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A REVIEW: CUTTING FLOWER TWIG REMAIN FRESH BY USING DIFFERENT SOLUTIONS

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Abstract:

Various method to extend the vase life of cut flower by using different chemical preservatives and other solutions like Sucrose, Citric acid, Salicylic acid and Potassium sulfate can increase longevity in some cut flower. Cut flowers vase life is affected by many factors. Some sugar in the vase solution increases the number and size of open flower as well as extends the vast life. Holding solution should contain chemical preservatives to extend the vase life of cut flower. Potassium sulfate provide excellently for dressing indoor flowers. Salicylic acid is natural plant hormone. Treatment of citric acid and sucrose for cut flowers to be beneficial in delaying senescence processes. Cut flowers shelf life extend by many chemical preservatives in most of cut flowers sucrose is best chemical preservative.

Key word:

Cut flower, Sucrose, Citric acid, Salicylic acid, Potassium sulfate, Calcium chloride and Ethanol

Introduction:

Several methods to extend the vase life of cut flower and their freshness for longer period have been reported (Hardenburg and R.E., 1968). Keeping quality is a major parameter for evaluation of cut flower quality, for both in domestic markets and international markets (Rubi patel *et al.*, 2016). Cut flowers are valuable products of horticulture. The post-harvest longevity of cut flowers is of critical importance in determining the value of the crop (Hassan bayat and Mohammad hossein aminifard, 2017). Cut flower is expensive products of horticulture. Maintaining good quality of cut flowers and extend the vase life having acceptable products for the market (Christian Stacey *et al*., 2019).

Vase life is one of the most important quality parameters to determine the quality of cut flower. Highly perishable nature is always challenging to vase life (Pragya Aryal *et al*., 2019). Bending of floral axis just below the flower head it called bend neck, wilting of leaves and petals and incomplete bud opening are major symptoms that indicate the end of vase life of flower (Asen *et al*., 1982). Senescence of cut flower is due to low water uptake due to xylem vessel blockadg by air and microorganism (Elgimabi *et al.*, 2009). Vase life is determined by many factors like reduced water absorption (Sanket *et al.*, 1994), effects of ethylene (Wu *et al*., 1991) and level of carbohydrate (Ketsa and S., 1989).

The marketing of cut flowers early senescence is main limiting factor. Extend of post-harvest cut flowers is importance in value of the crop. Floral preservatives usually growth regulators, contains of microbicides, inhibitors of ethylene synthesis, carbohydrates and minerals compounds are important to prolong the vase life of cut flowers (Gerailoo S and Ghasemnezhad M, 2003). In the cut flower blockage of xylem vessels by microorganism and air thus reduced the vase life of cut flower (Macnish Aj *et al*., 2008). The flower maintaining their physiological function very actively the starting of their senescence very frequently depends on ethylene action (Gonzalez L and Gonzalez-Vilar M, 2003).

Sucrose:

Sucrose is useful for open the flowers as well as prolong the life. There are maximum vase life and zero stem bending percentage were observed in cut Gerbera flower treatment consisted of sucrose 2% + vinegar 0.6% + $CaCl_2$ 1% with distilled water (W.A.N.T. De Silva *et al*., 2013). The maximum effective vase life in *Antirrhinm majus* L. recorded with 200 ppm 8-HQS + 2% sucrose is the best combination of chemical solution (Abdul-Wasea A. Asrar, 2011). The treatment of distilled water + 6% sucrose specially increased water uptake as compared to other treatments. Sucrose helps in maintaining the water balance and turgidity (G. Chaudhary and A.Khanal, 2018). Sucrose improves pulse treatment in sweet pea and hybrid *Limonium* cut flowers. Sucrose promoted flower opening (Kazuo, 1998). In the cut flowers sucrose improves water balance because it effects on the reduction of water loss and closure of stomata (Marousky and F.J., 1971).

