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CORRELATION STUDIES IN GLADIOLUS

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ABSTRACT

A correlation analysis conducted on 40 gladiolus varieties revealed a positive and significant association between spike yield per hectare and various morphological traits. At the genotypic level, spike yield per hectare exhibited positive correlations with number of corms per plant, spikes per plant, tillers per plant, leaves per plant and leaf area per plant. Similarly at the phenotypic level, spike yield per hectare showed a significant positive correlation with number of spikes per plant, corms per plant, tillers per plant and leaves per plant. The study highlights that spike yield per hectare in gladiolus is strongly influenced by key morphological traits, with both genotypic and phenotypic correlations emphasizing importance of corms, spikes, tillers and leaves per plant in yield improvement.
Keywords: genotypic, phenotypic and correlation,

Introduction

Gladiolus belonging to family Iridaceae, is often referred to as the "Queen of bulbous flowers." It ranks fifth in global cut flower trade (Butt et al., 2015) and has a rich and noble history. The genus *Gladiolus* consists of approximately 250 species, with its name originally given by Elder (23–79 AD), derived from the Latin word *gladius*, meaning sword, due to sword-like appearance of foliage. This popular bulbous cut flower is cultivated for its striking beauty, elegance, and tall, majestic spikes adorned with vibrant florets. Breeding programs primarily focus on developing high-yielding varieties with enhanced quality and creation of variability through segregating population. Gladiolus holds significant potential in the export market, particularly in winter. Despite India's favorable agro-climatic conditions, commercial cultivation is limited to about 1,500 hectares (Ramachandrudu and Thangam, 2009).

Vidarbha region of Akola lies in the subtropical zone at 22°42' N latitude and 77°02' E longitude, with an altitude of 307.42 meters above mean sea level. Akola experiences a semi-arid climate with three distinct seasons, including a hot and dry summer. Its favorable climatic conditions make the region well-suited for gladiolus cultivation. Gladiolus cultivars differ in various aspects such as flower color, size, growth duration, spike length, floret number and size, and vase life. Therefore, it is essential to evaluate cultivars and hybrids before recommending them for a specific agro-climatic region.

Due to the highly heterozygous nature of gladiolus, it is essential to evaluate existing germplasm before implementing hybridization programs to utilize the diversity in growth and flowering traits. Although gladiolus germplasm has been screened in India, information on high-yield cut flower performance remains scarce. Assessing genotypes across different environments is essential to determine their genetic potential and adaptability, enabling the selection of the best growth and flowering traits. Correlation study provides beneficial information regarding interrelationship of quantitative traits among each other and influence of these traits on yield, thereby aid in selection. Therefore, this study was undertaken to examine correlation between different traits in Vidarbha region of Maharashtra.

Material and Methods

The present study was conducted at experimental field of Department of Floriculture and Landscape Architecture, Dr. P.D.K.V., Akola, during rabi season of 2021-2023. The soil type at the location was light to medium black soil, uniform in texture and maintained free from weeds and diseases to ensure optimal crop growth. Gladiolus plants were cultivated using standard practices, including field preparation involving ploughing and multiple rounds of criss-cross harrowing. Raised beds were laid out, and mulch was applied according to the experimental treatments. Observations were recorded from five randomly selected plants in each plot and subjected to variance and covariance analysis described by Panse and Sukhatme (1967). The correlation at phenotypic and genotypic levels between all possible pairs of characters were calculated from variance and covariance components as proposed by Al- Jibouri *et al.* (1958).

Result and Discussion

Genotypic and phenotypic correlation analyses are crucial in plant breeding as they help determine the relationships between traits and their impact on crop improvement. Genotypic correlation reveals true genetic association between traits, guiding breeders in selecting traits that can be improved together, while phenotypic correlation accounts for both genetic and environmental influences, reflecting actual trait expression. A high genotypic correlation but a low phenotypic correlation indicates strong genetic control but significant environmental effects, aiding in the selection of stable genotypes. These correlations help in indirect selection for hard-to-measure traits, optimizing hybridization strategies, and ensuring balanced improvement of yield, quality and stress tolerance. Understanding these relationships enables breeders to make informed decisions, enhancing the efficiency and success of breeding programs. In this study, phenotypic and genotypic correlation coefficients were calculated for all possible combinations of 22 quantitative traits and are presented in Tables 1 and 2. Notably, genotypic correlation coefficients were generally higher than their phenotypic counterparts for most traits.

