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EGYPTIAN ACADEMIC JOURNAL OF
BIOLOGICAL SCIENCES
BOTANY

ISSN 2090-3812

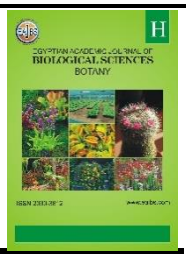
www.eajbs.com

Vol. 13 No.2 (2022)

Citation: Egypt. *Acad. J. Biolog. Sci.* (H. Botany) *Vol.13(2) pp297-304(2022)*
DOI: 10.21608/EAJBSH.2022.294276

Egypt. Acad. Journal Biology. Sci., 13(2):297-304(2022)

Egyptian Academic Journal of Biological Sciences
H. Botany
ISSN 2090-3812
www.eajbsh.journals.ekb.eg.



Study the Activity of Treatment in Prolonging the Vase life of *Chrysanthemum morifolium* Ramat.

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ARTICLE INFO
Article History
Received:23/10/2022
Accepted:22/12/2022
Available:27/12/2022

***Keywords*:**
Treatment in Prolonging, *Chrysanthemum morifolium* Ramat. Vase life.

ABSTRACT

The current study was conducted from 19/6/2022 until 20/8/2022. in the department of horticulture's college of agriculture at Raparin University, Qaladze, to assess the effects of different water types (Tap and Magnetic), sucrose concentrations (0, 2, and 4 g.l-1), and aspirin (100 mg.l-1) on the length of time chrysanthemums last in their vases (*Chrysanthemum morifolium* Ramat.).

The data were statistically analyzed using the Genestat statistical analysis program, and differences between the means of the treatments were considered significant when they were equal to or greater than the least significant difference (L.S.D.) at the 5% level. The experiment was factorial (25) and analyzed in a complete randomized design with 3 replicates, one flower to each replicate.

Vase life (day), fresh weight (g), water intake (ml), and total chlorophyll were among the characteristics noted (mg.100g-1). Aspirin at 100 mg/l and sugar at 2 g/l were shown to be the most effective treatments for extending the life of cut flowers, increasing water absorption, increasing total chlorophyll, and increasing fresh weight at the greatest rates (21.0 days, 185.0 ml, 1.53 mg/100g-1, and 17.89 g) respectively. Nevertheless, applications of tap water without the use of any concentrations resulted in the lowest responses, which were 15.67 days, 128.0 ml, 0.25 mg.100g-1, and 12.30 g, respectively.

INTRODUCTION

Many developed nations, especially those that care about the cultivation of cut flowers, have replaced a significant portion of their economies with the cut flower industry. Chrysanthemums, one of the most significant commercial cut flowers in the world, are grown for their beautiful, elegant, decorative flowers with a range of color tones (Rashed, 2014).

The chrysanthemum's flower or inflorescence consists of disc flowers in the center surrounded by ray flowers with colored petals; the number of rays varies depending on the type of ray flower, and more rays increase the size of the flower. The flowers bloom in the fall when there are fewer flowers on other plants, which raises consumer demand for the plant. It also has a sturdy stem and compact blossoms that are difficult to fragment, in addition to those other qualities (Alsultan and *et.al.*, 1992).

Vase life is the time a cut flower or a cut piece of greenery looks fresh in a vase. There are many inexpensive and efficient chemicals that can help preserve the flowers after harvest and prolong their life, such as aspirin and sugars, which can help save flowers for as long as possible and be used in floristry. This is a major consideration in identifying plant species suitable for use in floristry, with plants with a long vase life being far more desirable than those with a short vase life.

When a plant is injured, such as when it is cut, it naturally produces a chemical that also causes the plant to wilt. Aspirin blocks this compound, which slows down the aging process of the flowers in the vase. Sugars are the primary food supply for flowers. Upon separation from the mother plant, they are necessary for performing all biochemical and physiological functions. Since that cut flowers only contain a little quantity of sugar, sugars are crucial for maintaining the quality of cut flowers. Exogenous sucrose takes the role of the reduced endogenous carbohydrates used throughout the cut flower's post-harvest life. Sucrose is the primary sugar that is transported to flower buds. It is also a key structural component in cell development and expansion and a soluble component of petal tissues, making it a crucial osmotic regulator of water potential (Mayak *et al.*, 2001).

In the most recent ten years, there has been debate about whether to use tap water or other types of water instead of distilled water to preserve cut flowers (Abdel-kader, 2004); (Saleem *et al.*, 2014). The PH of the solution decreases as a result of magnetic or magnetized water (water that has been subjected to a magnetic field or that has passed through a magnetic device), which affects the cell's growth characteristics and a variety of functions, changing those functions at the tissue and organ levels (Hegazy and Fatma, 2019).

