



Jamun: A Traditional Fruit and Medicine

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“Jamun” is an important medicinal plant used in various traditional systems of medicine. It is effective in the treatment of diabetes mellitus, inflammation, ulcers and diarrhea and preclinical studies have also shown it to possess chemopreventive, radioprotective and antineoplastic properties. The plant is rich in compounds containing anthocyanins, glucoside, ellagic acid, isoquercetin, kaemferol and myrecetin. The seeds are claimed to contain alkaloid, jambosine, and glycoside jambolin or antimellin, which halts the diastatic conversion of starch into sugar. The present article describes briefly on the information on traditional and medicinal use of Jamun.

Introduction

Syzygium cumini (Family Myrtaceae) is also known as *Syzygium jamunum* and *Eugenia cumini*.

Other common names are Jambul, Black Plum, Java Plum, Indian Blackberry, Jamblang, Jamun etc. The tree fruits once in a year and the berries are sweetish sour to taste. The ripe fruits are used for health drinks, making preserves, squashes, jellies and wine (Warrier *et al.* 1996). In association to its dietary use, all parts of the tree and, importantly the seeds are used to treat a range of ailments, the most important being diabetes mellitus (Sagrawat *et al.* 2006). Different parts of the jamun were also reported for its antioxidant, anti-inflammatory, neuropsychopharmacological, anti-microbial, anti-bacterial, anti-HIV, anti-leishmanial and antifungal, nitric oxide scavenging, free radical scavenging, anti-diarrheal, antifertility, anorexi-genic, gastroprotective and anti-ulcerogenic and radio-protective activities.



Composition of Fruit

The Fruit Contain 83.70 - 85.80 g moisture, 0.70 - 0.13 g protein, 0.15 - 0.30 g fat, 0.30 - 0.90 g crude fibre, 14.00 g carbohydrate, 0.32 - 0.40 h ash, 8.30 - 15.00 mg calcium, 35.00 mg magnesium, 15.00 - 16.20 mg phosphorus, 1.20 - 1.62 mg iron, 26.20 mg sodium, 55.00 mg potassium, 0.23 mg copper, 13.00 mg sulfur, 8. I.U vitamin A, 0.01 - 0.03 mg thiamine, 0.009 - 0.01 mg riboflavin, 0.20 - 0.29 mg niacin, 5.70 - 18.00 mg ascorbic acid, 7.00 mg chlorine and 3.00 mg folic acid per 100 g of edible portion (Baliga *et al.*, 2011).

Food Uses

1. Good quality jamun juice is excellent for sherbet, syrup and “squash”. In India the latter is a bottled drink prepared by cooking the crushed fruits for 5 to 10 minutes at 140°F, pressing out the juice, combining it with sugar and water and adding citric acid and sodium benzoate as a preservative (Lai *et al.* 1960).
2. Jamuns of good size and quality, having a sweet or sub acid flavor and a minimum of astringency, are enjoyable raw and may be made into tarts sauces and jam.
3. Astringent fruits are improved in palatability by soaking them in salt water or pricking them, rubbing them with a little salt, and letting them stand for an hour.
4. All but decidedly inferior fruits can be utilized for juice which is often com-parable to grape juice.
5. When extracting juice from cooked jamuns, it is recommended that it be allowed to drain out without squeezing the fruit and it will thus be less as tringent.
6. The white-fleshed jamun has adequate pectin and makes a very stiff jelly unless cooking is brief (Miller *et al.* 1955).
7. The more common purple fleshed yields richly colored jelly but are deficient in pectin and require the addition of a commercial jelling agent or must be com-bined with pectin-rich fruits such as unripe or sour guavas.
8. In Goa jamun are an important source of wine, resembling Port.
9. Brandy and distilled liquor called “jambava” have also been made from the fermented fruit.
10. Jamun vinegar, extensively made throughout India, is an attractive, clear purple, with a pleasant aroma and mild flavor.

