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Review Article

**A REVIEW ARTICLE ON SYZYGIUM CUMINI****M. Yogitha<sup>\*1</sup>, Dr. V. Jayasankar Reddy<sup>2</sup>, Dr K. Venu Gopal<sup>3</sup>, Dr. C. Bhuvaneswara Roa<sup>4</sup>**<sup>1</sup> Final year B Pharmacy, Krishna Teja Pharmacy College, Tirupati, 517506.<sup>2</sup> Professor, Vice Principal, Krishna Teja Pharmacy College, Tirupati, 517506.<sup>3</sup> Professor, Principal, Krishna Teja Pharmacy College, Tirupati, 517506.<sup>4</sup> Professor, HOD of Pharmacology, Krishna Teja Pharmacy College, Tirupati, 517506.**Abstract:**

*Syzygium cumini* is an evergreen topical tree mostly found in southeast Asia. It belongs to the Myrtaceae family. This herbal origin is South Asia. From the early periods, most of the people used lots of herbal medicine. The *Syzygium cumini* Linn plant has many medical properties. Traditionally, *S. cumini* has been employed to combat diabetes and dysentery. Anatomical parts of *S. cumini* exhibit therapeutic potentials including anti-inflammatory, antiallergic, antibacterial, anticlastogenic, hepatoprotective, and anti-fungal activities attributed to the presence of various primary and secondary metabolites such as carbohydrates, flavonoids, proteins, amino substances, and anthocyanins. The recent research investigations encompassing studies on the various pharmacological activities of jamun are the main topic of this review. Today, *S. cumini* is also used in edible films. Different plant parts have been claimed to contain various constituents, due to which they possess an assorted pharmacological prospective. It is said that the seeds that are mostly used for their therapeutic properties include the glycoside jamboline or antimellin and the alkaloid jambosine. The new study's findings will help to clarify the importance of *S. cumini* in the medical area. Beyond its medicinal uses, *S. cumini* has found applications in food technology, particularly in the development of edible films, demonstrating its versatility. The plant's widespread distribution from India and Bangladesh to the Philippines and parts of Africa further emphasizes its global relevance. As research continues to uncover the biochemical potential of *S. cumini*, its role in modern medicine and sustainable agriculture becomes increasingly significant. This review underscores the importance of *Syzygium cumini* as a valuable natural resource, bridging traditional uses with contemporary scientific validation, and highlighting its potential for enhancing health and nutrition across diverse populations.

**Keywords:** *Syzygium cumini*, anti inflammation, radio protection, diabetes, pharmacological activity

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## 1. INTRODUCTION:

*Syzygium cumini* L., better known as Jamun in India, Jambolana in Spain, and Black Plum in Europe, is an important member of the Myrtaceae family of plants consisting of trees and shrubs. (Chagas VT et al., 2015). It is an evergreen tree with brown, thick bark; fruits are like berries, which can be edible; and ripe fruits are dark violet coloured. The taste of the fruits is sweet and sour to the tongue (Singh N and Gupta M 2007). The seeds and fruits of *S. cumini* have been used to treat diabetes mellitus in South Asian countries as traditional medicine for several centuries. The seeds are used as hypoglycaemic, antibacterial, anticancer, antioxidant, anti-leishmania, immunomodulatory activity, and also have many nutritive values. Historically, the diverse applications of *S. cumini* have made it a staple in Ayurvedic and folk medicine, where it is revered for its ability to regulate blood sugar levels, support digestive health, and enhance overall wellness. As modern scientific inquiry progresses, extensive research has validated many of these traditional uses, revealing a spectrum of pharmacological activities such as anti-inflammatory, antibacterial, antifungal, and immunomodulatory effects. This introduction serves to highlight the multifaceted nature of *Syzygium cumini*, emphasizing its cultural, medicinal, and economic relevance. As research continues to explore its potential, *S. cumini* stands out as a valuable resource, bridging the gap between traditional knowledge and modern scientific validation in the pursuit of health and wellness.

