Bulletin UASVM Horticulture, 68(1)/2011
Print ISSN 1843-5254; Electronic ISSN 1843-5394

Evaluation of Promising Hybrids of *Gladiolus hybridus* L.

Maria CANTOR, Erzsebet BUTA, Rodica POP

University of Agricultural Sciences and Veterinary Medicine, Faculty of Horticulture,
3-5 Manastur Street, 400372, Cluj-Napoca, Romania; marcantor@yahoo.com

Abstract. The genus *Gladiolus* contains more 255 species which grow in western and central Europe, western Asia, and in tropical and southern Africa. The main distribution area is South Africa. Most gladiolus cultivated worldwide as well as Romania has imported from the Netherlands, and only a few are created in our country. The present investigations were carried out in the experiment field of USAMV Cluj-Napoca, Floriculture Department, during of 2007-2011. In order to obtaining new cultivars were performed intraspecific crosses, involving 20 hybrid combinations between valuable genitors, followed by clonal selection of F_1 hybrids. The present paper contains experimental results obtained by testing to two gladiolus hybrids F_1 generations (H 8/11 and H 19/3). The morphological characteristics were evaluated and were sent for testing at ISTIS Bucharest for homologate as new cultivars.

Keywords: breeding, clones, morphological characteristics, new hybrids

INTRODUCTION

Gladiolus is grown through out the world and belongs to family *Iridaceae*. Large scale production for gladiolus cut flowers is seen in USA, Holland, Itlaly, France, Poland, Bulgaria, Brazil, Australia and also Israel.

The Gladiolus has a long and noble history. The Latin word “Gladius” means sword and hence it is often called as “sword lilly” because of the shape of its leaves. Gladiolus was also called “xiphium” based on the Greek word “Xiphos” also meaning sword. So, have here what might appear to be pretty war lake flower. But in another sense, the gladiolus is a romantic flower as it signifies remembrance and it also expresses infatuation. The roots of the gladiolus plants were thought to be an aphrodisiac. But whether romantic or war like or quack medicine, the gladiolus remains as a popular garden flower, an old fashioned one that is equally at homes in a cottage garden, in landscape design or in modern bouquets as a cut flower (Patil, 2003).There are over 180 known species of the gladiolus today, but only a few of then are found in most garden, in South Africa, India and Mediterranean region.

Gladiolus is very rich in its varietals wealth and every year there is an addition of new varieties; hence varietals evaluation becomes necessary to find out suitable variety for a particular region. Improvement of any crop is a continuous process and in gladiolus also there is scope to improve the existing cultivars or genotypes. In gladiolus the most common method of improvement is through hybridization. Since the gladiolus is highly heterozygous, it becomes more essential to evaluate.

Nowadays in Romania few person grow gladiolus, and the assortment it is limited at some cultivars obtained from commerce. At University of Agricultural Sciences and Veterinary Medicine (UASVM Cluj), Department of Floriculture was developing a sustainable work for improving the gladiolus assortment by breeding work and by exchanges biological materials.

The culture and selection work of Gladiolus in Romania began in 1953 at the Research Station of Cluj-Napoca, by Rudolf Palocsay and the research was concentrated for many years in only a few specialized units such are those of State Institutions and Research Station.

Saini *et al*. (1991) studied the performance of six gladiolus cultivars under Hissar conditions and found that maximum plant height was recorded by the cv. "George Mazure" (99.70 cm) and minimum by cv. "Miniature" (59.70 cm).

Kalasaraddi (1996) reported the cultivar "American Beauty" produced more number of leaves (4.61) and plant height (41.94 cm) compare to that of "Melody" at 30 DAP (days after planting) under Dharwad conditions.

Wilfret (1980) compared the performance of Dr. Magie a salmon gladiolus cultivar under Florida conditions for cut flower with various other cultivars and found that it was resistant for *Fusarium*. It also performed well under Florida conditions with other cultivars.

Cultivars "Suchitra", "Melody", "Ratans Butterfly" and "Snow Princess" were superior among many varieties evaluated under Ludhiana conditions with respect to spike length, which ranged form 80 to 90 cm (Arora and Khanna, 1985).

Kamble (2001) studied the performance of gladiolus cultivar and reported that maximum spike length (93.90 cm), spike weight (127.26 g), diameter of flowers (11.91 cm) and number of florets per spike were noticed in cultivar "Summer Sunshine" and "Vadanapali" showed the maximum spike girth and spike yield per ha.

