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Study on phenotypic correlation co-efficient in Dahlia germplasm

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ABSTRACT : Dahlia is an important bulbous flower crop which has position to increase economic earning of grower. Forty varieties were grown and studied for genotypic correlation of traits at C.S.Azad University of Agriculture and Technology, Kanpur, during 2011-12 and 2012-13. Vegetative and reproductive characters parameters were found to have considerable relationship which also indicated the scope for making improvement in dahlia. Plant height and maximum number of flower per head revealed the sustainable magnitude for crop improvement in dahlia crop.

KEY WORDS : Species, Varieties, Germplasm, Dahlia

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Dahlia is one of the important bulbous flowering crops and its flowers are used for various purposes of decoration. It belongs to the family Compositae. Dahlia has a large group of beautiful striking colours – bi-colours and multicoloured cultivars (Basu *et al.*, 1970). Due to its qualities, it is advocated as a flower of glamour and perforation. It provides inner enjoyment and feelings to human beings. Among the flowers it has own rank and standing in India and abroad. Its varieties have considerable importance and scope in economic field. In recent years dahlia farming along with other flowers has picked up very well both in the hills and plains. Its flowers of giant decorative, large decorative, medium decorative, small decorative, pompan and cactus types are grown in Uttar Pradesh, Delhi, Rajasthan, Punjab, Tamil Nadu, Himanchal Pradesh, Gujarat, Karnataka, Andhra Pradesh, Sikkim, Madhya Pradesh, Kolkata, Orissa, Assam, states and North Eastern Hill regions in sporadic cultivation. In some Institutions, Universities and National/ Regional Centers/ Research complex etc. grow it for different purposes.

RESEARCH METHODS

Present investigation was carried out during the year 2011-12 and 2012-13 at C.S. Azad University of Agriculture and Technology, Kanpur. The experiment material consisted of 40 standard dahlia genotypes. The experiment was laid out in Randomized Block Design with three replications. All the recommended cultural practices were followed to grow the successful crop. The data collected were statistically analyzed. The genetic diversity among the genotypes was worked out using Mahalanobis D² statistics as described by (Rao, 1952). Tubers of screened and selected varieties were taken as basic material for planting in the trials. Healthy tubers were planted in proper layout in the field.

RESEARCH FINDINGS AND DISCUSSION

Data of the phenotypic correlation coefficient are summarized in the Tables 1 and 2. Calculated data of phenotypic correlation summarized in Tables 1 and 2 revealed that plant height was recorded to have positive correlation with number of branches (0.1623), length of

branch (0.1719), number of leaves/ plant (0.4757), length of leaf (0.0361) diameter of leaf stock (0.0668) days for bud maturity (0.1809), number of flowers/ plant (0.1617), diameter of flower (0.1768), number of tuber/plant (0.0480) and weight of tuber (0.2135) during 2011-12.

In the investigations of 2012-13, the height of plant had positive correlation with number of branches/plant

(0.0979), length of branch (0.0630), number of leaves/ plant (0.2260), number of flowers/plant (0.2967), diameter of flowers (0.3696), number of tubers/plant (0.1127) and diameter of tuber (0.4224) characters in dahlia.

Number of branches/plant showed positive and highly significant correlation ship with length of branch

Table 1 : Phenotypic correlation co-efficient in dahlia for 16 characters (2011-12)

