

# SEEDLESS VARIETIES IN REPUBLIC OF MOLDOVA: ASCERTAINMENT AND PERSPECTIVES

## SOIURI APIRENE ÎN REPUBLICA MOLDOVA: CONSTATĂRI ȘI PERSPECTIVE

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**Abstract.** Traditionally in Carpathian-Danubian-Pontic region, inclusively in Republic of Moldova, in grapevine assortment did not existed seedless varieties, they having geographical origin from *Proles orientalis* Negr. The researches, testing of some introduced seedless varieties denoted the absence of any prospect for its cultivation in industrial vineyards: they are seriously affected by critical winter temperatures and have a low crop capacity. In this context it was expressed an opinion that in our region is not possible the cultivation of seedless varieties. Following amelioration researches disproved the skepticism regarding the possibilities to create a seedless assortment, adapted to the specific of climate conditions. Stable harvest and advanced resistance of new created genotypes during more than 20 years cultivation without protection during the winters, inclusively of varieties already included in register, are a convincing argument. At the same time accumulated biological material represents a significant genotypic diversity: diverse degree of seedlessness, earliness, quality, productivity, diverse utilization, resistance to abiotic unfavorable factors, and the presence of these properties in diverse combinations at diverse genotypes allows the creation of newly competitive varieties.

**Key words:** grapevine, seedless varieties, resistance, biodiversity

**Rezumat.** Tradițional, în spațiul carpato-danubiano-pontic, inclusiv Republica Moldova, în sortimentul viticol n-au existat soiuri apirene, ele având origine din *Proles orientalis* Negr. Cercetările, testările unor soiuri apirene introduse au demonstrat lipsa de perspectivă a cultivării lor în plantații industriale: sunt grav afectate de temperaturile critice în timpul iernii și manifestă o productivitate scăzută. În acest context s-a vehiculat ipoteza că în regiunea noastră nu este posibilă cultivarea soiurilor apirene. Cercetările ulterioare de ameliorare au infirmat scepticismul privind posibilitatea creării unui sortiment apiren, adaptat specificului condițiilor climatice. Producția stabilă și rezistența avansată, manifestată pe parcursul a mai bine de 20 ani de genotipurile noi create, cultivate fără protejare pe parcursul iernilor, inclusiv de soiurile deja înscrise în registru, sunt un argument convingător în acest sens. Totodată, materialul biologic acumulat prezintă o diversitate genotipică semnificativă: grad diferit de apirenitate, timpurietate, calitate, productivitate, utilizare diversă, rezistență la factorii abiotici restrictivi, iar prezența acestor însușiri în diferite combinații la diferite genotipuri permite de a crea noi soiuri competitive.

**Cuvinte cheie:** viță de vie, soiuri apirene, rezistență, biodiversitate

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## INTRODUCTION

In the context of dynamic market conditions as well as more frequent climatic challenge, amelioration of grapevine assortment, inclusive of seedless varieties with various utilization and advanced resistance to unfavorable factors of environment is an actual task. During the last 30 years in the Republic of Moldova were created many genotypes with different degree of seedlessness and diverse agro biological and technological characters regarding time of full maturity of berries, color and size of berry, size of the bunch, direction of use, resistance to restrictive a biotic factors. After preliminary evaluation in State Commission for Plant Testing, six new seedless varieties had been admitted for cultivation (2011). In order to diversify existing assortment other seedless varieties are evaluated and promoted. In the same time, the diversity of seedless grapevine resources from Institute's Genofond had been completed with new genotypes from other viticulture centers of the world. Appearance in the world viticulture of new seedless varieties, inclusive with very early time of berry maturity, large or very large berry, advanced resistance to winter conditions (<http://vinograd.info/sorta/>) determine new tasks and objectives in future amelioration of assortment adapted to the specific of climatic conditions of Carpathian – Danubian –Pontic region. Mobilization of these resources allows the accumulation of “critical mass” of genetic diversity for future efficiency of breeding process of new seedless varieties for industrial cultivation.

## MATERIAL AND METHODS

Is analyzed the segment of seedless grapevine genetic resources from the grapevine Genofond of Research and Practical Institute for Horticulture and Food Technologies (further the Institute), inclusive varieties Apiren alb, Apiren negru de Grozesti, Apiren roz, Romulus homologated in republic during the last six years as well as new varieties Apiren roz extratimpuriu and Apiren roz Basarabean with perspective for homologation. In the basis of analysis of diverse sources of literature was revealed and presented a segment of seedless grapevine assortment existed in other viticulture centers that represent interest for breeding.

Ampelographical descriptions and agrobiological estimations were effectuated according the OIV methodology (2009). Processing of experimental data with STATGRAPHICS Plus 5.1 software.