## 2. BOTANICAL DESCRIPTION AND TAXONOMY

*Syzygium cumini* is an evergreen tree that grows up to 25 meters (80 feet) tall, with greyish-white stems and coarse and discoloured lower bark. Simple, opposite, elliptic to oblong, shiny, smooth, and slightly leathery are the characteristics of the leaves. The leaves have a noticeable, golden midrib (Sharma et al., 2012). Also, the leaves are 5 to 15 centimetres long and 2 to 8 centimetres broad. The base is cuneate or round; the apex is short, rounded, or obtuse; the edges are toothed; the stalk is slender and light yellow; the veins are fine, close together, parallel, and gland-dotted (Ramya et al., 2012). The flowers are white to pinkish, about 1 centimetre across, with four petals and many stamens (Sharma et al., 2012). The calyx is cup-like, about 4 millimetres long and toothed. As a little disk, the petals stick together and fall together. Numerous and nearly as long as the calyx are the stamens

(Ayyanar and Subash Babu, 2012). Ovoid, one-seeded berries, the fruits are 2 cm long, rich purple red, glossy, and have white to lavender flesh (Sharma

et al., 2012). The Philippine description of the fruit's shape is from oval to elliptic, length from 1.5 to 3.5 cm, and colour from dark purple to black (Quisumbing, 1978). The fruit has a combination of sweet, mildly sour, and astringent flavours, and it tends to colour the tongue purple. Also, because of the dark violet colour of the fruit, it gives the impression of the olive tree fruit, both in shape and weight (Ayyanar and Subash-Babu, 2012).



**Fig1:** Tree of Jamun

Kingdom: Plantae  
Division: Tracheophyta  
Class: Magnoliopsida  
Order: Myrtales  
Family: Myrtaceae  
Genus: *Syzygium*  
Species: *Cumini*

Scientific name: *Syzygium cumini*

**2.1 Common Names from World-wide:** (Kritikar KR, and Basu BD, 1975) (Nadkarni KM, 1954)

Brazil: Azeitona

Pakistan: Jaman

West Indies: Jambol

Nepal: Java plum

Thailand: Lukwa

Japan: Madan

Madagascar: Rotra

**2.2 Other Names:** (Bijauliya RK et al., 2017) (Kritikar KR, and Basu BD, 1975) (Nadkarni KM, 1954)

Hindi: Jaman, Jam, Jamun

Bengali: Jam, Kala jam

Gujarati: Jambu, Jamli

Telugu: Jambuvu

Marathi: Jaman, Jamb

**2.3 Geographical source:**

The original home of Jamun is India, in forests up to 1800m, usually along the banks and moist localities, also cultivated as shared trees along road sides. It is

widely cultivated in Haryana as well as the rest of the Indo-Gangetic plains on a large scale. Its habitat starts in Myanmar and extends up to Afghanistan. It was cultivated in England by Miller in 1768 (Grieve M., 1768). It is also found in Thailand, the Philippines, Madagascar, and some other countries. The plant has been successfully introduced into many other tropical countries, such as the West Indies, West Africa, and some subtropical regions, including Florida, California, Algeria, and Israeli. (Ross IA, 1999)

**2.4 Distribution:** The tree is known to be native in India, Bangladesh, Nepal, Sri Lanka, Indonesia, and Malaysia (Ayyanar and Subash-Babu, 2012) and has been naturalised throughout Southeast Asia and the Pacific Islands (Dacanay, 2007). In the Philippines, it is

found throughout the country and is one of the most popular fruits (Ramos and Bandiola, 2017). The tree is also grown in Myanmar, Thailand, Nepal, Australia, Kenya, Zambia, Zimbabwe, Madagascar, Colombia, Cuba, Mexico, Brazil, etc.

