



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 211-213
Received: 24-01-2019
Accepted: 27-02-2019

Kshirsagar RB

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Desai GB

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Sawate AR

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Deshmukh NM

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Correspondence**Desai GB**

Department of Food
Engineering, College of Food
Technology, Vasant Rao Naik
Marathwada Krishi Vidyapeeth,
Parbhani, Maharashtra, India

Physico-chemical and nutritional properties of jamun (*Syzygium cumini*) seed

Kshirsagar RB, Desai GB, Sawate AR and Deshmukh NM

Abstract

The present investigation aimed to assess the physicochemical, proximate, vitamins and minerals composition of jamun (*Syzygium Cumini*) seed. The physical properties like colour of jamun fruit was dark purple and jamun seed were recorded white to pink. The shapes of the jamun fruit and seed resembled the oblong shape. The length, width and weight of jamun fruit (31 mm, 28.7 mm and 18.32g) and seed was found to be (18.20 mm, 11.05 mm and 1.62 g) respectively. Jamun seed were assessed for their chemical composition such as moisture, crude fat, crude protein, carbohydrate, crude fiber and ash as (53, 1.02, 3.84, 31.62, 7.01 and 1.51 g/100g), respectively. The values for vitamins presence of vitamins A (3 IU/100g), vitamins B₃ (0.09 mg/100g) and vitamins C (0.21 mg/100g) were found in jamun seed. The values for minerals presence of iron, calcium, magnesium, phosphorous, potassium and zinc in jamun seed powder was (0.140, 0.651, 0.010, 0.072, 16.07 and 0.009 mg/100g), respectively. Thus, it was concluded that these jamun (*Syzygium Cumini*) seed traditional medicinal plants provide good source of nutrients viz., protein, fibres, vitamins and minerals.

Keywords: jamun fruits, jamun seed, physicochemical, nutritional, vitamin, minerals

Introduction

India is origin of many fruit crops and the most of crops is limited to its growing region only. In spite of their high nutritional and medicinal properties their commercial cultivation is lacking. Most of underutilized fruits are in the core recipes of many ayurvedic formulations. The most common underutilized fruits which are gaining its popularity are Jamun (*Syzygium cumini*). This species is endemic to South East Asia and India, but also reported to be grown in Hawaii, Australia, Philippines Kenya, Florida etc. The jamun fruits are produced once in a year and its availability is possible in the month of June-July (Shrivastava and Kumar, 2009) ^[1], and the jamun fruits are characterized as berries that are sweetish sour to taste (Warrier *et al.*, 1996) ^[2]. The common cultivars of jamun are Kaatha, Narendra Jamun-6 and Konkan bhar doli. The jamun fruit is a berry which is big sized, oblong in shape and deep purple or bluish black in color. Its pulp is purple pink and fruit is juicy and sweet (Achrekar *et al.*, 1991) ^[3]. Estimated world production of Jamun is 13.5 million tons per annum out of which 15.4% are contributed by India. India stands second in production of Jamun in the world. Traditionally the jambul fruits, leaves, seeds and bark are all used in ayurvedic medicine. Jamun seed powder has been used for centuries as a natural form for balancing the healthy blood sugar level. It is a very delicious, detoxifying herb which has properties that helps to maintain natural urination and sweating. It has an hypolipidemic, cardioprotective, immunomodulatory, neuro-psychopharmacological property Besides, there are reports on the antioxidant, anti-inflammatory, antipyretic, anti-allergic, anti-bacterial, gastro-protective and radioprotective properties of Jamun seed extract. It also acts as liver stimulant, digestive, coolant and a blood Purifier. Jamun seeds contain a glycoside, named Jamboline which helps in the maintenance of glucose levels as in the normal limits (Kalse *et al.*, 2016) ^[4]. Ayurvedic text suggests that 1-3 g of jamun seed powder per day is an average dose for the treatment of diabetes (Shorti *et al.*, 1962) ^[5]. There is no systematic study on the Physicochemical and nutritional properties of Jamun seed. Hence the present study has been undertaken to study the physicochemical, proximate, vitamins and minerals composition of jamun seed.

