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EFFECTS OF PRESERVATIVE SOLUTIONS ON IMPROVING VASE LIFE OF CUT CARNATION FLOWER

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INTRODUCTION

Diantus caryophyllus cv. Red sim (carnation) belonging to Caryophyllaceae family is one the most important cut flowers in global market. Maintenance of quality during postharvest period and prolonging post harvest life require careful handling and applying suitable preservatives. There is a direct correlation between increasing ethylene and senescence. Rising respiration, losing membrane fluidity, decreasing of endogenous sugar and autocatalytic ethylene production are associated with cut flowers senescence. In addition, *D. caryophyllus* is highly sensitive to ethylene (Adugna et al., 2013). The objective of the study was to evaluate the effects of four preservative solutions during long term storage of carnation vase life.

MATERIALS AND METHODS

Cut flowers were placed in 2 liters plastic vases containing 500 ml preservative solutions including (1) Distilled water as control treatment (2) 100, 150, 200 mg/l silver nitrate (3) 125, 250, 375 mg/l calcium chloride (4) 5, 10, 15 % sucrose and (5) 100, 150 and 200 mg/l gibberellic acid. In order to determine vase life durability, petal edge drying and flower bud shrinking were considered as the end of cut flower longevity. In each treatment 5 flowers were placed in preservative solution and replicated 3 times to determine vase life longevity. Analysis of variance (ANOVA) using SAS (version 9.1) was applied to test the significance of treatment and means were compared using Duncan's multiple range test ($P \leq 0.05$).

RESULTS AND DISCUSSION

Preservative solution containing 125 mg/l calcium chloride had the longest vase life of 17 days, followed by holding in preservative solutions containing 100 mg/l silver nitrate and 5% sucrose which for both had a subsequent vase life of 15 days. Applying these three treatments, carnation vase life significantly increased by comparison with control treatment. The results of this survey were in agreement with Torre et al., (2002) that described $CaCl_2$ treatment successfully led in improving bud opening, hindering both membrane proteins and phospholipids reduction and also increasing ATPase activity in rose petals during senescence. In the same way, cut *Gerbera hybrida* flower holding in $CaCl_2$ preservative solution resulted in extending its vase life (Chen et al., 2004). Considering the results of this survey it can be inferred that bacterial population in carnation stem or vase solution, which cause xylem blockage and increase ethylene production, might be greatly susceptible to $CaCl_2$ at level of 125 mg/l.

Keywords: Carnation (*Dianthus caryophyllus*), Cut flowers, Calcium chloride, Postharvest, Vase life

REFERENCES

Adugna, B., D. Belew and N. Kassa, 2013. Response of carnation (*Dianthus caryophyllus*) cultivars to different postharvest preservatives. Pakistan Journal of Biological Science, 16 (19): 1051-1055.

Chen, D.S., N.H., Li, J.M. Wang, Y.X. Ding and X.J. Wang, 2004. Effect of calcium chloride on preservation of cut flowers of Gerbera hybrida. Acta Botanic Yunnanica, 26(3): 345-348.

Torre, S., A. Borochov and A.H.H. Haleavy, 2002. Calcium regulation of senescence in rose petals. Physiologia Plantarum, 107(2): 214-219.