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Sensory evaluation and storage stability of osmotically dehydrated aonla (*Phyllanthus emblica* L.) segments prepared with diverse hypertonic solutions

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Abstract
Consumer acceptability is a critical determinant of the commercial potential of dried aonla products, particularly because the fruit is naturally acidic and astringent. This study compared six osmotic media at 40° and 60° Brix, alongside a non-osmotic control, for their effects on the sensory quality of dried aonla (*Phyllanthus emblica* L.) segments during 120 days of storage. The experiment comprised 13 treatments in a completely randomized design with three replications. A semi-trained panel of five judges evaluated taste, colour, texture, flavour, appearance and overall acceptability using a nine-point hedonic scale at 0, 30, 60, 90 and 120 days. Honey syrup at 60° Brix (T_8) produced the highest reported overall means for taste (7.97), texture (7.73), flavour (8.11) and overall acceptability (7.90). Sugar syrup at 60° Brix (T_2) achieved the highest mean colour (8.01) and appearance (8.13) scores. Overall acceptability at the end of storage was highest jointly in T_2 and T_8 (7.30), followed by candied sugar syrup at 60° Brix (T_4; 7.10). Sensory scores generally decreased during storage, but the magnitude of decline was treatment- and attribute-dependent. A marked late-storage decline in colour and appearance was observed in honey treatments, indicating that high initial liking did not guarantee equivalent visual stability. The findings identify T_8 as the strongest treatment for flavour-led preference and T_2 as a more balanced option for visual quality and sustained acceptability. The results support selecting osmotic media on a multi-attribute basis rather than relying on a single sensory score.

Keywords: Aonla, Indian gooseberry, Osmotic dehydration, Sensory evaluation, Hedonic scale, Honey, Sucrose, Storage stability

1. Introduction

Aonla (*Phyllanthus emblica* L.; Indian gooseberry) is valued for its distinctive nutritional and phytochemical composition, but its high acidity and astringency can restrict fresh consumption. Drying and osmotic pretreatment offer routes to improve product convenience and shelf stability. Osmotic dehydration involves water transfer from plant tissue into a concentrated solution accompanied by solute uptake and, to a lesser extent, loss of native soluble constituents. The composition and concentration of the osmotic medium can therefore alter sweetness, flavour balance, texture and appearance (Torreggiani, 1993; Rastogi *et al.*, 2002; Chavan *et al.*, 2012) [2, 3, 1].

Comparative sensory information across refined sugar, candied sugar, brown sugar, honey, Date-palm jaggery and sugarcane jaggery sources at matched 40° and 60° Brix concentrations remains useful for product formulation. The present study therefore evaluates six sensory attributes of osmotically dehydrated aonla segments over 120 days of storage, with emphasis on treatment ranking, attribute-specific performance and the persistence of consumer liking.

2. Materials and Methods

2.1 Experimental design and treatments

The investigation was conducted during 2025–2026 at the Post Harvest Management and Processing Laboratory, College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India. The experiment used a completely randomized design (CRD), 13 treatments and three replications. Mature, healthy aonla fruits were selected, washed, blanched and prepared into segments. The control was dried without osmotic immersion; the remaining treatments were immersed in the respective hypertonic media and then hot-air oven dried. The treatment structure is summarized below.

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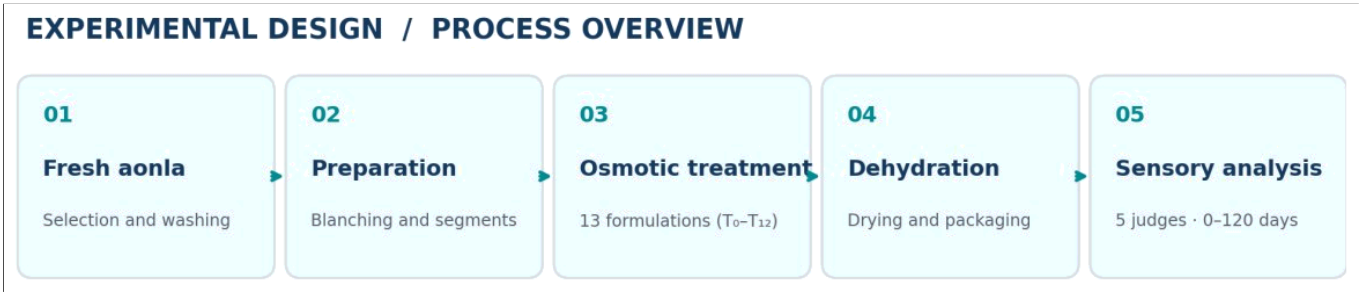


Figure 1. Workflow of aonla preparation, osmotic treatment, drying and sensory assessment.

2.2 Sensory evaluation

A semi-trained panel of five judges evaluated taste, colour, texture, flavour, appearance and overall acceptability. A nine-point hedonic scale was used, where 9 represented "like extremely" and 1 represented "dislike extremely." Samples were assessed at 0, 30, 60, 90 and 120 days of storage. The reported treatment means and the corresponding standard error of the mean [SE_m], critical difference at 5% [CD ($p \leq 0.05$)] and coefficient of variation (CV) are reproduced from the experimental results.

