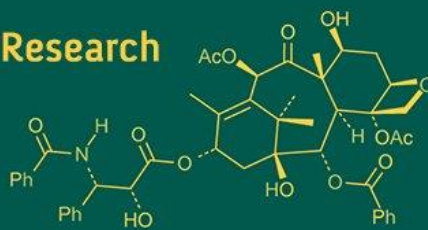


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(8): 2153-2157
www.biochemjournal.com
Received: 05-06-2026
Accepted: 09-07-2026

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Studies on sensory evaluation of value added kulfi prepared from custard apple (*Annona squamosa* L.) pulp

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DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i8Sx.9719>

Abstract

The present investigation entitled 'Studies on sensory evaluation of value added kulfi prepared from Custard Apple (*Annona squamosa* L.) pulp' was undertaken in the laboratory of Department of Animal Husbandry and Dairy Science, Dr. PDKV, Akola, Maharashtra with the aim to evaluate the effect of different levels of custard apple pulp (CAP) and sugar on the sensory quality of kulfi and to determine the optimum level of pulp. Cow milk standardized at 6.5 per cent fat and concentrated to 50% was used for kulfi preparation. Nine treatment combinations comprising four levels of CAP (5, 10, 15 and 20%) with 10 and 15% sugar levels, along with a control (0% CAP and 15% sugar), were evaluated under a Completely Randomized Design. Sensory evaluation parameter were judge by a semi-trained panel using a nine-point hedonic scale for flavour, colour and appearance, body and texture, taste, and overall acceptability.

The results revealed significant ($P < 0.05$) differences among treatments for all sensory attributes. T₇ (15% CAP + 15% sugar) recorded the highest scores for flavour (8.79), colour and appearance (8.91), body and texture (8.90), taste (8.86), and overall acceptability (8.77), whereas the control (T₁) recorded the lowest overall acceptability (7.46). Sensory scores improved with increasing pulp incorporation up to 15% where as decreasing trend in sensory quality was observed in T₈ (20%) addition of custard apple pulp. The low coefficients of variation (0.37-1.43%) indicated good experimental precision. Thus, incorporation of 15% custard apple pulp with 15% sugar was identified suitable and optimum levels of blending custard apple pulp which enhances the taste, flavour & overall acceptability and consumer acceptance in respect of sensory quality. The formulation provides potential for value addition to dairy products and effective utilization of custard apple pulp.

Keywords: Custard apple pulp (CAP), kulfi, cow milk, sensory evaluation, overall acceptability, sugar level, dairy dessert, functional dairy product, appearance, texture, taste

Introduction

Milk is a highly nutritious and complete natural food, rich in high-quality proteins, fat, lactose, vitamins, and minerals, especially calcium and phosphorus. Owing to its excellent nutritional value, digestibility, and functional properties, it is widely consumed by people of all age groups and serves as the principal raw material for the manufacture of various dairy products such as butter, cheese, yogurt, ice cream, and kulfi. Frozen dairy products, particularly ice cream and kulfi, have become an increasingly popular part of the Indian diet. Kulfi is a popular traditional frozen dairy dessert of Indian origin, with a history dating back approximately 500 years (Aneja, 1992). It occupies a privileged position among the traditional frozen dairy desserts of India. It is prepared by concentrating whole milk, followed by the addition of sugar, flavoring ingredients, nuts or fruits, and freezing the mixture without agitation, resulting in a dense, creamy texture with negligible overrun. Unlike conventional ice-cream, kulfi is a traditional Indian frozen dairy product characterized by rich flavour, dense body and texture and distinctive melting characteristics resulting from the concentration of milk during its preparation (Aneja, 1992; Ashokraju *et al.*, 1989). Its palatability, nutritional value and relatively low cost have contributed to its widespread popularity, and it is often referred to as the 'poor man's ice-cream' (Ubale *et al.*, 2014) [2, 1, 23].

