

Confirmed vocations towards high quality oenological achieved standards ascertained in regard to some vine kinds created at the Dragasani vineyard

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ABSTRACT

At the Research Station for Grape Growing and Winemaking in Dragasani, there have been and continue to be concerns related to improving grapevine genotypes as well as creating new genotypes for both table grapes and wine grapes. This study presents the oenological characteristics of the 'Victoria', 'Novac', and "Negru de Drăgășani" genotypes, obtained and cultivated at the Dragasani Station. Comparing the biological and technological characteristics of the progenitors of the 'Victoria' genotype, it is observed that it surpasses its progenitors and shows the greatest technological potential in Dragasani, compared to other vineyards where it is cultivated. Wines obtained from the 'Novac' and "Negru de Drăgășani" grapes can be compared to those obtained from the 'Cabernet Sauvignon' genotype, which they can surpass in certain oenological indicators.

Keywords: grapevine genotypes, improving grapevines, genotypes for the table, wine genotypes

INTRODUCTION

Research conducted over time in the field of grapevine cultivation in Romania has allowed the achievement of remarkable levels of scientific accuracy, gradually accumulated and reinforced through practical observations. These results enabled Romanian practitioners, especially after 1970, to develop new grapevine genotypes and clones adapted to the specific Romanian ecological conditions, all characterized by efficient productive capacities and clear potential for achieving the highest oenological standards.

The genuine oenological value respectively held by all of these creations has been consequently pointed out through many scientific publications (Teodorescu 1928; Popescu, Basamac 1960; Constantinescu et al. 1968; Neagu *et al.* 1968; Lepădatu, Condei 1991; Condei *et al.* 2004; Oprea, Moldovan 2007; Teodorescu *et al.* 2021; Popa *et al.* 2023; 2024).

As direct consequences of our investigations aimed at precisely defining the agricultural, biological and technological advantages empirically observed in the newly developed grapevine genotypes ('Victoria', 'Negru de Drăgășani' and 'Novac') this study presents a set of scientific arguments confirming the evident potential of these genotypes to achieve high levels of oenological quality.

MATERIALS AND METHODS

The study material consisted of the newly developed grapevine genotypes from the Dragasani vineyard, including 'Victoria', "Negru de Drăgășani", and 'Novac'. To accurately assess the agricultural, biological, and technological characteristics of the newly developed grapevine

genotypes, research methods recognized by the International Organization of Vine and Wine were applied. Observations and empirical evaluations were conducted directly in the vineyards and auxiliary processing facilities of the selected production units. Laboratory analyses were carried out at the Research Station for Vine Culture and Winemaking in Dragasani, the Faculty of Horticulture at the University of Craiova, and the Regional Laboratory for Wine Control and Analysis in the commune of Banu Maracine, Dolj County. Table 1 illustrates the vine genotypes obtained over time at Dragasani Research Station. In this article, scientific arguments are presented to confirm the vocation of these genotypes for producing high-quality wines, hypotheses that can be validated through their progressive expansion in current vineyards.

Table 1. New valuable vine kinds and clones created from the currently cultivated kinds and obtained by the use of the *Vine Germs&Plasma Collection* from Dragasani

