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Effect of Post Harvest Chemical Treatment on the Post Harvest Life of Jasmine (*Jasminum sambac* L. Aiton) Flowers

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A B S T R A C T

Investigation was carried out in the Department of Post harvest Management of fruit, Vegetable and Flower crops, Faculty of Agriculture, Post Graduate Institute of Post Harvest management of Dr.Balasaheb Sawant Konkan Krishi Vidypeeth, Dapoli during 2018-2019 to find out the effect of post harvest chemical treatment on post harvest life of Jasmine (*Jasminum sambac* L. Aiton) in Factorial Completely randomized Design (FCRD) with Ten treatment and three replications. Packaging material of polyethylene (PE) bags 200 gauge without ventilation is used. The periodical observations recorded every 24 hrs from 0hrs to 72 hrs. were physiological loss of weight, freshness index, flower opening index, colour retention score, fragrance index and shelflife. Results of this experiment envisaged that flowers treated with 4% boric acid proved effective in extending shelf life of Jasmine flower buds up to 81 hours with less physiological loss of weight, flower opening index, colour retention score and fragrance index and high freshness index and shelflife.

Introduction

Mogra (Jasmine) is one of the most important commercial flower crop widely cultivated in India and esteemed for its attractive fragrant flowers. The genus *Jasminum* have more than 200 species, among them 04 are cultivated commercially in India. Among the important species of jasmine, *Jasminum sambac* is the most common, is also known as Arabian Jasmine. The term jasmine is derived from an Arabic word "Jessamine" and in Persian language it is called as "Yasmin" or "Yasmyn" which means fragrance (Bailey, 1947). Jasmine oils are used for manufacture of cosmetics, soaps, confectionary perfumes, perfumed tobacco, syrups, aerated water, ointments, disinfectants and detergents.

Flowers are used for making garland, hair adornments of woman and for medicinal purpose. The fragrance of jasmine flower cannot be imitated by any one of the known synthetic aromatic chemicals (Bhattacharjee, 1980). The annual production of flowers in India is more than 199.26 MT and in Maharashtra, it is 2.46 MT (Anon., 2018). In India, if we avoid wastage of horticultural produce up to 2% from field to market, there will be saving of 100 to 200 crores per year (*Ramana et al.,* 1988). Keeping this in mind, A study was undertaken to increase shelflife of jamine flower with giving different pre chemical treatment.

Materials and Methods

The present research was carried out in the department of Post Harvest Management of Fruit, Vegetable and Flower crops, college Post Graduate Institute of Post Harvest Management. Killa-Roha, Raigad, Maharshtra during 2018-19. This experiment was laid out in Factorial Completely Randomized Design with 10 treatments and 3 replication. The treatments are: T1 – 1% Sucrose solution T2- 2%Sucrose Solution, T3- 3% Sucrose solution, T4- 2% Boric acid, T5- 4% Boric acid, T6-6% Boric acid, T7- 100 ppm Sodium benzoate solution, T8- 150 ppm Sodium benzoate solution, T9- 200 ppm Sodium benzoate solution and T10- Control (Distilled water treatment). Flowers are kept in 200 gauge polythene bag and stored at 12±1 °C. 50g of uniform size, freshly harvested flowers are used for each treatments and observation like physiological loses of weight (PLW), freshness score, fragrance score, colour retention score, flower opening index and shelf life were recorded during storage of flowers at 24 hours of intervals.

Physiological loses of weight was calculated by subtracting fresh weight of flowers at the time of packing and at 12^{th}, 24^{th}, and 36^{th}hr. after harvesting of flowers and expressed as percentage. Visual parameters like freshness and fragrance score which is used by Madaiah, (1991) and colour retention score were recorded based on scale, the score was expressed on 0 to 4 and average was calculated. Shelf life of the flower was measured as time taken to wilt 50% of flowers. The resulted data were statistically analyzed using the method of Panase and Sukhatme (1967) and Amdekar (2014).

Result and Discussion

The result obtained in respect of post harvest pre chemical treatment effect and shefllife of Jasmine flower viz., freshness index, fragrance score, flower opening index, colour retention score, physiological loss in weight and shelflife flowers revealed that there were significant effect of post harvest chemical treatment.