Vegetative characters

Days required for sprouting of corms recorded a positive significant correlation with days required for 50 % corms sprouting (rg= 0.796**, rp= 0.723**), days required for opening of first pair of florets (rg=0.528**, rp=0.434**), days required for 50% flowering (rg=0.504**, rp=0.432**) and days required for emergence of first spike (rg= 0.497**, rp= 0.422**). Days required for 50% corms sprouting recorded a positive significant correlation with days required for emergence of first spike (rg= 0.660**, rp= 0.493**), days required for opening of first pair of florets (rg= 0.679**, rp= 0.483**), days required for 50% flowering (rg=0.674**, rp=0.498**). Plant height at 90 days recorded a positive significant correlation with leaf area (rg= 0.649**, rp= 0.589**), leaf area per plant (rg= 0.577, rp=0.469), length of spike (rg= 0.828**, rp= 0.645**), number of florets per spike (rg= 0.500**, rp= 0.444**), blooming period in field (rg= 0.278*, rp= 0.264*), vase life (rg= 0.438**, rp= 0.323*), diameter of spike (rg= 0.417**, rp= 0.394**), number of cormels per plant (rg= 0.576**, rp= 0.495**), weight of corms per plant (rg= 0.719**, rp= 0.595**), average weight of single corm (rg= 0.717** rp=0.592**), weight of carmels per plant (rg= 0.405**, rp= 0.356*). Number of leaves per plant recorded a positive significant correlation with number of tillers per plant (rg= 0.630**, rp= 0.573**), leaf area per plant (rg= 0.661**, rp= 0.660**), blooming period in field (rg= 0.377**, rp= 0.292*), vase life (rg= 0.327*, rp= 0.272*), number corms per plant (rg= 0.612**, rp= 0.548**), weight of corms per plant (rg= 0.473**, 0.429**), average weight of single corm (rg= 0.474**, rp= 0.428**), number of spikes per plant (rg= 0.594**, rp= 0.552**), number of spikes per hectare (rg= 0.633**, rp=0.552**). These findings correspond to those reported by Hussain *et al.* (2001), Anuradha *et al.* (2002), Archana *et al.* (2008), Kumar *et al.* (2015), Kumar *et al.* (2011), Choudhary *et al.* (2011), Gautam and Singh (2021) and Vinutha *et al.* (2023) in gladiolus. Leaf area per plant showed the positive significant correlation with length of spike (rg=0.427**, rp=0.353*), number of florets per spike (rg= 0.407**, rp= 0.370**), blooming period in field (rg= 0.343*, rp=0.282*), vase life (rg= 0.410**, rp= 0.346*), diameter of spike (rg= 0.395**, rp= 0.351*), number of cormels per plant (rg= 0.411**, rp= 0.389**), weight of corms per plant (rg= 0.722**, rp=0.690**), average weight of single corm (rg= 0.735**, rp= 0.703**). Tillers per plant recorded a positive significant correlation with leaf area per plant (rg= 0.239*, rp= 0.221*), number of corms per plant (rg= 0.947**, rp= 0.874**), number of spike per plant (rg= 0.945**, rp= 0.933**) and spikes per hectare (rg= 0.934**, rp= 0.783**), number of tillers per plant in gladiolus plays a vital role in enhancing spike production and overall yield and it is influenced by genetic factors, nutrient availability and environmental conditions. The current study's findings resonate with the conclusions of Gautam and Singh (2021) and Choudhary *et al.* (2011) in gladiolus.