Vine kind/Genitors	Homologation year	Authors
1	2	3
I. Vine kinds destined to produce table grapes and sultanas		
‘Azur’ (Coarnă Neagră X ‘Cardinal’)	1984	‘Victoria’ Lepădatu, Gheorghe Condei
‘Victoria’ (‘Cardinal’ X Afuz Ali)	1978	‘Victoria’ Lepădatu, Gheorghe Condei
‘Călina’ (Braghină X Sultanină)	1993	M. Mărculescu, M. Vlădășel
II. Vine kinds destined to produce white wines		
Selected Crâmpoșie (naturally fecundated Crâmpoșie)	1972	Em. Popescu, M. Neagu, P. Baniță, I. Dobrescu, M. Mărculescu
Vilarom (Hamburg Muscat XCrâmpoșie X Ottonel Muscat 436)	2003	M. Mărculescu
‘Aromatic Crâmpoșie’ (Selected Crâmpoșie X Hamburg Muscat)	2023	M. Mărculescu, I.B. Trușcă, S.Șt. Gorjan, I.R. Popescu, M. Șeiculescu
III. Vine kinds destined to produce red and rosé wines		
Alutus (Băbească Neagră X ‘Saperavi’)	2003	M. Mărculescu
‘Negru de Drăgășani’(‘Negru Vârtos’ X ‘Saperavi’)	1993	M. Mărculescu, M. Vlădășel
‘Novac’ (‘Negru Vârtos’ X ‘Saperavi’)	1987	M. Mărculescu
IV. Clones obtained from the vine kinds destined to produce white and red wines		
‘Petit Sauvignon’ 62 Dg	1984	M. Mărculescu
‘Tămâioasă Românească ‘104 Dg	1982	M. Neagu, M. Mărculescu
‘Cabernet Sauvignon’ 7 Dg	1976	P. Baniță, D. Basamac
V. Vine kinds and clones destined to produce engraft-bearing plants		
‘Drăgășani M 70’	2003	M. Mărculescu, M. Baniță, M. Vlădășel, M. Ciolacu, M. Șeiculescu
‘Teleki 8 B’ selected from Dragasani 57	1987	P. Baniță

RESULTS AND DISCUSSIONS

The “Victoria” grapevine genotype was created through a deliberate interbreeding process between the “Cardinal” and ‘Afuz Ali’ genotypes.



Figure. 1. ‘Victoria’ vine kind’

Table 2. The 'Victoria' vine kind's main agricultural, biological and technological features hereby compared to the ones held by its genitors

Size parameter	"Cardinal"	'Victoria'	'Afuz Ali'
Cluster weight (g)	342.3	594.7	488.1
100 grapes weight (g)	596.8	860.7	628.3
Pedicle length (mm)	9.0	11.5	9.8
Grape length (mm)	23.4	30.4	24.1
Grape width (mm)	20.6	21.8	18.5
Seeds number in grape	2.5	1.9	1.6
Mean harvest (t/ha)	14.5	21.2	13.7
Commodity output (t/ha)	10.5	18.3	11.9
Sugar (g/l)	141.2	144.3	127.1
Tartaric acid amount (g/l)	5.27	5.63	6.51
Ascorbic acid amount (mg/100 g)	8.8	11.3	11.2
Transportation safety index	25	38	36
Resilience degree (points)	50	80	67
Dry substance biological mass (g/log)	2320	2910	2818

From the data presented in Table 2, we are therefore entitled to ascertain the respective facts that this vine kind's main agricultural, biological and technological features do prove to be by far superior in regard to the ones respectively held by its parental kinds. When being cultivated within three plots from Oltenia of which the local micro-climates and soil specific circumstances are for each of them different from the ones held by the other two (Table 3) the 'Victoria' kind does manifest a most suitable offshoots productive output while in the meantime its harvest's both quantitative dimensions and attained to quality levels do indeed overcome the ones respectively held by all of the other vine kinds destined to produce table grapes which are also cultivated in our country (Table 4).

Table 3. Offshoots productive output of the 'Victoria' vine kind when cultivated within some plots from Oltenia

Vine cultivated area	Year	Mean cluster weight (g)	Productivity Indices	
			Absolute	Relative
Dragasani	2020	291	456	331
	2021	294	441	358
	2022	293	501	381
	<i>Mean (2020-2022)</i>	292	484	347
Ramnicu Valcea - Jiblea	2020	285	456	324
	2021	290	435	353
	2022	293	501	351
	<i>Mean (2020-2022)</i>	286	474	340
Bechet - Dabuleni	2020	289	410	179
	2021	290	397	185
	2022	290	411	159
	<i>Mean (2020-2022)</i>	283	396	169

Yet as a matter of fact should the same vine kind be cultivated within the Dealul Olt – Dragasani area along its naturally shaped slope (Table 5) we could therefore ascertain the facts that its respectively obtained harvest's quantitative amounts and their attained to quality levels would be quite different in respect to the above presented case since upon it

only the grapes harvested from its upside could effectively reach for their highest possible quality level.

