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BEHAVIOR IN CULTURE AT SEGARCEA, VINE VARIETIES, FOR BLACK GRAPES, FROM WESTERN EUROPEAN VINEYARDS

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Abstract
In this paper I analyzed the behavior in the Segarcea culture of varieties of grape varieties (Syrah) of French origin, (Primitivo and Dornfelder), the realization of the German researchers. All the results, observations and determinations made on these varieties were compared with those found at the same time in the varieties that were much soared in the area, Cabernet Sauvignon and Merlot. In the vineyard of Oprisor, data were collected and collected on: the evolution of the grape growth and maturation process, the physico-mechanical composition of the grapes, the recording of the grape production and the analytical and sensory characteristics of the wines. The chemical and sensory analysis of wines highlights the fact that in Oprisor the Cabernet Sauvigon, Merlot, Syrah and Dornfelder varieties give us the possibility to obtain the highest quality red wines, high alcohol, keeping enough acidity, but also by large contents of the non-reducing extract of anthocyanins.The wines are intensely colored and with a beautiful shade of color, they are balanced, authentic wines with great aging in order to get very nice characters, difficult to overlook.

Keywords: black varieties,red wines,Segarcea vineyard,sensory analysis,vines.

1. INTRODUCTION

The purpose of this paper is to observe the behavior of vine varieties for new grapes, Syrah and Marselan, newly introduced in the French origin, in the vineyard of Segarcea during the period 2015-2017. All the observations and determinations provided in our research program for the two varieties have also been made on the Cabernet Sauvignon and Merlot varieties, also of French origin, but which have been part of the range of this area for a very long time and have offered the chance to obtain high quality red wines, contributing to the celebrity of these vineyards (Capruciu, 2012, Genoiu, 2011). In order to accomplish the purpose for which the research was undertaken, we set the following objectives:

1. Characterization of the oenoclimatic offer of the wine areas studied.
2. Following the evolution of the growth and maturation process of the grapes of the studied varieties.
3. Establishing the physico-mechanical composition of the grapes of the studied varieties.
4. Analysis of the chemical composition and sensory properties of the wines obtained from the grapes of the studied varieties.

In Segarcea, the soil under the influence of the climate influences the chemical composition and quality of grapes and wine. There are numerous scientific researches that have explained this phenomenon (Giugea, 2000; Popa, 1996, 2012). Wine is beneficial to health when it is natural and

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healthy. Since antiquity, the hygienic qualities of wine have been appreciated. The research that has been done confirms the positive link between wine and health, (Mihalca et al., 1999).
During the three years of study (2015-2017), from grape harvest to grape harvesting, the evolution of grain weights, acid content and sugars were observed.

2. MATERIALS AND METHODS

Research has been made in the Segarcea viticultural area, known for its vocation to provide the best pedoclimatic conditions for obtaining red wines through which chemical composition and sensory qualities have become known everywhere.
The vineyard vineyard at Segarcea is located at different latitudes and altitudes and offers different climatic and pedological conditions.
For the viticulture area of Segarcea, observations and research have been made on the Syrah and Marselan varieties. All observations and research have been made taking into account the black grape varieties for red wine already sourced (Cabernet Sauvignon and Merlot), which until now has been found to be irreplaceable. The Syrah variety is well known and appreciated in: Australia, California, South Africa, Argentina, Italy, Greece and Brazil.
Among all the criteria for evaluating the vocation of an area for a quality viticulture, we have chosen to use the one that captures the oenoclimatic aptitude of an area called Iaoe (Oenoclimatic Skills) established in 1977 by Ștefan Teodorescu. The oenoclimatic index means correlating the average anthocyanin content of the same variety with the climatic conditions of the wine regions where it is cultivated, as the level of anthocyanin content of the black grapes decreases as the climate resources in the wine centers decrease (Teodorescu, 1952; Teodorescu and Popa, 1959). The author left out of the idea that by combining the factors favoring the synthesis of anthocyanins in the grape grains, by summing the actual (I) and the temperature (T) and correcting the sum by reducing the excess rain (P) always unfavorable qualities can express the Oenoclimatic Aptitude (A) of the wine-growing area for the production of quality red wines by the formula:
$A = T + I - (P-250)$.
Observations and determinations on the quantitative and qualitative characteristics of the grapes concerned: the evolution of the grape growth and maturation process, the physico-mechanical analysis of the grapes and the production of grapes on the hub and on the surface unit (Teodorescu and Negreanu 1956).
In order to capture the way sugar accumulates, how the acidity increases and how the grain weight increases occur, in the end to determine the moment of full maturity and the optimum time for harvesting the grapes from the beginning of the spring to the next the harvesting of the sugar content, the total acidity and the weight of the grains was determined using the method developed by Ștefan Teodorescu (1952), which justifies the necessity of following the weight of the biological unit of the grapes to better capture the evolution of the relative sugar and absolutely and as a result the stages of growth and maturation. The mechanical and technological characterization of the grapes was done at the time of grapes harvesting, with data on the proportion of one gram of grapes of bunches, healthy and injured grains, must, pulp, seeds and marc. 100 grains were determined: total weight, weight and percentage of skin, weight and weight.
The analytical characteristics and the sensory qualities of the wines were established after the wines were clear and were going through the maturing period. For this purpose, the methods adopted and used by the International Organization of Vine and Wine, which did not lack the ones related to alcohol, organic acids, non-reducing extract, glycerol, anthocyanins, color intensity and tonality, were used.

