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Review Article

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A Brief Study on *Syzygium Cumini* Linn- A Review

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ABSTRACT

Syzygium cumini, commonly known as black plum or “jamun” is an important medicinal plant 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 review has been primed to describe the existing data on the information on traditional and medicinal use.

Keywords: *Syzygium cumini*, Chemopreventive, Radioprotective, Antineoplastic Activities

ARTICLE INFO

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1. Introduction

The jamun tree (Jamul; *Syzygium cumini* Lim.) is an evergreen tropical tree in the flowering plant family Myrtaceae), native to India, thrives easily in hardy tropical

regions and is found in all parts of our subcontinent as well as countries of Southeast Asia and Eastern Africa. In India, this large evergreen tree, is grown widely in the Gangetic

plains, and the Cauvery delta in Tamil Nadu. The most commonly found variety of luscious, glistening royal purple jamun is often oblong and has a deep purple to bluish colour. The pulp of the fruit is grey or pink and has a seed in the centre. Another common variety is seedless. The fruit is acidic and astringent in nature, with a sweet taste. Due to its acidic nature, it is usually eaten with a sprinkling of salt. Children are fond of this fruit as it colours the tongue purple due to anthocyanin, a plant pigment. Jamun is 70 % edible [1]. Glucose and fructose are major sugars found in a ripe jamun. The fruit is laden with a large number of minerals and provides fewer calories compared to other fruits. A medium-sized jamun provides about 3–4 calories. The seed of the fruit is also rich in protein carbohydrates and traces of calcium. It is also a source of iron, providing 1–2 mg/ 100 grams and also vitamin C, providing 18 mg/ 100 grams (~40 mg – daily adult requirement). It provides folate and vitamin B, carotene, phytochemicals (antioxidants), magnesium, potassium and fibre. Jamun is believed to be of special use in treatment of diabetes. In Unani and Ayurvedic system, it is used to treat digestive disorders including diarrhoea. Extracts of the bark, seeds and leaves have been found to cause a marked prolonged decrease in blood sugar and glycouria (sugar in urine) [2–5]. In middle age, many people in the modern world become susceptible to type II diabetes, this lifestyle disease is increasingly prevalent throughout much of the world as lifestyles and dietary habits change. Herbal treatment with jamun remedy is effective during the early and mild stages of the disease, when it is also accompanied by a strict dietary regimen by the affected person. Several studies provide evidence that jamun has hypoglycemic effects with up to 30 % reduction in blood sugar reported in some studies. Seeds are rich in alkaloids which have hypoglycemic effects. With the onset of rains, come the much loved jamuns. This Indian blackberry has a unique astringent taste. Popularly known as the black plum, the fruit has several beauty benefits to offer. Also, the fruit has medicinal properties, which can treat several ailments. From curing acne and dark spots to indigestion, it does it all. So, take a look at a few beauty and health benefits of this super fruit. In 1911, this tree was introduced in Florida by the USDA (United States Drug Authored). In the wild however, it grows all over India. It's a large and hardy evergreen tree and lives for over a hundred years. It starts flowering in the month of March and continues till May. Thereafter, with the onset of monsoon in June it starts bearing fruit. The flowers are white and have a sweet fragrance. The fruits Don't ripen at the same time and are picked daily. Fruits resemble the grapes and are oblong or ovoid in shape. Only ripe fruits are picked as they don't ripen once they are picked. They have a single seed and a soft dark purple colored almost black skin and a lighter purple flesh. When eaten, the fruits coat the mouth and the tongue a deep purple color that stays for a few hours. The fruit's sweet and tart and leaves a slight astringent action in the mouth⁶. The flowers are rich in nectar and yield high quality honey when apiculture is done close by. Industrially, fruits can be made into Jams, jellies, squashes, vinegar, juices, beverages, pickles, puddings and wine. The

seeds of Jamun are extensively used in India for treatment of diabetes and other ailments. Besides its sweet, sometimes astringent, edible fruit, the seed is also used in various alternative healing systems like Ayurveda (to control diabetes), Unani and Chinese medicine for digestive ailments. The leaves and bark are used for controlling blood pressure and gingivitis. Wine and vinegar are also made from the fruit. Precautions to be adopted: Never eat Jamul on empty stomach. Never drink milk after consuming jamun. Don't eat them in excess as it may cause body aches and fevers.