### 3. PHYTOCHEMICAL CONSTITUENTS OF JAMUN

**Table 1: Various chemical constituents**

| S.No | Parts used          | Solvent Extract type                                                       | Detected Phytochemicals                                                                                                                                                                                                                        |
|------|---------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Leaves              | Methanol, ethanol, aqueous chloroform, petroleum ether, acetone and hexane | Alkaloids, anthraquinones, flavonoids, glycosides, steroids, phenols, tannins, saponins, steroid terpenoids, cardiac glycosides, phytosterols, resins                                                                                          |
| 2.   | Stem bark           | Aqueous ethanol, methanol, hexane and chloroform                           | Terpenoids, flavonoids, anthraquinone glycosides, alkaloids, catechins, phenols, quinones saponins, phytosterols, quinones steroids tannins and amino acids and flavonoids                                                                     |
| 3.   | Seed and fruit pulp | Ethyl acetate, methanol, ethanol, hydroalcoholic                           | Alkaloids, anthocyanins, tannins, cardiac glycosides, flavonoids, phenols, terpenoids, glycosides, steroids, saponins, reducing monosaccharides, reducing sugars and proanthocyanidins, proanthocyanins, phenolic amino acids and phytosterols |
| 4.   | Root                | Hexane, aqueous                                                            | Alkaloids and resins and carbohydrates volatile oil, flavonoids, glycosides, saponins, steroids, tannins, terpenoids, carbohydrates and mucilage                                                                                               |

### 4. COLLECTION AND CULTIVATION:

#### 4.1 Soil:

A variety of soil types are suitable for growing the jamun tree. However, deep loam and well-

drained soil are required for optimum plant development and great yield potential. Additionally, these soils hold onto enough moisture, which is important for healthy fruiting and development. Jamun can thrive in both saline and waterlogged environments. However, growing jamun on extremely heavy sandy soils is not cost-effective.



**Fig 2: Planting**

#### **4.2 Climate:**

The ideal growing conditions for jamun are tropical or subtropical. It can also be seen growing up to 1300 meters in the lower Himalayan peaks. For the jamun to tower and set its fruit, it needs dry weather. Early rain is thought to help fruits ripen and grow properly in terms of size, colour, and flavour in subtropical regions.

#### **4.4 Propagation:**

Both vegetative and seed strategies are used to reproduce the jamun. Due to polyembryony, it is passed on to the parent through the seed. Seed propagation is still preferred even if the vegetative methods used in the majority of situations have had some success. However, because it causes late bearing, seed propagation is not advised. There is no dormancy in the seeds. It is possible to plant fresh seeds. The germination process takes ten to fifteen days. In the spring (February to March) or monsoon (August to September), seedlings are prepared for transplantation in order to be used as rootstock. Jamun may be spread easily and affordably. One-year-old seedling stocks that are 10-14 mm thick are used for budding. In regions with little rainfall, July through August is the ideal season for budding. Early in May or early June, budding operations are tried in places where rains come down quickly and heavily. The forkert, patch, and shield budding techniques have all been effective. It has been stated that the forkert approach may be more successful than shield or 'T' budding. Although inarching

is another way to spread jamun, it is not used commercially.

#### **4.5 Planting:**

It is possible to plant the evergreen jamun tree in both the spring (February–March) and monsoon (July–

August) seasons. The latter season is considered to be preferable because trees planted in February or March must endure a hot and dry spell in May and June soon after planting, and they typically die as a result of the unfavourable weather. One-size trenches are dug at a distance, and the land is thoroughly cleared and ploughed before planting. Jamun trees can also be grown by planting them as shade trees close to farm houses and wells. They offer a welcome shadow in addition to fruit here.

#### **4.6 Fertiliser Application:**

Manure is typically not applied to the Jamun trees. This is not because they don't need manuring or don't react to it, but rather because they can tolerate a lot of disregards. 75 kg per tree-bearing tree and around 19 kg per 1 yard of manure each year during the pre-bearing period is taken into consideration. Typically, seedling jamun trees begin to bear between the ages of 8 and 10, whereas grafted or budded trees begin to bear between the ages of 6 and 7. When trees are planted in extremely rich soil, they tend to develop more vegetatively, which delays fruiting. The trees should not be provided any fertiliser or fertiliser when they exhibit this inclination. In addition, irrigation should be applied sparingly and withholding in September–October and again in February–March. Fruit bud formation, flowering, and fruit setting are all aided by this. Occasionally, this might not work, and more extreme measures like ringing and root trimming might need to be used. Therefore, when manuring and fertilising jamun trees, a fruit producer must exercise caution and modify the dosages based on the plants' growth and fruiting.

