

## REMUS - NEW VARIETY OF VINE FOR ROSE AND RED WINES WITH HIGH BIOLOGICAL RESISTANCE

### REMUS - SOI NOU PENTRU OBȚINEREA VINURILOR ROSE ȘI ROȘII CU REZISTENȚĂ BIOLOGICĂ RIDICATĂ

PUȘCALĂU Marioara<sup>1</sup>\*, BOSOI Ionica<sup>1</sup>, MIHU G.<sup>1</sup>

\*Corresponding author e-mail: mioara\_bosoi@yahoo.com

**Abstract.** *The scientific research in the field of vine improvement, with a permanent role in the diversification the assortments of vine, is oriented both to the creation of new qualitative and productive genotypes, but also to the obtaining of genotypes with increased resistance to diseases and tolerance to stress factors. In order to respond to this goal, at R.D.S.V.O. Odobești, through the hybridization directed between the intraspecific hybrid (Băbească neagră x Fetească neagră) and the interspecific hybrid Couderc 14 (Vitis lincecumii x Aramon) has been obtained and homologated in 2016 the assortment called Remus. The new creation is characterized by small to medium sized grapes (167 g), small berry (1.9 g), with crisp core and dark red-purple coloured skin, the pulp is firm, semi-soft, very slightly colored. The average grape production is 4.0 kg/vin, respectively 15.5 tons/ha. It presents high biological resistance to major cryptogamic diseases. The grapes reach maturity in the epoch V. Are obtained the rose or red wines for current consumption or high quality, with an average alcoholic potential (11.5 – 12.0% alcohol by volume), relatively low acidity (5.8 - 6.8 g/L tartaric acid), and mean values of the non-reducing extract (17.9 - 19.5 g/L).*

**Key words:** variety, interspecific hybrid, biological resistance

**Rezumat.** *Cercetarea științifică din domeniul ameliorării viței de vie cu rol permanent în diversificarea sortimentului viticol, este orientată atât pentru crearea de genotipuri noi valoroase calitativ și productiv, dar și pentru obținerea de genotipuri cu rezistență sporită la boli și toleranță la factorii de stres. Pentru a răspunde acestui deziderat, la S.C.D.V.V. Odobești prin lucrări de hibridare sexuată între hibridul intraspecific (Băbească neagră x Fetească neagră) și hibridul interspecific Couderc 14 (Vitis lincecumii x Aramon) a fost obținut și omologat în anul 2016 soiul Remus. Noua creație se caracterizează prin struguri de mărime mică spre mijlocie (167 g), boabe mici (1,9 g), cu pielea groasă, de culoare roșu - violet închis, iar pulpa este fermă, semisuculentă, foarte slab colorată. Producția medie de struguri este de 4,0 kg/butuc, respectiv 15,5 tone/ha. Prezintă rezistență biologică mare la principalele bolile criptogamice. Strugurii ajung la maturitate în epoca a V-a. Se obțin vinuri rose sau roșii de consum curent sau superioroare, cu un potențial alcoolic mediu (11,5 – 12,0% vol alcool), aciditate relativ scăzută (5,8 - 6,8 g/L acid tartric) și valori medii ale extractului sec nereducător (17,9 - 19,5 g/L).*

**Cuvinte cheie:** soi, hibrid interspecific, rezistență biologică

<sup>1</sup> Research and Development Station for Viticulture and Oenology Odobești, Romania

## INTRODUCTION

The varietal range of the vine varieties admitted for cultivation in recreational plantations in households is rather limited and needs to be supplemented and diversified with new genotypes. The researches carried out over the last four decades in our country have led to the obtaining of genotypes of valuable vines with high tolerance to diseases resistant to drought and frost (Calistru and Damian, 1999; Culcea *et al.*, 2004; Damian *et al.*, 2012). New wine grape varieties with biological resistance to cryptogamic diseases and frost, by their qualities resembling "noble vine", sustained by a high production potential and superior sugar storage capacity, are a solution to counteract the growing spread and uncontrolled direct hybrid producers in some areas of Romania.

The use of valuable hybrid combinations with genetic resistances obtained over time in the field of vine cultivation has led to the obtaining and approval of a new Remus variety that complements the varietal conveyer of varieties of biologically enhanced disease resistance and low temperatures, adapted to the specific conditions of vineyards in south - east of Moldova.

## MATERIAL AND METHOD

The study was carried out between 2014 - 2015, on a plantation aged 35 years, planting on soil type cernoziom levigated, located in the biological field SCDVV Odobești. For comparison, as a witness was used Băbească neagră variety, that is found in the hybrid combination that represents the parents maternal and is similar to the production direction. The varieties Remus and Băbească neagră was grafted on Kobber 5 BB rootstock, the training system with trunk of hub to the ground, with Dr. Guyot cutting system. Fruit load was 44 eye/vine, distributed on the canes with 9 eye and the spur with 2 eye. Distance of planting by 2.2 m x 1.2 m is returning 3788 but/ha. Were studied the ampelographic main characters, were made measurements and determinations on elements of fertility and productivity, the amount and quality of grape production, disease resistance, physico-chemical characteristics of the wine.

