardiaceae. Pistachio trees are fairly hardy in the right conditions and can survive temperatures ranging between -10°C in winter and 48°C in summer. The flowers are apetalous and unisexual and borne in panicles. There are eleven species in the genus which is classified on the basis of leaf characteristics because floral characters are simple and uniform. Among the various *Pistacia* species, only *P. vera* produces the commercially acceptable edible nuts while other species serve as rootstocks of ornamental trees. Pistachio nut is relished very much dessert after roasting and salting but it is mainly used as an ingredient of sweetmeats, confectionery, bakery goods, meat dishes and

ice-creams. The nut is known for its excellent nutty flavor and digestive, sedative and tonic values. Marmalade is also made from the fruit husks. The kernel oil finds its use in confectionary and pharmacy.



Pistachio male flower (panicle)



Pistachio Fruit

Fig (*Ficus carica*)

Fig is deciduous and sub-tropical climate under cultivation. Fig is gynodioecious fruit with belong to family Moraceae. Morphologically it is called as 'syconium', which is a vegetative, fleshy tissue, with tiny true fruits enclosed inside. Fig is highly nutritious fruit with rich in calories, proteins, calcium (higher than milk), iron and highest fiber content. It is valued for its laxative properties and is used in the treatment of skin infection. Fruits help to maintain acid-alkali balance of the body. Latex is useful to coagulate milk. Climate has an important bearing on size, shape and color of skin and pulp. Figs can be eaten fresh or dried, and used in jam-making. Most commercial production is in dried or otherwise processed forms, since the ripe fruit does not transport well, and once picked does not keep well. The widely produced fig newton or fig roll is a biscuit (cookie) with a filling made from figs. Fresh figs are in season from August through to early October. Fresh figs used in cooking should be plump and soft, and without bruising or splits. If they smell sour, the figs have become over-ripe. Slightly under-ripe figs can be kept at room temperature for 1–2 days to ripen before serving. Figs are most flavorful at room temperature.

**Fig Fruits****Mulberry Fruits****Mulberry (*Morus alba*)**

Mulberry is a fast growing deciduous and dioecious woody perennial plant and belong to family Moraceae. It has deep root system. The leaves are simple, alternate, stipulate, petiolate, entire or lobed. Number of lobes is from 1 to 5. Inflorescence is catkin with pendent or drooping peduncle bearing unisexual flower. Fruit is a sorosis and the color of the fruit as mainly violet black. Mulberry is multipurpose tree and has high potential economic value other than sericulture because it has many unique and special features. Apart from being the sole food plant of mulberry silkworm, mulberry can also be exploited for several other biological and industrial purposes and it also has many medicinal values. Mulberry leaves are directly used in preparing of tea, roots and stem are boiled to prepare both are effective in lowering down the blood pressure. Mulberry fruit is high source of vitamin C and juice also good for brain heart, spleen and help curing diarrhea and intestine ulcers.

Loquat (*Eriobotrya japonica*)

Loquat is a large evergreen shrub or small tree, with a rounded crown, short trunk and woolly new twigs. The tree can grow to 5–10 metres tall, but is often smaller, about 3–4 metres. The fruit begins to ripen during spring to summer depending on the temperature on the area. The leaves are alternate, simple, 10–25 centimetres long, dark green, tough and leathery in texture, with a serrated margin, and densely velvety-hairy below with thick yellow-brown pubescence; the young leaves are also densely pubescent above, but this soon rubs off. The fruits are the sweetest when soft and orange. The flavour is a mixture of peach, citrus and mild mango. The loquat has a high sugar, acid, and pectin content. It is eaten as a fresh fruit and mixes well with other fruits in fresh fruit salads or fruit cups. The fruits are also commonly used to make jam, jelly, and chutney, and are often served poached in light syrup. Firm, slightly immature fruits are best for making pies or tarts. Loquats can also be

used to make light wine. It is fermented into a fruit wine, sometimes using just the crystal sugar and white liquor. In Italy nespolino liqueur is made from the seeds, reminiscent of nocino and amaretto, both prepared from nuts and apricot kernels. Both the loquat seeds and the apricot kernels contain cyanogenic glycosides, but the drinks are prepared from varieties that contain only small quantities (such as Mogi and Tanaka), so there is no risk of cyanide poisoning.



