CONTRIBUTIONS TO THE KNOWLEDGE REGARDING AGROBIOLOGICAL AND TECHNOLOGICAL CHARACTERISTICS OF GENETIC RESOURCES EXISTENT AT THE RESEARCH DEVELOPMENT STATION FOR VITICULTURE AND WINE PRODUCTION OF IAŞI

CONTRIBUŢII LA CUNOAŞTEREA UNOR ÎNSUŞIRI AGROBIOLOGICE ŞI TEHNOLOGICE ALE RESURSELOR GENETICE EXISTENTE LA STAŢIUNEA DE CERCETARE DEZVOLTARE PENTRU VITICULTURĂ ŞI VINIFICAŢIE IAŞI

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Abstract. *The researches carried out in 2009 on the existing genetic fund of SCDVV Iaşi focused on aspects regarding the development of vegetation phenophases, the grape production and its quality. The outcomes of the studies regarding the knowledge referring to the agrobiological and technological characteristics of the varieties existing in the ampelographic collection reveal the fact that very many of these are valuable and can keep constituting the study object with the purpose of promoting them in production.*
Key words: genotypes, the agrobiological and technological characteristics

Rezumat. *Cercetările efectuate în anul 2009 asupra fondului genetic existent la SCDVV Iaşi au vizat aspecte privind desfăşurarea fenofazelor de vegetaţie, producţia de struguri şi calitatea acesteia. Rezultatele obţinute în urma studiilor efectuate cu privire la cunoaşterea principalelor însuşiri agrobiologice şi tehnologice ale soiurilor existente în colecţia ampelografică, relevă faptul că, foarte multe dintre acestea sunt valoroase şi pot constitui în continuare obiect de studiu în scopul promovării lor în producţie.*
Cuvinte cheie: genotipuri, însuşiri agrobiologice şi tehnologice

INTRODUCTION

The ecologic plasticity of the grape vine has given birth to thousands of varieties/cultivar, spread today on all the continents of the globe, which present a very impressive phenotypic variety leading most of the times to uncertainties and confusions regarding the identity of the native varieties. The desire to know the best varieties, by comparison with those existent previously and the need of conserving the ancestral varieties have aroused the interest of wine growers, especially of the ampelographic specialists and ameliorators (G. Alleweldt et al., 1986; G. Alleweldt et al., 1987).

The local, native varieties, which along time were subject to a long selection process present a good adaptation to the culture conditions in which they were formed, but they were depreciated under the aspect of productivity and quality due to the action of genetic erosion, of some inadequate crop measures but

also due to the lack of applying a scientific, systematic selection which leads to maintaining and increasing their genetic potential (Gh. Calistru et al., 1997; Damian Doina et al., 1992; Vişan Luminiţa, 2001). By studying the species and varieties used in the crop, we are aiming at knowing their origin and evolution in the interdependency with the ecological factors, in view of establishing their variability as morphogenesis element reflected on the productivity and quality characteristics. Knowing the varieties of grape vine under the relation of agro-biological and technological characteristics, is a problem which is solved starting from the genetic resources from the gene bank (ampelographic collection) and which constitutes the subject of the present paper.

MATERIAL AND METHOD

The study collections that make up the gene bank where the researches took place are placed on a cernosium soil, with slight bent and southern exposal. The semi-protected crop system is used during the year, with direction forms on the stems and bilateral cords, with cuts in fruit stems and little cords of 4-6 eyes and safety stems at the basis of the grape vine. The variety cultivation taken in the study comprises 590 genotypes. The varieties cultivated come from the old autochthonous varieties, new varieties and clones, belonging to the species *Vitis vinifera* L., created (430), varieties with increased resistance and parent stock varieties (160). Given the very pronounced variability of the varieties within each production direction, for facilitating the researches, they were divided on groups of variations according to the determined elements. The level of climatic factors from the viticultural center Copou Iaşi, in 2009, can be appreciated as being favorable for the crop of grape vine, the vegetation period that the studied varieties have gone through being characterized by normal average temperatures (18,5^{o}C), those from July, august and September of 23,1°C, 21,2°C and 17,6°C ensured a good ripening of grapes and appropriate quality. In exchange, the precipitations were reduced, during the vegetation period registering only 214 mm. The sum of insolation hours was of 1521.7 hours.

RESULTS AND DISCUSSIONS

Based on a favorable climatic regime, all the studied genotypes have gone through the entire phonological specter, the triggering of vegetation occurring through debudding, and the ending through the yellowing and fall of leaves. Groups in variation classes for the debudding phenophases and the dough of grapes (table 1) within each production direction we ascertained that in 2009 debudding occurred during the period 20 April – 5 May with a duration of 6 days in the genotypes with apyrexia, 9 days in the resistant ones (April 25th – May 4th), 11 days in the varieties for the table grapes (April 22nd –May 3rd) and 12 days in those for white wines, rose (April 20th – May 3rd) and red (April 24th –May 5th). A pronounced variability for this characteristic is encountered in all the varieties taken in the study, 53% of those for table grapes, 49% for the white and rose wines and 57% for the red wines, debudding in the interval April 25th – May 1st, while the apyrenus genotypes were in the period April 24th – 30th. The flowering in the climatic conditions of 2009 was advanced with approximately 10 days and was produced in all the genotypes studied in the interval May 31st – June 9th with an average duration of 4 up to 10 days.

