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## EVALUATION OF GLADIOLUS VARIETIES IN THE RAYALASEEMA REGION OF ANDHRA PRADESH, INDIA

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### ABSTRACT

The present investigation evaluated 17 gladiolus (*Gladiolus hybridus* L.) cultivars for their vegetative, reproductive and propagation traits under Rayalaseema regional agroclimatic conditions of Andhra Pradesh. This experiment was carried out in RBD. Significant variation was observed across key parameters. Psittacinus Hybrid excelled in plant height (116.42 cm), spike length (75.18 cm), indicating superior growth and establishment potential. Arka Aayush recorded the highest spike count (2.28), while Pusa Suhagin had the maximum floret count (16.44). These findings suggest the suitability of select cultivars for enhanced floral output, market quality and propagation efficiency in commercial gladiolus cultivation in the Rayalseema region.

**Key words :** Vegetative, Reproductive and Propagation traits, Psittacinus Hybrid, Market quality.

### Introduction

Floriculture has become a transformative segment in Indian horticulture sector, blending cultural tradition with economic promise. As of 2023–2024, the nation cultivates floricultural crops across 297 thousand hectares, producing approximately 2284 thousand tonnes of loose flowers and 947 thousand tonnes of cut flowers (Sisodiya *et al.*, 2018). Loose flower cultivation including marigold, crossandra and jasmine is prominent in Andhra Pradesh, Karnataka and Tamil Nadu while cut flowers such as gladiolus, rose, and chrysanthemum serve both domestic and international markets. The CSIR Floriculture Mission has further energized the sector by integrating ornamental crop production with apiculture, aiming to uplift rural livelihoods and boost floral exports (Anonymous, 2021). Gladiolus is particularly noteworthy, ranking third in cut flower production in India and fourth in global trade, with returns significantly outpacing conventional crops (Safia *et al.*, 2024).

Gladiolus (*Gladiolus hybridus* Hort.), commonly known as the “Queen of bulbous flowers,” is known for its towering spikes and radiant blooms. Originating from

South Africa, it is now also cultivated in temperate and tropical zones worldwide. The genus includes over 255 species, each offering unique ornamental traits (Rajan *et al.*, 2010). Gladiolus symbolizes strength of character, moral integrity and remembrance. Its widespread use in bouquets, landscape designs and ceremonial decorations underscores its aesthetic and commercial importance across cultures.

In Rayalaseema region of Andhra Pradesh, gladiolus cultivation represents a high-value opportunity for floricultural entrepreneurship. The region’s moderate climate and well-drained soils provide ideal conditions for producing high-quality spikes and healthy corms. With consistent demand for floral decor in temples, weddings, and religious festivities, gladiolus cultivation offers small and marginal farmers a profitable avenue for market integration. Selecting region-adapted varieties and aligning production cycles with festive calendars enhances returns (Kumar and Yadav, 2005). With its growing economic significance and cultural relevance, gladiolus stands poised to become a cornerstone of sustainable floriculture development in Andhra Pradesh.

## Material and Methods

The field experiment titled “Evaluation of Gladiolus Varieties in the Rayalaseema Region of Andhra Pradesh” was conducted during the Rabi season of 2024–2025 at the College of Horticulture, Department of Floriculture and Landscape Architecture, Dr. YSR Horticultural University, located in Anantharajupeta, Annamayya district, Andhra Pradesh, India.

The experiment was carried out at Dr. Y.S.R.H.U- College of Horticulture, Anantharajupeta, which is located in Andhra Pradesh’s Southern agro-climatic zone and is situated between 13° 59' North latitude and 79° 19' East longitude and 162 m (531 feet) above mean sea level.

The field experiment was laid out using a Randomized Block Design (RBD), consisting of 17 gladiolus varieties, with each variety replicated three times to ensure statistical reliability. The planting material was procured from two premier floriculture institutes in India namely, Indian Institute of Horticultural Research (IIHR), Hessaraghatta, Bangalore, and the Directorate of Floriculture Research, Pune. The varieties included V<sub>1</sub>: Arka Naveen, V<sub>2</sub>: Arka Aayush, V<sub>3</sub>: Arka Darshan, V<sub>4</sub>: Punjab Flame, V<sub>5</sub>: Punjab Dawn, V<sub>6</sub>: Arka Amar, V<sub>7</sub>: Pusa Suhagin, V<sub>8</sub>: Phule Neelrekha, V<sub>9</sub>: Arka Pratham, V<sub>10</sub>: Arka Tilak, V<sub>11</sub>: Punjab Lemon Delight, V<sub>12</sub>: Punjab Pink Elegance, V<sub>13</sub>: Poonam, V<sub>14</sub>: Pusa Chandni, V<sub>15</sub>: Arka Gold, V<sub>16</sub>: Arka Shobha and V<sub>17</sub>: Psittacinus Hybrid.

