IMPROVEMENT AND DIVERSIFICATION OF THE ASSORTMENT OF ORCHIDS FROM *CYMBIDIUM* GENUS

ÎMBOGĂŢIREA ŞI DIVERSIFICAREA SORTIMENTULUI DE ORHIDEE LA GENUL *CYMBIDIUM*

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Abstract. *Cymbidiums have been cultivated for thousands of years, especially in China. They became popular in Europe during the Victorian era. One feature that makes the plant so popular is the fact that it can survive during cold temperatures and in temperate climates appreciate the fact that they can bloom in winter, when few other orchids are blooming. Researching activity for diversification of floral plants assortment by introducing of the most competitive tropical floral cultivars is one of the objectives of our experiments. This paper describes new Cymbidium spp. cultivars grow in greenhouses at the SCDP Cluj. These where and recorded for the main characteristics. The data obtained will be statistical interpretation. The most representative Cymbidium spp. cultivars can be used for indoor as potted plants or can be used as cut flowers in vase or different arrangements.*
Key words: cultivars, characteristics, collection

Rezumat. *Orhideele au fost cultivate de mii de ani, in special in China. Ele au devenit foarte populare in Europa in epoca Victorana. Ceea ce le face foarte populare este faptul ca ele pot trai la temperaturi scăzute si in climat temperat si înfloresc iarna când puţine orhidee sunt înflorite. Cercetări privind activitatea de diversificare a sortimentului de plante floricole prin introducerea celor mai competitive soiuri din zonele tropicale este unul din obiectivele cercetărilor noastre. Acesta lucrare descrie noi soiuri de Cymbidium cultivate in serele de la SCDP Cluj. Acestea au fost monitorizate privind principalele caracteristici. Toate datele obţinute au fost interpretate statistic. Cele mai reprezentative soiuri de Cymbidium vor putea fi utilizate ca plante la container sau ca flori tăiate in vase sau diferite aranjamente.*
Cuvinte cheie: soiuri, caracteristici, colecţie

INTRODUCTION

Cymbidium is one of the most popular and desirable orchids in the world because of the beautiful flowers. Since the time of ancient China, orchids were cultivated for their beauty and symbolized friendship, perfection, nobleness and femininity. Confucius was a well-known admirer of the perfume of these plants. In Europe, "Orchidmania" started only in the 18^{th} and 19^{th} centuries, when noblemen competed for the most beautiful and special plants. Orchids are not parasite plants. They are epiphytic and use the trees just to grow on their trunks and in the treetops. From this point of view, Orchids are much like Bromelias and Tilandsias (http://www.orchidclub.ro/en/en_orhidee.htm).

Cymbidium or **boat orchids**, is a genus of 52 evergreen species in the orchid family Orchidaceae. It was first described by Olof Swartz in 1799. This genus is distributed in tropical and subtropical Asia and northern Australia. The larger flowered species from which the large flowered hybrids are derived grow at high altitudes (Cribb and du Puy 2007).

Cymbidium plants are sympodial and grow to a height of 60 cm and the racemes as high as 90 cm. The raceme grows from the base of the most recent pseudobulb. They bloom during the winter, and each plant can have up to fifteen or more flowers. They show very diverse color patterns, different for every species (Cantor and Pop, 2008).

Cymbidiums are terrestrial orchids epiphytes or lithophytes, usually large, with pseodobulbi. Orchids have drawn attention to horticulture and tried to cultivate in greenhouses. While until 1800 only grew wild orchids, a major achievement was the first artificial hybrid obtain mid-nineteenth century (http://en.wikipedia.org/wiki/Cymbidium).

Nowadays, owing to the local technical and economical conditions and to the lack of a competitive market in the field of orchids, *Cymbidium* has become an important and viable promoter of the orchid cult in Romania.

MATERIAL AND METHOD

The experiments were performed at the Fruit Research Station Clu-Napoca (S.C.D.P. Cluj), Floriculture laboratory (Fig. 1) and the observations were obtained lasted two years (2008-2009). The floral collection of *Cymbidium* was improved with four cultivars which are representative for this experiment: 'Golden Buddha', 'Lady Spring', 'Violet Purple' and 'Green Spectable', obtained from Holland.

