THE VARIABILITY OF DNA CONTENT IN THE LEAVES OF *FETEASCĂ NEAGRĂ* GRAPE VINE SORT

VARIABILITATEA CONTINUTULUI IN AND IN FRUNZELE SOIULUI DE VITA DE VIE *FETEASCĂ NEAGRĂ*

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***Abstract**: The paper presents the variability of the DNA content of a mature leaf belonging to the Fetească neagră grape vine cultivar, analysed in different phenological phases. The values of the DNA content of the leaves belonging to the Frâncuşă cultivar offer the possibility of analysing different factors regarding the complexity of the genetic material of the studied genotype.*

The nucleic acids characterize the intensity of the growing processes, the general condition of metabolism, the speed of reactions as well as and their intensity in each ontogenetic phase, with an active participation, on one side in the proteins and bio-chemical synthesis (chlorophyll, complex lipids) and on the other side in the formation of cellular organites (chloroplasts, mitochondria, peroxysome) providing this way the appropriate performance of plants' biological cycle [Pădureanu Silvica, 2004; Pădureanu Silvica, 2004].

Among the nucleic acids, deoxyribonucleic acid (DNA) represents the essential conveyer of the genetic information, being a mould for the synthesis of structural and functional synthesis from plant's body. Considering the essential role played by DNA in the metabolic processes and in the plant's life, we have determined the DNA content to *Fetească neagră g*rape vine sort in different phenophases.

MATERIAL AND METHOD

The biologic material used in the experiment has been represented by *Fetească neagră* grape vine sort cultivated in the ampelographic collection of " V. Adamachi" Experimental Didactical Station belonging to University of Agricultural Sciences and Veterinary Medicine „Ion Ionescu de la Brad" from Iaşi.

From the relevant sort there were sampled mature leaves from the fertile of shoots from 30 grape vines, in 4 phenophases: unbudding, flowering, ripening up to the full maturity of grapes.

From the relevant leaves 50 mg of mesophil existing between N1 and N2 nervures was sampled, as close as possible to the leaf stalk.

10 determinations of DNA content were effected for each phenophases.

The method of determination of DNA content included 5 successive centrifugal operations, and the supernatant of the last centrifugal operation was read at Jenuay spectrophotometer in UV at two wave lengths: λ 270 nm and λ 290 nm compared to a blind sample represented by 0.5 N perchloric acid. The readings have been introduced into the follwing calculation formula [Glick B.R.,

Pasternak J.J., 1998; Kleber H.P., Schlee D., Schopp W.,1990; Toma O., Pîrîianu Gabriela, 2000]:

$$\text{mg DNA/g fresh tissue} = \frac{5525 \times \Delta}{mgfreshtissue} \times 0.25$$

where Δ = the difference between the extinction read at 270 nm and 290 nm respectively.

The achieved results for each phenophases have been analyzed from biostatical point of view [Ceapoiu N.,1968].

RESULTS AND DISCUSSIONS

There is ascertained a progressive reduction of the DNA content in the mature leaf at the studied grape vine sort as long as the grape vine progresses in vegetation.

In the unbudding phenophases, when the grape vine passes from the resting condition into the vegetation condition, the metabolism is intensified, accelerated bio-synthesis processes are produced so that an increased DNA quantity is evidenced that has a variation ranking between 3-0.50 and 34.00 mg/g with an average of 31.74 mg/g *(table 1)*.

A proper nitrogen feeding causes a normal growing as well as a proper colouring of the leaf that allows the achievement of photosynthesis in the most favourable conditions and, at the same time, the differentiation of floriferous buds is favoured. Therefore, at the flowering process, the quantity of DNA is relatively increased but it decreases significantly in the unbudding process, the average being of 8.33 mg/g *(fig. 1)*.

By the end of the active vegetation period a quantitative decrease of DNA is noticed, so that in grapes ripening phenophases DNA reaches 6.45 mg/g.

At the full maturation of grapes, the quantity of DNA is reduced until 4.68 mg/g.

Table 1

The DNA content in the leaves of *Fetească neagră grape vine sort*

Phenophase	The average value	Standard deviation (S)	Variability coefficient (S%)
Unbudding	31.74	0.41	5.19
Folwering	8.33	0.28	13.31
Ripening	6.45	0.08	5.01
Full maturation of grapes	4.68	0.16	13.90

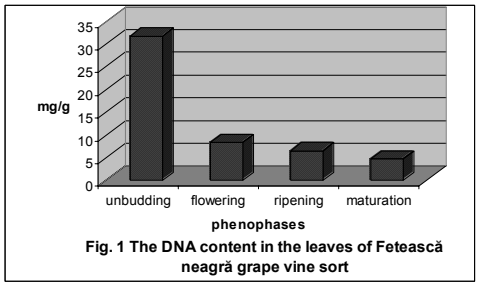

Fig. 1 The DNA content in the leaves of Feteasc neagr grape vine sort

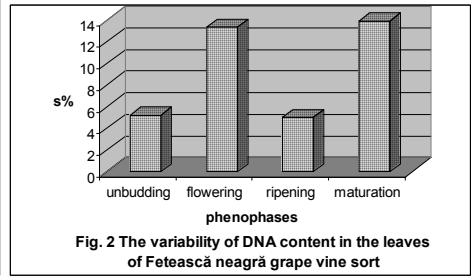

Fig. 2 The variability of DNA content in the leaves of Feteasc neagr grape vine sort

The variation of DNA content (S%) was small in the unbudding and ripening and moderate in flowering and maturation of grapes (*fig.2*).

The limit differences is represented in table 2.

Table 2

The DNA content in the leaves of *Fetească neagră*

Phenophase	The average value (mg/g)	Difference by comparison control	Significance of difference
Average (control)	12.8	-	-
Unbudding	31.74	+ 18.94	***
Folwering	8.33	- 4.47	000
Ripening	6.45	- 6.35	000
Full maturation of grapes	4.68	- 8.12	000

DL 5% = 1.5
DL 1% = 2.16
DL 0.1% = 3.18

CONCLUSIONS

1. DNA content in the leaves of *Fetească neagră* grape *v*ine sorts is quite high in the unbudding phenophase, when the metabolism is intensified.

2. Starting with the flowering phenophase, the quantity of DNA is decreasing rapidly. This phenomenon is directly correlated with the increased intensity of the biogenesis processes of the cellular organites.

3. The quantity of DNA decreases until the maturation of grapes phenophase.

4. The variation of DNA content is small in the unbudding and ripening and moderate in flowering and maturation of grapes phenophases.

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