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Genetic variability for morphological and flower characters in spray type Chrysanthemum [*Dendranthema grandiflora*]

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Abstract

The present investigation was carried out with 12 variety of chrysanthemum at Main Experimental Station, Horticulture of N.D.U.A.T., Faizabad during the year 2011-12 to evaluate the genetic variability, coefficient of variation, heritability (broad sense), Genetic advance in per cent of mean and correlation coefficient among 11 quantitative characters and their vase life in 4% sucrose solution.

Keywords: Genetic, variability, morphological, Chrysanthemum, *Dendranthema grandiflora*

Introduction

India has a long tradition of floriculture. References to flowers and gardens are found in ancient Sanskrit classics like Rigveda, Ramayana and Mahabharata. The social and economic aspects of flower growing were however, recognized much later. With changing life style and increased urban affluence, floriculture has assumed a definite commercial status in recent times and it has emerged as an important agri-business venture. In this regard chrysanthemum has gained much importance as it is the 'Queen of autumn' and 'Queen of East Asia'.

Materials and Methods

The present investigation entitled "Genetic variability for morphological and flower characters in spray type chrysanthemum [*Dendranthema grandiflora*]" was undertaken during the winter season of the year 2011-12 at the experimental field and laboratory of Floriculture section, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad [U.P.]. The details of the materials used, experimental procedures followed and techniques adopted are described herein.

Experimental finding

The mean performance of 12 variety for quantitative character of plant height was maximum in Suneel (50.20 cm), plant spread was maximum in Dentiment (34.74 cm), number of primary branch was maximum in Jaya (10.30), day to first flowering was earliest in Regal Time (89 days), day of full blooming was earliest in Sadbhawana (93.33 days), number of flower per plant was maximum in Dentiment (103.60 g), diameter of flower was maximum in Dentiment (10.40 cm), number of florets per flower was maximum in Suneel (339.67), weight of ten flower was maximum in Dentiment (63.00 g), flower yield was maximum in Dentiment (652.68 g) and Vase life of flower was maximum in Jayanti (16 days). The characters studied varied significantly.

The coefficient of variation both at phenotypic and genotypic levels were maximum for flower yield per plant (PCV=93.51%, GCV=93.36%) while, days to full blooming was minimum (PCV=13.74%, GCV=12.57%). High to very high heritability were observed for all the characters while, maximum heritability was recorded for flower yield per plant (99.7%). Flower yield per plant (192.02) was recorded to very high genetic advance in per cent of mean. The correlation coefficient for weight of ten flower exhibited highly significant and positive correlation at phenotypic level with flower yield per plant (0.887), number of florets per flower (0.845) and diameter of flower (0.785).

Thus, on the basis of flower yield per plant Dentiment can be chosen for commercial cultivation in eastern Uttar Pradesh condition.

Table 1: Analysis of variance for eleven characters in Chrysanthemum during 2011-12

S. No.	Characters	Mean sum of squares		
		Replication	Treatments	Error's
		d.f.:2	12	24
1.	Plant spread (cm)	8.66	109.80**	3.59
2.	Height of plant (cm)	0.81	294.28**	2.39
3.	Number of primary branches	0.59	9.96**	0.39
4.	Days to first flowering (days)	8.36	552.76**	31.97
5.	Days to full blooming (days)	24.11	728.94**	44.72
6.	Number of flowers/plant	16.05	1561.87**	18.47
7.	Diameter of flower (cm)	0.03	13.42**	0.13
8.	Number of florets/ flower	10.16	38080.21**	130.49
9.	Weight of ten flower (g)	0.001	856.21**	2.42
10.	Flower yield/plant (g)	33.15	88560.28**	92.69
11.	Vase life (days)	0.69	10.08**	0.94

*,** Significant at 0.05% and 0.01% probability level, respectively

Table 2: Performance of twelve varieties of chrysanthemum for qualitative characters during 2011-12

Varieties	Flower colour (qualitative traits)	
	Type of bloom	Colour of bloom
Mother-Teresa	Anemone type mini Chrysanthemum	White
Sadbhawana	Double Korean mini Chrysanthemum	Yellow Red
Suneel	Double Korean	Mauve Colour
Regal Time	Double Korean	Pinkish White
Little Darling	Pompon type	Yellow colour, bronze centre
Mix Gulabi	Decorative	Pinkish White
Jaya	Double Korean	Maroon
Jayanti	Decorative	Sulphur yellow
Manbhawan	Double Korean small flowered	Yellow Red
D-5	Double Korean	Red/Bronze
Sudha	Double Korean	Yellow
Dentiment	Anemone	Mauve/Pinkish

Table 3: Grand mean, range, GCV, PCV, heritability (in broad sense), genetic advance in per cent of mean in chrysanthemum varieties during 2011-12

S. No.	Characters	Grand mean (\bar{X}) \pm SE	Range	GCV	PCV	Broad sense heritability (%)	G.A.	G.A. in per cent of mean
1.	Plant spread (cm)	23.68 \pm 1.094	17.20-34.74	25.123	26.365	90.8	11.680	49.314
2.	Height of plant (cm)	30.03 \pm 0.892	17.37-50.20	32.853	33.253	97.6	20.075	66.862
3.	Number of primary branches	6.20 \pm 0.364	4.03-10.30	28.785	30.524	88.9	3.468	55.918
4.	Days to first flowering (days)	102.64 \pm 3.264	89.00-130.67	12.837	13.969	84.4	24.942	24.301
5.	Days to full blooming (days)	119.89 \pm 3.861	99.33-156.67	12.571	13.748	83.6	28.446	23.678
6.	Number of flowers/plant	70.21 \pm 2.481	34.80-103.60	32.307	32.881	96.5	45.908	65.388
7.	Diameter of Flower (cm)	6.10 \pm 0.207	3.27-10.40	34.500	34.996	97.2	4.274	70.063
8.	Number of florets/ flower	217.32 \pm 6.595	53.07-339.67	51.755	52.021	99.0	230.506	106.069
9.	Weight of ten Flower (g)	25.84 \pm 0.899	4.00-63.00	65.277	65.554	99.2	34.605	133.901
10.	Flower yield/plant (g)	183.93 \pm 5.558	31.84-652.68	93.364	93.510	99.7	353.197	192.027
11.	Vase life (days)	12.56 \pm 0.559	10.00-16.00	13.905	15.899	76.5	3.145	25.052

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