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The sensory analysis was attended by seven licensed tasters and the system was used by comparison points from 1 to 20.

3. RESULTS AND DISCUSSIONS

The results obtained with regard to the evolution of the grape growth and maturation process are presented in the following tables:

Table 1. ***Evolution of the process of grape varieties grapes for red wines grown in Segarcea 2015-2017 (average data)***

Quality parameters	Varieties	Calendar dates						
		10 VIII	15 VIII	20 VIII	25 VIII	30 VIII	5 IX	10 IX
Mass of 100 grains (g)	Cabernet-Sauvignon	92.3	94.4	96.2	100.6	106.6	110	118
	Merlot	93.2	98.7	108.8	117.9	128. 8	137.9	146.2
	Syrah	89.2	99.4	108.2	120.3	127.5	136.2	147.0
	Marselan	70.1	74.2	80.9	89.2	98.3	116.1	120.1
Acidity g/l (H_2SO_4)	Cabernet-Sauvignon	15.6	12.2	10.1	7.3	6.2	5.9	5.2
	Merlot	13.6	10.6	8.8	7.2	5.7	5.1	4.8
	Syroh	9.8	8.7	8.1	7.3	6.5	5.4	4.8
	Marselan	10.8	9.6	8.8	7.5	6.8	5.7	4.7
Sugars (g/l)	Cabernet-Sauvignon	168.7	179.8	190.3	201.7	211.9	223.8	234.6
	Merlot	159.3	187.1	200.1	211.5	224.6	232	241.0
	Syrah	173	182	190	209	220	243	249.0
	Marselan	185	200	229	240	258	269	275.0

The grape period, in all cases, began around August 10, when the mass of 100 grains oscillated between 70.1 g at Marselan and 98.2 g at Merlot. Until Aug. 25, the weight of the grains records a small growth rate for all varieties, and the growth rate is obviously increasing until the full maturity starts to fall, especially due to the evaporations that take place.

Harvested, the lowest grain weight is recorded at Cabernet Sauvignon (118 g), followed by Marselan (120, 7 g), Merlot (146 g, 2 g) and Syrah (147 g).

The acidity content at the beginning of the spring season varies from one species to the next, the highest being recorded at Cabernet Sauvignon (15.6 g/l), followed by Merlot (13.6 g/l), lower recorded on grapes of the Syrah variety (9,8 g/l) and 10,8 g/l for Marselan grapes (10,8 g/l). When picking up the acidic content, it decreases steadily, at even higher rates in the old varieties (Cabernet Sauvignon and Merlot) and lower rates for the two varieties, new in culture (Syrah and Marselan). It is obvious that the harvested Cabernet Sauvignon grapes contain the highest amount of acids (5.2 g/l), and Merlot (4.8 g/l) is also nearby. Pickled Marselan grapes have 4.2 g/l organic acids, followed closely by Syrah (4.8 g/l). So we find that newly introduced varieties have a lower acidity content than Cabernet Sauvignon, but very close to the Merlot variety.