Spike characters

The study showed that at both phenotypic and genotypic levels, spike yield per hectare was found positively and significantly associated with number of corms per plant (rg= 0.912**), spikes per plant (rg= 0.888**), number of tillers per plant (rg= 0.783**), number of leaves per plant (rg= 0.633 **) and leaf area per plant (rg= 0.248 *) in genotypic level. In case of phenotypic correlation spike yield per hectare showed positive and significant correlation with number of spike per plant (rp=0.999*), number of corms per plant (rp=0.944**), number of tillers plant (rp=0.934**) and number of leaves per plant (rp= 0.552**). Spike yield per hectare in gladiolus depends on factors like variety, planting density, and agronomic practices, influencing overall productivity. Higher spike yield is associated with traits such as more corms per plant, increased tillers, and optimal nutrient management. Similar results reported by Gautam and Singh (2021), Kumar *et al.* (2015), Pattanaik *et al.* (2015), Singh and Fatmi (2024) in gladiolus.

Days required for emergence of first spike showed a positive and significant correlation with days required for opening of first pair of floret opening (rg= 0.970**), rp= 0.962**), and days required for 50% percent flowering (rg= 0.971**, rp= 0.961**), Days required for opening of first pair of floret showed a positive and significant correlation with length of spike (rg= 0.266*), diameter of spike (rg= 0.294*) and days required for 50% flowering (rg= 0.984**). Days required for 50 % flowering showed a positive and significant correlation with diameter of spike (rg= 0.308*, rp= 0.231*). Length of spike showed the positive and significant genotypic correlation with number of florets per spike (rg= 0.679**), blooming period (rg= 0.531**), vase life (rg= 0.715**), diameter of spike (rg=0.783**), number of cormels per plant (rg= 0.504**), weight of corms per plant (rg= 0.637**), average weight of single corm (rg=0.644**) and weight of cormels per plant (rg= 0.270*). Number of florets per spike had a positive and significant correlation with blooming period (rg= 0.523**, rp= 0.473**), vase life (rg= 0.457**, rp= 0.437**), diameter of spike (rg= 0.641**, rp= 0.589**), number of cormels per plant (rg= 0.541**, rp= 0.517**), weight of corms per plant (rg= 0.346*, rp= 0.331*), average weight of single corms (rg= 0.353*, rp= 0.333*) and weight of cormels per plant (rg= 0.480**, rp= 0.433**). Blooming period on field showed the positive and significant correlation with vase life (rg= 0.690**, rp= 0.590**), diameter of spike (rg= 0.621**, rp= 0.548**), number of cormels per plant (rg= 0.281**, rp= 0.260*), weight of corms per plant (rg= 0.263**, rp= 0.231*) and average weight of single corm per plant (rg= 0.271**, rp= 0.234**). Diameter of spike showed the positive and significant correlation with number of cormels per plant (rg= 0.258*, rp= 0.230*), weight of corms per plant (rg= 0.422**, rp= 0.384*) and average weight single corm (rg= 0.418**, rp= 0.383*). Vase life showed the positive and significant correlation with diameter of spike (rg= 0.783**, rp= 0.652**), number of cormels per plant (rg= 0.281*, rp= 0.257*), weight of corms per plant (rg= 0.473**, 0.425**) and average weight of single corm (rg= 0.477**, rp= 0.427**).

Corms and cormels characters

Number of corms per plant showed the positive and significant correlation with number of spikes per plant (rg= 0.788**, rp= 0.943**) and spikes per hectare (rg= 0.912*, rp= 0.944**) number of corms per plant in gladiolus shows a strong positive correlation with spike yield and plant vigor, making it a key trait for selection in breeding programs. Improving this trait can enhance both propagation efficiency and overall productivity in gladiolus cultivation.