Treatment	Treatment notation	Osmotic condition
Control (without osmosis)	T_0	No osmotic immersion
Sugar syrup, 40° Brix	T_1	40° Brix
Sugar syrup, 60° Brix	T_2	60° Brix
Candied sugar syrup, 40° Brix	T_3	40° Brix
Candied sugar syrup, 60° Brix	T_4	60° Brix
Brown sugar syrup, 40° Brix	T_5	40° Brix
Brown sugar syrup, 60° Brix	T_6	60° Brix
Honey syrup, 40° Brix	T_7	40° Brix
Honey syrup, 60° Brix	T_8	60° Brix
Date-palm jaggery syrup, 40° Brix	T_9	40° Brix
Date-palm jaggery syrup, 60° Brix	T_{10}	60° Brix
Sugarcane jaggery syrup, 40° Brix	T_{11}	40° Brix
Sugarcane jaggery syrup, 60° Brix	T_{12}	60° Brix

Table 1. Nine-point hedonic scale used for sensory assessment.

Score	Hedonic interpretation
9	Like extremely
8	Like very much
7	Like moderately
6	Like slightly
5	Neither like nor dislike
4	Dislike slightly
3	Dislike moderately
2	Dislike very much
1	Dislike extremely

2.3 Statistical treatment and data presentation

The experiment was evaluated using CRD-based analysis and provides SE_m, CD at the 5% level and CV for each storage interval. These values are presented alongside the treatment means where relevant.

3. Results and Discussion

3.1 Integrated sensory response

Treatment performance was attribute-specific rather than uniformly dominated by one osmotic agent. T_8 led taste, texture, flavour and overall acceptability, whereas T_2 led colour and appearance. The heatmap (Figure 2) provides a compact comparison of the six reported overall means across all treatments.

3.2 Taste

Taste scores ranged from 3.98 in the untreated control (T_0) to 7.97 in honey syrup at 60° Brix (T_8). T_8 was followed by sugar syrup at 60° Brix (T_2; 7.64), candied sugar syrup at 60° Brix (T_4; 7.58) and date-palm jaggery syrup at 60° Brix (T_{10}; 7.49). The control showed the lowest score at every storage interval, falling from 5.20 at day 0 to 2.50 at day 120. T_8 declined from 8.50 to 7.35 over the same period, retaining a high liking score.

3.3 Colour

Colour was rated highest overall in T_2 (8.01), followed by T_4 (7.90) and T_1 (7.83). T_8 had a lower overall mean of 7.35 despite its strong performance in taste and flavour. A notable feature was the decline in the honey treatments after 60 days: T_7 decreased from 7.70 at day 60 to 5.10 at day 120, while T_8 decreased from 8.00 to 5.25. This late-storage reduction indicates weaker colour-score retention in these treatments under the conditions evaluated.

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3.4 Texture

T_8 recorded the highest overall texture mean (7.73), followed by T_2 (7.71) and T_4 (7.63). The differences among the leading treatments were comparatively small, while the control (5.62) remained clearly lower. At 120 days, T_2 scored 7.25, T_4 7.20 and T_8 7.20. The relatively high late-storage scores of these treatments suggest that the preferred high-solids osmotic treatments maintained a favourable mouthfeel/texture response better than the untreated control. Texture changes can be affected by water loss, solute uptake and structural changes during drying and storage (Torreggiani, 1993; Chavan *et al.*, 2012) [2, 1].

