



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
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NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; 9(5): 275-278
Received: 16-02-2026
Accepted: 19-03-2026

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Effect of different packaging materials on shelf life of fresh coriander (*Coriandrum sativum* L.) leaves under refrigerated conditions

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DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i5d.5515>

Abstract

The present investigation entitled “Effect of different packaging materials on shelf life of fresh coriander (*Coriandrum sativum* L.) leaves under refrigerated conditions” was conducted during the year 2024-25 at the lab in Vegetable Science under Pt. KLS College of Horticulture and Research Station, Rajnandgaon, (C.G.). The experiment was laid out under of completely randomized design (CRD) with three replication and the experimental materials was consist of ten treatments at different interval (4 days) till 40 days out of which treatment T₇ was found best for minimum physiological loss in weight (19.52%), yellowing (3.57%), decay (1.50%), shriveling (0.75%), moisture (46.04%), dry matter content (90.38%), ascorbic acid (51.31 mg/100 g) and shelf life (39.67 days) at 40 days respectively followed by T₉ physiological loss in weight (45.70%), yellowing (2.88%), decay (1.80%), shriveling (4.47%), moisture (43.51%), dry matter content (88.82%), ascorbic acid (49.18 mg/100 g) and shelf life (36.09 days).

Hence the treatment T₇ (Glass container) may be recommended for packaging materials for improvement of shelf life and quality parameters of coriander leaves.

Keywords: Coriander, packaging material, shelf life, storage condition

Introduction

Coriander is generally known as “*dhania*, dhane, cilantro” belongs to family *Apiaceae*. (Ahmed, 1984) [1]. The stem, leaves and fruits of this widely acclaimed crop have a pleasant aromatic flavor and is used in preparing chutney, sauces and soup. Medicinal potentiality of coriander is widely acclaimed (Enas, 2010, Shukla *et al.* 2013 and Samyah, 2014) [3, 10., 9]. Coriander leaves are an excellent source of vitamin A (6.75 IU/100 gm) and vitamin C (27 mg/100 g) and along with these nutrients, each serving of coriander leaves is loaded with a potful of nutrients like dietary fibre, iron (0.07 mg), manganese (1.04), calcium (2.68 mg), vitamin K (12.4 mg), phosphorus (1.92 mg) and potassium (20.84 mg).

In India coriander is cultivated under an area of 629 thousand hectares with an annual production of 822 thousand MT (Anon., 2024). In Chhattisgarh total area of coriander cultivation 14.98 hectare and production is 59.68 MT.

Over the last couple of years, demand for fresh coriander herbs in India and over has increased rapidly with a potential for further market expansion both at domestic as well as export. Just like many other food products which are perishable by nature, it requires protection from spoilage during their preparation, storage and distribution to give them desired shelf-life. Approximately 85% of growers and distributors have very little knowledge of handling the fresh leaves particularly during transport.

In order to select a suitable packaging material, the use of low-cost packaging materials and refrigerated condition are probably the two most important means of extending the storage life of fresh coriander leaves at household level. Coriander leaves are highly perishable and prone to quick spoilage due to their high moisture content and metabolic activities. Proper storage is essential to extend their shelf life.

Materials and Methods

The present study involved the evaluation of different packaging materials on shelf life of fresh coriander (*Coriandrum sativum* L.) leaves under refrigerated conditions. The study conducted on Completely Randomized Design (CRD) comprising with 10 treatments of packaging material including control which are (T₀) Without packaging (control), (T₁) - Brown paper, (T₂) LDPE wrapping, (T₃) High density plastic box, (T₄) Cotton cloth bag, (T₅) Ecofriendly jute bag, (T₆) Newspaper, (T₇) Glass container, (T₈) Organic (Biodegradable) bag, (T₉) Polypropylene pouch (PP), were procured from the market. Processed coriander leaves weighing 100 g were filled in each packaged material, so on the packaged coriander leaves were kept in refrigerated storage at 3-4°C Temperature. The observation was recorded in interval of 4 days till 40 days.

Results and Discussion

Physiological loss in weight (%)

The observations during research that reported on Physiological loss in weight revealed that the influence on physiological loss in weight (%) is variable for various treatments during studies. The minimum loss of observed that T₇ (Glass containers) in 04 to 40 days like (4.68 to 19.52%) followed by T₉ (Polypropylene pouch) in 04 to 36 days like (6.88 to 45.70%). The minimum physiological loss in weight was observed in T₇ (glass containers) which is followed by T₉ (poly propylene pouch) due to the minimum yellowing, decay, shriveling percent and may be due to slow down respiration observed in T₇ (glass container). It is a pioneer work regarding glass container as a treatment. This result was supported by Nainar *et al.* (1997) [15].

