Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Scholars Research Library

Annals of Biological Research, 2013, 4 (3):127-129
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library
ISSN 0976-1233
CODEN (USA): ABRNBW

Improvement vase life, protein content and postharvest quality of *Dendranthema grandiflorum* L. cv white by *Artemisia* oil

Mojtaba Samiee[1]*, Mohammad Zarchini[2], Shokrollah Haji Vand[3] and Davood Hashemabadi[4]

[1]Islamic Azad University, Tehran-Center Branch, Tehran, Iran
[2]Young Researchers Club, Rasht Branch, IslamicAzad University, Rasht, Iran
[3]Agriculture Education and Organization of Iran, Iran
[4]Department of Horticulture, Rasht Branch, Islamic Azad University, Rasht, Iran

---

ABSTRACT

In this research effect of Artemisia oil on vase lifeand postharvest quality of cut chrysanthemum (Dendranthemagrandiflorum) were investigated. The experiment were conducted based on randomized completely design with 4 levels of Artemisia oil (0, 10, 30 and 50%) and 3 replications. Analysis of variance showed thateffect of Artemisia oil on vase life, brix in final day ($p\leq0.05$), protein content and chlorophyll a($p\leq0.01$) was significant. Results showed that 30% Artemisia oil with 10 days vase life, 32.76% protein content, 1.62 chlorophyll a and 3.16 ˚brix was the best treatment compared to other levels of Artemisia oil.

Key words: *Dendranthemagrandiflorum*, vase life, protein content.

INTRODUCTION

Chrysanthemum (*Dendranthemagrandiflorum*) belong to Asteraceae family and one of the most important cut flowers in the world[1, 12]. Cut chrysanthemum flowers have showed leaf yellowing and petal wilting and these problems decreased vase life and postharvest quality [7, 17]. So, application of antimicrobial compounds such as humic acid, silver nanoparticles, essential oils and etc. has been suggested [2, 8, 16]. Essential oils as novel compounds are secondary metabolites and aromatic materials that friendly by environment and improved vase life of cut flowers [20]. Solgiet al.[21] demonstrated that application of essential oils and silver nanoparticles increased vase life and solution uptake compared to control in cut gerbera cv. Dune.JaliliMarandiet al. [14] showed that essential oils can be improved vase life, water uptake and fresh weight in cut rose (*Rosa hybrida* L.). Damunpolaetal. [6] revealed that s-carvone oil (monoterpene found in *carumcarvi*) at 0.318 and 0.636 mM improved vase life in *Baekaefrutescences*, *Chamelauicumuncinatum* and *Chrysanthemum* cut flowers.In this study effect of different concentrations of *Artemisia* oil on vase life and postharvest quality of cut chrysanthemum were investigated.

MATERIALS AND METHODS

In September 2012 cut chrysanthemum (*Dendranthemagrangiflorum* cv. White) at commercial stage were purchased from greenhouse located in Mahallat and immediately transferred to the postharvest laboratory of Islamic Azad University, Rasht Branch, Iran under standard conditions. 4 cut flowers were placed in 2 liter vases and they were treated with different concentrations of *Artemisia* oil. Experiment was conducted based on randomized completely design with treatments of *Artemisia* oil (0, 10, 30 and 50%) in 3 replications and 12plots. In this experiment vase life, petal protein content.chlorophyll a and ˚brix in final day were measured. Vase life index based on petal wilting and leaf yellowingof cut chrysanthemum flowers[18] For determination of petal protein content in 5th days in each plot petal was sampled and petal protein content was evaluated by Bradford method[5]. For determination of chlorophyll a content in 4thday in each plot leaf was sampled and chlorophyll content was measured by spectrophotometer apparatus[13]. For determination of ˚brix in final days, stem end (2cm) of cut flowers was sampled and ˚brix was evaluated by refractometer N-α model [13]. Data analysis carried out by using SPSS and MSTATC softwares and mean comparison wasdone according LSD test.

RESULTS AND DISCUSSION

Vase life

Analysis of variance showed that effect of treatments on vase life was significant ($p \leq 0.05$).Mean comparison showed that 30% *Artemisia* oil by 10 days increased vase life in compared to control(6days) (Table 1). Positive effect of this treatment is due to antimicrobial and antibacterial properties that prevent vascular blockage and increased water uptake [7, 18]. Our resultsagreement by MousaviBazaz and Tehranifar[17]. Liaoet *a*l.[15] showed that essential oils with increasing water uptake improved postharvest quality of cut rose (*Rosa hybrid* L.).

Table 1.Effect of *Artemisia* oil improved vase life, petal protein content, chlorophyll a and ˚brix in final days of cut chrysanthemum flowers

Treatments Artemisia oil	Vase life (Days)	Petal protein contents (%)	Chlorophyll a	˚Brix in final (%) day(%)
0	6d	3.83d	0.02c	2.36b
10%	8bcd	17.66b	1.35d	2.96b
30%	10a	32.76a	1.62a	3.16a
50%	6.33cd	8.81d	1.55bc	2.56b

**According to LSD test, in each column, means with the same letters are not significantly different.*

Petal protein content

Analysis of variance showed that effect of *Artemisia* oil on petal protein content was significant ($p \leq 0.01$). Artemisia oil (30%) increased petal protein (32.76%) compared to control flowers (Table 1). Increasing of petal protein contentis due to inhibition of peptidase enzyme activity and decrease of drought stress and improvement water relation that prevent membrane stability destruction[22]. Similar study such asNikbakhtetal. [19].Ezhilmathiet al. [10] demonstrated that in cut flowers membrane stability was important. In senescence cell membrane destroyed with ROS. Hashemabadi et al. [13] reavaledthat in cutcarnation (*Dianthus caryophyllus* L. cv. Tempo) use of antimicrobial agents improved membrane stability and petal protein content.

