

# Underutilized Horticultural Crops

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India is one of the most populous countries of the world and accounts for about one fifth of the world's population with more than 70% of the farming households. The annual population growth rate is around 1.8 percent, whereas, the overall demand for food is expected to grow by 3% or more per annum in the near future. Although, diverse agro-climatic conditions of India permit to grow more than 60 cultivated and about 30 lesser-known vegetable crops, not much attention has been given on underutilized vegetables known. Underutilized crops/plant species as "those species with underexploited potential for contributing to food security, health (nutritional/medicinal), income generation, and environmental services".

## What do you mean by underutilized crops?

Neglected and underutilized crops are domesticated plant species used for food, medicine, trading, or cultural practices. They are significant within their local communities but are not widely commodified or studied as part of mainstream agriculture. Such crops may be in declining production. They are considered underutilized in scientific inquiry for their perceived potential to contribute to knowledge regarding nutrition, food security, genetic resistance, or sustainability. Other terms to describe such crops include minor, orphan, underused, local, traditional, alternative, minor, niche, or underdeveloped.

Underutilized crop species as crops whose potential contribution to the national economy have not been adequately explored due to the decreased attention to their production, consumption and utilization (Aboagye et al., 2007).

## Features, importance and scope of underutilized horticultural crops

Features of underutilized horticultural crops to be considered a crop as an 'underutilized horticultural crops', it must have the following features:

- The underutilized horticultural crops crop must have scientific proof of food value.

- They must have been cultivated in a specific geographical region or natural habitat and have indigenous uses in localized areas.
- Crop must have less or no proper supply of planting materials.
- Crop must be currently cultivated less than other conventional crops.
- Received little or no attention from consumers, farmers, researchers and policy makers.
- May be highly nutritious and have therapeutic or medicinal properties or other multiple uses.
- Most of the underutilized horticultural crops are hardy and thus resistant to adverse climatic conditions, biotic and abiotic stress.

## Importance of underutilized horticultural crops

- The underutilized horticultural crops played a major role in diversification of diet and more balanced form of nutrition there by eliminating malnutrition in rural areas.
- They played a role in keeping alive the cultural diversity through food habits, religious rituals, social exchange and constitute essential biological assets of the rural poor.
- They are effectively deployed to address poverty through employment and income generation
- They provide crop diversification and a hub of genetic resources in conservation and crop improvement.
- Some sections of underutilized horticultural crops are effectively employed in manufacturing traditional herbal medicines, decoctions and drugs in treating several health issues or directly consumed as food to boost the immune system of human body.

## Scope of underutilized horticultural crops

The underutilized horticultural crops being hardy and adaptable to adverse climate and soil with India being a diverse climatic country, it is possible to explore the untapped potential of a particular region with a scientific approach and subsequently extend the area under horticultural crops. The increasing demand from consumers in developed and

developing countries for diversity in diets and novelty in foods is creating new market niches for underutilized horticultural crops. These can create opportunities to generate additional income and employment for poor farmers in rural areas. A startup among the unemployed youths can be established to generate income through processing and other value-added products of underutilized horticultural crops. Apart from nutritive value, underutilized horticultural crops are particularly more important for their medicinal values and famous in Ayurvedic medicine. Mostly the local people are familiar with the infusion preparations and used in the treatment of particular ailments.

### List of Underutilized Vegetable Crops

#### *Alternanthera sessilis* (Ponnanganni Greens, Gudrisag)

The leaves are eaten as potherb and used for cool down the body useful in diarrhoea, fever, anaemia etc. In Karnataka and Tamil Nadu, the leaves, flowers and tender stems are consumed as vegetables. Ponnanganni greens are rich in protein, carbohydrate, fat, fibre, carotene, vitamin C, riboflavin, niacin and various minerals. Leaves and tender shoots are used as vegetables. It is mainly propagated by seed.



#### *Sesbania grandiflora* (Agathi)

Leaves, flower and tender fruits are valued as vegetables or mixed into curries or salads in many countries due to their high nutritious value particularly vitamin A and minerals. Leaves and flowers have nutritional and medicinal properties. However, it is not grown large scale for vegetable purpose. It is mainly propagated by seed. In T.N grown around banana as a wind break, around coconut seedlings as a shade plant. It has also ornamental, food and fodder



values. Agathi is a folk remedy for bruises, catarrh, dysentery, eyes, fevers, headaches, smallpox, sores, sore throat, and stomatitis (Duke and Wain, 1981.)

#### *Sauropus androgynus* (Chekkurmanis)

The plant is reputed for its high nutritive value and therefore it is popularly known as "multivitamin green" and "multi mineral packed leafy vegetable". Chekkurmanis is a rich source of carbohydrate, vitamins and minerals. In Malayalam, this plant is known as 'Madhurakeera' and in Tamil it is "Thavarai



Muringai". It is mainly propagated by Semi hard wood stem cuttings. Juice of leaves of chekkurmanis is pounded with roots of pomegranate and leaves of jasmine are used against eye troubles. The tender shoots and leaves are used for vegetable in Tamil Nadu and Kerala. Leaves

are very rich in protein, minerals and vitamin A, B, C and also used to give light green colour to pastry and to fermented rice in Dutch East Indies, preparation of soup in java. It is planted as live fence in garden beds and provides shade to vegetables.