In recent years, the demand for frozen dairy desserts has increased significantly in India, particularly among urban consumers. This has created opportunities for the development of traditional products such as kulfi by incorporating different natural flavours and fruit pulps to enhance both their nutritional quality and consumer appeal while keeping the product economical for the middle-income population.

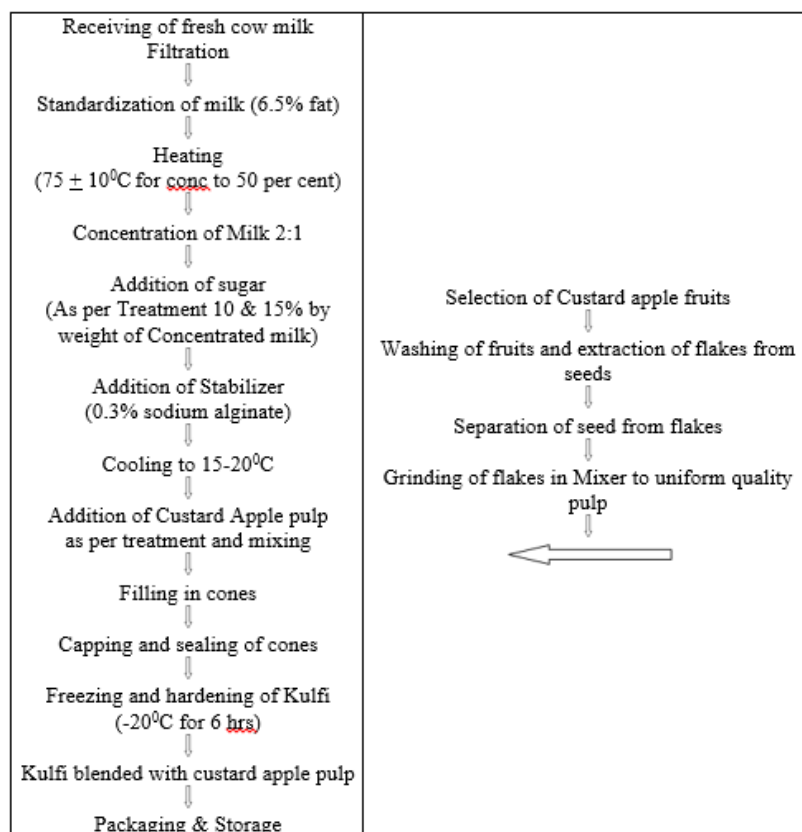
Cane sugar is one of the essential ingredients in the preparation of custard apple kulfi, as it contributes not only sweetness but also significantly influences the physicochemical and sensory characteristics of the product. Besides improving taste and balancing the acidity of custard apple pulp, sugar enhances flavour perception and overall acceptability. It also increases total soluble solids and energy value while contributing to desirable body and texture. Furthermore, sugar depresses the freezing point of the mix and helps control ice-crystal formation, thereby improving the smoothness and mouth feel of the product. The appropriate level of sugar is therefore important for achieving optimum sweetness, texture and melting characteristics of kulfi (Aneja *et al.*, 2002). Sugar contributes sweetness and total solids to frozen dairy products and depresses the freezing point of the mix, thereby influencing the body, texture and overall quality of the product (De, 1980)^[3, 4].

Custard apple (*Annona squamosa* L.) commonly known as sitaphal or sugar apple is an important tropical and subtropical underutilized fruit with considerable nutritional and commercial potential. The processing of custard apple into pulp, beverages, ice cream, kulfi, milkshakes, jam, squash, toffee and other processed products can extend its utilization beyond the short harvesting season, reduce post-harvest losses and increase the economic value of the fruit (Jain *et al.*, 2019; Soni *et al.*, 2021)^[7, 20]. It is highly valued