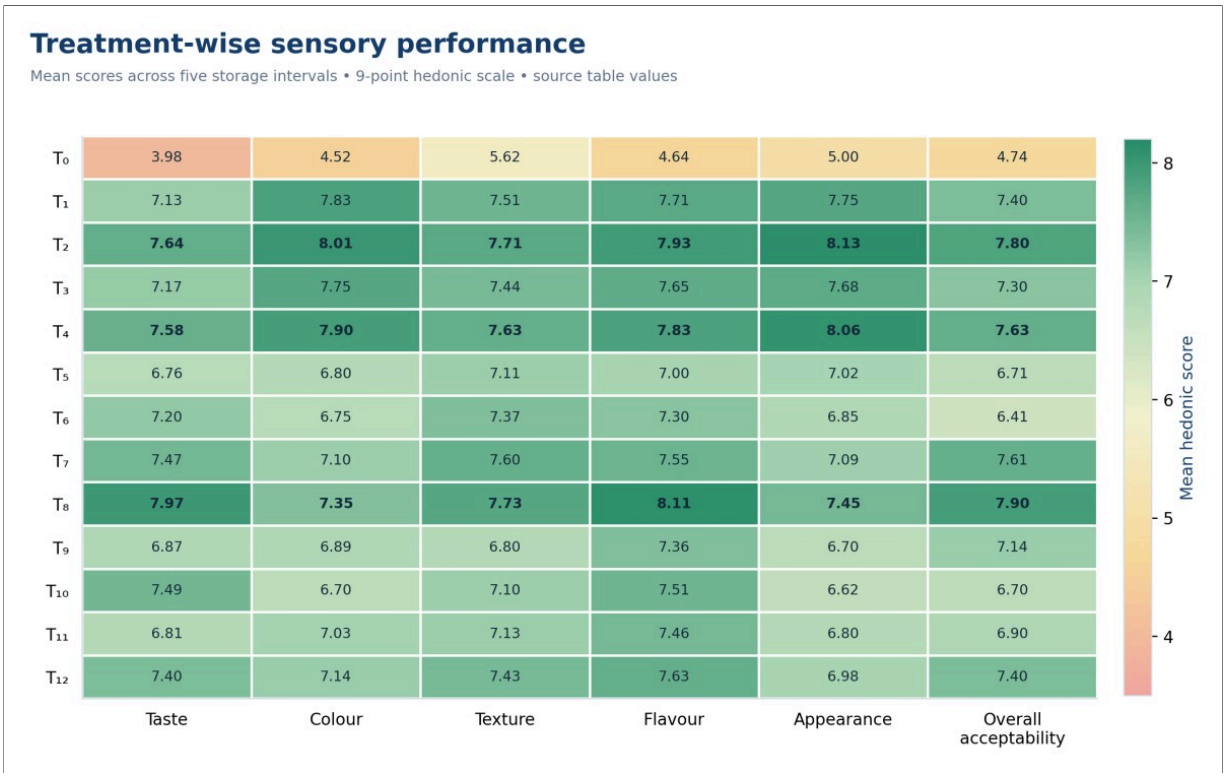


Figure 2. Heatmap of reported overall mean sensory scores for all 13 treatments (nine-point hedonic scale).

3.5 Flavour

Flavour showed the strongest overall mean in T_8 (8.11), followed by T_2 (7.93), T_4 (7.83) and T_1 (7.71). T_8 began at 8.60 and remained at 7.53 after 120 days. In contrast, the control decreased from 5.90 to 3.10. Honey's distinctive flavour profile may have contributed to the higher preference.

3.6 Appearance

Appearance was highest in T_2 (8.13), closely followed by T_4 (8.06). T_8 scored 7.45 overall, with a pronounced decrease from 8.50 at day 0 to 5.50 at day 120. T_2 declined more gradually from 8.60 to 7.60, and T_4 from 8.55 to 7.50. The control showed the lowest overall mean (5.00) and fell to 2.50 by day 120. These results suggest that sucrose-rich formulations, particularly T_2 and T_4, offered stronger visual acceptability throughout storage than the honey treatments.

Table 2. Overall mean sensory scores across storage intervals.

Code	Treatment	Taste	Colour	Texture	Flavour	Appearance	Overall acceptability
T_0	Control (without osmosis)	3.98	4.52	5.62	4.64	5.00	4.74
T_1	Sugar syrup, 40° Brix	7.13	7.83	7.51	7.71	7.75	7.40
T_2	Sugar syrup, 60° Brix	7.64	8.01	7.71	7.93	8.13	7.80
T_3	Candied sugar syrup, 40° Brix	7.17	7.75	7.44	7.65	7.68	7.30
T_4	Candied sugar syrup, 60° Brix	7.58	7.90	7.63	7.83	8.06	7.63
T_5	Brown sugar syrup, 40° Brix	6.76	6.80	7.11	7.00	7.02	6.71
T_6	Brown sugar syrup, 60° Brix	7.20	6.75	7.37	7.30	6.85	6.41
T_7	Honey syrup, 40° Brix	7.47	7.10	7.60	7.55	7.09	7.61
T_8	Honey syrup, 60° Brix	7.97	7.35	7.73	8.11	7.45	7.90
T_9	Date-palm jaggery syrup, 40° Brix	6.87	6.89	6.80	7.36	6.70	7.14
T_{10}	Date-palm jaggery syrup, 60° Brix	7.49	6.70	7.10	7.51	6.62	6.70
T_{11}	Sugarcane jaggery syrup, 40° Brix	6.81	7.03	7.13	7.46	6.80	6.90

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Code	Treatment	Taste	Colour	Texture	Flavour	Appearance	Overall acceptability
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.40	7.14	7.43	7.63	6.98	7.40

3.7 Overall acceptability

Overall acceptability integrated the panel's response across sensory impressions. T_8 had the highest overall mean (7.90), followed by T_2 (7.80), T_4 (7.63), T_7 (7.61) and T_{12} (7.40). The control was lowest (4.74). At 120 days, T_2 and T_8 jointly recorded the highest score (7.30), followed by T_4 (7.10). The convergence of T_2 and T_8 at the final interval is noteworthy: T_8 led on the full-period average, while T_2 showed better colour and appearance retention.

3.8 Storage-related decline and treatment stability

All six sensory attributes generally declined with storage, but the rate of decline depended on the treatment and attribute. The control showed large losses in taste (2.70 points), colour (2.90), texture (2.20), flavour (2.80), appearance (4.30) and overall acceptability (2.60) between day 0 and day 120. T_2 retained a comparatively high overall acceptability score, decreasing from 8.20 to 7.30 (0.90 points). T_8 declined from 8.40 to 7.30 (1.10 points) in overall acceptability, but its colour and appearance scores fell more sharply. T_4 decreased from 8.10 to 7.10 in overall acceptability (1.00 point). The results support a multi-dimensional definition of stability: the preferred treatment depends on whether the product target prioritizes flavour-led liking, visual appearance or the combined score. The line plot (Figure 3) compares the storage trajectories of the control and selected high-performing treatments.

