The Pharma Innovation Journal 2023; 12(9): 2710-2712

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(9): 2710-2712

www.thepharmajournal.com
Received: 09-06-2023
Accepted: 13-07-2023

Harpreet Kaur
Student of MSc, Department of Floriculture and Landscape Architecture, Mata Gujri College, Fatehgarh Sahib, Punjab, India

Dr. Jujhar Singh
Assistant Professor, Department of Agriculture, Mata Gujri College, Sri Fatehgarh Sahib, Punjab, India

Corresponding Author:
Harpreet Kaur
Student of MSc, Department of Floriculture and Landscape Architecture, Mata Gujri College, Fatehgarh Sahib, Punjab, India

Effect of tinted colour and embedding media for Chrysanthemum (*Dendranthema grandiflorum*) cv. Pusa shwet in Microwave oven

Harpreet Kaur and Dr. Jujhar Singh

Abstract
The research on "Effect of tinted colour and embedding media for chrysanthemum (*Dendranthema grandiflorum*) cv. Pusa shwet" in microwave oven was conducted in Mata Gujri College, Fatehgarh Sahib during the educational year 2022-2023 inside the laboratory of Department of Agriculture, to determine the best tinted colour and media in microwave oven. We used six different embedded media for drying tinted chrysanthemum flower i.e., sand, borax, silica gel, sand + borax (1:1v/v), sand + silica gel (1:1v/v), borax + silica gel (1:1v/v) were used. The data recorded on different parameters like percent moisture loss, sensory parameters and percent reducing sugar were subjected to analysis with Factorial CRD. Results indicate that present ability of the tinted chrysanthemum flowers was best in media silica gel tinted with yellow colour in microwave oven.

Keywords: Chrysanthemum, media and colour

Introduction
Flowers look more attractive, tinting is a crucial means of value enhancement in where the colour pigments are weak or faint. It was a successful strategy for getting the appropriate colour at the post harvest stage by altering the colour according to the desired wish (Ranchana *et al*., 2017) [10]. For decoration purposes when a specific colour is required, tinting of white flowers may be the only option to get the desired colour. Chrysanthemum, tuberose and lillium are popular cut flowers, globally these blooms come in a variety of brilliant, vivid and cleared colours making them the perfect addition to any arrangement (Soni and Godra., 2017) [16]. Fresh flowers are very attractive though quite expensive, perishable in nature and available only for a particular season. So, to preserve flowers for a long time, we use different drying methods and on the other hand, dried flower products have long shelf life and maintain their aesthetic value for a long period of time (Malclm1994) [5]. Dried flowers and plant parts play an important role and constituent about 70 percent of the total share of floriculture exports from India (Singh, 2005) [14]. The practice of drying flowers is very old age practice. For the aim of identifying different species of flowers, flowers were dried by botanists in the form of herbarium (Prasad *et al.* 1997) [9]. Chrysanthemum is also one of them which are suitable for drying purpose.

Materials and Methods
The experiment was carried out in floriculture lab at Mata Gujri college, Sri Fatehgarh Sahib, Punjab during 2022-2023. We used different food dyes colour like orange colour, yellow colour and green colour for tinted chrysanthemum and six different embedding media like sand, borax, silica gel, sand:borax, sand:silica gel and borax:silica gel for drying tinted chrysanthemum in microwave oven. In microwave oven method, firstly flowers treated with different food dyes colour are taken for drying. After setting the flowers in the media, different coloured flowers had been placed in the Microwave oven. The glass jars had been removed after the treatment and had been kept as such for 24 hours without removing the flowers from the media. The flowers after removed from the desiccant had been wiped clean with the help of smooth camel hair brush to see its original colour after dying.

Results and Discussion
Moisture Loss (%)
Microwave oven is the quick drying method that generates less heat. It is based on the principle of releasing moisture by stirring up water molecules in organic materials using

