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Jamun {*Syzygium Cumini* (L.)}: A Seasonal Fruit With Numerous Health Benefits

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Introduction

The native place of *Syzygium cumini* (L.) (commonly known as Jamun) tree is the subcontinent of India, but in the present day, it can be found in the other parts of the world. The synonyms for *Syzygium cumini* L. are *Eugenia jambolana*, *Syzygium jambolana*, *Eugenia cumini*, Indian blackberry, black plum, Malabar plum, Damson plum, Jambolan, Java plum, Duhat plump, and so on. The flowers of this tree are white color (fig:1), whereas the tree bears fruits that are initially green and on maturation, they become light magenta, and on ripening, they turn into dark purple or black colour (fig:1). Jamun is a seasonal fruit, and in India, it is usually available in summer. On consumption of fruit, the tongue becomes purple (Pai *et al.*, 2013). Fruits are in the form of clusters, and each cluster contains 10-40 fruit. The shape of the fruit is circular or oblong, and the size varies between half to two inches (Jagetia, 2017).

There are two to three morphological types of Jamun such as 'Katha Jamun', which are small and extremely acidic in nature, 'Adaka Jamun' which are medium Jamun having large seeds and pink color pulp. 'Jumbo Jamun' has seeds which are moderate to small in size, and they have ample amount of pulp (Reddy, 2020).Jamun fruit can be processed to make various food products such as jam, cheese, vinegar, ready to serve (RTS) drinks, ice-

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cream, beverages (fermented and non-fermented), jelly, toffee, wine, squash, and so on. Jamun pulp is used to prepare fortified food products (Dagadkhair et al., 2017). (Kapoor et al., 2015) used Jamun pulp to make flatbread, also known as Indian chapatti.

Nutritional composition of Jamun

Table 1: Nutritional information of Jamun fruit (per 100 g) (Kumawat *et al*., 2018)

Energy (kcal)	39 – 62
Moisture (%)	83.7 – 85.80
Protein (%)	0.53 – 0.65
Carbohydrate (%)	14.0
Fat (%)	0.15 – 0.30
Crude fibre (%)	0.6 – 1.2
Ash (%)	0.32 – 0.40
Pectin (%)	2.3 – 3.7
TSS (%)	9.0 – 17.4
Calcium (mg)	8.30 – 15.0
Magnesium (mg)	4 – 35
Iron (mg)	0.8 – 1.2
Phosphorus (mg)	15 – 30
Sulphur (mg)	13.0
Copper (mg)	0.23
Sodium (mg)	26.20
Chlorine (mg)	8.0
Carotenoid (mg)	12.38 – 22.34
Vitamin C (mg)	10.70 – 29.52
Tannins (mg)	201.50 – 386.25
Anthocynins (mg)	115.38 – 210.76

Chemical composition of Jamun

The seeds of Jamun are rich in alkaloid, glycoside jambolin and jambosine, which terminates the diastatic transformation of starch into sugar. Jamun seed is beneficial in

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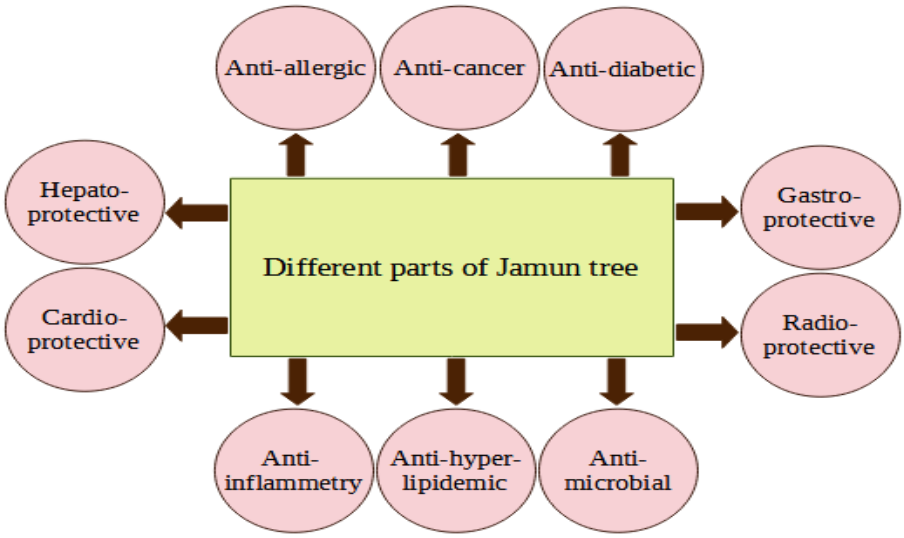
lowering blood pressure by about 34.6% due to the presence of ellagic acid. The extract of Jamun seed is beneficial in lowering blood pressure by about 34.6%. The seed also contain flavonoids, antioxidants, and phenolics, and is a good source of calcium, and protein (Ayyanar & Subash-Babu, 2012). The Jamun fruit contains different anthocyanins and non-anthocyanins compounds (Phenolics). The main constituents of leaves are quercetin, myristicin, acylated flavonol glycosides, myricetin, esterase, triterpenoids, tannins, galloyl carboxylase, butyric acid, octacosane, n-hepatcosan, and myricetin 3-O-4-acetyl-L-rhamnopyranoside (Jagetia, 2017; Kumawat et al., 2018).