Number of cormels per plant showed the positive and significant correlation with weight of corms per plant (rg= 0.384**, rp= 0.369**), average weight of single corm (rg= 0.387**, rp= 0.369**) and weight of cormels per plant (rg= 0.492**, rp=0.476**), Weight of corms per plant showed a positive and significant correlation with plant height at 90 day (rg= 0.718**, rp= 0.595**), number of leaves per plant (rg= 0.473**, rp= 0.429**), leaf area (rg=0.616**, rp=0.600**), length of spike (rg=0.637**, rp= 0.494**), number of florets per spike (rg=0.346*, rp= 0.331*), blooming period (rg= 0.263*, rp= 0.231*), vase life (rg= 0.473**, rp= 0.425**), diameter of spike (rg= 0.422**, rp= 0.384**), number of cormels per plant (rg= 0.384**, rp= 0.369**). Average weight of single corm showed a positive and significant correlation with plant height at 90 day (rg= 0.717**, rp= 0.592**), number of leaves per plant (rg= 0.474**, rp= 0.428**), leaf area (rg=0.631**, rp=0.613**), leaf area per plant (rg= 0.735**, rp= 0.703**), length of spike (rg=0.644**, rp= 0.493**), number of florets per spike (rg=0.353*, rp= 0.333*), blooming period (rg= 0.271*, rp= 0.234*), vase life (rg= 0.477**, rp= 0.427**), diameter of spike (rg= 0.418**, rp= 0.383**), number of cormels per plant (rg= 0.387**, rp= 0.369**). Weight of cormels per plant was recorded a positive and significant correlation with plant height (rg=0.405**, rp= 0.356*), number of florets per spike (rg= 0.488**, rp= 0.433*), number of cormels per plant (rg= 0.492**, rp=0.476**) and length of spike (rg= 0.270*, rp= 0.259*) at both genotypic and phenotypic level.

Table 1: Genotypic path coefficient showing direct and indirect effects for yield and attributing traits in different gladiolus varieties.

