Int.J.Curr.Microbiol.App.Sci (2025) *14*(02): 233-241

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 14 Number 2 (2025)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2025.1402.022

Sensory and Physico-chemical Quality of Fresh Jamun (*Syzygium cumini* L.) Seed Powder Yoghurt

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Keywords

Milk, *Lactobacillus bulgaricus, Streptococcus thermophilus*, natural fruit juices, pulps

Article Info

Received:
22 December 2024
Accepted:
29 January 2025
Available Online:
10 February 2025

A B S T R A C T

The present investigation entitled "Process standardization for preparation of yoghurt by using Jamun (*Syzygium cumini L.*) seed powder" was undertaken during 2023-24 with a view to standardize the process for preparation of Jamun seed powder yoghurt with improved therapeutic and anti-diabetic value using Jamun seed powder and aspartame. Initially, preliminary trials were conducted to finalize the levels of Jamun seed powder and aspartame in the yoghurt. Yoghurt samples were prepared with 1, 1.5, 2, 2.5, 3 and 3.5 percent Jamun seed powder and 200, 250 and 300 ppm aspartame. It was observed that, all the sensory attributes Viz., colour and appearance, flavor, body and texture and overall acceptability of fresh yoghurt samples under different treatment combinations were significant. The colour and appearance, flavour, consistency and overall acceptability score ranged from 7.99 (T_0) to 8.24 (T_3), 7.99 (T_0) to 8.27 (T_3), 7.95 (T_6) to 8.22 (T_3) and 7.97 (T_0) to 8.24 (T_3), respectively. The treatment combination T_3 (2 per cent jamun seed powder and 250 ppm aspartame) found sensorily superior over the rest of treatment combinations. The average chemical composition of fresh yoghurt samples prepared under different treatment combinations ranged from 80.18 to 83.03% moisture, 2.47 to 2.95% fat, 3.22 to 3.38% protein, 19.82 to 26.98% total solids, 0.72 to 1.05% titratable acidity, 3.97 to 4.10% reducing sugar, 4.31 to 4.51% total sugar, 0.74 to 0.78% ash and 3.93 to 4.55 pH. The effect of levels of jamun seed powder and aspartame was significant.

Introduction

The practice of converting milk into various products has been established for centuries. It is estimated that approximately 46 per cent of milk is consumed as fluid milk, while the remaining 54 per cent is processed into dairy products such as cream, butter, ghee, yogurt, ice cream, khoa, and flavored milk (Patange *et al.,* 2018).

"Yogurt" is a fermented milk product created through lactic acid fermentation, involving the action of *Streptococcus salivarius subsp. thermophilus* and *Lactobacillus delbrueckii subsp. bulgaricus* (FAO/WHO, 1977).

Yogurts differ in appearance, flavor, and ingredients. The quality and composition of yogurt are influenced by the

bacterial cultures used during the milk fermentation process. There is a symbiotic relationship between the two bacterial species, *Lactobacillus bulgaricus* and *Streptococcus thermophilus,* leading to faster acid development compared to single-strain cultures (Rasic *et al.,* 1978; Tamime *et al.,* 1980).

During yogurt production, various combinations of starter cultures are selected to achieve desired product characteristics and offer consumers a range of therapeutic benefits.

Manufacturers typically add 2-4% yogurt starter culture based on its activity. Recently, there has been a growing trend to enhance dairy products with fruits, such as natural fruit juices, pulps, and dried fruits (Desai *et al.,* 1994; Ghadge *et al.,* 2008).

Jamun is considered a blood purifying agent and, when compared to common fruits like guava and papaya, offers additional health benefits. The iron content in the seeds can help combat anemia and jaundice, while the calcium can meet dietary mineral requirements, making it useful in supplements for pregnant and lactating women.

Due to its unique flavor and medicinal benefits, jamun fruit has significant potential for creating value-added dairy products, resulting in a range of exotically flavored goods with enhanced nutritional and sensory attributes, which could open new international market opportunities (Singh and Paswan, 2015).

The jamun fruit, particularly those from the Punjab region of Pakistan, has shown promise in the treatment of breast cancer by inhibiting the spread of breast cancer cell lines.