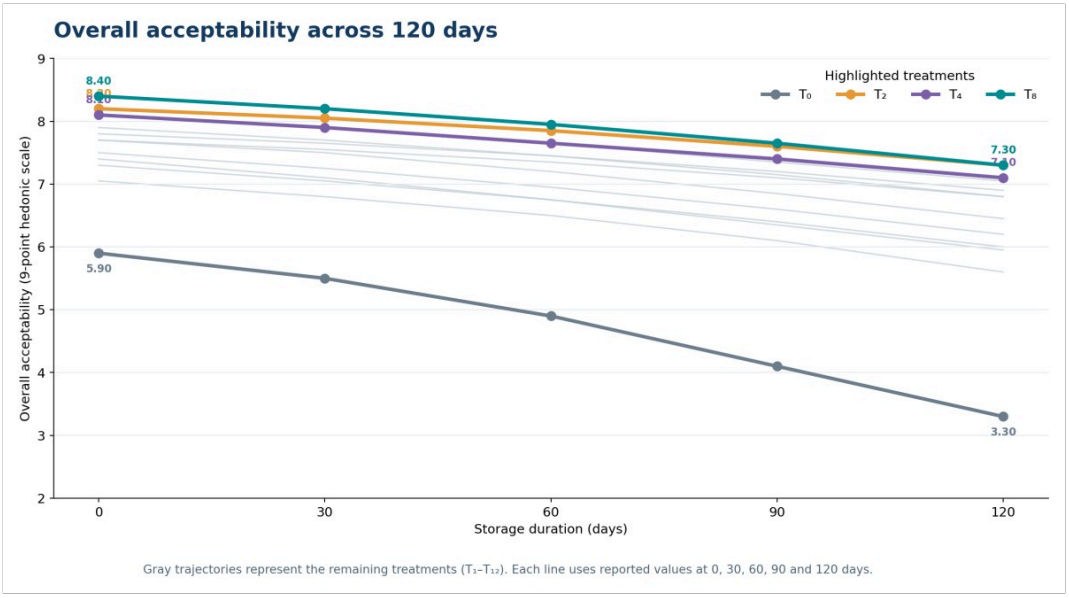


Figure 3. Storage-wise overall acceptability of selected treatments; T_2, T_4 and T_8 represent the leading formulations, while T_0 is the untreated control.

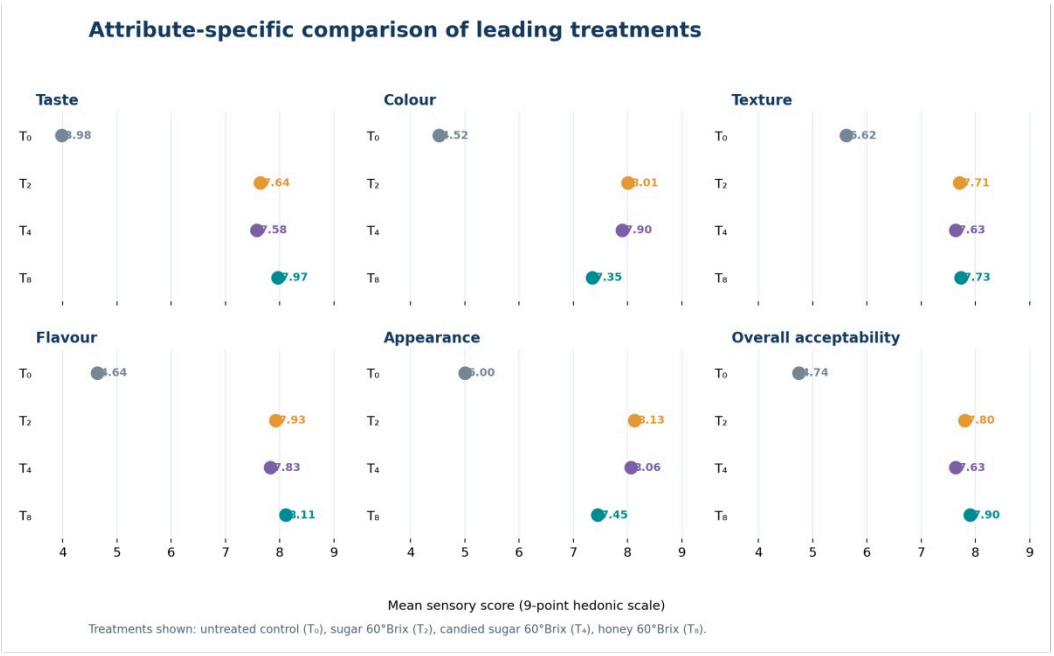


Figure 4. Comparison of overall mean scores across the six sensory attributes.

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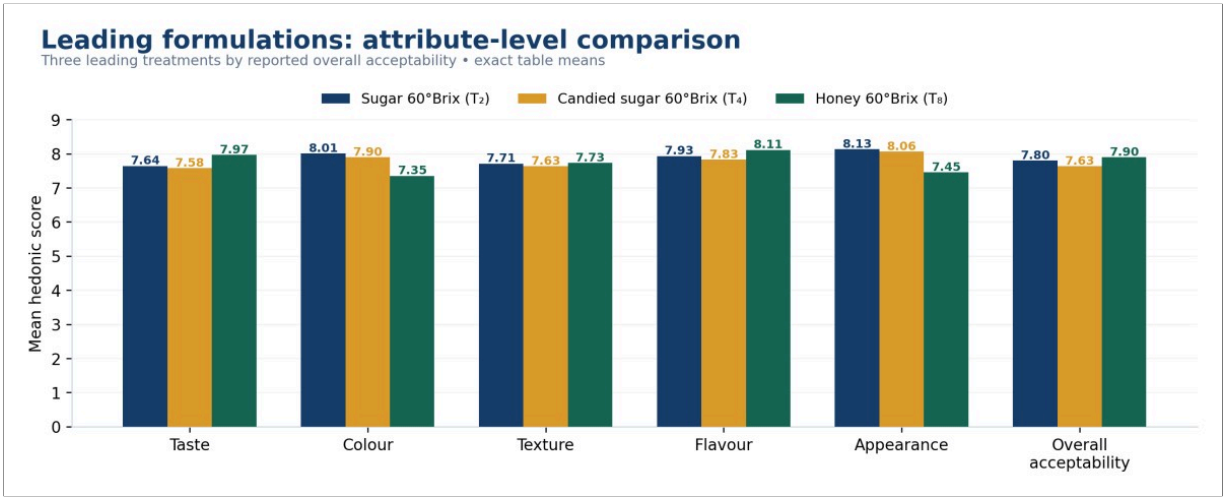


Figure 5. Comparative mean sensory scores of the three leading treatments (T_2, T_4 and T_8) across six attributes.

