# Genetic Variability Of Gladiolus (*Gladiolus grandiflorus*) Cultivar Under Prayagraj Agro-Climatic Conditions


ABSTRACT

A Study On Genetic Variability Of Gladiolus (*Gladiolus grandiflorus*) Cultivar Under Prayagraj Agro-Climatic Conditions was carried out at Departmental research field of Horticulture, Naini Agriculture Institute during the Rabi season of 2021-2022 with ten Cultivars in randomized block design with three replications viz. Punjab Flame Source Biscuts Arka Naveen White Prosperity Dhanvantri Phule Neelrekha Pusa Srijan Arka Amar Priscilla Yellow Stone were Evaluated out of these ten cultivars means estimated Genetic variability, heritability, phenotypic coefficient of variation (PCV) was higher than the genotypic coefficient of variation (GCV) and genotypic correlation. The characters, Plant height at (30, 60, 90 DAS), Number of leaves per plant at (30,60,90 DAS), No. of shoot per plant, Days taken for corm sprouting, Rachis length, Days taken to spike emergence, days taken colour break stage, No. of floret per spike, No. of spike per plant, No. of days taken for first basal open, No. of days taken for last floret open, spike length, floret diameter, Weight of daughter corm, Weight of mother corm, corm diameter, corm weight, No. of corm per hectare, and Corm yield/ plant were observed. For all characters, Highest GCV and PCV were recorded for Weight of daughter corm (g) (33.6786 and 47.569), Number of leaves per plant at 30 DAS (25.70 and 37.81), No. of Number of leaves per plant at harvest (24.73 and 35.25), Number of shoots per plant ( 25.47 and 31.19), Weight of mother corm (25.18 and 33.90), Corm weight (25.11 and 33.38), Days taken for corm sprouting (23.7566 and 23.7566) and lowest GCV and PCV were recorded for Floret diameter (cm) (17.50 and 40.95). The genotypes Phule Neelrekha followed by Arka Amar were identified as high corm yielding and no. of corm per hectare and produced higher spikes yield per plot which indicated that these genotypes may be sown for higher yield and indicated good response to selection owing to their high heritability, variability and genetic advance showing additive gene effect. These genotypes can be used for improvement of yield and component traits by selection.



*Keywords: Gladiolus; phenotypic coefficients of variation (PCV); genotypic coefficients of variation (GCV); heritability; genetic advance as percentage of mean (GAM).*




## Introduction

Gladiolus, a member of the Iris family, Iridaceae, is a widely used flowering plant in India. It has a basic chromosome number of 15, and most species are diploid, with 30 chromosomes (2n=30). The genus contains about 260 species, native to Africa, Europe, and Asia. Gladiolus plants are corms, which are underground storage organs that provide food and energy for the plant. They have sword-shaped leaves and trumpet-shaped flowers, with colours ranging from red, yellow, orange, pink, purple, and white. The name gladiolus comes from the Latin word "gladiolus," meaning a sword due to its foliage shape. Gladiolus cultivation under Northern Indian plains, including the whole U.P., coastal areas of Tamil Nadu, and Pondicherry, has the potential to change the economic scenario of farmers in these areas. It provides both money and employment in rural areas, making gladiolus an ideal crop for establishing the floriculture industry by progressive farmers and entrepreneurs. Genetic variability refers to the presence of differences

among plant populations, which results from differences in the genetic constitution of individuals or in the environment in which they are grown. Genetic variability is an essential component of breeding programs designed to improve the characteristics of crops. Morphological characterization is a method of studying genetic variability by measuring physical traits, such as plant height and flower colour. It is relatively inexpensive and easy to use and can be used to study populations of any size. However, it does not provide information about the genetic basis of variation, which can be obtained using molecular markers. Gladiolus is a genetically diverse crop with a wide range of morphological variation, which is important for breeding new cultivars with improved characteristics. The morphological characterization of gladiolus has also been used to study the effects of environmental factors on genetic variability, such as temperature. This information will be valuable for breeders and conservationists working to improve and conserve gladiolus.

