INFLUENCE OF DIFFERENT CHEMICALS ON ANTHURIUM FLOWERS FOR INCREASING THE VASE LIFE AND QUALITY.

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ABSTRACT

The present experiment was conducted to find out the appropriate preservative solution for extending the vase life of anthurium cut flowers cv. Tropical. Ten chemical preservative solutions were used for extending the vase life, and the treatments are T_1 Silvar Thiosulphate (25 ppm), T_2 Citric Acid (25 ppm), T_3 Silver nitrate (25 ppm), T_4 8-HQC (25 ppm), T_5 2% sucrose + Silvar Thiosulphate (25 ppm), T_6 2% sucrose + Citric Acid (25 ppm) T_7 2% sucrose + Silver nitrate (25 ppm), T_8 2% sucrose +8-HQC (25 ppm), T_9 Distilled water and T_{10} 2% sucrose + Distilled water using Completely Randomized Design with three replications. Maximum days taken for spadix necrosis, Days taken for spathe blueing, Physiological loss in weight, Solution uptake and Vase life were recorded in (T_7) 2% sucrose + Silver nitrate (25 ppm) may be due to appropriate action of silver nitrate and sucrose. The treatment of Silver nitrate may decreased the ethylene production and also highly efficient in reducing bacterial growth in the vase solution and the cut stem ends of anthurium flowers which led to increase in the water uptake of the flower. Sucrose act as a source of energy required for the continuation of the vase life of the cut flowers and also helped for the improvement in the keeping quality value of Anthurium cut flowers.

Key words: anthurium, preservative solutions, vaselife

Introduction

Anthuriums are tropical plants grown for their showy cut flowers and attractive foliage. It has gained the importance as major cut flower of the modern world. Anthurium growing is a potential source of commercial farming and it makes best use of ready market for cut flowers with high returns both for its cut flower and whole plant. The plant produces blooms throughout the year, one bloom emerging from the axil of every leaf. Flowers are usually harvested once a week at three quarters maturity. Adding chemical preservatives to the holding solution is recommended to prolong the vase life of the cut flowers. All holding solutions must contain essentially two components, sugar and germicides. The sugar provides a respiratory substrate, while the germicides control harmful bacteria and prevent plugging of the conducting tissues. Among all the different types of sugars, sucrose has been found to be the most commonly used sugar in prolonging vase life of cut flowers (Redman, *et al*, 2002). The major reasons for less vase life of cut flowers may be due to nutrient deficiency, bacterial and fungal infection, water stress-induced wilting and vascular blockage (Alaey *et al*., 2011). Application of various chemicals could alter the post-harvest life of cut flowers (Prashanth *et al*., 2010). Different chemicals have been used in vase solution to extend vase life of cut flowers mainly by improving their water uptake and reducing transpiration, thereby promoting the vase life of cut flowers (Amariutei *et al*., 1986).

Material and Methods

Experiment was conducted at Flora-tech floriculture unit at Kottarakara, kollam Dist, kerala state, India during 2009 - 2010 to find out the appropriate preservative solution for extending the vase life of anthurium cut flowers cv. Tropical. Ten chemical preservative solutions were used for extending the vase life, and the treatments are T_1 Silvar Thiosulphate (25 ppm), T_2 Citric Acid (25 ppm), T_3 Silver nitrate (25 ppm), T_4 8-HQC (25 ppm), T_5 2% sucrose + Silvar Thiosulphate (25 ppm), T_6 2% sucrose + Citric Acid (25 ppm) T_7 2% sucrose + Silver nitrate (25 ppm), T_8 2% sucrose +8-HQC (25 ppm), T_9 Distilled water and T_{10} 2% sucrose + Distilled water using Completely Randomized Design with three replications. Each treatment had three flowers with each flower as a replication. Observations on various parameters of post harvest life were recorded at 12 th day of the experiment on Days taken for spadix necrosis, Days taken for spathe blueing, Physiological loss in weight, Solution uptake and Vase life.

Results and Discussion

The holding solutions given significant influence in overall performances on the vase life of cut Anthurium flowers. Among the different treatment , the maximum Vase life of 27.48 days , Days taken for spadix necrosis (22.89 days), Days taken for spathe blueing (25.73 days), Physiological loss in weight (8.67), Solution uptake 3.16) and Days taken for gloss loss is 20.57

days were recorded in T_7 2% sucrose + Silver nitrate (25 ppm), this was followed by T_8 2% sucrose +8-HQC (25 ppm) with the Vase life of 25.89 days , Days taken for spadix necrosis (20.84 days), Days taken for spathe blueing (24.12 days), Physiological loss in weight (10.93), Solution uptake 3.02) and Days taken for gloss loss is 18.80 days. The least results were found in the treatment T_9 with Distilled water and recorded a Vase life of 11.36 days, Days taken for spadix necrosis (9.71days), Days taken for spathe blueing (10.75 days), Physiological loss in weight (21.79), Solution uptake (1.23) and Days taken for gloss loss is 10.49days.