The main climatic conditions of during the study period and multiannual values are presented in table 1. The research period was characterized by heliothermal availability close to normal in 2014 and very high (2549.0 hours) in 2015 compared to the multi-annual value (2137.2 hours). The average annual air temperatures recorded during the two years of study (12.1°C and 13.1°C) were above the multi-annual average (10.7°C). The pluviometric regime was surplus in 2014 (903.3 mm) and close to normal in 2015 (650.6 mm), with uneven distribution over the vegetation period, with a surplus of 153.8 mm in 2014 and a deficit of 29.4 mm in 2015. The sum of the useful temperature ranges during the vegetation period (1885.7°C, respectively 2035.0°C) was well above the multiannual value (1590.8°C).

The main ampelographic characters were studied, the fertility and productivity determinations, the behavior at cryptogamic diseases and frost, the grape production quantity and quality, the physico-chemical characteristics of the wine.

The main climatic conditions of study period (Odobești, 2014-2015)

Climatic Indicator	Multiannual (1946 -2013)	Year		Average 2014 - 2015
		2014	2015	
Annual				
The average temp., °C	10.6	12.1	13.1	12.6
Temp max. abs., °C	39.4	35.6	37.4	36.5
Temp min. abs., °C	-22.8	-16.6	-17.4	-17.0
Amount degrees usful temp.( $\Sigma^{\circ}\text{tu}$ ), °C	1613.6	1932.2	2085.3	2008.8
The amount heatstroke, hours	2137.2	2132.3	2549.0	2340.7
Precipitation amount, mm	610.8	903.3	650.6	777.0
On the vegetation period				
The average temp., °C	17.0	18.5	19.2	18.9
Temp max. abs., °C	39.4	35.6	37.4	36.5
Temp min. abs., °C	-8.2	0.1	1.6	0.9
Amount degrees usful temp.( $\Sigma^{\circ}\text{tu}$ ), °C	1590.8	1885.7	2035.0	1960.4
The amount heatstroke, hours	1645.2	1694.6	1880.8	1787.7
Precipitation amount, mm	427.6	581.4	398.2	489.8

## RESULTS AND DISCUSSIONS

The ampelographic characters of the Remus variety (fig. 1 and fig. 2) are shown in table 2.



Fig. 1 Young shoot



Fig. 2 Remus variety (adult leaf, grape, berry)

In the climatic conditions presented, the Remus variety has started in vegetation (disbudding phase) between 20<sup>th</sup> – 26<sup>th</sup> of April, the flowering phase was between 25<sup>th</sup> - 29<sup>th</sup> of May and the veraison was recorded between 4<sup>th</sup> - 8<sup>th</sup> of August. The grapes reached full maturity between 12<sup>th</sup> - 24<sup>th</sup> of September, approximately 3-4 days earlier than the control variety (tab. 3).

Table 2

**The ampelographic description of the vine variety Remus**  
(according OIV descriptors list for grape varieties and *Vitis* species, 2<sup>nd</sup> edition -2009)

The character (OIV code)	Remus variety
Young shoot: opening of the shoot tip (OIV 001)	half open
Young shoot: Intensity of anthocyanin coloration (OIV 003)	none or very low
Young shoot: density of prostrate hairs on the shoot tip (OIV 004)	none or very low
Young leaf: color of upper side of blade (OIV 051)	copper- reddish
Adult shoot: attitude -before tying (OIV 006)	semi-erect
Adult shoot: color of the dorsal side of internodes (OIV 007)	green with red
Adult shoot: color of the dorsal side of internodes (OIV 008)	green with red
Adult shoot: length of tendrils (OIV 017)	medium
Mature leaf: size of blade (OIV 065)	small
Mature leaf: shape of blade (OIV 067)	pentagonal
Mature leaf: number of lobes (OIV 068)	five
Mature leaf: shape of teeth (OIV 076)	both sides convex
Mature leaf: degree of opening / overlapping of petiole sinus (OIV 079)	open
Mature leaf: depth of upper lateral sinuses (OIV 094)	deep
Mature leaf: density of erect hairs between main veins on lower side of blade (OIV 085)	none or very low
Mature leaf: density of erect hairs on main veins on lower side of blade (OIV 087)	none or very low
Mature leaf: length of petiole compared to length of middle vein (OIV 093)	slightly shorter
Bunch: length - peduncle excluded (OIV 202)	medium
Bunch: density (OIV 204)	medium
Bunch: length of peduncle of primary bunch (OIV 206)	medium
Berry: length (OIV 220)	short
Berry: width (OIV221)	narrow
Berry: shape (OIV 223)	globose
Berry: color of skin (OIV 225)	dark red violet
Berry: thickness of skin (OIV 228)	thick
Berry: intensity of flesh anthocyanin coloration (OIV 231)	none or very low
Berry: firmness of flesh (OIV 235)	Slightly firm

Table 3

**Phenological spectrum in the conditions of Odobești vineyard**

Variety	Disbudding	Flowering	Veraison	Physiological maturity
Remus	20 - 26.04	25 - 29.05	04 - 08.08	15 - 20.09
Băbească neagră (Mt.)	18 - 24.04	23 - 27.05	05 - 08.08	19 - 23.09

Under the conditions of the Odobești vineyard, the variety has small to medium growth, and the grapes are matured in the second half of September - epoch V –a (tab. 4).

