

CHAPTER IV

Jamun (*Syzygium cumini*): a medicinal tree of India

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ABSTRACT

Diabetes is a prevalent health issue worldwide. The traditional agents used to prevent diabetes originate from India. The most used tree species in India for treating diabetes and other health issues is *Syzygium cumini*. It provides economic and ecological benefits as well. Considering this, an effort has been made to compile the data on *S. cumini* that is presented in the present study.

Keywords: Diabetes, ecological values, economic aspect, medicinal tree

INTRODUCTION

Syzygium cumini (L.), belonging to the Myrtaceae family, known as *Syzygium jambolanum* and *Eugenia cumini*. Common names are black plum, java plum, Indian blackberry, Jambul, jamblang, jamun, jamboo neredu in South India etc. *S. cumini* is an important medicinal plant in various traditional systems of medicine. Jamun is an important underutilized tropical fruit crop in India, possessing high nutraceutical value. It is a polyembryonic species and is native to the Indian subcontinent and Southeast Asia, including Myanmar, Sri Lanka, Bangladesh, and the Andaman Islands. India ranks second in the world in the production of jamun. This tree can reach a height of up to 8–15 meters and can live more than 100 years (Swami et al. 2012). The tree fruits once a year, and the berries are sweetish-sour to taste. The ripe fruits are used for making preserves, squashes, jellies, and wine (Sagrawat et al. 2006). This species is

effective in the treatment of diabetes mellitus, inflammation, ulcers, and diarrhea, and preclinical studies have also shown it to possess radioprotective, chemo-preventive, and antineoplastic properties (Swami et al. 2012). Jamun has received far more recognition in folk medicine and in the pharmaceutical trade than in any other field. Older reports from Indian medical journals suggest jamun seed and bark can be beneficial in humans with diabetes. The fruit seeds and pulp have been reported to serve numerous purposes in diabetic patients, such as lowering blood glucose levels and delaying diabetic complications, including neuropathy and cataracts. Additionally, a fruit extract showed antimicrobial and cytotoxic activities and may potentially be used in topical antimicrobial products. All parts of the jamun can be used medicinally, and it has a long tradition in alternative medicine. The aim of this research is bringing value for sustainable use and conservation by highlighting the traditional food values and ethnopharmacological information about jamun.

METHODOLOGY

The botanical, food, and ethnomedicinal information on *S. cumini* is collected from the field (Jharkhand, Odisha, and Himachal Pradesh) and literature survey in 2023. Photographs were taken from the field during the survey and presented here for easy identification in the field.

MORPHOLOGY

It grows up to a height of 8 to 15 m with oblong, opposite leaves that are smooth and glossy with a turpentine smell. The bark is scaly gray, the trunk is forked, and it has fragrant white flowers in branched clusters with hermaphrodite nature at the stem tips and purplish-black oval edible berries with a single seed. The flowering occurs from April to May and lasts for 1-2 weeks. The peak period for fruit availability is from August to September. Flower and fruit drop is the major problem, which leads to considerable yield loss (Figure 1-3; Saxena and Brahmam 1995).

RESULTS AND DISCUSSION

Food values

Good-quality jamun juice is excellent for syrup, and squash (Kumar et al. 2009). In India, a bottled drink prepared by cooking the crushed jamun fruits for 5–10 minutes at 140° F, pressing out the juice, combining it with sugar and water, and adding citric acid and sodium benzoates as a preservative (Reynertson et al. 2005).



Figure 1: Leaves and fruits of *S. cumini* in wild

In many countries, jamuns are important sources of wine. Brandy and a distilled liquor called jambava have also been made from the fermented fruit (Kumar et al. 2009). It is also consumed by frugivorous birds and fruit bats. Flowers are an important source of nectar and pollen for honeybees.

Ethnopharmacological uses

Traditionally, *S. cumini* fruits, leaves, seeds, and bark are all used in ayurvedic medicine. The bark contains tannins and carbohydrates, accounting for its long-term use as an astringent to combat ailments like dysentery (Namasivayam et al. 2008). A glycoside in the seed, jamun, is considered to have antidiabetic properties. The seeds have also shown anti-inflammatory effects and antioxidant properties (Prince and Venon 1998). Older reports from Indian medical journals suggest the seeds and bark of *S. cumini* can be beneficial in diabetes (Sepaha and Bose 1956). 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 (Sagrawat et al. 2006). Jamun extracts also provide protection to the DNA against radiation-induced DNA damage. The phytochemicals ellagic acid, gallic acid, quercetin, and oleanolic acid present in jamun also possess radioprotective effects (Swami et al. 2012).