Healthy and uniform sized corms from various gladiolus varieties were initially treated with a fungicidal solution for 30 minutes to mitigate the potential fungal infections. Following treatment, the corms were shade-dried and subsequently planted in the field during November 2024. The planting was done at a spacing of 30 cm×30 cm, accommodating approximately 16 corms per the treatment. The experiment was structured using a Randomized Block Design (RBD) with three replications to ensure statistical reliability.

Standard agronomic practices which include weeding, hoeing, earthing-up and timely irrigation were implemented across all cultivars throughout the vegetative and reproductive phases. Irrigation was withheld approximately 20 days before corm lifting to facilitate maturity. Data collection was performed on five randomly selected plants per treatment, and the average of these observations was used to represent each parameter.

Growth and performance were assessed based on key morphological and reproductive traits. These included vegetative parameters such as plant height, number of leaves, leaf length and leaf width; floral traits like days to

spike emergence, number of days for the first floret to show color, rachis length, spike length, number of florets spike<sup>-1</sup>, number of spikes plant<sup>-1</sup>, floret size, field longevity; corm development characteristics, namely corm diameter, number of corms per plant and number of cormels per plant. All collected data were subjected to statistical analysis to evaluate varietal performance under the experimental conditions.

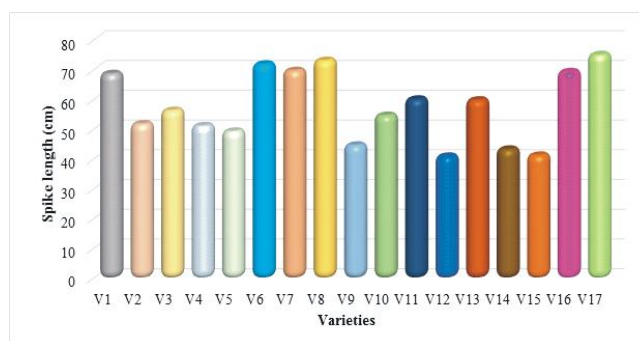
## Results and Discussion

At 90 days after planting (DAP), significant variation in vegetative traits was recorded among gladiolus varieties. Psittacinus Hybrid exhibited the tallest plants (116.42 cm), which showed on par results with Phule Neelrekha (113.47 cm), Arka Shobha (111.04 cm) and Arka Naveen (108.33 cm) while, the shortest stature was observed in Arka Tilak (83.16 cm), indicating genotypic influence on growth potential.

Similar observations were reported by Sahariya *et al.* (2018) and Rakshitha and Singh (2024), confirming the role of genetic constitution and environmental responsiveness in determining plant height.

Significant variation in spike emergence was recorded among gladiolus cultivars, underscoring genotypic influence on reproductive transition. Punjab Flame initiated spike emergence earliest (52.67 days), followed closely by Punjab Lemon Delight (53.89 days), while Pusa Chandni exhibited the longest duration to spike emergence (81.67 days). Early sprouting in certain varieties likely enhanced photosynthetic efficiency, contributing to accelerated assimilate accumulation and hastened floral initiation. These results are in line with earlier findings reported by Sahariya *et al.* (2018), Kadam *et al.* (2014), and Chourasia *et al.* (2015), supporting the role of cultivar-specific physiological dynamics in influencing the spike emergence.