	SC	50%SC	HP@90	NL	NT	LA	LAPP	DEFS	DOFF	50% FLW	LS	FPS	BP	VL	DS	CPP	Capp	WCPP	AWSC	WCaPP	SPPT	Rg SPH
SC	**0.0128**	0.0102	-0.0051	-0.0034	0.0005	-0.0022	-0.0034	0.0063	0.0067	0.0064	-0.0025	0	-0.0002	-0.0041	-0.0008	0.0007	-0.0036	-0.0044	-0.0044	-0.0033	0.0005	0.0183
50%SC	0.0062	**0.0078**	-0.0033	-0.0012	0.0012	-0.001	-0.0015	0.0052	0.0053	0.0053	-0.0011	0.0005	-0.0004	-0.0018	0.0003	0.0014	-0.0016	-0.0015	-0.0015	-0.0028	0.0012	0.165
HP@90	-0.0366	-0.0393	**0.0925**	0.014	-0.0239	0.0601	0.0534	0.0011	0.0091	0.0126	0.0766	0.0463	0.0257	0.0405	0.0386	-0.028	0.0533	0.0665	0.0663	0.0374	-0.0321	-0.356*
NL	-0.0043	-0.0025	0.0025	**0.0164**	0.0103	0.0032	0.0108	-0.0041	-0.0028	-0.0027	0.0006	0.0025	0.0062	0.0054	0.0025	0.01	0.0026	0.0078	0.0078	-0.001	0.0097	0.633**
NT	0.0003	0.0011	-0.0018	0.0045	**0.0071**	-0.0008	0.0017	-0.0014	-0.0011	-0.0013	-0.0014	-0.0001	0.001	0.0005	-0.0003	0.0074	0	0.0016	0.0016	-0.0002	0.0071	0.783**
LA	-0.0037	-0.0026	0.0138	0.0041	-0.0025	**0.0213**	0.0181	0.0023	0.0026	0.0026	0.0116	0.0093	0.005	0.0074	0.0088	-0.0033	0.0092	0.0131	0.0134	0.0037	-0.0031	-0.1303
LAPP	0.011	0.008	-0.0238	-0.0273	-0.0098	-0.0352	**-0.0413**	0.0013	-0.0008	-0.0009	-0.0176	-0.0168	-0.0141	-0.0169	-0.0163	-0.0082	-0.017	-0.0298	-0.0303	-0.0038	-0.008	0.248*
DEFS	0.038	0.0505	0.0009	-0.0189	-0.0151	0.0082	-0.0023	**0.0765**	0.0736	0.0743	0.0152	0.0075	-0.0057	-0.0238	0.0169	-0.0177	-0.0148	-0.0105	-0.0111	-0.022	-0.018	-0.228*
DOFF	-0.0554	-0.0712	-0.0103	0.0178	0.016	-0.0127	-0.002	-0.1009	**-0.1048**	-0.1069	-0.0279	-0.0129	0.0044	0.0282	-0.0308	0.0214	0.0173	0.0146	0.0156	0.0293	0.0234	-0.222*
50%FLW	0.0177	0.0237	0.0048	-0.0059	-0.0063	0.0043	0.0008	0.0341	0.0358	**0.0352**	0.01	0.0058	-0.0015	-0.0084	0.0108	-0.0075	-0.0046	-0.0039	-0.0042	-0.0096	-0.0079	-0.242*
LS	0.0128	0.0092	-0.0532	-0.0024	0.0129	-0.0352	-0.0274	-0.0128	-0.0171	-0.0183	**-0.0643**	-0.0437	-0.0341	-0.046	-0.0503	0.0154	-0.0324	-0.0409	-0.0414	-0.0174	0.0179	-0.300*