Table 1: List of medicinal uses of different plant parts of *S. cumini*

Parts used	Medicinal uses	Sources
Leaves	Anti-allergic	Katiyar et al. (2016)
Stem, fruit extract	Antibacterial	Katiyar et al. (2016)
Fruit	Anticancer	Bhanuprakash et al. (2007)
Fruit pulp, flowers, leaves, seeds	Antidiabetic	Katiyar et al. (2016)
Seeds	Anticlastogenic	Arun et al. (2010)
Seeds	Antimicrobial	Singh and Mukhtar (2017)
Seeds	Analgesic	Singh and Mukhtar (2017)
Leaves	Antiviral	Bhanuprakash et al. (2007)
Bark	Anti-inflammatory	Das and Sarma (2009)

Fruits	Gastroprotective	Das and Sarma (2009)
Leaf and pulp	Hepato-protective	Das and Sarma (2009)
Seeds	Hypolipidemic	Bhanuprakash et al. (2007)
Bark	Antidiarrheal	Katiyar et al. (2016)
Fruit pulp	Antioxidant	Katiyar et al. (2016)
Leaf	Antifungal	Katiyar et al. (2016)



Figure 2: whole plant of *S. cumini* in wild

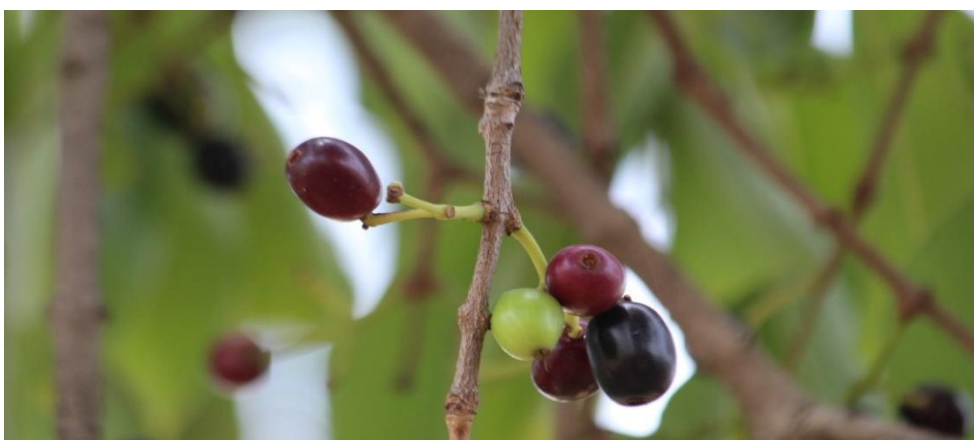


Figure 3: Fruit and stem of *S. cumini*

CONCLUSION

Jamun is traditionally used for the treatment of various diseases, especially diabetes and related complications. Most pharmacological works on diabetes were carried out with seeds, but the pharmacological potential of the other parts of the plant is required to be explored in detail. Jamun fruit demand is increasing day by day because of its nutritive value, and that will require selected plants of superior quality with high yield potential. The role of *S. cumini* in various treatments recommends that further phytochemical and clinical research can be done for the discovery of safer drugs. Studies should also be conducted to understand which of the phytochemicals are responsible for the observed beneficial effects and, if effective, what is their mechanism of action.

REFERENCES

- Arun R, Prakash MV, Abraham SK and Premkumar K. (2010). Role of *Syzygium cumini* seed extract in the chemoprevention of in vivo genomic damage and oxidative stress. Journal of Ethnopharmacology.
- Bhanuprakash V, Hosamani M, Balamurugan V, Singh RK and Swarup D. (2007). In-vitro antiviral activity of *Eugenia jambolana* plant extract on buffalopox virus: conventional and QPCR methods. International Journal of Tropical Medicine. **2**: 3-9.
- Das S and Sarma G. (2009). Study of the hepatoprotective activity of the ethanolic extract of the pulp of *Eugenia jambolana* (jamun) in albino rats. Journal of Clinical and Diagnostic Research. **3**: 1466-1474.
- Katiyar D, Singh V and Ali M. (2016). Recent advances in pharmacological potential of *Syzygium cumini*: a review. Advances in Applied Science Research. Pelagia Research. **7**(3): 1-12.
- Kumar A, Jayachandran T and Aravindhan P. (2009). Neutral components in the leaves and seeds of *Syzygium cumini*. African Journal of Pharmacy and Pharmacology. **3**(11): 560-561.
- Namasivayam R, Ramachandran B and Deecaraman M. (2008). Effect of aqueous extract of *Syzygium cumini* pulp on antioxidant defense system in streptozotocin induced diabetic rats. International Journal of Post harvest Technology. **7**:137-145.
- Prince P and Venon M. (1998). Effect of *Syzygium cumini* in plasma antioxidants on alloxan-induced diabetes in rats. Journal of Clinical Biochemistry and Nutrition. **25**(2): 81-86.
- Reynertson K, Basile A and Kennelly MJ. (2005). Antioxidant potential of seven mystaceous fruits. Ethnobotany Research and Applications. **3**: 25-35.
- Sagrawat H, Mann, AS and Kharya MD. (2006). Pharmacological potential of *Eugenia jambolana*: a review. Pharmacogenesis Magazine. **2**: 96-104.

- Sepaha G and Bose S. (1956). Clinical observations on the antidiabetic properties of *Pterocarpus marsupium* and *Eugenia jambolana*. Journal of the Indian Medical Association. **27**: 388-391.
- Singh H and Mukhtar HM. (2017). Pharmacognostic, analgesic and antimicrobial screening studies of *Eugenia jambolana* seeds- an overview. International Journal of Sciences and Applied Research. **4**(3): 12-33.
- Swami SB, Thakor NSJ, Patil MM, Haldankar PM. (2012). Jamun [*Syzygium cumini* (L.)]: a review of its food and medicinal uses. Food and Nutrition Sciences. **3**: 1100-1117.
- Saxena HO and Brahman M. (1995). The Flora of Orissa. Regional Research Laboratory, Bhubaneswar and Orissa Forest Development Corporation, Bhubaneswar. **2**:682-683