#### **4.7 Irrigation:**

In the early stages, the jamun tree requires frequent irrigations, but after the trees get established, the

interval between irrigations can be greatly decreased. Young trees require 8 to 10 irrigations in a year. The mature trees require only about half the number, which should be applied during May and June when the fruit is ripening. During the autumn and winter months, just an occasional irrigation may be applied when the soil is dry. This will also save the trees from the ill effects of frost in winter.

#### 4.8 Flowering and Fruiting:



**Fig 3:** Fruits of Jamun

Flowers are borne in the axils of leaves on branchlets. In North Indian conditions, flowering starts in the first week of March and continues up to the end of April. The pollen fertility is higher at the beginning of the season. The maximum receptivity of stigma is one day after anthesis. The jamun is cross-pollinated, and the pollination is done by honey bees, houseflies, and wind. The maximum fruit set can be obtained by hand pollination when it is done after one day of anthesis. Thereafter, a sharp decline is observed in fruit set. There is a heavy drop of flowers and fruits within 3 to 4 weeks after blooming. Later natural fruit drop can be reduced with two sprays of GA3 60 ppm, one at full bloom and another 15 days after initial setting of fruits. The pattern of growth and fruit development of jamun can be divided into three phases: the first phase from 15-52 days after fruit set having slow growth of fruit, the second phase from 52-58 days after fruit set having fast growth, and the third and last phase from 58-60 days after fruit set having slow growth and very little addition in fruit weight.

#### 4.9 Harvesting and Yield:

The seedling jamun plants start bearing after 8 to 10 years of planting, while grafted ones bear after 6 to 7

years. However, commercial bearing starts after 8 to 10 years of planting and continues till the tree becomes 50 to 60 years old. The fruit ripens in the months of June and July. The main characteristic of ripe fruit at full size is its deep purple or black colour. The fruit should be picked immediately when it is ripe because it cannot be retained on the tree in the ripe stage. The ripe fruits are handpicked singly by climbing the tree with bags slung on

the shoulder. Care should be taken to avoid all possible damage to fruits. The average yield of fruits from a full-grown seedling tree is about 80 to 100 kg and from a grafted one 60 to 70 kg per year.

#### 4.10 Storage and Marketing:

The fruits are highly perishable in nature. They cannot be stored for more than 3 to 4 days under ordinary conditions. However, pre-cooled fruits packed in polythene bags can be stored well up to three weeks at low temperatures of 8 to 10 degrees Celsius and 85 to 90% relative humidity. The fruit is packed and sent to the market almost daily. For marketing, well-ripe and healthy fruits are selected. Damaged, diseased, and unripe fruits are discarded. These selected fruits are then carefully packed in wooden baskets and sent to the local markets.

#### 5. MACROSCOPIC STUDY:

Macroscopic examination is the study of the external morphology of plants and plant parts as seen by naked eyes. Which included the study of habitat, root, stem, leaf, flower, fruits, and seed of plant. This study was done partly in the field and laboratory, and the characteristic features of the plant were recorded.

In the microscopy study, anatomical observations of plant sections were made. The free-hand sections of leaves and stems were taken in the laboratory and stained using safranin and fast green. After staining, the sections were fixed in glycerine and observed under the microscope.

#### 5.1 Stomatal number and stomatal index:

The study of stomatal number and stomatal index was done by taking epidermal peels of leaves. The epidermal peel was removed and stained with safranin and observed under the 10X eyepiece and 45X light microscope. The total number of stomata in a specific area of objective were counted, and the stomatal index was determined by using the following formula. (Shyam Bamboo et al.)

$$\text{Stomatal index} = \frac{S}{S+E} \times 100.$$

where S = stomatal cells and E = epidermal cells.