Materials and Methods

The jamun fruits (*Syzygium cumini*) were collected from the Department of Botany, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani. The proposed research was carried out in Department of food engineering, College of Food Technology, VNMKV, Parbhani.

Methods

The physical properties like colour, shape, weight, length, width and texture were measured according to the method (Shahnawaz and Sheikh) [6]. Chemical properties like Moisture, crude fat, crude protein, Carbohydrate, crude fiber and ash measured according to (AOAC 2005) [7]. Vitamins content like vitamin A content was determined spectrophotometrically using a modified standard method of (AOAC 2000) [8]. vitamin B₃ was determined using the standard procedure of (Anuradha *et al.*, 2013) [9]. The method of (Hussian *et al.*, 2006) [10] was used for determination of vitamin C and Mineral content like iron, calcium, magnesium, phosphorous potassium and zinc were were estimated method given by (Ranganna 2011) [11].

Preparation of jamun seed powder

Evenly matured disease free and sound jamun fruits have to select. The pulp and seed of jamun fruit was separated by pulper. Then the seed washed in water and dried in tray dryer at 60°C for 48 hours still complete drying and ground the seed in pulveriser to fine powder of average particle size 0.58 mm.

Result and Discussion

Physical characteristic of jamun fruit and seed

The physical properties help in visual identification of fruits. Therefore, some physical properties are observed and tabulated in Table 1.

The results presented in Table 1 indicate the details of the physical properties determined. The colour of jamun fruit was recorded as dark purple, jamun seed were recorded white to pink and also the colour of jamun seed kernel was black. The shapes of the jamun fruit, seed and seed kernel resembled the oblong shape. The length of jamun fruit, seed and seed kernel was found to be 31 (mm), 18.20 (mm) and 16.48 (mm) respectively. Width of jamun fruit, seed and seed kernel was recorded as 28.7 (mm), 11.05 (mm) and 10.29 (mm) respectively. The results indicated that the average weight of jamun fruit was found to be 18.32 (g), seed 1.62 (g) and seed kernel 0.92 (g).

Table 1: Physical characteristic of jamun fruit and seed

Sr. No.	Physical characteristic			
	Parameters	Fruit	Seed	Seed kernel
1	Colour	Dark purple	White to pink	black
2	Shape	Oblong	Oblong	Oblong
3	Length (mm)	31	18.20	16.48
4	Width (mm)	28.7	11.05	10.29
5	Weight (g)	18.32	1.62	0.92
6	Texture	Smooth	Coarse	Coarse

The data related to physical characteristics of jamun fruit were showed that, visual observation smooth texture and seed and seed kernel showed that coarse in texture. The similar results related to physical characteristics of jamun were also found by (Ghosh *et al.*, 2017) [12]. The results of present investigation for jamun fruit related to physical properties are in close agreement with the finding of (Muhammad *et al.*, 2009) [13].

Proximate composition of jamun seed

Information regarding proximate composition of jamun seed is given in Table 2 results indicated that the jamun seed contain moisture, crude fat, crude protein, carbohydrate, crude

fiber and ash were the different parameters employed to assess the proximate composition of jamun seed powder.

Proximate composition (Table 2) indicated that jamun seeds contain moisture, crude fat, crude protein, carbohydrate, crude fiber and ash as 53 g/100g, 1.02 g/100g, 3.84 g/100g, 31.62 g/100g, 7.01 g/100 g and 1.51 g/100g, respectively. These results were in accordance with earlier findings Reported by Prasad *et al.*, (2010), who depicted that jamun seeds consisted of 9.34±1.99% moisture, 2.42±0.44% crude protein, 0.92±0.52% crude fat, 6.08±1.11% crude fiber and 2.93±0.82% ash (Shahnawaz *et al.*, 2010) [14].

