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Control of the main quality parameters and quality indicators for the white and aromatic wines obtained in the Drăgășani vineyard

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Abstract The study aims to analyze the quality and authenticity of the wines obtained in the wine years 2019 from the Drăgășani vineyard. For this purpose, white and aromatic wines obtained from Romanian and French varieties cultivated in Drăgășani were analyzed. Quality and naturalness of wine can be determined by analyzing the main parameters (alcohol, total acidity, extract, ash) and calculating the most important indicators of quality (ratio alcohol / glycerol, alcohol / extract, extract / ash Halphen and Gautier). Following this analysis it was found that all wines are authentic, natural and of exceptional quality.

Key words

quality, aromatic wine, vineyard, natural, authentic

Wine is a product widely consumed and establishing its authenticity is one of the most important aspects in quality and food safety.

Wine is a polyphasic system of substances, some of which come from grapes, and most are formed during alcoholic and malolactic fermentation, as well as during the aging process of wines [3]. The chemical composition of the wine comprises over 500 associated substances in an extremely complex and inconsistent manner, some pass through grapes in an unchanged state (acids: tartaric, malic, citric, carbohydrates, mineral substances etc.), others are formed during alcohol fermentation, or other fermentative processes (alcohols, lactic and succinic acids etc.), and others occur as a result of reactions that occur either between the substances in the nascent state or on the basis of the existing ones (esters, acetals) [2]. The authentication, identification of frauds and determination of the conformity of the product with the specifications inscribed on the label are requirements of the consumers and of the European Community. In order to solve this problem optimally, the development and harmonization of the analytical methods valid at national and European level, as well as the establishment and enlargement of the database necessary to improve the efficiency of the wine control represent priorities at international level [1].

Capitalizing on the wine potential of Romania, in order to obtain sustainable competitive advantages on foreign markets, requires the creation and promotion of an identity of Romanian wine, based on analytical investigations that certify the quality and natural chemical composition of the wines [6].

Material and Method

For this study we have analyzed the following white wines and flavored, obtained both from traditional varieties Romanian vineyard Drăgășani ('Crâmpoșie selecționată', 'Crâmpoșie Aromată' and 'Tămâioasă Românească') and varieties of foreign origin – French ('Sauvignon'). For the calculation of alcohol - glycerol, ash - extract, alcohol - extract ratios, Halphen, Gautier and the main parameters defining the aroma of wines, we determined in the Oenology laboratory of the Development Research Resort for Viticulture and Vinification Drăgășani the alcoholic concentration of wines, the contents in glycerol, ash and dry extract by International Organisation of Vine and Wine methods, as well as the aroma characteristics at National Institute for Research and Development for Cryogenic and Isotopic Technologies, Râmnicul Vâlcea, by gas chromatography [4].

Using these data, the ratios between the weight of the dosage alcohol and the glycerol, the alcohol and extract ratios, the ratios between the weight of the non-reducing dry extract and the ash were calculated.

In order to determine the alcohol-glycerol ratio, the alcoholic degree is multiplied by 10 to obtain the amount of alcohol by volume. The amount of alcohol by volume is then multiplied by 0.79 (molecular weight) to obtain the amount of alcohol by weight. Then, by mathematical calculation, the ratio of the weights of the two elements is determined. The limits of variation of this report are between 5.5 and 13.5, with an average of 8.5 for Romanian wines.

For the determination of the extract - ash ratio, the extract is considered 100%, and the ash represents as% of the extract. There is no linear relationship between the reduced extract and ash.

To determine the ratio RR, alcohol - extract, the alcoholic degree is multiplied by 10 to obtain the amount of alcohol by volume. The amount of alcohol by volume is then multiplied by 0.79 (molecular weight) to obtain the amount of alcohol by weight. The variation limits of the RR ratio are 4.3-5.5, for white wines and 3.6 - 4.5 for red wines.