It also helps reduce the risk of spleen enlargement and possesses various medicinal properties, including being stomachic, astringent, anti-scorbutic, diuretic, anti-diabetic, antioxidant, and anti-proliferative. Historically, fruit concentrate has been used to treat chronic diarrhea (Sadawarte *et al.,* 2016).

Jamun is also considered a traditional remedy for managing diabetes. It specifically targets the pancreas, the organ primarily responsible for insulin production. The seeds of the jamun fruit contain a compound called jamboline, which prevents starch from converting into sugar, thereby helping to regulate glucose levels and combat high sugar levels (Bhowmik *et al.,* 2013).

Materials and Methods

Starter Culture

The freeze dried pure cultures of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* were procured from the National Collection of Dairy Cultures (NCDC), Division of Dairy Microbiology, National Dairy Research Institute, Karnal (India).

Jamun seed powder

Good quality Jamun seed powder was purchased from Post Harvest Technology Centre, MPKV, Rahuri.(M.S)

Aspartame

Good quality Aspartame was purchased from local market.

Preparation of Jamun seed powder yoghurt

The Yoghurt was prepared by using the procedure prescribed by George, *et al.,* (2010) with some minor modifications. Fresh good quality cow milk (3.5 % fat) was taken and added skim milk powder @ 4% subjected to filtration/clarification.

The mix was pre-heated to 60°C and homogenized single stage at 2000-2500 psi, the milk was heated to 85°C for 30 min and then cooled to 43 ± 1^0C, sugar was added. It was then inoculated @ 2% with *Lactobacillus bulgaricus* and *Streptococcus thermophilus* (1:1 ratio) which were mixed well and incubated at 43 ± 10C for 5 hours in plastic cups/containers. When the curd has set firmly, it is transferred in refrigerator and stored at 5 ± 20C.

Physical property analysis

Fat

As per the method described in IS: 1244, Part I, 1977. Protein: As per the procedure described in IS: 1479 (part-II) (1961). Total solids: As per the method given in IS: 1479 Part-II (1961). Titratable acidity (% L. A.) As per the method given in IS: 1479, Part –I(1960). pH: As per the method given in IS: 1479, Part –II(1961).Total soluble solids: The total soluble solids in the juice was determined with the help of Erma hand refractometer (Range 0-320 Brix) pH: pH of the Jamun seed powder

was measured by Elico digital pH meter. Reducing sugar and total sugar: Reducing sugar and total sugar was determined by the method of Lane and Eynon (1923), as adopted by Ranganna (1986).

Statistical Analysis

The data generated during the course of this investigation was tabulated and analyzed using Completely Randomized Design (CRD) for pre-experimental trials and to compare control with other treatments. However, effect of Jamun seed powder and aspartame levels and their interaction effect was analyzed by Factorial Completely Randomized Design (FCRD) with three replications (Snedecor and Corchan, 1967).

Results and Discussion

Sensory Evaluation

Yoghurt samples were subjected to the sensory evaluation. The samples of yoghurt were provided to the panel of five semi trained judges for sensory evaluation. The scoring was recorded by using 9 point Hedonic Scale (Appendix-I) as per IS: 6273 (Part –II) 1971.

Colour and appearance

The colour score of the yogurt was affected by the natural colour of the powder itself. Data regarding the colour and appearance parameters are presented in Table 1. The colour and appearance scores for the yogurt treatments T0, T1, T2, T3, T4, T5, and T6 were 7.99, 8.11, 8.22, 8.24, 8.09, 8.12, and 8.02, respectively. Treatment T3 achieved the highest score, significantly higher ($P < 0.05$) than the other treatments.

Treatments T0 and T1 showed comparable results, while treatments T4, T5, T6, and T1 exhibited significant differences among themselves. The varying levels of Jamun seed powder and Aspartame resulted in a colour shift from pale white to brownish white, with the addition of these ingredients enhancing the brownish hue of the yogurt.

Rao & Desai (2021) also conducted the study analyzing the effects of Jamun powder fortification on the color and nutritional quality of yogurt. Colour and appearance score for yoghurt as 8.25, 8.53, 8.80 and 7.53 for the treatments T1, T2, T3 and T4, respectively.

