Journal of Research & Development, Vol. 12 (2012) *ISSN 0972-5407*

Studies on the Impact of Different Biocides and Anti-Ethylene Compounds on Vase Life of Rose Cv. Kardinl

Nasir Hamid Masoodi, C. R. Gupta, M. A. A. Siddique* and Muzain Masoodi*
Department of Horticulture (COA), Raipur (C.G)
*** Division of FMAP, SKUAST-K, Shalimar, J&K, India**
e mail : masoodi_nasir@yahoo.com

ABSTRACT

The laboratory experiment was conducted during winter season of year 2007-08 in post harvest technology laboratory of Department of Horticulture, College of Agriculture, Raipur (C.G.). Experiment was laid out under completely randomized block design (CRD) comprised of 13 treatments of biocidal and anti ethylene sources replicated thrice. Results of the experiment reveals that biocidal and anti-ethylene compounds enhanced solution uptake (ml), fresh weight(g), flower diameter (cm) and vase life (days) over control. However 8HQC (100 ppm) resulted with highest values for solution uptake (22.33 ml) , flower diameter (9.39 cm) and vase life (11.66 days). Minimum solution uptake((13.10 ml), fresh weight (8.20 g), flower diameter (5.22 cm), vase life (5.06 days) resulted with control (distilled water).

Key words: Vase life, biocidal compounds, rose Cv. Kardinal

INTRODUCTION

The improvement of vase life of cut rose is an important aspects needed to be explored for better returns. Quality of a flower to consumer is very important as it is associated with prestige, status and dignity of a consumer. The most important step for retaining flower quality, enhancing beauty and successful opening of flower bud is to utilize a suitable holding solution.(Biruszewki, 1968). Cut flowers have high surface area to volume ratio and are prone to water loss(Ryan, 1973). Another important

factor is to minimize ethylene rise and produce germicidal effects for enhancing vase life and reduce senescence rate. (Martin and Thiman, 1972). Suitable holding solutions minimize proteolytic activities as hydrolysis of proteins into amino acids is a result of combined action of proteinases and peptidase. Preservative solutions having growth regulators, minerals and organic acids enhance vase life of cut flowers (Bhaskar *et. al.,* 1991). Preservatives help in enhanced solution uptake and vase life (Bhatia *et al.,* 2002).Cut flowers are actively metabolizing living plant parts subjected to the same aging process as that of plant depending upon repairable substrates, water balance and factors like respiration and transpiration(Burdett, 1970).So there is a need to evaluate the holding solution having capacity to enhance the solution uptake capacity, ensure successful bud opening and enhance vase life of a cut flower by restricting ethylene rise and preventing germicidal attack. Thus this study was carried out to evaluate a suitable holding solution which can enhance vase life of cut roses.

MATERIAL AND METHODS

The vase life of cut flowers was studied after harvesting under different holding solutions. The flower buds were harvested after colour showing stage and pre cooling was done with cold water by immersing stem of cut flowers in cold water immediately after harvesting. Holding solution treatments comprised of 8 HQC 50 ppm (T1), 8 HQC 100 ppm (T2), STS 50 ppm (T3), STS 100 ppm (T4), $CaCl_2$ 50 ppm (T5), $CaCl_2$ 100 ppm (T6), $CoSO_4$ 50 ppm (T7) , $CoSO_4$ 100 ppm (T8), GA 50 ppm (T9), GA 100 ppm (T10), 2% sucrose (T11), 4% sucrose (T12), and Distilled water (T13). The harvested stems were put in these holding solutions. The observations on solution uptake (ml), fresh weight of flower (g), flower diameter (cm) and vase life (days) were recorded and significant differences were decided in the light of critical difference (CD).

RESULT AND DISCUSSION

Solution uptake was recorded maximum (22.33ml) with the application of 8 HQC (100

ppm), followed by $CoSO_4$ (100ppm), 8 HQC (50ppm) and $CaCl_2$ (100ppm) with solution uptake of (19.90ml), (19.80ml) and (19.56 ml) respectively. Minimum solution uptake (13.10ml) was recorded with distilled water (control).Most of the variations among the treatments were significant (Table 1 & Fig. 1).