The Halphen ratio is Total Acidity (g / L) / Alcohol (% vol.). The values for this ratio range from 0.2-0.8 for natural wines.

The Gautier index representing the sum of alcohol% vol. and the total acidity g /L shows values between the legal limits 13-17 [1].

These relationships are taken into account especially when determining the degree of naturalness of the wines and the compositional balance of the products.

Results and Discussions

The main composition characteristics of the white and aromatic wines obtained at the Olt Deal point from the Drăgășani vineyard are presented in Table 1.

According to the data entered in Table 1 the analyzed wines have alcoholic degrees, between 11.2% vol. ('Crâmpoșie selecționată') and 13.3% vol. ('Sauvignon') and aromatic wines with 0.5-0.8% vol. the threshold of 12.0% vol.

Being in accordance with the Norms of application of laws of vine and wines in current, the total acidity showed values of over 4 g / L in H_2SO_4 or over 6 g / L in $C_2O_6H_6$ in all other varieties.

The close relationship between Gay-Lussac and glycerol-pyruvic fermentation is faithfully reflected in the glycerol contents. This explains the higher proportions of glycerol (10.6 g / L and 10.15 g/L) in the wines of 'Sauvignon' and 'Tămâioasa Românească', where the alcoholic strengths were 13.1% vol. and 12.7% vol. [5]. In the other wines, the glycerol contents were between 6.82 g / L ('Crâmpoșie selecționată'), 9.36 g / L ('Crâmpoșie Aromată') and 9.81 g / L ('Tămâioasă Românească').

Table 1. The main composition characteristics of white and aromatic wines

Composition characteristics	Year 2019			
	White wines		Aromatic wines	
	Crâmpoşie selecţionată	Sauvignon	Crâmpoșie Aromată	Tămâioasă românească
Alcohol (% vol.)	11.2	13.3	12.2	12.7
Total acidity (g / l H_2SO_4)	4.16	4.20	4.41	4.65
Glycerol (g / l)	6.82	10.15	9.36	9.82
Non-reducing extract (g / l)	20.1	22.34	23.07	23.11
Ash (g / l)	1.38	2.28	2.24	2.32
Glycerol x 100 / Alcohol	7.71	9.66	9.71	9.79
Alcohol / Extract	4.40	4.70	4.18	4.34
Total acidity / Alcohol	0.37	0.32	0.36	0.37
Ash x 100 / Non-reducing extract	6.35	6.76	6.57	6.65
Indice Gautier %vol Alcohol + Total acidity (g / l)	15.36	17.50	16.61	17.35

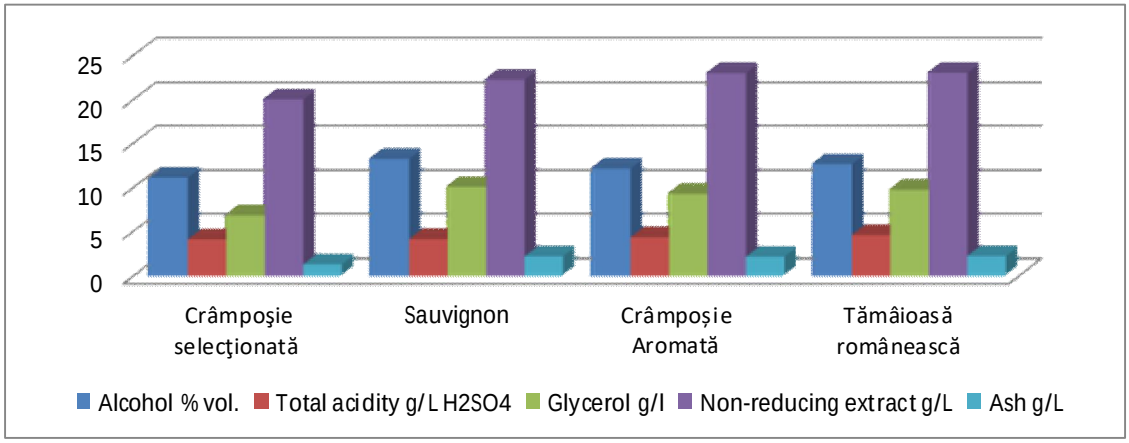

Figure 1. The main composition characteristics of white an aromatic wines products in the year 2019