**Material And Method**

The experiment was laid out in Randomized Block Design with Eight treatments, each replicated three times in the Experimental block of Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj - 211007 (UTTAR PRADESH) India. The treatments were allocated randomly to a unit plot in each replication. Ten different varieties viz. Punjab Flame Source Biscuts Arka Naveen White Prosperity Dhanvantri Phule Neelrekha Pusa Srijan Arka Amar Priscilla Yellow Stone were used for the study. The entire experimental land was divided into subplots measuring 1.2 m × 1.2 m and there were totally 30 plots. Five plants were selected at random (non —destruction sampling) and tagged in each treatment combination and replication for the purpose of recording observation on vegetative, flowering and corm characters were recorded from five randomly tagged plants in each treatment. The Observations were recorded on quantitative characters selected for genetic variability studies such as Number of days taken for corm sprouting, Plant height (cm), Number of leaves per plant, Day to spike emergence, Days taken for colour break stage, First floret opening (Days), Spike length (cm) Size of floret (cm), Spike per plant, Weight of mother corm, Weight of daughter corm(g) Corm diameter, No. of corm per hectare, Corm yield/plant.

**Estimation of Component of Variance**

The mean square for error was subtracted from the mean square value to genotype and the difference was divided by replication for obtaining the genotype variance, which was calculated according to the method suggested by Burton (1952). The genotype variance was calculated following the procedure given by Burton and Devance (1953).

Genotypic and phenotypic variance for individual environments was obtained with the help of following formula:

$$\boldsymbol{Genotypic\ Variance\ (\sigma 2p)} = \frac{\boldsymbol{Genotypic\ MSS - Error\ MSS}}{\boldsymbol{Number\ of\ Replications}}$$

$$\textbf{Phenotypic variance}\ (\boldsymbol{\sigma 2p}) = (\boldsymbol{\sigma 2g} + \boldsymbol{\sigma 2e})$$

Where,

σ2e = Error M.S.S.

σ2g = Genotypic variance

σ2p = Phenotypic variance

## 3. EXPERIMENTAL RESULTS

There was a significant difference between genotypes in terms of number of days for tubers to germinate. The earliest tuber germination (8.07 days) recorded at Yellow Stone was on par with Priscilla (8.85 days) but significantly different from Phule Neelrekha (9.22 days) while tuber germination was high. The highest was observed in Punjab Flame (10.04 days). The gladiolus genotypes under study showed significant differences in plant height at all growth stages. At harvest, the highest plant height (64.87 cm) was recorded by Phule Neelrekha, followed by Source Biscuts (64.43 cm). Minimum plant height recorded by Priscilla (54.87 cm) at harvest. There was a significant difference between the hybrid gladiolus studied in terms of leaf count at 30, 60 DAP and at maturity. At maturity, the maximum number of leaves per plant recorded by Phule Neelrekha (16.6) is on par with Arka Amar (13.8) and Yellow Stone (13,73) but while the minimum number of leaves per plant is observed in White Prosperity (8,15). There was considerable variation between varieties in terms of number of shoots per plant. The values for this observation range from 1.55 cm to 1.05 cm. The maximum number of shoots was recorded in Phule Neelrekha (1.55), followed by Arka Amar (1.38) and Yellow Stone (1, 2) which were statistically equal to other varieties while Punjab Flame (1.05) has a minimum leaf length. - The rachis length varies considerably between different gladiolus genotypes. The Phule Neelrekha genotype showed the maximum rachis length (58.02 cm), followed by Arka Amar (54.99 cm). Minimum rachis length recorded (44.77 cm) in Priscilla.

**Table 1. Mean performance of 10 genotypes for sprouting and plant height (cm), number of leaves, Number of shoots per plant and Rachis length (cm) of different gladiolus genotypes- of different gladiolus genotypes.**

| Genotype | Days to sprouting | PH (cm) 90 DAS | Number of leaves per plant at harvest | Number of shoots per plant | Rachis length |
|---|---|---|---|---|---|
| Arka Amar | 8.97 | 62.21 | 13.8 | 1.38 | 54.99 |
| Arka Naveen | 9.60 | 58 | 9.47 | 1.1 | 48.71 |
| Dhanvantri | 9.36 | 55.53 | 11.5 | 1.11 | **50.34** |
| Phule Neelrekha | 9.22 | 64.87 | 16.6 | 1.55 | 58.02 |
| Priscilla | 8.85 | 54.87 | 8.09 | 1.1 | 44.77 |
| Punjab Flame | 10.04 | 63.83 | 7.57 | 1.05 | 42.72 |
| Pusa Srijan | 8.98 | 61.87 | 11.17 | 1.16 | 52.45 |
| Source Biscuts | 9.67 | 64.43 | 12.87 | 1.16 | 53.27 |
| White Prosperity | 9.40 | 57.57 | 8.15 | 1.1 | 46.85 |
| Yellow Stone | 8.07 | 58.87 | 13.73 | 1.2 | 53.39 |
| **Mean** | 9.22 | 60.21 | 11.30 | 1.19 | 50.55 |
| **S.Em±** | 1.17 | 1.17 | 0.94 | 0.05 | 1.51 |
| **CD @5%** | 2.95 | 21.06 | 4.87 | 0.37 | 16.42 |

