EVALUATION OF POTENTIAL MORPHO-DECORATIVE IN SOME VARIETIES OF *FREESIA HYBRIDA*

EVALUAREA POTENȚIALULUI MORFO-DECORATIV LA UNELE SOIURI DE *FREESIA HYBRIDA*

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Abstract. *Freesia originates from South Africa and got its name in honour of Friedrich Heinrich Theodor Freese. Freesia hybrida is the member of the Iridaceae family. This paper presents six varieties of Freesia hybrida and the importance of these flowers in our life. This plant is one of the most famous one for the majority of people. It is available in white, yellow, lavender, mauve, orange, gold, pink, red, velvet shades colors. The biological materials were studied in didactical greenhouse at Floriculture department of UASVM Cluj-Napoca. The next varieties 'El Dorado', Apollo', 'Corona', 'Romany', 'Balerina' and 'Margaret' were analysed concerning their main morpho-decorative characteristics, following to be recommended for promoting in our country. The observations and measurements were made in the years 2010-2011 on 30 plants from each variety. Were analyzed the next characteristics: colors of flowers, height of plant, length of stem, number of florets/inflorescence and the number of simultaneous flower open. The statistical analyze of the characters was do using LSD test.*
Key words: new varieties, statistical analyze, floral characteristics, diversification

Rezumat. *Freziile provin din Africa de Sud şi-au primit numele în cinstea lui Friedrich Heinrich Theodor Freese. Freesia hybrida aparţine familiei Iridaceae. Această lucrare prezintă şase soiuri de Freesia hybrida şi importanţa acestor flori în viaţa noastră. Această plantă este una dintre cele mai apreciate pentru majoritatea oamenilor. Acesta floare este cunoscută în diferite culori alb, galben, lavanda, mov, portocaliu, auriu, roz, nuanţe de catifea roşie. Materialul biologic a fost studiat în sera didactică a disciplinei de Floricultură de la USAMV Cluj-Napoca. Următoarele soiuri au fost studiate cu privire la principalele lor caracteristici morfo-decorative:* 'El Dorado', Apollo', 'Corona', 'Romany', 'Balerina' şi 'Margaret', *urmând să fie recomandate pentru promovarea în ţara noastră cele mai valoroase. Observaţii şi măsurători au fost făcute în anii 2010-2011 la 30 de plante din fiecare soi. S-au analizat caracteristicile următoare: culoarea florilor, înălţimea plantelor, lungimea tijei florale, numărul de flori/inflorescenţă şi a numărului de flori deschise simultan. Mediile au fost utilizate pentru interpretarea statistică, folosind testul DL.*
Cuvinte cheie: noi varietăţi, analiza statistică, caracteristici florale, diversificare

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INTRODUCTION

Floriculture in recent decades and especially in our country since 1990 has sought to promote new technologies to ensure the sustainability of horticultural production and ultimately lead to safe and steady profits with minimum effect on the environment. This is possible by maximizing production capacity per unit area on one hand and reduces costs per unit, on the other hand (Draghia and Chelariu, 2011). In horticultural practice is necessary to improve the assortment of flower plants with the latest ones, created in our country or internationally, and improvement of some effective crop technologies in order to obtain qualitative and quantitative production. The transition to a market economy for our country is a highly complex process requiring profound changes regarding the restructurance of horticultural production in line with consumer requirements actual and potential, both in the internal and external market (Toma, 2009).

The interest of foreign specialists in the Netherlands, Germany, France, Israel, or East, it manifests to improve the assortment of flower plants for understanding the ecology and for grounding appropriate culture technologies, and it is diversifying more and more every day (Vargane, 1990).

Freesia hybrida is a floricultural species that is grown on thousands of hectares worldwide, ranked among the top six of the most sold flowers and in Romania unfortunately is grown on small areas (because of the lack modern culture areas or because of the high costs of production), but it has upward trend in private firms that are building modern greenhouses / solariums using European funds (Şelaru, 2002).

Studying *Freesia hybrida* species is justified because this floricultural plant is very popular and it is appreciated by many people especially for elegance, delicacy and fragrance.

Also, the growth trends of *Freesia* consumption in our country, ranking 4 place after carnations, chrysanthemums and roses, justifies the research for finding technological solutions for controlled conditions climate and tracking the behavior in terms of qualitative and quantitative assortments novelties (http://www.desert-tropicals.com/Plants/Iridaceae/Freesia_hybrida.html).

