



**Biotica
Research**

Today

**Vol 2:6 416
2020 418**

Underutilized Fruit Crops- A Potential Source of Nutraceutical Significance

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 Open Access

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Keywords

Underutilized fruit crops, Nutraceuticals, Health benefits, Bioactive compounds

Article History

Received in 04th June 2020

Received in revised form 10th June 2020

Accepted in final form 11th June 2020

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How to cite this article?

Padmapriya et al., 2020. Underutilized Fruit Crops- A Potential Source of Nutraceutical Significance. Research Today 2(6): 416-418.

Abstract

Underutilized plants, in general, constitute those plant species that occur as life support species in extreme environmental conditions and threatened habitats, having genetic tolerance to survive under harsh conditions and possess qualities of nutritional and/or industrial importance for a variety of purposes. In the current scenario of increasing rate of degenerative diseases these plant materials can be used to manage them economically with fewer side effects when compared to modern medicines. In this chapter emphasis is given on few underutilized fruits available in India and their nutritional and potential health benefits to manage different diseases and disorders.

Introduction

It was reported that approximately 7200 plant species have medicinal properties and among them 3000 plant species were recognized by India. Several fruit crops are believed to be the storehouse of chemical nutrients which have a significant role in human well-being and healthier sustenance. Among these substances can be listed vitamins, minerals, polyphenols, flavonoids and anthocyanins. The nutraceutical properties of these compounds are mainly concerned with the antioxidant activity that neutralizes the effects of free radicals, which contribute to cause oxidative damage to various cellular components. The nutraceutical products are recognized and produce health benefits like alleviating the risk of cancer and heart disease and also prevent hypertension, high cholesterol, obesity, osteoporosis, diabetes, joint pain, macular degeneration (leading to irreversible blindness), cataracts, menstrual symptoms, insomnia, memory loss etc. (Whiteman, 2011).

Aonla or Amla (*Emblica officinalis* Gaertn)

The fruit of amla is the treasure house of medicinal properties, are highly nutritious as it contains carbohydrates, fiber and minerals like calcium, prosperous, iron, vitamin C and vitamin B complex. Phylloemblin, a secondary metabolite obtained from pulp of the fruit has been found to have mild depressant properties on central nervous system and good liver tonic. It has recorded evidences of increasing eyesight and aphrodisiac effects. It is the main ingredient of the ayurvedic preparation 'Chavanprash' and one of the three ingredients of 'Thiphala choorna', (mixture of Amla, *Terminalia chebula* and *T. bellerica*) which is a health and digestion tonic, which also prevents hair from premature graying and falling. Medicinally it acts as anti-scorbutic (cures scurvy), diuretic, laxative, antibiotic

and anti-dysenteric. The fruits contain proteins, ascorbic acid and higher concentrations of most minerals and amino acids. Glutamic acid, proline, aspartic acid, alanine and lysine are the important amino acids present in amla fruits. It is profusely used in the process of complete rejuvenation of the body (Hegade, 2005).

Bael (*Aegle marmelos*)

The Bael tree is considered as a sacred tree by the Hindus native to India. It was identified that edible portion of Bael contains water, protein, sugar, fat, fiber, phosphorus, potassium, calcium, iron and mineral salts, carotene, niacin, vitamin A, vitamin B1, vitamin B2 (Riboflavin) and vitamin C (ascorbic acid). Sweet drink prepared from the pulp of fruits produce a soothing effect on the patients who have just recovered from bacillary dysentery. The ripe fruit is a good and simple cure for dyspepsia. The medicinal value of Bael fruit is enhanced due to presence of the volatile substance, tannin, in its rind. The rind contains 20% and the pulp has only 9% of tannin. This substance helps to cure diabetes. Ripe fruit is taken during summer as a tranquilizer.