Sr. No.	Characters	Days for tuber sprouting	Plant height	No. of branches/ plant	Length of branch	No. of leaves/ plant	Length of leaf	Diameter of leaf stalk	Days for bud emergence
		1	2	3	4	5	6	7	8
1.	Days for tuber sprouting	1.0000	0.0139	0.3835	0.1898	0.0520	-0.1919	0.0325	-0.2162
2.	Plant height	0.0139	1.0000	0.1623	0.1719	0.4757**	0.0361	0.0668	-0.2942
3.	No. of branches/ plant	0.3856	0.1623	1.0000	0.6067***	0.3184	-0.4727**	0.3598*	-0.2102
4.	Length of branch	0.1898	0.1719	0.6067***	1.0000	0.4196**	-0.5366***	0.4545**	0.0435
5.	No. of leaves/plant	0.0520	0.4751	0.3184*	0.4196**	1.0000	-0.1992	0.2576	-0.1179
6.	Length of leaf	-0.1919	0.0361	-0.4727**	-0.5366***	-0.1792	1.0000	-0.3565	0.2204
7.	Diameter of leaf stalk	0.0325	0.0668	0.3598*	0.4545**	0.2576	-0.3565*	1.0000	0.1220
8.	Days for bud emergence	0.2162	-0.2942	-0.2102	0.0435	-0.1179	0.2204	0.1220	1.0000
9.	Days for bud maturity	-0.1398	0.1809	0.0112	0.1458	0.3395*	-0.0037	0.2515	0.0691
10.	Length of flower bud	0.0465	0.0484	0.1724	0.2911	-0.0853***	-0.0863	0.2396	0.1152
11.	No. of flowers/plant	0.3020*	0.1617	0.3375**	0.4188**	0.0843	-0.1410	0.0493	0.0509
12.	Diameter of flower	0.2333	0.1768	0.2171	0.2671	0.0732	-0.1472	0.0160	-0.1018
13.	No. of flowers/head	0.2161	0.0815	0.4982**	0.5703	0.1808	-0.4470**	0.2674	0.1459
14.	No. of tubers/plant	-0.2397	0.0480	-0.3477*	-0.4042**	-0.1467	0.4579**	-0.3565*	0.0160
15.	Diameter of tuber	0.1349	0.3056*	0.3268*	0.1818	0.0620	0.2384	0.0761	-0.0615
16.	Weight of tuber	0.2681	0.2135	0.2989	0.2494	0.2302	-0.1559	0.1824	0.0248

Table 1 contd...

Sr. No.	Characters	Days for bud maturity	Length of flower bud	No. of flowers/ plant	Diameter of flower	No. of flowers/ head	No. of tubers/ plant	Diameter of tuber	Weight of tuber
		9	10	11	12	13	14	15	16
1.	Days for tuber sprouting	-0.1398	0.0465	0.3020*	0.2333	0.2161	-0.2397	0.1349	0.2681
2.	Plant height	0.1809	-0.0484	0.1617	0.1768	0.0815	0.0480**	0.3056	0.2135
3.	No. of branches/ plant	0.0112	0.1724	0.3375*	0.2171	0.4982**	-0.3477*	0.3268	0.2989
4.	Length of branch	0.1458	0.2911	0.4188**	0.2671	0.5703***	-0.4042**	0.1818	0.2494
5.	No. of leaves/plant	0.3395*	-0.0853	0.0845	-0.0732	0.1808	-0.1467	0.0620	0.2302
6.	Length of leaf	-0.0037	-0.0863	-0.1410	-0.1472	-0.4470**	0.4579**	0.2384	-0.1559
7.	Diameter of leaf stalk	0.2515	0.2396	0.0493	-0.0160	0.2674	-0.3565	0.0761	0.1824
8.	Days for bud emergence	0.0691	0.1152	0.0502	-0.1018	0.1459	-0.0160	0.0615	0.0248
9.	Days for bud maturity	1.0000	-0.1488	-0.0068	-0.0679	0.0481	0.0644	0.1907	-0.0510
10.	Length of flower bud	0.1488	1.0000	0.3977*	0.2229	0.2128	-0.0502	0.0759	0.3037*
11.	No. of flowers/plant	-0.0068	0.3977*	1.0000	0.4671**	0.5829	-0.0926	0.2365	0.3366*
12.	Diameter of flower	-0.0679	0.2229*	0.4671**	1.0000	0.5498	-0.1567	0.1159	0.1661
13.	No. of flowers/head	0.0481	0.2128	0.5829***	0.5498***	1.0000	-0.3252*	0.2416	0.2710
14.	No. of tubers/plant	-0.0644	-0.0502	-0.0926	-0.1567	-0.3252	1.0000	0.1124	0.3252*
15.	Diameter of tuber	-0.1907	0.0759	0.2365	0.1159	0.2416	0.1124	1.0000	0.4486*
16.	Weight of tuber	-0.0510	0.3037*	0.3366*	0.1661	0.2710	0.3252*	0.4486	1.0000

*, ** and *** indicate significance of value at P=0.05, 0.01 and 0.10, respectively

(0.6067), number of leaves/plant (0.3184), diameter of leaf stalk (0.3598), number of flowers/plant (0.3375), numbers flowers/head (0.4982), diameter tubers/plant (0.3268) and weight of tuber (0.2989) during 2011-12. In the aspect of number of branches/plant also have positive and highly significant correlation with length of branch (0.5674), number of leaves/plant (0.3587),

diameter of leaf stalk (0.3616) number of flowers/head (0.3873) and weight of tuber (0.3478) in the investigations of 2012-13.