MATERIAL AND METHOD

The experiments were performed in the greenhouse of UASVM Cluj-Napoca, Romania, Ornamentals department, in 2010-2011 periods. The next varieties 'El Dorado', Apollo', 'Corona', 'Romany', 'Balerina' and 'Margaret' were analysed concerning their main morpho-decorative characteristics. *'El Dorado'* was used for contro. The experience was such monofactorial randomized blocks with six variants and three repetitions and were applied to all technological measures specific to this plant.

Phenological and morfo-decorative observations were made on plant:

- Height of plant (cm)
- Diameter of flower (cm)
- Number of flowers \ inflorescence
- Distance between first and second flower (cm)

- Lenght of inflorescence (cm)
- Color of flower.

Processing and interpretation of statistical data were analyzed using the mean characteristics for each variety studied. All data were statistically interpreted for each character, and test significance of differences between the test versions using using the LSD test (Ardelean et al., 2007).

RESULTS AND DISCUSSIONS

The experimental data for the *Freesia* cultivars were presented in the next tables.

Table 1

Plants's height (cm) of *Freesia* cultivars in 2010-2011

No. crt.	Variety	Average height (cm)	Relative height (%)	± d	Significant difference
1.	**El Dorado** (Control)	49.5	100	-	-
2.	Corona	46.0	92.9	-3.5	-
3.	Romany	58.5	116.2	+9.0	**
4.	Balerina	44.3	89.5	-5.2	-
5.	Margaret	56.5	114.1	+7.0	-
6.	Apollo	53.1	107.3	+3.6	-

LSD 5% = 7.6 cm LSD 1% = 8.5 cm LSD 0.1% = 14.5 cm

The analysis of the table 1 shows that average height of plant varied within the limits of 44.3 cm at 'Balerina' and 57.5 cm at 'Romany' cultivar.

As statistically point of view, there are distinct significant positive differences at the 'Romany' cultivars, but and the other cultivars ('Corona', 'Balerina', 'Margaret' and 'Apollo') are not significant regarding the average height of plant compared to the control variant 'El Dorado'.

Table 2

Diameter of flower (cm) of *Freesia* cultivars in 2010-2011

No. crt.	Variety	Average diameter of flower (cm)	Relative average diameter (%)	± d	Significant difference
1.	**El Dorado** (Control)	4.8	100	-	-
2.	Corona	4.5	91.7	-0.3	-
3.	Romany	5.2	106.3	+0.4	*
4.	Balerina	4.6	95.8	-0.2	-
5.	Margaret	5.0	104.2	+0.2	-
6.	Apollo	4.8	100	0.0	-

LSD 5% = 0.4 cm LSD 1% = 0.5 cm LSD 0.1% = 0.7 cm

The table 2 indicate that the diameter of flower varies on the analyzed cultivars from 4.5 cm ('Corona') to 5.2 cm ('Romany'). In terms of statistics, the

cultivar ‘Romany‘has a significant positive difference while the other cultivars are not significant regarding the average diameter of flower.

Table 3

Number of flowers\inflorescence of *Freesia* cultivars in 2010-2011

No. crt.	Variety	Average number of flower\infl.	Relative number flower\infl. (%)	± d	Significant difference
1.	**El Dorado** (Control)	8.0	100	-	-
2.	Corona	7.8	88.9	-0.2	-
3.	Romany	10.2	75.6	+2.2	***
4.	Balerina	8.8	97.8	0.8	-
5.	Margaret	8.5	94.4	0.5	-
6.	Apollo	8.8	97.8	0.8	-

LSD 5% = 1.1 LSD 1% = 1.5 LSD 0.1% = 2.0

The data on this character are summarized in table 3 that indicating that the number of flowers\inflorescence analyzed cultivars varies from 7.8 to ‘Corona‘to 10.2 at ‘Romany‘. Statistically analyzing the obtained data shows the ‘Romany‘cultivar proved to be very significant positive and ‘Corona’, ‘Balerina’, ‘Margaret’ and ‘Apollo’ are not significant compared to the control cultivar.