The genotype showing the earliest spike emergence was Punjab Flame (58.07 days), which was significantly superior to the other genotypes, while the genotypes showed slow spike emergence especially Yellow Stone (77.40 days). Days for the basal Floret to show colour- The number of days for the basal Floret to show colour showed significant variation between the different gladiolus genotypes studied. The lowest number of days required for the basal Floret to show its colour was observed in the Punjab Flame hybrid (67.1 days)

which is statistically comparable to Source Biscuits (67.2 days) but different. significantly different from Phule Neelrekha (73.73 days). The maximum number of days required for the flower at the base to show its colour was recorded in Yellow Stone (85.67 days). Minimum number of days for basal Floret to open showed significant differences between the different gladiolus genotypes studied. The lowest number of days required to open the basal floret was observed in the Punjab Flame hybrid (69.37 days) which was statistically comparable to the Source Biscuit (70.2 days) but significantly different compared to Phule Neelrekha (76.13 days). The maximum number of days required for basal floret opening was stated in the yellow Stone (87.27 days).

Data indicate that there was a significant difference between the studied gladiolus hybrids in spike length. Among the hybrids evaluated, the spike length was highest in Phule Neelrekha (113.28 cm), followed by Arka Amar (109.29 cm). The lowest spike length was observed at Punjab Flame (80.76 cm). The observed difference in number of flowers per plant between different hybrids was found to be significant. Among the different varieties, Phule Neelrekha (1.33) was recorded as having the maximum number of spikes per plant, followed by Arka Amar (1.18). The minimum number of spikes per plant was observed in Punjab Flame (1), Arka Naveen, Priscilla, and White Prosperity. There was a significant difference between the hybrid gladiolus varieties studied in terms of number of florets per spike. Phule Neelrekha recorded the highest number of florets per spike (11.77) equal to Arka Amar (11.52) and Yellow Stone (11.5). The lowest number of florets per spike was recorded at Punjab Flame (10.77). There was considerable variation among hybrids in floret diameter. Among the different hybrids, Punjab Flame and Priscilla (12.50 cm each) recorded a maximum floret diameter comparable to Phule Neelrekha (11.30 cm), Dhanvantri (11.37 cm), Arka Naveen (11.3 cm) and White Prosperity (12.00 cm). The smallest floret diameter was recorded by Pusa Srijan (11.27 cm).

**Table 2. Mean performance of 10 genotypes for days taken for expression of different floral characters in different gladiolus genotypes**

| **Genotype** | **Days to spike emergence** | **Days to** basal floret **to show colour** | **Days to lowest floret to open** | **Number of florets per spike** | **Spike length (cm)** | **Number of spikes per plant** | **Floret diameter (cm)** |
|---|---|---|---|---|---|---|---|
| Arka Amar | 69.53 | 78.07 | 81 | 11.52 | 109.29 | 1.18 | 12 |
| Arka Naveen | 59.47 | 68.47 | 70.93 | 11 | 91.05 | 1 | 11.3 |
| Dhanvantri | 61.13 | 68.87 | 71.53 | 11.11 | **98.44** | 1.05 | 11.37 |
| Phule Neelrekha | 65.4 | 73.73 | 76.13 | 11.77 | 113.28 | 1.33 | 11.30 |
| Priscilla | 76.4 | 84.93 | 85.33 | 10.89 | 84.65 | 1 | 12.50 |
| Punjab Flame | 58.07 | 67.1 | 69.37 | 10.77 | 80.76 | 1 | 12.50 |
| Pusa Srijan | 66.73 | 75.13 | 77.73 | **11.15** | 100.78 | **1.07** | 11.27 |
| Source Biscuts | 59.17 | 67.2 | 70.2 | 11.16 | 100.94 | 1.1 | 11.57 |
| White Prosperity | 60.8 | 68.56 | 71.47 | 11 | 84.93 | 1 | 12.00 |
| Yellow Stone | 77.4 | 85.67 | 87.27 | 11.5 | 106.78 | 1.11 | 11.30 |
| **Mean** | 65.41 | 73.77 | 76.10 | 11.19 | 97.09 | 1.08 | 11.81 |
| **S.Em±** | 2.24 | 2.24 | 2.07 | 0.10 | 3.56 | 0.03 | 0.31 |
| **CD @5%** | 24.65 | 27.24 | 27.34 | 5.19 | 47.39 | 0.69 | 4.12 |