Properties of Jamun

Ancient Rishies and Munies did enough research works on blackberries. According to them, the fruit is small, rough, sour, sweet, acidic, coolant, destroys cough, pitt (bile) and vat (wind), blood circulator, highly helping in digestion and antiacidic, useful in skin diseases, activator of liver, thirst extinguisher, anti diarrhoeic, destructs bad bacteria in stomach and effective in respiratory system.

Planting

Jamun can be transplanted in February-March or in July-August. The plants are transplanted with the soil ball intact. Jamun propagation is by seed. Seedling plants bears fruits of variable size and quality, such trees are generally hardy and long live for improved and selected true-to-type plants, vegetative methods of propagation, like inarching, budding, cutting, and air-layering are advocated. Regular pruning is not required however in later years. The dry twigs and crossed branches are removed. In the early age, the plants require 8–10 irrigation in a year. Intercropping of Jamun orchard with suitable crop not only brings good income but also improves fertility of soil. A full dose of 20kg rotten FYM during the prebearing period of tree and at bearing stage 80kg FYM per tree should be supplied for proper growth and fruiting. Seeds sown fresh usually show a high percentage of germination within two or three weeks, but if stored they lose their viability rapidly. Leaf eating caterpillar infests the leaves and may defoliate the trees. Treatment with Malathion is effective. White fly damages the tree in all parts, sometimes the fruits of Jamun get wormy due to attack of fruit fly.



Figure 1: Jamun tree and fruits

2. Manuring and fertilization

In pre bearing period, 20–25 kg well rotten farmyard manure or compost/plant/ year should be applied. For

bearing trees, this dose should be increased up to 50-60kg/plant/ year. The ideal time for applying organic manure is a month before flowering. Grown up trees should be applied 500 kg N, 600g and 300g K /plant /year. This should be spread near the canopy of the plant and mixed in soil by hoeing.

Medicinal Properties of Black Berry

1. The extracts of the bark, seeds and leaves are used for the treatment of diabetes.
2. The leaves have antibacterial properties and used for strengthening teeth and gums.
3. Oral administration of dried alcoholic extracts of the seeds to diabetic patients was found to reduce the level of blood sugar and glycosuria in trials conducted at CDRI, Lucknow[4]. The bark of black berry tree is astringent, digestive, diuretic, anthelmintic and is considered useful for throat problems.
5. A decoction of the bark and powdered seeds is believed to be very useful in the treatment of diarrhea, dysentery and dyspepsia.
6. The antibiotic activity of black berry extract has been widely studied and found useful against a number of microbial agents.
7. The fruit is also considered to be stomachic, carminative, antiscorbutic and diuretic.
8. Vinegar made from black berry fruit is administered in cases of enlargement of spleen, chronic diarrhoea and urine retention.
9. For ringworm treatment, water diluted juice is used as lotion.
10. A decoction of bark is used in cases of asthma and bronchitis and are gargled or used as mouthwash for the astringent effect on mouth ulcerations, spongy gums, and stomatitis.

Varieties

There is no improved variety for commercial cultivation. The most common type grown in north India is known as Raja jamun. This is a large-fruited type having oblong fruits of deep purple colour. A type having large- sized fruits is known as Paras in Gujarat. Another type found in Varanasi has no seed. A selection with desirable traits has been located by the agricultural university at Faizabad. It has been named by them as Narendra Jamun.

3. Medicinal Value of Jamun

Jambolan or Jamun (syzygium) is an important indigenous minor fruit of commercial value. The tree is tall, evergreen, also grown for shade and windbreak. The fruit possesses considerable nutritive value. It is a good source of iron, apart from the usual contents, e.g, minerals, protein etc. The nutritive value of this fruit is given below. Jamun fruit is usually shaken with used in making beverages, jellies, jam, squash, wine, vinegar and pickles. Jamun squash is a refreshing drink in summers. Jamun syrup is beneficial in diarrhoea. Juice of Jamun and mango if mixed in equal quantity is good in quenching thirst of diabetic patients. Jamun wine is prepared, particularly in Goa. The vinegar prepared from the slightly unripe fruit is stomachic, carminative and diuretic, apart from having cooling and digestive properties. Smaller fruits are used in beverage

