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Varietal response and effect of *Trichoderma* on flowering in gladiolus

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Abstract

A field experiment on evaluation of gladiolus varieties and see the effect of *Trichoderma* on flowering parameters was carried out at Horticulture Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (U.P.), during 2017-2018. Eight varieties of gladiolus *i.e.* Yellow Jester, Tiger Flame, Punjab Morning, Punjab Dawn, Pusa Kiran, Shubhangini, IIHR, and Dhanvantri. These varieties treated with *Trichoderma* and untreated (control). Thus there was sixteen treatment combinations. Experiment was laid out in Randomized Block Design with three replications. Application of *Trichoderma* influenced some flowering parameters. *Trichoderma* significantly influenced length of spike and duration of flowering, but there was no any significant effect of *Trichoderma* on days to spike emergence, opening of first floret, and number of floret per spike. Among different varieties cv. IIHR was earlier to days to spike emergence and opening of 1st floret which was at par with cv. Pusa Kiran. The number of florets per spike was recorded maximum in cultivar Pusa Kiran. Cv. Pusa Kiran also registered maximum length of spike. The maximum duration of flowering was recorded in cultivar Shubhangini.

Keywords: gladiolus, cultivars, *Trichoderma*, flowering, spike

Introduction

Gladiolus is a bulbous ornamental plant that belongs to the family Iridaceae. It is popularly grown for cut flowers which are of high commercial importance. Gladiolus spikes are used in flower arrangements as well as bouquets. Among the commercial flowers, gladiolus is one of the most important flowers in India because of its majestic spikes containing attractive, elegant and delicate florets of various shades, sequential opening of flowers for long duration and good keeping quality of cut spikes (Singh, 2006) [7]. *Trichoderma* have their own importance on floral qualities of gladiolus because *Trichoderma* supply the nutrients and improve the soil physical health. *Trichoderma* is an asexually reproducing fungal genus most frequently found in soils as well as in association with plants. Evaluation of varieties for a particular location or agroclimatic zone has significant importance to get optimum production. Therefore, an experiment was conducted to study the varietal response and effect of *Trichoderma* on flowering in gladiolus.

Materials and Methods

An experiment was carried out at Horticulture Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (U.P.), during 2017-2018 to evaluate gladiolus varieties and see the response of *Trichoderma* on flowering in gladiolus. Varanasi is situated at 25° 02' North latitude, 83° 03' East longitudes and at an elevation of 128.93 meters above sea level. Healthy and disease-free corms of 8 varieties (Yellow Jester, Tiger Flame, Punjab Morning, Punjab Dawn, Pusa Kiran, Shubhangini, IIHR and Dhanvantri) were planted with spacing of 30 cm between the rows and 20 cm between the plants during December 2017. Gladiolus corms of each variety were treated with *Trichoderma*. The experiment was laid out in Randomized Block Design with three replications. All cultural operations were uniformly done for all the varieties. Observations were recorded on various flowering parameter and data were analyzed statistically.

Results and Discussion

Various flowering parameters were influenced significantly due to *Trichoderma* and gladiolus varieties (Table 1). However, application of *Trichoderma* fail to exert any conspicuous effect on days to spike emergence, opening of first floret and number of florets per spike. *Trichoderma* treated plant recorded maximum number of florets per spike, but there was no any significant effect of *Trichoderma*, whereas there was a significant effect of *Trichoderma* on length of spike and duration of flowering.

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Trichoderma treated plant noticed maximum length of spike and more duration of flowering as reported by various workers (Dongardive *et al.*, 2007 and Dubey *et al.*, 2008)^[1, 2]. All the flowering characters influenced significantly due to varieties of gladiolus. Cultivar IIHR was recorded early spike emergence which was statistically at par with cv. Pusa Kiran. Similarly earlier opening of first floret was also noticed with cultivar IIHR and at par with cv. Pusa Kiran. The variation in spike emergence and opening of first of first floret among different cultivar reported by Kadam *et al.* (2014)^[3] and Singh *et al.* (2017)^[6]. The maximum number of florets per spike was noticed in cultivar Pusa Kiran which was statistically at par with Tiger Flame and Shubhangini and significant to all other varieties. The maximum length of spike was noticed in cultivar Pusa Kiran which was statistically at

par with Yellow Jester, Tiger Flame, Shubhangini, IIHR and Dhanvantri and significant to other varieties. Variation in spike length might be due to variation in their intrinsic factor as reported by various previous workers Sarkar and Chakraborty (2014)^[5], Sushila (2013) and Singh *et al.* (2017)^[6]. The maximum duration of flowering was recorded in cultivar Dhanvantri followed by cvs. Shubhangini, Pusa Kiran and Tiger Flame. However, it was statistically significant to all the varieties. Diameter of flower also influenced due to various cultivars (Fig.1). Diameter of first floret was maximum with cv. Dhanvantri, whereas, 3rd and 5th florets were found bigger in germplasm IIHR. Varietal influence on flowering parameters was also noticed by earlier workers (Singh *et al.* 2013, Kumar *et al.* 2014, Sisodia and Singh, 2015)^[10, 4, 9].

