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Effect of *Artemisia* Oil on Vase Life, Flower Opening Index and Fresh Weight Loss of Cut Chrysanthemum (*Dendranthema grandiflorum* L. cv. 'White')

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ABSTRACT

In present study effect of *Artemisia* oil on vase life, flower opening index and fresh weight loss were investigated. Experiment carried out based on completely randomized design with 4 treatments of (*Artemisia* oil in four levels of 0, 10, 30 and 50%) in 3 replications and 12 plots. Meant comparison showed that longest vase life and lowest fresh weight loss was achieved in 30% *Artemisia* oil with 10 days and 4.09 g respectively $p \leq 0.05$. Also 50% essential oil had longest flower opening index with 0.99.

Keywords: *Artemisia* oil, vase life, fresh weight loss

INTRODUCTION

Chrysanthemum (*Dendranthema grandiflorum* L.) belongs to Asteraceae family and one of the most important cut flower in the world [9]. Chrysanthemum is sensitive to microorganism population and this problem disrupts water uptake [3]. Essential oils as a novel natural material have strong properties. These compounds improved vase life of cut flowers [1, 2, 14, 15, 16]. Oraee et al. [14] studied on *Gerbera jamesonii* and found that thymus oil improved vase life and reduced on microbial contamination in stem end and vase solution. Hosseini Darvishan et al. [6] studied on effect of essential oils on vase life of cut rose (*Rosa hybrid* L.) and demonstrated that this compounds increased vase life in comparison to the control. The aim of this study is investigation on effect of *Artemisia* oil on vase life, flower opening index and fresh weight loss of cut chrysanthemum (*Dendranthema grandiflorum* L. cv. White).

MATERIALS AND METHODS

Fully open cut chrysanthemum (*Dendranthema grandiflorum* L. cv. White) were purchased from commercial grower in Mahallat (Iran) and immediately transported to laboratory of Department of Horticulture, Faculty of Agriculture, Islamic Azad University, Rasht Branch (Iran) and treated by specific concentration of *Artemisia* oil. 24 h pulse experiment carried out based on completely randomized design with four levels (0, 10, 30 and 50%) of *Artemisia* oil in 3 replications and 12 plots and in each plot 5 cut flowers were held. Then held in 500 ml distilled

water mixed 4% of sucrose and 200 mg l⁻¹ 8-hydroxy quinoline sulphate. In this study vase life, flower opening index and fresh weight loss was measured. For determination of vase life, leaf yellowing and petal wilting were evaluated in the end of flower longevity [13]. For determination of flower opening index utilized this formula [5]:

$$FOI = [(Dn+2/Dn) + (Dn+4/Dn+2) + (Dn+6/Dn+4)]/3$$

Fresh weight was measured by digital scale (0.01g) and fresh weight loss calculated by this formula [7]:

$$\text{Fresh weight loss} = \text{First fresh weight} - (\text{Fresh weight in final day} + \text{re-cuts weight})$$

Data were analyzed by SPSS and SAS software and means were compared by LSD method.

RESULTS AND DISCUSSION

Analysis of variance showed that effect of *Artemisia* oil on vase life, flower opening index and fresh weight loss was significant at $p \leq 0.05$. Results showed 30% essential oils had highest vase life (10 days) compared to control (6 days) (Table 1). Also 30% *Artemisia* oil decreased 4.09 g fresh weight compared to control (Table 1 & Fig. 1). Positive effects of plant essential oils on vase life of cut chrysanthemum flowers could be attributed to their antimicrobial effect that act as biocide in the preservative solution and increase water uptake. These compounds prevents vascular blockage and increase vase life, decreased fresh weight loss and improves postharvest quality of cut flowers [2, 5, 10, 12, 15, 6]. Our results agreement by Hossini Darvishan et al. [6], Solgi et al. [16] and Oraee et al. [14]. Jalili Marandi et al. [8] reported that *Carom copticum* oil and *Satureja hortensis* oil improved vase life, solution uptake and fresh weight of cut rose flowers. Also our results about of positive effect of antimicrobial compounds on vase life and postharvest quality, is agreement by Mohamadi Ostad Kalayeh et al. [11] and Edrisi et al. [4]. Results showed that 50% *Artemisia* oil with 0.99 flower opening index (FOI) delayed compared to control (1.02) (Table 1 and Fig. 2). This effect of essential oils compound due to antirespiratory properties as antimicrobial compound that prevent catabolism of carbohydrates and improves flower opening index in cut chrysanthemum flowers. Our results are agreement to Hashemabadi [5].

