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Path coefficient analysis in gladiolus (*Gladiolus hybridus* Hort.) genotypes

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Abstract
Path coefficient analysis was worked out for number of spike per plant in forty genotypes of gladiolus (*Gladiolus hybridus* Hort.). It revealed that number of leaves recorded the highest direct effect on number of spikes per plant followed by leaf area, weight of corm before planting and rachis length which indicated the possibility of increasing spike yield by selecting the genotypes for these characters directly.

Keywords: Coefficient, analysis, gladiolus, *Gladiolus hybridus*

Introduction
Gladiolus (*Gladiolus hybridus* Hort.) is commonly known as Sword lily or Corn flag. It is the most popular bulbous flower grown throughout the world for its beautiful flowers and said to be "Queen of bulbous flower crops". Gladiolus is ideal for garden display and floral arrangement for table and interior decoration as well as making high quality bouquets. Heritable traits of yield and flower quality are complex characters and are known to be collectively influenced by various polygenically inherited traits, which are highly vulnerable to environmental effects. Hence, the knowledge of the nature and the extent of association of yield with yield contributing characters is considered to be of great importance for planning an efficient breeding programme. The path coefficient analysis method splits the correlation coefficients into direct and indirect effects which help in assessing the relative influence of each important character on the ultimate yield and flower quality. Therefore, path co efficient was workedout in gladiolus.

Material and Methods
The present investigation was carried out at Department of Floriculture and Landscape Architecture, K.R.C. College of Horticulture Arabhavi, UHS, Bagalkot, India. The experiment was laid out in randomized block design with two replications, consisted forty genotypes of gladiolus. The investigation was conducted in open field at a spacing of 30 × 20 cm. All recommended agronomic package and practices were followed to grow a successful crop. The experiment was conducted in both *kharif* and *rabi* season. The observations on different morphological traits were recorded on five randomly selected plants from each genotype in each replication were used for data analysis. Pooled data of both seasons was used for data analysis. The analysis of variance was carried out according to the standard procedure suggested by Panse and Sukhatme (1967) [4]. Path coefficient analysis was carried out using genotypic and phenotypic correlation coefficients for number of spike per plant as dependent variable as suggested by Wright (1921) [6] and illustrated by Dewey and Lu (1959).

Results and Discussion
Significant differences were observed for all the characters studied among all the genotypes. The implication of studies becomes more evident, when correlations are partitioned into components through path analysis in order to determine the relative magnitude of various attributes contributing to correlation. Partitioning of total correlation into direct and indirect effects would be worthwhile for an effective selection programme. Path coefficient analysis was carried out using genotypic and phenotypic correlation coefficient for number of spike per plant and are presented in tables 1 and 2, respectively.
Among the twelve characters studied, four characters showed significant direct positive effect on the spike yield at genotypic level. In pooled mean data of the both seasons indicated that

number of leaves, leaf area per plant, weight of corm before planting and rachis length had significant direct positive effect on spike yield indicating their true positive and significant association with spike yield. It revealed that direct selection of genotypes based on these characters will increase the spike yield. Whereas significant negative direct effect was expressed by spike length, plant height, number of cormels, number of shoots, vase life and number of florets which signifies that direct selection cannot be done considering these characters. But they showed significant indirect positive effect on spike yield through number of leaves, leaf area per plant, weight of corm before planting and rachis length. The indirect positive effects suggested that selection for any of these characters would improve the yield through the associated characters. The residual effect of the genotypic path analysis was 31.7 per cent indicated that the studied characters contributed 68.3 per cent variation on number of spikes per plant. The results are in accordance with the findings of Pattanaik *et al*. (2015) [5], Geeta *et al*. (2014) [4], Kumar *et al.* (2015) [3] and Aido (2014) [1] in gladiolus.

At phenotypic level, number of leaves showed significant positive direct effect on number of spike per plant. The residual effect of the phenotypic path analysis was 55 percent indicates that the studied characters contributed 45 percent variation on number of spikes per plant.

Table 1: Genotypic path coefficient for growth, flowering, yield and quality parameters in gladiolus genotypes (Pooled analysis of both seasons)

	WCP	PH	NS	NL	LA	DSE	SL	RL	NF	VL	NDC	NCr
WCP	0.7649	0.3819	-0.1450	-0.2298	0.4393	-0.0190	0.5079	0.4813	0.3996	0.4492	-0.1527	0.3710
PH	-0.2739	-0.5486	0.2190	0.1550	-0.4429	-0.0342	-0.3512	-0.2130	-0.0827	-0.1200	-0.0010	-0.2001
NS	0.0740	0.1559	-0.3905	-0.3253	0.1922	0.1272	0.0202	-0.0564	-0.0799	-0.0728	-0.1014	0.0829
NL	-0.5446	-0.5120	1.5099	1.8127	-0.8414	-0.7861	-0.0164	0.2738	0.3425	0.3043	0.7031	-0.2582
LA	0.5244	0.7372	-0.4494	-0.4239	0.9132	0.1233	0.6956	0.4109	0.3274	0.3748	0.0206	0.3689
DSE	-0.0043	0.0108	-0.0564	-0.0750	0.0234	0.1730	-0.0030	-0.0050	-0.0231	-0.0218	-0.0257	0.0578
SL	-0.4560	-0.4395	0.0355	0.0062	-0.5230	0.0119	-0.6866	-0.5699	-0.4613	-0.4962	-0.1080	-0.2922
RL	0.3718	0.2294	0.0853	0.0893	0.2659	-0.0171	0.4905	0.5910	0.4686	0.4840	0.0267	0.3003
NF	-0.1130	-0.0326	-0.0442	-0.0409	-0.0776	0.0289	-0.1453	-0.1715	-0.2163	-0.2103	0.0144	-0.0571
VL	-0.2209	-0.0823	-0.0701	-0.0632	-0.1544	0.0473	-0.2719	-0.3081	-0.3658	-0.3762	0.0166	-0.1005
NDC	0.0156	-0.0001	-0.0202	-0.0302	-0.0018	0.0116	-0.0123	-0.0035	0.0052	0.0034	-0.0779	-0.0142
NCr	-0.2291	-0.1723	0.1003	0.0673	-0.1908	-0.1577	-0.2010	-0.2400	-0.1247	-0.1262	-0.0861	-0.4723
NSp	-0.0910	-0.2724*	0.7742**	0.9422**	-0.3978**	-0.4907**	0.0265	0.1896	0.1895	0.1922	0.2284*	-0.2137

