

Effect of packaging and storage on shelf life of dried flowers of *Dendrobium orchid* var. SONIA-17

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SUMMARY : An investigation was carried out to evaluate the shelf life of dried flowers of *Dendrobium* orchid var. Sonia-17 for long term storage. Dried flowers packed in an air tight plastic container and stored under dark condition, resulted in good colour (19.37) and texture (21.00). Flexibility was good in control (open) which was at par with flowers packed in an air tight plastic containers. Shelf life of dried flowers can be extended up to six months if stored under dark in an air tight plastic container.

Key Words : Packaging, Storage, Shelf life, *Dendrobium*, Drying

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Drying and preserving of flowers and plant materials is a form of artistic expression that was very popular during the Victorian age and has once again gained popularity. The beauty and fresh look of cut flowers can be retained only for few weeks even by the best techniques of post-harvest technology but the charm of dried flowers and foliage can be maintained from a few months to years together, if these protected from the damage of high humidity. By drying in absence of moisture the microbial activity causing the ageing effect is drastically reduced. The main qualities of dried flowers include novelty, longevity, aesthetic, flexibility and year round availability (Singh, 2009). Keeping this in view, the present investigation was undertaken to evaluate the shelf life of dried flowers in different package and storage conditions.

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EXPERIMENTAL METHODS

The present investigation was carried out at the Division of Post harvest technology, Indian Institute of Horticultural Research, Hesaraghatta, Bengaluru, during 2009-2010. Dried flowers of *Dendrobium* orchid var. Sonia-17 were packed in different packages viz., plastic container, 300 gauge thick polyethylene covers and without any package (open) and stored under dark and light condition. The experiment was laid out in a Completely Randomized Design with factorial concept. Observations on shelf life and quality parameters of these dried flowers were evaluated at monthly interval. Quality parameters like colour, texture and shape were assessed by means of sensory evaluation on a 25 point scale viz., Very good, good, average, poor and very poor with a weightage of 21-25, 16-20, 11-15, 6-10 and 0-5, respectively.

EXPERIMENTAL FINDINGS AND ANALYSIS

Quality parameters like colour, texture and shape of dried flowers of *Dendrobium* orchid var. SONIA-17 as affected by different package and storage are presented in Table 1. Packaging had significant effect on quality of dried flowers. Dried flowers were packed in an air tight plastic container retained good colour (17.87), texture (20.75) and shape (21.89)

Table 1: Effect of packaging and storage condition on sensory score of dried flowers of *Dendrobium* orchid var. Sonia-17

Sr. No.	Treatments	Before storage			After storage		
		Colour	Texture	Shape	Colour	Texture	Shape
Package (P)							
1.	Plastic container	24.25	22.50	23.75	17.87	20.75	21.89
2.	Polyethylene cover	24.25	22.50	23.75	12.25	15.75	18.80
3.	Control(open)	24.25	22.50	23.75	10.50	10.62	14.71
	S.E.±	0.18	0.2	0.53	0.18	0.16	0.56
	C.D. (P=0.05)	NS	NS	NS	0.54	0.47	1.68
Storage (Sc)							
1.	Dark	24.25	22.50	23.75	13.96	15.91	18.70
2.	Light	24.25	22.50	23.75	13.12	15.50	18.17
	S.E.±	0.14	0.17	0.43	0.15	0.13	0.46
	C.D. (P=0.05)	NS	NS	NS	0.45	0.39	NS
Interaction effect (P x Sc)							
1.	Plastic container x Dark	24.25	22.50	23.75	19.37	21.00	22.25
2.	Plastic container x Light	24.25	22.50	23.75	11.75	20.50	19.37
3.	Polyethylene cover x Dark	24.25	22.50	23.75	16.37	16.00	14.69
4.	Polyethylene cover x Light	24.25	22.50	23.75	10.75	15.50	21.25
5.	Control (open) x Dark	24.25	22.50	23.75	12.75	10.75	18.25
6.	Control (open)x Light	24.25	22.50	23.75	10.25	10.50	14.75
	S.E.±	0.25	0.29	0.75	0.13	0.22	0.79
	C.D. (P=0.05)	NS	NS	NS	0.77	0.67	NS

NS- Non significant

Very Good : 21- 25, Good : 16-20, Average : 11-15, Poor : 6-10 and Very Poor : 0-5

Table 2 : Effect of packaging and storage condition on flexibility and shelf life of dried flowers of *Dendrobium* orchid var. Sonia-17

Sr. No.	Treatments	Flexibility(°)	Shelf life (Months)
Package (P)			
1.	Plastic container	44.5	5.1
2.	Polyethylene cover	42.00	3.3
3.	Control (open)	46.50	2.3
	S.E.±	0.24	0.05
	C.D. (P=0.05)	0.72	0.15
Storage (Sc)			
1.	Dark	44.58	4.0
2.	Light	44.12	3.1
	S.E.±	0.19	0.04
	C.D. (P=0.05)	NS	0.12
Interaction effect (P x Sc)			
1.	Plastic container x Dark	45.62	6.0
2.	Plastic container x Light	43.37	3.5
3.	Polyethylene cover x Dark	42.0	2.5
4.	Polyethylene cover x Light	42.0	4.2
5.	Control (open) x Dark	47.0	3.0
6.	Control (open)x Light	46.1	2.0
	S.E.±	0.34	0.07
	C.D. (P=0.05)	1.02	0.21

NS- Non significant

as compared to the dried flowers packed in polyethylene covers and dried flowers held without any package (open). This is because polyethylene covers is more permeable to gases such as O₂, CO₂ and water vapour than the plastic container. Bull (1997) had claimed that dried flowers should not be stored in plastic covers. Among storage conditions flowers were stored under dark condition retained good colour (13.96). This is due to the colouring pigments of flowers are highly sensitive to oxidation damage by light as well as by free radicals which leads to reduction in colour intensity and also change of pigments to unacceptable colour shades.

Among interaction effects, dried flowers packed in an air tight plastic container and stored under dark condition resulted in good colour (19.37) and texture (21.00). This may be due to the reabsorption of moisture from atmosphere and also the colour start fading due to direct light. Dried materials should be stored in a dark, dry airtight container to prevent them from absorbing water during humid periods and also to prevent dust from sticking and discolouration of the petals (Gouin, 1994).

Data on flexibility and shelf of dried flowers *Dendrobium orchid* var. Sonia-17 as affected by different package and storage are presented in Table 2. Packaging had a significant effect on flexibility of dried flowers. Flexibility was good in control (open) which was at par with flexibility in flowers which were packed in an air tight plastic containers. This may be due to flowers which were kept open absorbed atmospheric moisture thus resulting in more moisture content which in turn resulted in less degree of breakage of the flower.

Individual effect of packaging and storage had a significant effect on shelf life of dried flowers. Dried flowers packed in an air tight plastic container could retain all the parameters evaluated in acceptable form up to five months as compared to dried flowers without package. Dried flowers stored under dark

condition can be well maintained up to four months. Significant differences were observed among the interaction effect of package and storage on shelf life of dried flowers of *Dendrobium orchid* var. Sonia-17. Flowers packed in an air tight plastic container and stored under dark condition can be retained up to six months whereas flowers without any package stored under light can be stored only for two months. This may be because of change in the dried flower colour, texture and shape during the period of storage. Evans and Davis (1998) suggested to store the herbs in a cool, dry place away from light, moisture and heat. From the foregoing discussion, it is concluded that for long term storage, dehydrate the *Dendrobium orchid* var. Sonia-17 flowers during season and store them under dark in an air tight plastic containers to use them during high market demand.

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