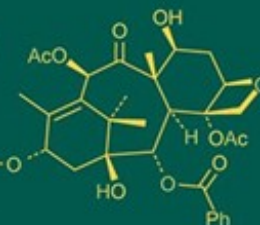
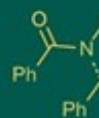
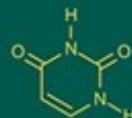
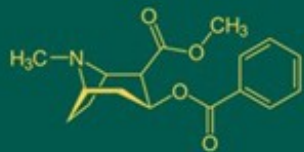


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
Indexing: Embase
IJABR 2026; SP-10(10): 612-619
www.biochemjournal.com
Received: 22-08-2026
Accepted: 25-09-2026
Published: 08-10-2026

The names and affiliations of all authors are provided below, following the references.

Effect of *Aloe vera* mucilage and calcium chloride treatments on postharvest quality and shelf life of teasel gourd

Vadikari Alekhya¹, Dr. B. Neeraja Prabhakar², Dr. D. Laxmi Narayana³, Dr. D. Vijaya⁴,
Dr. D. Anitha Kumari⁵, Dr. R. Preetham Goud⁶, Dr. G. Sathish⁷

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i10Sh.10348>

ABSTRACT

Teasel gourd (*Momordica subangulata* ssp. *renigera*) is an underutilized cucurbitaceous vegetable with considerable potential for diversification of vegetable production. The present investigation was conducted to evaluate the effect of *Aloe* mucilage and calcium chloride (CaCl₂) treatments on the postharvest quality and storage behaviour of teasel gourd (*Momordica subangulata* ssp. *renigera*) fruits. The experiment comprised 16 treatments involving different concentrations of *Aloe* mucilage and CaCl₂, including their combinations, with an untreated control. Fruits were evaluated at 2, 4 and 6 days after storage (DAS) for total soluble solids (TSS), titratable acidity, carotenoids, ascorbic acid, protein, iron, fibre, fat and fruit decay. TSS increased progressively during storage, with the highest values of 6.25, 7.35 and 7.92 °Brix at 2, 4 and 6 DAS, respectively, recorded in the control (T₁₆). Titratable acidity declined with storage, with the highest values of 2.29, 1.92 and 1.15% recorded in T₁₅, T₁₅ and T₉ at 2, 4 and 6 DAS, respectively. T₁₅ (40% *Aloe* mucilage + 30% CaCl₂) recorded the highest carotenoid content (146.08, 158.40 and 189.84 µg 100 g⁻¹), protein (2.57, 2.41 and 2.26%), iron (2.26, 2.16 and 2.07 mg 100 g⁻¹) and fibre (1.77, 1.73 and 1.69%) at 2, 4 and 6 DAS, respectively. Ascorbic acid content was highest in the control at all storage intervals, whereas fat content was also highest in the control. Fruit decay increased with storage duration and reached 45% in the control at 6 DAS, while the lowest decay (10%) was recorded in T₈ and T₁₅. Overall, the combined application of *Aloe* mucilage and CaCl₂, particularly T₁₅, was effective in maintaining important nutritional quality attributes and reducing postharvest decay of teasel gourd fruits during storage.

Keywords: Teasel gourd, *Aloe vera* mucilage, Calcium chloride, Edible coating, Postharvest quality, Physiological loss in weight, Decay, Shelf life

1. Introduction

Teasel gourd (*Momordica subangulata* ssp. *renigera*) is an underutilized cucurbitaceous vegetable cultivated in tropical and subtropical regions. The crop is valued for its edible fruits and adaptation to diverse environmental conditions. Despite its potential for commercial cultivation, limited attention has been given to postharvest handling and storage technologies for maintaining fruit quality. The short storage life of tender cucurbit fruits is primarily associated with high moisture content, active respiration, transpiration, tissue softening and microbial deterioration. (Hasan *et al.*, 2021; Bhardwaj *et al.*, 2024) [2, 1].

Postharvest deterioration is a major constraint in the marketing of fresh vegetables. After harvest, fruits remain physiologically active and continue to respire and lose water through transpiration. Consequently, physiological loss in weight, wilting, loss of firmness and changes in colour occur progressively during storage. Reduction of respiration and transpiration is therefore an important objective of postharvest management. Edible coatings can provide a physical barrier on the fruit surface and modify the exchange of oxygen, carbon dioxide and water vapour, thereby slowing physiological deterioration. (Hasan *et al.*, 2021) [2].

Aloe vera gel or mucilage has attracted considerable attention as a natural edible coating because of its film-forming, antimicrobial and antioxidant properties. The coating can form a protective layer over the fruit surface, reducing moisture loss and gas exchange and delaying ripening-related changes. Studies on different fruits and vegetables have demonstrated that *Aloe vera* coatings can reduce weight loss and decay while maintaining firmness and other physicochemical quality attributes during storage. (Farina *et al.*, 2020) [3].

