

## THE INFLUENCE OF CUTTINGS HARVESTING PHENOPHASE ON THE GROWTH AND FLOWERING OF *SAINTPAULIA IONANTHA* WENDL.

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### Abstract

The species studied was the Uzambar violet or African violet (*Saintpaulia ionantha* Wendl.). To determine which the phenophase of the plants from which cuttings were collected influences the growth and flowering of the species, measurements were made regarding the number of leaves and the number of flowers. The number of leaves accurately reflects vegetative growth, while the number of flowers, of course, reflects the flowering capacity of the plants. The measurements were carried out over three consecutive years, at three different stages. The morphological characters studied refer to leaves and flowers, aiming to observe the correlation between these and certain biological or decorative traits. Biometric determinations and measurements were conducted through quantitative and qualitative research, and the calculations were made using statistical methods, variance analysis based on DL, that is, limit differences, an analytical method developed by R. A. Fisher. Cuttings harvested from young individuals produced plants with more leaves and flowers, thus with better growth and a much more attractive appearance.

**Key words:** cuttings, phenophase, leaves, flowers

### INTRODUCTION

*Saintpaulia ionantha* Wendl., a species with large margins on the flower market, is a small, acaulaceous species, only 10-15 cm tall, with a fine, fibrous root system. The stem is short and rhizomatous, the oval or round leaves are compactly arranged in a uniform rosette. The plant constantly forms new rosettes in the center from the apical meristem. The dichotomously branched floral stems are grouped in the center of the leaf rosettes. The inflorescence is a loose cyme, made up of small, simple or whorled flowers, very variably colored. The flowers are hermaphrodite, zygomorphic. The corolla is bilabiate, with the tube much shorter than the lacinia, two fertile stamens. The fruit is an elongated capsule, containing very small seeds (25,000 seeds/gram). The seeds are ovate in shape.

In order to enrich the knowledge on the cultivation of Uzambar violets, experiments were conducted on the influence of the phenophase of cuttings harvesting on the

growth and flowering of the species. The number of leaves accurately reflects the vegetative growth, and the number of flowers, obviously, the flowering capacity of the plants.

### MATERIALS AND METHODS

The material used comes from young and mature violet plants. Biometric determinations and measurements were carried out through quantitative and qualitative research, and the calculation was made using statistical methods, analysis of variance based on DL, i.e. limit differences, analytical method developed by R. A. Fisher. The experiments were carried out over a period of three years, at three distinct epochs and were located in the Multiplication Greenhouse of the "Alexandru Buia" Botanical Garden of the University of Craiova. The three epochs were: epoch I (June year I, June year II and April year III); epoch II (July year I,

July year II, May year III); epoch III (August year I, August year II, June year III).

## RESULTS AND DISCUSSIONS

### Results of determinations regarding the influence of the phenophase of cuttings harvesting on the number of leaves

In the determinations carried out at the first time, on average over three years, *Saintpaulia ionantha* plants formed 13.75 leaves when they came from cuttings of young plants and 11.84 leaves when the cuttings were harvested from mature plants. (table 1, figure 1)

Table 1  
The influence of the cuttings harvesting phaenophase on the number of leaves  
in the species *Saintpaulia ionantha* – epoch I

Phenophase Factor A	Number of leaves			Average 3 year	%	Differcense	Meaning
	year I	year II	year III				
a1-young plants	15,86	12,93	12,46	13,75	100	-	Control plant
a2-adult palnts	13,33	11,46	10,73	11,84	86	-1,91	000
DL 5%	1,59	1,43	0,75			0,43 leaves	
DL 1%	3,68	3,30	1,75			0,63 leaves	
DL 0,1%	11,72	10,53	5,57			1,01 leaves	