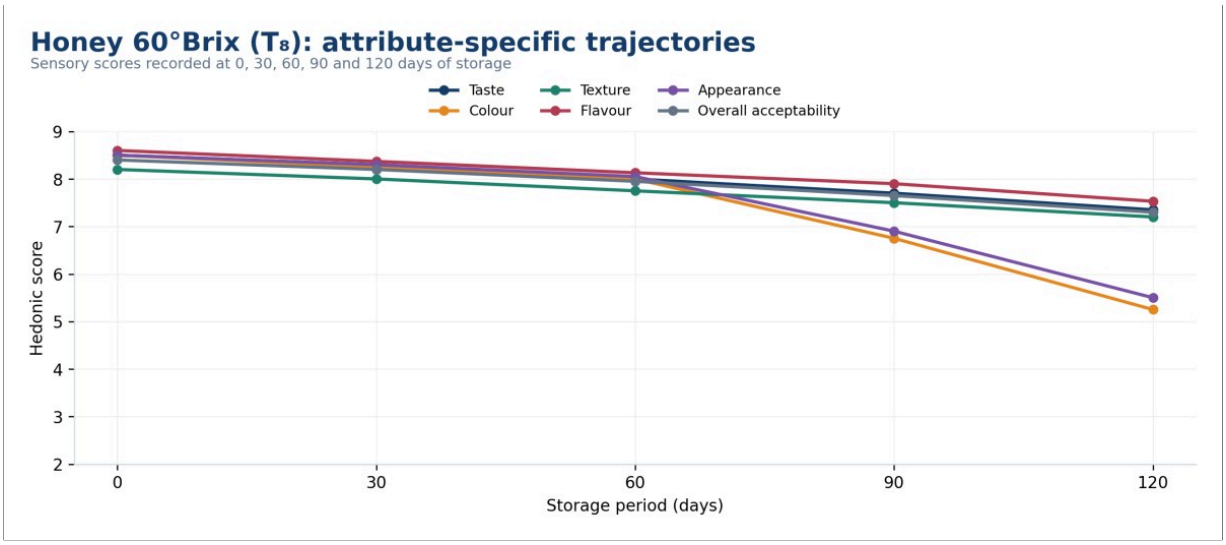


Figure 6. Attribute-specific sensory trajectories for honey syrup (T_8) at 60° Brix over 120 days of storage.

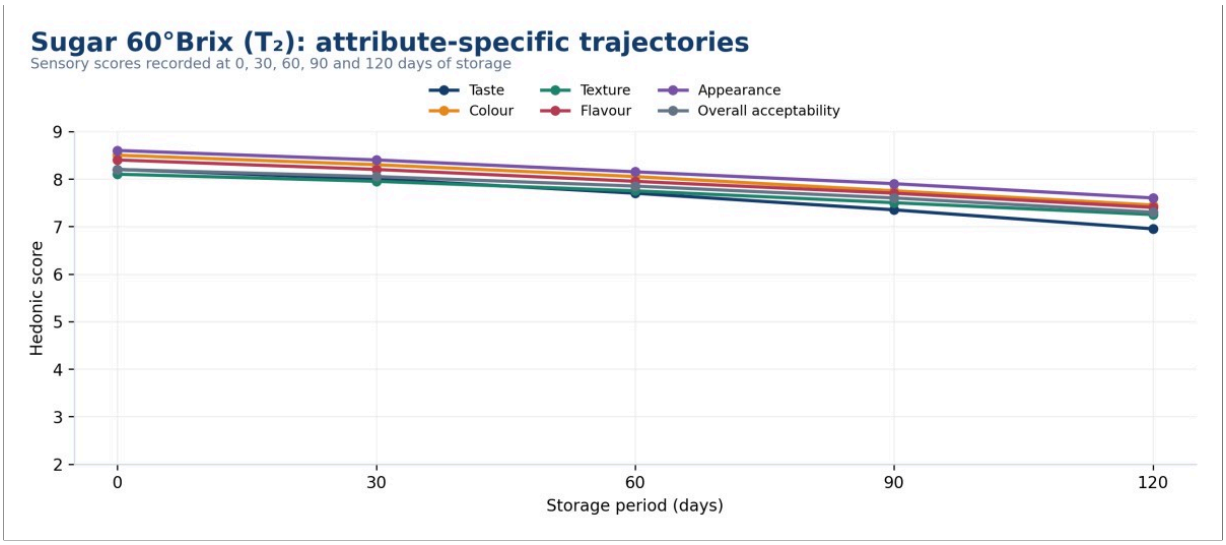


Figure 7. Attribute-specific sensory trajectories for sugar syrup (T_2) at 60° Brix over 120 days of storage.