Silver nitrate is very potent inhibitor of ethylene action in plant tissues. The treatment of Silver nitrate may decreased the ethylene production. It is also provides some antimicrobial activity inside the plant tissues, thus its beneficial for ethylene sensitive flowers (Nowak and Rudnicki, 1990). In addition, under Silver nitrate treatment the percentage of wilting and carbohydrate degradation was minimized and as a consequence, the vase life was extended. These result are in harmony with the result of Singh and Tiwari (2002); Harode et al. (1993) and Reddy et al. (1988). Silver nitrate is one of the most common forms of silver salts used as a strong antimicrobial agent in flower preservative solutions (Halevy and Mayak, 1981). Silver nitrate has large surface area-to-volume ratios and thus has a great efficacy against several bacterial species (Jiang et al., 2004). Similar results were reported by (Liu, 2009) on cut Gerbera and cut roses. Similar results were reported by (Lu, 2010) who reported that pulsing cut roses with silver nitrate reduced number of bacteria in and improved water uptake the vase solution and the cut stem end in the first two days of the flower vase life.

It is well known that sucrose supply increases the longevity of many cut flowers, since sucrose can act as a source of nutrition for tissues approaching carbohydrate starvation, flower opening and subsequent water relations (Kuiper et al., 1995), similar finding were obtained by Lalonde et al. (1999); Nichols (1973); Ichimura (Ichimura, 1998) and Downs (1988).Sucrose act as a source of energy required for the continuation of the vase life of the cut flowers (Halevy and mayak, 1981), and may also act as osmotically active molecule, thereby lead to the promoting of subsequent water relations and lengthening their vase life. In addition to sucrose, the presence of strong antimicrobial agent silver nitrate increase water uptake and improve water relations, thereby increase fresh weight and the vase life of the flower. Similar results were reported by (Lu et al., 2010)

Concerning the role of sucrose with Silver nitrate in the experimental results show that adding sucrose extended the vase life and improved the quality of cut flowers. The data on Days taken for spadix necrosis, Days taken for spathe blueing and Vase life show the positive role of Silver nitrate with sucrose and sucrose individually on preserving the flowers in good condition by lowering the per cent of wilting similar result were obtained by Serek et al. (1996), Bartoli et al. (1997) and WeiMing et al. (1997). A significant improvement in vase life of anthurium cut flowers was occurred when treated with sliver nitrate at 25 ppm combined with 2% sucrose which attained the best result compared to other concentrations of sucrose. Also the per cent of wilting was minimized, beside Days taken for spadix necrosis as well as Days taken for spathe blueing and Vase life has been increased during the postharvest life as the result of using this combination treatment.

Considering the above facts it can be concluded that the increased results in (T_7) 2% sucrose + Silver nitrate (25 ppm) may be due to appropriate action of silver nitrate and sucrose. The treatment of Silver nitrate may decreased the ethylene production and also highly efficient in reducing bacterial growth in the vase solution and the cut stem ends of anthurium flowers which led to increase in the water uptake of the flower. Sucrose act as a source of energy required for the continuation of the vase life of the cut flowers and also helped for the improvement in the keeping quality value of Anthurium flowers.

Table: 1. Response of Anthurium flowers to different chemicals used for increasing the shelf life and quality.

Treatments	Days taken for gloss loss	Vase life	Days taken for spadix necrosis	Days taken for spathe blueing	Physiological loss in weight	Solution uptake
T_1	15.57	18.48	17.29	20.10	15.04	2.32
T_2	16.21	19.38	17.31	21.22	14.63	2.31
T_3	16.39	19.98	18.92	22.18	13.59	2.55
T_4	16.86	23.67	19.48	23.04	12.58	2.64
T_5	17.63	24.34	20.12	23.13	11.69	2.96
T_6	16.81	23.87	19.27	22.91	12.83	2.82
T_7	20.57	27.48	22.89	25.73	08.67	3.16
T_8	18.80	25.89	20.84	24.12	10.93	3.02
T_9	10.49	11.36	9.71	10.75	21.79	1.23
T_{10}	12.06	13.09	10.79	12.98	20.87	1.48
CD (p=0.05)	0.97	1.48	1.29	1.38	1.27	0.18
SE (d)	0.49	0.68	0.64	0.69	0.63	0.09

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