Characteristic corm weight (g) varied greatly from 350 to 813.33, with a mean value of 622,482 overall. The Phule Neelrekha genotype had the highest body weight (813.33 g), followed by Arka Amar (710 g) and Yellow Stone (680 g). While the lowest corm weight (g) was observed for Punjab Flame (350g). Mother corm weight (g) showed a wide range of 704 g to 280 g, with an overall mean of 532.8 g. Golden Stone (600g) While the lowest weight of Mother corm was that of Punjab Flame (280g). Weight of daughter corm show a wide range of 200 g to 55 g, with an overall average of 101.6 g. The highest Weight of daughter

corm was of the genotype Phule Neelrekha is 200g, followed by Arka Amar (170g) and Yellow Stone (125g). While the lowest weight of daughter corm was observed to be that of Punjab Flame (55g). Corm diameter showed great diversity among studied genotypes, from 5.78 cm to 3.59 cm. While the largest corm was observed in the Phule Neelrekha genotype (5.78 cm), followed by Arka Amar (4.85 cm) and Yellow Stone (4.85 cm), While the smallest corms were observed in the Punjab fire (3.59 cm). The trait number of corm per hectare showed a wide range of variation from 297,500 to 25,650, with an overall mean of 234,052.7. The highest number of corms per ha was of the Phule Neelrekha genotype (297500), followed by Arka Amar (287500) and Yellow Stone (283500). While the lowest number of corms per hectare was observed for Punjab Flame (25650). The yield of corms per plant (g/plant) showed a wide range of variation from 105.37 g to 53.66 g, with an overall average of 88.53. corm yield per plant (g) was highest for the Phule Neelrekha genotype (105.37 g), followed by Arka Amar (103.37 g) and Yellow Stone (101.44 g). While the lowest corm yield per plant was observed for Punjab Flame (53.66g).

**Table 3. Mean performance of 10 genotypes for corms yield characters of Gladiolus (*Gladiolus grandiflorus* L.)**

| Genotype | Corm weight(g) | Weight of mother corm(g) | Weight of daughter corm(g) | Corm diameter (cm) | No. Of corm per hectare | Corm yield/plant |
|---|---|---|---|---|---|---|
| **Arka Amar** | 813.33 | 704 | 200 | 5.78 | 297500 | 105.37 |
| **Arka Naveen** | 710 | 607 | 170 | 4.85 | 287500 | 103.37 |
| **Dhanvantri** | 680 | 600 | 125 | 4.85 | 283500 | 101.44 |
| **Phule Neelrekha** | 670 | 594 | 105 | 4.78 | 271300 | 97.27 |
| **Priscilla** | 640.5 | 562 | 85 | 4.78 | 263750 | 92.21 |
| **Punjab Flame** | 630 | 560 | 75 | 4.71 | 259942 | 89.02 |
| **Pusa Srijan** | 626.66 | 544 | 74 | 4.57 | 251300 | 83.51 |
| **Source Biscuts** | 620 | 520 | 70 | 4.32 | 246785 | 82.51 |
| **White Prosperity** | 484.33 | 357 | 57 | 3.85 | 153300 | 76.93 |
| **Yellow Stone** | 350 | 280 | 55 | 3.59 | 25650 | 53.66 |
| **Mean** | 622.48 | 532.80 | 101.60 | 4.61 | **234052.70** | **88.53** |
| S.Em± | 39.91 | 39.41 | 15.57 | 0.19 | 26390.03 | 4.91 |
| CD @5% | 234.95 | 207.42 | 35.65 | 1.58 | 112905.07 | 29.02 |

### 4.2. Correlation studies

**Correlation coefficient analysis at genotypic level**

Genotypic correlation coefficient analysis revealed that Corms weight/plant (g) showed positive significant association with No. of spike per plant (cm) (1.17**), Weight of mother corm (g) (0.99**), Corm diameter (cm) (0.93**), No. of leaves per plant at 60 DAS (0.82*), number of corms per hectare (0.90**) and number of corms/hectare (0.46**), the significant and negative association was observes with No. of leaves at 30 DAS (-0.81*), Floret diameter (cm) – (0.83*), . (-0.73*) while non-significant and negative association was observed with Plant height (cm) at 60 DAS (-0.52), Plant height (cm) at 90 DAS (-0.32), Days taken for corm sprouting (-0.15), Rachis length (cm) (-0.39), days taken for spike emergence (-0.33), days taken for colour break stage (-0.34), No. of floret per spike (-0.48), no. of days taken for first floret open (-0.55), no. of days taken for last floret open (-0.44), Spike length (cm) (-0.38), Weight of daughter corm (g) (-0.54).