FPS	0	0.0003	0.0022	0.0007	0	0.0019	0.0018	0.0004	0.0005	0.0007	0.0029	**0.0043**	0.0023	0.002	0.0028	-0.0002	0.0023	0.0015	0.0015	0.0021	-0.0003	-0.0494
BP	0.0004	0.0011	-0.0063	-0.0086	-0.0034	-0.0054	-0.0078	0.0017	0.001	0.001	-0.0121	-0.0119	**-0.0228**	-0.0157	-0.0141	-0.0031	-0.0064	-0.006	-0.0062	-0.0004	-0.0028	0.0465
VL	-0.0158	-0.0113	0.0215	0.016	0.0035	0.0171	0.0201	-0.0153	-0.0132	-0.0118	0.0351	0.0224	0.0339	**0.0491**	0.0384	0.0029	0.0138	0.0232	0.0234	0.0091	0.0038	0.1105
DS	-0.0013	0.0007	0.0085	0.0031	-0.0009	0.0084	0.0081	0.0045	0.006	0.0063	0.016	0.0131	0.0127	0.016	**0.0204**	-0.0016	0.0053	0.0086	0.0085	0.0022	-0.0023	-0.1702
CPP	0.0024	0.0079	-0.0136	0.0274	0.0466	-0.0069	0.0089	-0.0104	-0.0091	-0.0095	-0.0107	-0.0024	0.0061	0.0026	-0.0035	**0.0448**	-0.0008	0.0089	0.0089	-0.0025	0.0456	0.912**
CaPP	-0.0028	-0.0021	0.0058	0.0016	0	0.0044	0.0042	-0.002	-0.0017	-0.0013	0.0051	0.0055	0.0028	0.0028	0.0026	-0.0002	**0.0101**	0.0039	0.0039	0.005	0	0.009
WCPP	0.0052	0.0029	-0.0109	-0.0072	-0.0035	-0.0093	-0.0109	0.0021	0.0021	0.0017	-0.0096	-0.0052	-0.004	-0.0072	-0.0064	-0.003	-0.0058	**-0.0152**	-0.0152	-0.003	-0.0029	0.2156
AWSC	0.0092	0.0052	-0.0192	-0.0127	-0.0062	-0.0169	-0.0197	0.0039	0.004	0.0032	-0.0172	-0.0094	-0.0073	-0.0128	-0.0112	-0.0053	-0.0104	-0.0268	**-0.0268**	-0.0052	-0.0051	0.2153
WCaPP	0.0069	0.0095	-0.0109	0.0017	0.0007	-0.0046	-0.0025	0.0077	0.0075	0.0074	-0.0073	-0.0129	-0.0004	-0.005	-0.0029	0.0015	-0.0132	-0.0053	-0.0052	**-0.0269**	0.0008	0.0171
SPPT	0.0361	0.1543	-0.3376	0.5773	0.9721	-0.1423	0.1884	-0.2283	-0.2168	-0.2189	-0.2703	-0.065	0.1198	0.0748	-0.1081	0.9904	-0.0001	0.1854	0.187	-0.0274	**0.9726**	0.888**
SPH	0.0183	0.165	-0.356*	0.633**	0.783**	-0.1303	0.248*	-0.228*	-0.222*	-0.242*	-0.300*	-0.0494	0.0465	0.1105	-0.1702	0.912**	0.009	0.2156	0.2153	0.0171	0.888**	1

Residual effect : rg: 0.0804

Table 2: Phenotypic path coefficient showing direct and indirect effects for yield and attributing traits in different gladiolus varieties.