Calcium chloride is another important postharvest treatment used for maintaining fruit firmness and delaying senescence. Calcium is associated with the stability of cell walls and membranes, particularly through its interaction with pectic substances in the middle lamella. Exogenous calcium application can therefore delay cell-wall degradation and tissue softening during storage. Calcium chloride treatments have been reported to

Corresponding Author:
Vadikari Alekhya
Ph.D Scholar, Department
of Vegetable Science,
SKLTGHU, Mulugu,
Siddipet, Telangana, India

improve firmness and maintain quality in several fresh fruits and vegetables. (Shabir *et al.*, 2021; Amiri *et al.*, 2022) [5, 4].

The combined application of *Aloe vera* and calcium chloride may provide complementary benefits. *Aloe vera* provides a protective coating that reduces water loss and microbial deterioration, while calcium contributes to maintenance of cell-wall strength and firmness. A study on spine gourd, a closely related cucurbitaceous vegetable, reported that combined calcium chloride and *Aloe vera* mucilage treatment reduced physiological loss in weight and decay and maintained fruit quality during storage. (Bhardwaj *et al.*, 2024) [1].

Therefore, the present investigation was undertaken to study the effect of *Aloe vera* mucilage and calcium chloride treatments, individually and in combination, on physiological, biochemical and quality changes and shelf life of teasel gourd fruits under storage conditions.

2. Material and methods

Experimental material and site

Fresh fruits of teasel gourd (*Momordica subangulata* ssp. *renigera*) were harvested at the Vegetable Research Station, Rajendranagar, Hyderabad. Immature green and marketable stage from the experimental field and immediately transported to the Postharvest Laboratory for conducting the experiment. The harvested fruits were carefully handled to avoid mechanical injury during harvesting and transportation. Fruits were washed with clean tap water to remove adhering soil, dust and other inert materials and were subsequently air dried under ambient conditions. Only healthy, well-developed, uniform-sized fruits free from disease symptoms, insect damage, bruises, mechanical injury and other physical defects were selected for the experiment. The selection of uniform and healthy fruits was made to minimize variation in initial quality and ensure reliable assessment of postharvest treatments.

Preparation of coating solutions (*Aloe vera* mucilage and CaCl_2 solution)

Fresh, healthy and fully developed leaves of *Aloe vera* were collected for preparation of the coating material. The leaves were thoroughly washed with clean water to remove adhering dirt and contaminants. The marginal spines and outer rind were removed carefully, and the inner mucilaginous portion was collected. The extracted mucilage was homogenized to obtain a uniform coating material and filtered before use. The prepared *Aloe vera* mucilage was maintained under suitable storage conditions until application. *Aloe vera* gel contains polysaccharides and other bioactive compounds that facilitate film formation and provide antimicrobial and antioxidant properties, making it suitable for application as an edible coating on fresh fruits and vegetables.

The required concentrations of *Aloe vera* mucilage were prepared by diluting the extracted mucilage with sterilized distilled water. *Aloe vera* concentrations of 10, 20, 30, 40, 50 and 75 per cent were prepared according to the respective treatments. Calcium chloride solutions were prepared at the required concentrations using food-grade CaCl_2 dissolved in distilled water. Calcium chloride concentrations of 5, 10, 20 and 30 per cent were prepared according to the treatment combinations. The use of calcium chloride as a postharvest treatment is associated with maintenance of cell-wall integrity and reduction of fruit softening during storage.

Treatment application and experimental work

Freshly harvested teasel gourd fruits were randomly divided into treatment lots according to the experimental design. The experiment consisted of sixteen postharvest treatments with two replications. The treatment combinations were T₁: *Aloe vera* 50%; T₂: *Aloe vera* 75%; T₃: CaCl_2 5%; T₄: 10% *Aloe vera* + 10% CaCl_2 ; T₅: 10% *Aloe vera* + 20% CaCl_2 ; T₆: 10% *Aloe vera* + 30% CaCl_2 ; T₇: 20% *Aloe vera* + 10% CaCl_2 ; T₈: 20% *Aloe vera* + 20% CaCl_2 ; T₉: 20% *Aloe vera* + 30% CaCl_2 ; T₁₀: 30% *Aloe vera* + 10% CaCl_2 ; T₁₁: 30% *Aloe vera* + 20% CaCl_2 ; T₁₂: 30% *Aloe vera* + 30% CaCl_2 ; T₁₃: 40% *Aloe vera* +

10% CaCl_2 ; T₁₄: 40% *Aloe vera* + 20% CaCl_2 ; T₁₅: 40% *Aloe vera* + 30% CaCl_2 ; and T₁₆: control.