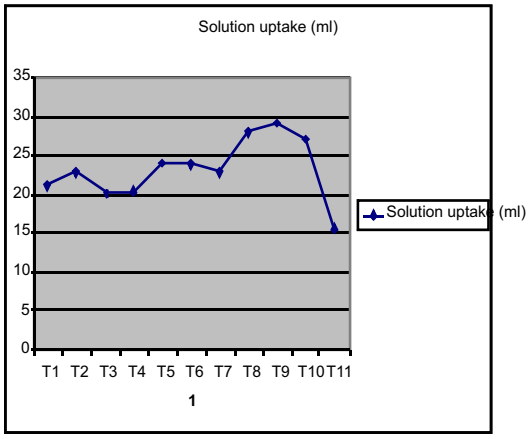
Table 1: Influence of different chemical preservatives on post harvest parameters of cut Rose cv. Kardinal

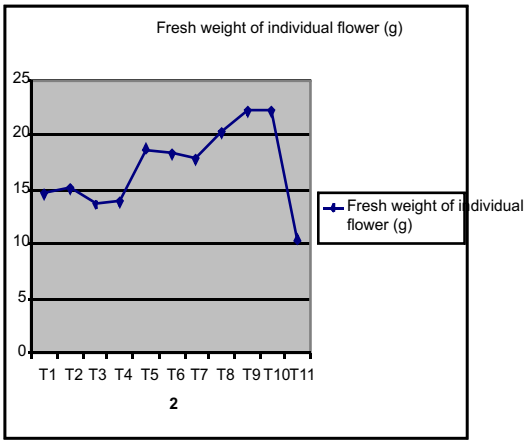
Treatments	Parameters			
	Solution uptake (ml)	Fresh weight (g)	Flower diameter (cm)	Vase life (days)
T_1 : 8 HQC 50 ppm	19.80	14.30	8.68	10.66
T_2 : 8 HQC 100 ppm	22.33	15.50	9.39	11.66
T_3 : STS 50 ppm	18.76	12.30	7.30	8.33
T_4 : STS 100 ppm	20.50	13.46	7.67	9.33
T_5 : $CaCl_2$ 50 ppm	18.66	12.13	7.16	8.34
T_6 : $CaCl_2$ 100 ppm	19.56	13.46	7.33	9.66
T_7 : $CoSO_4$ 50 ppm	18.76	12.43	7.13	8.33
T_8 : $CoSO_4$ 100 ppm	19.90	13.30	7.33	8.33
T_9 : GA 50 ppm	16.10	10.83	5.93	6.33
T_{10} : GA 100 ppm	17.30	11.20	6.73	6.66
T_{11} (2% sucrose)	16.20	11.600	6.66	7.90
T_{12} (4% sucrose)	17.20	11.80	7.16	8.35
T_{13} : Control (water)	13.10	8.20	5.22	5.05
CD (1%)	0.68	0.25	0.44	0.97

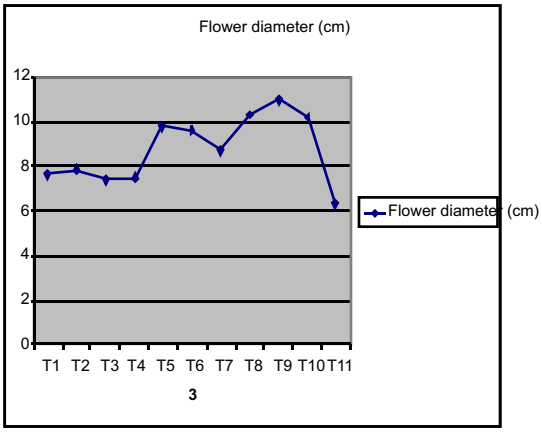
This might be due to antimicrobial nature of these chemicals which prevent vascular blockage and increases water uptake and its retention. Further, these acidify water and the chelating property of quinoline compounds or esters probably chelated the metal ions of enzymes active in creating the stem blockage. Pruthi *et al*. (2001) reported enhancement of solution uptake by gladiolus spikes treated with these biocidal compounds. The role of 8 HQC and STS in enhancing solution uptake was reported by Bhatia *et al*. (2003). Similarly co-related findings were reported by Tiwari and Singh (2002) and Bhattacharjee and Kumar (2002) for roses.

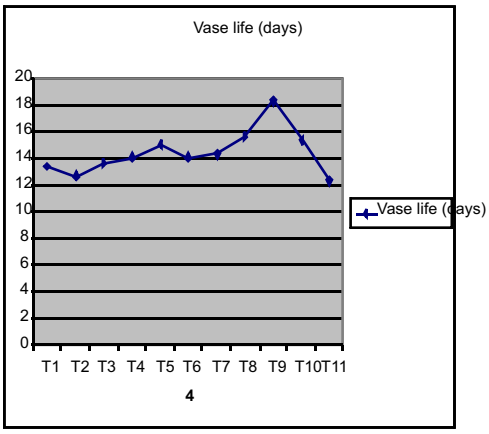
The highest values for flower diameter (9.39 cm), (8.68 cm) and (7.60 cm) respectively were recorded with 8 HQC 100 ppm, 8 HQC 50 ppm and, STS 100 ppm. Similarly average fresh weight of flower was recorded maximum (15.50 gm) with treatment (8 HQC 100 ppm) followed by 8 HQC 50 ppm and STS 100 ppm with (14.4 gm and 13.46 g) flower fresh weight respectively. Minimum, flower diameter (8.20 cm), fresh weight (5.22 g) was recorded with control (Table 1,Fig 2,3,). Reduced rate of respiration and water balance caused by these biocidal compounds might have augmented flower diameter. Bhatia *et al*. (2002) while working on vase life improvement of cut carnations reported STS and 8HQC at various concentrations significantly improve flower diameter by improved solution uptake capacity. Similarly Pal *et al*. (2003) studied the vase life of red cut roses and reported that improvement of flower diameter by the application of 8HQC. These findings are in close conformity to the findings of the present study.