Table 4

Distance between I-II flowers (cm) of *Freesia* cultivars in 2010-2011

No. crt.	Variety	Average Dist. I-II flower (cm)	Relative Dist. I-II flower (%)	± d	Significant difference
1.	**El Dorado** (Control)	2.3	100	-	-
2.	Corona	1.6	69.6	-0.7	o
3.	Romany	1.5	65.2	-0.8	o
4.	Balerina	3.5	47.8	+1.2	**
5.	Margaret	2.9	73.9	+0.6	*
6.	Apollo	3.0	69.6	+0.7	*

LSD 5% = 0.6 cm LSD 1% = 0.9 cm LSD 0.1% = 1.2 cm

Analyzing the behavior of *Freesia* cultivars studied compared to ‘El Dorado’, control variant, can conclude that the best results concerning the distance between first and second flower indicate that the average was 3.5 cm to ‘Balerina’, this presented a distinct significant positive while ‘Margaret’ and ‘Apollo’ cultivars are significant positive for this character.

‘Corona’ and ‘Romany’ present a difference negative compared with control variant.

The data on this character are summarized in table 5 that indicating that the length of the inflorescence of analyzed cultivars varies from 5.1 cm to 'Romany' to 8.1 cm at 'Margaret'.

In terms of length of inflorescence, ‘Margaret‘ was not significant, 'Apollo' was significantly negative difference and cultivars ‘Corona’, ‘Romany’ and ‘Balerina’ presented differences distinct significant negative.

Table 5

Length of inflorescence (cm) of *Freesia* cultivars in 2010-2011

No. crt.	Variety	Average lenght of infl.(cm)	Relative length (%)	± d	Significant difference
1.	**El Dorado** (Control)	7.8	100	-	-
2.	Corona	5.7	73.1	-2.1	oo
3.	Romany	5.1	65.4	-2.7	oo
4.	Balerina	5.5	70.5	-2.3	oo
5.	Margaret	8.1	94.9	0.3	-
6.	Apollo	6.3	80.8	-1.5	o

LSD 5% = 1.5 cm LSD 1% = 2.1 cm LSD 0.1% = 2.8 cm

Table 6

Coefficient of variation of *Freesia* cultivars

No. crt.	Variety	Color of flower		Height plant (cm)	Diam. Flower (cm)	No fl.\ infl.	Dist.I-II flower (cm)	Length of infl. (cm)
1.	El Dorado	yellow	S	11.7	0.3	1.8	0.5	3.2
			S%	23.6	6.3	20.0	21.7	41.03
2.	Corona	yellow	S	11.9	0.97	2.9	0.53	1.97
			S%	25.9	22.1	36.3	33.1	34.6
3.	Romany	purple	S	14.2	0.81	3.3	0.84	2.2
			S%	24.7	15.8	48.6	55.8	43.1
4.	Balerina	cream	S	6.5	1.0	1.3	0.37	0.4
			S%	14.6	21.7	14.2	33.2	7.3
5.	Margaret	red	S	4.1	0.94	1.9	1.1	1.7
			S%	6.3	19.0	22.4	64.7	23.0
6.	Apollo	white	S	6.1	0.4	1.9	0.06	1.5
			S%	11.5	8.3	21.6	23.8	23.8

In terms of plant height coefficient of variation is less than 10% of the variety 'Margaret', so variability is small and this character is stable. Varieties 'Corona' and 'Romany' presents a high variability (table 6).

In terms of flower diameter coefficient of variation varies widely from the lowest (the variety 'Apollo) to the largest at the 'Corona'.

The data obtained on the number of flowers show that the coefficient of variation is greater than 20% resulting in high variability.

As the distance between the first and second flower and inflorescence length coefficient of variation is greater than 20%, so variability is high.

CONCLUSIONS

The study was performed on six varieties of *Freesia* showed differences between varieties concerning the main characteristics.

Flower color varieties it covers a wide range of colors one color or multicolored petals with rounded or slightly sharp edge.

Because morphological characteristics decorative top, Freesia varieties studied have real opportunities to be extended in production in our country. Calculating coefficients of variation for the analyzed characters gives us clues about their genetic determinism, knowing that small values can be trusted to strengthen the character. This remark especially cultivars: 'Romany', 'Ballerina', 'Margaret', they are characterized by abundant flowers, crisp, intense, large flower, long and rigide flower stem, which can be used for works of improvement.

The most important cultivars are: 'Romany', 'Ballerina', 'Margaret', these are characterized by abundant flowers, crisp, intense, large flower, long and rigid flower stem, which can be used for works of improvement.

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