For individual *Aloe vera* treatments, the selected fruits were dipped in the respective *Aloe vera* mucilage solutions and subsequently allowed to air dry. For calcium chloride treatment, fruits were dipped in the respective CaCl_2 solutions and allowed to dry under ambient conditions. For combined treatments, fruits were treated with the respective *Aloe vera* mucilage and calcium chloride combination according to the treatment schedule and subsequently air dried. For the control treatment, fruits were maintained without application of *Aloe vera* or calcium chloride. After treatment, the fruits were placed in 2 % perforated polyethylene bags under ambient storage conditions and observations were recorded at 2, 4 and 6 days after storage. The use of *Aloe vera* and calcium chloride as combined postharvest treatments has been reported to improve the quality and storability of cucurbitaceous vegetables. (Bhardwaj *et al.*, 2024) [1].

Postharvest fruit quality assessment

The physicochemical and quality attributes of teasel gourd fruits, including, total soluble solids, titratable acidity, carotenoid content, ascorbic acid, protein, iron, fibre, fat and fruit decay percentage. Observations were recorded at 2, 4 and 6 days after storage.

Total soluble solids

Total soluble solids were determined using a calibrated digital refractometer and expressed as °Brix. Changes in TSS during storage are associated with hydrolysis of carbohydrates, concentration of soluble constituents due to moisture loss and metabolic changes accompanying ripening. (Farina *et al.*, 2020) [3].

Titratable acidity

Titratable acidity was estimated by titrating fruit juice against standard sodium hydroxide and expressed as percentage acid. Organic acids are progressively consumed during respiration after harvest, resulting in a decline in titratable acidity during storage. Maintenance of higher acidity is generally associated with delayed metabolic deterioration. (Farina *et al.*, 2020) [3].

Carotenoid content

Carotenoids were estimated using a spectrophotometric method and expressed as mg 100 g⁻¹ fresh weight. Changes in carotenoid content during storage are associated with the development of fruit colour and progression of ripening. Postharvest coatings can delay these changes by reducing respiration and slowing senescence. (Hasan *et al.*, 2021) [2].

Estimation of ascorbic acid

Ascorbic acid content was estimated by the 2,6-dichlorophenol indophenol (DCPIP) titration method. Fresh fruit pulp was extracted with 3% metaphosphoric acid and filtered. A known volume of the extract was titrated against standardized DCPIP solution until a persistent light pink colour appeared. Ascorbic acid content was calculated using the standard dye factor and expressed as mg 100 g⁻¹ fresh weight.

Estimation of protein

Protein content was estimated by the Kjeldahl method. A known quantity of dried and powdered fruit sample was digested with concentrated sulphuric acid in the presence of a catalyst until a clear solution was obtained. The digest was distilled with alkali, and the liberated ammonia was collected in boric acid and titrated against standard acid. Nitrogen content was calculated and multiplied by the appropriate conversion factor to obtain protein content, expressed as percentage.

Estimation of iron

Iron content was estimated by a spectrophotometric method. The fruit sample was digested appropriately and the resulting extract was treated with suitable reagents to develop a coloured iron complex. The absorbance was measured at 540 nm using a spectrophotometer.

Iron concentration was calculated from a standard calibration curve and expressed as mg 100 g⁻¹ fresh weight.

Estimation of crude fibre

Crude fibre was estimated by the standard acid–alkali digestion method. A known quantity of dried and defatted sample was successively digested with dilute sulphuric acid and sodium hydroxide. The residue was filtered, washed, dried and weighed, followed by ignition in a muffle furnace. The loss in weight on ignition was considered as crude fibre and expressed as percentage.

Estimation of fat

Fat content was estimated by Soxhlet extraction. A known quantity of dried and powdered fruit sample was placed in a Soxhlet apparatus and extracted continuously with petroleum ether. After completion of extraction, the solvent was evaporated and the extracted fat was dried and weighed. Fat content was calculated based on the weight of the sample and expressed as percentage.

Decay percentage

Decay percentage was calculated based on the number of fruits showing visible symptoms of deterioration and expressed as percentage:

$$\text{Decay(\%)} = \frac{\text{Number of decayed fruits}}{\text{Total number of fruits}} \times 100$$

Microbial decay is one of the major causes of postharvest losses in fresh fruits and vegetables. *Aloe vera* has been reported to possess antimicrobial properties that can help suppress microbial development on coated fruit surfaces. (Hasan *et al.*, 2021) [2].

Statistical analysis

The experimental data were subjected to analysis of variance (ANOVA) appropriate for a Completely Randomized Design (CRD). The significance of treatment effects was tested using the *F*-test at the 5% probability level. When the treatment effect was significant, the treatment means were compared using the critical difference (CD) at *P* = 0.05. (Panse *et al.*, 1985) [6].

3. Results and discussion

Total soluble solids (TSS) increased progressively during storage. The highest TSS was recorded in T₁₆ (control) at 2 DAS (6.25 °Brix), 4 DAS (7.35 °Brix) and 6 DAS (7.92 °Brix). The progressive increase in TSS during storage may be associated with hydrolysis of polysaccharides and conversion of complex carbohydrates into soluble sugars during ripening. The relatively lower increase in coated fruits indicates delayed ripening due to reduced gas exchange and metabolic activity. Similar effects of *Aloe vera*-based coatings in delaying postharvest changes have been reported by Hasan *et al.* (2021) [2] and Bhardwaj *et al.* (2024) [1].