industry for being rich in acidity, tannins and anthocyanins. Its seed can be used as a concentrate for animals because it is rich in protein, carbohydrates, and calcium. Jambolan crop is easily grown in neglected and marshy areas where annual rainfall is between 1,500-10,000mm. The fruit is black or purple in colour, sweet in taste. The fruit has received more recognition in folk medicine and in pharmacy. The juice of ripe fruit or a decoction of it is administered in spleen enlargement, chronic diarrhoea and urine retention. The seed extract in liquid or powdery form are given to patients with diabetes mellitus or glycosuria. In many cases blood sugar level drops quickly. Dried alcoholic extract of Jamun seeds reduces blood sugar and glycosuria. Seeds contain an alkaloid, jambosine and glycoside jambolin or antimellin which halts the conversion of starch into sugar. Seed extract lowers blood pressure by 34.6 per cent. The leaf juice is effective in dysentery either alone or in combination with the juice of mango. Jamun leaves may be helpful as poultices on skin disease. Leaves, stems, flower buds, open blossoms, and bark have antibiotic properties. A decoction of bark is good for dyspepsia, dysentery, and diarrhoea. Bark decoctions are taken for asthma and bronchitis and are gargled or used as mouthwash for the astringent effect on mouth ulcerations. There are no named or standard cultivars of this fruit. The common cultivar grown in Pakistan is 'Ra Jamun'. It produces big-sized oblong, deep purple or bluish black fruit. Its pulp is purple pink and fruit is juicy and sweet. The stone is small in size. Climate and soil: Jamun is grown in tropical and subtropical climate. It requires dry atmosphere at the time of flowering and fruiting. Early rains are beneficial to proper growth, development and ripening of fruits. The young plants are susceptible to cold and drought conditions. The Jamun tree requires deep loam and well-drained soil. Its cultivation should be avoided in very heavy or light sandy soils.

Health Benefits of Jamun Fruit in General

It's digestive and activates the liver and spleen. It's a good remedy for urinary diseases, Regulates heartbeat. Purifies blood, cures anaemia and stops skin eruptions. Stops diarrhoea and dysentery. Relieves throat affections and other respiratory diseases. Removes worms. Vinegar made from the fruit gives relief in colitis, indigestion, stomach diseases. It relieves gas and improves digestive power. It breaks renal stones. Jamun leaves have anti-bacterial properties and are used for making medicines for strengthening of the teeth and gums. In fact, the ash of its leaves is one of the essential ingredients in tooth powders (manjan) and is effective in treating spongy gums. Ash of jamun leaves (powder obtained after drying and burning them) mixed with an equal amount of ash of hard almond shell makes an excellent manjan. Its regular use strengthens teeth by checking gum infection and bleeding. A little peppermint added to this manjan can cure bad breath as well. The K content in jamuns is high, with a 100g serving containing 55 mg of K. People who eat unhealthy diets may face deficiency of this vital ingredient, and that may lead to heart disease, high blood pressure and stroke among other things[8-11]. It is important that you eat foods like jamun and tomatoes which are rich in this ingredient, as such

foods often contain many other nutrients also that are beneficial for your health. Leaves of the jamun tree are great for your digestive system and oral health. The leaves have been traditionally used in Ayurvedic medicine to treat diarrhea and ulcers. They also have anti-bacterial properties which makes them an ingredient in many medicines for treating oral health problems. The fruit is known to cure menstrual problems as well. Jamun fruit and leaves are most useful for women during menopause or sterility. Jamun leaves have the power of fertility for females and can be taken with honey at any time of the day on a daily basis for at least a month. An infusion of the fresh tender leaves of jamun fruit prepared by pouring 250 ml of boiling water over 20 gm. Of fresh jamun leaves, and allowing it to steep for two hours, is an excellent remedy for sterility or miscarriage due to an ovarian or endometrium functional disorder. The infusion may be taken with either two teaspoons of honey or 200 ml of buttermilk. To get relief from vomiting one can take extracts of Jamun leaves mixed in honey two times a day[12]. It is so because the iron content makes up for the blood loss, thus keeping women healthy. A decoction of the bark and powdered seeds is believed to be very useful in the treatment of diarrhea, dysentery and dyspepsia. The fruits can be processed for squashes, sherbets, syrups, jams, jellies, wines, vinegar and juices. The juice cools the body in the heat of summer and quenches thirst. It also helps in the proper functioning of the digestive system due to its extremely soothing and cooling effect. Regular use of Jamun juice helps in managing blood sugar and cholesterol levels, prevents the onset of Alzheimer's disease, boosts the immune system and helps in slowing down ageing and cartilage deterioration in osteoarthritis. Also useful in