Table 1

The phenologic specter of the studied genotypes in the ampelographic collection SCDVV - 2009

Specification	Duration of the phenopahse	Total genotypes	Variation class % (calendar dates)			
THE DEBUDDING						
Genotypes for table grapes	11	193	22 – 26.04 30	27 – 30.04 53	01 – 03.05 17	
Genotypes with apyrenus characteristics	6	13	24 – 30.04 100			
Genotypes for white and rose wines	12	151	20 – 24.04 17	25 – 28.04 49	29.04 – 03.05 44	
Genotypes for red wines	12	54	24 – 27.04 37	28.04 – 01.05 57	02 – 05.05 6	
Genotypes with increased biological resistance	9	82	25 – 28.04 40	29.04 – 01.05 30	02 – 04.05 30	
THE FLOWERING						
Genotypes for table grapes	8	193				
Genotypes with apyrenus characteristics	4	13				
Genotypes for white and rose wines	8	151				
Genotypes for red wines	6	54				
Genotypes with increased biological resistance	10	82				
THE VERAISON						
Genotypes for table grapes	22	193	16 – 20.07 6	21 – 26.07 14	27.07 – 01.08 15	02 – 08.08 65
Genotypes with apyrenus characteristics	15	13		22 – 26.07 23	27.07 – 01.08 23	02 – 06.08 44
Genotypes for white and rose wines	23	151	16 – 21.07 2	22 – 26.07 2	27.07 – 02.08 15	03 – 09.08 81
Genotypes for red wines	12	54			28.07 – 02.08 7	03 – 09.08 93
Genotypes with increased biological resistance	17	82		22 – 26.07 6	27.07 – 02.08 11	03 – 08.08 83

The veraison, as the other phenophases was strongly influenced by the great values of the temperatures and the lack of precipitations which rushed the beginning of the veraison for the varieties, this occurring in the period July 16th – August 9th. For all the directions, we emphasized only the fact that between 2 and 6% of the varieties began their veraison early (July 16th–July 21st) most of them (44-93%) belonging to the first variation class (August 2nd- August 9th). They were emphasized through an early and semi-early veraison of grapes, the varieties: Ozana, Otilia, Paula, Gelu, Transilvania (table varieties); Aromat de Iaşi, Donaris, Fetească albă, Fetească regală, Busuioacă de Bohotin, Lampara, Armărie, Albuţ, Coada oilor (for the white and rose wines), while the genotypes destined for obtaining the red wines had the veraison almost simultaneously in around 12 days, and among these 90% in the interval August 3rd-9th.

The ripeness of grapes began with the white genotypes for the table in the interval August 6th – September 4th being followed by the black ones (September 2nd – September 22nd) while those destined to obtaining white, rose or red whines, the technological ripeness of grapes coincided with the harvesting period in the interval September 14th –October 1st.

The production of grapes was variable from one group of varieties to the other but also within the cultivars of the same production direction. For this technological characteristic there was a pronounced variability, so that only 24% of the genotypes for the table grapes produced over 3.1 kg grapes/ vine, 16% of the apyrenus ones, 42-47% varieties for the white and red wines and 27% of the varieties with increased biological resistance (table 2).

Table 2

Production of grapes - 2009

Specification	Total genotypes, no.	Production classes, 0%		
		0,5-1,5 kg/ vine	0,5-1,5 kg/ vine	0,5-1,5 kg/ vine
Genotypes for table grapes	193	31	45	24
Genotypes with apyrenus characteristics	13	46	38	16
Genotypes for white and rose wines	143	18	40	42
Genotypes for red wines	52	8	46	46
Genotypes with increased biological resistance (interspecifici)	77	21	52	27

The following varieties manifested a higher production potential: Gelu, Milcov, Paula, Muscat timpuriu de Bucureşti, Transilvania, Coarnă neagră, Românie (table varieties); Golia, Crâmpoşie selected, Negru de Drăgăşani, Arcaş, Fetească albă, Fetească regală, Frâncuşă, Zghihară de Huşi, Busuioacă de Bohotin, Creaţă, Băşicată de Drăgăşani, Băbească neagră and Negru românesc (varieties for the white, rose and red wines) and Brumăriu, Valeria, Moldova, Frumoasă albă (varieties with characteristics of increased biological resistance)

The researches made regarding the quality of the studied genotypes production emphasize a great variability within each production direction and from one variety to the other (table 3). Thus, the size of grapes, appreciated in the average mass, character with genetic variety marks, but variably under the action

of the environment factors, was specific to each variety. The results obtained emphasize the fact that over 30% of the varieties for table achieve larger grapes of 350 g, existing a distribution for each variation class.