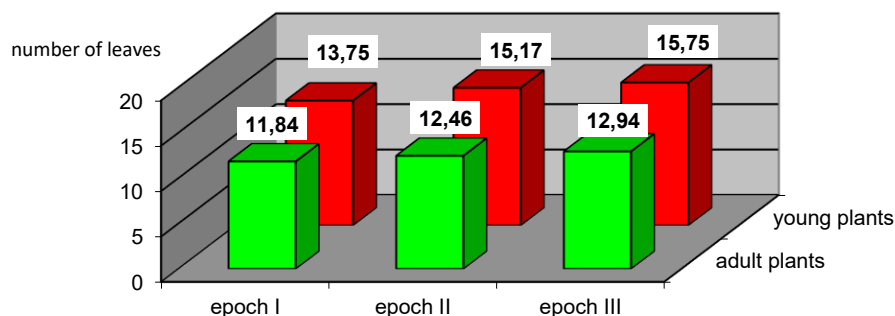


Figure 1 Variation in leaf number in *Saintpaulia ionantha* under the influence of the phenophase of cuttings harvesting (3-year average)

The number of leaves in plants derived from cuttings harvested from mature individuals is 14% lower or, in absolute terms, 1.91, which represents a very significant negative difference. The fact that cuttings harvested from young individuals provided plants with more leaves, therefore with better growth, is explained by the superior vitality and

faster intensity of metabolic phenomena at the plant cell level, in young organisms. In the determinations carried out in the second period (July year I, July year II, May year III), on average, an increase in the number of leaves was generally observed compared to the previous period, with cuttings harvested from young plants remaining in first place (table 2).

Table 2  
Influence of the cuttings harvesting phenophase on the number of leaves  
in the species *Saintpaulia ionantha* – epoch II

Phenophase Factor A	Number of leaves			Average 3 year	%	Differcense	Meaning
	year I	year II	year III				
a1-young plants	16,66	14,26	14,60	15,17	100	-	Control plant
a2-adult plants	13,33	12,26	11,80	12,46	82	-2,71	000
DL 5%	1,24	0,86	0,57			0,30 leaves	
DL 1%	2,88	1,98	1,32			0,44 leaves	
DL 0,1%	9,17	6,32	4,21			0,71 leaves	

They formed plants with 15.17 leaves on average, while cuttings harvested from mature plants, only 12.46, the difference between the two values being very significant. In the third epoch (August year

I, August year II, June year III) the number of leaves continued to increase but slightly compared to the previous epoch (table 3).

Table 3  
The influence of the phenophase of cuttings harvesting on the number of leaves  
in the species *Saintpaulia ionantha*, - epoch III

Phenophase Factor A	Number of leaves			Average 3 year	%	Differcense	Meaning
	year I	year II	year III				
a1-young plants	17,06	14,80	15,39	15,75	100	-	Control plant
a2-adult plants	13,88	12,50	12,46	12,94	82	-2,81	000
DL 5%	1,59	1,43	1,24			0,47 frunze	
DL 1%	3,68	3,30	2,88			0,70 frunze	
DL 0,1%	11,72	10,53	9,17			1,13 frunze	

The number of leaves in plants derived from cuttings harvested from mature individuals was 18% lower or in absolute figures by 2.81, which represents a very significant negative difference.

### Results of determinations regarding the influence of the phenophase of cuttings harvesting on the number of flowers

At the first determination period carried out, as shown above in June year I, June year II, April year III, *Saintpaulia ionantha* formed an average of 14.17 flowers/individual, when it came from cuttings harvested from young plants and 11.05 flowers/individual when the cuttings came from mature plants.

It results that plants derived from mature cuttings had 3.12 flowers less than plants

resulting from young cuttings, a very significant difference from a statistical point of view.

Considering the relative number of flowers, it is found that plants from cuttings harvested from mature individuals have, on average, a flowering capacity of only 78% of the flowering capacity obtained with cuttings harvested from young plants.

It is very clear that the use of cuttings taken from young plants subsequently ensures plants with more numerous flowers, with a much more pleasant decorative apparatus (table 4, figure 2).