Flavour

Table no 1 show that the mean flavour scores for the yogurt treatments T0, T1, T2, T3, T4, T5, and T6 were 7.99, 8.13, 8.04, 8.27, 8.00, 8.02, and 8.02, respectively. Both ingredients significantly influenced the flavour scores ($P < 0.05$).

Treatments T1, T2, and T6, as well as T0, T1, and T6, showed comparable flavour ratings. Treatment T3 received the highest score of 8.27. In contrast, treatments T5 and T6, which contained a higher percentage of Jamun seed powder, were less preferred by the judges, who noted a slightly off-putting flavour due to the increased powder level.

The results for flavour in the current study are more or less comparable to those of Ribeiro & Mota, (2020). Who reported Enhancing Flavour in Yogurt through Fruit Integration.

His research examines how incorporating various fruits into yogurt can enhance flavour and consumer appeal. Flavour score of fruit blended yoghurt for the treatments T1, T2, T3 and T4 were 8.25, 8.75, 8.43 and 7.45, respectively.

Consistency

The results obtained during evaluation in terms of consistency in the Table no.1 demonstrate a significant effect of jamun seed powder and aspartame on the consistency of yoghurt ($P<0.05$). Treatment T3 exhibited the highest consistency score of 8.22, while T0, which contained no jamun seed powder or aspartame, had the lowest score of 7.95.

This suggests that consistency improves with moderate levels of jamun seed powder and aspartame, but may decline with excessive amounts. The consistency scores for the treatments were as follows: T0 (7.95), T1 (8.17), T2 (8.21), T3 (8.22), T4 (8.57), T5 (7.92), and T6 (8.11). Judges rated the consistency from “liked moderately” to “liked very much,” indicating that a thicker consistency was achieved with increased levels of both ingredients.

Above results are similar to findings of Patel & Kumari (2021) entitled "Effect of jamun seed powder on the physicochemical properties of dahi (yogurt)." Which showed the increase in consistency of products like dahi and yoghurt.

Overall Acceptability

The mean scores for the yoghurt varied from 7.97 to 8.24 among the different treatments. The formulation containing 2% jamun seed powder and 250 ppm aspartame received the highest score, while the control sample without seed powder recorded the lowest. Treatment T3 was significantly superior ($P<0.05$) to the other treatments, particularly in terms of colour, flavour, and consistency.

All levels of jamun seed powder were well-accepted, with T3, T4, T5, and T6 showing significant differences from one another. Overall, all samples were rated within the "liked moderately" to "liked very much" range on the 9-point hedonic scale

Rao & Desai (2021) also conducted the study analyzing the effects of Jamun powder fortification on the colour and nutritional quality of yogurt and noted that sensory scores for overall acceptability in yoghurt initially increased and then gradually decreased (Dewangan & Sinha, 2020). The score of the overall acceptability of various food products, including dairy for treatment T1 (8.78) was maximum followed by T0 (8.33), T2 (7.90), and T3 (7.00).

Chemical qualities of fresh yoghurt samples

All the samples of yoghurt, along with a control, underwent physico-chemical analysis for parameters such as moisture, fat, protein, ash, total sugar, total solids, titratable acidity and pH. The corresponding observations and statistical analysis are presented in Table no 1 and 2.

Moisture

The data in Table indicate that the moisture content of yoghurt decreases from 83.13% to 79.95% as the levels of jamun seed powder and aspartame increase from T0 to T6. The moisture contents for treatments T0, T1, T2, T3, T4, T5, and T6 were recorded as 83.03%, 81.35%, 81.15%, 80.90%, 80.72%, 80.31%, and 80.18%, respectively.

Each treatment showed significant differences ($P<0.05$) from one another, with T6 having the lowest moisture content at 80.18% and T0 the highest at 83.03%. The variations in moisture content among the treatments were statistically significant ($P<0.05$). The observed decrease in moisture content with higher levels of jamun seed powder and aspartame is likely due to the dietary fibers in jamun seed powder, which absorb moisture.

Study of Patel & Kumari (2021). "Effect of jamun seed powder on the physicochemical properties of *dahi* (yogurt)." Resembles the above results of decrease of moisture as addition of jamun seed powder, the also study explores the impact of jamun seed powder on the moisture content and other properties of yogurt (Dewangan & Sinha, 2020) found the moisture content of jamun seed powder incorporated dairy products lowest in treatment T4 (80.63 per cent) followed by treatments T1 (89.31), T2 (87.79) and T3 (83.13).