Titrate acidity decreased progressively during storage. The highest acidity was recorded in T₁₅ at 2 DAS (2.29%) and 4 DAS (1.92%), while T₉ recorded the highest value at 6 DAS (1.15%). The decline in acidity is mainly associated with the utilization of organic acids as respiratory substrates during storage. Coatings containing *Aloe* mucilage and CaCl₂ can reduce respiratory activity and thereby help maintain organic acids for a longer period. Similar observations were reported by Shabir *et al.* (2021) [5] in guava treated with *Aloe vera* gel and calcium chloride.

Carotenoid content increased throughout storage, with T₁₅ recording the highest value at 2 DAS (146.08 µg 100 g⁻¹), 4 DAS (158.40 µg 100 g⁻¹) and 6 DAS (189.84 µg 100 g⁻¹). The increase in carotenoids is associated with ripening-related pigment biosynthesis. The higher carotenoid content under T₁₅ may indicate continued pigment development while the coating helped to reduce other deterioration processes. *Aloe vera* coatings have been reported to modify ripening and maintain quality attributes during postharvest storage (Hasan *et al.*, 2021) [2].

Ascorbic acid content declined with increasing storage duration. The highest values were recorded in T₁₆ at 2 DAS (4.68 mg 100 g⁻¹), 4 DAS (3.54 mg 100 g⁻¹) and 6 DAS (2.72 mg 100 g⁻¹). The reduction in ascorbic acid during storage is generally attributed to oxidation of ascorbic acid and increased metabolic activity during ripening. Edible coatings can reduce oxygen diffusion and consequently slow oxidative degradation of ascorbic acid (Hasan *et al.*, 2021) [2].

Protein content decreased gradually during storage, while T₁₅ recorded the highest values at 2 DAS (2.57%), 4 DAS (2.41%) and 6 DAS (2.26%). Maintenance of higher protein content under T₁₅ may

be related to delayed senescence and reduced metabolic degradation. Postharvest coatings can slow physiological deterioration by creating a modified atmosphere around the fruit surface, thereby delaying senescence and associated biochemical changes (Bhardwaj *et al.*, 2024) [1].

Iron content also showed a gradual decline during storage. The highest iron content was recorded in T₁₅ at 2 DAS (2.26 mg 100 g⁻¹), 4 DAS (2.16 mg 100 g⁻¹) and 6 DAS (2.07 mg 100 g⁻¹). The comparatively higher retention under T₁₅ may be associated with delayed deterioration and maintenance of fruit tissue integrity. Calcium treatments are known to contribute to maintenance of cell-wall stability and postharvest quality, which may indirectly reduce nutrient losses during storage (Shabir *et al.*, 2021; Bhardwaj *et al.*, 2024) [5, 1].

Fibre content decreased slightly during storage, with T₁₅ recording the highest values at 2 DAS (1.77%), 4 DAS (1.73%) and 6 DAS (1.69%). The relatively higher fibre content under T₁₅ may be related to better maintenance of cell-wall structure during storage. Calcium ions can interact with pectic substances in the cell wall and contribute to tissue firmness and structural integrity, thereby delaying softening and deterioration (Bhardwaj *et al.*, 2024) [1].

Fat content gradually declined during storage. The highest values were recorded in T₁₆ at 2 DAS (0.365%), 4 DAS (0.350%) and 6 DAS (0.335%). The decline in fat during storage may be associated with lipid oxidation and utilization during respiration. *Aloe* mucilage coatings may reduce oxygen availability at the fruit surface and thereby influence oxidative changes during storage (Hasan *et al.*, 2021) [2].

Fruit decay increased progressively with storage duration. The highest decay was recorded in T₂, T₁₀ and T₁₆ at 2 DAS (10%), T₁₆ at 4 DAS (25%) and T₁₆ at 6 DAS (45%). The substantially higher decay in untreated fruits indicates faster physiological deterioration and microbial spoilage in the absence of a protective coating. *Aloe* mucilage provides a physical barrier against moisture loss and microbial invasion, while CaCl₂ helps maintain cell-wall integrity and fruit firmness. Similar reductions in postharvest deterioration through combined *Aloe vera* gel and calcium chloride treatments have been reported by Shabir *et al.* (2021) [5] and Bhardwaj *et al.* (2024) [1].

4. Conclusion

Overall, T₁₅ (40% *Aloe* mucilage + 30% CaCl₂) consistently recorded the highest values for carotenoids, protein, iron and fibre at all three storage periods, while T₁₆ recorded the highest TSS, ascorbic acid and fat. The untreated control also showed the highest fruit decay, demonstrating the beneficial role of *Aloe* mucilage and CaCl₂ treatments in reducing postharvest deterioration and maintaining quality during storage.