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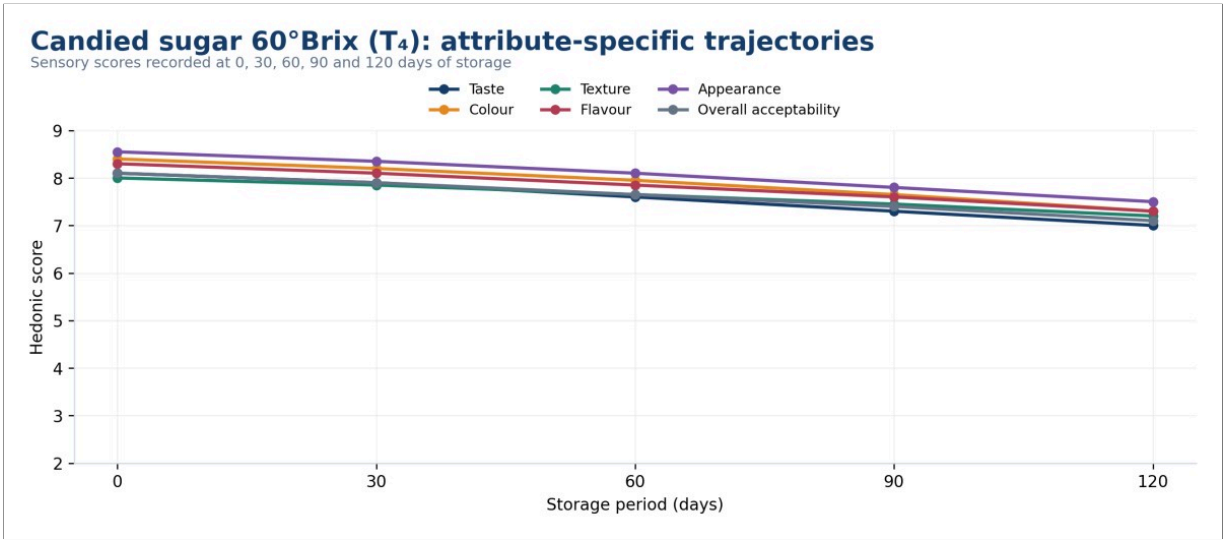


Figure 8. Attribute-specific sensory trajectories for candied sugar syrup (T_4) at 60° Brix over 120 days of storage.

4. Statistical interpretation

The original tables provide storage-specific SE_m, CD (5%) and CV values. For overall acceptability, the reported CD values ranged from 0.13 to 0.20 across storage intervals; for taste, from 0.11 to 0.22; for colour, from 0.13 to 0.19; for texture, from 0.10 to 0.14; for flavour, from 0.13 to 0.18; and for appearance, from 0.10 to 0.16. These reported critical differences indicate that the original study tested treatment differences at each interval.

5. Conclusions

Among the 13 osmotic treatments evaluated, honey syrup at 60° Brix (T_8) achieved the highest overall means for taste (7.97), texture (7.73), flavour (8.11) and overall acceptability (7.90). Sugar syrup at 60° Brix (T_2) recorded the highest colour (8.01) and appearance (8.13) means and shared the highest overall acceptability at 120 days with T_8 (7.30). Candied sugar syrup at 60° Brix (T_4) was a consistent second-tier treatment, particularly for colour and appearance. Sensory quality declined during storage, with the most pronounced late decline in colour and appearance observed in honey-based treatments. Accordingly, T_8 is recommended as the leading flavour-oriented formulation, whereas T_2 is the stronger balanced choice where visual quality and end-of-storage acceptability are emphasized. These conclusions are limited to the sensory conditions and storage period evaluated.

Acknowledgements

The authors acknowledge the institutional facilities of the College of Horticulture and Research Station, Sankara-Patan, Durg, Chhattisgarh, India.

Supplementary data tables

The following tables reproduce the treatment-wise interval means for each sensory attribute.

Supplementary Table. Taste score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	5.20	4.70	4.10	3.40	2.50
	Control (without osmosis)					
T_1	Sugar syrup, 40° Brix	7.60	7.40	7.15	6.90	6.60
	Sugar syrup, 40° Brix					
T_2	Sugar syrup, 60° Brix	8.20	8.00	7.70	7.35	6.95
	Sugar syrup, 60° Brix					
T_3	Candied sugar syrup, 40° Brix	7.70	7.50	7.20	6.90	6.55
	Candied sugar syrup, 40° Brix					
T_4	Candied sugar syrup, 60° Brix	8.10	7.90	7.60	7.30	7.00
	Candied sugar syrup, 60° Brix					
T_5	Brown sugar syrup, 40° Brix	7.20	7.00	6.80	6.55	6.25
	Brown sugar syrup, 40° Brix					
T_6	Brown sugar syrup, 60° Brix	7.70	7.50	7.25	6.95	6.60
	Brown sugar syrup, 60° Brix					
T_7	Honey syrup, 40° Brix	8.00	7.80	7.55	7.20	6.80
	Honey syrup, 40° Brix					
T_8	Honey syrup, 60° Brix	8.50	8.30	8.00	7.70	7.35
	Honey syrup, 60° Brix					
T_9	Date-palm jaggery syrup, 40° Brix	7.30	7.15	6.90	6.65	6.35
	Date-palm jaggery syrup, 40° Brix					
T_{10}	Date-palm jaggery syrup, 60° Brix	7.90	7.75	7.55	7.30	6.95
	Date-palm jaggery syrup, 60° Brix					