Uses in Traditional Medicine

1. Traditionally the jambul fruits, leaves, seeds, and bark are all used in ayurvedic medicine.
2. The bark contains tannins and carbohydrates, accounting for its long-term use as an astringent to combat ailments like dysentery (Namasivayam *et al.* 2008).
3. A glycoside in the seed, jamun is considered to have antidiabetic properties.
4. The seeds have also shown anti-inflammatory effects in rats and antioxidant properties in diabetics (Chaudhuri *et al.* 1990).
5. Jamun fruit seeds and pulp have been reported to serve various purposes in diabetic patients, such as lowering blood glucose levels and delaying diabetic complications including neuropathy and cataracts.
6. Jamun is most often recognized as an adjuvant therapy in type-2 diabetes.
7. Jamun fruit reduces the sugar in the blood and is very good in the control of diabetes. Its seeds contain Glucoside, Jamboline and Ellagic acid, which are reported to have the ability to check the conversion of starch into sugar in case of excess production of glucose (Giri *et al.* 1985).
8. All parts of the jamun can be used medicinally and it has a long tradition in alternative medicine. The plant has been viewed as an antidiabetic plant since it became commercially available several decades ago.

Ayurvedic texts suggest that 1-3 g of seed powder per day is an average dose. Additionally, juice of ripe fruits in the amount of 0.5-2 tsp (2.5-10 ml) at least three times daily has been recommended for the treatment of diabetes.

Medicinal Properties

The jamun has received far more recognition in folk medicine and in the pharmaceutical trade than in any other field. Medicinally, the fruit is stated to be astringent, stomachic, carminative, antiscorbutic and diuretic (Srivastava *et al.* 1983). Additionally, a fruit extract showed antimicrobial and cytotoxic activities and may potentially be used on typical antimicrobial products. In comparison to other non- traditional fruits jamun showed considerable high antioxidant activity, which can constituent such as anthocyanins, tannins and



flavonols. Fruits contain many different kinds of anti-oxidant compounds, including flavonoids, phenolics, carotenoids and vitamins, which are all considered bene-ficial to human health, for decreasing the risk of degen-erative diseases by reduction of oxidative stress, and for the inhibition of macromolecular oxidation (Kubola *et al.*, 2011).

Table 1. Phytochemicals present in the jamun plant.

Sr. No.	Plant Part	Chemicals Present
1	Seeds	Jambosine, gallic acid, ellagic acid, corilagin, 3, 6-hexahydroxy diphenoylglucose, 1-galloylglucose, 3-galloylglucose, quercetin, β -sitosterol, 4, 6 hexahydroxydiphenoylglucose.
2	Stem bark	Friedelin, friedelan-3- α -ol, betulinic acid, β -sitosterol, kaempferol, β -sitosterol-Dglucoside, gallic acid, ellagic acid, gallotannin and ellagitannin and myricetine.
3	Flowers	Oleanolic acid, ellagic acids, isoquercetin, quercetin, kampferol and myricetin.
4	Fruit pulp	Anthocyanins, delphinidin, petunidin, malvidin-diglucosides.
5	Leaves	β -sitosterol, betulinic acid, mycaminose, crategolic (maslinic) acid, n-hepatcosane, n-nonacosane, n-hentriacontane, noctacosanol, n-triacontanol, n-dotriconanol, quercetin, myricetin, myricitrin and the flavonol glycosides myricetin 3-O-(4"-acetyl)- α Lrhamnopyranosides.
6	Essential oils	α -terpeneol, myrtenol, eucarvone, muurolol, α -myrtenal, 1, 8-cineole, geranyl acetone, α -cadinol and pinocarvone.

Conclusion

Jamun is traditionally used for the treatment of various diseases especially diabetes and related complications. With regard to the antineoplastic activities studies suggest that Jamun is selective in its action in breast cancer cells. The effect of Jamun and its phytochemicals should also be investigated for its chemopreventive effects in other models of carcinogens, that includes chemical, radiation and viral carcinogenesis models. Jamun raw and value added products should be advertised to urban population for its health benefits and especically for promotion of Jamun growers in tribal areas of India.

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