Table 4. Grape harvests and respective quality levels held by the 'Victoria' vine kind when cultivated within some plots from Oltenia

Vine cultivated area	Year	Grapes amount for one vine log				Sugar (g/l)	Acidity (g/l H ₂ SO ₄)	Gluco-acidity metric index
		Total amount (kg)	Extra (%)	I - st quality (%)	Commodity output (%)			
Dragasani	2020	3.709	71	11	82	135	4.11	32.84
	2021	6.450	69	12	81	139	4.00	34.75
	2022	7.200	75	10	85	140	4.05	34.56
	Mean	5.786	71.66	11	82.66	138	4.05	34.07
Ramnicu Valcea - Jiblea	2020	5.250	62	16	78	136	4.00	34.00
	2021	7.040	64	17	81	140	3.95	35.44
	2022	6.940	69	18	87	141	3.84	36.71
	Mean	6.410	65	17	82	139	3.93	35.36
Bechet - Dabuleni	2020	4.390	69	21	90	130	3.20	40.62
	2021	5.040	70	22	92	129	3.29	39.28
	2022	5.000	68	23	91	139	3.26	42.63
	Mean	4.810	69	22	91	132.66	3.25	40.81

Table 5. Amounts and quality levels achieved by the 'Victoria' vine kind while cultivated within the Dealul Olt – Dragasani area, throughout various segments of its naturally shaped slope

Log situation upon the slope	Harvest year	Grape amounts for one log				Sugar (g/l)	Acidity (g/l H ₂ SO ₄)	Gluco-acidity metric index
		Total amount (kg)	Extra (%)	I - st quality (%)	Commodity output (%)			
Downside slope's third part	2020	7.440	53	33	86	136	4.35	31.26
	2021	7.140	51	30	81	135	4.40	30.68
	2022	6.295	52	29	81	137	4.52	30.30
	Mean	6.958	52	30.66	82.66	136	4.42	30.76
Amidst slope's third part	2020	3.709	71	11	82	135	4.11	32.84
	2021	6.450	69	12	81	139	4.00	34.75
	2022	7.200	75	10	85	140	4.05	34.56
	Mean	5.786	71.66	11	82.66	138	4.05	34.07
Upside slope's third part	2020	6.480	73	20	93	150	4.95	37.97
	2021	6.497	74	18	92	145	3.88	37.37
	2022	6.590	74	19	93	146	3.92	37.24
	Mean	6.522	73.66	19	92.66	147	3.91	37.59

The grapes maturation process is therefore effectively accomplished during the scientifically speaking acknowledged as the II-nd time period because this vine kind's naturally imparted resilience interval (before falling down from the log) does seem to be rather large (of around 30 days). Its harvests quantity amounts are as well rather large (of about 16 until 18.6 t/ha) from which their respective commodity outputs' amounts may elevate themselves towards 83% or even 85%. At the very moment of their most adequate maturity (in view of consumption) this vine kind's grapes might accumulate from 140 g/l until 150 g/l of sugars while in the meantime their acidity's respective levels do prove to be (at least relatively) some quite low ones such as standing from 3.5 g/l H₂SO₄ until 3.8 g/l H₂SO₄. These do as well present some most adequate resilience capacities during their transportation processes. Their most outstandingly remarkable features respectively are:

earliness in time; average high productive potentialities; an empirically most attractive physical appearance of the grapes. All of these above-mentioned assets do point out this vine kind as being one among the valuable Romanian such kinds (plainly speaking it is therefore seen as the best ever genuine Romanian creation among them) destined to produce table grapes. It is thus most highly recommended for cultivation throughout all of the vineyards and vine cultivating centers which are specialized for the production of table grapes. As a matter of fact we are entitled to state that recently in Romania (more precisely in 2021) the 'Victoria' kind has occupied a total cultivated surface of 154.01 hectares. As it is indeed a most highly praised vine kind its culture has as well been taken into due consideration by some other vine cultivating countries throughout Europe (Italy – with around 7000 hectares; France; Spain; Portugal; Greece). It has also become duly known outside of our continent (as for example in Australia. China. South Africa etc.).



Figure 2. ‘Negru de Drăgășani’ vine kind’s **Figure 3.** ‘Novac’ vine kind’s

Those two vine kinds have both been issued from the same genitors (namely from ‘Negru Vârtos’ and ‘Saperavi’). They are also both destined to create some high-quality red and *rosé* wines.

At the ‘Novac’ kind the grapes maturation process should be accomplished throughout the scientifically speaking acknowledged as the V-th time period; its average fertility ratio is rather a middle-sized one (54% of fertile offshoots); its respectively related coefficients are: - the relative one of 0.84; - the absolute one of 1.48; it does present some most suitable tolerance capacities towards manna. oidium and the grapes rotten grey mildew; the moment of its grape’s fully accomplished maturity does occur during the second half of September; its averagely accumulated amounts of sugar do use to stand in-between 200 g/l and 220 g/l; its total acidity amounts could then be situated from 5 g/l until 6 g/l (of H₂SO₄); its averagely ensured harvested quantities might usually stand in-between 19 t/ha and 24 tons/ha. As it is cultivated within the Dealul Olt – Dragasani area (for trading purposes) the oenological potentialities of which it could effectively dispose have been by us most accurately evaluated (Table 6). In the hereby studied case the grapes have been harvested ten days after the moment of having reached to their full oenological maturity.

Table 6. Oenological potentialities held by the ‘Novac’ vine kind as it is cultivated in the Dealul Olt – Dragasani area (Harvesting the grapes 10 days after full maturity)

Harvest year	Grapes produced amounts (kg/ha)	Glucose s (g/l)	Total acidity (g/l H ₂ SO ₄)	Tartaric acid (g/l)	pH	Total poly-phenols (g/kg of grapes)	Anthocyanin s (mg/kg of grapes)
2006	10150	213	4.36	3.67	3.06	4.11	1395
2007	10080	214	4.23	3.88	3.04	4.31	1402
2008	9960	210	4.05	3.61	3.06	4.10	1411
2009	9855	207	4.09	3.39	3.07	4.25	1401
Mean	10019	211	4.18	3.64	3.06	4.19	1402

Table 7. Evolution throughout time of chromatic features held by wines issued from grapes of the 'Novac' vine kind

Wines chromatic features	At separation moment of must hard-boiling process	Ages of wines expressed in months					
		3	6	9	12	15	18
		Maturation process age gathering process					
Wines colours intensities (CI)	1.675	1.624	1.504	1.436	1.366	1.351	1.324
Wines colors tonalities (CT)	0.542	0.550	0.566	0.567	0.592	0.593	0.596
<i>Flavilium</i> cathode ions (dA%)	60.56	59.89	59.35	59.70	58.10	58.07	58.21