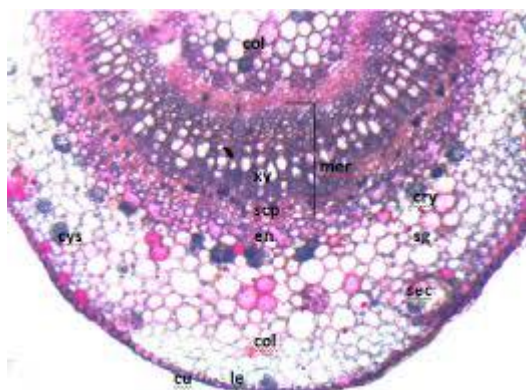


**Fig 3:** TS of leaf passing through midrib lower region at 10X.

### 5.2 Organoleptic study of powder:

In organoleptic evaluation, the characters like colour, odour, taste, and textures of leaf, stem, and fruit powder were studied (Shanthi 2014).

**5.3 Physico-chemical property of powder:** In physio-chemical studies we have analysed leaves, stem bark, and fruit powder for the fluorescence analysis, moisture content, swelling index, foaming index, etc., including primary phytochemistry.

**5.4 Fluorescence analysis:** The Jamun leaves, stem bark, and fruit powder were treated with various chemical reagents and passed through the visible light and UV light. The powder was prepared after passing it through mesh 40, and its fluorescence characters were studied both in daylight and UV light (254 and 366 nm) using different solvents like sulphuric acid, hydrochloric acid, ferric chloride, acetic acid, etc. (Tanwar et al. 2012)

**5.5 Moisture content:** The studies on moisture content of powder were performed by the loss on drying methods. The moisture present in jamun leaves, stems, and fruits was determined by drying the sample in a hot air oven at 110°C till constant weight. (Ahmad Raza, 2015)

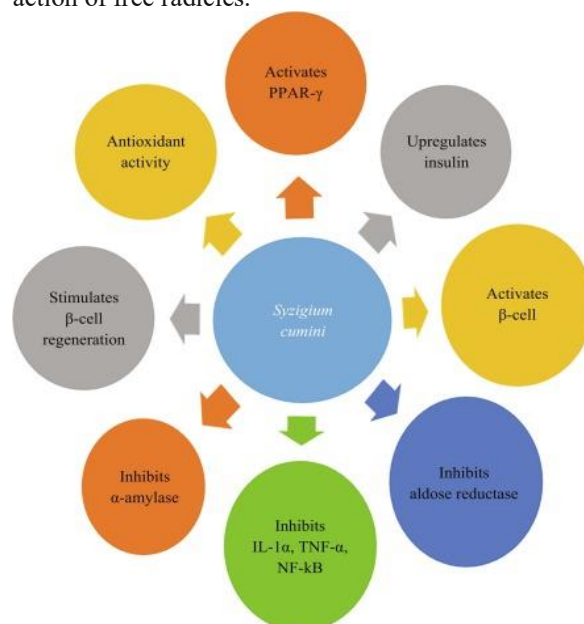
$$\text{Moisture\%} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Initial weight}} \times 100$$

## 6. PHARMACOLOGICAL ACTIONS OF SYZYGIUM CUMINI

### 6.1 ANTIDIABETIC

Diabetes mellitus is caused by insulin deficiency, thus disturbing the endocrine system and carbohydrate metabolism (Alberti and Zimmet 1998). It is known that plants possess pancreatic  $\alpha$ -amylase inhibitors, forming a critical aspect in the treatment of diabetes on withdrawal of starch indigestion (Eichler et al., 1984; Gajera et al., 2017). They prepared methanolic and aqueous extracts of all parts of the Jamun plant and tested them for antidiabetic functionality associated with phenolic constituents. The screening