for its sweet, creamy, aromatic pulp and excellent nutritional composition. The fruit is a rich source of natural sugars, dietary fibre, vitamin C, potassium, calcium, magnesium, phenolic compounds, flavonoids, and other antioxidants that contribute to its health-promoting properties. Besides its pleasant flavour, custard apple exhibits antioxidant, antimicrobial, anti-inflammatory, and antidiabetic activities, making it a promising functional food ingredient for the development of value-added products (Pareek *et al.*, 2011). The fruit is valued for its sweet, creamy and aromatic pulp and contains carbohydrates, natural sugars, dietary fibre, vitamins, minerals and various bioactive compounds. Its nutritional and functional properties make it a promising raw material for the development of value-added and functional food products (Solanke *et al.*, 2019; Nazeer *et al.*, 2022). The custard apple pulp is easy to digest and it can be consumed easily by children and people of all ages (Kirtikar and Basu 1955). Custard apple is considered as one of the delicious and nutritionally valuable fruit. It contains about 28-55% of edible portion consisting of 73.30% moisture, 1.60% protein, 0.30% fat, 0.70% mineral matter, 23.90% carbohydrates, 0.20% calcium, 0.40% phosphorus, 1.0% iron, 12.4-18.15% sugar, 0.26-0.65% acidity and with calorific value of 105 k cal/100 g (Nissen *et al.*, 1988). It is also a good source of vitamin A and C is known to serve as blood tonic (Rao, 1974). The pulp has a pleasant texture and flavor. It is sweet with moderate acidity (Sravanthi *et al.*, 2014)^[15, 19, 12, 9, 14, 17, 22].

Thus, development of custard apple-based kulfi is therefore a suitable approach for utilizing this underexploited fruit while combining its desirable nutritional and sensory characteristics with the nutritive value of milk.

Method of Preparation of custard apple Kulfi: Flow diagram



Materials and Methods

Whole, fresh and clean cow milk was procured from herd maintained at Livestock Instructional Farm, Department of Animal Husbandry and Dairy Science, Dr.PDKV, Akola and utilized for the preparation of kulfi. Good quality organically produced Custard apple of variety Sardar was procured from Department of Fruit Science, Dr. PDKV, Akola. Pulp was extracted manually and used as per requirement. Clean crystalline commercial grade cane sugar was purchased from the local market of Akola city and used as per requirement. Sodium alginate was used @ 0.3 per cent as a stabilizer for preparation of kulfi. For cooling and ageing of kulfi mix L. G. refrigerator was used, the temperature was 0°C to -5°C. Kulfi prepared in a kulfi machine placed at laboratory of Dairy Science and transferred in to deep freezer for hardening at temperature -20°C for 4 to 6 hrs. The preparation process of kulfi was illustrated through a schematic flow diagram which outlines the steps involved in creating this traditional dessert.

Treatment Combinations

For the preparation of kulfi blended with Custard apple pulp and sugar the following treatment combinations were taken:

Treatments	Kulfi Mix		Custard Apple pulp%		Sugar%
T ₁	KM	+	0	+	15
T ₂	KM	+	5	+	10
T ₃	KM	+	5	+	15
T ₄	KM	+	10	+	10
T ₅	KM	+	10	+	15
T ₆	KM	+	15	+	10
T ₇	KM	+	15	+	15
T ₈	KM	+	20	+	10
T ₉	KM	+	20	+	15

Sensory evaluation

The product was subjected to organoleptic evaluation by the semi expert panel of judges. It was evaluated for colour and appearance, flavor, taste and body and texture and overall acceptability. Score card was provided to all the judges comprising “9-points Hedonic Scale” as prescribed by Nelson and Trout (1964).

Statistical analysis of the data

The experiments were carried out in three trials. Data obtained in the present investigation was tabulated and analyzed for critical difference variance statistically by using Completely Randomized Design (CRD). The significance was tested at five percent level using ‘F’ test and CD percent was calculated.

Result and Discussion

The acceptability of control and experimental kulfi was measured in terms of sensory attributes such as flavour, colour and appearance, body and texture, taste and overall acceptability by using 9-point hedonic scale by a panel of semi-trained judges. The results obtained on account overall sensory evaluation of this parameter were tabulated, statistically analyzed and presented in Table 1.