Citric acid:

Citric acid increased the water counductance in xylem of cut flowers and reduced bacterial population in vase solution (Van doorn and W.G., 1997). Treatment of 3% sucrose + 50mg L^{-1} citric acid + 0.1g L^{-}GA was the best solution for cut sunflower. In this experiment flower can prolong vase life 3 days or 5 days. The appropriate citric acid concentration was so important to preservation of cut sunflower that to high (150 mg L^{-1}) to maintain vase life (Taoze sun *et al*., 2019). The best improves of citric acid treatments (1.4%) was observed at 200 ppm in cut chrysanthemum flower (N. Vahdati Mashhadian *et al*., 2012). The vase life of rose flowers treated with 100 mg L^{-1} of citric acid was found 4.74 days longer than control (S. Kazaz *et al*., 2019). Treatment with 2% sucrose solution + 15ppm citric acid is best result for cut rose flower (Pragya Aryal *et al*., 2019). Water constitutes a big part of horticultural products weight. Citric acid significantly transported irons in plants (Hell *et al*., 2003). Citric acid decreases the vascular blockage in cut flower through its anti-embolism quality (Bhattacharjee *et al*., 1993). Citric acid is used for to control the growth of microorganisms. It also used to regulate water pH. Citric acid is commercially advised for number of cut flowers (Dole *et al*., 1998).

Salicylic acid:

Salicylic acid is natural plant hormone. The best result observed treatment with 300 mg/L salicylic acid for (*Alstromeria, Gerbera, Rosa, Polianthus, Lilium)* cut flower (Hassan Bayat and Mohammad Hossein Aminifard, 2017). Salicylic acid treatment was positive effects for opening flower bud. In salicylic acid vase solution cut flowers fresh weight greater than water control, compared to control treated with salicylic acid 6 times gets the best result in cut rose flower (M. Alaey *et al*., 2011). Salicylic acid has important role in biotic and abiotic stress (Mayak S and Halevy, 1980). Cut flowers vase life is extend by various antimicrobial compounds such as salicylic acid (Kazemi *et al*., 2011). In carnation flowers (*D. caryophyllus* L.) salicylic acid extend the vase life treatment with 2 Mm salicylic acid (Kazemi *et al*., 2012). In cut rose flower highest vase life was recorded with treatment of 200 mg l^{-1} salicylic acid (Sevana Ghadimian and Ehsan Danaei, 2019). The maximum result in cut chrysanthemum flower was observed in 300 ppm salicylic acid solution (N.Vahdti Mashhadian *et al*., 2012). Salicylic acid has been suggested as single transducer or messenger under stress conditions (Petridou M *et al*., 2001). Salicylic acid is qualified as a plant hormone by reason of its biological and physiological roles in plants (Reid *et al.,* 1992).

Potassium sulfate:

Application of potassium sulfate (K_2SO_4) and sucrose confirmed the positive effects of leaf treatments in Asiatic Lily flower (G. Burchi *et al*., 2009). For the indoor flower potassium sulfate serves excellently.

Calcium chloride:

The maximum vase life observed with treatment of 20 Mm $CaCl_2$ was 21 and 19% longer than control in cut Lily flower (Jing Zhang *et al*., 2018). The treatment with 25 and 50 mmol of calcium L^{-1} was best positive effects on cut Alstroemeria flower (V.C. Galati *et al*., 2015).

Ethanol:

Bougainvillea flowers vase life increased with 8% and 12% ethanol was best treatment (M. Moniruzzamn *et al*., 2011). Treatments with 7% ethanol was most effective for cut chrysanthemum flowers (Azadeh Mousavi Bazaz *et al*., 2015).

Conclusion:

Cut flowers quality is major parameter for both in domestic markets and international markets. For cut flowers sucrose and citric acid treatment to be useful in delaying senescence process. Citric acid used to lower pH. Treatment with salicylic acid was positive effects for opening flower bud. Important role of salicylic acid in biotic and abiotic stress. Potassium sulfate serves excellently for indoor flowers. In most of cut flower sucrose is best preservative solution. Preservative solutions are useful for to delaying of flower senescence.

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