Residual effect: 0.317 Bold: Direct effect Above and below diagonal: Indirect effect
Critical r_g value = 0.219 at 5 per cent and 0.286 at 1 per cent
* and ** indicate significant at 5 and 1 per cent probability level, respectively

WCP – Weight of corm before planting (g)
PH - Plant height (cm)
NS - Number of shoots
NL - Number of leaves
LA - Leaf area (cm^2)
DSE - Days to spike emergence
SL - Spike length (cm)
RL - Rachis length (cm)
NF - Number of florets
VL - Vase life (days)
NDC - Number of daughter corms per plant
NCr - Number of cormels per plant
NSp – Number of spikes per plant

Table 2: Phenotypic correlation coefficient for growth, flowering, yield and quality parameters in gladiolus genotypes (Pooled analysis of both seasons)

	WCP	PH	NS	NL	LA	DSE	SL	RL	NF	VL	NDC	NCr
WCP	0.1242	0.0520	-0.0136	-0.0152	0.0555	-0.0054	0.0668	0.0660	0.0488	0.0591	-0.0143	0.0488
PH	-0.0631	-0.1508	0.0391	0.0256	-0.1168	-0.0093	-0.0830	-0.0477	-0.0138	-0.0249	0.0011	-0.0488
NS	-0.0086	-0.0204	0.0787	0.0633	-0.0239	-0.0098	-0.0010	0.0085	0.0114	0.0109	0.0149	-0.0156
NL	-0.0824	-0.1146	0.5428	0.6747	-0.2031	-0.1297	0.0168	0.0824	0.0913	0.0894	0.1887	-0.0910
LA	0.0123	0.0212	-0.0083	-0.0083	0.0274	0.0026	0.0178	0.0103	0.0066	0.0083	0.0007	0.0099
DSE	0.0064	-0.0092	0.0186	0.0285	-0.0143	-0.1482	-0.0015	0.0020	0.0115	0.0130	0.0209	-0.0208
SL	-0.0314	-0.0321	0.0007	-0.0014	-0.0378	-0.0006	-0.0583	-0.0482	-0.0384	-0.0410	-0.0086	-0.0196
RL	0.1018	0.0607	0.0206	0.0234	0.0717	-0.0025	0.1586	0.1917	0.1482	0.1528	0.0156	0.0766
NF	-0.0574	-0.0134	-0.0211	-0.0198	-0.0353	0.0113	-0.0962	-0.1129	-0.1461	-0.1383	-0.0005	-0.0254
VL	0.0262	0.0091	0.0076	0.0073	0.0165	-0.0048	0.0387	0.0438	0.0520	0.0549	0.0008	0.0118
NDC	0.0020	0.0001	-0.0032	-0.0048	-0.0005	0.0024	-0.0025	-0.0014	-0.0001	-0.0003	-0.0172	-0.0021
NCr	-0.0510	-0.0420	0.0257	0.0175	-0.0466	-0.0182	-0.0437	-0.0519	-0.0226	-0.0279	-0.0158	-0.1298
NSp	-0.0210	-0.2393*	0.6875**	0.7909**	-0.3071**	-0.3122**	0.0124	0.1424	0.1488	0.1559	0.1864	-0.2060

Residual effect: 0.551 Bold: Direct effect Above and below diagonal: Indirect effect
Critical r_g value = 0.219 at 5 per cent and 0.286 at 1 per cent
* and ** indicate significant at 5 and 1 per cent probability level, respectively

WCP – Weight of corm before planting (g)
PH - Plant height (cm)
NS - Number of shoots
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VL - Vase life (days)
NDC - Number of daughter corms per plant
NCr - Number of cormels per plant
NSp – Number of spikes per plant

Conclusion

The present study has been suggested that maximal emphasis should be given on number of leaves plant, leaf area weight of corm before planting and rachis length because they are the most important yield contributing traits. Finally, it concluded that the selection of genotypes based on these traits could be exploited for a future breeding program to improve the gladiolus spike yield.

References

1. Aido T. Genetic divergence studies in gladiolus (*Gladiolus grandiflorus* L.) M.Sc. Thesis, Dr. Y.S.R. Horticultural University 2014,
2. Geeta SV, Shirol AM, Nishani S, Parvati P, Varuna KJ. Path coefficient analysis studies in gladiolus. Plant Arch 2014;14(2):1131-1133.
3. Kumar P, Kumar M, Kumar A. Study of correlation coefficient and path coefficient analysis in gladiolus (*Gladiolus hybridus* Hort.). Annals Horti 2015;8(1):113-115.
4. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers, ICAR. New Delhi 1967.
5. Pattanaik S, Paul A, Lenka PC. Genotypic and phenotypic variability and correlation studies in gladiolus, J Crop. Weed 2015;11(1):113-119.
6. Wright S. Correlation and causation. J Agric. Res 1921;20:557-585.