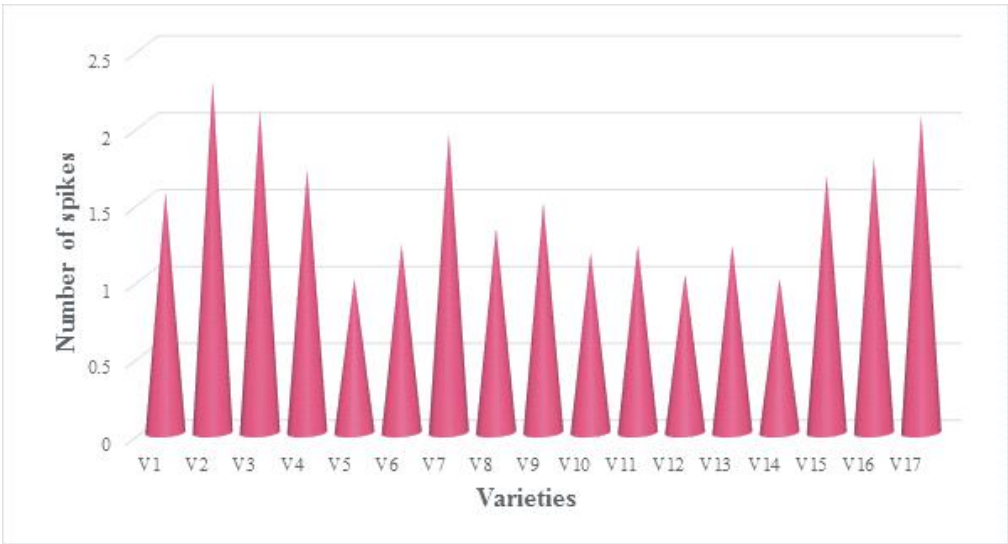
The maximum rachis length was observed in Psittacinus Hybrid (49.76 cm) meanwhile, Punjab Pink Elegance exhibited the minimum rachis length at (24.37



**Fig. 1:** Variation in the spike length (cm) among gladiolus varieties.

**Table 1 :** Performance of gladiolus varieties for Plant height (cm), Days for spike emergence, Rachis length(cm), Spike length (cm), No. of spikes plant<sup>-1</sup>, No. of florets spike<sup>-1</sup>.

| Variety              | Plant height (cm) | Days for spikee emergence (days) | Rachis length (cm) | Spike length (cm) | No. of spikes plant <sup>-1</sup> | No. of florets spike <sup>-1</sup> |
|----------------------|-------------------|----------------------------------|--------------------|-------------------|-----------------------------------|------------------------------------|
| Arka Naveen          | 108.33            | 60.22                            | 45.90              | 68.81             | 1.56                              | 14.22                              |
| Arka Aayush          | 104.93            | 68.04                            | 37.01              | 51.90             | 2.28                              | 13.33                              |
| Arka Darshan         | 87.67             | 73.33                            | 37.58              | 56.41             | 2.10                              | 11.89                              |
| Punjab Flame         | 99.27             | 52.67                            | 37.53              | 51.29             | 1.71                              | 10.22                              |
| Punjab Dawn          | 92.02             | 60.78                            | 37.73              | 49.43             | 1.00                              | 7.22                               |
| Arka Amar            | 101.85            | 65.67                            | 48.72              | 71.96             | 1.22                              | 14.22                              |
| Pusa Suhagin         | 105.64            | 79.09                            | 45.41              | 69.84             | 1.94                              | 16.44                              |
| Phule Neelrekha      | 113.47            | 66.67                            | 49.58              | 73.21             | 1.33                              | 14.67                              |
| Arka Pratham         | 101.67            | 56.56                            | 26.46              | 44.72             | 1.49                              | 9.11                               |
| Arka Tilak           | 83.16             | 75.85                            | 35.79              | 54.76             | 1.17                              | 10.67                              |
| Punjab lemon Delight | 97.31             | 53.89                            | 34.71              | 60.22             | 1.22                              | 8.67                               |
| Punjab Pink Elegance | 90.53             | 74.56                            | 24.37              | 41.03             | 1.03                              | 8.56                               |
| Arka Poonam          | 104.90            | 67.56                            | 36.01              | 59.91             | 1.22                              | 9.22                               |
| Pusa Chandni         | 94.15             | 81.67                            | 24.73              | 43.40             | 1.00                              | 8.22                               |
| Arka Gold            | 105.29            | 66.51                            | 27.72              | 41.37             | 1.67                              | 8.11                               |
| Arka Shobha          | 111.04            | 62.67                            | 44.72              | 69.42             | 1.78                              | 14.89                              |
| Psittacinus Hybrid   | 116.42            | 80.33                            | 49.76              | 75.18             | 2.06                              | 13.89                              |
| Mean                 | 101.04            | 67.41                            | 37.87              | 57.82             | 1.52                              | 11.39                              |
| SE (m)               | 3.179             | 0.750                            | 0.471              | 0.83              | 1.516                             | 0.232                              |
| CD @ 5%              | 9.186             | 2.167                            | 1.361              | 2.39              | 0.501                             | 0.671                              |