Previous studies have reported 40.86 to 57.33% moisture, 2.42 to 5.05%, protein, 1.47 to 6.21% ash, 1.55 to 8.00% fat and 1.28 to 10.95% crude fibre in java plum seeds (Kochar *et al.*, (2006) [15]; Swami *et al.*, (2012) [16]. Present results of seed composition were close to previously reported values except for protein and fibre content which were higher.

Table 2: Proximate composition of jamun seed

Sr. No.	Proximate composition	
	Parameters	Values (g/100g)
1	Moisture content	53
2	Crude Fat	1.02
3	Crude protein	3.84
4	Carbohydrate	31.62
5	Crude fiber	7.01
6	Ash	1.51

*Each value is average of three determinations

These differences might arise from the variation in variety, agricultural practices and climatic conditions. Jamun seed consisted of moisture (16.34±0.49%), crude protein (1.97±0.59%), crude fat (0.65±0.01%), crude fiber (4.19±0.12%), ash (2.18±0.06%) and NFE (74.67±2.24%) (Ahmad *et al.*, 2015) [17].

Vitamin content of jamun seed

The quantitative estimation of vitamins present in the jamun seed is given in Table 3.

Table 3: Vitamin content of jamun seed

Sr. No.	Vitamin content	
	Vitamins	Values (mg/100g)
1	Vitamin A (Retinol)	3 IU/100g
2	Vitamin B ₃ (Niacin)	0.09
3	Vitamin C (Ascorbic acid)	0.21

*Each value is average of three determinations

The data in Table 3 showed, jamun seed contained fat soluble vitamins A (Retinol) 3 IU/100g and while water soluble vitamins B₃ (Niacin) 0.09 (mg/100g) and vitamins C (Ascorbic acid) 0.21 (mg/100g) were found. Jamun seed were found to contain higher amount of water soluble vitamins. The findings are similar with the results given by Ghosh *et al.*, (2017) [12] and Shahnawaz *et al.*, (2010) [14].

Mineral composition of jamun seed

The data in the table 4 revealed estimated mineral composition of jamun seed powder. Results indicated that the iron, calcium, magnesium, phosphorous potassium and zinc were the different parameters employed to assess the nutritive value of jamun seed powder.

Table 4: Mineral composition of jamun seed powder

Sr. No.	Mineral composition	
	Minerals	Values (mg/100g)
1	Iron	0.140
2	Calcium	0.651
3	Magnesium	0.010
4	Phosphorous	0.072
5	Potassium	16.07
6	Zinc	0.009

*Each value is average of three determinations

Trace element contents (mg/100g) of iron, calcium, magnesium, phosphorous, potassium and zinc in jamun seed powder was 0.140, 0.651, 0.010, 0.072, 16.07 and 0.009 mg/100g, respectively. The present results of seed composition were close to previously reported values of minerals content which were reported by (Ayya *et al.*, 2015)^[18] and (Veeram *et al.*, 2017)^[19]. These results were in accordance with earlier findings reported by (Desai *et al.*, 2018)^[20].

Conclusion

The aim of present investigation was to study the physicochemical, proximate, vitamins and minerals composition of Jamun seed. The physical parameters are essential for designing of processing machineries and equipments. Jamun contains enough amounts of protein and fat. It also contain appreciable amount of vitamin C (ascorbic acid) and minerals (Iron, Calcium and Potassium) thus Jamun seed can be utilized for development of functional food products.