Similarly in the first year trial of 2011-2012 revealed that number of leaves/plant showed positive correlation with diameter of leaf stalk (0.2576), days for flower bud maturity (0.3395), number of flowers/plant (0.0845),

Table 2 : Phenotypic correlation co-efficient in dahlia for 16 characters (2012-13)

Sr. No.	Characters	Days for tuber sprouting	Plant height	No. of branches/plant	Length of branch	No. of leaves/plant	Length of leaf	Diameter of leaf stalk	Days for bud emergence
		1	2	3	4	5	6	7	8
1.	Days for tuber sprouting	1.0000	0.0110	-0.0393	-0.2313	-0.1417	0.0016	-0.2742	0.2933
2.	Plant height	0.0110	1.0000	0.0979	0.0630	0.2260	-0.0703	-0.0934	-0.3468*
3.	No. of branches/ plant	-0.0394	0.0979	1.0000	0.5674***	0.3587*	-0.3344*	0.3616	-0.1156
4.	Length of branch	-0.2313	0.0630	0.5674***	1.0000	0.2928	-0.2755	0.5773***	0.0083
5.	No. of leaves/plant	-0.1417	0.2260	0.3587*	0.2928	1.0000	-0.1208	0.10109	-0.1613
6.	Length of leaf	0.0016	-0.0703	-0.3344*	-0.2755	-0.1208	1.0000	-0.1522	0.3246
7.	Diameter of leaf stalk	0.2742	-0.0934	0.3616*	0.5773	0.1909	-0.1522	1.0000	-0.1004
8.	Days for bud emergence	-0.2933	-0.3468*	-0.1156	0.0083	-0.1613	0.3246*	-0.1004	1.0000
9.	Days for bud maturity	0.1006	-0.2180	-0.0704	-0.1384	-0.1920	0.2199	-0.2690	0.4433
10.	Length of Flower bud	0.0407	-0.144	-0.0480	0.0449	0.0002	-0.2196	0.1296	-0.3017
11.	No. of flowers/plant	-0.0049	0.2967	0.2651	0.4638	0.0882	-0.2657	0.1616	-0.1792
12.	Diameter of flower	0.0108	0.3696*	0.0425	0.1469	-0.1363	-0.2563	0.1640	-0.2689
13.	No. of flowers/head	0.0310	0.1253	0.3873*	0.5613	0.1002	-0.2864	0.3563*	0.0110
14.	No. of tubers/plant	0.0417	0.1127	-0.0835	-0.4091	0.1969	0.1204	-0.2391	-0.0830
15.	Diameter of tuber	0.0246	0.4224**	0.0053	0.1433	0.0158	0.0205	-0.0041	-0.0220
16.	Weight of tuber	0.0226	0.0445	0.3478*	0.3272	0.3047*	-0.0790	0.2204	0.1526

Contd.... Table 2

Sr. No.	Characters	Days for bud maturity	Length of flower bud	No. of flowers/plant	Diameter of flower	No. of flowers/head	No. of tubers/plant	Diameter of tuber	Weight of tuber
		9	10	11	12	13	14	15	16
1.	Days for tuber sprouting	0.1006	0.0407	-0.0049	0.0108	0.0310	-0.0417	0.0246	0.0226
2.	Plant height	-0.2180	-0.0144	0.2967	0.3696*	0.1253	0.1127	0.4224**	-0.0445
3.	No. of branches/ plant	-0.0704	-0.0480	0.2651	0.0425	0.3873*	-0.0835	-0.0053	0.3478*
4.	Length of branch	-0.1384	0.0449	0.4638**	0.1469	0.5613***	-0.4091**	0.1433	0.3272*
5.	No. of leaves/plant	-0.1920	0.0002	0.0882	-0.1363	0.1002	0.1969	0.0158	0.3047*
6.	Length of leaf	0.2199	-0.2996	-0.2657	-0.2563	-0.2864	0.1204	0.0205	-0.0790
7.	Diameter of leaf stalk	-0.2690	0.1296	0.1616	0.1640	0.3563*	-0.2391	-0.0041	0.2204
8.	Days for bud emergence	0.4433**	-0.3017	-0.1792	-0.2689	0.0110	-0.0830	-0.0220	0.1526
9.	Days for bud maturity	1.0000	-0.0639	-0.2107	-0.1752	-0.0381	0.0781	0.0384	0.2584
10.	Length of Flower bud	-0.0639	1.0000	0.1515	0.2627	0.104	-0.1549	-0.1888	-0.0299
11.	No. of flowers/plant	-0.2107	0.1515	1.0000	0.4426**	0.5309***	-0.1146	0.2815	0.2293
12.	Diameter of flower	-0.1752	0.2627	0.4426**	1.0000	0.4701**	-0.0526	0.2021	0.0461
13.	No. of flowers/head	0.0381	0.1004	0.5309***	0.470**	1.0000	-0.2770	0.1974	0.3473*
14.	No. of tubers/plant	0.0781	-0.1549	-0.1146	-0.0526	-0.2770	1.0000	0.1064	0.1357
15.	Diameter of tuber	0.084	-0.1888	0.2815	0.2021	0.1974	0.1064	1.0000	0.3321*
16.	Weight of tuber	0.2584	0.0299	0.2293	-0.0461	0.3473*	0.1357	0.3321*	1.0000