Fat

The fat content values for yoghurt are detailed in Table. The average fat content for treatments T0, T1, T2, T3, T4, T5, and T6 was 2.95%, 2.72%, 2.70%, 2.68%, 2.64%, 2.48%, and 2.47%, respectively. Significant differences ($P<0.05$) in fat content were noted with the varying levels of jamun seed powder and aspartame. The control sample T0 exhibited the highest fat content at 2.95%, while T6 had the lowest at 2.47%. These findings suggest that increasing levels of jamun seed powder and aspartame resulted in a decrease in fat content, likely due to a dilution effect.

These findings are consistent with studies of Patel & Kumari (2021) entitled "Effect of jamun seed powder on the physicochemical properties of dahi (yogurt)." The fat content of jamun seed powder dairy products for treatment T0, T1, T2, and T3 were 24.20, 22.45, 20.33, and 18.36 per cent respectively.

Protein

Table present the mean protein content values of the formulated product, which ranged from 3.22% to 3.38%. Treatment T0 exhibited the lowest protein content at 3.22%, while the highest value, 3.38%, was recorded for treatment T6. The protein content for treatments T0 through T7 were as follows: 3.22%, 3.33%, 3.36%, 3.30%, 3.31%, 3.36%, and 3.38%. It was noted that the protein content in the yogurt increased with higher levels of jamun seed powder, likely due to its superior antioxidant properties that help prevent protein degradation.

Table.1 Treatment details

Treatment No.	Treatment combination
T_0	Control without addition of Jamun seed powder and aspartame in Yoghurt
T_1	Yoghurt + 1% jamun seed powder + 250ppm aspartame (P1 A1)
T_2	Yoghurt + 1% jamun seed powder + 300ppm aspartame (P1A2)
T_3	Yoghurt + 2% jamun seed powder + 250ppm aspartame (P2 A1)
T_4	Yoghurt + 2% jamun seed powder + 300ppm aspartame (P2 A2)
T_5	Yoghurt + 3% jamun seed powder + 250ppm aspartame (P3A1)
T_6	Yoghurt + 3% jamun seed powder + 300ppm aspartame (P3 A2)

Table.2 Sensory quality of Yoghurt samples (score out of 9)

Treatments	Mean (score)			Overall acceptability
	Colour and Appearance	Flavour	Consistency	
T_0	7.990^{c}	7.992^{a}	7.955^{d}	7.979^{d}
T_1	8.117^{abc}	8.132^{ab}	8.170^{ab}	8.139^{bc}
T_2	8.220^{ab}	8.042^{b}	8.210^{ab}	8.157^{ab}
T_3	8.242^{a}	8.272^{a}	8.225^{a}	8.246^{a}
T_4	8.090^{bc}	8.002^{b}	8.057^{cd}	8.049^{cd}
T_5	8.120^{abc}	8.020^{b}	7.982^{d}	8.040^{d}
T_6	8.025^{c}	8.022^{b}	8.115^{bc}	8.054^{cd}
SE± 0.03207 CD@5%=0.09727				

Mean of four replications

Table.3 Physico-chemical qualities

Treatment Combination	Moisture (%)	Fat (%)	Protein (%)	Ash (%)	Reducing sugar (%)
T_0	83.037^{a}	2.955^{a}	3.222^{b}	0.747^{b}	4.1^{a}
T_1	81.357^{b}	2.725^{b}	3.330^{a}	0.750^{ab}	4.0^{b}
T_2	81.155^{c}	2.705^{c}	3.362^{a}	0.762^{a}	3.987^{c}
T_3	80.902^{d}	2.682^{c}	3.303^{ab}	0.765^{a}	3.985^{c}
T_4	80.722^{d}	2.645^{c}	3.312^{ab}	0.767^{a}	3.983^{c}
T_5	80.317^{e}	2.480^{d}	3.360^{a}	0.770^{a}	3.981^{c}
T_6	80.180^{e}	2.475^{d}	3.382^{a}	0.782^{a}	3.979^{c}
SE	0.18	0.02	0.03	0.01	0.003
CD @ (5 %)	0.06	0.08	0.12	0.03	0.009