Table 4  
The separate influence of the cuttings harvesting phenophase on the number of flowers  
in the species *Saintpaulia ionantha* – epoch I

Phenophase Factor A	Number of flowers			Average 3 year	%	Difference	Meaning
	year I	year II	year III				
a1-young plants	14,80	13,93	13,80	14,17	100	-	Control plant
a2-adult plants	11,30	10,73	11,13	11,05	78	-3,12	000
DL 5%	1,59	0,99	1,87			0,49 flowers	
DL 1%	3,68	2,29	4,34			0,74 flowers	
DL 0,1%	11,72	7,29	13,81			1,19 flowers	

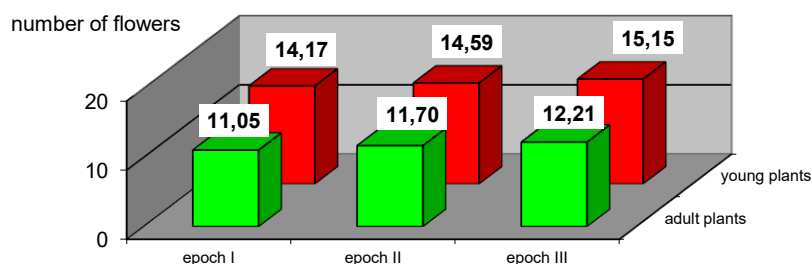


Figure 2 Variation in the number of flowers  
of *Saintpaulia ionantha* under the influence of the phenophase of  
cuttings harvesting  
(average 3 years)

In the second period (July year I, July year II, May year III) *Saintpaulia ionantha* plants presented a slightly higher number of flowers compared to the first period, i.e., on average, 14.59 flowers/plant when

they came from cuttings harvested from young plants and 11.70 flowers/plant on average, when they were formed from cuttings harvested from mature plants (table 5).

Table 5  
The separate influence of the cuttings harvesting phenophase on the number of flowers in the species  
*Saintpaulia ionantha* – epoch II

Phenophase Factor A	Number of flowers			Average 3 year	%	Difference	Meaning
	year I	year II	year III				
a1-young plants	15,39	14,26	14,13	14,59	100	-	Control plants
a2-adult plants	11,86	11,12	12,13	11,70	80	-2,89	000
DL 5%	1,79	2,44	1,72			0,66 flowers	
DL 1%	4,13	5,65	3,97			1,00 flowers	
DL 0,1%	13,15	17,99	12,64			1,60 flowers	

The differences between the first and second epochs are small, but in general, the plants increased their flowering capacity in the second epoch, those from young cuttings giving an average of a 20% increase in flowering compared to plants from mature cuttings.

In the third epoch (August year I, August year II, June year III) the *Saintpaulia*

*ionantha* plants increased their flowering capacity, but slightly compared to the previous epoch.

Plants formed from cuttings from young plants continued to have a higher number of flowers, namely, an average of 15.15 flowers compared to plants from cuttings harvested from mature plants, which

formed only 12.21 flowers/individual (table 6).

Table 6  
Separate influence of cuttings harvesting phenophase on flower number  
in *Saintpaulia ionantha* species – 3rd epoch

Phenophase Factor A	Number of flowers			Average 3 year	%	Difference	Meaning
	year I	year II	year III				
a1-young plants	15,72	15,13	14,60	15,15	100	-	Control plants
a2-adult plants	12,39	11,64	12,60	12,21	80	-2,94	000
DL 5%	1,79	1,24	1,72			0,52 flowers	
DL 1%	4,13	2,88	3,97			0,77 flowers	
DL 0,1%	13,15	9,17	12,64			1,25 flowers	

The difference between the two variants, of 2.94 flowers, is very significant, clearly demonstrating the advantages of using propagation material in an earlier phenophase.

## CONCLUSIONS

The phenophase of the plants from which the cuttings were harvested had a considerable influence on the growth and flowering of the *Saintpaulia ionantha* plants resulting from the respective cuttings.

On average over the three years, cuttings from young plants gave rise to more vigorous individuals, with 13.75 leaves at the I determination period, 15.17 leaves at the II period and 15.75 leaves at the III period. At all 3 periods, cuttings taken from mature plants gave rise to plants with much fewer leaves, the differences being very significantly negative.

In addition to the positive influence on vegetative growth, cuttings from young plants gave rise to individuals of *Saintpaulia ionantha* with 14.17 flowers, 3.12 flowers more than those from mature plants. At the second determination

epoch, the difference between the two types of cuttings was 2.89, and at the third epoch, 2.94 flowers, a very statistically significant difference, always in favor of young cuttings. The data presented demonstrate beyond doubt that cuttings from young plants subsequently give rise to plants with a higher flowering capacity

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