electrically powered microwave (Bhattacharjee and De, 2003) [1]. In microwave oven, maximum moisture loss (77.38%) was recorded when flowers embedded with silica gel whereas minimum moisture loss (55.52%) was observed when flowers dried in borax. This might be possible due to the fact that the agitatition caused by treatment may be the cause of greatest moisture loss in microwave oven dehydration in silica gel. Compared to other treatments, the water molecules present in silica gel and flower petals have better hydro - sorbent capabilities. The better hydro – sorbent qualities may be due to the fact that silica gel is made of sodium silicate and has a huge network of interconnected microscopic holes that draw and store moisture through a process known as capillary condensation and physical absorption. (Safeena *et al*., 2006a) [11]. Similar findings were observed by Chaukle *et al*., 2022 [2] in standardization of different drying techniques in aster flower. The interaction between media × colour showed the maximum moisture loss (85.07%) was recorded when green colour flowers dried in silica and minimum moisture loss (44.31%) was recorded when orange colour flowers dried in borax. This might be due to the reason that silica act as an indicator for the amount of moisture absorbed. Silica gel absorbs moisture rapidly from the flowers as compared to borax and shape and colour of the flowers is also preserved in silica. This similar outcome is stated by Norman Winter, 1998 [8] and Nirmala, 2008 [7].

Sensory Evaluation

Effect of media on sensory parameters like (colour, shape, texture, brittleness and overall acceptability) was found to be maximum (19.27) in sand followed by borax, borax + silica gel. This might be because of fact that sand does not react with the water vapour produced during the drying process of flowers. Similar findings were observed by Meman *et al*., (2008) [6] and he noticed that when flowers dried in sand as a medium they retain their bright colour. Singh *et al*., (2005) [15] also claimed that silica gel and sand were superior in preserving the colour and texture of many flowers. The best grade dry materials were discovered to be produced by embedding sand in microwaves and hot air oven in the current investigation. Whereas minimum (16.98) effect of media on sensory parameters was recorded in sand + borax. Among colours, effect of sensory parameters was found to be maximum (19.03) in yellow colour and minimum (17.90) in green colour. Similar result can be lined with Sindhuja *et al*., (2015) [12] and opined that the colour can be vary according to colour and desiccant used for drying and similar result found in carnation flower cv. Harvey which had a yellow colour, had good colour retention and obtain the highest possible score. The interaction between media × colour on sensory parameters was found to be maximum (20.67) when white colour flowers dried in borax whereas minimum (15.33) was found to be when green colour flowers dried in sand + silica. This might be due to the reason that a microwave oven higher temperature and longer runtime which leads to more loss of the pigment. Similar to our findings, according to Dahiya *et al*., 2003 [3] carotenoid content of chrysanthemum flowers decreased with a rise in temperature and time after being embedding in sand and silica gel.

Reducing Sugar

Effect of media on reducing sugar was found to be maximum (6.06%) in microwave oven when flowers dried in borax + silica gel whereas minimum (5.33%) was found to be when flowers dried in sand + silica gel. This might be due to the reason that borax and silica gel has strong hygroscopic properties which lead to quick removal of moisture from flowers as compared to sand desiccants. Similar results were observed by Singh *et al*., (2003) [13]. Among colours, effect of reducing sugar was found to be maximum (5.71%) in white colour and minimum (5.52%) was found to be in green colour. The interaction between media × colour on reducing sugar was found to be maximum (6.67%) when white colour flowers dried in borax and silica gel whereas minimum was found to be when orange colour flowers dried in sand and silica gel. This might be due to the reason that borax and silica gel has strong hygroscopic properties which lead to quick removal of moisture from flowers as compared to sand desiccants. However, drying of flowers for a longer period of time led to the removal of more moisture which increase the sugar content. Eliminated less moisture for a shorter period of time for a shorter period of time and therefore led to a lower sugar content. Similar outcome are as stated by Dilta *et al*., (2014) [4] in rose flower cv. 'First Red.

Table 1: Effect of tinted colour and embedding media for chrysanthemum (*Dendranthema grandiflorum*) cv. Pusa shwet in microwave oven and their interaction on different parameters

	Moisture Loss (%)	Sensory Parameters (colour, shape, texture, brittleness and overall acceptability)	Reducing Sugar (%)
Media			
M_1	67.56	19.75	5.66
M_2	55.44	19.27	5.46
M_3	77.38	17.90	5.47
M_4	62.32	16.98	5.83
M_5	77.24	18.02	5.33
M_6	55.52	19.71	6.06
$CD_{0.05\%}$	4.88	1.05	0.24
Colour			
C_1	65.90	18.58	5.62
C_2	61.12	19.03	5.69
C_3	70.96	17.90	5.52
C_4	65.65	18.90	5.71
$CD_{0.05\%}$	3.99	0.85	0.19
Interaction			
M_1C_1	75.61	20.58	5.61
M_1C_2	67.62	20.25	5.78
M_1C_3	64.62	19.08	5.59