Yellowing (%)

The observations during research that reported on yellowing (%) revealed that the influence on yellowing (%) is variable for various treatments during studies. The minimum yellowing (%) of observed that T₇ (Glass containers) in 04 days was no yellowing percent and 40 days was 3.57% followed by T₉ (Polypropylene pouch) in 04 days was no yellowing percent and 36 days was 2.88%. The minimum yellowing percent was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to chlorophyll degradation and contamination observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was supported by Sahu *et al.* (2024) [18].

Decay (%)

The observations during research that reported on decay (%) revealed that the influence on decay (%) is variable for various treatments during studies. The minimum decay (%) of observed that T₇ (Glass containers) in 04 days was no decay percent and 40 days was 1.50% followed by T₉ (Polypropylene pouch) in 04 days was no decay percent and 36 days was (2.88%). The maximum decay percent was observed in T₇ (glass container) which is followed by T₉ (poly propylene pouch) due to slow down enzymatic and microbial activities observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was supported by Sundrum (2016).

Shriveling (%)

The observations during research that reported on shriveling (%) revealed that the influence on shriveling (%) is variable for various treatments during studies. The minimum shriveling (%)

of observed that T₇ (Glass containers) in 04 days was no shriveling percent and 40 days was 1.90% followed by T₉ (Polypropylene pouch) in 04 days was no shriveling percent and 36 days was 4.47%. The minimum shriveling percent was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to lower respiration and transpiration yellowing (%) observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was supported by Povratanak *et al.*, (2015) [17].

Moisture (%)

The observations during research that reported on moisture (%) revealed that the influence on moisture (%) is variable for various treatments during studies. The minimum moisture (%) of observed that T₇ (Glass containers) in 40 days like (46.04%) followed by T₉ (Polypropylene pouch) in 36 days like (43.51%). The minimum moisture percent was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to delay in physiological weight loss and may be due to moisture retention observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was supported by Garande *et al.*

Dry matter content (%)

The observations during research that reported on dry matter content (%) revealed that the influence on dry matter content (%) is variable for various treatments during studies. The minimum dry matter content (%) of observed that T₇ (Glass containers) in 40 days like (90.38%) followed by T₉ (Polypropylene pouch) in 36 days like (88.82%). The minimum dry matter content percent was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to reduced ethylene production observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was supported by Ndiya *et al.*

Ascorbic acid (mg/100 g)

The observations during research that reported on ascorbic acid (mg/100 g) revealed that the influence on ascorbic acid (mg/100 g) is variable for various treatments during studies. The minimum ascorbic acid (mg/100 g) of observed that T₇ (Glass containers) in 04 days like (51.31 mg/100 g) followed by T₉ (Polypropylene pouch) in 04 days like (49.18 mg/100 g). The minimum ascorbic acid (mg/100 g) content was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to slow down oxidative reaction and enzymatic degradation observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. Similar results are seen by Kamat *et al.*

Shelf life (days)

The observations during research that reported on shelf- life (days) revealed that the influence on shelf- life (days) is variable for various treatments during studies. The minimum shelf- life (days) of observed that T₇ (Glass containers) in 40 days followed by T₉ (Polypropylene pouch) in 36 days. The minimum shelf life was observed in T₇ (glass container) which is followed by T₉ (Poly propylene pouch) due to store in airtight glass container there by delaying senescence observed in T₇ (glass container) it is a pioneer work regarding glass container as a treatment. This result was similar by Rai *et al.* (2019) [12].

Table 1: Effect of different packaging material on shelf life of fresh coriander leaves on physiological loss in weight (%)

Analysis of mean (Physiological loss in weight (%))										
Notations	4 DAYS	08 DAYS	12 DAYS	16 DAYS	20 DAYS	24 DAYS	28 DAYS	32 DAYS	36 DAYS	40 DAYS
T ₀	55.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₁	46.88	38.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₂	9.00	3.63	4.08	15.79	22.89	26.55	31.41	41.29	50.82	0.00
T ₃	14.24	4.85	11.48	21.85	63.00	0.00	0.00	0.00	0.00	0.00
T ₄	48.86	57.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₅	46.60	38.54	37.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₆	47.72	39.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₇	4.68	2.60	2.89	15.03	11.47	12.77	20.82	5.81	18.19	19.52
T ₈	12.53	4.12	4.18	16.69	26.05	27.75	31.53	42.21	0.00	0.00
T ₉	6.88	3.60	3.84	15.56	13.37	23.52	26.98	31.08	45.70	0.00
SEm (±)	0.75	0.52	0.165	0.241	0.331	0.224	0.312	0.296	0.301	0.052
CD (5%)	2.22	1.54	0.49	0.71	0.98	0.66	0.92	0.87	0.89	0.15
CV (%)	4.46	4.68	4.49	4.92	4.19	4.29	4.87	4.25	4.54	4.63