Analyzing the data in Table 1 regarding the evolution of the sugar content of grapes, from the beginning of the harvest period to the harvest, we find that the average daily storage rate oscillates from 2.1 g/l (Cabernet Sauvignon) to 3 g/l for Marselan variety grapes. It is obvious that the grapes of the Cabernet Sauvignon and Merlot varieties have a daily average accumulation rate almost the same throughout the grapes. Instead, on the grapes of the two varieties newly introduced in culture,

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after 25 August and until harvest (10 September), the average daily sugar accumulation rate is obviously much higher than the beginning of the harvest season and until 25 August. It is likely the effect of a more laborious photosynthesis process.

The grapes of the two varieties, newly harvested in culture, have the most sugars, 275 g / l at Marselan and 249 g/l at Syrah. Merlot grapes harvest 241 g/l sugar, and Cabernet Sauvignon 234.6 g/l. It is to be appreciated that the four varieties of black grape vines accumulate enough large amounts of sugars and maintain their acidity at a level (around 5 g/l of H_2SO_4), which entitles us to appreciate that , in all situations, we will get very good quality wines.

Over time, breeders have demonstrated that the physico-mechanical composition of the grapes of a certain vine variety (the size of the bunches, the size of the grain, the placement of the berries in a cluster, the color of the skin and its elasticity, the weight of the skin, grape seed, grape seed, but also the number of seeds in a grape, etc.) is the one that indicates the technological and compositional value of a grape, table or wine grape variety.

Table 2. Mechanical and technological characterization of varieties cultivated in Segarcea (average data 2015-2017)

The researched item		Cultivated varieties			
		Dedicated		New, taken in culture	
		Cabernet Sauvignon	Merlot	Syrah	Marselan
1kg of grapes contains:					
Clusters	g %	13.98 1.39	26.01 2.60	21.03 2.10	25.15 2.51
Healthy grains	no g	584 630.10	884 902.14	641 773.18	893 921.14
Damaged grains	no g	82 40.2	23 71	33 20.14	28 20.55
Must	ml g	393 379.01	394 404.31	412 422.36	420 430.41
Rest skin and core (pulp)	g %	135.43 13.54	143.11 14.31	189.31 18.93	153.12 15.31
Seed	g %	38.4 3.84	72.8 7.28	43.11 4.31	79.14 7.91
Total marc	g %	187.81 18.78	241.92 24.19	253.45 25.34	256.28 25.62

Table 2 presents the results of the determinations made during the period 2015-2017 regarding the physical-mechanical and technological characterization of vine varieties for black grapes intended for obtaining red wines in the Segarcea vineyard. It was natural that in this respect the grapes of the newly introduced varieties should be characterized alongside that of the grape varieties cultivated in Segarcea (Cabernet Sauvignon and Merlot). The data on the composition of a gram of grape allow us to highlight the proportions of bunches and grains, but also the resulting wort or the proportions of the skin and the pulp, as well as the seeds.

Table 3. ***Grape crops produced by vine varieties for red wines in Segarcea, media (2015-2017)***

Variety	Grape production (kg/ha)	Grape production (kg/hub)
Cabernet Sauvignon	8.125	1.62
Merlot	9.630	1.92
Syrah	9.200	1.84
Marselan	10.875	2.17

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Table 3 shows the grape yields of each variety, calculated on the surface unit and on the hub.
The largest grape production is made by the Marselan variety (10,875 kg / ha and 2.17 kg/hull), while the lowest is the Cabernet Sauvignon variety (8125 kg/ha and 1.62 kg/hull). The Merlot and Syrah varieties offer relatively close quantitative yields (1.92 kg/hull and 1.84 kg/bull). Finally, it is the wine that most expresses the oenological potential of a grape variety and, at the same time, the vocation for the quality of a wine-growing area. But we must not forget that the grape through the complex and balanced composition is the one that decides the quality of a wine.