	SC	50%SC	HP@90	NL	NT	LA	LAPP	DEFS	DOFF	50%FLW	LS	FPS	BP	VL	DS	CPP	Capp	WCPP	AWSC	WCaPP	SPPT	RP SPH
SC	**0.0029**	0.0021	-0.0011	-0.0007	0.0001	-0.0005	-0.0007	0.0012	0.0013	0.0013	-0.0004	-0.0001	0	-0.0009	-0.0002	0.0002	-0.0008	-0.0009	-0.0009	-0.0007	0.0001	0.0367
50%SC	-0.005	**-0.007**	0.0022	0.0008	-0.0011	0.0008	0.0012	-0.0034	-0.0034	-0.0035	0.0004	-0.0004	0.0003	0.0013	-0.0003	-0.0012	0.0015	0.0012	0.0012	0.0022	-0.001	0.1412
HP@90	0.0021	0.0019	**-0.0058**	-0.0006	0.0012	-0.0031	-0.0027	-0.0002	-0.0005	-0.0005	-0.0038	-0.0026	-0.0015	-0.0019	-0.0023	0.0014	-0.0029	-0.0035	-0.0034	-0.0021	0.0016	-0.267*
NL	-0.0015	-0.0007	0.0007	**0.0062**	0.0035	0.0011	0.0041	-0.0016	-0.0012	-0.0012	0.0004	0.0007	0.0018	0.0017	0.0007	0.0034	0.0008	0.0026	0.0026	-0.0003	0.0034	0.552**
NT	0.0008	0.0038	-0.0048	0.0138	**0.024**	-0.0028	0.0053	-0.0036	-0.003	-0.0025	-0.0037	0.0001	0.0034	0.0019	-0.0007	0.0227	0.0001	0.0052	0.0051	-0.0005	0.0224	0.934**
LA	-0.0025	-0.0019	0.0085	0.0029	-0.0018	**0.0158**	0.0133	0.0013	0.0015	0.0015	0.0069	0.0065	0.0031	0.0046	0.006	-0.0024	0.0067	0.0095	0.0097	0.0026	-0.0023	-0.1405
LAPP	0.0066	0.0047	-0.0125	-0.0178	-0.0059	-0.0225	**-0.0267**	0.0015	0.0006	0.0004	-0.0094	-0.0099	-0.0075	-0.0092	-0.0093	-0.0048	-0.0104	-0.0184	-0.0187	-0.0026	-0.0049	0.1879
DEFS	-0.0168	-0.0197	-0.0012	0.0102	0.006	-0.0034	0.0023	**-0.0398**	-0.0386	-0.0383	-0.0058	-0.0046	-0.0006	0.0082	-0.0066	0.0049	0.0056	0.0032	0.0028	0.0104	0.0071	-0.172
DOFF	0.0246	0.0273	0.0046	-0.0112	-0.007	0.0053	-0.0012	0.0549	**0.0566**	0.0557	0.0094	0.0077	0.0025	-0.0088	0.012	-0.0053	-0.0062	-0.0041	-0.0036	-0.0144	-0.0088	-0.1474
50%FLW	-0.0061	-0.007	-0.0013	0.0026	0.0015	-0.0013	0.0002	-0.0136	-0.0139	**-0.0142**	-0.0027	-0.0021	-0.0008	0.0022	-0.0033	0.0012	0.0013	0.0008	0.0007	0.0034	0.0022	-0.1505
LS	0.0005	0.0002	-0.0021	-0.0002	0.0005	-0.0014	-0.0012	-0.0005	-0.0005	-0.0006	**-0.0033**	-0.0018	-0.0012	-0.0014	-0.0019	0.0005	-0.0013	-0.0016	-0.0016	-0.0008	0.0007	-0.224*
FPS	-0.0002	0.0006	0.0041	0.0011	0.0001	0.0038	0.0034	0.0011	0.0012	0.0013	0.0051	**0.0092**	0.0043	0.004	0.0054	-0.0003	0.0047	0.003	0.003	0.004	-0.0005	-0.0477
BP	0	0.0001	-0.0009	-0.001	-0.0005	-0.0006	-0.0009	-0.0001	-0.0001	-0.0002	-0.0012	-0.0016	**-0.0033**	-0.0019	-0.0018	-0.0004	-0.0009	-0.0008	-0.0008	0	-0.0003	0.1048
VL	0.0001	0.0001	-0.0001	-0.0001	0	-0.0001	-0.0002	0.0001	0.0001	0.0001	-0.0002	-0.0002	-0.0003	**-0.0004**	-0.0003	0	-0.0001	-0.0002	-0.0002	-0.0001	0	0.0602
DS	-0.0003	0.0002	0.0021	0.0006	-0.0001	0.002	0.0018	0.0009	0.0011	0.0012	0.003	0.0031	0.0029	0.0034	**0.0052**	-0.0003	0.0012	0.002	0.002	0.0005	-0.0004	-0.0753
CPP	-0.0002	-0.0007	0.0009	-0.002	-0.0035	0.0006	-0.0007	0.0004	0.0003	0.0003	0.0005	0.0001	-0.0004	-0.0002	0.0002	**-0.0036**	0.0001	-0.0007	-0.0007	0.0002	-0.0034	0.944**
CaPP	-0.0017	-0.0014	0.0032	0.0009	0	0.0027	0.0025	-0.0009	-0.0007	-0.0006	0.0026	0.0034	0.0017	0.0017	0.0015	-0.0001	**0.0065**	0.0024	0.0024	0.0031	0	0.0078
WCPP	0.0346	0.0184	-0.0643	-0.0463	-0.0232	-0.0649	-0.0746	0.0088	0.0078	0.0059	-0.0534	-0.0358	-0.025	-0.0459	-0.0415	-0.0212	-0.0398	**-0.1081**	-0.1077	-0.0202	-0.0209	0.1951
AWSC	-0.0376	-0.0205	0.0698	0.0504	0.0252	0.0723	0.0828	-0.0084	-0.0076	-0.0055	0.0581	0.0392	0.0275	0.0503	0.0452	0.0232	0.0435	0.1174	**0.1179**	0.0219	0.0227	0.1949
WCaPP	0.0047	0.006	-0.0066	0.0008	0.0004	-0.0031	-0.0018	0.0049	0.0047	0.0045	-0.0048	-0.0081	0.0003	-0.0027	-0.0017	0.0011	-0.0089	-0.0035	-0.0035	**-0.0186**	0.0005	-0.0369
SPPT	0.0317	0.1346	-0.262	0.5414	0.9148	-0.1413	0.1814	-0.1749	-0.153	-0.1558	-0.2218	-0.0507	0.0976	0.0543	-0.0816	0.9247	0.0071	0.1896	0.1886	-0.025	**0.9807**	0.999**
SPH	0.0367	0.1412	-0.267*	0.552**	0.934**	-0.1405	0.1879	-0.172	-0.1474	-0.1505	-0.224*	-0.0477	0.1048	0.0602	-0.0753	0.944**	0.0078	0.1951	0.1949	-0.0369	0.999**	1