Table 1: Varietal response and effect of *Trichoderma* on spike emergence, opening of first floret, no. of florets/spike, duration of flowering and length of spike in gladiolus.

Treatment	Days to spike emergence	Opening of 1 st floret	Number of floret per spike	Length of spike (cm)	Duration of flowering (days)
Bio-agent					
Control	72.23	85.64	13.99	81.70	13.11
<i>Trichoderma</i>	74.13	87.30	14.11	84.09	16.17
CD at 5%	NS	NS	NS	2.18	2.53
Gladiolus varieties					
Yellow Jester	82.91	91.72	13.50	85.90	9.13
Tiger Flame	84.50	90.05	14.85	86.38	14.91
Punjab Morning	74.54	91.20	9.69	65.57	11.91
Punjab Dawn	73.36	84.72	14.27	70.99	8.16
Pusa Kiran	64.86	82.90	17.29	89.67	16.01
Shubhangini	68.25	84.42	17.12	86.37	16.03
IIHR	62.47	80.87	13.44	89.18	14.94
Dhanvantri	74.55	85.89	12.26	86.15	26.01
CD at 5%	5.42	6.33	2.72	4.47	5.13

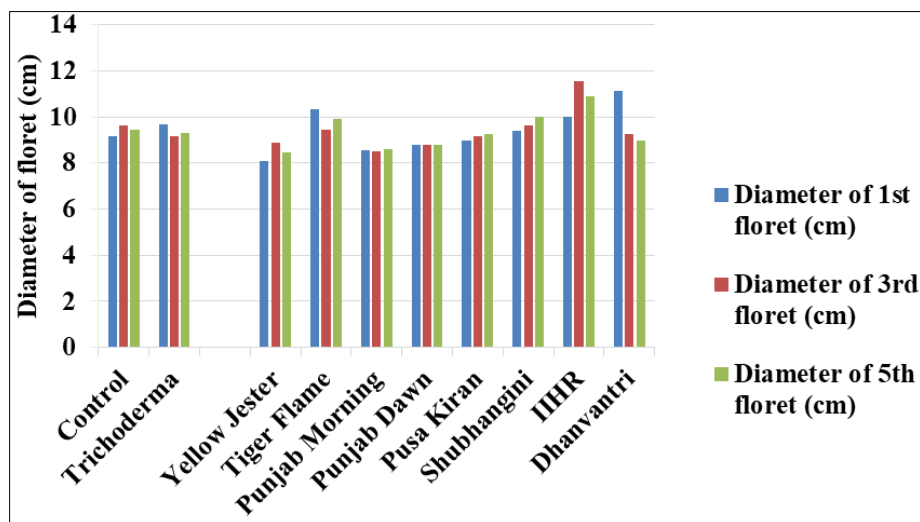


Fig 1: Diameter of 1st, 3rd and 5th floret

References

- Dongardive SB, Golliwar VJ, Bhongle SA. Effect of organic manure and biofertilizers on growth and flowering in gladiolus cv. White Prosperity. Plant Archives. 2007; 7(2):657-658.
- Dubey RK, Kumar P, Singh N. Effect of *Trichoderma viride* and *Pseudomonas fluorescens* on growth and flowering of gladiolus. Indian Journal of Ecology. 2008; 35(1):97-98.
- Kadam GB, Kumar G, Saha TN, Tiwari AK, Kumar R. Varietal evaluation and genetic variability studies on gladiolus. Indian Journal of Horticulture. 2014; 71(3):379-384.
- Kumar A, Sisodia A, Singh AK. Evaluation of tuberose cultivars for growth, flowering and post-harvest life. Indian Perfumer. 2014; 58(1):29-32.
- Sarkar I, Chakraborty S. Varietal performances on important floral attributes of 15 indigenous and exotic varieties of gladiolus in North Eastern Himalayan region. Journal of Agriculture and Technology. 2014; 1(1):80-85.
- Singh AK, Sisodia A, Sisodia V, Ray P. Performance of Indian and exotic varieties of gladiolus under Eastern

- U.P. conditions. Journal of Ornamental Horticulture. 2017; 20(3-4):153-157.
7. Singh AK. Flower Crops: Cultivation and Management. New India Publishing Agency, New Delhi. 2006, 147.
 8. Singh AK, Kumar A, Sisodia A. Growth, flowering and bulb yield in tuberose as influenced by cultivars. Environment and Ecology. 2013; 31(4A):1823-1825.
 9. Sisodia A, Singh AK. Effects of farmyard manure, vermicompost and *Trichoderma* on flowering and corm attributes in gladiolus. Bangladesh Journal of Botany. 2015; 44(2):309-314.
 10. Susila T. Evaluation of gladiolus varieties for Visakhapatnam District of Andhra Pradesh. Indian Agricultural Science Digest. 2013; 33(3):237-238.