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A study on dehydration of dutch rose and value added products

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Abstract

Beauty and quality of flowers can be retained from few months to several years by applying suitable drying techniques. Experimental and explorative study was conducted to evaluate the dried flowers for value added products. For development of value added products, Dutch rose and three drying techniques i.e., air, desiccant, and microwave oven drying was used. A panel of five judges were assessed the quality parameters of Dutch rose. An observation sheet was developed to evaluate the dried flower products by selected 30 respondents. The study revealed that among three different drying techniques, embedding in silica gel drying obtained the maximum scores for quality parameters hence, flowers which dried in silica gel embedding media were used for the development of dried flower products. Majority (93.33%) of the respondents had very good response towards visual appearance and shape (70.00%) of the potpourri product. ANOVA was used to evaluate the result.

Keywords: Dutch rose, potpourri, shadow box, table mount, and greeting frame

Introduction

Beauty of flowers always attracts the world and has a special place in everywhere, due to their purity and beauty. Flowers are symbol of love, respect, sacrifice, friendship, beauty and regard. The beauty and quality of fresh flowers can be retained only for few days or few weeks. In order to reduce the major problem of short life of fresh flowers dehydration plays an important role because dried flowers can be retained from few months to several years.

Dutch rose is one of the nature's most beautiful flowers and it is universally accepted as "queen of flowers". It belongs to the family Rosacea and Genus Rosa. Rose is symbol of love, adoration and innocence and it occupies a prominent position in the tradition, religious and social culture of every country in the world. Rose is one of the top making cut flower in the international flower trade and dry cut flowers traded in the international market. (Renuka *et al.*, 2017) [7].

The entire seasonal colorful vegetation can be converted into value added products by using dehydration technique. Dehydration technology is removal of water and reduced microbial activity in fresh flowers and other plant materials. Dehydration technology can also be exploited for promising colourful cut flowers in its original colour and shape for long term enjoyment and for commercial utilization (Katagi *et al.*, 2014) [4]. The most common dehydration techniques are air drying, embedding (silica gel, borax 1: sand 1), hot air oven and microwave oven drying etc.

Flowers are the utmost perishable horticultural farm produce, there remains some hindrance in proper marketing following the standard post-harvest management practices by the common farmers. Hence, value addition has become very popular towards the expansion of floricultural trade by the art of preservation of flowers, other plant materials and creation of value added products (Chatterjee R., and Das K., 2017). Value addition is a process that elevates a production into a product. Value addition is the enhancement added to a product before the product is offered to the customers. It is a business strategy for creating new market demands or indulging renewed demand from the set of conventional customers. A value added horticultural product can ignore the risk of seasonality in crop availability and market vagaries. Greeting cards, flower arrangement, shadow box, and potpourri etc. are the some of the common value added products from the dried flowers.

Methodology

The experiment was carried out in department of Family Resource Management, College of Community Science, in 2017-18. In the present study the Dutch rose was selected. The flowers were dried in different drying techniques such as air drying, desiccant (silica gel and borax 1: sand 1) drying and microwave drying (after embedding them in silica gel) techniques and

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evaluated in ANOVA with three replications. The healthy and disease free of Dutch rose flowers were harvested at the commercial stage in the morning hours. Immediately after harvest, the cut ends of the flower stalks were placed in water. The stem length of the each flower kept at a uniform length. Observation on flower fresh weight, dry weight, moisture loss (%) and time taken to dry were recorded. A panel of 5 judges assessed the quality parameters such as colour, appearance and shape of dried flowers. To assess quality parameters scale was used given by Dinesh, 2000 [3]. The flowers dried in silica gel drying technique give best results. Hence, silica gel dried Dutch rose flowers were used to develop value added products such as Greeting card, Potpourri, Shadow box and Table mount. An observation sheet was developed to evaluate the value added products by 30 respondents. Rating scale of 1-3 (very good, good and fair) scores were used and parameters considered for evaluation of developed dried flowers value added products were visual appearance, shape/form and overall acceptability. The data were analysed using ANOVA.

Result and Discussion

Physical parameters of dried Dutch rose flowers as affected

by different drying techniques were presented in table 1. The colour and appearance of dried flowers differed significantly at 5% level due to dehydration or drying techniques. Silica gel drying technique was found significantly superior for colour and appearance of the dried flowers as indicated by recording the maximum mean score of 4.7 and 4.6 respectively. The flowers dried by other methods of drying techniques such as microwave oven drying 4.6, mixture of borax and sand drying 4.4 and air drying 4.3 received less mean points for the retention of colour, followed by retention of appearance of dried flowers recorded minimum mean score in microwave drying (4.5), mixture of borax and sand (4.3) and air drying (4.2). The shape of the dried flowers non-significantly differed with method of drying techniques used. Among the four drying techniques silica gel drying technique was proved as superior for retention of shape with highest mean score of 4.4 and followed by mixture of borax and sand drying scored 4.2, microwave oven drying scored 4.1 and less mean score was observed in the air drying i.e., 3.4. Dhatt *et al.*, (2007) [2] found that silica gel drying of rose buds had the best quality with respect to colour and shape. Safeena *et al.*, (2006b) [8] opined that drying different varieties of rose with silica gel gives good result for colour, appearance and texture.