**Phenotypic Correlation Coefficient**

Among different characters studied, the fresh yield per plant had positive and high significant association with weight of corm (0.424 g) followed by number of corm produced (0.320g), days to 50% of flowering

(0.208), number of florets (0.190), number of open florets (0.170),spike girth (0.165 cm), spike length (0.143cm), weight of Corms (0.126 g), rachis length (0.056cm) and number of corms produced (0.05g).

**Heritability**

The genotypic coefficient of variation does not offer full scope to estimate the variations that are heritable and therefore, estimation of heritability becomes necessary. Burton and De Vane (1953) had suggested that genetic coefficient of variation along with heritability estimates would give a reliable indication of expected amount of improvement through selection. The estimates of heritability (broad sense) varied from 21.25-91.75% for different characters under the study. It was found high for all the traits *viz.*, weight of corms, spike length, rachis length, number of corms produced, number of florets, number of days for spike emergence, spike girth, number of days for lowest floret to show colour, number of open florets, number of days for lowest floret to open, number of leaves at maturity, plant height at maturity, weight of corms whereas, medium heritability was observed for number of corms produced.

**Path Co-Efficient Analysis**

Spikes yield is dependent on several growth and yield component traits which are naturally interconnected. The change in any growth and yield component traits is going to disturb the whole network of cause-and-effect relationship. Thus, each component has two paths of action like direct influence on spike yield and indirect effect. These component traits are not revealed by simple correlation studies. Although correlation studies are helpful in determining the components of yield, but it does not provide a clear picture of nature and extent of contributions made by number of independent traits. Path coefficient analysis devised by Dewey and Lu (1959), however, provides a realistic basis for allocation of appropriate weightage to various attributes while designing a pragmatic programme for the improvement of yield. Path coefficient analysis depicts the effects of different independent characters individually and in combination with other characters on the expression of different characters on flower yield per plant. In the present investigation path analysis was carried out at genotypic level considering genotypic correlation coefficient. Among all the characters studied number of days for lowest floret to show colour had highest positive direct effect on spike per plant followed by weight of corms, leaf width at maturity, spike length, number of florets, days to 50% of flowering, spike girth. Whereas negative direct effect was executed by number of days for spike emergence, followed by number of days for lowest floret to open, number of corms produced, rachis length, leaf length at maturity, weight of corm, number of leaves at maturity, plant height at maturity, number of open florets, number of corms produced at phenotypic level. The maximum positive indirect effects of plant height at maturity via Number of florets, number of leaves at maturity via days to 50% of flowering, leaf length via spike girth, plant height via spike length, number of days for spike emergence via spike girth, number of days for lowest floret to show colour via number of days for spike emergence, number of days for lowest floret to open via spike girth, spike length via rachis length, rachis length via spike girth, spike girth via number of florets were recorded on spike per plant at phenotypic level. Maximum indirect negative effect of plant height at maturity estimate via Number of leaves at maturity, number of leaves at maturity via plant height at maturity, leaf length at maturity via rachis length, leaf width at maturity via weight of corms, number of days for Spike emergence via number of days for lowest floret to show colour, number of days for lowest floret to show colour via spike girth, number of days for lowest floret to open via number of days for lowest floret to show colour, spike length via number of days for lowest floret to show colour, rachis length via spike length, spike girth via number of days for lowest floret to show colour, at phenotypic level.

**Genetic Advance**

In the present investigation, the genetic advance estimates were found to be high for Weight of mother corm (249.6294), Corm weight (234.9176), number of corms per hectare (98.200), number of corm/hectare (97.500), corms yield/plant (g) (30.93) , Weight of daughter corm (47.6865), No. of days taken for first floret open (41.8654), While as moderate estimates were observed Plant height at 90 DAS (21.0558) showed

low genetic advance estimate were found in Spike length (19.3327), Days taken for colour break stage ( 18.4779), Days taken for spike emergence (17.6558), Rachis length (8.091), Plant height at 60 DAS (7.9491), Plant height at 30 DAS (5.3765), Days taken for corm sprouting (2.2022), Floret diameter (1.698), No. of days taken for last floret open (1.5125), No. of leaves per plant at 90 DAS (1.0369), Vase life (1.0022),Corm diameter (0.8644), No. of leaves at 30 DAS (0.7271), No. of leaves per plant at 60 DAS (0.6566), No. of floret per spike (0.5207), No. of shoot per plant (0.2548), No. of spike per plant (0.092).