Kishan *et al*. (2005) studied on the performance of gladiolus under Delhi condition and found that weight of single corm recorded maximum by "Gold Dust" (124.66 g) and "Dhanavantari (120.00 g); while minimum by "Vinks Glory" (66.66 g). The cormels weight (16.00 g) was recorded highest in "Chandani" and lowest (3.66 g) in "Melody". Varietal "African Star" produced maximum cormels per plant and minimum by "Gold Dust". The number of corms per plant was found to be non-significant.

Singh *et al*. (2000) studied the effect of cultivar response on keeping quality of gladiolus spikes and reported that cultivars "Applause", "Hunting Song", "Jacksonville Gold", Mayur", "Melody" and "White Prosperity" showed 7-10 days was life when harvested at 5-7 florets showed colour.

Development and selection of suitable genotypes is an important factor that determines successful cultivation of gladiolus under different agro-climatic conditions as the performance of varieties with respect to various vegetative parameters like yield, quality of morphological characteristics.

The factor accounting of for variation in growth and yield of crop plants a very complex in nature. The performance of a cultivar in respect of growth and yield is known to be greatly influenced by the environmental conditions in which it is grown and the genetical potential of it.

MATERIALS AND METHODS

The present investigations were carried out in the experimental field at USAMV Cluj-Napoca, Botanical garden, during the period 2007-2011 (Fig. 1).

Breeding methods were intraspecific hybridization, followed by conservative selection. In 2007 year, were selected the best gladiolus cultivars for use as genitors and were performed 20 hybrid combinations. Were made different crosses using between 5 and 36 florets per hybrid combination, and were obtained 3885 seed hybrids. F_1 hybrids were grown in experimental field and were analyzed concerning the main morpho-decorative characteristics (Tab. 1).

Fig. 1. General view of experimental field

Tab. 1

Hybrid combination and the number of seeds obtained at *Gladiolus hybridus*, 2007

No. comb. hybrid	Genitors ♀		♂	No. flowers pollinate	No. flower with seeds	Total seeds
1.	Praha	x	Break a Dawn	30	-	-
2.	Blue Isle	x	Priscilla	10	2	27
3.	Princesse Marg. Rose	x	Expresso	36	2	21
4.	Jester	x	Peter Pears	44	23	175
5.	White Prosperity	x	Grune Specht	11	9	201
6.	Nova Lux	x	Fidelio	21	17	583
7.	Nova Lux	x	Madona	20	18	612
8.	Oscar	x	My Love	26	-	-
9.	White Prosperity	x	Plumtart	38	29	908
10.	Mon Amour	x	Traderhorn	5	-	-
11.	Praha	x	Fidelio	16	-	-
12.	Grune Specht	x	Madona	12	-	-
13.	Traderhorn	x	Mon Amour	12	6	224
14.	Mon Amour	x	Madona	22	-	-
15.	Praha	x	Fidelio	24	-	-
16.	Princesse Marg. Rose	x	Plumtart	36	10	543
17.	Expresso	x	Praha	20	6	168
18.	Break a Dawn	x	Nova Lux	25	10	250
19.	White Prosperity	x	Praha	15	8	126
20.	Blue Isle	x	Alice	20	10	47

The elites were selected are propagated by corms and cormels and evaluated in the field trials in comparison to standard cultivars or parents.

This paper evaluated two new Romanian hybrids recording on various parameters of vegetative growth and floral character which were selected and then were send to ISTIS Bucharest for be evaluated in order to homologate as new cultivars.

The cultivars were analyzed concerning their main characteristics (color, plant height, stem length, number of florets, number of corms and cormels etc.). From each cultivar were do observations and measurements, and where the averages of data do.

For blooming season we used the follow earliness approximation: VE (very early) - under 70 days; E (early) - 70-74 days; EM (early midseason) - 75-79 days; M (midseason) - 80-84 days; LM (late midseason) - 85-90 days; L (late) - 91-99 days; VL (very late) - 100 days or more.

RESULTS AND DISCUSSION

This paper reports two new promising hybrids H 8/11 and H 19/3 which were selected obtained by intraspecific hybridization method followed by clonally selection and vegetative multiplication (Fig. 2, Fig. 3).

Fig. 2. Hybrid H 8/11

Fig. 3. Hybrid H 19/3

This hybrids (H 1/20, H 8/1) selected are propagated by corms and cormels and evaluated in the field in comparison with cultivar (Priscilla).