Jamun (*Syzygium cumini*)

The stimulating and healing properties of jamun make it one of the useful medicinal fruit tree of India. Fruits are good source of iron and are used as an effective medicine against diabetes, heart and liver problems. It is reported that hundred grams of jamun fruits contain 83 Kcal, 0.9 g of fibre, 1.5mg of iron, 0.4 g of mineral etc. Antioxidant activity of Jamun is due to anthocyanins, gallic acid, quercetin etc. Juice is diuretic and prevents enlargement of spleen. The fruit extract prevents oxidation of LDL, control; prevent atherosclerosis, cancer, and cardiovascular/ inflammatory diseases. Seed powder used as diabetic medicine Consumption of fresh fruits purifies blood, avoids bad breath and strengthens gum and teeth. Seed powder is classified under fiber food items, which reduces the glucose level in the blood. The study of supplementation of jamun seed powder @ 2g daily for three months, found reduced blood sugar level to 30mg per 100ml of blood (Shilpa and Krishnakumar, 2015).

Passion fruit (*Passiflora incarnata*)

Passion fruit is a rich source of vitamins, minerals, antioxidants and fiber. The fruit is an excellent source of dietary fiber which helps remove cholesterol from the body and 100 g fruit contains about 97 calories. A 100-gram serving provides 10 percent (348 milligrams) of daily potassium needs, and small amounts of riboflavin, niacin, vitamin B6, iron, magnesium, phosphorus, and folate. A trio of standout antioxidants – vitamin C, beta carotene and flavonoids – in passion fruit may protect your cells from oxidative damage from harmful molecules called free radicals. The vitamin C (L-ascorbic acid) in passion fruit is essential for good bone

structure, cartilage, muscle, and blood vessels. It also aids in the absorption of iron and promotes wound healing. It was used as a cure for nervous restlessness and gastro-intestinal spasm. Now, it is widely approved that passion fruit juice could reduce anxiety due to mental tension, bring relaxation and induce sleep. Like the fruit, the peel of the passion fruit is rich in flavonoids and can be found as a nutritional supplement.

Phalsa (*Grewia subininaequalis*)

Phalsa contains 90.5 Kcal, 5.53 g fiber, 1.57g protein, 372 mg potassium, 136 mg calcium, 24.2 mg phosphorus, 1.08 mg of iron, 16.11 µg vitamin A, 0.02 mg thiamin, 0.26 mg riboflavin, 0.82 mg niacin, 4.38 mg ascorbic acid per 100 g of fruits. Ripe fruits are sub-acidic in taste and a rich source of vitamins A and C. Phalsa is an astringent, coolant, and stomachic widely used for several medical formulations. The fruit has low glycemic index, thereby regulating blood glucose metabolism. They are also rich in phosphorous, and iron. They help to cure inflammation, heart and blood disorders, fever and constipation.

Karonda (*Carissa caranda*)

Karonda is a fair source of calcium, phosphorus, vitamin-A and ascorbic acid. The dried fruits may act as a substitute for raisins. The fruits are traditionally used for medicinal treatments of malaria, epilepsy, nerve disorder, relieve of pain and headache, fever, blood purifier, itches and leprosy. Fruits of *Carissa caranda* being rich source of iron and vitamin C are used for curing anaemia. The major bioactive constituents, which impart medicinal value to the herb, are flavonoids, saponins alkaloids and large amounts of triterpenoids, cardiac glycosides, phenolic compounds and tannins. Decoction of its leaves is also used against fever, diarrhoea and ear ache, and the roots are used for stomachic, remedy for itches, vermifuge and insect repellent.

Conclusion

The minor fruits are reservoirs of several essential nutrient elements, vitamins and minerals and bioactive compounds are directly attributed to antioxidant properties against various free radicals. Anti-nutritional factors have to be evaluated before their utilization and consumption. It is believed that regular consumption of these fruits will aid in preventing several diseases and disorders including obesity, diabetes and chronic diseases. Since the market of nutraceuticals is ever growing, there is an urgent need to explore the potential nutraceutical properties of fruits. So that more awareness is created among the consumers, which will subsequently benefit to fight several nutrition related problems.

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