Chlorophyll a

Analysis of variance showed that effect of *Artemisia* oil on chlorophyll a was significant ($p \leq 0.01$). Results showed that 30% *Artemisia* oil (1.62) was the best treatment and improved chlorophyll a in compare to control (0.02) (Table 1). This effect is due to antimicrobial properties that improved water uptake and prevented vascular blockage [9, 20]. MousaviBazaz&Tehranifar [17] found that essential oils in 50 mg l^{-1} concentration was increased chlorophyll content compare to control. Our results about positive effect of antimicrobial compounds on chlorophyll content were agreement by Basiriet al.[4] and Ferranteet al. [12].

˚Brixin final day

Analysis of variance showed that the effect of *Artemisia* oil on ˚brix in final day was significant ($p \leq 0.05$).Mean comparison showed that 30% *Artemisia* oil by 3.16% was the best treatment and significantly increased this trait compared to control (Table 1). Positive effect of this treatment is due to improvement water relation and permanent

recuts under water and increasing water uptake[3]. ElgimabiandAhmed[9]demonstrated that use of 8-hydroxy quinolone sulphate as antimicrobial compound can be improvement carbohydrate status in stem and reduced respiration in cut rose flowers.

CONCLUSION

In conclusion, 30% *Artemisia* oil improved vase life, petal protein content, chlorophyll a and ˚brix in final days of cut chrysanthemum flowers.

Acknowledgments
Authors would like to thank Islamic Azad University, Rasht Branch, Special Dr. Ali MohammadiTorkashvand (Research Office Manager)for financial supports.

REFERENCES

[1] Anjum, A.M., Nawaz, A., Gul, S. and Naveed, F. **2007**.*Pak JAgricSci*, 44(3): 475-480.
[2] Ansari, S., Hadavi, E., Salehi, M., andMoradi, P.*J Ornament Hortic Plants.* **2011**, 1(1): 27-33.
[3] Bartoli C.G., Juan, G., and Edgrdo, M. **1997**. *Plant Sci*, 124:15-21.
[4] Basiri, Y., Zarei, H., Mashayekhi, K. **2011**. *Journal of Advanced Laboratory Research in Biology*., 2(2): 49-55.
[5] Bradford, M. M. **1976**. *Annal.Biochem.*,72: 248-254.
[6] Damunpola, J.W., Qian, T., Muusers, R., Joyce, D.C., Irving, D.E, and van Meeteren, U.**2010**. *Postharvest BiolTechnol*, 55: 66-69.
[7]Edrisi, B.**2010**. *Payam-e-Digar Publication*.150 pages
[8] Edrisi, B., Sadrpoor, A., Saffari, V. R. **2012**. *J. Ornament. Hortic.Plants*., 2(1): 1-12.
[9] Elgimabi, M.N., and Ahmad, O.K. **2009**. *Botany Res. Int*, 2(3): 164-168.
[10] Ezhilmathi, K., Singh. V. P., Arora, A., Sairam, R. K. **2007**. *Plant Growth Regulation.*, 51: 99-108.
[11] Ferrante, A., Hunter, D.A., Hackett, W.P, Reid, M., **2002.** *Postharvest Biol. Technol*., 25: 333-338.
[12] Hashemabadi, D., Haji Vand, S., Zarchini, M., EmamiKaldeh, N., Ghaderi, A., Hajian, G., andZarchini S. **2012**. *Annals.Biol Res*, 3 (11):5399-5402.
[13] Hashemabadi, D., Kaviani, B., Sedaghathoor, S., MohammadiTorkashvand, A.**2009**. *African Journal of Biotechnology*.,8(20): 535-5357.
[14] JaliliMarandi, R., Hassani, A., Abdollahi, A., Hanafi, S.**2011**. *JMPR.*,5(20): 5034-5038.
[15] Liao, L. J., Lin, Y. H., Huang, K. L., and Chen, W.S. **2001**. *Bot Bull Acad Sin*, 42: 35-38.
[16] MohammadiOstadKalayeh, Y., Mostofi. Y., Basirat. M. **2011.** *J. Ornament. Hortic. Plants.*, 1(2): 123-128.
[17] MousaviBazaz, A., Tehranifar, A. **2011**. *J. Biol. Environ. Sci*., 5(14):41-46.
[18]Nabigol, A., Naderi, R., Babalar, M., Kafi,M.**2007**. *J. Hortic. Sci. Technol.*, 7(4): 207-216.
[19]Nikbakht, A., Kafi, M., BabalarM., Xia, A., Luo, A., andEtemadi, N.A. **2008**. *J Plant Nutr*, 31:2155-2167.
[20] Oraee, T., AsgharZadeh, A., Kiani, M., Oraee, A. **2011**.*J. Ornament. Hortic. Plants.*, 1(3): 161-166.
[21] Solgi, M., Kafi, M., Taghavi, T. S., Naderi, R. **2009**. *Postharvest. Biol. Technol.*, 53: 155-158.
[22] Sood, S., and Nagar, P.K. **2003**. *Plant Growth Regul*, 39: 155-160.