M_1C_4	62.38	19.08	5.65
M_2C_1	44.31	18.42	6.16
M_2C_2	47.08	19.00	5.41
M_2C_3	66.91	19.00	5.08
M_2C_4	63.46	20.67	5.19
M_3C_1	79.94	18.42	5.46
M_3C_2	79.90	15.75	5.90
M_3C_3	83.95	18.58	5.65
M_3C_4	65.72	18.83	4.88
M_4C_1	61.98	16.75	5.55
M_4C_2	48.59	18.83	5.48
M_4C_3	76.08	16.00	5.88
M_4C_4	62.24	16.33	6.42
M_5C_1	79.47	17.25	4.67
M_5C_2	68.24	20.42	6.10
M_5C_3	77.56	15.33	5.10
M_5C_4	83.68	19.08	5.44
M_6C_1	54.10	20.08	6.27
M_6C_2	55.30	19.92	5.49
M_6C_3	56.65	19.42	5.81
M_6C_4	56.03	19.42	6.67
$CD_{0.05\%}$	9.76	2.09	0.47

Conclusions

From the present studies, it can be concluded that silica gel is the most suitable media for maximum moisture loss for drying of tinted chrysanthemum flowers in microwave oven and minimum moisture loss when dried in borax. Among edible food dye colours, yellow colour more uniform colour on florets of chrysanthemum when dried in microwave oven.

Acknowledgement

I am very obliged to my research advisor Dr. Jujhar Singh and my companions Amritpal kaur and Alisha Kamboj to supported me during my research work.

References

1. Bhattacharjee SK, De LC. Dried flowers and plant parts, In: Advanced commercial floriculture. Avishkar Publishers, Jaipur; c2003, p. 162-273.
2. Chaukle RM, Rathod NG, Gupta NS, Uphade VC. Standardization of different drying techniques in aster flower. The Pharma Innovation Journal. 2022;11(1):842-845.
3. Dahiya DS, Unnikrishnan D, Gupta AK, Sehrawat SK, Siddiqui S. Dehydration of annual Chrysanthemum (*C. coronarium*). Acta Horticulture. 2003;624:385-387.
4. Dilta BS, Behera TB, Gupta YC, Bhalla RB, Sharma P. Effect of embedding media, temperature and durations on hot air oven drying of rose (*Rosa hybrida* L.) cv. First Red. Indian journal of Applied Research. 2014;4:233-239.
5. Malcolm H. Guide to arranging dried flowers. Step by step handbook of growing, drying and displaying, Dorling Kindersley Ltd., London (U.S.A.), c1994.
6. Meman MA, Barad AV, Varu DK. Technology for dry flower production of calendula (*Calendula officinalis*) flowers. Indian Journal of Horticulture. 2008;3(1):1-4.
7. Nirmala A, Chandrasekar R, Padma M, Rajkumar M. Standardisation of drying techniques of carnation. Journal of Ornamental Horticulture. 2008;11(3):168-172.
8. Norman Winter. Preserving Flowers and Leaves; c1998. www.extension.umd.edu/publications/PDFs/ FS556.pdf.
9. Prasad JJK, Pal PK, Voleti SR. Drying of flowers: an upcoming industry. Floriculture Today; c1997, p. 20-23.
10. Ranchana P, Ganga M, Jawaharlal M, Kannan M. Standardization of tinting techniques in China aster cultivar Local white. International Journal of Current Microbiology and Applied Sciences. 2017;6(9):27-31.
11. Safeena SA, Patil VS, Naik B Hemla. Response of drying in hot air oven on quality of rose flowers.Journal of Ornamental Horticulture. 2006a;9(2):114-117.
12. Sindhuja S, Padmalatha T, Padmavathamma AS. Effect of embedding media on production of quality dry flowers in Carntion. Plant Archives. 2015;15(1):27-33.
13. Singh A, Dhaduk BK, Shah RR. Effect of dehydration on post harvest life and quality of zinnia flowers. Journal of Ornamental Horticulture. 2003;6(2):141-142.
14. Singh HP. Current status of floriculture in India. *Floriculture Today*, 2005, 5-6.
15. Singh A, Dhaduk BK. Effect of dehydration techniques in some selected flowers. Journal of Ornamental Horticulture. 2005;8(2):155-156.
16. Soni SS, Godra AK. Evaluation of gerbera varieties for growth and floral characters grown under greenhouse condition. International Journal of Current Microbiology and Applied Sciences. 2017;6(5):2740-745.