## RESULTS AND DISCUSSIONS

The diversity of grapevine genetic resources with diverse degree of seedlessness presented in Institute's Genofond include about 65 genotypes with various ecological – geographical and genetic origin: traditional seedless varieties Kishmish belyi, Kishmish chernyi, Sultanina, Perlette et al. and new forms and elites obtained during the years in the result of breeding programs (Savin, 2002). Also were introduced new genotypes (Tab. 1) with favorable characteristics for amelioration of seedless assortment according the criteria: early and medium time

of full berry maturity, large berry and bunch, some of them with relative or advanced resistance to wintering.

Table 1

**Diversity of some seedless genotypes from the Genofond of ISPHTA**

Genotype	Country of origin	Time of berry maturity	Berry color	Berry weight, g
Besemeannii ghibrid V-6	Bulgaria	Medium-late	Green-yellow	4,5
Besemeannii pozdnii	Uzbekistan	Late	Blue black	2,0
Besemeannii ranii	Russia	Early	Green-yellow	3,0
Călina	Romania	Early	Rose	1,9
Centennial seedless	USA	Early	Green-yellow	2,8
Flame seedless	USA	Early	Red	2,0
Himrood	USA	Very early	Green-yellow	1,5
langhi Er	Uzbekistan	Early	Green-yellow	1,6
Interleikin	USA	Early	Green-yellow	1,6
Kis-mis Vatcana	Uzbekistan	Medium	Rose	2,6
Mecita	Ukraine	Early	Rose	2,1
Perlon	USA	Medium	Red-violet	3,0
VIII-1-24	R.Moldova	Medium-late	Red-violet	4,5
XI-37-38	R.Moldova	Late	Red-violet	4,5

According the preliminary estimations seedless varieties originated from USA (Loose Perlette, Dawn seedless, Summer muscat et al.), admitted for testing in production conditions of Republic of Moldova (2010), it was established that although have high quality (large and attractive bunch, early maturity), most of them are very susceptible to wintering and diseases.

A valuable potential for breeding for advanced resistance to unfavorable conditions of environment, inclusively wintering, have recently homologated varieties Apiren alb, Apiren roz, Apiren negru de Grozesti and varieties evidentiati as perspective for implementation in production – Apiren roz extratimpuriu and Apiren roz Basarabean. Most of them have early or medium time of berry maturity and variety Apiren roz extratimpuriu can complement the list of varieties with very early maturity (Tabelul 2). The period bud burst – harvest vary for these varieties between 106-139 days, but indicated period may be different in function of direction of utilization of grapes. Thus, full maturity for consumption of fresh grapes is reached earliest by one week in comparison with the indicated mean value. For technological processing (for must, juice, homogenate, marinate, jam, raisins) and wine making the harvesting is effectuated on respective conditions of quality. The variety Apiren roz extratimpuriu, with the same time of full maturity like variety Perla de Csaba, can complete the existing assortment for this period, having at the same time colored berry and specific aroma. In comparison with other varieties of the same time of maturity included in Register, the grapes of Apiren roz extratimpuriu are less affected by cryptogam diseases, the grapes can be preserved on the bush for the long time (Figura 1) and in favorable for viticulture years the berries can accumulate already at the middle

of August 240-260 g/l of sugar. The estimations of the possibilities of technological processing of these varieties (Savin et al., 2005) confirmed its utility for this purpose.

Table 2

Phenology of seedless varieties (2006-2011, Genofond of RPIHFT)

Genotype	Bud burst*	Full bloom	Berry ripening	Full maturity	Days from bud burst to maturity
Apiren alb	26.IV	09.VI	28.VII	01.IX	128
	21.IV-02.V	08.VI-10.VI	20.VII-06.VIII	26.VIII-07.IX	
Apiren negru de Grozești	24.IV	08.VI	29.VII	10.IX	139
	22.IV-27.IV	07.VI-10.VI	25.VII-02.VIII	06.IX-15.IX	
Apiren roz	26.IV	08.VI	28.VII	02.IX	129
	25.IV-28.IV	05.VI-12.VI	22.VII-03.VIII	25.VIII-10.IX	
Apiren roz Basarabean	23.IV	07.VI	24.VII	04.IX	134
	20.IV-27.IV	04.VI-10.VI	21.VII-28.VII	28.VIII-11.IX	
Apiren roz extratimpuriu	23.IV	08.VI	16.VII	07.VIII	106
	21.IV-26.IV	07.VI-09.VI	13.VII-19.VII	30.VII-16.VIII	
Romulus	23.IV	09.VI	29.VII	29.VIII	128
	20.IV-27.IV	08.VI-10.VI	25.VII-02.VIII	22.VIII-05.IX	

\* - is indicated mean value and the limits

The majority of these varieties have medium or large grapes, with medium weight and small or medium berries.



