

# Enriched Essentials: Unique Potential of Processed Underutilized Fruits

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Underutilized species are defined in different ways such as minor, traditional, neglected, new, alternative, lost, orphan, promising and underdeveloped. Minor fruits are characterized by the fact that they are locally abundant, but restricted in their geographical dispersion with a high use value; they are widely adaptable to agro-ecological niches/marginal areas; it lacks scientific knowledge about them; their current use is limited relative to their economic potential. In India, about 27 % of the fruit production consists of a large number of minor fruits. There are nearly 150 of consumable species of minor fruits in India. Most of the minor fruits are enriched with nutritional and medicinal value and can be grown even in wastelands without much care. A wide variety of underutilized crops, which are neither commercially cultivated nor traded on a large scale, are mainly grown, commercialized and consumed locally. The potentiality of processed products from some minor fruits are essential.

## Important Underutilized fruits



## Indian gooseberry - Aonla

Aonla is native to India and it has a load of vitamin (500 -1800 mg/100 g) among other fruits. Fruits are widely used in ayurvedic medicines. Rather than fresh consumption value added products are preferred because the fruits tastes acidic and astringent.

Aonla fruits are processed into various products such as jam, jelly, syrup, sauce, chutney, preserve, candy, osmo-air dried aonla slices, pills, pickle, shreds and supari. Pectin in fruit provides a good set in jam and high concentration of sugar helps in preservation of jam. Aonla sauce has the shelf life of about 9 months. Aonla chutney is hot, sugary, smooth texture, spicy, mellow flavoured aroma and delicious in nature. Aonla murabba purifies the blood and reduces the cholesterol level. Candy has high nutrient content and longer storage life. Aonla juice, lemon juice and ginger juice were used at various combinations with sugar and artificial sweeteners (aspartame and saccharine) for preparation of nutritious RTS beverages. Dried aonla contains leucoanthocyanins or poly-phenols which increases the stability of ascorbic acid. Ayurvedic Aonla Processed Products are triphala, chyawanprash, ashokarishta and kanchanar Guggulu. Novel products of aonla are Anola-ginger Toffee and mouth freshener.

## Indian date - Tamarind

Tamarind fruit pulp and seed contains tartaric acid, reducing sugar, tannin, pectin, cellulose, fibre, potassium, calcium, phosphorous, sodium, iron and zinc. The fruit pulp is considered as a great delicacy and it is the main source for preparation of sauces, curries, chutneys, beverages and food colorants.

Tamarind juice concentrate is a refreshing drink and beverage in most of the Asian, Southern and Central American countries and it has high content of vitamin B (Thiamine and Niacin), vitamin C (Ascorbic acid: 5.1- 6.1 mg/100 ml) and carotene. The pickles are predominantly used in Asian countries as an accompaniment to curries and other meals. In Philippines, Fruits are processed into balls or "Champoy" which is a common tamarind product. Sous is prepared by extracting dried roots of sweet wood, mulahatti and yastimadhu which are all infused with tamarind dried pulp. It is a traditional and popular refreshing tamarind drink of Jordan.

### **Madras thorn - Manila tamarind**

Fruit tastes like sweet acidic in nature. It has a high content of dietary fiber, proteins, Ca, Fe, P, unsaturated fatty acids and antioxidants. Manila fruit cures toothaches, mouth ulcers, stress, aging symptoms, sore gums, dysentery, chronic diarrhoea and dark skin spots.

Coloured varieties are suited for preparation of jam and squashes. Sweet edible aril is eaten as fresh or macerated in water to make a lemonade like beverage. Pods pulp is used in making of paste, mixed fruit jam and beverage. In India, the seeds are eaten in curries because of their edible nature.

### **Elephant apple - Wood apple**

Wood apple fruit is rough, hard-shelled with sweet aromatic edible pulp. It has therapeutic and functional properties such as leaves relieves the diuretic, anti-microbial and stomach disorders; roots and bark has insecticidal property; fruit pulp cures skin cancer, diarrhoea, sore throat, Jaundice and gastropathy.

The fruit is processed as powder, preserve, squash, sherbet, beverage, jam, cream, leather, wine, toffee, candy, RTS, pickle and capsules. The wood apple blended fruit bars were qualitatively and organoleptically accepted and fit for consumption up to 6 months of storage.

### **Poor man's apple - Ber**

Ber is the king of arid zone fruit crop. It is a rich source of Caffeic acid, p-hydroxybenzoic acid, ferulic acid and p-coumaric acid. The fruit pulp contains carotenoids, protein, vitamins - A, B, C, fructose, glucose and galactose. Ber seeds contain saponins, jujubogenin and obelin lactone. The fruit is perishable in nature and it should be consumed within 5 days after harvesting. Due to its short storage period, value added products have to be developed.