Table 4. ***Analytical characteristics and organoleptic characteristics of red wines obtained at Segarcea (average data 2015-2017)***

The type of wine	Alcool (vol%)	Total acidity (g/l H_2SO_4)	Fixed acidity (g/l H_2S0_4)	Tartaric acid (g/l))	Non reducing extract (g/l)	Ash (g/l)	Antocyanins (mg/l)	Glycerol (g/l)	Color intensity (IC)	Tone (N.C.)	Sensory analysis (1-20 puncte)
Cabernet-Sauvignon	13.5	4.1	3.8	3.10	27.5	2.4	700	12.5	11.7	0.5	19.7
Merlot	12.8	4.1	3.9	3.10	27	2.5	600	12	11.2	0.5	19
Syrah	13.8	4.5	4.2	3.8	27.9	2.6	710	13.5	11.8	0.7	19.4
Marselan	14.3	4.6	4.4	3.9	28	2.7	720	13	11.8	0.9	19.6

Table 4 presents the analytical characteristics of the wines and their sensory qualities. As a result of the large accumulation of sugars by the grapes, after the maceration-fermentation process wines with a high alcohol content were made. This component oscillates between 12.8 volts. % for Merlot wine and 14.3 vol. % for wine made from Marselan grape. Although they have a high alcoholic strength, wines also have a sufficient total acidity that does not fall below 4.1 g / l of Ca2SO4 in Cabernet Sauvignon and Merlot and under 4.5-4.6 g / l of H2SO4 at Syrah, respectively Marselan. It is also worth highlighting the high share of fictitious acids (3.8-4.4g / l), and especially the proportion of tartaric acid that has alcohol along with it ensures good wine stability and an obvious suitability for aging wines.
If we analyze the non-reducer content of red wines obtained at Segarcea during the studies (2015-2017), we find very high levels from 27g/l to Merlot to 28g/l at Marselan. The non-reproductive extract is the one that gives the fullness, the robustness of the wines.
The mineral content (ash) is found in the ratio of 1/10 to the non-reducing extract, which betrays the naturalness of the wines. Perhaps as important as alcohol, fixed acidity, and non-reproductive extract, if not more important, is the content of anthocyanins, those components that, among other things, make wines beneficial to human health but also provide a higher conservative threshold of wines. The proportion of anthocyanins determined by us oscillates between 600 mg/l at Merlot and 720 mg/l at Marselan. Moreover, the complex, rich and balanced composition of the wines is complemented by a dye intensity of around 11.2 (Merlot) and 11.8 (Marselan) and at the same time by a beautiful hue of color whose values are ranging from 0.7 (Cabernet Sauvignom, Merlot and 0.9 Marselan). Wines are also highlighted by high glycerol content (12 g/l at Merlot, up to 13.5 g/l at Syrah), which gives them a beautiful softness.
The complex, rich and balanced chemical composition is what makes the sensory traits of wines greatly appreciated. In sensory analysis, wines have been offset with scores close to the maximum that can be given to ideal wines. They particularly impressed Cavernet Sauvignon wines (19.7 points out of 20 possible) as well as Marselan (19.6 points) and Syrah (19.4 points) and Merlot wines received 19 points out of the 20 possible to grant.

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4. CONCLUSIONS

1. In the ecological climate of Segarcea, vines with red grapes for red wine are going through the grape aging period starting on August 10, when the spring period is beginning to start and until September 10, when the grapes have accumulated enough sugars (234-275 g/l) to obtain very good quality red wine;
2. Until August 25, the average daily sugar accumulation rate is about 2 g, after this date and until the harvest (September 10), this date increases significantly to 3 g/l/day, especially in the variety Marselan;
3. The two varieties, newly introduced into culture (Syrah and Marselan), accumulate the most sugars;
4. The evolution of the baking process of the Cabernet Sauvignon grapes is slow, not leaping, perhaps due to the fact that it is more late than the others;
5. At harvest, the grapes of the four varieties, besides the large amount of sugars, maintain their total acidity level. The highest acidity is recorded on grapes of the Cabernet Sauvignon variety.
6. The Segarcea wines made from the four varieties have a high alcoholic strength , they have sufficient acidity where the acid predominates tartaric acid, are highly extractive, large amounts of glycerol, rich in anthocyanins have an intense color and a beautiful tone;
7. The sensory analysis of wines has led to the appreciation that all four wines are among the top-quality wines with a designation of origin, are authentic, with real aging properties. In addition, quality wines are Cabernet Sauvignon wines;
8. Syrah and Marselan wines, by their sensory composition and traits, recommend that the two varieties be extended to produce, which can produce very fine red and rosé wines and can be Cabernet Sauvignon's partners preferably for the production of new assortments, which may also bear the designation of origin "Segarcea".

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