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Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.30	7.10	6.85	6.55	6.25
	Sugarcane jaggery syrup, 40° Brix					
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.80	7.65	7.45	7.20	6.90
	Sugarcane jaggery syrup, 60° Brix					
	SE_m (±)	0.07	0.06	0.05	0.04	0.04
	SEm (±)					
	CD (5%)	0.22	0.17	0.16	0.13	0.11
	CD (5%)					
	CV (%)	1.54	1.37	1.34	1.14	1.02
	CV (%)					

Supplementary Table. Colour score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	5.80	5.30	4.70	3.90	2.90
	Control (without osmosis)					
T_1	Sugar syrup, 40° Brix	8.30	8.10	7.85	7.60	7.30
	Sugar syrup, 40° Brix					
T_2	Sugar syrup, 60° Brix	8.50	8.30	8.05	7.75	7.45
	Sugar syrup, 60° Brix					
T_3	Candied sugar syrup, 40° Brix	8.25	8.05	7.80	7.50	7.15
	Candied sugar syrup, 40° Brix					
T_4	Candied sugar syrup, 60° Brix	8.40	8.20	7.95	7.65	7.30
	Candied sugar syrup, 60° Brix					
T_5	Brown sugar syrup, 40° Brix	7.30	7.10	6.85	6.55	6.20
	Brown sugar syrup, 40° Brix					
T_6	Brown sugar syrup, 60° Brix	7.15	7.00	6.80	6.55	6.25
	Brown sugar syrup, 60° Brix					
T_7	Honey syrup, 40° Brix	8.20	8.00	7.70	6.50	5.10
	Honey syrup, 40° Brix					
T_8	Honey syrup, 60° Brix	8.50	8.25	8.00	6.75	5.25
	Honey syrup, 60° Brix					
T_9	Date-palm jaggery syrup, 40° Brix	7.40	7.20	6.95	6.65	6.25
	Date-palm jaggery syrup, 40° Brix					
T_{10}	Date-palm jaggery syrup, 60° Brix	7.10	6.95	6.75	6.50	6.20
	Date-palm jaggery syrup, 60° Brix					
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.50	7.35	7.10	6.80	6.40
	Sugarcane jaggery syrup, 40° Brix					
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.70	7.50	7.20	6.85	6.45
	Sugarcane jaggery syrup, 60° Brix					
	SE_m (±)	0.06	0.06	0.05	0.05	0.04
	SEm (±)					
	CD (5%)	0.19	0.17	0.16	0.14	0.13
	CD (5%)					
	CV (%)	1.45	1.35	1.32	1.24	1.25
	CV (%)					

Supplementary Table. Texture score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	6.60	6.20	5.75	5.15	4.40
	Control (without osmosis)					
T_1	Sugar syrup, 40° Brix	7.90	7.75	7.55	7.30	7.05
	Sugar syrup, 40° Brix					
T_2	Sugar syrup, 60° Brix	8.10	7.95	7.75	7.50	7.25
	Sugar syrup, 60° Brix					

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Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_3	Candied sugar syrup, 40° Brix	7.85	7.65	7.45	7.25	7.00
	Candied sugar syrup, 40° Brix					
T_4	Candied sugar syrup, 60° Brix	8.00	7.85	7.65	7.45	7.20
	Candied sugar syrup, 60° Brix					
T_5	Brown sugar syrup, 40° Brix	7.50	7.35	7.15	6.90	6.65
	Brown sugar syrup, 40° Brix					
T_6	Brown sugar syrup, 60° Brix	7.80	7.65	7.40	7.15	6.85
	Brown sugar syrup, 60° Brix					
T_7	Honey syrup, 40° Brix	8.00	7.85	7.65	7.40	7.10
	Honey syrup, 40° Brix					
T_8	Honey syrup, 60° Brix	8.20	8.00	7.75	7.50	7.20
	Honey syrup, 60° Brix					
T_9	Date-palm jaggery syrup, 40° Brix	7.30	7.10	6.85	6.55	6.20
	Date-palm jaggery syrup, 40° Brix					
T_{10}	Date-palm jaggery syrup, 60° Brix	7.60	7.40	7.15	6.85	6.50
	Date-palm jaggery syrup, 60° Brix					
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.60	7.40	7.15	6.90	6.60
	Sugarcane jaggery syrup, 40° Brix					
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.90	7.70	7.45	7.20	6.90
	Sugarcane jaggery syrup, 60° Brix					
	SE_m (±)	0.05	0.04	0.04	0.04	0.03
	SEm (±)					
	CD (5%)	0.14	0.13	0.13	0.11	0.10
	CD (5%)					
	CV (%)	1.08	1.03	1.06	0.93	0.90
	CV (%)					