*T₀ – Without packaging (control) T₃- High density plastic box T₆- Newspaper T₉- PP (Polypropylene pouch)
 T₁- Brown paper T₄- Cotton cloth bag T₇- Glass container
 T₂- LDPE Wrapping T₅- Eco-friendly jute bag T₈- Organic (Biodegradable) bag

Table 2: Effect of different packaging material on shelf life of fresh coriander leaves on yellowing

Analysis of Mean (Yellowing%)										
Notations	04 days	08 days	12 days	16 days	20days	24 days	28 days	32 days	36 days	40 days
T ₀	2.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₁	0.00	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₂	0.00	1.23	1.32	0.00	4.47	0.00	8.25	4.82	3.84	0.00
T ₃	0.00	2.22	3.07	7.16	6.10	0.00	0.00	0.00	0.00	0.00
T ₄	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₅	1.61	0.00	8.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₆	2.15	4.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₇	0.00	0.78	1.13	1.79	4.32	1.51	2.29	2.40	2.18	3.57
T ₈	1.18	2.22	2.17	6.56	5.19	3.14	8.30	5.68	0.00	0.00
T ₉	0.00	1.15	1.22	3.82	4.40	1.92	5.46	3.28	2.88	0.00
SEm (±)	0.020	0.038	0.016	0.051	0.058	0.023	0.042	0.027	0.017	0.006
CD (5%)	0.06	0.11	0.05	0.15	0.17	0.07	0.12	0.08	0.05	0.02
CV (%)	4.75	4.61	3.14	3.20	4.09	3.78	2.98	2.87	3.25	2.91

*T₀ – Without packaging (control) T₃- High density plastic box T₆- Newspaper
 T₁- Brown paper T₄- Cotton cloth bag T₇- Glass container
 T₂- LDPE Wrapping T₅- Eco-friendly jute bag T₈- Organic (Biodegradable)
 T₉- PP (Polypropylene pouch)

Table 3: Effect of different packaging material on shelf life of fresh coriander leaves on decay (%)

Analysis of Means (Decay%)										
Notations	04 days	08 days	12 days	16 days	20days	24 days	28 days	32 days	36 days	40 days
T ₀	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₁	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₂	0.00	1.80	0.00	0.00	3.45	0.00	1.27	0.00	3.21	0.00
T ₃	1.29	0.00	0.00	2.35	4.39	0.00	0.00	0.00	0.00	0.00
T ₄	0.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₅	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₆	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₇	0.00	0.00	0.00	2.14	1.61	0.00	0.00	0.00	0.00	1.50
T ₈	0.00	0.00	0.00	2.26	0.00	0.00	0.00	1.11	0.00	0.00
T ₉	0.00	0.00	1.07	2.23	2.35	1.80	0.00	0.00	0.00	0.00
SEm (±)	0.003	0.008	0.002	0.018	0.022	0.004	0.002	0.002	0.006	0.003
CD (5%)	0.01	0.02	0.01	0.05	0.07	0.01	0.01	0.01	0.02	0.01
CV (%)	3.75	3.30	3.40	3.54	3.26	3.65	2.49	3.85	3.48	3.16

*T₀ – Without packaging (control) T₃- High density plastic box T₆- Newspaper
 T₁- Brown paper T₄- Cotton cloth bag T₇- Glass container
 T₂- LDPE Wrapping T₅- Eco-friendly jute bag T₈- Organic (Biodegradable) bag
 T₉- PP (Polypropylene pouch)

Table 4: Effect of different packaging material on shelf life of fresh coriander leaves on shriveling (%)