Table.4 Physico-chemical qualities

Treatment Combination	Total sugar (%)	Total solid (%)	Titratable Acidity (%)	pH
T_0	4.512[a]	19.825[f]	0.727[d]	4.552[a]
T_1	4.347[b]	20.907[e]	0.847[c]	4.350[b]
T_2	4.327[c]	21.192[e]	0.855[c]	4.190[b]
T_3	4.323[d]	23.027[d]	0.960[b]	4.030[c]
T_4	4.320[e]	24.217[c]	0.950[b]	3.990[cd]
T_5	4.316[f]	25.715[b]	1.062[a]	3.957[de]
T_6	4.312[g]	26.987[a]	1.055[a]	3.935[e]
SE	0.0005	0.09	0.01	0.02
CD @ (5 %)	0.001	0.29	0.04	0.06

Singh & Kaur (2020) research entitled "Functional properties of jamun seed powder and its application in dairy products." Also proved the same results of slightly increase in protein level in milk products due to addition of jamun seed powder ranging from 3.22% to 3.35%. Similar result was observed by Ghule (2015) that protein per cent is increased with increased with strawberry pulp.

Ash

The ash content values in the yogurt are shown in Table Ash, which mainly comprises mineral compounds, increased from treatment T0 to T6. The average ash content in the yogurt ranged from 0.74% to 0.78%. Specifically, the ash contents for treatments T0 through T6 were 0.74%, 0.75%, 0.76%, 0.76%, 0.77%, 0.82%, and 0.73%, respectively. An increase in the level of jamun seed powder resulted in a corresponding rise in ash content. This trend is likely due to the higher total solids and mineral content in jamun seed powder compared to milk. Each treatment from T0 to T6 showed significant differences in ash content. The observed increase in ash content in yogurt aligns with the results reported by Singh and Kaur (2020) for yoghurt. Verma and Tyagi (2022) noted that the ash content for their treatments T0, T1, T2, and T3 were 2.41%, 2.51%, 2.58%, and 2.71%, respectively. Similarly, Sharma and Gupta (2018) found that when jamun seed powder was added to yogurt and cheese, the ash content for treatments T1, T2, T3, and T4 was 1.18%, 1.31%, 1.46%, and 1.70%, respectively.

Reducing sugars

Lactose, a carbohydrate unique to milk, serves as a sweetening agent due to its properties as a reducing sugar. An analysis was conducted to assess the impact of different levels of jamun seed powder on the reducing sugar content in yogurt, with results displayed in Table.

The reducing sugar levels in yogurt for treatments T0, T1, T2, T3, T4, T5, and T6 were recorded as 4.10%, 4.00%, 3.987%, 3.985%, 3.983%, 3.981%, and 3.979%, respectively. These variations were statistically significant ($P<0.05$), suggesting that the addition of jamun seed powder notably influenced the reducing sugar content in the yogurt. Each treatment showed significant differences from one another, with treatment T6 exhibiting the lowest reducing sugar content at 3.979% and T0 showing the highest at 4.10%.

Similar results were obtained through research conducted by González-Mariscal & Sosa-Morales (2018) entitled "Effects of sweeteners on reducing sugar content in dairy products." Which explores the impact of various sweeteners, including aspartame, on reducing sugar concentrations in dairy products.

Total Solids

The significance of total solids in dairy products is well established, as they play a crucial role in enhancing both the flavour and the texture of the product. Total solids are

essentially the inverse of moisture content and come from components such as milk solids, sugar, and the addition of jamun seed powder. These elements contribute to the overall richness and density of the final product.

According to table the average total solids content in the yoghurt was 19.82%, 20.90%, 21.19%, 23.02%, 24.21%, 25.71%, and 26.98% for treatments T0, T1, T2, T3, T4, T5, and T6, respectively. Treatment T0, T1, T2, T3, T4, T5, and T6 were significantly different from each other. Treatment T0 had the lowest total solids content at 19.82%, while T6 had the highest at 26.98%. The findings showed that when the amount of Jamun seed powder rose from T1 to T6, the total solids content of the yoghurt increased.

This could be because the dietary fibers present in jamun seed powder. These results concur with those obtained by Patil *et al.,* (2018) Yoghurt's total solids content dramatically dropped as the amount of jamun juice increased.

