Studies on Grouping of Gladiolus Genotypes in Clustering Magnitude

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Abstract— *Genetic divergence results among the important traits provided a basis for making improvement leading to successful selection through breeding programme. Experimental results grouped of 50 genotypes in 3 clusters. Intra cluster distance was found maximum in cluster I which was followed by cluster II. Maximum inter-cluster distance was found between cluster I and II.*

Keywords— *Cluster, divergence, gladiolus, magnitude, replication, superior.*

I. INTRODUCTION

Gladiolus has got a great scope in floriculture industry which may increase Indian economy by exporting spikes and seed material to national and international markets (Dadlani, 1996; Kumar *et al.,* 2004). In this age floriculture has come up as considerable high status and has a bright future for exporting to foreign countries. Quality flowers, flower products and genuine plant materials are in great demand for earning (Singh, 2010). Swarup (1993) and Prasad *et al.* (1998) advocated a great scope of floriculture and its export potential oriented industry. Since Indian varieties of gladiolus has got an outstanding status for income in our country and abroad. The optimum parental diversity is required to obtain superior genotypes. The generalized distance occupies an unique place in plant breeding (Mahalanobis, 1936). Trials were planned to study the genetic divergence grouping magnitude in commercial varieties.

II. MATERIAL AND METHODS

Present investigations were planned to study genetic divergence in gladiolus at Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during 1999-2000. Experimental material consisted fifty commercial genotypes of gladiolus. Disease free and corms were selected and sown in randomized block design with three replication. Data were recorded in observations for genetic divergence grouping. Multivariate analysis based on Mahalanobis D^2 statistic and canonical variate analysis was used in quantifying the genetic divergence (Rao, 1952).

III. RESULTS AND DISCUSSION

Mean squares due to treatments for all the characters were found significant and indicated variability for different genotypes which were grouped into non overlapping clusters. It was found that maximum number of 48 genotypes was included in cluster I, followed by one each in cluster II and III,

respectively. Infact this may be attributed to the distribution of different gene constellation into different geographical regions. Similar results were reported in earlier investigations by Kumar *et al.* (2004) in Canna, Prasad and Arya (1998) in Dahlia and Prasad *et al.* (2000) in narcissus. The intra cluster distances were found to vary, which suggested that genotypes occupying one cluster may also have little diversity. The inter-cluster distances varied to a great extent. The maximum inter cluster distance was found between cluster III and II, cluster III revealed highest cluster mean values for certain clusters. This cluster had the highest mean values for important traits.

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TABLE I. Average of Intra and Inter Cluster D^2 value in 50 varieties of gladiolus (1999-2000).

Cluster	I	II	III
I	13,186.885	175.760	723.266
II		0.000	557.985
III			0.000

TABLE II. Average of Intra and Inter Cluster D^2 value in 50 varieties of gladiolus (2000-2001).

Cluster	I	II	III
I	9,302.981	118.077	439.702
II		0.000	336.585
III			0.000

TABLE III. Average of Intra and Inter Cluster D value in 50 varieties of gladiolus (1999-2000).

Cluster	I	II	III
I	114.834	13.257	26.894
II		0.000	23.623
III			0.000

TABLE IV. Average of Intra and Inter Cluster D value in 50 varieties of gladiolus (2000-2001).

Cluster	I	II	III
I	96.452	10.866	20.969
II		0.000	18.346
III			0.000

TABLE V. Cluster Mean value for 10 characters in 50 varieties of gladiolus (1999-2000).

Cluster	Plant height	No. of leaves	Length of leaf	Width of leaf	Length of spike	No. of days to flowering	No. of florets/ spike	No. of croms/ plant	No. of cormels/ Plant	Weight of cormel/ plant
I	1.359*	11.329	39.873**	4.486**	75.422	81.828	17.741	1.377**	34.450	7.417
II	1.427	11.117*	32.867	4.383	73.467*	80.533*	16.133*	1.233*	32.767*	7.333*
III	1.520**	12.473**	31.933*	4.310*	81.600**	82.833**	18.533**	1.300	55.567**	11.233**

TABLE VI. Cluster Mean value for 10 characters in 50 varieties of gladiolus (2000-2001).

Cluster	Plant height	No. of leaves	Length of leaf	Width of leaf	Length of spike	No. of days to flowering	No. of florets/ spike	No. of croms/ plant	No. of cormels/ Plant	Weight of cormel/ plant
I	1.386*	11.433*	34.310**	4.965**	75.916	82.369*	18.228	1.367*	35.481	8.968
II	1.840**	11.600	34.200	4.297*	75.367*	83.500**	18.767**	1.167*	34.800*	7.367*
III	1.467	12.567**	32.800*	4.607	82.833**	83.233	17.900*	1.300	54.800**	11.613**