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Sachi Gupta
College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Ayodhya, Uttar Pradesh, India

Ashok Kumar
College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Ayodhya, Uttar Pradesh, India

Sanjay Pathak
Department of Plant Pathology Acharya Narendra College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Ayodhya, Uttar Pradesh, India

Nishakant Maurya
College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sachi Gupta
College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Ayodhya, Uttar Pradesh, India

Biocides effect on different cultivars of gladiolus (*Gladiolus grandiflorus* L.) to assess the vase life

Sachi Gupta, Ashok Kumar, Sanjay Pathak and Nishakant Maurya

Abstract
In order to understand the effect of two preservatives along with their chemical combination on gladiolus to assess the vase life under Eastern Uttar Pradesh condition. The experiment was conducted in the laboratary of department of horticulture ANDUA&T, Ayodhya (U.P.), India during 2018. The CRD design with 6 Treatments and 3 replications has been used under the study. The preservative has been taken was aluminium sulphate and bleaching powder along with the distilled water as control and others denoted as T_1,T_2, T_3, T_4, T_5, T_6 respectively. The result indicates that aluminium sulphate to be the best preservative with White Prosperity and Red Beauty for maximum floret opening, increase in spike length and longer vase life within the western U.P. for the season.

Keywords: $Al_2(SO_4)_3$, Bleaching powder, gladiolus, preservatives, sucrose, cut spike etc.

Introduction
In northern plains of U.P. commercial cultivation of Gladiolus is gaining popularity due to prevailing congenial climatic conditions for planting form August to December and spikes are available from 1st week of January to end of March. In India most of the cultivars of the gladiolus were introduced. The use of floral preservatives is the most economical practical methods for extending post-harvest life of gladiolus cut flower. The vase life of cut flower is influenced by constant water supply, checking of microbial growth prevention of ethylene formation and energy source. Several types of floral preservatives in form of germicides, ethylene antagonist and source of energy (Sucrose) are in use to preserve the flower quality and extending post-harvest longevity of cut flowers. A lot of works have been done for the study of Gladiolus with the different chemicals in different part of India, but less work has been done in this direction in Uttar Pradesh. In the present study, an attempt has been made for the chemical effect of biocide on different varieties of Gladiolus most commonly cultivated in UP.

Material and methods
The present study was performed in February 2018. The experiment on flowers were held in the laboratory at ambient room temperature and 80 ± 5ºC% relative humidity (RH).Under this study 3 replication for each 6 treatments like T_1,T_2,T_3,T_4,T_5 and T_6 have been taken as $Al_2(SO_4)_3$ (300 ppm) + Sucrose (20%), Chlorine (50ppm) [source: Bleaching Powder] + Sucrose(20%) along with Distilled water (control) respectively, under layout of CRD. Total 6 treatments and 3 flower scales per treatment has been taken for the study. The cut spikes have been harvested in the morning between 7 to 8 am. In order to understand the effect of two preservatives [Aluminum Sulphate (B_1), Chlorine (B_2)] upon the following three varieties of gladiolus (White Prosperity, Red Beauty and Novalux) the vase life was monitored. Thereafter, in laboratory the spikes have cut to a constant length of each treatment in replication and results were recorded.

Preparation of floral preservative solution
Two chemicals viz. Aluminium sulphate and Chlorine (Source: Bleaching Powder) have used along with the combination of sucrose for assessment of quality parameter (preservatives) of cut gladiolus flower. The stock solution of Aluminium Sulphate [Al_2 $(SO_4)_3$] at 300ppm + sucrose (20%) and Chlorine at 50ppm (Source: Bleaching Powder) + sucrose (20%) were prepared by dissolving proportionate weight in milligram of individual chemical in distilled water and then final volume make up to 500 ml.

All the holding solution has been stored in 500 ml flask and covered with cotton plug to avoid contamination, evaporation for further use.

Statistical analysis

The experiments were conducted in Completely Randomized Design with 6 treatments and 3 replications during vase-life study. The collected data were analysed to find out the significant treatment at 5% and 1% (Panse and Sukhatme, 1985).

Results and discussion

Percent opening of florets

Data as embodied in Table clearly reveals that opening of floret take place in some of the treatment up till 12th day. Maximum opening of floret was recorded in T_6 (V_3B_2) i.e Nova lux with Chlorine (Source: Bleaching Powder) but the long term opening of floret was in aluminium sulphate with nova lux this is might be due to absorption of higher amount of vase solution that facilitated to more uptake of sucrose.