Table 3

The quality of grape production

Specification	No.	Variation classes, %					
Average mass of grapes, g		**<150**	**151-200**	**201-250**	**251-300**	**301-350**	**>350**
Genotypes for table grapes	193	10	16	21	14	8	31
Genotypes with apyrenus characteristics	13	23	15	31	8	8	15
Bean mass, g.		**<2**	**2,1-3,5**	**3,6-5**	**>5**		
Genotypes for table grapes	193	8	51	32	9	-	
Genotypes with apyrenus characteristics	13	23	62	15	-	-	
Sugars, g/L		**<145**	**146-170**	**171-195**	**196 -220**	**>220**	
Genotypes for table grapes	193	10	27	33	15	15	
Genotypes with apyrenus characteristics	13	-	15	37	23	15	
Genotypes for white and rose wines	143	1	5	27	26	41	
Genotypes for red wines	52	-	6	19	23	52	
Genotypes with increased biological resistance	77	3	18	44	19	16	
Acidity, g/L H_2SO_4		**2,4-4,0**	**4,1-5,5**	**5,6-7,0**	**7,1-8,5**	**>8,6**	
Genotypes for table grapes	193	35	39	21	4	1	
Genotypes with apyrenus characteristics	13	31	23	38	7	-	
Genotypes for white and rose wines	143	22	52	22	4	-	
Genotypes for red wines	52	13	46	40	-	-	
Genotypes with increased biological resistance	7	30	44	13	13	-	

As regards the size of the bean we ascertained that in most varieties for the table grapes (51%) and with characteristics of apyrenus (62 %) produce grapes with the average mass of the bean comprised between 2,1 and 3,5 g/bean, only 9 % having the beans larger than 5 g.

The results obtained emphasize new or foreign varieties, autochthonous or local varieties with grapes and large beans that deserve to be taken into consideration: Victoria, Italia, Ceauş alb, Deac Ferencz, Greaca, Afuz Ali, Xenia, Gelu and the apyrenus varieties Kiş Miş moldovenesc and Călina.

Under the aspect of the potential of accumulation of sugars in the stum, there was also a higher variability both from one group to the other and within the sale direction of production. Grouped in variation classes, from a smaller content of 145 g/L to a bigger one of 220 g/L we ascertained that most varieties for the table grapes (27-33%) and apyrenus (15-37%) belong to the classes 146-170 g/L, respectively 171-195 g/L, while those destined for obtaining white, rose and red wines had a superior potential, the majority belonging to the variation classes of 196-220 g/L (23-26%), respectively larger than 220 g/L (41-52%). The genotypes with increases resistance belonged to the highest extent in the first variation classes, knowing their lower potential of accumulating the sugars in the stum.

The total acidity of the stum in the climatic conditions of 2009 oscillated in very large limits, between the five groups of varieties for the table grapes and

with apyrenus characteristics presented a total variety of 2,4-5,5 g/L H_2SO_4, character specific to the varieties for consume in fresh state (77 – 87%) an acidity of 4,1 - 7,0 g/L H_2SO_4.

The following varieties distinguished themselves through a superior potential of sugars accumulation in the stum accompanied by a corresponding acidity: Gelu, Paula, Napoca, Muscat timpuriu de Bucureşti, Coarnă neagră, Ţâţa caprei, Razachie (table varities); Călina, Kiş Miş negru, Otilia (apyrenus varities); Selena, Cristina, Donaris, Golia, Busuioacă de Bohotin, Fetească albă, Fetască regală, Grasă de Cotnari, Tămâioasă românească, Lampara, Galbenă verde, Cioinic, Albar (varieties for rose and white wines) and Arcaş, Negru de Drăgăşani, Fetească neagră, Băbească neagră, Merlot, Oporto, Negru românesc (varieties for red wines)

CONCLUSIONS

1. The genotypes studied went through the entire phenologic specter in the interval April 20th –October 28th, after 182- 188 days of active vegetation.

2. The productions of grapes achieved were, generally, under the biologic potential of the majority of varieties studied, most of them achieving between 1.5 and 3,0 kg/vine, distinguishing through productions of over 3,1 kg/vine a significant number of genotypes from each production direction.

3. The size of grapes and beans has had large variation limits, from grapes smaller than 150 g up to over 350 g/grape, respectively from the beans situated under 1,4 g/bean at over 5 g/bean.

4. The accumulation potential of sugars in the stum was high, all the varieties according to the production direction, manifesting a pronounced variability, larger quantities of sugars accumulating the varieties for the white, rose and red wines.

Acknowledgments

This study was financed by the National Center of Program Management, project, no. 52-116/2008.

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