In the tables 2 3 and 4 can see the main morphological characteristics of the new *Gladiolus* hybrids. Analyzing the data of hybrid H 8/11, we can conclude the following: her color of florets has a delicate color (white with greeny throat), and the hybrid 19/3 has a pink somon with pink line, apricot throat colour which it is much appreciated now a day. Have a good vigor (106.1 cm and 111.8 cm), long spike, and good numbers of cormels (52-78) in drought condition that made possible their multiplication.

Tab. 2

Morphological characteristics of the new hybrids of *Gladiolus*

Cultivars	Flower color	Floret shape	Spot	Anther color	Use
H 8/11	White with greeny throat	Round	no	greeny	Cut flower, border or group in the field, container culture
H 19/3	Pink somon with pink line, apricot throat	Star	no	red somon	Cut flower Landscape design
Priscilla - control	Light rose with dark rose lines	Round	yes	white rose	Cut flower garden

The H 8/11 and H 19/3 hybrids are characterized by remarkable achievement in combining the superior quality of morphological characteristics. This hybrids are early and early midseason, having a very good vase life. Especial they are recommended for cut flowers, for landscape design or containers.

Tab. 3

Quantitative characteristics of the new gladiolus cultivars

Cultivars	Days to flowering	Plant height (cm)	Spike length	No. of florets/ flower	Flower width (cm)	No. of simultaneously flowering floret	Vase life (days)
H 8/11	73	106.1	72.1	15.4	8.5	5.1	7.1
H 19/3	68	111.8	79.4	18.2	9.7	5.6	8.2
Priscilla	82	110.3	75.2	15.0	11.5	5.1	6.9

Tab. 4

Corm productivities of new gladiolus cultivars

Cultivars	No. of cormels/plant	Circumference of corm (cm)	Corm weight (g)
H 8/11	52	12.7	34.1
H 19/3	78	14.8	43.5
Priscilla	65	14.0	41.3

The new Gladiolus hybrids were sending in 2011 to ISTIS Bucharest for testing and in order to be certificate as new cultivars.

CONCLUSION

Commercial hybrids could be the conservative breeding to developing *Gladiolus* cultivars for garden, cut flowers or landscape design.

Important differences were recording among the hybrids under trial for the plants height. The range was from 106.1 cm (H 8/11) to 111.8 cm (H 19/3).

Maximum spike length recorded at hybrid H 19/3 (72.1 cm). Analyzing the data presented in Table 2 observed that the number of florets per spike was between 15.4 (H 8/11) to 18.2 in hybrid H 19/3.

Florets with maximum diameter of the floret were recorded in the hybrid H 19/3 (9.7 cm).

The hybrid H 19/3 has recorded a maximum number of cormels per plant (78).

The maximum vase life period was observed in hybrid H 19/3 (8.2 days).

The results obtained suggest that gladiolus hybrids there are fair changes develop commercial cultivars.

REFERENCES

1. Arora, J.S. and K. Khanna (1985). Evaluation of gladiolus cultivars. Journal of Research. Punjab Agricultural University, 22:655-662.

2. Kalasaraddi, P. (1996). Effect of time of planting and corm size on growth, flowering and flower quality of gladiolus (*Gladiolus hybridus* Hort.). M.Sc.(Agri). Thesis. University of Agricultural Sciences, Dharwad.

3. Kamble, B.S. (2001). Evaluation of gladiolus (*Gladiolus hybridus* Hort.) varieties.

M.Sc.(Hrt.). Thesis. University of Agricultural Sciences, Dharwad.

4. Kishan, P. Krishan and K.P. Singh. (2005).Performances of gladiolus under Delhi conditions. Journal of Ornamental Horticulture, 8(1):32-35.

5. Patil, K.B. (2003). Study of some exotic varieties of gladioulus. Orissa Journal Horticulture. 31(1):42-48.

6. Saini, R.S., A.K. Gupta and R.V. Yamadgni (1991). Performance of different cultivars of gladiolus (*Gladiolus grandiflorus* L.) under Hissar conditions. South Indian Horticulture, 39(2): 99-101.

7. Singh, K., P. Singh and J.S. Arora (2000). Effect of cultivar response, season, stage of harvest and sucrose on keeping quality of gladiolus spikes. Proceeding of the National Conference on Gladiolus. January, 143-149.

8. Wilfret, G.J. (1980). Gladiolus. In Introduction to Floriculture. Ed. Larson, R.A., Academic Press, New York, 161-181.