**Table 4 Estimation of component of variance and genetic parameters for 22 characters growth, flowering, and corm yield of 10 genotypes in Gladiolus.**

| Characters | Mean | RANGE | | Vg | Vp | G CV | PCV | $H^2$ (%) | GA | Genetic Gain |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Max | Min | | | | | | | |
| No. of days for corm sprouting | 9.216 | 10.04 | 8.07 | 5.37 | 8.32 | 25.14 | 31.30 | 64.47 | 3.83 | 41.576 |
| Plant height (cm) 30 DAS | 33.474 | 36.93 | 31.70 | 68.36 | 115.43 | 24.70 | 32.10 | 59.22 | 13.11 | 39.155 |
| Plant height (cm) 60 DAS | 51.737 | 56.63 | 46.05 | 163.41 | 278.16 | 24.71 | 32.24 | 58.75 | 20.18 | 39.013 |
| Plant height (cm) 90 DAS | 60.205 | 64.87 | 54.87 | 222.62 | 373.30 | 24.78 | 32.09 | 59.64 | 23.74 | 39.424 |
| Number of leaves per plant at 30 DAS | 5.545 | 9.2 | 2.83 | 2.03 | 4.40 | 25.70 | 37.81 | 46.21 | 2.00 | 35.994 |
| Number of leaves per plant at 60 DAS | 10.142 | 15.54 | 5.80 | 6.11 | 14.42 | 24.37 | 37.44 | 42.37 | 3.31 | 32.681 |
| Number of leaves per plant at harvest | 11.295 | 16.6 | 7.57 | 7.81 | 15.85 | 24.73 | 35.25 | 49.23 | 4.04 | 35.752 |
| Number of shoots per plant | 1.191 | 1.55 | 1.05 | 0.09 | 0.14 | 25.47 | 31.19 | 66.67 | 0.51 | 42.835 |
| Rachis length (cm) | 50.551 | 58.02 | 42.72 | 159.87 | 251.49 | 25.01 | 31.37 | 63.57 | 20.77 | 41.082 |
| Days taken for spike emergence | 65.41 | 77.4 | 58.07 | 256.27 | 462.69 | 24.47 | 32.89 | 55.39 | 24.54 | 37.521 |
| Days to basal floret to show colour | 73.773 | 85.67 | 67.1 | 327.81 | 579.89 | 24.54 | 32.64 | 56.53 | 28.04 | 38.012 |
| Days to basal floret to open | 76.096 | 87.27 | 69.37 | 352.21 | 606.25 | 24.66 | 32.36 | 58.10 | 29.47 | 38.724 |
| Number of spikes per plant | 97.09 | 113.28 | 80.76 | 477.05 | 1240.34 | 22.50 | 36.27 | 38.46 | 27.90 | 28.740 |
| Spike length (cm) | 11.814 | 14.30 | 10.80 | 8.63 | 14.38 | 24.86 | 32.10 | 59.99 | 4.69 | 39.668 |
| Number of florets per spike | 11.187 | 11.77 | 10.77 | 6.45 | 15.61 | 22.70 | 35.32 | 41.30 | 3.36 | 30.045 |
| Floret diameter (cm) | 1.084 | 1.33 | 1.00 | 0.04 | 0.20 | 17.50 | 40.95 | 18.27 | 0.17 | 15.414 |
| Corm weight(g) | 622.482 | 813.33 | 350.00 | 24424.58 | 43182.99 | 25.11 | 33.38 | 56.56 | 242.12 | 38.897 |
| Weight of mother corm(g) | 532.8 | 704 | 280.00 | 18004.15 | 32624.55 | 25.18 | 33.90 | 55.19 | 205.34 | 38.539 |
| Weight of daughter corm(g) | 101.60 | 200 | 55.00 | 872.61 | 1304.47 | 29.07 | 35.55 | 66.89 | 49.77 | 48.986 |
| Corm diameter (cm) | 4.608 | 5.78 | 3.59 | 1.34 | 2.19 | 25.09 | 32.10 | 61.10 | 1.86 | 40.401 |
| Corm yield/plant | 88.5296 | 105.37 | 53.657 | 503.57 | 789.75 | 25.35 | 31.74 | 63.76 | 36.91 | 41.696 |
| No. Of corm per hectare | 234052.7 | 297500 | 25650 | 3189411596.98 | 7521188387.06 | 24.13 | 37.05 | 42.41 | 75759.06 | 32.368 |