Treatments	Total soluble solids (°Brix)		
	2 nd day	4 th day	6 th day
T ₁	5.35 ^b	5.85 ^b	6.20 ^b
T ₂	5.20 ^b	5.70 ^b	6.00 ^c

(continued on next page)

Total soluble solids (°Brix)			
T ₃	4.65 ^c	5.50 ^b	5.90 ^c
T ₄	6.10 ^a	7.25 ^a	7.45 ^a
T ₅	5.30 ^b	5.70 ^b	6.25 ^b
T ₆	4.80 ^b	5.50 ^b	6.00 ^c
T ₇	5.10 ^b	5.80 ^b	6.35 ^b
T ₈	5.80 ^a	6.20 ^b	6.65
T ₉	5.20 ^b	6.00 ^b	6.35 ^b
T ₁₀	5.95 ^a	6.40 ^a	6.80 ^b
T ₁₁	5.15 ^b	5.65 ^b	6.10 ^c
T ₁₂	5.40 ^b	5.90 ^b	6.20 ^b
T ₁₃	4.75 ^b	5.20 ^c	5.70 ^c
T ₁₄	4.55 ^c	5.30 ^c	5.85 ^c
T ₁₅	5.45 ^b	5.85 ^b	6.40 ^b
T ₁₆	6.25 ^{a*}	7.35 ^{a*}	7.92 ^{a*}
SE(m) ±	0.26	0.32	0.29
CD at 5%	0.78	0.95	0.88

9. 9.

T₁: Aloe mucilage @ 50%	T₉: 20% aloe mucilage + 30% @ CaCl₂
T₂: Aloe mucilage @ 75%	T₁₀: 30% aloe mucilage + 10% @ CaCl₂
T₃: CaCl₂ @ 5%	T₁₁: 30% aloe mucilage + 20% @ CaCl₂
T₄: 10% aloe mucilage + 10% @ CaCl₂	T₁₂: 30% aloe mucilage + 30% @ CaCl₂
T₅: 10% aloe mucilage + 20% @ CaCl₂	T₁₃: 40% aloe mucilage + 10% @ CaCl₂
T₆: 10% aloe mucilage + 30% @ CaCl₂	T₁₄: 40% aloe mucilage + 20% @ CaCl₂
T₇: 20% aloe mucilage + 10% @ CaCl₂	T₁₅: 40% aloe mucilage + 30% @ CaCl₂
T₈: 20% aloe mucilage + 20% @ CaCl₂	T₁₆: Control (without any coating)

10. 10.

11. 11.

12. 12.

13. 13.

14. **Table 2. Effect of calcium chloride in combination with aloe mucilage on titratable acidity (%) of teasel gourd during storage.**

15. 15.

Titratable acidity (%)			
Treatments	2 nd day	4 th day	6 th day
T ₁	1.13 ^f	0.77 ^g	0.50 ^e
T ₂	0.84 ⁱ	0.70 ^h	0.46 ^f
T ₃	0.57 ^k	0.44 ^j	0.32 ^g
T ₄	1.02 ^g	0.84 ^f	0.70 ^c
T ₅	1.02 ^g	0.78 ^g	0.58 ^d
T ₆	1.53 ^d	1.08 ^d	0.71 ^c
T ₇	1.28 ^e	0.91 ^e	0.77 ^c
T ₈	1.22 ^e	0.89 ^e	0.71 ^c
T ₉	1.90 ^c	1.48 ^c	1.15 ^a
T ₁₀	2.08 ^b	1.55 ^b	1.08 ^b
T ₁₁	0.77 ^j	0.58 ⁱ	0.32 ^g
T ₁₂	0.95 ^h	0.83 ^f	0.51 ^e

Titratable acidity (%)			
T ₁₃	1.09 ^f	0.90 ^e	0.51 ^e
T ₁₄	1.05 ^g	0.92 ^e	0.73 ^c
T ₁₅	2.29 ^{a*}	1.92 ^{a*}	0.19 ^h
T ₁₆	0.70 ^j	0.58 ⁱ	0.45 ^f
SE(m) ±	0.055	0.0436	0.0458
CD at 5%	0.16	0.1307	0.1373

16. 16.

17. 17.

18. 18.

19. 19.

20. 20.

21. 21.

22. 22.

23. 23.

24. 24.

25. 25.

26. 26.

27. 27.

28. 28.

29. 29.

30. 30.

31. 31.

32. 32.

33. 33.

34. 34.

35. **Table 3. Effect of calcium chloride in combination with aloe mucilage on carotenoids (µg 100 g⁻¹) of teasel gourd during storage.**

36. 36.