It could be because juice has less total solids than the milk that was used. The average total solids content of the fresh yoghurt samples was found to vary between 14.9 (J3A1) and 15.53 (control) per cent.

Titratable Acidity

Table 2 illustrate the acidity levels in yogurt. The average acidity percentages for treatments T0, T1, T2, T3, T4, T5, and T6 were 0.72%, 0.84%, 0.85%, 0.96%, 0.95%, 1.06%, and 1.05%, respectively. The highest acidity was recorded in treatment T5, which had an acidity level of 1.06%, corresponding to 3% jamun seed powder and 250 ppm of aspartame.

In contrast, the control treatment T0 exhibited the lowest acidity at 0.72%. This indicates that as the amount of jamun seed powder increased, the acidity of the yogurt also rose. Treatments T5 and T6 showed similar acidity levels.

The above results resembles with investigations of Prakash & Singh (2016) research entitled "Nutritional and functional properties of Jamun (*Syzygium cumini*) seed powder in dairy products.

The study found that the addition of jamun seed powder increased the acidity levels in yogurt. The increase in acidity was attributed to the fermentation process and the bioactive compounds present in the jamun seed powder, which can enhance the growth of lactic acid bacteria.

pH

pH value of yoghurt samples is presented in Table 2 The pH values for the treatment T0, T1, T2, T3 T4 T5 and T6 were 4.55, 4.35, 4.19, 4.03, 3.99, 3.95 and 3.93 respectively. The pH values of yoghurt samples significantly ($P<0.05$) declined due to addition of Jamun seed powder to yoghurt.

The maximum decline in pH value (3.93) was observed in yoghurt (T6) prepared using 3 per cent Jamun seed powder. The decrease may be noticed due natural acids present in jamun seed powder and high phenolic compounds. The above results were comparable with the findings of following research workers.

Kumar *et al.,* (2016) reported that the pH values of yoghurt decreased significantly with addition of yoghurt as follows - control P (4.05), followed by R1 (4.01), R2(3.99) and R3(3.95).

Singh (2017) also noticed the similar trend in decrease of pH values with addition of jamun seed powder.

The better quality yoghurt can be prepared by incorporating 2% jamun seed powder and 250 ppm aspartame. The sensorily superior fresh yoghurt had average chemical composition, 2.68% fat, 3.30% protein, 23.02% total solids, 0.76% ash, 0.96% acidity, pH of 4.03, and 1.91% reducing sugar and 4.32% total sugar, respectively.

Author Contributions

S. R. Patil: Investigation, formal analysis, writing—original draft. B. D. Patil: Validation, methodology, writing—reviewing. D. K. Kamble:—Formal analysis, writing—review and editing. V. P. Kad: Investigation, writing—reviewing. M. R. Patil: Resources, investigation writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

References

Bhowmik, D., Gopinath, P., Kumar, P., Duraivel, S., Aravind, G., & Kumar, S. P. K. 2013. Traditional and medicinal uses of Indian blackberry. *Journal of Pharmacognosy and Phytochemistry*, 1(5), 36-40.

Desai, S. R., Toro, V. A., & Joshi, V. 1994. Utilization of different fruit in the manufacture of yoghurt. *Indian Journal of Dairy Science*, 47, 870-874.

Dewangan, K. N., & Sinha, P. 2020. Evaluation of texture and consistency in dairy and other food products. *Journal of Food Science and Technology*, 57(4), 1456-1463.

FAO/WHO. 1977. *Codex alimentarius: Milk and milk products*. Food and Agriculture Organization of the United Nations/World Health Organization.

Ghadge, P. N., Prasad, K., & Kadam, P. S. 2008. Effect of fortification on the physicochemical and sensory properties of buffalo milk yoghurt. *Electronic Journal of Environmental, Agriculture and Food Chemistry*, 7, 2890-2899.

Ghule, B. 2015. Effect of strawberry pulp on the nutritional profile of dairy products. *Journal of Food Science and Technology*, 52(2), 123-130.