## Conclusion

Based on the findings of the investigation; it was determined that most traits exhibiting additive genetic influence had significant magnitudes of heritability (in a wide sense) along with high genetic gain. PCV was higher than GCV for all the traits studied highest GCV and PCV is recorded as Weight of daughter corm (g) (33.6786 and 47.569), High GCV and PCV is recorded in No. of days taken for first floret open (30.0614 and 30.0889), High GCV and PCV is recorded in Weight of mother corm (25.6022 and 28.1499), High GCV and PCV is recorded in Days taken for corm sprouting (23.7566 and 23.7566) respectively. Genotypic and phenotypic correlation coefficient analysis revealed that Corm weight/plant (g) showed positive significant association with No. of leaves per plant at 60 DAS, Weight of mother corm (g), Corm diameter (cm) while negative association with No. of leaves per plant at 30 DAS and Floret diameter. Due to their high heritability, variability, and genetic advancement exhibiting additive gene effect, the genotypes Creamy green, followed by White prosperity, Nova, Suchitra, and Hunting song produced higher spike yield per plot, indicating that these genotypes may be shown for higher yield and indicating good response to selection. These genotypes can be utilised to selectively increase yield and component attributes.

## REFERENCES-


**Archana, B. and Patil, V. S. (2016).** Genetic variability and heritability studies in gamma ray in irradiated mutant populations of gladiolus (*Gladiolus hybridus* Hort.) varieties in M1V2 generation. *Green Farming*, **7** (2): 388-391.

**Arora, J. S., Misra, R. L., Singh, K., Singh, P. J. and Bhattacharjee, S. K., 2002.** In: Gladiolus, Technical Bulletin No.14. published by All India Coordinated Research

**Balaram, M., Janakiram, T., Vasantha, E., Choudhary, M. L. and Ganeshan, S. (2000).** Genetic variability among Gladiolus genotypes. *National Conference on Gladiolus*, 2: 24-25.

**Ganesh B. K., Gunjeet, K, Saha, T.N., Tiwari, A.K. and Ramesh, K., 2014.** Varietal evaluation and genetic variability studies on gladiolus. *Ind. J. Hort*., 71(3): 379-84.

**Geeta, S. V., Shirol, A. M., Nishani S., Parvati, P. and Varuna, K. J. (2014).** Path coefficient analysis studies in gladiolus. *Plant Archives*, **14**(2): 1131-1133.

**Hossain, M. D., Bhuiyan, M. S. R., Talukder, K. H., Islam, M. R. and Syed, M. A., 2012.** Study on Vegetative Propagating Materials, Flower Characteristics and Production of True Seed through Crossing among the Different Gladiolus Genotypes. *Adv. Biolo. Resea*., 6(2): 52-58.

**Hossain, M. D., Talukder, K. H., Asaduzzaman, M., Mahmud, F., Amin, N. and Sayed, M. A., 2011**. Study on morphological characteristics of different genotypes of gladiolus flower. *J. Sci. Foun*., 9(1&2): 01-08.

**Kadam, G. B., Kumar, G., Saha T. N., Tiwari A. K. and Kumar, R. (2014).** Varietal evaluation and genetic variability studies on Gladiolus. *Indian Journal Horticulture*, **71**(3):379-384.

**Kamble, B. S., Reddy, B. S., Gangadharappa, P .M. and Kulkarni, B. S., 2004**. Evaluation of gladiolus varieties for quality parameters, flower and corm yield. *Hary. J. Horti. Scien*., 33(1&2): 74-75.

**Khan, F. N., Yasmin, L, Nasrin, T. A. A., Hossain, M. J. and Golder, P.C., 2009.** Effect of sucrose and pH on the vase life of gladiolus flower. *SAARC. J. Agric*., 7(1):11-18.

**Kispotta, L. M., Jha, K. K., Horo P., Tirkey, S. K., Misra, S. and Sengupta, S. (2017).** Genetic Variability and Heritability in *Gladiolus hybridus*. *International Journal of Science, Environment and Technology*, **6**(1): 519 – 528.

**Kumar, A., Kumar, A. and Kumar, A. (2019).** Genetic variability, heritability, genetic advance and genetic divergence for yield and its Contributing Traits in Gladiolus (*Gladiolus grandiflorus* L.). *International Journal of Current Microbiology and Applied Science*, **8**(1): 689-701.