Research is needed to determine how different kinds of water and holding solutions affect the lengthening of the vase life of cut chrysanthemum flowers, one of the most often used cut flowers. Therefore, the purpose of this study was to determine whether certain chemical preservative solutions could improve the keeping quality, increase water uptake, and lengthen the vase life of cut chrysanthemum flowers by using holding solutions that might enhance flower quality over the course of the vase life.

MATERIALS AND METHODS

The study used two types of water, tap water and magnetic water, either alone or in combination with aspirin and various concentrations of sucrose +, and it was conducted in the horticulture department College of Agriculture at Raparin University - Qaladze from 19/6/2022 until 20/8/2022. (Ascorbic acid 0.1 g. l- 1 for acidity and 1ml from Sodium hypochlorite NaOCl as sterilizer agent).

Getting The Plant and The Remedy Ready:

The cut chrysanthemum cv. Pink Decorative (Dutch provenance) was sent from the Nergz nursery in Ranya city (Fig. 1), selected at the bloom stage, and was gathered when the flowers were completely open.

Fig. 1: Chrysanthemums bring from the nursery.

All save the top pairs of leaves were removed from the stems after they had been chopped with a sharp object to a length of 25 cm (Mashhadian et al, 2012). Each flower stock was then put into a 500 ml container with 250 ml of aqueous solutions (Fig. 2), with the flowers split into two groups and treated as follows: one group soaked in tap water, the other in magnetic water.

- When sucrose (0, 2, and 4) g.l-1 is used alone, it serves as a symbol. S 0, S 2, and S 4.
- 100 milligrams of aspirin, represent it (A).
-Symbolizing the combination of aspirin (100 mg.l-1) and sucrose (2 g.l-1)

Each treatment unit consisted of three replications, each of which was represented by a single flower. Okra extract was used to cover all of the flowers, which were then arranged in various positions throughout the room.

Fig. 2: Distributed flowers in bottles containing an aqueous solution**.**

Preparing Magnetized Water:

With the use of a magneto system with a force of 2000 Gauss, water exposed to a magnetic field was transformed into magnetized water (Fig. 3). The treated water maintains its properties for 12 to 24 hours.

Fig. 3: Magnetic system

Preparing Okra Extract:

One kilogram of fresh okra should be dissolved in one liter of distilled water at 50°C, smoothed out for an hour, and then sprinkled on flowers to slow down transpiration and sustain blossoming.

Researched Traits:

Vase life (days): The number of days from the commencement of a flower's shelf life to the point at which its petals begin to droop or exhibit discolouration and senescence (Fig. 4).

Fig. 4: Wilting of Chrysanthemum petals**.**

At the conclusion of the experiment, fresh weight (in grams) was calculated for each treatment. (Fig. 5) (Bahrehmand and colleagues, 2014)

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Calculate the water uptake (in milliliters) from each treatment (by subtracting the original volume of water in the bottle from that of water reduction in bottles containing flowers).

Fig. 5: calculate a fresh weight (g).

Total Chlorophyll (mg.100gm-1): Total chlorophyll was calculated by measuring the extract's absorbance using a spectrophotometer at wavelengths of 645 and 663 nm after extracting (0.2 g) of leaves in 10 ml of acetone until the residue was colorless. The extract was then filtered.

Experimental Design: The experiment's factorial test with Complete Randomized Design (C.R.D.), consisting of two factors and five treatments, and three replications (2, 5, 3), was set up.

When the differences between the means of the treatments were equal to or greater than the least significant difference (L.S.D.) at the 5% level, the statistical analysis software Genestat was used to do the statistical analysis of the data.

RESULTS

Effect of water type, aspirin, and sucrose restriction on Chrysanthemum cut flower quality.

The findings in Table (1) demonstrated that employing magnetic water as opposed to non-magnetized water resulted in substantial changes. According to the results in table (4-1), it is also evident that there are no significant variations between treatments in terms of the magnetic properties of water absorption, fresh weight (which peaks in the first days before progressively declining), vase life, and chlorophyll content (individual effects of sucrose and aspirin concentrations).