Table 4

**The main agrobiological characteristics of Remus variety**

Elements studied	Remus	Băbească neagră (Mt.)
Length of vegetation period (days)	180 -190	182 - 194
The maturing period (at Odobesti)	V	V
The vigor of the vine stock - through the bonitation	small to medium	medium

The main fertility and productivity elements, as well as the resistance to frost of new Remus variety, are presented in table 5.

Table 5

**Fertility/productivity elements, and the resistance to frost (average data 2014 - 2015)**

Variety	Dead buds (%)	Fertile shoots (%)	Fertility coefficients		Productivity indices	
			Relative	Absolute	Relative	Absolute
Remus	3.5	70.9	1.11	1.56	185	260
Băbească neagră (Mt.)	7.0	69.6	0.96	1.33	192	266

Remus variety showed a fertility potential higher than the variety control (70.9%, and 69.6%) and higher fertility coefficients (Cfa - 1.46 for the Remus variety and 1.33 for the Băbească neagră variety ). Instead, productivity indices have lower values for the new variety (Ipa - 260; Ipr - 185). Resistance to wintering of Remus variety under unprotected crop conditions in the 2014 - 2015 climate was very good (3.5% dead bud).

Compared to control variety - Băbească neagră, in the climatic conditions of the years 2014 - 2015, the Remus variety manifested high resistance to the main cryptogamic diseases (tab. 6).

Table 6

**The behavior at the main diseases of the vine**

(according OIV descriptor list for grape varieties and *Vitis* species, 2<sup>nd</sup> edition – 2009)

Variety	Downy mildew ( <i>Plasmopara viticola</i> )		Powdery mildew ( <i>Uncinula necator</i> )		Black rot ( <i>Botrytis cinerea</i> )	
	Leaf	Grape	Leaf	Grape	Leaf	Grape
	OIV 452	OIV 453	OIV 455	OIV 456	OIV 458	OIV 459
Remus	9	9	9	9	9	7 - 9
Băbească neagră (Mt.)	5 - 7	5	5	5	7	5

Studying the technological characteristics of grape production was completed knowledge elements for the new grape variety (tab. 7).

Table 7

**The quantity and quality of grape production (average data 2014 - 2015)**

Variety	No. bunch/vine	Weight grapes (g)	Weight 100 berry (g)	Production grape		Sugars g/L	Total acidity g/L H <sub>2</sub> SO <sub>4</sub>
				Kg/vine	t/ha		
Remus	23.9	167.0	171.0	4.0	15.5	193.0	3.4
Băbească neagră (Mt.)	22.5	200.0	180.0	4.5	17.4	215.0	4.4

Although the number of bunch on the vine is higher for the Remus variety, the lower average weight of the grape has led to a lower production (4.0 kg/vine and 15.5 t/ha) compared to the control variety – Băbească neagră (4.5 kg/vine, respectively 18.6 t/ha). Regarding the quality of the grape production, the content of sugars in the must of the Remus variety was 193.0 g/L and the total acidity was 3.4 g/L H<sub>2</sub>SO<sub>4</sub>.

The main features of wines produced are presented in table 8. The wine obtained from the Remus variety had an alcoholic strength of 11.99% vol. with a total acidity of 6.85 g/L tartaric acid, a non-reducing extract of 18.34 g/L and a residual sugar content of 1.39 g/L.

Table 8

**The physico-chemical characteristics of wines** (average data 2014 – 2015)

Soiul	Alcohol vol. %	Total acidity g/L tartaric acid	Dry extract unreducible g/l	Residual sugar g/L
Remus	11.99	6.85	18.34	1.39
Băbească neagră (Mt.)	13.49	8.12	19.90	1.41

The qualitative characteristics of the wines obtained were below those of the control variety, but in the favorable climatic years they are approaching the characteristics of a high quality wine. Being a vine variety with high biological resistance to cryptogamic diseases, requires a few treatments, especially in years with climatic conditions favorable to the development of pathogens.

## CONCLUSION

1. Remus variety originates from the sexual crossing between the hybrid combination (Băbească neagră x Fetească neagră) and interspecific hybrid Couderc 14 (*Vitis lincecumii* x Aramon).

2. There are obtained rose-to-red wines of current consumption, and in the years favorable even wines of high quality, with medium alcoholic potential (11.5 - 12.0% vol. alc.), relatively low acidity (5.8 – 6.8 g/l tartaric acid), and average values of the non-reducing extract (17.9 - 19.5 g/l).

3. Due to its qualities resembling "noble vine", the genetic resistance to diseases and high tolerance to frost, Remus variety completes the variety of wine varieties and is a solution to counteract the spread of direct producers hybrids in Romania.

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