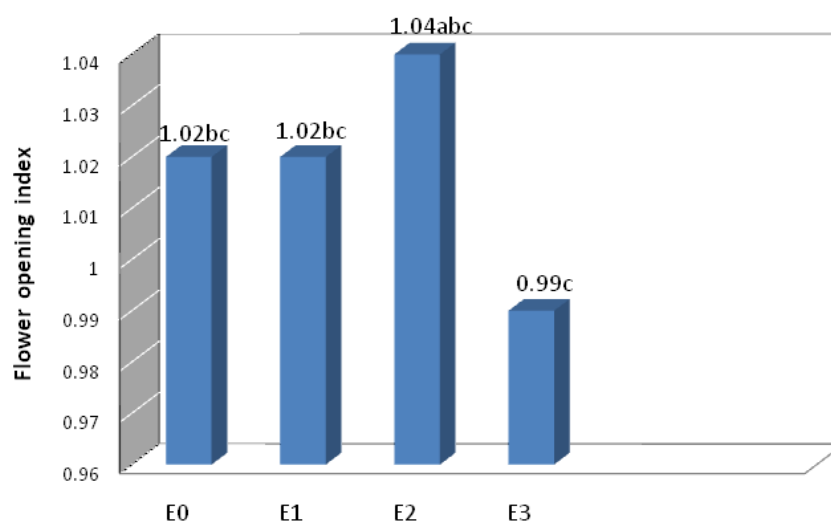


Fig. 1: Effect of *Artemisia* oil on vase life of cut chrysanthemum cv. White flowers

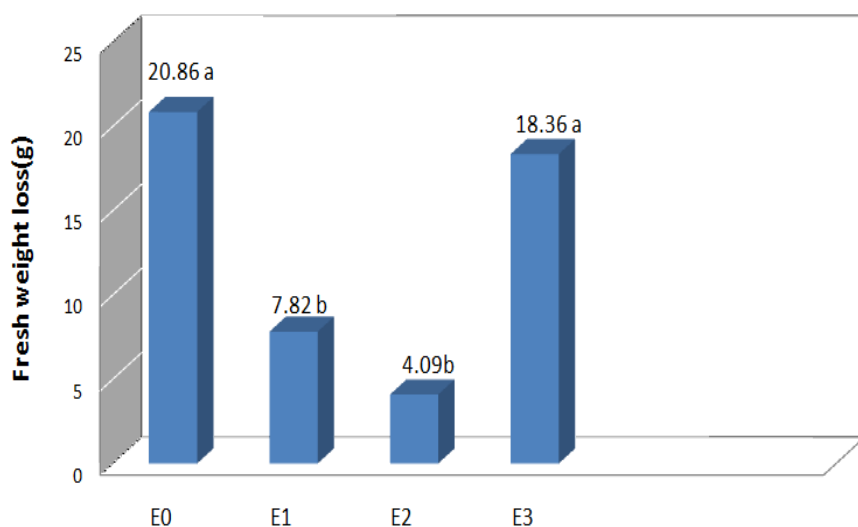


Fig. 2: Effect of *Artemisia* oil on fresh weight loss of cut chrysanthemum cv. White

Table 1- Effect of *Artemisia* oil on vase life, flower opening index and fresh weight loss of cut chrysanthemum cv. White flowers

Treatments	Vase life(days)	Flower opening index	Fresh weight loss(g)
E0: control	6d	1.02bc	20.86a
E1: 10% <i>Artemisia</i>	8bcd	1.02bc	7.82b
E2: 30% <i>Artemisia</i>	10ab	1.04abc	4.09b
E3: 50% <i>Artemisia</i>	6.33cd	0.99 c	18.36a

*Means with the same letters are not significantly different.

CONCLUSION

In conclusion best treatment that improves vase life and decreases fresh weight loss of cut flowers was 30% *Artemisia* oil.

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