Effect on physiological loss in weight of jasmine flower during storage period

The data in respect to the effect on physiological loss in weight of jasmine flower during storage period are presented in Table - 1. There were significant effects of various post harvest treatment on physiological loss weight of jasmine flowers. The treatment T_5 (1.15) have less PLW, were significantly superior to all other treatment. The treatment T10 were recorded higher PLW i.e., (4.01).Similar result was observed by Jawaharlal *et al.,* (2012) in jasmine flowers.

Effect on Freshness index of jasmine flower during storage period

The data respect to freshness index is presented in Table 2. The treatment T10 (83.62) were recorded less freshness index and the treatment T5 (97.13) were recorded higher freshness index which was

significantly different with the all other treatment. The treatment T5 was at par with treatment T6. The treatment T5 were recorded higher freshness index (90.90) at 72 hours of storage period. Similar result was observed by Manimaran *et al.*, (2108) and Patel *et al.*, (2017) during storage study on jasmine flowers.

Effect on flower opening index of jasmine flower during storage period

The data pertaining to the flower opening index during storage period are shown in the Table no. 3. The treatment T5 (6.38%) were recorded lowest mean flower opening index and which was significantly different with all other treatment. The lowest flower index (0.24) was recorded at 24 hours of storage period and highest flower opening index (34.80) was recorded at 72 hours of storage period. Similar result was observed by Karuppaiah *et al*., (2006) and Patel *et al.*, (2017) during storage study on jasmine flowers.

Effect on colour retention score of jasmine flower during storage period

The data related to colour retention score of jasmine flower during storage period are shown in Table 4. The treatment T10 recorded lower colour retention score i.e. (2.88). The treatment T3 was recorded higher colour retention score which was found significantly superior over all other treatments. However the treatment T2 (3.29), T5 (3.25) and T6 (3.25) were found at par with the treatment T3. Similar result was also recorded Yathindra *et al.*, (2018) in jasmine flower.

Table.1 Effect on physiological loss in weight of jasmine flower during storage period

Treatment	Physiological loss in weight (%)				Mean
	Storage period (hours)				
	0	**24**	**48**	**72**	
T1	0	1.95	5.33	7.99	**3.82**
T2	0	0.65	2.73	6.11	**2.37**
T3	0	1.65	4.33	7.37	**3.34**
T4	0	1.74	3.29	5.22	**2.56**
T5	0	0.50	1.55	2.54	**1.15**
T6	0	0.89	2.86	4.68	**2.11**
T7	0	1.64	4.57	8.16	**3.59**
T8	0	1.35	3.64	7.22	**3.05**
T9	0	1.15	4.58	7.72	**3.36**
T10	0	1.45	4.30	10.29	**4.01**
Mean	0	1.30	3.72	6.73	
	S.Em ±		**CD at 5%**		
Treatments (T)	0.13			0.37	
Storage (S)	0.08			0.24	
Interaction (T×S)	**0.26**			NS	

Table.2 Effect on Freshness index of jasmine flower during storage period

Treatment	Freshness index				Mean
	Storage period (hours)				
	0	24	48	72	
T1	100.00	95.47	92.71	78.49	**91.67**
T2	100.00	96.27	92.91	80.77	**92.49**
T3	100.00	96.64	93.22	81.76	**92.91**
T4	100.00	97.95	96.54	90.39	**96.22**
T5	100.00	98.79	98.81	90.90	**97.13**
T6	100.00	97.72	97.18	90.43	**96.33**
T7	100.00	95.20	88.69	75.33	**89.80**
T8	100.00	95.22	89.78	76.59	**90.40**
T9	100.00	95.72	90.31	77.82	**90.96**
T10	100.00	88.80	77.46	68.24	**83.62**
Mean	100.00	95.78	91.89	80.44	
	S.Em ±		**CD at 5%**		
Treatments (T)	0.20			0.55	
Storage (S)	0.12			0.35	
Interaction (T×S)	**0.39**			NS	