Carotenoids (µg 100 g ⁻¹)			
Treatments	2 nd day	4 th day	6 th day
T ₁	94.24 ^h	107.52 ⁱ	112.32 ⁱ
T ₂	99.36 ^g	109.44 ⁱ	113.76 ⁱ
T ₃	123.12 ^d	132.24 ^e	135.36 ^f
T ₄	104.88 ^f	115.20 ^h	123.12 ^h
T ₅	132.72 ^c	144.48 ^c	136.80 ^f
T ₆	121.60 ^d	123.84 ^f	142.40 ^e
T ₇	110.88 ^e	120.08 ^g	120.96 ^h
T ₈	109.20 ^e	110.16 ^j	126.72 ^g
T ₉	140.80 ^b	145.60 ^c	155.20 ^d
T ₁₀	112.48 ^e	136.08 ^d	156.56 ^d
T ₁₁	144.48 ^a	149.52 ^b	161.28 ^c
T ₁₂	146.08 ^a	158.40 ^a	168.96 ^b
T ₁₃	112.48 ^e	102.24 ^j	115.20 ⁱ
T ₁₄	96.48 ^g	110.16 ⁱ	141.36 ^e
T ₁₅	146.08 ^a	158.40 ^a	189.84 ^a
T ₁₆	84.96 ⁱ	92.72 ^k	106.40 ^j
SE(m) ±	1.19	1.21	1.37
CD at 5%	3.55	3.64	4.12

37. 37.

38. 38.

39. 39.

40. 40.

41. 41.
42. 42.
43. 43.
44. 44.
45. 45.
46. 46.
47. 47.
48. 48.
49. 49.
50. 50.
51. 51.
52. 52.
53. 53.
54. 54.
55. 55.
56. Table 4. Effect of calcium chloride in combination with
aloe mucilage on ascorbic acid (mg 100 g⁻¹) of teasel
gourd during storage.
57. 57.

Ascorbic acid (mg 100 g ⁻¹)			
Treatments	2 nd day	4 th day	6 th day
T ₁	4.50 ^c	3.45 ^b	2.47 ^c
T ₂	3.00 ^j	1.62 ^j	1.34 ^j
T ₃	4.23 ^e	2.32 ^h	2.06 ^f
T ₄	3.90 ^h	2.93 ^f	2.10 ^f
T ₅	4.03 ^f	3.10 ^e	2.33 ^d
T ₆	4.31 ^d	3.24 ^c	2.55 ^b
T ₇	3.74 ⁱ	2.82 ^g	2.01 ^f
T ₈	4.58 ^b	3.48 ^a	2.68 ^a
T ₉	3.67 ⁱ	2.68 ^g	1.94 ^g
T ₁₀	3.54 ^j	2.57 ⁱ	1.86 ^h
T ₁₁	4.14 ^e	3.16 ^d	2.40 ^c
T ₁₂	3.96 ^g	3.03 ^e	2.22 ^e
T ₁₃	4.26 ^d	3.29 ^b	2.47 ^c
T ₁₄	3.60 ^j	2.61 ^h	1.89 ^h
T ₁₅	4.45 ^d	3.36 ^b	2.60 ^b
T ₁₆	4.68 ^a	3.54 ^a	2.72 ^a
SE(m) ±	0.02	0.02	0.02
CD at 5%	0.06	0.06	0.05

58. 58.
59. 59.
60. 60.
61. 61.
62. 62.
63. 63.
64. 64.
65. 65.
66. 66.
67. 67.
68. 68.
69. 69.
70. 70.
71. 71.

72. 72.
73. 73.
74. 74.
75. 75.
76. 76.
77. 77.
78. Table 5. Effect of calcium chloride in combination with
aloe mucilage on protein (%) of teasel gourd during
storage.
79. 79.

Protein (%)			
Treatments	2 nd day	4 th day	6 th day
T ₁	2.32 ^f	2.17 ^d	2.07 ^c
T ₂	2.25 ^h	2.08 ^f	1.95 ^f
T ₃	2.30 ^g	2.12 ^e	2.00 ^e
T ₄	2.47 ^b	2.30 ^b	2.14 ^b
T ₅	2.35 ^e	2.19 ^d	2.05 ^d
T ₆	2.51 ^a	2.33 ^b	2.18 ^b
T ₇	2.28 ^h	2.10 ^f	1.97 ^f
T ₈	2.53 ^a	2.38 ^a	2.23 ^a
T ₉	2.32 ^f	2.14 ^e	2.01 ^e
T ₁₀	2.26 ^h	2.08 ^f	1.94 ^f
T ₁₁	2.40 ^c	2.23 ^c	2.09 ^c
T ₁₂	2.35 ^e	2.19 ^d	2.04 ^d
T ₁₃	2.31 ^{fg}	2.13 ^e	2.00 ^e
T ₁₄	2.42 ^c	2.27 ^c	2.12 ^{bc}
T ₁₅	2.57 ^a	2.41 ^a	2.26 ^a
T ₁₆	2.34 ^{ef}	2.03 ^g	1.92 ^f
SE(m) ±	0.03	0.02	0.02
CD at 5%	0.10	0.06	0.05

80. 80.
81. 81.
82. 82.
83. 83.
84. 84.
85. 85.
86. 86.
87. 87.
88. 88.
89. 89.
90. 90.
91. 91.
92. 92.
93. 93.
94. 94.
95. 95.
96. 96.
97. 97.
98. 98.
99. 99.

