THE DYNAMIC OF CELLS DIVISION AT *GLAUCIUM FLAVUM* CR. VAR.*LEIOCARPUM* (BOISS.) IN ACCORDANCE WITH AGE OF THE SEEDS

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Abstract: At *yellow poppy* - *Glaucium flavum* Cr. var. *leiocarpum* (Boiss.) - , ageing of the seeds induce an increase of polyploidy cases, and that in absence of any biological substances.

INTRODUCTION

The polyploidy was defined at the beginning of this century by H. Winkler (1916) as the process of multiplication of genomic number (known as *x*). Actually, the polyploidy is recognized as a process of duplication of the entire genome, which means duplication of all structural and regulatory genes, duplication of all linkage groups. In fact, polyploidy is a *genomic mutation* process, which had influenced the plant evolution.

Appreciatively 30 – 50% from flowering plants has gametic number of chromosomes which are multiple of their genre original base number. This means that that polyploidisation take place in course of vascular plants evolution and it had a major impact in speciation process.

Polyploidy plays an important role in increase of the genetic material. Polyploidy, or duplication of entire genome, imply the double of the homologue chromosomal sets (autopolyploidy) or the double of the initial chromosomal complex from two or more different species (amphyploidy).

Polyploidy is an important mechanism for the enlarge of genetic variability. Thus, polyploidy generate appearance of hybrid stable combinations which show heterozis or homeostasis and perpetuate sexually the new genotype.

Also, polyploidy increase the quantity of genetic material (DNA) and increase the variation possibility by genetic recombination. Consequently, the polyploid organisms is acting like diploids and manifest a normal fertility, which increase the adaptation and surviving capacity.

The evolution, as diversification and improvement of the species, can be noticed at chromosome level. The changes in chromosomes number, due to aneuploidy, polyploidy or simply due to chromosome restructurations, can be easily distinguished by citogenetic analyses. By such investigations it is possible to catch, relatively early the diversity effect of the environmental factors in one and the same species, in different populations form territory of the species, or in the same population, in longer or shorter period.

THE AIM OF INVESTIGATION

In this study we aimed to point out the dynamic of cells division in roots (meristemes) at yellow poppy - *Glaucium flavum* Cr. var. *leiocarpum* (Boiss.) – and to evaluate the cases of polyploidy in individuals from the same population, but from three different annual populations.

MATERIAL AND METHODS

The individuals submitted to analyses are from seeds obtained from the collection of Botanical Garden from Iaşi, from yield of years 1999, 2000 and 2001. The study was realised in year 2003, which means the seeds are 4, 3 and 2 years old.

The germination of the seeds was realised in Petri plates, on filter paper moistured with distilled water, at room temperature, in dark conditions. When the little roots have growth at 1 – 2 centimetres, they were remove out and put into colchicines solution (0,2%), for two hours, for destroy the mitotic spindle. After they were washed with clear water, the roots was fixed into a mixture with ethylic alcohol 96°C / acetic acid absolute in ratio of 3 / 1, for 24 hours.

The hydrolisation, staining and realisation of the microscopic slides were obtained in accordance with "squash" method (Băra, 1993). The staining was realised with CARR stain (modified Schiff reactive).

The microscopic slides were visualised and photographed with camera Nikon Eclipse 600.

RESULTS AND DISCUSIONS

To calculate the *mitotic index* (MI) the seeds were prelucrate in accordance with "squash" method, by preparing 3 microscopic slides for each annual lot of seeds, which were visualised at microscope at 40x. it was counted 10 microscopic areas on each microscopic slide, but with out overlapping cells and cells which appear partly in microscopic areas. In each area were counted *cells in division* and *cells in interphase*, and according with the results it was calculated the *mitotic index* (MI) in accordance with the formula:

$$MI = \frac{\text{cells in division}}{\text{total cell number}} \times 100$$

Regarding mitotic index (see Table I.), we are notices that were no major differences, although the seeds are from three different annual yields (years 1999, 2000 and 2001). Contrary to expectation, the most active cellular division was recorded at seeds from year 1999 (MI = 9,62), and the most reduced at seeds from year 2001 (MI = 8,94). Consequently, at the seeds from year 2001 was recorded the highest percent of prophases, anaphases and telophases, the seeds from year 2001 were recorded the most highest values.

Regarding polyploidy cases (see Table II.) at *Glaucium flavum* Cr. var. *leiocarpum* (Boiss.), we notice the increase of this case at individuals from yield of the year 1999 at a percentage value of 11,012, comparatively with the individuals from the yield from year 2001 at a percentage value of 0,602.

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Table I. The average values of the mitotic index for the seeds from the three different yields

Year	Total number of cells	Cells in division	MI	Prophases		Metaphases		Anaphases		Telophases	
				Nr.	%	Nr.	%	Nr.	%	Nr.	%
1999	37.457	3.614	9,62	1.786	49,41	808	22,35	554	15,32	466	12,89
2000	35.686	3.338	9,35	1.505	45,08	979	29,32	496	14,85	358	10,72
2001	33.422	2.988	8,94	1.429	47,82	939	31,42	378	12,65	242	8,09

Table II. Polyploidy cases at yellow poppy

Year	Total number of cells	Cells in division	Polyploid cells	
			Nr.	%
1999	37.457	3.614	398	11,012
2000	35.686	3.338	234	7,010
2001	33.422	2.988	18	0,602