Per cent increase in spike length

The different level of holding solution showed significant effect on increase in spike length over control in Table. The increase in spike length ranged from 0.72 to 0.03%. The maximum increase in spike length (0.72%) was observed with T_3 (V_2B_1) followed by T_4 (V_2B_2) while it was lowest in T_1 and T_6. On the 10th day of vase life maximum increase was observed in the T_1 (V_1B_1) and T_3(V_2B_1). The continuous increase in spike length was observed in all the treatments as cell division and elongation were continued in spikes even after harvesting.

Per cent drooping of florets

There was no drooping was recorded till 4th day of observation and then after a progressive increase in florets drooping up till the end of the experiment. The minimum drooping was observed with T_3 (V_2B_1) which was 32.47% that might be because the fact that sucrose acts as carbon source, maintains mitochondrial structure and provide longer period energy to delay the senescence of florets (Halevy and Mayak, 1981; Kaur *et al*., 2006) [6, 7].

Per cent absorption of vase solution

It can be seen from the data presented in Table, on absorption of vase solution during vase-life study. Cut spikes of different treatments having different order which significantly affect the vase solution uptake, there after absorption was decreased till 12th day but the uptake was lesser in the treatment containing Chlorine (Source: Bleaching Powder) this might due to the presence of chlorine which causes stomatal closing. The maximum absorption was with aluminium sulphate because solution exerted a dual effect in delaying senescence by increasing water uptake and reducing water loss, thereby improving water balance and sucrose helps in maintaining the water balance and turgidity. The maximum absorption of vase solution was observed in the T_3 (V_2B_1).

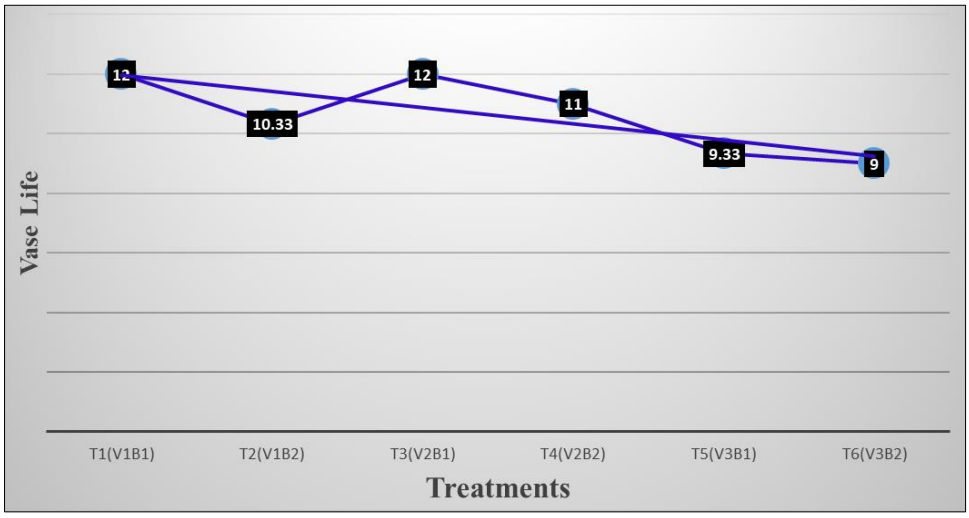
Vase-life

Observations presented in Table, reveals that maximum (12.00 days) vase-life was recorded in T_1 and T_3 solution which was significantly higher in comparison to T_1, T_2, T_3, T_4, and T_6 treatments. The longer vase-life might be because of influence of mineral salts such as $Al_2(SO_4)_3$ on the physiological and biochemical changes of cut spikes of gladiolus in relation to extension of vase life and was attributed to their effective increase in the permeability of the cell membrane and keeping the peroxidative changes at minimum rate (Bhaskar *et al*, 2003) [3].