From the above presented Tables 6 and 7 we do estimate ourselves as being scientifically entitled in the case of the 'Novac' vine kind to ascertain the existence of the following active as well as highly significant oenological valuable features: the existence of a great productive potentiality; some quite large quantitative accumulations of sugar while this vine kind is also most magnanimously endowed with some rather considerable respective amounts of poly-phenols and of anthocyanins. By the use made of the classical red-type wine-making technology the wines issued from the grapes of the 'Novac' kind had been therefore respectively submitted to the maturation and then age gathering processes. Table 7 above does present as scientific evidence some experimentally gathered data which do effectively stand as proofs of the existence in the case of the 'Novac' kind's issued wines of a genuine vocation towards some as successful as highly valuable (under oenological terms) age gathering processes. Insofar they could be ever concerned the facts are respectively obvious that the 'Novac' wines chromatic parameters (intensity and tonality) do both evolve in the sense of improving the wines held quality levels since they are not just endowed with some perfectly balanced compositional structures but furthermore (as some most attractive details) their above mentioned chromatic respectively attained to intensities do obviously reach for some quite high values while their corresponding tonalities (nuances of their colors) could indeed acquire some ruby red reflective glimpses which do essentially define the greatest wines that pertain to this type.

'Negru de Drăgășani'

This vine kind could be essentially defined through the following features: a medium-sized stamina growth ratio; a most suitable fertility output (65% to 75% of fertile offshoots); a quite large tolerance capacity concerning the grapes' grey mildew; some rather adequate resilience capacities regarding drought, to manna and to the flour-like disease; a rather developed survival capacity while submitted to extremely low – plainly speaking to stone-freezing - temperatures (even until -22°C); the grapes maturation process does become fully accomplished during the scientifically denominated *V-th time period*; the grapes are averagely accumulating sugars in amounts which do stand in-between 195 g/l and 230 g/l; its total acidity amounts do never fall under the minimum value of 4.7 g/l of H₂SO₄; in quantitative terms its achieved harvests do averagely reach for productions going from 11 tons/hectare until 16 tons/hectare. As for its wines organoleptic (that is to say empirically attractive) features these do as well seem to be quite outstanding: their contained amounts of extract do averagely oscillate from 22 g/l until 26.6 g/l; their alcoholic concentrations do stand in-between 12.5 vol% and 13 vol%; these do always present some averagely quite high color intensities (should this even be after the passed time intervals dedicated to the maturation and next to the age gathering undergone processes when as a matter of fact these do eventually come to acquire some exquisite color nuances which do seem to be most beautifully kindred to the ones commonly held by rubies). As this vine kind is cultivated

within the Dealul Olt – Dragasani area (for trading purposes) the oenological potentialities of which it could effectively dispose have been by us most accurately evaluated (Table 8). In the hereby studied case the grapes have been harvested ten days after the moment of having reached to their full oenological maturity.

Let us therefore enumerate some obvious and through figures above illustrated assets of the 'Negru de Drăgășani' vine kind: at the moment of having achieved their full maturity its grapes are holding some quite suitable levels of total acidity; under these circumstances the average harvests productive potentialities as well as the ones of their average sugars accumulations do prove to hold some rather constant values; the future wines do prove to be endowed with a quite strong vocation for some long-lasting and in a good health preservation time intervals through the ratios respectively held by tartaric acid within the frames of their total acidity amounts; its wines are quite likely to dispose of both some quite high colors intensities and simultaneously of some rather beautiful colors tonalities; these assets are respectively guaranteed through the most suitable levels reached to by their contained amounts of poly-phenols and anthocyanins.

Table 8. Oenological potentialities held by the 'Negru de Drăgășani' vine kind as it is cultivated in the Dealul Olt – Dragasani area

Harvest year	Grapes produced quantities (kg/ha)	Glucides (g/l)	Total acidity (g/l H ₂ SO ₄)	Tartaric acid (g/l)	pH	Total poly-phenols (g/kg grapes)	Anthocyanins (mg/kg grapes)
2006	11105	216	4.29	3.52	3.05	4.09	1389
2007	10600	219	4.17	3.69	3.04	4.38	1398
2008	10050	212	4.11	3.72	3.06	4.19	1465
2009	9988	209	4.12	3.44	3.07	4.21	1422
Mean	10436	214	4.17	3.59	3.06	4.22	1419