for  $\alpha$ -amylase inhibitors was done using the porcine pancreatic  $\alpha$ -amylase (PPA), and an inhibition assay was carried out by the dinitro salicylic acid (DNSA) method. The methanolic extract of pulp (16.1%) of a medium to small *S. cumini* fruit had a higher antidiabetic potential compared to aqueous extracts but was lower than the kernel (92.6%) methanolic extract. The methanolic pulp extract of a very small *S. cumini* fruit exhibited maximum (53.8%) antidiabetic activity in comparison to other-sized fruits. The small-sized fruits were further examined for  $IC_{50}$  (indicates fruit extract concentration showing  $\geq 50\%$  inhibition on PPA activity) values to check for  $\alpha$ -amylase inhibition activity. The methanolic extract of the pulp of *S. cumini* fruit had the highest  $IC_{50}$  value of 270 mg/ml, thus being a moderate option for antidiabetic activity (Gajera et al. 2017). The aqueous extract of *S. cumini* fruit showed a reduction in blood glucose levels by approximately 20%, where the serum insulin levels enhanced in normal and diabetic rats (Ayyanar et al. 2013). In the same study, the fruit extract of *S. cumini* has also been reported to decrease the risk of development of atherosclerosis in diabetic patients as it reduces the action of free radicals.



### 6.2 ANTI-ALLERGIC

Allergy is an abnormal of the reaction of the body to the allergen introduced by indigestion, injection, inhalation, or skin contact. A novel safe and effective remedy is required for this ailment. In an investigation, the aqueous extract of SC leaves (25-100 mg/kg) inhibited the rat paw oedema induced by 48/80 (allergenic compound), histamine, and 5-HT. However, the extract could not produce any beneficial effects against the platelet aggregating factor-induced paw oedema (Brito FA et al., 2007).

### 6.3 ANTI BACTERIAL

Now a days, people have started using antibiotics as OTC (over-the-counter) drugs, which has led to antibiotic resistance; thus, safer novel antibacterial agents are required. In the case of SC, its stem, leaf, and fruit extracts were found to be effective against all the bacterial stains used in the study. Best results were observed against *Roultella plantikola* (zone of inhibition 25 mm) (Pareek A et al., 2015). Microbroth dilution and agar well diffusion assays were utilised to study the antibacterial effects of SC seeds against multidrug-resistant human bacterial pathogens, and it was found that the ethyl acetate fraction from the ethanol extract was most effective. Then, the ethyl acetate fraction was subjected to phytochemical analysis and TLC-bioautography, which exhibited the phenolics to be the main component responsible for the activity (Bag A et al., 2012).

### 6.4 ANTI-DIARRHOEAL

Natural products are a drug of choice for diseases like diarrhoea. SC ethanolic extract (400 mg/kg) administered orally has exhibited a reduction in gastro-intestinal activity in PEG2-induced enteropooling and castor oil-induced diarrhoea in rats (Mukherjee Pet al., 2011).

### 6.5 ANTI-FUNGAL

The indiscriminate utilisation of medicines has led to resistance against some fungal species; thus, there is a requirement for safer remedies. The methanolic fruit extract of SC has shown excellent antifungal action against the targeted pathogenic fungi *Fusarium oxysporum*, *Rhizoctonia solani*, and *Sclerotium rolfsii* (Pant OP et al., 2014). A research investigation utilised different concentrations of n-hexane, alcohol, and aqueous extracts of different plant parts of SC to study their antifungal potential against *Ascochyta rabiei*, the causative agent for the blight disease of *Cicerarietinum* (Jabeen K, Javid A, 2010). The aqueous, benzene, chloroform, ethanol, methanol, and petroleum ether extracts of SC leaf were evaluated against various species of *Aspergillus*, i.e., *A. tamari*, *A. ochraceus*, *A. flavus*, *A. columnaris*, *A. candidus*, and *A. flavipes*. The results revealed that the methanolic extract was most potent (Satish S et al., 2008).