Flavour acceptability

The flavour scores of kulfi varied significantly among the different treatment combinations of custard apple pulp (CAP) and sugar (S). The flavour score increased

progressively from 7.45 in T₁ (0% CAP + 15% sugar) to 8.79 in T₇ (15% CAP + 15% sugar). Among the treatments, T₇ recorded the highest flavour score (8.79), followed by T₆ (8.32), T₅ (8.09), T₄ (7.95), T₃ (7.81), T₈ (7.67), T₉ (7.63), T₂ (7.56), and T₁ (7.45). The higher flavour score in T₇ may be attributed to the optimum incorporation of custard apple pulp and sugar, which imparted a desirable characteristic flavour to the kulfi. The F-test differences among treatments were significant.

These results are in agreement with results showed by Kedaree *et al.* (2021) observed the highest flavour score of 8.20 with 15 per cent pineapple pulp (T₃) where as the pineapple kulfi with 5, 10 and 15% pineapple kulfi had significantly lowest flavour score of 7.20, 7.43 and 7.68 respectively with 15% sugar in all treatments. Sontakke *et al.* (2023) studied the effect of addition of strawberry pulp on sensory attributes of kulfi and observed the flavour score for various treatments ranged between 7.90 to 8.48. The flavour score reported were 8.48, 8.25, 8.18, 8.16, 7.90 for the treatments T₂ (15%), T₁ (10%), T₃ (20%), T₀ (Control) and T₄ (25%) with constant level of sugar added (13%). Darade *et al.* (2016) prepared kulfi with incorporation of Mango pulp and reported mean flavour score was 6.56, 7.56, 8.27 and 7.67 for mango kulfi prepared in treatments T₀-Control, T₁-10% Mango pulp, T₂-15% mango pulp and T₃-20% mango pulp with 15% sugar in all treatments. The highest flavour score in treatment T₂ with 15% Mango pulp and 15% sugar were observed [5].

Colour and appearance acceptability

The colour and appearance scores of kulfi were significantly influenced by the incorporation of custard apple pulp and sugar. The scores ranged from 7.61 in T₁ (0% CAP + 15% sugar) to 8.88 in T₇ (15% CAP + 15% sugar). Treatment T₇ recorded the highest score (8.88), followed by T₆ (8.19), T₅ (8.06), T₃ (7.85), T₄ (7.88), T₈ (7.78), T₂ (7.70), T₉ (7.65), and T₁ (7.61). The improved colour and appearance with the incorporation of custard apple pulp may be due to the natural colour and attractive appearance imparted by the pulp at an optimum level. The F-test revealed significant differences among the treatments. These findings are in concurrence with the findings of Singh *et al.* (2017) [18]. They observed that wood apple supplemented kulfi prepared by 15 per cent Wood apple pulp and 14 per cent sugar had highest colour and appearance score (8.59) followed by 8.30, 8.32 and 8.18 in 5, 10 and 0 per cent wood apple pulp.

Body and Texture acceptability

The body and texture of kulfi were significantly affected by the levels of custard apple pulp and sugar. The sensory scores ranged from 7.51 in T₁ (0% CAP + 15% sugar) to 8.90 in T₇ (15% CAP + 15% sugar). Treatment T₇ exhibited the highest body and texture score (8.90), indicating superior textural quality, followed by T₆ (8.20), T₅ (8.09), T₄ (7.99), T₃ (7.95), T₈ (7.88), T₉ (7.80), T₂ (7.73), and T₁ (7.51). The improvement in body and texture may be associated with the optimum combination of custard apple pulp and sugar, which contributed to desirable consistency and mouthfeel of the kulfi. The similar results were reported by Singh *et al.* (2017) [18] recorded highest score 8.48 in T₃ treatment with 15 per cent wood apple pulp and 14 per cent sugar. Darade *et al.* (2016) observed the body and texture of mango kulfi was significantly affected by addition of mango pulp. The mean score of body and texture of Mango kulfi

were 6.88, 7.17, 8.25 and 7.34 in treatments T₀, T₁, T₂ and T₃ respectively. The highest score was obtained by treatment T₂ while lowest score was obtained by treatment T₀.