30.VII: Z= 183 g/l;  
t.a.= 9,15 g/l



12.IX: Z=240 g/l;  
t.a.=5,7 g/l

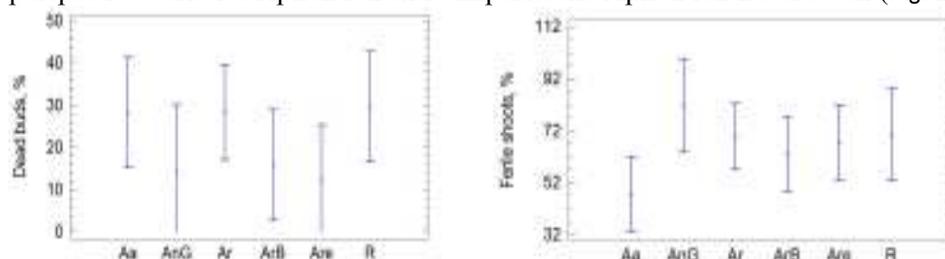


18.IX: Z=272 g/l;  
t.a.=4,5 g/l

\* Z= sugar content of must  
t.a.= total acidity of must (g/L tartaric acid)

Fig. 1 – The evolution of grapes of variety Apiren roz extratimpuriu

With very good resistance to wintering (according the percent of dead buds) is distinguished the homologated variety Apiren negru de Grozesti and new perspective varieties Apiren roz extratimpuriu and Apiren roz Basarabean (Fig. 2).



**Fig. 2** – Mean values and 95,0 percent LSD intervals for the percent of dead buds and percent of fertile shoots (2008-2011) (varieties in order according Table 2)

These creations represent a modest beginning, but they disprove the scepticism concerning the possibility to create an assortment adapted to the climatic conditions specific for Carpathian-Danubian-Pontic region, confirmed and by the practice of neighboring countries (2005). Information from diverse sources (e.g.: <http://vinograd.info/sorta/>, [http://www.anfic.com.au/table\\_grape.htm](http://www.anfic.com.au/table_grape.htm)) (Tab. 3) denotes the appearance, on international level of an avalanche of new seedless varieties, inclusive with the characteristics valuable for breeding purposes: early and medium time of berry maturity, various berry color, large bunch and berry, specific aroma, good resistance to frosts.

Table 3

**Diversity of seedless genotypes resistant to critical temperatures**

Genotype	Country of origin	Time of maturity	Berry color	Berry weight, g	Bunch weight, g	Resistance to low temperatures
Alexandrit	Russia	Early	Green-yellow	5-6	450-600	-25°C
Arsenevskii	Russia	Medium-late	Green-yellow	9	1000-2000	-25°C
Attica Seedless	France	Very early	Blue black	4-5	-	-
Besemeannâi krasnâi	Russia	Early	Red	5	400-500	-20°C
Besemeannâi rozovâi	Russia	Medium	Rose	5	200-500	-22°C
Black Emerald Seedless	USA	Early	Blue black	3-5	500	-23°C
Black Finger *	Israel	Early	Blue black	12-14	-	-
Concord Seedless	USA	Late	Blue black	2-3	230-300	-29°C
Desert seedless	RSA	Early	Blue black	-	-	-
Canadice	USA	Medium-early	Rose	2-3	250-450	-29°C

Genotype	Country of origin	Time of maturity	Berry color	Berry weight, g	Bunch weight, g	Resistance to low temperatures
Kişmiş Askaiskii	Russia	Early	Rose	4-5	500-600	-26°C
Kişmiş Zaporjiskii	Ukraine	Early	Rose	2-2,5	600-900	-25°C
Mystery	Israel	Early	-	6	-	-
Polinka	Russia	Early	Rose	2-3	400-500	-26°C
Prime*	Israel	Early	Green-yellow	6	-	-
Venus	USA	Early	Blue black	2-3	-	-26°C

\* Berry weight after growth stimulation

Consequently, the diversity of seedless genetic resources allows initiation and realization of breeding programs for creation of new seedless varieties for industrial cultivation.

## CONCLUSIONS

1. Seedless genetic resources from Institute's genofond contain, in various combination, the favorable characteristics: annually ensured quality and productivity, competitive production; early maturity and resistance to stress factor of environment.

2. This diversity allows the creation of new competitive varieties for fresh consumption, for storage in refrigerator for 3-4 months, technological processing, wine, raisins.

3. The variety Apiren roz extratimpuriu is recommended for testing in State Commission for Plant Testing.

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