### 6.6 ANTI-INFLAMMATORY

The anti-inflammatory drugs are those that help to overcome a localised physical condition in which part of the body becomes reddened, swollen, hot, and often painful, especially as a reaction to injury or infection. Ethyl-acetate and methanolic extracts of SC leaves and seeds showed significant anti-

inflammatory activity in carrageenan-induced paw oedema in Wistar rats (Jain A et al., 2010; Kumar A et al., 2008).

### 6.7 ANTI-LEISHMANIA

Anti-leishmania agents are those that destroy protozoa of the genus *Leishmania*. The essential oil of SC and its main component,  $\alpha$ -pinene, were evaluated for their anti-leishmanial action against *Leishmania amazonensis*.  $\alpha$ -pinene showed its efficacy with an IC<sub>50</sub> of 19.7 mg/mL. Immunomodulatory action was considered the most probable mechanism of action (Klinger AFR et al., 2015).

### 6.8 RADIOPROTECTIVE

Radioprotective agents are those that reduce the effect of radiation on tissues. SC leaf extract provided protection against radiation-induced intestinal mucosal damage due to exposure to different doses of gamma radiations (Jagetia GC, Baliga MS, 2003). Dichloromethane extract of SC leaf and hydroalcoholic seed extract when administered intraperitoneally exhibited radioprotective effects (Jagetia GC, Baliga MS, 2003). SC leaf extract in various concentrations (0.0, 1.56, 3.125, 6.25, 12.5, 25, 50, and 100 µg/ml) was found to reduce the radiation-induced DNA damage in the cultured human peripheral blood lymphocytes (Jagetia GC, Baliga MS, 2002).

## 7. TRADITIONAL APPLICATIONS:

Jamun, or black plum, is an important summer fruit associated with many health and medicinal benefits. The black plum is known to relieve stomach pain, be carminative, and be diuretic. Black plum vinegar is good to reduce enlargement of spleen, diarrhoea, and those who have urine retention problems. Jamun's polyphenolic compounds are effective against cancer, heart diseases, diabetes, asthma, and arthritis. Black plum fruit and its leaves are good for diabetic patients. The fruit helps to convert starch into energy. The extracts of bark, seeds, and leaves are too beneficial in the treatment of diabetes. Black plum has an adequate amount of iron and vitamin C. The presence of iron in the black plum is good to increase the haemoglobin count. The fruit's iron content acts as a blood purifying agent.

Some of the amazing and surprising health benefits of this juice are given below:

- ✓ It is used to treat digestive disorders such as diarrhoea.
- ✓ This juice, along with curd, is good against digestive problems.

- ✓ Teeth-related problems can be solved by applying black plum juice or by drinking it.
- ✓ Jamun juice is beneficial in treating piles.
- ✓ Drinking fresh juice helps with coughs and asthma. Juice enhances the immune system.
- ✓ It protects you from colds and acts as an anti-ageing agent.

### CONCLUSION:

*Syzygium cumini*, or Jamun, stands out as a remarkable evergreen tree with profound medicinal and nutritional significance. This plant, native to South Asia, has been traditionally utilized for centuries to treat various ailments, particularly diabetes and digestive issues. Its diverse parts fruits, seeds, leaves, and bark are rich in phytochemicals, including flavonoids, tannins, and alkaloids, which contribute to its extensive pharmacological properties. Recent scientific studies have validated these traditional uses, revealing strong anti-diabetic, anti-inflammatory, anti-bacterial, and anti-fungal activities, thus showcasing Jamun's potential as a natural remedy. Additionally, Jamun's adaptability to various soil types and climatic conditions enhances its cultivation prospects, making it an economically viable crop in tropical and subtropical regions. The fruit not only provides essential nutrients, such as iron and vitamin C, but also serves as a functional food with potential applications in food technology, including edible films. As ongoing research continues to explore the bioactive compounds of *Syzygium cumini*, its relevance in modern healthcare and sustainable agriculture will likely expand. This synthesis of traditional knowledge and contemporary scientific inquiry underscores the importance of Jamun as a valuable resource for promoting health and well-being in diverse populations.

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