Taste acceptability

The taste scores of the kulfi differed significantly with the incorporation of different levels of custard apple pulp and sugar. The highest taste score was recorded in T₇ (15% CAP + 15% sugar), with a score of 8.86, followed by T₆ (8.69), T₃ (7.85), T₄ (7.93), T₅ (7.98), T₂ (7.68), T₈ (7.80), T₉ (7.74), and T₁ (7.41). The lowest taste score was observed in the control treatment T₁ (0% CAP + 15% sugar). The superior taste of T₇ may be attributed to the balanced combination of custard apple pulp and sugar, which provided a pleasant and desirable flavour balance. The F-test indicated significant differences among the treatments.

These results are in agreements with results showed by Gaikwad *et al.* (2020) [6] prepared ice-cream by using jackfruit pulp and reported that sweetness of product influenced by the level of jackfruit pulp. The score ranged from 7.80 to 8.25. The minimum score was observed in 0 per cent jackfruit pulp whereas maximum score was observed in

jackfruit ice-cream contains 15 per cent jackfruit pulp and 15 per cent sugar.

Overall acceptability: The overall acceptability scores of kulfi were significantly influenced by the incorporation of custard apple pulp and sugar. The scores ranged from 7.46 in T₁ (0% CAP + 15% sugar) to 8.77 in T₇ (15% CAP + 15% sugar). Treatment T₇ recorded the highest overall acceptability score (8.77), followed by T₆ (8.38), T₅ (8.02), T₄ (7.96), T₃ (7.89), T₈ (7.72), T₉ (7.64), T₂ (7.61), and T₁ (7.46). The higher acceptability of T₇ suggests that the combination of 15% custard apple pulp and 15% sugar provided the most desirable balance of flavour, colour and appearance, body and texture, and taste.

Similar observation were recorded by Yadav *et al.* (2010) [24] Ice-cream prepared with incorporation of 15 per cent custard apple pulp and 15 per cent sugar level T₄ had overall acceptability of 8.05 score of hedonic scale. Nalkar *et al.* (2018) reported highest score 8.11 in kulfi prepared from addition of 15% mango pulp and 15% sugar. Gaikwad *et al.* (2020) [11, 10, 16] analyzed ice-cream made using 15 per cent jackfruit pulp and 15 per cent sugar had significantly superior score 8.25.

Table 1: Overall average sensory evaluation of kulfi blended with different levels of custard apple pulp & sugar

Sr. No	Treatments (CAP%-S%)	Flavour	Colour and appearance	Body and Texture	Taste	Overall acceptability
1	T ₁ (0-15)	7.45 ⁱ	7.61 ^{cd}	7.51 ^b	7.41 ^f	7.46 ^f
2	T ₂ (5-10)	7.56 ^h	7.70 ^{cd}	7.73 ^g	7.68 ^{ef}	7.61 ^e
3	T ₃ (5-15)	7.81 ^e	7.85 ^b	7.95 ^d	7.85 ^{de}	7.89 ^{cd}
4	T ₄ (10-10)	7.95 ^d	7.88 ^b	7.99 ^d	7.93 ^{cd}	7.96 ^c
5	T ₅ (10-15)	8.09 ^c	8.06 ^{ab}	8.09 ^c	7.98 ^{cd}	8.02 ^{bc}
6	T ₆ (15-10)	8.32 ^b	8.19 ^{ab}	8.20 ^b	8.69 ^b	8.38 ^b
7	T ₇ (15-15)	8.79 ^a	8.88 ^a	8.90 ^a	8.86 ^a	8.77 ^a
8	T ₈ (20-10)	7.67 ^{ig}	7.78 ^{cd}	7.88 ^e	7.80 ^{de}	7.72 ^c
9	T ₉ (20-15)	7.63 ^{ig}	7.65 ^{cd}	7.80 ^f	7.74 ^{de}	7.64 ^c
Grand Mean		7.922	7.954	8.007	7.994	7.907
SEm (±)		0.0171	0.066	0.018	0.03	0.043
SEd (±)		0.0242	0.093	0.025	0.042	0.061
CD at 5%		0.0508	0.194	0.053	0.088	0.129
CV (%)		0.374	1.430	0.39	0.64	0.95
F-test		Sig	Sig	Sig	Sig	Sig