Supplementary Table. Flavour score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	5.90	5.40	4.80	4.00	3.10
	Control (without osmosis)					
T_1	Sugar syrup, 40° Brix	8.10	7.95	7.75	7.50	7.25
	Sugar syrup, 40° Brix					
T_2	Sugar syrup, 60° Brix	8.40	8.20	7.95	7.70	7.40
	Sugar syrup, 60° Brix					
T_3	Candied sugar syrup, 40° Brix	8.05	7.90	7.70	7.45	7.15
	Candied sugar syrup, 40° Brix					
T_4	Candied sugar syrup, 60° Brix	8.30	8.10	7.85	7.60	7.30
	Candied sugar syrup, 60° Brix					
T_5	Brown sugar syrup, 40° Brix	7.50	7.30	7.05	6.75	6.40
	Brown sugar syrup, 40° Brix					
T_6	Brown sugar syrup, 60° Brix	7.80	7.60	7.35	7.05	6.70
	Brown sugar syrup, 60° Brix					
T_7	Honey syrup, 40° Brix	8.30	7.77	7.43	7.37	6.87
	Honey syrup, 40° Brix					
T_8	Honey syrup, 60° Brix	8.60	8.37	8.13	7.90	7.53
	Honey syrup, 60° Brix					
T_9	Date-palm jaggery syrup, 40° Brix	7.75	7.60	7.40	7.15	6.90
	Date-palm jaggery syrup, 40° Brix					
T_{10}	Date-palm jaggery syrup, 60° Brix	8.00	7.80	7.55	7.25	6.95
	Date-palm jaggery syrup, 60° Brix					
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.85	7.70	7.50	7.25	7.00
	Sugarcane jaggery syrup, 40° Brix					
T_{12}	Sugarcane jaggery syrup, 60° Brix	8.10	7.90	7.65	7.40	7.10
	Sugarcane jaggery syrup, 60° Brix					

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Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
	SE_m (±)	0.06	0.06	0.05	0.05	0.05
	SEm (±)					
	CD (5%)	0.18	0.16	0.15	0.14	0.13
	CD (5%)					
	CV (%)	1.39	1.29	1.24	1.16	1.09
	CV (%)					

Supplementary Table. Appearance score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	6.80	6.20	5.40	4.10	2.50
	Control (without osmosis)					
T_1	Sugar syrup, 40° Brix	8.15	8.00	7.80	7.55	7.25
	Sugar syrup, 40° Brix					
T_2	Sugar syrup, 60° Brix	8.60	8.40	8.15	7.90	7.60
	Sugar syrup, 60° Brix					
T_3	Candied sugar syrup, 40° Brix	8.10	7.95	7.75	7.45	7.15
	Candied sugar syrup, 40° Brix					
T_4	Candied sugar syrup, 60° Brix	8.55	8.35	8.10	7.80	7.50
	Candied sugar syrup, 60° Brix					
T_5	Brown sugar syrup, 40° Brix	7.55	7.35	7.10	6.75	6.35
	Brown sugar syrup, 40° Brix					
T_6	Brown sugar syrup, 60° Brix	7.35	7.15	6.90	6.60	6.25
	Brown sugar syrup, 60° Brix					
T_7	Honey syrup, 40° Brix	8.05	7.90	7.70	6.60	5.20
	Honey syrup, 40° Brix					
T_8	Honey syrup, 60° Brix	8.50	8.30	8.05	6.90	5.50
	Honey syrup, 60° Brix					
T_9	Date-palm jaggery syrup, 40° Brix	7.20	7.00	6.75	6.45	6.10
	Date-palm jaggery syrup, 40° Brix					
T_{10}	Date-palm jaggery syrup, 60° Brix	7.10	6.95	6.70	6.35	6.00
	Date-palm jaggery syrup, 60° Brix					
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.30	7.10	6.85	6.55	6.20
	Sugarcane jaggery syrup, 40° Brix					
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.50	7.30	7.05	6.75	6.30
	Sugarcane jaggery syrup, 60° Brix					
	SE_m (±)	0.03	0.06	0.05	0.04	0.03
	SEm (±)					
	CD (5%)	0.13	0.14	0.16	0.11	0.10
	CD (5%)					
	CV (%)	0.68	1.35	1.31	0.96	0.98
	CV (%)					

Supplementary Table. Overall acceptability score (9-point hedonic scale).

Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_0	Control (without osmosis)	5.90	5.50	4.90	4.10	3.30
T_1	Sugar syrup, 40° Brix	7.80	7.65	7.45	7.20	6.90
T_2	Sugar syrup, 60° Brix	8.20	8.05	7.85	7.60	7.30
T_3	Candied sugar syrup, 40° Brix	7.70	7.55	7.35	7.10	6.80
T_4	Candied sugar syrup, 60° Brix	8.10	7.90	7.65	7.40	7.10
T_5	Brown sugar syrup, 40° Brix	7.40	7.10	6.75	6.35	5.95
T_6	Brown sugar syrup, 60° Brix	7.05	6.80	6.50	6.10	5.60
T_7	Honey syrup, 40° Brix	8.10	7.90	7.65	7.35	7.05
T_8	Honey syrup, 60° Brix	8.40	8.20	7.95	7.65	7.30

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Code	Treatment	Day 0	Day 30	Day 60	Day 90	Day 120
T_9	Date-palm jaggery syrup, 40° Brix	7.70	7.50	7.20	6.85	6.45
T_{10}	Date-palm jaggery syrup, 60° Brix	7.30	7.05	6.75	6.40	6.00
T_{11}	Sugarcane jaggery syrup, 40° Brix	7.50	7.25	6.95	6.60	6.20
T_{12}	Sugarcane jaggery syrup, 60° Brix	7.90	7.70	7.45	7.15	6.80
	SE_m (±)	0.07	0.07	0.06	0.05	0.04
	CD (5%)	0.20	0.19	0.17	0.14	0.13
	CV (%)	1.57	1.53	1.42	1.23	1.21

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