Table 1: Effect of various biocides on different cultivars of Gladiolus (*Gladiolus grandiflorus* L.) to Assess the Vase life

Solutions	Opening of florets (%)					Increase in spike length (%)					Drooping of florets (%)				Vase solution absorption (%)					Average vase life (Days)
	2nd day	4th day	6th day	8th day	10thday	2nd day	4th day	6th day	8th day	10th day	4th day	6th day	8th day	10th day	2nd day	4th day	6th day	8th day	10th day	
V_1	11.33	1.45	2.20	0.35	0.07	0.66	29.92	48.76	62.51	79.99	3.96	23.52	34.20	43.43	2.08	1.66	1.80	2.39	1.55	11.16
V_2	15.80	1.78	1.08	0.47	0.59	0.41	36.93	54.69	69.89	77.82	11.72	15.38	26.61	36.73	2.50	2.15	2.22	1.73	2.65	11.50
V_3	15.66	1.10	1.91	0.31	0.21	0.92	40.52	59.99	78.25	84.94	9.10	19.63	38.61	55.24	1.66	1.57	1.65	0.86	0.19	9.17
SEm±	0.45	0.07	0.12	0.06	0.07	0.08	0.822	0.85	0.82	0.64	1.40	1.203	1.18	0.959	0.10	0.12	0.16	0.06	0.10	0.14
CD at 5%	1.43	0.23	0.38	N.S	0.23	0.25	2.53	2.64	2.53	2.00	4.32	3.707	3.65	2.956	0.33	0.39	N.S	0.19	0.31	0.42
B_1	12.79	1.95	1.61	0.37	0.30	0.53	34.86	54.29	71.32	82.23	6.10	21.84	33.07	42.86	1.66	1.82	2.00	1.20	1.83	11.11
B_2	15.73	0.94	1.85	0.38	0.29	0.79	36.72	54.67	69.12	79.61	9.58	17.17	33.20	47.41	2.50	1.76	1.77	2.13	0.10	10.11
SEm±	0.37	0.06	0.10	0.05	0.06	0.06	0.67	0.70	0.67	0.53	1.15	0.982	0.967	0.783	0.08	0.10	0.13	0.05	0.10	0.11
CD at 5%	1.17	0.18	N.S	N.S	N.S	0.20	N.S	N.S	2.06	1.63	N.S.	3.026	N.S.	2.413	0.27	N.S	N.S	0.16	0.31	0.34
T_1 (V_1B_1)	7.53	2.20	1.91	0.38	0.03	0.56	27.38	50.0	65.07	84.91	5.16	27.38	34.91	42.45	0.83	0.85	1.41	0.73	0.18	12.00
T_2 (V_1B_2)	15.12	0.70	2.50	0.33	0.11	0.75	32.47	47.53	59.95	75.08	2.78	19.66	33.48	44.42	3.33	2.47	2.19	4.05	2.91	10.33
T_3 (V_2B_1)	16.23	2.21	1.45	0.50	**0.72**	0.29	40.59	56.83	75.64	83.75	8.37	15.12	27.68	32.47	2.50	2.88	3.13	1.51	5.13	12.00
T_4 (V_2B_2)	15.36	1.36	0.71	0.44	0.47	0.53	33.26	52.56	64.15	71.88	15.07	15.63	25.54	40.99	2.50	1.43	1.31	1.95	0.17	11.00
T_5 (V_3B_1)	14.62	1.45	1.48	0.25	0.39	0.72	36.62	56.04	73.25	78.02	7.32	23.04	36.61	53.66	1.66	1.74	1.47	1.35	0.20	9.33
T_6 (V_3B_2)	16.71	0.76	2.34	0.36	0.03	1.11	44.42	63.94	83.25	91.87	10.89	16.23	40.59	56.83	1.66	1.39	1.82	0.38	0.19	9.00
SEm±	0.64	0.10	0.17	0.09	0.10	0.11	1.16	1.21	1.16	0.91	1.98	1.70	1.67	1.35	0.15	1.82	0.22	0.09	0.14	0.19
CD 5%	2.03	0.32	0.55	N.S	0.33	N.S	3.58	3.73	3.58	2.83	N.S.	N.S.	N.S.	N.S.	0.47	0.56	0.70	0.28	0.44	0.59

T_1- White Prosperity + Aluminium Sulphate, **T_2 -** White Prosperity + Chlorine (Source: Bleaching Powder), **T_3 –** Red Beauty + Aluminium Sulphate, **T_4-** Red Beauty + Chlorine (Source: Bleaching Powder), **T_5-** Novalux + Aluminium Sulphate, **T_6-** Novalux + Chlorine (Source: Bleaching Powder)



Graph: Average vase life

Photo plate: Effect of biocides on cultivars White Prosperity and Novalux

Conclusion

It can be concluded from the above experiment results indicated that spikes harvested at 1-4 floret colour show stage and sucrose and biocide in vase solution would give maximum 12.00 days vase-life with continuous opening of florets, maximum increase in spike length and minimum florets drooping when put in to a vase solution at room temperature. The maximum vase life was obtained in solution $T_1(V_1B_1)$ and $T_3(V_2B_1)$ containing aluminium sulphate with White Prosperity and Red Beauty.