Fig. 1. Experimental field of *Cymbidium* at SCDP Cluj

We carried out a set of observations and determinations measurements on those characteristics of the plants that are in direct connection with their quality (leaf length and width, number of leaves per plant, spike length and width of flower). The dates were statistically interpreted with the help of the DL test and "t" test (Ardeleanu et al., 2002). The observations were made for 10 plants from each cultivars and were calculated the average of experiment.

RESULTS AND DISCUSSIONS

The observations and the measurements of main morphological characteristics of new four cultivars belonging to Cymbidium spp. were monitoring and investigated in greenhouse conditions. The new cultivars have a great diversity of color of spike: 'Golden Buddha' has a yellow color, flowering early April-May (fig. 2), 'Lady Spring' is white, blooming at the beginning of June (fig. 3), 'Violet Purple' is violet and 'Green Spectable' has a green banana color.

Fig. 2. Golden Buddha

Fig. 3. Lady Spring

Concerning the length and width of leaves of orchid cultivars, we can show the different between these characters (table 1). The cultivar 'Green Spectable' has the biggest leaf with 69.6 cm length and 3.3 cm of width while the cultivar 'Violet Purple' has the small leaves (58.0/2.1cm). The average of experiment was 65.85 cm for length of leaves and 2.55 cm for the width of leaves. The number of leaves varied between 98 ('Violet Purple') and 114 ('Golden Buddha'), with an average of experiment 107.75 leaves/plant.

Table 1

Morphological observations of the main characteristics of Cymbidium cultivars

Cultivar	Leaf			
	Length (cm)	Width (cm)	Number of leaves	
			number	% of average of exp.
Golden Buddha	69.6	3.3	114	105.80
Lady Spring	65.8	2.5	108	100.23
Violet Purple	58.0	2.1	98	90.95
Green Spectable	70.0	2.3	111	103.02
Average (Control)	65.85	2.55	107.75	100.0

Under separate matter statistically significant positive difference in the varieties recorded 'Golden Buddha' and 'Green Spectable'. In terms of leaf length proved to be very significant negative 'Violet Purple' variety (table 3). Under the statistical aspect of the three varieties of *Cymbidium* leaf width are insignificant (table 4). Analyzing the table 5 under statistical point variety 'Golden Buddha' and 'Green

Spectable' have a very significant positive difference on the number of leaves. 'Violet Purple' variety has proved to be very significantly negative.

Table 2

Morphological observations on the flower at the *Cymbidium* cultivars

Cultivar	Flower			
	Length (cm)	Width (cm)	Length of stem	
			(cm)	% % of average of exp.
Golden Buddha	6.7	3.7	56.28	121.63
Lady Spring	6.3	3.3	54.17	117.07
Violet Purple	5.9	3.2	42.44	91.72
Green Spectable	6.2	2.9	32.20	69.59
Average (Control)	6.27	3.27	46.27	100.00

Table 3

Experimental data concerning length of leaves

Cultivar	Variant	Length of leaf		Difference (± cm)	Significatio n of difference
		Absolute (cm)	Relative (%)		
Golden Buddha	v-1	69.6	105.70	3.75	**
Lady Spring	V-2	65.8	99.92	-0.05	-
Violet Purple	v-3	58.0	88.08	-7.85	ooo
Green Spectable	v-4	70.0	106.30	4.15	**
Average (Control)		65,85	100.00		

DL 5% = 2.6 DL 1% = 3.5 DL 0,1 = 4.6

Table 4

Experimental data concerning width of leaves

Cultivar	Variant	Width of leaf		Difference (± cm)	Signification of difference
		Absolute (cm)	Relative (%)		
Golden Buddha	v-1	3,3	129,41	0,75	-
Lady Spring	v-2	2,5	98,04	-0,05	-
Violet Purple	v-3	2,1	82,35	-0,45	-
Green Spectable	v-4	2,3	90,20	- 0,25	-
Average (Control)		2,55	100,00		

DL 5% = 1.68 DL 1 % = 2.25 DL 0,1% = 2.9

Table 5

Experimental data concerning number of leaves

Cultivar	Variant	Number of leaves		Difference ±	Signification of difference
		Absolute (No)	Relative (%)		
Golden Buddha	v-1	114	105.80	6.25	***
Lady Spring	v-2	108	100.23	0.25	-
Violet Purple	v-3	98	90.95	-9.75	ooo
Green Spectable	v-4	111	103.02	3.25	***
Average (Control)		107.75	100.00		

DL 5% = 0.64 DL 1 % = 0.86 DL 0,1% = 1.12

Table 6

Experimental data concerning length of flower (petal)