Table 9. Anthocyanins held amounts and amounts of respective components of their coloring complex chemical aggregate at wines issued from the 'Novac' and 'Negru de Dragasani' vine kinds while cultivated within the Dealul Olt - Dragasani area
(Mean values for the time interval 2006 - 2009)

Vine kinds	Anthocyanins (mg/l)	Chromatic structure			Chromatic assets		
		Yellow pigments (%)	Red pigments (%)	Blue pigments (%)	Colors intensities (I _c)	Colors tonalities (T _c)	Flavilium cathodeions (dA%)
'Cabernet Sauvignon'	724.3	28.9	60.3	10.8	15.79	0.478	66.74
'Merlot'	662.8	30.0	60.2	9.5	14.44	0.502	66.56
'Fetească Neagră'	662.7	30.2	59.8	10.0	13.94	0.505	65.97
'Novac'	768.5	30.5	57.0	12.5	15.95	0.534	61.83
'Negru de Drăgășani'	776.6	30.3	57.5	12.2	16.06	0.527	62.80
'Pinot Noir'	383.8	34.5	56.6	8.9	9.35	0.609	61.38

To provide the clearest outlines of the above mentioned two vine kinds coloring chemical complex components as well as the exact values of their anthocyanins amounts we are hereby presenting (Table 9) the results obtained through the analyses we have performed upon some wines issued from the vine kinds of 'Negru de Drăgășani' and 'Novac' while these are placed in a comparative situation regarding some other wines respectively created from vine kinds which have longtime since already acquired some at least excellent reputations through undergoing their cultivation processes ("Cabernet Sauvignon", "Merlot", 'Fetească

Neagră’ and ‘Pinot Noir’). We have therefore been able to ascertain the respective facts that the wines created from ‘Novac’ and ‘Negru de Drăgășani’: do enjoy a chromatic structure endowed with an exquisite and most finely balanced equilibrium; do effectively dispose among the hereby compared vine kinds of the greatest amounts of anthocyanins; as the ‘Cabernet Sauvignon’ wines do continue to be most highly praised as being the: "kings of red wines" we are therefore scientifically entitled to state that the respective colors intensities and tonalities held by the wines coming from the kinds of ‘Novac’ and ‘Negru de Drăgășani’ are indeed more obviously outstanding than the ones achieved by the former. As the vine kinds ‘Novac’ and ‘Negru de Drăgășani’ (as we have ourselves demonstrated above) have undoubtedly proven their effective vocations for high quality levels and for highly productive amounts throughout their harvests these have as well of course been quickly adopted by the Romanian practitioners of our domain for current cultivation: until the present day each of them two has come to be cultivated upon total surfaces of around 100 hectares. As a matter of fact these two kinds have been also legally authorized for cultivation throughout all of the Romanian vineyards and vine cultivated centers which are really endowed with the vocation towards creating red high-quality wines (this been said with an outstandingly particular mention addressed to the ones respectively situated in the Romanian historically attested provinces of Oltenia, Wallachia, Banat and Dobrousa).

CONCLUSIONS

The grape genotypes ‘Victoria’, “Negru de Drăgășani”, and ‘Novac’ were developed at the Dragasani Research Station and subsequently introduced into cultivation in many vineyards across the country and abroad, especially the ‘Victoria’ genotype.

A comparative analysis of the agro-biological characteristics of the ‘Victoria’ genotype and its parent genotypes showed that it surpasses the genotypes from which it was created, which supports its introduction into cultivation as a table grape genotype. The “Negru de Drăgășani” and ‘Novac’ genotypes exhibit very good characteristics, particularly regarding color structure, surpassing certain parameters of the ‘Cabernet Sauvignon’, “Merlot”, or ‘Pinot Noir’ genotypes, which are renowned worldwide for producing red wines.

The three analyzed genotypes perform very well in cultivation in the Dragasani vineyard, constituting a very valuable germplasm resource.

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