CAP: Custard apple pulp S- Sugar

The observations summarize in table 1 revealed that the overall sensory evaluation of custard apple kulfi, comprising flavour, colour and appearance, body and texture, taste, and overall acceptability, was significantly ($P < 0.05$) influenced by different levels of custard apple pulp and sugar, as confirmed by the analysis of variance. All sensory attributes exhibited significant treatment effects with low coefficients of variation (0.37-1.43%), indicating excellent experimental precision and consistency of the sensory panel.

The treatment T₇ (15% custard apple pulp + 15% sugar) recorded the highest scores for all sensory parameters, viz., flavour (8.79), colour and appearance (8.88), body and texture (8.90), taste (8.86), and overall acceptability (8.77), and was found to be significantly superior to all other treatments. This was followed by T₆ (15% custard apple pulp + 10% sugar) and T₅ (10% custard apple pulp + 15% sugar). The control treatment (T₁) exhibited the lowest sensory scores, while increasing the pulp level beyond 15% (T₈ and T₉) resulted in a decline in sensory quality. Therefore, the results clearly indicate that the incorporation of 15% custard apple pulp with 15% sugar (T₇) produced the

most acceptable kulfi with superior sensory characteristics. These results are in agreement with results showed by Makwana *et al.*, (2018) [10] studied effect of different concentration of custard apple pulp on the properties of ice-cream and observed variation due to different treatments was found significant and better performance for organoleptic parameter like colour, texture, taste, overall acceptability and palatability in 15% custard apple pulp (T₃). Poyam *et al.* (2024) [16] reported that the kulfi prepared from 15% custard apple pulp had the highest mean score for overall quality for all sensory parameters, including flavour, taste and overall acceptability.

Conclusion

The findings of the overall sensory evaluation of kulfi blended with different levels of custard apple pulp and sugar significantly influenced the sensory quality of kulfi. Among all treatments, T₇ (15% custard apple pulp + 15% sugar) recorded the highest scores for flavour, colour and appearance, body and texture, taste, and overall acceptability and was found significantly superior to the

other treatments. The pooled analysis for all the replications together compile concluded that T₇ (15% custard apple pulp + 15% sugar) was ranked first and identified as the optimum formulation, recording the highest overall acceptability (8.60) with superior sensory quality and consumer acceptability. This indicates that value addition of kulfi blended with fruit pulp like custard apple is suitable and it could fetch the consumer price and enhance the sensory quality of the product.

Acknowledgement

I sincerely express my gratitude to the Department of Animal Husbandry and Dairy Science, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola for providing me with the opportunity and necessary laboratory facilities to carry out this study. I am also deeply thankful to the Department for its valuable guidance, support and encouragement throughout the course of this research work.