- Jeern Atisaar and rakta Pradar: Gind mango guthli powder along with the guthli powder of jamun and fried up small harrey powder in equal proportions. Eat 3gm of this mixture with water till the complications clear off.
- Rakt Pradar: With marh of rice should be gulped 3 gm of jamun guthli powder to cure Rakt Pradar.
- Cataract (motiabind): stir well the guthli powder with honey and prepare tablets of
- 3 gm each. Take 1-2 tablets with cow milk. Apply on eyes the tablet by making a paste of it with honey to cure the beginning of cataract.
- Pimples: Rub the guthali with and apply this to get relief from pimples. Ghamaury coming off during summers also get cured from this.
- Boils and ulcers of mouth: Chew fresh and soft black berries leaves for a while and gargle after wards. Bloody piles: Grind soft leaves of jamun like chutney and mix a little of jaggary with this and lick it.
- **Diabetic:** Drop 25 gm of good fresh jamun in 200 gm of boiling water (after taking the pot down from the burner. Crush it after ½ an hour and filter it. Make it into three portions and drink it thrice during the day. Continue this process and keep monitoring your sugar levels apart from having a balanced diet.

- Come June and the market is flooded with small shiny oval black fruits attracting our attention. Tradition has it that one should take at least one jamun fruit in a season to clear the digestive system and keep the human machine running.
- Jamun or Indian blackberry no doubt, is a wonder tree. Every part of the jamun tree, also called the black plum, has one or more medicinal uses, right from its fruit to its seed and bark to the leaves.

Table 1: Nutritional Levels in Jamun

Energy	251 kJ (60 kcal)
Carbohydrates	15.56 g
Fat	0.23 g
Protein	0.72 g
Water	83.13g
Vitamin A	3IU
Thiamine (vit. B1)	0.006 mg (1%)
Riboflavin (vit. B2)	0.012 mg (1%)
Niacin (vit. B3)	0.260 mg (2%)
Pantothenic acid (B5)	0.160 mg (3%)
Vitamin B	60.038 mg (3%)
Vitamin C	14.3 mg (17%)
Calcium	19 mg (2%)
Iron	0.19 mg (1%)
Magnesium	15 mg (4%)
Phosphorus	17 mg (2%)
Potassium	79 mg (2%)
Sodium	14 mg (1%)

[Nutritional value/ 100 g (3.5 oz)]

4. Cosmetic Applicability of Jamun

Jamun seeds are the best remedy to treat acne. For this, grind some dry jamun seeds and add some cow milk to it. Mix it well. Apply this paste on your pimples before going to bed. Wash it off the next morning. Remember, your pimples cannot be treated overnight; results will only show over a period of time. So, make sure you apply it regularly for better results. Alternatively, you can prepare another concoction of jamun seed powder, orange powder, a few drops of almond oil, red lentil powder (masoor dal) and rose water. Apply this paste on your entire face. Rinse with cold water after 15 minutes. Jamun can also work wonders for people with oily skin, because of its astringent properties. Prepare a face mask using jamun pulp, barley flour, aonla juice and rose water.

Apply this pack evenly on your face and rinse it off once it dries off. A regular application of it will control your skin's oil secretion levels. Have you stopped stepping out of your house due to dark spots and pigmented skin? Well, no more! Take a look at another jamun pack that will treat your ugly marks. For this, mix jamun seed powder, lemon powder and gram flour (besan). Add a few drops of almond oil and rose water to this dry mixture. Make a paste out of it. Apply it on your face, and let it stay till it dries off completely. Wash it off with cold water. Follow this routine for at least a month, and you will surely see promising results.[13-15].

Jamun Remedies you can use at Home

- In case of dysentery (bloody) take 20 gm powdered seeds and take with 1/2 cup of water twice daily.
- If your child is doing bed wetting then you should give 1 tea spoon ground seed with water to child.
- In case diarrhea take two soft leaves of Jamun and make paste of it. Now add some rock salt to it and make small pills and take twice daily with water.
- In case of conjunctivitis boil soft 20 leaves of Jamun and boil in in 2 cup water till it reduces to 100 ml. Cool down this and wash eyes with this water (decoction).
- In case of acidity drink 10 ml Jamun vinegar with some water it will give you relief.

5. Conclusion

Jamun has also anticancer and anti-viral properties. Its fruits extract inhibit growth and induces apoptosis of breast cancer. Jamun juice is carminative, having mild astringent effect, stomachic and diuretic, give a soothing effect in digestive system. The powder of Jamun bark is applied extremely to effectively control the bleeding. The fruits are effectively in blood purifying and fruits pulps with sesame oil are effective in higher fever.

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