100. Table 6. Effect of calcium chloride in combination with
aloe mucilage on iron (mg 100 g⁻¹) of teasel gourd dur-
ing storage.

101. 101.

Iron (mg 100 g ⁻¹)			
Treatments	2 nd day	4 th day	6 th day
T ₁	2.16 ^b	2.06 ^b	1.96 ^b
T ₂	2.00 ^f	1.90 ^e	1.81 ^e
T ₃	2.08 ^d	1.99 ^c	1.89 ^d
T ₄	2.22 ^a	2.12 ^a	2.03 ^a
T ₅	2.17 ^b	2.07 ^b	1.98 ^b
T ₆	2.10 ^c	2.00 ^c	1.91 ^c
T ₇	2.20 ^a	2.10 ^a	2.00 ^a
T ₈	2.13 ^c	2.03 ^b	1.94 ^c
T ₉	1.92 ^g	1.84 ^f	1.75 ^f
T ₁₀	1.97 ^f	1.88 ^e	1.79 ^e
T ₁₁	2.06 ^e	1.97 ^d	1.88 ^d
T ₁₂	2.12 ^c	2.03 ^b	1.94 ^c
T ₁₃	2.02 ^e	1.93 ^e	1.84 ^e
T ₁₄	2.24 ^a	2.14 ^a	2.05 ^a
T ₁₅	2.26 ^a	2.16 ^a	2.07 ^a
T ₁₆	1.90 ^g	1.81 ^f	1.72 ^f
SE(m) ±	0.02	0.01	0.02
CD at 5%	0.06	0.04	0.05

102. 102.

103. 103.

104. 104.

105. 105.

106. 106.

107. 107.

108. 108.

109. 109.

110. 110.

111. 111.

112. 112.

113. 113.

114. 114.

115. 115.

116. 116.

117. 117.

118. 118.

119. 119.

120. 120.

121. 121.

122. **Table 7. Effect of calcium chloride in combination with aloe mucilage on fibre (%) of teasel gourd during storage.**

123. 123.

Fibre (%)			
Treatments	2 nd day	4 th day	6 th day
T ₁	1.61 ^d	1.59 ^c	1.55 ^c
T ₂	1.57 ^f	1.53 ^e	1.49 ^f
T ₃	1.59 ^e	1.55 ^d	1.51 ^e
T ₄	1.70 ^b	1.67 ^b	1.59 ^b
T ₅	1.64 ^c	1.60 ^c	1.56 ^c
T ₆	1.72 ^b	1.69 ^b	1.65 ^a
T ₇	1.57 ^f	1.51 ^e	1.49 ^f
T ₈	1.75 ^a	1.71 ^a	1.67 ^a
T ₉	1.61 ^d	1.52 ^e	1.47 ^f

Fibre (%)			
T ₁₀	1.58 ^e	1.54 ^d	1.50 ^e
T ₁₁	1.66 ^c	1.60 ^c	1.58 ^b
T ₁₂	1.64 ^c	1.58 ^c	1.56 ^c
T ₁₃	1.59 ^e	1.55 ^d	1.51 ^e
T ₁₄	1.68 ^b	1.64 ^b	1.60 ^b
T ₁₅	1.77 ^a	1.73 ^a	1.69 ^a
T ₁₆	1.56 ^f	1.52 ^e	1.48 ^f
SE(m) ±	0.0126	0.0161	0.014
CD at 5%	0.0378	0.0483	0.0421

124. 124.

125. 125.

126. 126.

127. 127.

128. 128.

129. 129.

130. 130.

131. 131.

132. 132.

133. 133.

134. 134.

135. 135.

136. 136.

137. 137.

138. 138.

139. 139.

140. 140.

141. 141.

142. 142.

143. 143.

144. **Table 8. Effect of calcium chloride in combination with aloe mucilage on fat (%) of teasel gourd during storage.**

145. 145.

146. 146.

Fat (%)			
Treatments	2 nd day	4 th day	6 th day
T ₁	0.295 ^f	0.280 ^e	0.260 ^e
T ₂	0.265 ^j	0.250 ^h	0.225 ^h
T ₃	0.285 ^h	0.270 ^f	0.245 ^f
T ₄	0.335 ^c	0.320 ^b	0.305 ^b
T ₅	0.305 ^e	0.290 ^d	0.275 ^d
T ₆	0.345 ^b	0.330 ^b	0.315 ^b
T ₇	0.275 ⁱ	0.260 ^g	0.245 ^f
T ₈	0.355 ^a	0.340 ^a	0.310 ^b
T ₉	0.295 ^f	0.280 ^e	0.265 ^e
T ₁₀	0.285 ^h	0.270 ^f	0.255 ^e
T ₁₁	0.315 ^d	0.300 ^c	0.285 ^c
T ₁₂	0.305 ^e	0.290 ^d	0.275 ^d
T ₁₃	0.285 ^h	0.270 ^f	0.255 ^e
T ₁₄	0.275 ⁱ	0.260 ^g	0.245 ^f
T ₁₅	0.325 ^c	0.310 ^c	0.295 ^c
T ₁₆	0.365 ^a	0.350 ^a	0.335 ^a
SE(m) ±	0.005	0.010	0.007