The non-reducing extract presented values determined by the genetic nature of the variety, but also by some interventions in the primary vinification. The qualitative level of the raw material, but also the slight maceration applied to the vinification of the grapes of 'Tămâioasă Românescă' and 'Crâmpoșie Aromată' determined the highest contents in the extract of their wines (23.07 g / L and 23.11 g / L respectively). For the other wines, the extract showed values between 20.01 g / L ('Crâmpoșie selecționată') and 22.34 g /L ('Sauvignon').

The contents in mineral substances (ash) follow, in general, proportionally the sizes of the non-reducing extract, being over 2 g / L in 'Sauvignon' wines, 'Crâmpoșie Aromată', and 'Tămâioasă Românească' and below 2 g / L for the 'Crâmpoșie selecționată' wine (1,38 g / L).

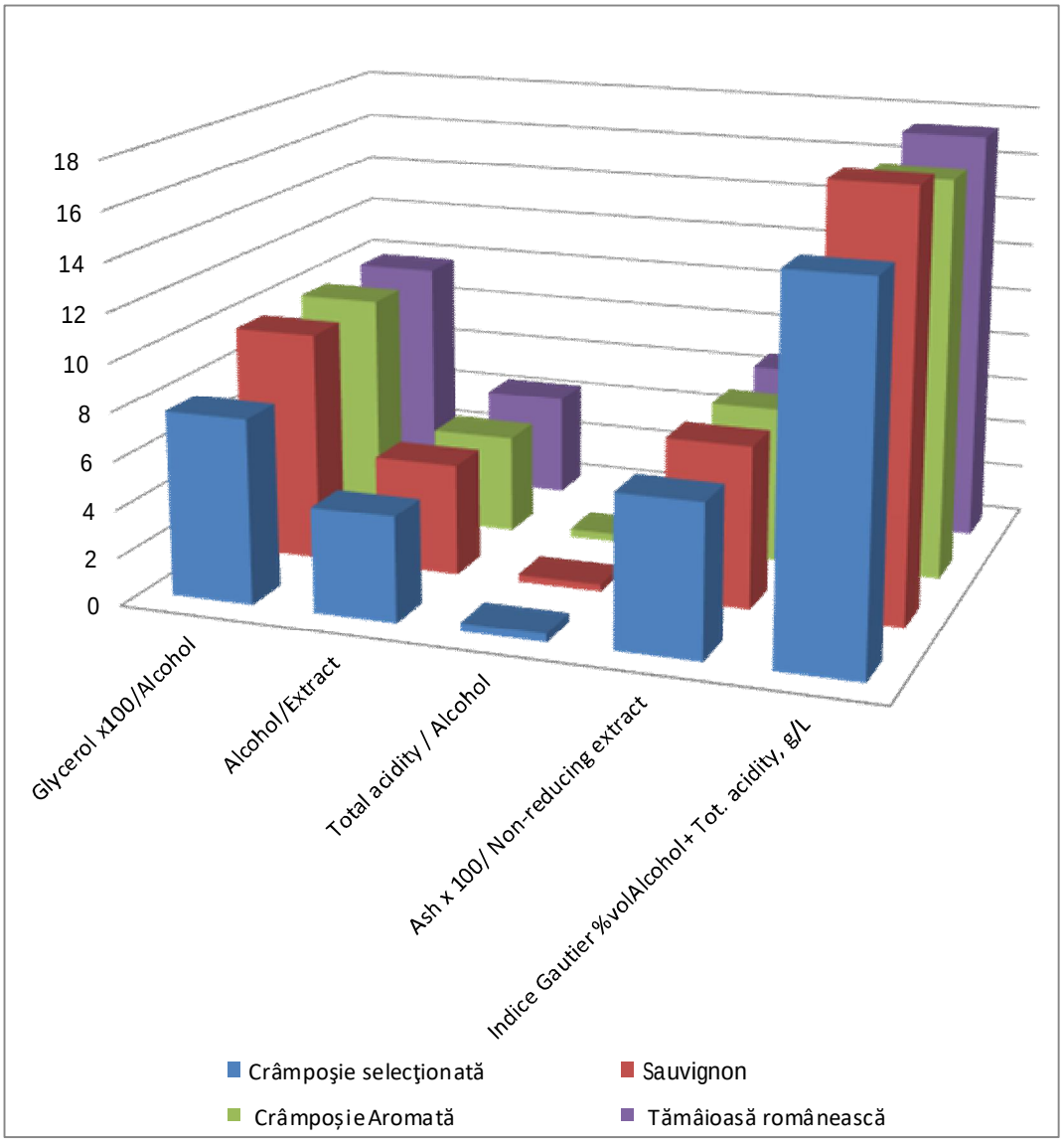

Figure 2. The main indices that define the authenticity of white and aromatic wines produced in 2019

The glycerol ratios compared to the alcohol dosage, apart from 'Crâmpoșie selecționată', are slightly below 10% or even above this threshold considered as ideal (in the case of the 'Tămâioasă Românească' and 'Crâmpoșie Aromată' wines).

The relations between the two oenological dimensions are considered favorable, the proportions of ash compared to the non-reducing extract are between 6.57 ('Crâmpoșie Aromată'), 6.65 ('Tămâioasă Românească') and 6.76 ('Sauvignon').

The Gautier index representing the sum of alcohol% vol. and the total acidity g / L shows values between the legal limits 13-17. Only in the case of 'Sauvignon' and 'Tămâioasă Românească' wine this index exceeds the maximum value due to higher contents in both alcohol and total acidity.

The natural and high quality character of white and aromatic wines also results from the values of glycerol ratios x 1001 alcohol and ash x 100 / non-reducing extract.