References

- Shrivastava RP, Kumar S. Fruit and vegetable preservation principles and practices, IBDC, New Delhi. Srivastava, H. C. 1953. Paper chromatography of fruit juices. Journal of Science and Industrial Research. 2009; 12:363-365.
- Warrier PK., Nambiar VPK, Ramankutty C. Indian medicinal plants. Hyderabad, India: Orient Longman Ltd. 1996; 5:225-228.
- Achrekar S, Kaklij GS, Pote MS, Kelkar SM. Hypoglycemic activity of *Eugenia jambolana* and *Ficus bengalensis*: Mechanism of action. *In vivo*. 1991; 5:143-147.
- Kalse SB, Swami SB, Sawant AA, Thakor NJ. Development and quality evaluation of jamun seed powder fortified biscuit using finger millet. J Food Process Technol 2016; 7:2-3.
- Shorti DS, Kelkar M, Deshmukh VK, Aiman R. Investigation of hypoglycaemic properties of *Vinca rosea* and *Eugenia jambolana*. Indian Med. 1962; 3:51-62.
- Shahnawaz M, Sheikh SA. Physicochemical characteristics of Jamun fruit, Journal of Horticulture and Forestry. 2011; 3(10):301-306.
- AOAC. Association of Official Analytical Chemists. Official Methods of Analysis, 18th edition, Washington DC, 2005.
- AOAC Official method of Analysis of Association of Analytical Chemists International. 17th Edition, Horowitz, Maryland, 2000.
- Anuradha V, Praveena A, Sanjayan KP. Nutritive analysis of fresh and dry fruits of *Morinda tinctoria*. Int. J Curr. Microbiol. App. Sci. 2013; 2(3):65-74.

- Hussian I, Saleem M, Iqbal Y, Khalil SJ. Comparison of vitamin C contents in commercial tea brands and fresh tea leaves. Journal of the Chemical Society of Pakistan, 2006; 28:421-425.
- Ranganna S. Handbook of analysis and quality control for fruits and vegetable products. IInd edition. Tata McGraw-Hill Publ. Co., New Delhi, India, 2011.
- Ghosh P, Pradhan RC, Mishra S, Patel AS, Kar A. Physicochemical and Nutritional Characterization of Jamun (*Syzygium Cumini*). Current Research in Nutrition and Food Science. 2017; 5(1):25-35.
- Muhammad S, Saghir AS, Nizamani SM. Determination of nutritive of jamun (*Syzygium cumini*) fruit and seed. Journal of Agriculture and Environmental Science, 2009; 15(7):1221-1223.
- Shahnawaz M, Sheikh SA, Bhangar MI, Ahmed E. Total phenolic compounds and antioxidant activity of jamun fruit (*Eugenia jambolana*) products. Pakistan Journal of Nutrition. 2010; 20:31-41.
- Kochar A, Nagi M, Sachdeva R. Proximate composition, available carbohydrates, dietary fiber and anti-nutritional factors of selected traditional medicinal plants. Journal of Human Ecology. 2006; 19:195-199.
- Swami SB, Thakor NSJ, Patil MM, Haldankar PM. Jamun (*Syzygium cumini* (L.)): A review of its food and medicinal uses. Food and Nutrition Sciences. 2012; 3:1100-1117.
- Ahmad R, Muhammad UA, Tanzeela N, Saeed AQ, Riaz H, Muhammad NS. Proximate composition of jamun (*Syzygium cumini*) fruit and seed. Journal of Agriculture and Environmental Science. 2015; 15(7):1221-1223.
- Ayya N, Nalwade V, Khan TN. Effect of jamun (*Syzygium cumini* L.) seed powder supplementation on blood glucose level of type-II diabetic subject. Food Science Research Journal, 2015; 6(2):353-356.
- Veeram A, Sindhu G, Girish C. review on pharmacology and phytochemistry of *Syzygium cumini*. Indian Journal of Pharmaceutical and Biological Research, 2017; 5(4):24-28.
- Desai GB, Sawate AR, Taur AT, Thorat PP, Deshmukh NM, Kshirsagar RB *et al.* Effect of fortification of jamun seed (*Syzygium cumini*) powder on nutritional and sensory quality of herbal multigrain cookies. International Journal of Chemical Studies. 2018; 6(2):1083-1087.