References

1. Al-Humaid AI. Effect of glucose and biocides on vase-life and quality of cut gladiolus spikes. Journal of King Saud University Agricultural Science. 2004; 17(1):11-23. (Amer. Society Horticulture Sciences 104, 860-863).
2. Arora JS, Singh PJ, Singh K. Standardization of post-harvest package technology of cut flowers. Final report of ICAR funded ad-hoc project, 2001, 124.
3. Bhaskar VV, Rao PV, Reddy YN. Effect of certain chemicals on vase life of cut roses. Journal of Ornamental Hoticulture. 2003; b(2):113-118.
4. Bhosale AM, Bankar GJ, Kadam RE, Patinge SP. Post-harvest life of gladiolus spikes influenced by sucrose and metal salts. Annals of Plant Physiology. 2002; 16(1):99-100.
5. Gargi, Sharma, Devi J. Effect of different holding solutions on post-harvest quality of cut tuberose and gladiolus spikes. Mysore Journal of Agriculture Science. 2005; 39(4):447-451.
6. Halevey AH, Mayak S. Senescence and post-harvest physiology of cut flowers. Part 2 Horticulture Reviews. 1981; 3:59-143.
7. Kaur G, Singh P, Parmar V. Change in sugar metabolism in gladiolus tritis during senescence as affected by ethylene and its antagonists. Journal of Plant Science Research. 2006; 22:81-89.
8. Kumar L, Kumar M, Kumar V, Malik S, Singh MK, Singh VK. Effect of pulsing with different chemicals on post-harvest life of gladiolus (*Gladiolus grandiflorus* A.). Progressive Agriculture. 2008; 8(2):268-269.
9. Kirad KS, Barche S, Mahapatra S. Studies on effect of biocides and sucrose on vase life and quality of cut gerbera (*Gerbera jamesonii*) cv. Maron Clementine. Orissa Journal of Horticulture. 2008; 36(2):77-81.
10. Macnish AJ, Leonard RT, Nell TA. Treatment with chlorine dioxide extends the vase life of selected cut flowers. Post-harvest biology. 2008; 50(2-3):197-207.
11. Namita, Kumar R, Singh K. Response of vase solution on keeping quality of cut spikes of gladiolus. Journal of Ornamental Horticulture. 2006; 9(4):296-297.
12. Nelofar, Paul TM. Post-harvest management of gladiolus. Journal of Ornamenta Horticulture. 2008; 11(1):69-71.

13. Pal A, Kumar S, Srivastava R. Effect of floral preservatives on post-harvest management in gladiolus spikes. Journal of Ornamental Horticulture. 2003; 6(4):367-371.
14. Reid MS, Waithaka K, Doge LL. Cold storage and flower keeping quality of cut tuberose (*Polianthes tuberose*). Journal of Horticultural Science and Biotechnology. 2001; 76(3):271-275.
15. Singh K, Singh PJ, Arora JS, Mann RPS. Studies on post-harvest management of gladiolus. Journal of Ornamental Horticulture (New Series). 2000; 3(2):107-110.
16. Singh K, Singh P, Singh M. Effect of chemical treatments on keeping quality and sugar contents in rose and gladiolus, Science of Horticulture. 2004; 9(2):147-151.
17. Singh K, Singh PJ, Kumar R. Effect of chlorine on keeping quality of cut roses. Journal of Ornamental Horticulture. 2007; 10(2):125-127.
18. Sooch M, Singh K, Kumar R, Singh P. Effect of chemicals on vase life of gerbera. Floriculture Research Trend in India: Proc. Nat. Sym. on Indian Floriculture in the New Millennium, Lal Bagh, Bangalore. 2002; 25(27):321-322.