Ratios glycerol x 100 / alcohol and ash x 100/non-reducing extract were close to the ideal level (10%) for 'Tămâioasă Românească', 'Crâmpoșie Aromată' and 'Sauvignon' wines, with values between 9.66 and 9.79 for the report glycerol x 100 / alcohol and between 6.35 and 6.76 for the ash ratio x 100 /non-reducing extract, signifying important criteria for the quality and compositional balance of the products.

As for the alcohol / extract ratio, all the wines analyzed fall within the legal limits 4.3-5.5, with no suspicion of alcohol forgeries, and the values of the Halphen ratio fall within the limits of 0.2-0.8.

It can be concluded, from the values obtained for the five quality indices, that all wines are authentic, natural, without illegal additions of alcohol

Conclusions

Studies have shown to be very convincing that all the wines analyzed, from the Drăgășani vineyard are of exceptional quality, highlighted both by the harmonious chemical composition and by the very pleasant organoleptic properties.

White wines have been proven, both by their balanced composition and by their satisfactory qualities and that the varieties they come from are capable of using the excellent natural conditions in the area, and as such it is necessary to extend them in culture.

Studies carried out in the Drăgășani vineyard, on semi-aromatic and aromatic wines, have shown that the wines of 'Sauvignon', 'Crâmpoșie Aromată' and 'Tămâioasa Românească' have an exceptional oenological potential.

All the control parameters of the counterfeit, the reports Alcohol / Glycerol, Alcohol / Extract, Extract / Ash, the Gautier index and the Halphen report, through the values obtained for all the wines analyzed from the Drăgășani vineyard, indicate that we are in the presence of some natural, authentic wines, high quality and kept, according to the category they belong to.

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