Blooming in loquat



Loquat Fruits

The loquat is low in saturated fat and sodium, and is high in vitamin A, dietary fiber, potassium, and manganese. Loquat syrup is used in Chinese medicine for soothing the throat and is a popular ingredient for cough drops. In Japan, loquat leaves are dried to make a mild beverage known as *biwa cha* by brewing them using the traditional Japanese method. *Biwa cha* is held to beautify skin and heal inflammatory skin conditions such as psoriasis and eczema and to heal chronic respiratory conditions such as bronchitis. Eaten in quantity, loquats have a gentle but noticeable sedative effect, lasting up to 24 hours.

Quince (*Cydonia oblonga*)

The quince is the sole member of the genus *Cydonia* in the family Rosaceae (which also contains apples and pears, among other fruits). It is a deciduous tree that bears a pome fruit, similar in appearance to a pear, and bright golden-yellow when mature. The seeds contain nitriles, which are common in seeds of the rose family. In the stomach, enzymes or stomach acid or both cause some of the nitriles to be hydrolyzed and produce hydrogen cyanide, which is a volatile gas. The seeds are only likely to be toxic if a large quantity is eaten. Quinces are appreciated for their intense aroma and flavor. However, most varieties of quince are too hard and tart to be eaten raw; even ripe fruits should be subjected to bletting by frost or decay to be suitable for consumption. However, they may be

cooked or roasted and used for jams, marmalade, jellies, or pudding. The flesh of the fruit turns red after a long cooking with sugar by formation of anthocyanins. Quince is one of the most popular species for deciduous bonsai specimens along with related Chinese quince and Japanese quince.

**Quince Flower****Quince Fruits**

Blackberries

Blackberry (*Rubus* sp.) fruit contains high levels of anthocyanins and other phenolic compounds, mainly flavonols and ellagitannins, which contribute to its high antioxidant capacity and other biological activities. Blackberry phenolic composition and concentrations are known to be influenced by genetics, growing conditions, and maturation. Sweet, pulpy and mouth-watering blackberries are summer delicacies which are consumed as table. This versatile fruit is also used in baked goods, Pie, wine, added to fruit or vegetable salads or turn them into jellies, jams or sauces. The Blackberry has not only unique taste but numerous therapeutic values. It has anti-inflammatory, antiviral, antimicrobial and anti-carcinogenic properties with notable nutritional contents like vitamin C, K, folic acid, essential minerals and anthocyanins. Besides, it is also good source of potassium, calcium, manganese and iron and rich in anti-oxidant vitamins A and C. The Greeks used the blackberry as a remedy for Gout while the Romans made a tea from the leaves of the blackberry plant to treat various illness. It is valuable remedy for dysentery and diarrhea. A 1-cup serving of blackberries contains 62 calories, 1 gram of fat, 2 grams of protein and 14 grams of carbohydrates, including 8 grams of dietary fibre. The vitamins, minerals, phytochemicals and fibre in blackberries may help to lower your risk for heart disease. Blackberries are said to strengthen

blood vessels, help fight heart disease and help improve eyesight. The high tannin content of blackberries help tighten tissue, relieve intestinal inflammation, and help reduce hemorrhoids and stomach disorders.



Blackberry shrub in flowering and fruiting

Strategies of improvement of Underutilized fruit

Neglected or underutilized crops have the potential to play a number of roles in the improvement of food security in India that include being:

- Part of a focused effort to help the poor for subsistence and income,
- A way to reduce the risk of over-dependency on very limited numbers of major staple food crops,
- A way to increase sustainability of agriculture through a reduction in inputs, Increase the food quality.
- A way to preserve and celebrate cultural and dietary diversity, A way to use marginal and wastelands for agricultural purposes to meet the ever increasing food demand.

These underutilized fruit resources can be used to combat malnutrition, hunger and to reduce burden on overexploited fruits. Adaptation of new fruit sources will bring the unexploited underutilized and neglected plants into mainstream of consumption. There is an urgent need for the conservation and protection of these plants of future.