Aspirin treatment causes growth and blooming to be reduced in plants, who then continually expend energy fighting infection as the aspirin's effects wear off. With cut flowers, which often continue to be malnourished owing to a lack of nutrition, this process frequently accelerates. This indicates that microbial contamination may be the cause of the decrease in water uptake and that this decrease may be caused by a physiological blockage and/or a varietal effect (Jones and Hill, 1993). Conversely, the interaction between aspirin and sucrose concentration 2g.l -1 with using magnetic water showed high longevities. On the other hand, applications of tap water without the use of any concentrations result in the lowest reaction (15.67 days, 128.0 ml, 0.25 mg). 100g-1 and 12.30 g) accordingly, Table (1).

Table (1): effect of water type, aspirin and sucrose constriction in vase life, fresh weight, water uptake and chlorophyll content of *Chrysamthemum morifolium* Ramat**.**

Treatment		Vase life (day)	Fresh weight (g)	water uptake (ml)	chlorophyll content (mg.100g $^{-1}$)
Magnetic Water	S0	16.67	13.25	148.2	0.31
	S2	18.33	14.87	167.5	0.66
	S4	19.00	16.24	158.3	1.08
	A	17.33	15.12	155.0	0.45
	S2A	21.00	17.89	185.0	1.53
Tap Water	S0	15.67	12.30	142.3	0.25
	S2	17.33	14.23	156.8	0.54
	S4	18.33	16.33	155.0	0.83
	A	16.33	14.34	156.7	0.46
	S2A	18.67	17.34	160.7	1.17
L.S.D. 5%		4.65	3.58	20.54	0.30

DISCUSSION

Among water types, the use of magnetized water produced the longest vase life, the greatest rise in fresh weight, and the highest level of chlorophyll in Chrysanthemums, as well as a more stable trend in water absorption. These outcomes will be consistent with the outcomes obtained by Abdel-Kader *et al.* (2015) when they submerged a cut Gladiolus flower in magnetic water. Since tap water sources vary in their salt content, it is not advised to use tap water to handle cut flowers (van Meeteren et al., 2000). Water that has been magnetized has better hydrating properties. Electrons are readily dispersed across water clusters as a consequence of hydrogen bonding (Del Giudice *et al.*, 2010).

Moreover, Cai *et al.* (2009) observed that when water was subjected to a magnetic field, its physicochemical characteristics altered over time. Surface tension decreased and viscosity increased throughout the treatment period, and the water became more stable with higher activation energy.

It has been noted that exposing water to a magnetic field lowers the pH, improves the water's capacity to dissolve gases, and lowers the surface tension of the water. Cho and Lee, 2005; Cai *et al.*, 2009), and these elements could help overcome air bubbles created after the flower stem was cut. Also, magnetic water improves its capacity to dissolve gases and has a positive impact on the trend of water absorption. It also lessens vascular blockages. Sucrose extends the vase life by enhancing the function of cytokinins in postponing the senescence of cut flowers by lessening the impact of ethylene activity. Sugars' impact on stomata closure and the reduction in water loss they cause also reduce transpiration (Vandoorn, 1997).

Sugars are said to give cut flowers vigor and extend their vase life, according to Meng and Meng (2001). In contrast, if too much sugar is applied, necrotic areas on the leaves and black necks appear, the quality of the flowers declines, and they get infested with microorganisms, which is in agreement with Amin (2017).

Aspirin is a well-known phenol that inhibits the action of the enzyme ACC-oxidase, which is a direct precursor to ethylene and reduces ROS by boosting the activity of the enzyme antioxidants. Aspirin (salicylic acid) is regarded as a hormone-like compound that is crucial in controlling a variety of physiological processes and protecting plants from biotic and abiotic stressors. The protective role of the control of ROS and antioxidant enzymes is one of the salicylic acid's functions (Zamani and *et al.*, 2011).

Conclusion

By mixing chemical metal salts of sucrose and aspirin with magnetic water, all measured parameters were dramatically enhanced. The finest treatment increased the vase life of cut flowers and other characteristics and offered the maximum value of chlorophylls. It consisted of 100 mg. l-1 of aspirin, 2 g.l-1 of sucrose, and magnetic water. Aspirin reduces biotic stress, carbohydrates give cut flowers vigor, and magnetic water enhances the characteristics of water, all of which contribute to lifespan. On the other hand, if too much sugar is applied, leaf spots, necks that are black or red, and the number of infected grow.

Recommendation

We suggest the following depending on the search results:

1. The substitution of magnetic water for tap water due to its superior effectiveness.
2. To the cut flower solution, add an acidity source to stop the development of pathogens. You may also add a source of energy, such as sugar, but you should avoid large concentrations since they shorten the life of the cut flower.
3. The utilization of interactions rather than individual effects between doses of sugar and aspirin is preferable.

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