Table 1: Effect of drying techniques on physical parameters of Dutch rose flowers

Techniques	Physical Parameters					
	Colour		Appearance		Shape	
	Mean	'F' Value	Mean	'F' Value	Mean	'F' Value
Air drying	4.3	4.25*	4.2	4.66*	3.4	0.27
Silica gel drying	4.7	9.50*	4.6	15.50*	4.4	2.36
Borax + Sand drying	4.4	5.66*	4.3	3.63*	4.2	1.40
Microwave oven drying	4.6	10.50*	4.5	6.33*	4.1	0.25

The data with respect to developed dried Dutch rose flower value added products are presented in table 2. In this study the dried Dutch rose flowers were treated with different drying techniques such as air drying, silica gel drying and mixture of borax and sand drying and microwave drying and artistically arranged these dried flowers in varieties of display containers which enhance the beauty of any interior and exterior. The value added products namely shadow boxes; table mounts, photo frames and potpourris were developed by using dried Dutch rose flowers. It was noted that developed dried flower products were differing with respect to material used. Some of the materials used for developing dried flowers products were wooden, plastic and glass material due to some silent features

of these packing materials. Silent features of these materials were as follows, wooden is more strong and durable compared to other material followed by plastic is easily available, less cost and easy to carry and glass is heavy material but it provides good visual appearance and it is transparent where flowers can easily viewed by the people and it is reusable. Radha Rani and Reddy (2015) [5] opined that the dehydrated flowers retain their original shape, size and colours and can be used in value addition which includes distinctive and artistic greeting cards, landscapes, wall hangings, table mats, photo frames, paper weights, magnets, decoration of different types and sizes of glass containers etc.

Table 2: Developed dried Dutch rose flowers value added products

Sl. No.	Product Name	Products picture	Material
1	Shadow box		Wooden
2	Greeting frame		Plastic and wooden

3	Potpourri		Glass and plastic
4	Table mount		Glass

Table 3 stated acceptance of developed dried Dutch rose flowers value added products. In shadow box majority (70.00%) of the respondents had very good attitude towards visual appearance and 30.00 per cent good attitude followed by 46.66 per cent respondents very good attitude, 43.33 per cent good attitude and only 10.00 per cent respondents fair attitude towards shape or form and majority (76.66%) of the respondents had very good attitude towards overall acceptability and 23.33 per cent good attitude with respect to shadow box. Among three parameters such as visual appearance, shape and over all acceptability, majority (27.00 per cent, 43.33 per cent and 60.00 per cent respectively) of the respondents had very good attitude and in 06.66 per cent respondents had good attitude towards visual appearance and 50.00 per cent towards shape and 40.00 per cent towards over all acceptability and only 03.33 per cent and 06.66 per cent respondents had fair attitude towards visual appearance and shape respectively with respect to greeting frame. In potpourri majority (93.33%) respondents had very good attitude

towards visual appearance, 70.00 per cent towards shape or form and 76.66 per cent towards over all acceptability followed by 06.66 per cent respondents had good attitude towards visual appearance, 30.00 per cent towards shape or form and 23.33 per cent respondents towards overall acceptability. With regard to table mount 50.00 per cent respondents very good attitude towards visual appearance, 36.66 per cent towards shape or form and 40.00 per cent respondents towards the overall acceptability followed by equal per cent *i.e.*, 43.33 respondents had good attitude towards visual appearance and shape or form and 53.33 per cent respondents towards overall acceptability followed by majority (20.00%) respondents had fair attitude towards shape or form and equal per cent (06.00%) respondents towards visual appearance and overall acceptability. According to Ravichandra and Pedapati (2014) [6] maximum sensory score was observed for floral arrangements in glass followed by photo frames (4.50), flower arrangements (4.43) and less sensory scores was observed for floral greetings (3.75).

Table 3: Acceptance of developed dried Dutch rose flowers value added products

N=30

Parameters	Products											
	Shadow box			Greeting frame			potpourri			Table mount		
	V.G	G	F	V.G	G	F	V.G	G	F	V.G	G	F
Visual appearance	21.00 (70.00)	09.00 (30.00)	-	27.00 (90.00)	02.00 (06.66)	01.00 (03.33)	28.00 (93.33)	02.00 (06.66)	-	15.00 (50.00)	13.00 (43.33)	02.00 (06.66)
Shape or form	14.00 (46.66)	13.00 (43.33)	03.00 (10.00)	13.00 (43.33)	15.00 (50.00)	02.00 (06.66)	21.00 (70.00)	09.00 (30.000)	-	11.00 (36.66)	13.00 (43.33)	06.00 (20.00)
Overall acceptability	23.00 (76.66)	07.00 (23.33)	-	18.00 (60.00)	12.00 (40.00)	-	23.00 (76.66)	07.00 (23.33)	-	12.00 (40.00)	16.00 (53.33)	02.00 (06.66)

Conclusion

From this study, it is concluded that the colour and appearance of dried Dutch rose flowers differed significantly at 5 per cent level due to method of drying technique used. It was also observed that silica gel drying technique showed the best results in retention of colour, appearance and shape. Silica gel dried Dutch rose flowers were used to develop value added products like greeting card, shadow box, potpourri and table mount. Dehydration of flowers has huge potential in dry flower industry to provide employment to unemployed youths and rural women. There are many simplified drying techniques have been developed by which flowers and other plant materials can be retained in their fresh look for several months or even years. The need is to promote

these techniques and industries by providing support both from public as well as private sector organization.

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