(continued on next page)

Fat (%)			
CD at 5%	0.015	0.030	0.021
147.	147.		
148.	148.		
149.	149.		
150.	150.		
151.	151.		
152.	152.		
153.	153.		
154.	154.		
155.	155.		
156.	156.		
157.	157.		
158.	158.		
159.	159.		
160.	160.		
161.	161.		
162.	162.		
163.	163.		
164.	164.		
165.	165.		
166.	Table 9. Effect of calcium chloride in combination with aloe mucilage on fruit decay percentage (%) of teasel gourd during storage.		
167.	167.		

Fruit decay percentage (%)			
Treatments	2 nd day	4 th day	6 th day
T ₁	0	10	20
T ₂	10	20	30
T ₃	5	15	25
T ₄	0	10	20
T ₅	0	15	20
T ₆	0	10	15
T ₇	10	20	35
T ₈	0	10	10
T ₉	5	15	25
T ₁₀	10	20	30
T ₁₁	0	10	20
T ₁₂	0	15	20
T ₁₃	5	15	25

Authors

Vadikari Alekhya

Ph.D Scholar, Department of Vegetable Science, SKLTGHU, Mulugu, Siddipet, Telangana, India

Dr. B. Neeraja Prabhakar

Former Vice-Chancellor, SKLTGHU; Senior Professor (Hort.) & University Head (Retd.), PJTAU, Rajendranagar, Hyderabad, Telangana, India.

Dr. D. Laxmi Narayana

Professor (Hort.) & Director of Research, SKLTGHU, Mulugu, Telangana, India.

Dr. D. Vijaya

Professor (SSAC) & Officer In-Charge, PGIHS, SKLTGHU, Mulugu, Telangana, India.

Dr. D. Anitha Kumari

Principal Scientist (Ento.) & Head, Vegetable Research Station, Rajendranagar, Hyderabad, Telangana, India.

Dr. R. Preetham Goud

Professor & Associate Dean, College of Horticulture, Malyal, Telangana, India.

Fruit decay percentage (%)			
T ₁₄	0	10	20
T ₁₅	0	5	10
T ₁₆	10	25	45
SE(m) ±	2.1651	3.3072	3.0619
CD at 5%	6.4909	9.9149	9.1795

168. 168.

169. 169.

170. 170.

171. 171.

References

- Bhardwaj RL, Choudhary K, Hingoniya K, Priyanka, Sharma A, Meena J. Effect of calcium chloride postharvest treatment in combination with *Aloe vera gel* on fruit quality and storability of spine gourd (*Momordica dioica* Roxb.) fruits under refrigeration condition. *Journal of Applied Horticulture*. 2024;26(4):423–428.
- Hasan MU, Riaz R, Malik AU, Khan AS, Anwar R, Rehman RNU, Ali S. Potential of *Aloe vera gel* coating for storage life extension and quality conservation of fruits and vegetables: An overview. *Journal of Food Biochemistry*. 2021;45(4):e13640.
- Farina V, Passafiume R, Tinebra I, Scuderi D, Giardina G, Schirra M. Postharvest application of *Aloe vera* gel-based edible coating to improve the quality and storage stability of fresh-cut papaya. *Journal of Food Quality*. 2020;8303140.
- Amiri S, Rezazad Bari L, Malekzadeh S, Amiri S, Mostashari P, Ahmadi Gheshlagh P. Effect of *Aloe vera* gel-based active coating incorporated with catechin nanoemulsion and calcium chloride on postharvest quality of fresh strawberry fruit. *Journal of Food Processing and Preservation*. 2022;46(10):e15960.
- Shabir R, Riaz A, Shah SM, Sohail A. *Aloe vera gel* coating along with calcium chloride treatment enhance guava (*Psidium guajava* L.) fruit quality during storage. *Pure and Applied Biology*. 2021;10(3):549–565.
- Panse VG, Sukhatme PV. Statistical methods for agricultural workers (4th ed.). Indian Council of Agricultural Research; 1985.
- Table 1. Effect of calcium chloride in combination with aloe mucilage on total soluble solids (0 Brix) of teasel gourd during storage.

How to cite this article: Alekhya V, Prabhakar BN, Narayana DL, Vijaya D, Kumari DA, Goud RP, et al. Effect of *Aloe vera* mucilage and calcium chloride treatments on postharvest quality and shelf life of teasel gourd. *International Journal of Advanced Biochemistry Research*. 2026;SP-10(10):612-619. doi: <https://www.doi.org/10.33545/26174693.2026.v10.i10Sh.10348>

Dr. G. Sathish

Assistant Professor (Statistics), PGIHS, SKLTGHU, Mulugu, Telangana, India.