

VARIABILITY OF DIFFERENT TRAITS IN SEVERAL *CHRYSANTHEMUM* CULTIVARS

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Abstract. The study was carried out to assess the variability and heritability of several traits in seven *Chrysanthemum* cultivars in order to identify cultivars that present valuable characteristics for *Chrysanthemum* breeding. Coefficients of heritability for the examined traits varied between 0.781 (plant height) and 0.922 (breadth of the leaves). This demonstrates a strong genetic determination of these traits under the experimental conditions used. Therefore, based on the results of the experiment it is worth mentioning the following cultivars: Lameet Bright for the diameter of the flowers, White Criquette and Nivalachs for the length of the petals, La Cagouille and Yellow Criquette for the breadth of the petals. These valuable cultivars can be used as genitors in hybridisations to obtain descendents with superior qualitative traits and their cultivation worth being spread.

Key words: *Chrysanthemum*, variability, heritability

INTRODUCTION

Chrysanthemums are flowers popular both among the public as well as among breeders. This popularity is due to factors such as the great variety of colors and shapes of these flowers as well as the fact that they can be bred throughout the year. Their sturdiness once cut also makes them desirable. Chrysanthemums are used either as cut flowers or grown in pots. (Vidraşcu, 1993).

MATERIALS AND METHODS

The experiment has been carried out in the „Alexandru Borza” Botanical Garden in Cluj-Napoca, Romania. For each of the seven varieties used in the experiment, 50 representative individuals were chosen and measured.

The results were statistically analyzed and coefficients of variability and heritability calculated. The mean values obtained for the whole experiment have been designated as „control” and the analysis of significant differences has been carried out using these values.

RESULTS AND DISCUSSIONS

As it is presented in tables 1 and 2, the tested *Chrysanthemum* cultivars show several statistically significant differences concerning their growth characteristics. It is worth mentioning the following cultivars: La Cagouille for its rather tall plants, Lameet Bright for its flowers and stems with a larger diameter, Nivalachs and White Criquette for their flowers presenting longer petals than the other cultivars.

Table 3 shows the variability of traits among the seven chosen cultivars. The coefficients of variability for the traits targeted by the experiment were among the values of

7,0% and 10,4%. The lowest variability has been recorded for the breadth of the leaves, while the highest variability was that of the diameter of the stem.

Table 1

Mean values of the main growth characters in seven Chrysanthemum cultivars

No of entry	Variants (Cultivars)	Plant height (cm)	Stem diameter (cm)	No of leaves/ stem	Length of the leaves (cm)	Breadth of the leaves (cm)
1.	Escort	99.0	0.67	23.7	15.5	8.8**
2.	La Cagouille	117.7 ^(*)	0.65	26.7	17.3*	7.9
3.	Lameet Bright	98.3	0.86**	27.0	13.4	6.8
4.	Nivalachs	105.7	0.72	24.3	17.0 ^(*)	8.5*
5.	Palisade	84.7	0.54 ^(o)	23.0	14.7	6.7
6.	White Criquette	90.6	0.66	22.0	11.4 ^(o)	6.3
7.	Yellow Criquette	105.0	0.52 ^o	18.3 ^{oo}	10.3 ^o	5.5 ^{oo}
Mean of experience (Control)		100.1	0.66	23.6	14.2	7.2
DL 5%		18.0	3.7	0.13	1.2	2.9
DL 1%		25.3	0.18	5.3	4.1	1.6
DL 0.1%		35.8	0.26	7.4	5.8	2.3

Table 2

Mean values of the main flower characters in seven Chrysanthemum cultivars

No	Variants (Cultivars)	Flower diameter (cm)	Length of petals (cm)	Breadth of petals (cm)
1.	Escort	9.6	3.6	0.8 ^o
2.	La Cagouille	9.0	3.2	1.4*
3.	Lameet Bright	12.0**	3.4	1.1
4.	Nivalachs	9.9	3.9 ^(*)	1.0
5.	Palisade	10.6	3.5	1.2
6.	White Criquette	8.5	4.2**	1.2
7.	Yellow Criquette	8.0 ^o	3.0 ^o	1.3 ^(*)
Mean of experience (Control)		9.6	3.5	1.1
DL 5%		1.4	0.5	0.3
DL 1%		2.0	0.7	0.5
DL 0.1%		2.8	1.0	0.7

Table 3

Variability of traits in seven Chrysanthemum cultivars

No of entry	Traits	Coefficient of variability (s%)
1.	Plant height	8.7
2.	Diameter of the flowers	7.7
3.	Diameter of stem	10.4
4.	Number of leaves/plant	8.0
5.	Length of the leaves	9.2
6.	Breadth of the leaves	7.0
7.	Length of the petals	7.1
8.	Breadth of the petals	9.9

Coefficients of heritability for the examined traits varied between 0.781 (plant height) and 0.922 (breadth of the leaves). This demonstrates a strong genetic determination of these traits under the experimental conditions used. This is especially true for traits such as diameter of the flowers, diameter of the stem, number of leaves per plant, length of the leaves, breadth

of the leaves and breadth of the petals, where the coefficient of heritability is very close to the value of 0.9.

Table 4

Coefficients of heritability for selected traits of seven Chrysanthemum cultivars

No of entry	Traits	Coefficient of heritability in broad sense (H^2)
1.	Plant height	0.781
2.	Diameter of the flowers	0.903
3.	Diameter of stem	0.873
4.	Number of leaves/plant	0.866
5.	Length of the leaves	0.891
6.	Breadth of the leaves	0.922
7.	Length of the petals	0.875
8.	Breadth of the petals	0.893

CONCLUSIONS

Based on the results of the experiment, the following Chrysanthemum varieties can be evidenced as having especially valuable qualitative traits: Lameet Bright for the diameter of the flowers, White Criquette and Nivalachs for the length of the petals, La Cagouille and Yellow Criquette for the breadth of the petals. The variety Lameet Bright had the thickest stem, which makes it an excellent starting material in further breeding programs aimed at producing sturdier Chrysanthemum varieties. The high coefficients of heritability for traits such as the diameter of the flowers and diameter of the stem demonstrate that the phenotypes of these varieties are mostly genetically determined and ensure the fact that these traits would be preserved in hybrid descendants as well.

REFERENCES

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REZUMAT

VARIABILITATEA ŞI EREDITATEA UNOR CARACTERE DE INTERES ÎN AMELIORAREA CRIZANTEMELOR

În lucrare sunt prezentate principalele caracteristici la şapte soiuri de crizanteme de seră, alese pe baza unor considerente de ordin estetic, dar şi de interes economic. Heritabilitatea în sens larg a fost cuprinsă între 0,781 (înălţimea plantelor) şi 0,922 (lăţimea frunzelor). Rezultă că toate caracterele au, cel puţin în condiţiile experienţei de faţă, un puternic determinism genetic, fiind puternic influenţate de genotip şi într-o măsură relativ redusă de mediul de cultură. Pentru diametrul florii, se remarcă soiul Lameet Bright, care se poate utiliza în vederea obţinerii unor descendenţi valoroşi. În ceea ce priveşte lungimea petalelor, se recomandă folosirea soiurilor White Criquette şi Nivalachs pentru obţinerea unor descendenţi valoroşi, cu aspect estetic superior, iar privind lăţimea petalelor se recomandă folosirea soiurilor La Cagouille şi Yellow Criquette. Soiul Lameet Bright a înregistrat cea mai mare valoare în ceea ce priveşte grosimea tijei florale, de aceea se recomandă folosirea lui în lucrările de ameliorare pentru obţinerea unor descendenţi viguroşi, cu aspect comercial.