*, ** and *** indicate significance of values at P=0.05, 0.01, 0.10, respectively

number of flowers/head (0.1808), diameter of tuber (0.0620) and weight of tuber (0.2302). Number of leaves/plant exhibited the positive correlation (0.1909), length of flower bud (0.0002), number of flowers/plant (0.0822), number of flowers/head (0.1002), number of tubers/plant (0.1969) and weight of tuber (0.3047) characters.

Length of branch exhibited positive correlation with number of leaves/plant (0.2928), diameter of leaf stalk (0.5773), number of flowers/plant (0.4638), number of flowers/head (0.5613), diameter of tuber (0.1433) and weight of tuber (0.3272) in the experiment of 2012-13.

Length of flower bud exhibited positive correlation with number of flowers/plant (0.3977), diameter of flower (0.2229), number of flowers/head (0.2128) and weight of tuber (0.3037) during 2011-12. In the trial of next year this character revealed positive correlation with number of flowers/plant (0.1515), diameter of flower (0.2627) and number of flowers/head (0.104) during 2012-13. It is also exhibited that a number of tubers/plant and its weight per tuber also revealed the positive and significant correlation but with some aspects it had negative correlation.

REFERENCES

- Anuradha, S. and Gowda, J.V.N. (1990).** Genetic variability studies in gladiolus. *Abst. Int. Sem. New Frontier Hort.*, Bangalore, pp. 65.
- Anuradha, S. and Gowda, J.V.N. (1990a).** Genetic variability in gladiolus. *Prog. Hort.*, **22** (1-4) : 55-59.
- Anuradha, S. and Gowda, J.V.N. (1992).** Phenotypic and Genotypic correlation studies in gladiolus. *Crop. Res.*, **5** (2) : 381-386.
- Beura, S. and Maharana, T. (1990).** Genetic variance in different Dahlia varieties. *Orissa J. Agric. Res.*, **3** (2) : 169-172.
- Bihari, M., Kumar, R., Singh, K. and Narayan, S. (2011).** Phenotypic and genotypic path coefficient studies in Ginger. *J. Academetia*, **15** (4) : 549-555.
- Bihari, M., Kumar, R., Singh, K. and Prasad, A. (2009a).** Phenotypic Path-coefficient studies in Floribunda Rose Genotypes. *J. Orna Hort.*, **12** (3) : 118-121.
- Bihari, M., Kumar, R., Singh, K. and Prasad, A. (2009b).** Studies on genetic Divergence in gladiolus genotypes. *J. Orna Hort.*, **12** (3) : 200-205.
- Katiyar, J.N. (1996).** Studies on variability and correlation on orchids. Ph.D. Thesis, Kanpur University, KANPUR, U.P. (INDIA).
- Katiyar, J.N., Prasad, A. and Arya, S. (1995).** Studies on genotypic correlation in orchids. *Recent. Hort.*, **4** (2) : 113-116.
- Katiyar, J.N., Prasad, A., Kumar, R. and Arya, S. (1994).** Studies on Phenotypic correlation in orchids. *Prog. Hort.* (Accepted).
- Katiyar, S.P. (1984).** Studies on path coefficient relationship in hybrid varieties of gladiolus. Ph.D. Thesis, Kanpur University, Kanpur, U.P. (INDIA).
- Prasad, A. and Pradhan, N. (1991).** Studies on genotypic correlation in different characters in gladiolus. *Ibid.* pp. 42.
- Prasad, A. and Pradhan, N. (1991a).** Studies on genetic and phenotypic correlation of various characters in gladiolus. *Nat. Symp. Soil Water pollution its remedial measures* held at Allahabad. *Abst.* pp. 8.
- Rao, C. R. (1952).** *Advanced statistical methods in biometrical research.* J. Wiley and Sons, New York

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