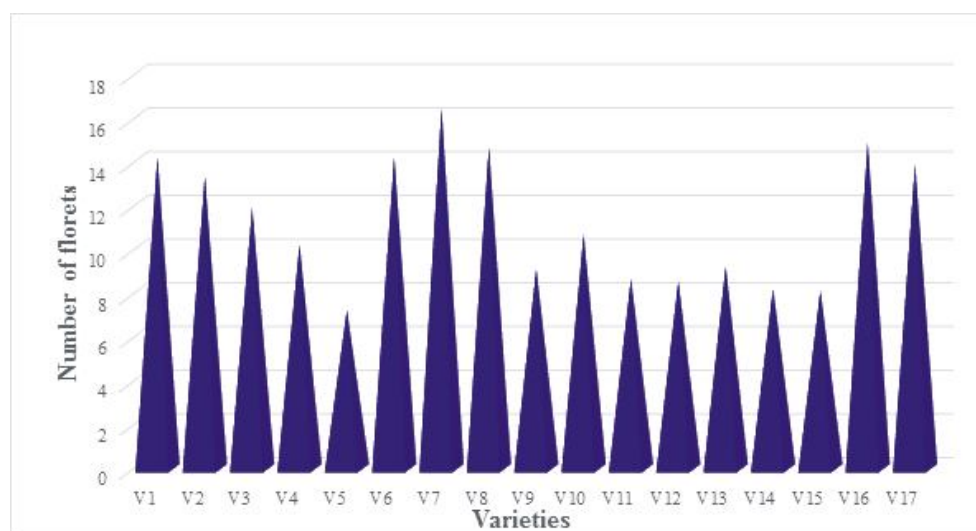


**Fig 2 :** Number of spikes plant<sup>-1</sup> in gladiolus varieties.

cm), indicating notable differences in floral architecture. These results align with the observations reported by Swain *et al.* (2008), Geeta *et al.* (2014) and Baksh *et al.* (2024), who also highlighted comparable interrelationships among these traits.

Psittacinus Hybrid produced the longest spikes (75.18

cm) which was on par with Phule Neelrekha (73.21 cm) and Punjab Pink Elegance exhibited the shortest spike length (41.03 cm). Variation in spike and rachis lengths among gladiolus cultivars reflects inherent genetic differences and environmental interactions. These traits, closely tied to corm vigour, significantly influence plant



**Fig. 3 :** Number of florets spike<sup>-1</sup> in different gladiolus varieties.



**Fig. 4 :** Plant height and rachis length in gladiolus varieties. stature and floral architecture (Safia *et al.*, 2024). Consistent with the findings of Singh *et al.* (2017) and Mushtaq *et al.* (2018), such morphological diversity plays a key role in determining the commercial value and market appeal of gladiolus spikes.

Notable variation was observed in the number of spikes per plant among the gladiolus cultivars. Arka Aayush recorded the highest spike count (2.28) and Punjab Dawn and Pusa Chandni produced the minimum spike count (1.0). Spike yield in gladiolus is strongly governed by genotypic traits such as shoot emergence per corm and sprouting percentage, which directly influence floral output (Kamble, 2001; Nalage *et al.*, 2018; Kumar *et al.*, 2024). Regarding number of florets per spike Pusa Suhagin recorded the highest floret count (16.44) and Punjab Dawn exhibited the lowest (7.22).

Variation in floret number per spike among gladiolus cultivars is primarily governed by genetic makeup and environmental conditions (Kumar *et al.*, 2024). Taller plants with larger leaf area generally produced longer rachis and higher floret counts, while shorter genotypes yielded fewer florets (Wani *et al.*, 2020; Naresh, 2015). Spike quality and vase longevity were positively associated with floret number, arrangement, and planting material, as supported by Devi Priya (2014), Shaukat *et al.* (2013), Sisodia *et al.* (2018), Rakshitha and Singh (2024) and Safia *et al.* (2024).

### Conclusion

The present investigation revealed significant genotypic variation across all evaluated traits among 17 gladiolus varieties. Psittacinus Hybrid exhibited superior vegetative performance with maximum plant height (116.42 cm), leaf length (85.28 cm) and spike length (75.18 cm). Arka Aayush produced the highest number of spikes per plant (2.28), while Pusa Suhagin recorded the highest floret count (16.44). Arka Amar showed the longest spike retention (14.89 days), indicating postharvest durability. Psittacinus Hybrid also led in corm diameter (5.89 cm) and corm weight (18.53 g), while Punjab Flame excelled in corm count (2.56) and cormel production (55.78). These findings highlight the commercial and propagation potential of specific cultivars for gladiolus cultivation in Rayalaseema region of Andhra Pradesh.

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