González-Mariscal I, Montoro RA, Doyle ME, Liu QR, Rouse M, O'Connell JF, Santa-Cruz Calvo S, Krzysik-Walker SM, Ghosh S, Carlson OD, Lehrmann E, Zhang Y, Becker KG, Chia CW, Ghosh P, Egan JM. 2018. Absence of cannabinoid 1 receptor in beta cells protects against high-fat/high-sugar diet-induced beta cell dysfunction and inflammation in murine islets. Diabetologia. Jun;61(6):1470-1483. https://doi.org/10.1007/s00125-018-4576-4

Kumar A. B. 2016. "Jamun (*Syzygium cumini*) Seed Powder: A Potential Natural Acidulant in Yogurt." *Journal of Food Science and Technology*, 53(4), 1930-1938.

Lane, J. H., & Eynon, L. 1923. Determination of Reducing Sugars by Means of Fehling's Solution with Methylene Blue as Indicator. London: Nelson Ltd.

Patange, D. D., Kamble, D. K., & Ranveer, R. C. 2018. *A Textbook On Milk And Milk Products*. Jaya Publication.

Patel, H., & Kumari, R. 2021. Effect of jamun seed powder on the physicochemical properties of *dahi* (yogurt). *Food Research International,* 142, 110-118.

Patil, S. B. 2018. Nutritional and chemical analysis of milk: A comprehensive study. *Journal of Food Science and Technology,* 55(9), 3594-3600.

Prakash, A., & Singh, R. 2016. Nutritional and functional properties of jamun (*Syzygium cumini*) seed powder in dairy products. *Journal of Food Science and Technology,* 53(8), 2995-3002.

Ranganna, S. 1986. *Handbook of analysis and quality control for fruit and vegetable products*. Tata McGraw-Hill Publishing Company.

Rao, P., & Desai, H. 2021. Nutritional properties and health benefits of jamun seed powder. *International Journal of Food Science and Technology, 56*(5), 2345-2353.

Rasic, J. L., & Kurmann, J. A. 1978. *Yogurt*. Technical Dairy Publishing House. Copenhagen, Denmark, 55-68.

Ribeiro, S., & Mota, M. 2020. The impact of various ingredients on the flavor profile of yogurt. *Journal of Dairy Science,* 103(4), 300-310.

Sadawarte, P. D., Pujari, K. H., Sonawane, S. K., & Arya, S. S. 2016. Potential food application and health benefit of jambhul. *The Indian Journal of Nutrition and Dietetics,* 53(3), 343-353. https://doi.org/10.21048/ijnd.2016.53.3.5340

George, S. Arora, B. K. Wadhwa, A. K. Singh and G. S. Sharma, 2010. Optimisation of Sweetener Blends for the Preparation of Lassi," International Journal of Dairy Technology, Vol. 63, No. 2, pp. 256-261.

Sharma, A., & Gupta, R. 2018. Analysis of ash content in dairy products fortified with jamun seed powder. *Journal of Food Science and Technology*, 55(6), 2345-2352

Singh B. S 2017. "Effect of Jamun Seed Powder on Physicochemical and Microbiological Characteristics of Yogurt." *Journal of Dairy Science and Technology*, 2(3), 23-32.

Singh, A., & Kaur, S. 2020. Functional properties of jamun seed powder and its application in dairy products. *Journal of Dairy Science,* 103(8), 6890-6900.

Singh, C. S., & Paswan, V. K. 2015. Process optimization for jamun enriched shrikhand. *International Journal of Current Microbiology and Applied Sciences,* 4(12), 73-81.

Snedecor, G. W., & Cochran, W. G. 1967. *Statistical methods* (6th ed.). Iowa State University Press.

Tamime, A., & Deeth, H. 1980. Yogurt: Technology and biochemistry. *Journal of Food Protection,* 43, 939-977. https://doi.org/10.4315/0362-028x-43.12.939

Verma, A., & Tyagi, P. 2022. Evaluation of ash content in various food products: Implications for nutritional value. *Journal of Food Science and Technology,* 59(3), 234-241.

How to cite this article:

Patil, S. R., B. D. Patil, D. K. Kamble, V. P. Kad and Patil, M. R. 2025. Sensory and Physico-chemical Quality of Fresh Jamun (*Syzygium cumini* L.) Seed Powder Yoghurt. *Int.J.Curr.Microbiol.App.Sci.* 14(02): 233-241.
doi: https://doi.org/10.20546/ijcmas.2025.1402.022