Cultivar	Variant	Length of flower (petal)		Difference (± cm)	Significati on of difference
		Absolute (cm)	Relative (%)		
Golden Buddha	v-1	6.7	106.86	0.43	*
Lady Spring	v-2	6.3	100.48	0.03	-
Violet Purple	v-3	5.9	94.09	-0.37	-
Green Spectable	v-4	6.2	98.88	-0.07	-
Average (Control)		6.27	100.00		

DL 5% = 0.3 DL 1% = 1.0 DL 0,1% = 1.4

In terms of leaf length, proved that the variety 'Golden Buddha' is significantly positive and the other varieties are not significant in terms of character study (table 6).

Statistical analysis of data from the other varieties is found as follows: in terms of leaf width, all varieties studied are insignificant (table 7).

Table 7

Experimental data concerning width of petals

Cultivar	Variant	Width of petals		Difference (± cm)	Signification of difference
		Absolute (cm)	Relative (%)		
Golden Buddha	v-1	3.7	113.15	4.30	-
Lady Spring	v-2	3.3	100.92	0.03	-
Violet Purple	v-3	3.2	97.86	-0.07	-
Green Spectable	v-4	2.9	88.68	-0.37	-
Average (Control)		3.27	100.00		

DL 5% = 0.54 DL 1% = 0.72 DL 0,1% = 0.95

Table 8

Experimental data concerning length of flower stem

Cultivar	Variant	Length of flower stem		Difference (± cm)	Signification of difference
		Absolute (cm)	Relative (%)		
Golden Buddha	v-1	56.28	121.63	10.01	**
Lady Spring	V-2	54.17	117.07	7.90	*
Violet Purple	v-3	42.44	91.72	-3.83	-
Green Spectable	v-4	32.20	69.59	-14.00	oo
Average (Cntrol)		46.27	100.00		

DL 5% = 7.45 DL 1% = 9.97 DL 0,01% = 14.15

In table 8 observe the length of flower stem vary in range from 32.20 cm ('Green Spectable') to 56.28 cm at 'Golden Buddha'. From a statistical viewpoint, 'Golden Buddha' variety is distinct significantly positive in terms of this character. Regarding the variety 'Green Spectable' is distinct significant negative differences. In table 9 the mean of four varieties were correlated with the average of all plants pursued. Differences 'Golden Buddha' and 'Violet Purple'

and the average are insignificant. 'Lady Spring' and 'Green Spectable" forms shows a distinct significant difference.

Table 9

Productivities of *Cymbidium* cultivars/plant (test «t»)

Nr. Var.	Cultivar	Mean production of floral stem/plant $x \pm s_x$	D	T	Signification of difference
v-1	Golden Buddha	2,2 ± 0,385	0.10	0.22	-
v-2	Lady Spring	0,8± 0,428	1.50	3.13	**
v-3	Violet Purple	2,6 ± 0,262	0.38	1.13	-
v-4	Green Spectable	0,8 ± 0,428	1.50	3.13	**
	Average (Control)	2,3 ± 0,212			

CONCLUSIONS

The floral collection of Fruit Research Station Cluj-Napoca, Department of Floriculture was enriched with new cultivars of *Cymbidium*, which have been not cultivated by now in Romania.

The knowledge of the morphology, biology and productivity of the new cultivars is very important because those can be recommended for new varieties that will be adequate to the Romanian local conditions.

Hence, following the carried research, the 'Green Spectable' cultivar became highly notable at leaf length, with 70 cm long leaves. 'Golden Buddha' stands as the most important *Cymbidium* from the point of view of leaf width (3.3 cm). At leaves number, it is the 'Golden Buddha' cultivar again that comes first, with 114 leaves growing on a plant. The length of a flower is a characteristic directly linked to the overall aspect of a plant and the longest *Cymbidium* flower belongs to the 'Golden Buddha' cultivar (6.7 cm); also, the widest cymbidium petals were found, again, at the 'Golden Buddha' cultivar, 3.7 cm. The *Cymbidium* plant with the most stems belongs to the 'Violet Purple' cultivar, with 2.6 flowers per plant. The same cultivar has the greatest production of flower buds per plant.

Due to their great variety of colors and to their superior traits, the *Cymbidium* cultivars that were considered in this study make up excellent choices for the decoration of homes and offices, both as cut flowers or different arrangements, placed individually or mixed to other species.

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