References

1. Ashokraju A, Pasha AM, Kondal RK, Reddy CR, Rao RM. Studies on the preparation and quality of kulfi. *Indian Journal of Dairy Science*. 1989;42(1):127-129.
2. Aneja RP. Traditional milk specialties: a survey. In: Gupta PR, editor. *Dairy India*. 4th ed. New Delhi: Devarsons Stylish Printing Press; 1992. p. 268-269.
3. Aneja RP, Mathur BN, Chandan RC, Banerjee AK. *Technology of Indian milk products*. Delhi: Dairy India Publications; 2002. p. 127-130.
4. De S. *Outlines of dairy technology*. New Delhi: Oxford University Press; 1980. p. 411-412.
5. Darade R, Chaudhary S, Atkare VG. Preparation of kulfi with incorporation of mango pulp. *Food Science Research Journal*. 2016;7(2):165-169.
6. Gaikwad SB, Kamble DK, Jaybhay VB. Development of ice-cream by using jackfruit pulp. *The Pharma Innovation Journal*. 2020;9(9):533-539.
7. Jain C, Champawat PS, Mudgal VD, Madhu B, Jain SK. Post-harvest processing of custard apple (*Annona squamosa* L.): a review. *International Journal of Chemical Studies*. 2019;7(3):1632-1637.
8. Kedaree VC, Nalkar SD, Ghawate TS. Preparation of kulfi incorporation with pineapple (*Annona scomosus*) pulp. *Journal of Pharmacognosy and Phytochemistry*. 2021;10(2):803-806.
9. Kirtikar KR, Basu BD. *Indian medicinal plants*. Vol. 1. Allahabad: Lalit Mohan Basu; 1955. p. 66-68.
10. Makwana A, Varu DK, Malam VR, Bhad M, Maheta P. Effect of different concentration of custard apple pulp on the properties of ice cream. *HortFlora Research Spectrum*. 2018;7(2):126-132.
11. Nalkar SD, Patel AR, Bhambure CV, Kalyankar SD, Khedkar CD. Studies on suitability of incorporating probiotics in mango-based kulfi: a popular Indian frozen dessert. *Annals of Food Science and Technology*. 2018;19(4):714-721.
12. Nazeer MA, Biju A, Biju DS, Patil SS, Raju BP. Review based study on nutritional, medicinal properties, post-harvest technology and packaging of custard apple. *The Pharma Innovation Journal*. 2022;11(1):1562-1565.
13. Nelson JA, Trout GM. *Judging of dairy products*. 4th ed. Milwaukee: Olson Publishing Co.; 1964. p. 302-306.
14. Nissen RJ, Brown BI, George AP, Wong LS. Comparative studies on the post harvest physiology of fruit from different species of *Annona* (custard apple). *Journal of Horticulture Science*. 1988.
15. Pareek S, Yahia EM, Pareek OP, Kaushik RA. Post harvest physiology and technology of *Annona* fruits. *Food Research International*. 2011;44(7):1741-1751.
16. Poyam S, Nag GP, Kumar B, Singh DP. Effect of different concentration of custard apple (*Annona squamosa* L.) pulp on physicochemical properties and sensory qualities of kulfi during storage. 2024;8(11):1079-1085.
17. Rao SN. *Annona the legendary fruit*. *Indian Horticulture*. 1974;18:19-20.
18. Singh SB, Das A, Kumar P. Sensory evaluation of wood apple pulp supplemented kulfi. *The Pharma Innovation Journal*. 2017;6(5):34-36.
19. Solanke SB, Bakane PH, Gawande AB. Technological, nutritional approach, processing and storage of custard apple (*Annona squamosa*)—review. *International Journal of Current Microbiology and Applied Sciences*. 2019;8(7):2766-2775.
20. Soni N, Mudgal VD, Champawat PS. Post harvest processing of custard apple (*Annona squamosa* L.) a review. *Journal of Postharvest Technology*. 2021.
21. Sontakke MM, Narwade SG, Zine PL. Effect of addition of strawberry pulp on sensory attributes of kulfi. *International Journal of Environment and Climate Change*. 2023;13(8):1741-1745.
22. Sravanthi T, Waghrey K, Daddam JR. Studies on preservation and processing of custard apple (*Annona squamosa* L.) pulp. *International Journal of Plant, Animal and Environmental Sciences*. 2014;4(3):676-682.
23. Ubale PJ, Hembade AS, Choudhari DM. To study the effect of level of jaggery and sapota pulp on chemical quality of kulfi. *Research Journal of Animal Husbandry and Dairy Science*. 2014;5(2):62-67.
24. Yadav CM, Karanjikar LM, Kashid UB. Effect of assimilation of custard apple pulp (*Annona squamosa*) on chemical quality and cost of ice-cream. *Journal of Dairying, Foods & Home Sciences*. 2010;29(2):86-91.