Table.3 Effect on flower opening index of jasmine flower during storage period

Treatment	Flower opening index				Mean
	Storage period (hours)				
	0	24	48	72	
T1	0	5.55	13.25	33.54	**13.84**
T2	0	6.75	14.73	37.13	**14.65**
T3	0	7.70	16.37	40.66	**16.18**
T4	0	1.47	3.92	28.57	**8.49**
T5	0	0.24	4.44	20.83	**6.38**
T6	0	0.71	4.97	26.99	**8.17**
T7	0	8.90	17.88	42.04	**17.21**
T8	0	9.87	21.35	42.80	**18.50**
T9	0	11.28	23.46	43.09	**19.46**
T10	0	17.82	57.49	63.90	**34.80**
Mean	0	6.96	17.85	38.26	
	S.Em ±		**CD at 5%**		
Treatments (T)	0.38		**1.07**		
Storage (S)	0.24		**0.68**		
Interaction (T×S)	**0.76**		**NS**		

Table.4 Effect on colour retention score of jasmine flower during storage period

Treatment	Colour retention score				Mean
	Storage period (hours)				
	0	24	48	72	
T1	4.00	3.67	2.67	2.33	**3.17**
T2	4.00	3.50	3.00	2.67	**3.29**
T3	4.00	3.33	3.00	3.00	**3.33**
T4	4.00	3.33	3.00	2.50	**3.21**
T5	4.00	3.00	3.00	3.00	**3.25**
T6	4.00	3.17	3.00	2.83	**3.25**
T7	4.00	3.33	2.67	2.33	**3.08**
T8	4.00	3.33	2.67	2.17	**3.04**
T9	4.00	3.33	3.00	2.17	**3.13**
T10	4.00	3.33	2.17	2.00	**2.88**
Mean	4.00	3.33	2.82	2.50	
	S.Em ±		**CD at 5%**		
Treatments (T)	0.10		**0.29**		
Storage (S)	0.07		**0.19**		
Interaction (T×S)	**0.21**		**NS**		

Table.5 Effect on fragrance index and shelflife of jasmine flower during storage period

Treatment	Fragrance index				Mean	Shellife (Hrs.)
	Storage period (hours)					
	0	24	48	72		
T1	2.00	2.67	3.00	3.33	2.75	**68.12**
T2	2.33	2.67	3.00	3.33	2.83	**69.94**
T3	2.00	2.33	3.00	3.33	2.67	**70.74**
T4	2.00	2.33	3.00	3.17	2.63	**82.58**
T5	2.00	2.17	2.33	3.00	2.38	**84.00**
T6	2.00	2.00	3.00	3.17	2.54	**77.67**
T7	2.00	3.00	3.33	3.83	3.04	**61.59**
T8	2.00	2.67	3.33	3.83	2.96	**62.61**
T9	2.00	2.39	2.89	3.33	2.65	**64.91**
T10	2.00	2.33	3.00	3.67	2.75	**51.12**
Mean	2.03	2.46	2.99	3.40		
	S.Em ±			**CD at 5%**		
Treatments (T)	0.10			**0.27**		
Storage (S)	0.06			**0.17**		
Interaction (T×S)	**0.19**			**NS**		

Photograph-1

4% treated flowers after 72 hours

Untreated flowers after 72 hours

Effect on fragrance index and shelflife of jasmine flower during storage period

The data pertaining to the fragrance index an shelflife of jasmine flower during storage period are shown in Table 5. A significant difference was found in the fragrance index of jasmine buds in all the treatments. The treatment T5 recorded the lowest (2.38) mean value for fragrance index and it was at par with the treatments T6 [6% boric acid] and the treatment T4. The highest (3.04) mean value for fragrance index was observed in the treatment T7 were was at par the treatments T8 and T2. The similar result recorded by Yathindra *et al.*, (2018).

The highest shelflife (84.00 hours) of jasmine flower was recorded in treatment T5 and this treatment was superior to all other treatments followed the treatment T4, T6 and treatment T3.Similar observation was made by Thamaraiselvi *et al.*, (2010) in Jasminum sambac and Nirmala and Reddy (1993) was also observed significant increase in shelf life due to packaging and storage conditions in jasmine.

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