Vase life was recorded maximum (11.66days), (10.66days), (9.66 days) and (9.33days) respectively with the treatment application 8 HQC 100 ppm (T_2), $CaCl_2$ 100 ppm (T_6), STS 100 ppm (T_4), and STS 50 ppm (T_3), respectively while as minimum vase life (5.05 days) resulted with distilled water (Table 1, Fig 4).









Treatments T_1 : 8 HQC 50 ppm, T_2 : 8 HQC 100 ppm, T_3 : STS 50 ppm, T_4 : STS 100 ppm, T_5 : $CaCl_2$ 50 ppm, T_6 : $CaCl_2$ 100 ppm, T_7 : $CoSO_4$ 50 ppm, T_8 : $CoSO_4$ 100 ppm, T_9 : GA 50 ppm, T_{10} : GA 100 ppm, T_{11} (2% sucrose), T_{12} (4% sucrose), T_{13} : Control (water)

(Fig 1-4): Fig. 1. Solution uptake (ml), Fig. 2. Fresh weight (g), Fig. 3. Flower diameter (cm), Fig. 4. vase life (Days)

There are various reasons associated with the enhancement of vase life of cut flower. Cut flowers are actively metabolizing living plant parts subjected to the same basic aging process as that of a cut flower depends on the amount of respirable substrate, water balance and physiological factors like respiration and transpiration. The treatment of cut flower with chemicals might have inhibited ethylene production, increase in mineral salt uptake and reduction in rate of respiration as these are known for inhibition of ethylene biogenesis and ultimately enhanced vase life. The findings of Pruthi *et al*. (2001) for rose, Bhatia *et al*. (2002) for carnation, Tiwari and Singh (2002) for rose, Bhattacharjee and Palani Kumar (2003) for roses, depicting enhancement of vase-life by the treatment application of different biocidal compounds, are in close conformity to the present study. Siddique *et al* (2011) reported enhancement of vase-life in cut *Narcissus* by the application of 8 HQS,STS and $CaCl_2$.

REFERENCES

Bhaskar, V., Vijaya, R., Venkata, P and Reddy A.N. 2002. Effect of post harvest application of sucrose on the physiological and biochemical changes of cut rose petals during vase life period. *The Orissa J. Hort.,* **30**(2): 6-12.

Bhatia, S., Gupta Y.C., Dhiman, S.R and Thakur, K.S. 2002 Studies on pulsing and storage of carnation. *J.Orn. Hort.,* **5** (2):24-26.

Bhatia, S., Gupta, Y.C., Dhiman, S.R. and Thakur, K.S. 2003. Studies on pulsing and storage of carnation flower. *Journal of Ornamental Hort*., **5**(2): 24-26.

Bhattacharjee, S.K. and Kumar, Palani 2002. Post harvest life of roses as affected by holding solution. *Journal of Ornamental Horticulture*., **5**(2): 37-38.

Biruszewki, T.E. 1968. The influence of chemical preservative on post harvest rates and biochemical changes in carnation. *Diss. Abst. Sec*., **29**: 866.

Burdett, A.N. 1970. The cause of bent neck in cut roses. *J.American Society Hort.Sci.,*

95: 527-531.

Martin, C. and Thiman, K.V 1972. The role of protein synthesis in senescence of leaves. I. The formation of protease. *Plant Physiology*, **49**:64-71.

Pal, R.K., Lahji, M.F. and Roy, S.K. 2003. Influence of storage environment, 8-HQC and sucrose on post harvest quality of first ret cut rose. *Journal of Ornamental Horticulture*, **6**(2): 130-133.

Pruthi, V., Godara, R.K. and Bhatia, S.K. 2001. Effect of different pulsing treatments on post harvest life of gladiolus cv. Happy end. *Haryana J. Hort. Sci*., **30**(3&4): 196-197.

Ryan, C.R. 1973. Proteolysis enzymes and their inhibition in plants. *Ann.rev plant physiol.,* **24**:176-196.

Siddique M. A. A., Masoodi, N.H and Khan, F.U. 2011 . Influence of chemical preservatives on vase life of cut spathes of *Narcissus* (daffodils). *National Conference on Recent Trends and Future Prospectus in Floriculture,* 5-8 March at SVPUA& T, Modipuram, Meerut

Tiwari, A. K. and Singh, R. 2002. Effect of certain chemicals on post harvest life of rose. *Journal of Ornamental Horticulture*, **5**(2) : 39-40.