Analysis of Means (Shrivelling%)										
Notations	04 days	08 days	12 days	16 days	20days	24 days	28 days	32 days	36 days	40 days
T ₀	12.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₁	10.48	19.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₂	0.00	0.00	1.12	2.55	3.10	7.18	3.32	4.79	9.38	0.00
T ₃	0.00	2.41	2.25	8.44	9.52	0.00	0.00	0.00	0.00	0.00
T ₄	12.08	23.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₅	8.32	0.00	2.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₆	11.23	20.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T ₇	0.00	0.00	0.00	0.00	0.00	3.27	1.12	1.80	1.90	0.75
T ₈	0.00	0.00	1.65	2.81	4.36	7.48	4.54	9.66	0.00	0.00
T ₉	0.00	0.00	0.00	0.00	2.50	3.44	2.52	3.77	4.47	0.00
SEm (±)	0.088	0.120	0.008	0.038	0.042	0.030	0.029	0.031	0.019	0.001
CD (5%)	0.26	0.36	0.02	0.11	0.12	0.09	0.09	0.09	0.06	0.03
CV (%)	2.79	3.16	1.86	4.81	3.73	2.47	4.42	2.69	2.13	2.45

T₀- Without packaging (control)T₃- High density plastic boxT₆- NewspaperT₉- PP (Polypropylene pouch)T₁- Brown paperT₄- Cotton cloth bagT₇- Glass containerT₂- LDPE WrappingT₅- Eco-friendly jute bagT₈- Organic (Biodegradable) bag**Table 5:** Effect of different packaging materials on shelf life of fresh coriander leaves under refrigerated conditions

Notations	Moisture (%)	Dry matter content (%)	(Ascorbic acid mg/100 gm)	Shelf life (Days)
T ₀	10.03	53.87	45.16	4.89
T ₁	20.56	64.45	46.88	7.11
T ₂	36.37	83.23	48.80	35.67
T ₃	31.13	76.95	47.33	18.56
T ₄	12.02	56.74	45.54	6.67
T ₅	22.99	69.99	47.20	9.89
T ₆	17.86	63.81	45.98	6.89
T ₇	46.04	90.38	51.31	39.67
T ₈	35.93	79.18	48.34	31.67
T ₉	43.51	88.82	49.18	35.56
SEm (±)	0.270	0.487	1.212	0.149
CD (5%)	0.80	1.44	3.57	0.44
CV (%)	1.69	1.16	4.41	1.31

References

- Ahmed KMU, Pashu P, Sampad OM. Plant, Animal-Bird and Fish Wealth. New Market, Dhaka: Sarbajanin Granthalay; 1984. p. 235.
- Anonymous. Horticulture and Farm forestry. Nava Raipur, Atal Nagar, C.G.; 2024. p. 10.
- Enas AK. Study the possible protective and therapeutic influence of coriander (*Coriandrum sativum* L.) against neurodegenerative disorders and Alzheimer's disease induced by aluminum chloride in cerebral cortex of male albino rats. Researcher. 2010;2(8):24-33.
- Grande VK, Raut PD, Shinde US, Sonawane PN, Dhumal SS, Sonawane PN. Studies on storage behaviour of primary leafy vegetables under different storage conditions. Int J Curr Microbiol Appl Sci. 2019;8(6):249-272.
- Nainar P, Bsalakrishnan K, Pappiah C, Sambandamurthi S. Studies on improving the shelf life of green amaranthus through different storage methods. South Indian Hort. 1997;45(5-6):293-296.
- Ndisya J, Mbugu D, Kulig B, Gitau A, Hensel O, Sturm B. Hot air drying of purple-speckled cocoyam (*Colocasia esculenta* L.) slices: Optimisation of drying conditions for improved product quality and energy savings. Therm Sci Eng Prog. 2020;12:2451-2459.
- Povratanak H, Gnean ND, Vouchsim K, Borarin B. Effects of NaOCl and LDPE packaging on postharvest quality of tomatoes. J Food Nutr Sci. 2015;3(2):9-12.
- Sahu P, Sharma SP, Singh J, Paikra MS, Nishad D, Kumar A. Effect of different storage condition on storage behavior of primary processed leafy vegetables. Int J Res Agron. 2024;7(11):314-324.
- Samyiah DJ. The antimicrobial activity of some plant extracts, commonly used by Saudi people, against multidrug resistant bacteria. J Life Sci. 2014;11(8):78-84.
- Shukla AN, Srivastava S, Rawat AKS. A survey of traditional medicinal plants of Uttar Pradesh (India) used in treatment of infectious diseases. Nat Sci. 2013;11(9):24-36.
- Sundaram V. Studies on storability of vegetables in zero energy cool chamber. Agric Sci Digest. 2016;36(2):244-246.
- Rai M, Ingle AP, Gupta I, et al. Smart nanopackaging for the enhancement of food shelf life. Environ Chem Lett. 2019;17:277-290.