The processed products of ber are candy, jam, preserve, Dehydrated and sundried ber, beverages and pickle. Umran cultivar of ber is best suited for candy preparation. Ber jam treated with 0.3 % citric acid can be stored for 60 days without any deterioration in the product. Ber murabba can be stored for a year. The dehydrated fruit can be eaten as such or it can be reconstituted with 10 % sugar solution and consumed as liquid beverage. All

unfermented/fermented, sweetened/unsweetened drinks are categorised as beverages. It includes squash, nectar, crush, wine, RTS etc. Lemon treated ber pickle can be stored for three months compared to vinegar-based pickle.

### **Golden apple - Bael**

Bael fruit is highly nutritive with rich source of riboflavin. The unripe bael fruits are used for pharmaceutical and therapeutic purpose. Bael has a high tannin content which cures dysentery and cholera. The bael fruit is rich in carotenoids, carbohydrates and vitamin C. Fruit pulp contains detergent properties which can be utilized for washing the garments and the fruit is used to remove scum from vinegar production.

Bael processed products are preserve, candy, panjiri, toffee, jam, slab, squash and wine. Fruit toffee and fruit bar is chewy texture in nature and has high dietary fibre and natural sugar content. Jam is flavourful. The limonene-rich oil extracted from the fruit peel has been used as a hair oil.

### **Bullock's heart - Custard apple**

Custard apple is a source of the medicinal and industrial products. Fruit contains vitamins A, B, C, E, and K<sub>1</sub>, essential minerals, antioxidants and poly-unsaturated fatty acids. Therapeutic properties include antimalarial, antifeedant and immune-suppressive.

The processed products include jam, fruit-flavoured yoghurt, fruit drinks, juices, candies, wines and syrups. The jam is fit for consumption during the 4 months of storage and during the storage period the amount of TSS, total sugars and reducing sugars increased gradually. Toffees can be used as an ideal supplement for the children. The RTS beverage with preservative has shelf life of 180 days when stored at room temperature.

### **Black plum - Jamun**

Jamun is rich in biochemical compounds such as anthocyanins, myrecetin, ellagic acid, isoquercetin, glucoside, kaemferol and it is used for its anti-inflammatory, neuropsychological, anti-microbial and anti-HIV. Different value-added products that can be prepared from Jamun includes jam, jelly, squash and seed powder.

### Christ's thorn - Karonda

Karonda fruit is a rich source of iron (39 mg/100 mg) and contains a fair amount of Vitamin C. Mature fruit contains high amount of pectin. It is antiscorbutic and cures anaemia. Fruits are used in many ayurvedic formulations because of their nutritional value. Immature fruit is also used as a vegetable, while the fully ripe fruit is consumed as fresh.










Karonda has a high potential for value addition. Value added products prepared from unripe fruits are Pickle, Candy and Chutney, from ripe fruits are Jam, RTS, Nectar, Squash, Canned fruits, Syrup and Fruit powder. Purple to deep red fruits of karonda are used for preparation of jam and it can be stored for atleast three months without any deterioration. Pickle is easy to prepare and ready to eat and it can be stored for four months. Juice can be blended with various proportion of guava, papaya and pineapple juice

shows best organoleptic quality and acceptability. A natural food colourant cum nutraceuticals supplement was prepared from the ripe fruits.

### Conclusions

The underutilized fruit species play a main role in mitigating nutritional insecurity and poverty in rural areas of the country. The minor fruits plays an important role for their therapeutic properties due to their significant medicinal value and it can be considered as future horticulture asset to help nation in assuring nutrition and food security. Considering the potential of the underutilized fruit crops, the emphasis shall be made to substantiate the efforts being made towards eradicating global malnutrition by their direct introduction in other arid and semi-arid regions of the world so as to achieve the goal of sustainable development. Due to the perishable nature of the fruits the processed products made it available throughout the year.

**Table 1: Major value-added products of minor fruits**

Fruits	Products	Fruits	Products	Fruits	Products
Aonla	 Aonla murabba	Ber	 Ber candy	Wood apple	 Wood apple Jam
Tamarind	 Tamarind juice concentrate	Bael	 Bael candy	Jamun	 Jamun jelly
Manila tamarind	 Manila tamarind squash	Custard apple	 Custard apple icecream	Karonda	 Karonda chutney

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