#### *Ipomoea muricata* (Clove bean)

Tender fruits are used for cooking. It is used as vegetable in mostly in Kerala. The fruits contain fibre, vitamin C, potassium and calcium. Powdered clove bean are known remedy to fever. Plants juice is sprayed to kill bugs.



#### *Dioscorea bulbifera* (Aerial yam, Air potato)



The bulb is eaten on peeling off the hard back after cooking Aerial yam has been used as a folk remedy to treat conjunctivitis, diarrhoea, and dysentery, among other ailments. Useful in syphilis, gonorrhoea, hydrocele. Goitre, piles, dysentery. It is used as vegetable in South Indian states. It is propagated by bulbil.



## List of Underutilized Fruit Crops

### Bayberry (*Myrica esculenta* spp.)

Bayberry is a perennial fruit tree originated in Southern China. It comprises of more than 50 species distributed throughout tropical, subtropical and temperate climates (He et al., 2002). Some of the species are distributed throughout the NE hill region in India. It is a tall plant up to 20 m height with dark green and glossy leaves. The plant exhibit four different types of flowers depending upon the presence of male and female flower (Miao and Wang, 1987) viz., only male flowers, only female flowers, female flowers > male flowers and male flowers > female flowers. The catkins arise axially from shoots as a racemose inflorescence with pollination carried out by wind. Upon ripening, the fruits turned greenish white, purple, red or greenish yellow from unripe green colour depending on species and has a pleasant combination of sweet (sugar) and tart (acid) tastes. It is rich in vitamin C, carbohydrate, organic acid, thiamine, riboflavin, carotene and antioxidants. (Wang et al., 2002). It can be propagated sexually through seeds and asexually through cuttings and suckers arising from layering.



### Monkey jack (*Artocarpus lakoocha*)

Monkey Jack fruit (*Artocarpus lakoocha* Roxb., Moraceae) is a tropical fruit and originated from India.



It is mostly found in Asian countries like Bangladesh, Bhutan, Nepal, Myanmar, Sri Lanka, Thailand,

Malaysia, Singapore, Vietnam, Cambodia and Laos. It is usually propagated through seeds. The seeds are recalcitrant and loses its viability within a week of harvest.

### Khirni (*Manilkara hexendra* L.)

Khirni/rayan belongs to the *Sapotaceae* family, and it is a native to India, evergreen, medium-sized, slow-growing fruit plant with a spreading canopy. It is a wild plant found in the arid and semi-arid to tropical climate as an avenue



tree and can be used as bonsai due to the evergreen, dense foliage and dwarf habit. It bears flowers in February–March, whereas fruit ripen in May–June, and it is commercially used as rootstock for sapota to exploit its tolerance to salinity and drought. Khirni fruit and bark are used for numerous medicinal purposes, such as curing fever, flatulence, stomach disorder, leprosy, ulcers, opacity of the cornea, dyspepsia, urethrorrhea and bronchitis.

### Manila tamarind (*Pithecellobium dulce* (Roxb.) Benth.)

Manila tamarind is commonly known as Madras thorn Monkey pod and Jungle jalebi and belongs to the *Fabaceae* family. It is a multipurpose, fast-growing, medium-sized thorny tree used as live fencing, animal fodder, hardwood timber, windbreak and a potential source of lac culture. Its fruit has a sweet acidic taste and high content of dietary fibre, proteins, Ca, Fe, P, unsaturated fatty acids and antioxidants. Manila fruit is used to treat toothaches, mouth ulcers, sore gums, dysentery, chronic diarrhoea, stress, aging symptoms and dark skin spots.



### Constraints in cultivation of underutilized horticultural crops:

- Lack of awareness among the farming community about the nutritional and medicinal values of underutilized horticultural crops.
- Lack of research and extension work.

- Lack of proper documentation of these crops.
- Lack of cultivation technique and practices.
- Lack of desirable planting materials among the farmers for large scale cultivation.
- Lack of post-harvest management practices in increasing the shelf life.
- Limited and inadequate marketing supports & infrastructure facilities for transportation, storage and processing.
- Limited participation of financial Institutions in setting up of agro industries.

### Strategies for the development of underutilized horticultural crops

- A detailed research and extension of targeted potential underutilized horticultural crops
- should be taken up through various national programs focusing on their conservation and uses.
- As the underutilized horticultural crops mostly occur naturally in the forest, domestication through homestead cultivation should be encouraged to avoid overexploitation from their natural habitat.
- Production of quality seeds and other vegetative planting materials should be focus.
- Awareness campaign on the nutritional and medicinal properties of underutilized horticultural crops among the producers as well as consumers.
- Proper documentation and ethnobotanical studies of underutilized horticultural crops should be done.

### Conclusion

India is bestowed with different agro-climatic regions for the production of under-exploited horticultural crops. Apart from the fresh produce, production of quality seeds including hybrids and varieties of underutilized horticultural crops can be

developed and exported. Similarly, desirable genes present in these crops can also be exploited in breeding programmes. It can also generate income and create employment opportunities in agro-based industries, packaging, storage, preservation, canning and transportation. Thus, safeguarding and conservation of these crops should be given a prior importance to avoid over exploitation in the future.

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