Health benefits of Jamun

The whole Jamun plant (leaves, bark, fruit pulp, seeds) has several health benefits. Jamun is used in numerous conventional medicinal structures like Unani, Homeopathic, Siddha, and Ayurveda (Kumawat et al., 2018).

The Jamun leaves are known for thier antibacterial property, and they are also used to nourish the gums and teeth. It was reported that the leaf is used to prepare tea which shows an antihyperglycemic effect. The bark of Jamun tree is utilized to treat bronchitis, sore throat, asthma, ulcers, dysentery, and also it is used as a blood purifier. Seeds possess anti-diabetic properties due to the presence of glycoside, Jamboline. The fruit is widely used for the treatment of cough, dysentery, ringworm, inflammation, and diabetes. Ripe fruit is used to make vinegar which is used as a diuretic, and also it is beneficial for spleen enlargement, and chronic diarrhea (Ayyanar & Subash-Babu, 2012).



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Essential oil of Jamun leaves exhibits antibacterial activity against *Staphylococcus aureus, Bacillus sphaericus, Pseudomonas aeruginosa, E. coli, Salmonella typhimurium,* and *Bacillus sphaericus*. Jamun fruit extract produces cytotoxic impact in HCT-116 cells of colon cancer. The 70% ethanol extract of seeds, pulp, bark, and leaf of the Jamun tree reported a potential antimicrobial activity towards several Gram-positive, and Gram-negative bacteria. The sections of seeds and leaves have a scavenging effect against nitric oxide free radicals. The fruit's skin shows antioxidant activity towards hydroxyl, 2-2-diphenyl-1-picrylhydrazy (DPPH), and superoxide free radicals (Jagetia, 2017). Jamun fruits are recognized in controlling Diabetes mellitus. It is also reported that the seeds are used to reduce the sugar level of urine rapidly. A blend of the equal amounts of mango, and Jamun juices are consumed to quench the thirst, which is often noticed in people who have diabetes (Singh et al., n.d.). Jamun fruit extract has also been reported to induce a cytotoxic effect in a concentration-dependent manner in HCT-116 colon cancer cells. Jamun has shown several other properties in different experimental systems, including improvement of memory, antiarthritic activity, anti-nociceptive activity, antigenotoxic effect, central nervous system depressant activity, positive inotropic effect, antispasmodic activity, and many more.

According to Sushruta (ancient Indian physician), the Jamun fruit is used to cure obesity, cold infusion in intrinsic bleeding, and menstrual disorders. Jamun has anti-inflammatory properties, and it reduces both chronic, and acute inflammation. Dichloromethane extract using Jamun leaf showed radioprotective impact. The methanolic Jamun fruit extract has splendid anti-fungal activity towards the pathogenic fungi: *Rhizoctonia solani, Sclerotium rolfsii,* and *Fusarium oxysporum* (Joshi et al., 2019). It is reported that the methanol extract of *Syzygium cumini* (L.) fruit enhances the cytotoxic effect, and subdue proliferation in cells of lung cancer (H460). Various studies have shown that Jamun is also used as anti-arthritic, anti-nociceptive, antispasmodic, and anti-genotoxin (Jagetia, 2017).

Conclusion

Syzygium cumini (L.) has many health benefits and is widely used to treat various diseases. The plant has many beneficial compounds, the knowledge of which could help in the prevention of many diseases and maintenance of good health. The purpose of this paper is to

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discuss its photochemical and their advantageous health effects. However, more research is required to explore its pharmacological potential and medicinal benefits.

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