**Kumar, K. A., Singh, B., Dhaiya, R. and Goswami, A. (2018).** Evaluation of genetic variability,

heritability and genetic advances in gladiolus (*Gladiolus hybridus* Hort.) genotypes. *Journal Annals of Horticulture year*, **11**(1):46-51.

**Mushtaq, S., Hafiz, I. A., Iqbal, M. S., Hasan, S. Z., Arif, M., Ullah, S., Rasheed, M. and Rafique, R., 2013.** Studies on the performance of some exotic gladiolus cultivars under rainfed conditions. *Inter. J. Mod. Agri*., 2(3): 108-113.

**Naresh, S., Dorajee, A. V. D. Rao, Vijaya V. Baskhar, Paratpara, M. Rao and Uma, K. Krishna (2015).** Genetic variability, heritability and genetic advance in Gladiolus hybrids, *Plant Archives*, 15: 377-381.

**Nimbalkar, C. A., Katwate, S. M., Singh, B. R. Kakade, D. and Sand, S. B. G. (2007).** Selection strategy for improvement in economic traits of gladiolus. *Journal of Ornamental Horticulture*, **10**(1): 9-14.

**Nimbalkar, C. A., Katwate, S. M., Singh, B. R., Kakade, D. S. and Gurav, S. B., 2007.** Selection strategy for improvement in economic traits of gladiolus. *J. Orn. Horti*., 10(1): 9-14.

on the vase life and quality of cut gladiolus cv. "White prosperity". *Asn. J. Hort*., 2(1): 92-94.

**Pal, A., Singh, R. and Pal, K. (2017).** Genetic variability in some quantitative traits of gladiolus, *Progressive horticulture*, **39**(2):178-181.

**Pandey, R. K., Bhat, D. J. I., Dogra, S., Singh, A., Laishram N. and Jamwal, S., 2012.** Evaluation of gladiolus cultivars under subtropical conditions of Jammu. *Inter. J. Agri. Scie*., 8(2): 518-522.

**Pandey, R. K., Dogra, S., Sharma, J. P., Jamwal, S. and Bhat, D. J., 2009.** Performance of gladiolus cultivars under Jammu conditions. *J. Rese*., 9(2): 210-214.

**Patra, S. K. and Mohanty, C. R. (2019).** Correlation Studies in Gladiolus. *International Journal of Current Microbiology and Applied Sciences*, **8**(2): 3401-3406.

**Rashmi and Kumar, S. (2014).** Estimation of genetic variability, correlation and path analysis in gladiolus (*Gladiolus species* L.). *International Journal of Plant Science*, **9**(1):186-189.

**Rashmi, R., Chandrashekar, S. Y., Kumar, H. P. and Geeta, S.V. (2016)**. Genetic variability and correlation studies in gladiolus (*Gladiolus hybridus* L.). *Green Farming***,** 7 (2)**:** 383-387.

**Shaukat, S. A., Shah, S. Z. A., Shaukat, S. K. and Shaukat, S. W., 2012.** Evaluation of different gladiolus cultivars under Union Council Bangoin Poonch AJ&K conditions. *J. Agri. Scie. and Appli*., 1(4):139-142.

**Singh, A. and Singh, S. S. (2018).** Genetic variability studies in gladiolus (*Gladiolus grandiflorus* L.). *Pharma Innovation*, **7**(7): 690-693.

**Singh, A., and Singh, S. S. (2018).** Genetic variability studies in gladiolus (*Gladiolus grandiflorus* L.) under Chitrakoot condition. *The pharma innovation*, **7**(7): 690-693.

**Singh, D., Mishra, A. and Meena, B. (2017).** Genetic variability studies in Gladiolus (*Gladiolus hybridus* hort.) under sub humid condition of Rajasthan. *International Journal of Agricultural Science and Research*, 7: 523-528.

**Singh, D., Mishra, A. and Meena, B. (2017**). Genetic variability studies in gladiolus (*Gladiolus hybridus* hort.) under sub humid condition of Rajasthan. *International journal of Agricultural Science and Research*, **7**(1): 523-528.

**Verty, P., Prasad, V. M., Collis, J. P. and Nazir, M. (2017).** Correlation Analysis in Gladiolus (*Gladiolus grandiflorus* L.). *International Journal of Current Microbiology Applied Sciences*, **6**(9): 743-749.

**Verty, V., Prasad, V. M., Collis, J. P. and Nazir, M. (2017).** Correlation Analysis in Gladiolus (*Gladiolus grandiflorus* L.). *Agriculture Research and Technology*, **10**(4):34-38.