Residual effect : rp: 0.041 : Bold diagonal figures are the direct effects & non-diagonal figures are indirect effect

SC: Days required for sprouting of corms
50% SC: Days required for 50% sprouting of corms
HP @90 Days: Height of plant @90 days
NL: Number of leaves
NT: Number of tillers per plant
LA: Leaf area
LAPP: Leaf area per plant

DEFS: Days required for emergence of first spike
DOFF: Days required for emergence of 1st pair of floret
50% FLW: Days required for 50% flowering
LS : Length of spike
FPS : Number of florets per spike
BP: Blooming period in field
VL: Vase life , DS : Diameter of spike

CPP: Number of corms per plant
CaPP: Number of cormels per plant
WCPP: Weight of corms per plant
AWSC: Average weight of single corm per plant
WCaPP: Weight of cormels per plant
SPPT: Number of spikes per plant
SPH: Spikes per hectare

These observations align closely with the conclusions of Choudhary *et al.* (2011) and Singh and Fatmi (2024) in gladiolus.

Conclusion

The study of genotypic and phenotypic correlations provides valuable insights into the relationships between key traits, helping breeders identify desirable characteristics for selection. Genotypic correlations reveal true genetic associations, ensuring stable trait improvement, while phenotypic correlations account for environmental influences on trait expression. A higher genotypic correlation than phenotypic correlation indicates strong genetic control, guiding breeders in selecting traits less influenced by the environment. These correlations help in indirect selection for complex traits, optimizing hybridization strategies, and improving yield, quality, and stress tolerance. Understanding these relationships is crucial for future breeding programs, enabling the development of superior, high-performing gladiolus varieties.

References

Al-Jibouri, H. A., Miller P. A. and Robinson H. F. (1958). Genotypic and environ-mental variances and covariances in an upland cotton cross of interspecific origin. *Agron. J.*, **50:** 633-636.

Anuradha S., Narayana G. J. V. and Jayaprasad K. V. 2002. Path coefficient analysis studies in gladiolus. *Journal of Ornamental Horticulture*. **5**(1): 32-34.

Archana B., Patil A. A., Ravi H. and Patil V.S. 2008. Studies on genetic variability analysis in gladiolus hybrids. *Journal of Ornamental Horticulture*. **11** (2): 121-126.

Butt S. J., Varis S. Nasir I. A., Sheraz S., Shahid A. and Ali Q., 2015, Micro Propagation in Advanced Vegetable Production: A Review. *Adv. Life Sci.,* 2(2): 48-57.

Choudhary M., Moond S.K. and Kumari A. 2011. Correlation studies in gladiolus. *Research in Plant Biology*. **1**(4):68-72.

Gautam S. and Singh A. 2021. Studies on character association for corms yield and it's contributing traits in gladiolus (*Gladiolus grandiflorus* L.). *Journal of Pharmacognosy and Phytochemistry*. **10**(6): 283-287.

Hussain C. T. S., Misra R. L., Bhattacharjee S. K. and Saini H. C. 2001. Correlation and path coefficient analysis in gladiolus. *Journal of Ornamental Horticulture***. 4**(1):13-16.

Kumar M., Kumar S. and Chaudhary P. 2015. Correlation and path analysis study in gladiolus (*Gladiolus hybridus* hort.). *International Journal Agriculture Statistics Sciences*. **11**(2):527-532.

Kumar R., Kumar S., Yadav Y. C. 2011. Variability studies for yield and yield attributing traits in gladiolus. *Progressive Agricultue*. **11**(2):356-360.

Panse, V.G. and Sukhatme, P.V. (1967) *Statistical Methods for Agricultural Workers*. ICAR, New Delhi.

Pattanaik S., Paul A. and Lenka P. C. 2015. Genotypic and phenotypic variability and correlation studies in gladiolus, *Journal of Crop Weed*. **11**(1):113-119.

Ramachandrudu K and Thangam M. 2009. Production technology of gladiolus in Goa. Technical Bulletin No.20, ICAR Research Complex for Goa, Ela, Old Goa, pp 1–31.

Singh D. and Fatmi U. 2024. Estimation of genotypic and phenotypic correlation of gladiolus (*Gladiolus grandiflora* L.) under agroclimatic conditions of Prayagraj. *International Journal of Advanced Biochemistry Research.* **8**(8): 337-339.

Vinutha D. B., Sateesh R. P., Seetharamu G. K., Satish D., Pavan Kumar P., Mahesh Y. S.and Thilak J. C. 2023. Genetic variability and character association in gladiolus (*Gladiolus grandiflora* L.). *The Pharma Innovation Journal*. **12**(1): 2788-2793.