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WINE COMPOSITION ANALYSES OF THE MAIN GRAPE CULTIVARS FROM THE DRĂGĂŞANI VINEYARD

Gorjan Sergiu-Ștefan[1], Truşcă Ion Bogdan [1,2], Popescu Raluca Iuliana[1]
[1] Research and Development Station for Viticulture and Vinification Drăgășani, Blvd. Regele Ferdinand, no. 64, Zip Code: 245700, Drăgășani, Vâlcea, Romania
[1,2]The Doctoral School of Engineering and Management of Vegetal and Animal Resources, USAMV University, Bd. Mărăşti , nr. 59, Sector 1, Bucharest, Romania
** Correspondance author:* gorjansergiustefan@yahoo.com

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ABSTRACT

Research and analyses were carried out in 2021-2023 in the plantations of Drăgăşani vineyard, in the plantations and the SCDVV Laboratory Drăgăşani.

The grape cultivars analyzed and studied were 'Sauvignon petit', 'Fetească regală, 'Crâmpoşie Selecţionată', 'Vilarom', 'Alutus', 'Cabernet sauvignon', 'Negru de Drăgăşani' and 'Novac', grape cultivars of certain value in obtaining quality white and red wines.

The qualities of the wine obtained from these grape cultivars were highlighted, through physical-chemical analyses, in order to obtain DOC and GI wines and promote them on the national and international wine market. Drăgăşani wines therefore continue their traditional performance today, that of dominating the market with their famous wines with unrivaled quality characteristics.

INTRODUCTION

The wines of Drăgăşani impressed with their harmonic balance, bouquet and richness in glycerol, which gives them their velvety texture (Măcău and Gorjan, 2016). Teodoreanu (1935) considered that the wines of Drăgăşani are closer to those of Bordeaux than to those of Burgogne. About the wine from Drăgăşani, Prof. Teodorescu I.C. (1943) said that: "...it is of a golden yellow color (18 carats), with a pronounced fruit flavor and a very personal bouquet. It is one of the few Romanian bouquets that have nothing in common with Cotnar, most of the others being only a variant of it. In general, all the wines of Drăgăşani are light, fragrant, generous and susceptible to aging".

MATERIAL AND METHODS

The physicochemical analyses of wine referred to: alcoholic strength (vol%); total acidity (g/l); total dry extract (g/l); reducing sugar (g/l); relative density at +20°C (Gorjan, 2013).

Principle of the method alcoholic strength (vol%):

The method is based on determining the boiling point of wine, which is between the boiling point of water (100°C) and that of alcohol (78.4°C).

Knowing the boiling point determined with the ebulliometer, the alcoholic strength is deduced, using a disk or a special calculation ruler.

Principle of the method total acidity (g/l):

The wine sample is potentiometrically titrated with a sodium hydroxide solution, after the prior elimination of carbon dioxide and sulfur dioxide. The sensitivity of the method is 0.5 milliequivalents, 0.005 g, in the case of expression in tartaric acid and 0.025 g, in the case of expression in sulfuric acid.

Apparatus: - potentiometer with glass electrode, - magnetic stirrer.

Principle of the total dry extract method (g/l):

The relative density of the aqueous solution of the extract is calculated, corresponding to the difference between the relative density of the wine sample and the relative density of the hydroalcoholic mixture with the same alcoholic strength as the wine sample. Based on the relative density, the corresponding total dry extract content is deduced (Boștinaru et al., 2023).

Principle of the reducing sugar method (g/l):

Reducing sugar is understood as the amount of sugars with ketone and aldehyde functions that directly reduce an alkaline copper solution. The determination of reducing sugar involves two operations: Defecation with mercuric oxide and the determination of reducing sugar.

When determining reducing sugar, a solution of cupric salt is reduced under heat with the help of the reducing sugar from the sample to be analyzed. The cuprous oxide resulting from the reaction is indirectly titrated with a potassium permanganate solution.

Principle of the method relative density at +20 °C:

Establishment of the density of must and wine by introducing the hydrometer into the mass of the liquid. The apparent density read on the rod of the apparatus at laboratory temperature is correct with the help of tables to be established at 20°C.

RESULTS AND DISCUSSION

In white wines, the average alcoholic strength of the 'Sauvignon petit' wine variety is very good at 13.06 vol%, and the total acidity is 5.23 g/l tartaric acid. The sugar content in the wine is high, namely 3.130 g/l, the total dry extract has a value of 21.39 g/l. The density is 0.991 g/cm³.

The 'Fetească regală' wine variety also has a good average alcoholic strength in the production of quality white wines. It has an alcoholic strength of 13.41 vol % and a good average acidity of 5.10 g/l tartaric acid. The sugar and total dry extract in the wine have values of 0.654 g/l and 25.43 g/l respectively. As for the density, it has a value of 0.990 g/cm³.

Another variety of certain value in obtaining quality white wines is 'Crâmpoşie selecţionată'. The average alcoholic concentration over the three years studied is 12.36 vol %, and the average total acidity is high at 6.23 g/l tartaric acid. The sugar in the wine is 0.320 g/l, and the total dry extract is 21.23 g/l. The average density is 0.991 g/cm³.

The 'Vilarom' wine variety has high quality qualities in the production of aromatic wines. It has an average alcoholic strength of 12.96 vol %, with a total acidity of 5.48 g/l tartaric acid. The sugar present in the wine is 4.899 g/l, and the total dry extract is 21.54 g/l. The determined density value is 0.992 g/cm³.

Red wines are of a very high quality, appreciated by connoisseurs and wine consumers (Gorjan et al., 2024)

Thus, the wine variety 'Alutus' has an average alcoholic strength over the three years studied of 13.20 vol. %, with a high acidity of 6.19 g/l tartaric acid. The

presence of sugar in the wine has a value of 1.210 g/l, and the total dry extract is 24.19 g/l. The average relative density at +20°C has a value of 0.992 g/cm³.

The average alcoholic strength of the red wine variety 'Cabernet sauvignon' is 13.26 vol.%, with a high average total acidity of 6.60 tartaric acid. The sugar in the wine is high at 4.336 g/l and the total dry extract is 29.30 g/l. The average density is 0.992 g/cm³.

A wine variety for obtaining quality red wines is 'Negru de Drăgăşani'. It has a good average alcoholic concentration of 13.43 g/l vol.% and a good average total acidity, respectively 6.20 g/l tartaric acid. The presence of sugar in the wine is 2.416 g/l, and the total dry extract has a value of 23.03 g/l. As for the density, it is 0.992 g/cm³.

Another valuable variety for obtaining red wines is 'Novac'. The average alcoholic strength is 12.76 vol.%, the average total acidity is 5.26 g/l tartaric acid. The sugar in the wine is 1.203 g/l. The total dry extract is 25.08 g/l and the average relative density at +20°C is 0.992 g/cm³.

Table 1

Average values of compositional determinations of the wines 2021-2023

Variety	Conc. alcohol (vol. %)	Total acidity (g/l acid tartric)	Sugar (g/l)	Total dry extract (g/l)	Density (g/cm³)
'Sauvignon petit'	13,06	5,23	3,130	21,39	0,991
'Fetească regală'	13,41	5,10	0,654	25,43	0,990
'Crâmpoşie selecţionată'	12,36	6,23	0,320	21,23	0,991
'Vilarom'	12,96	5,48	4,899	21,54	0,992
'Alutus'	13,20	6,19	1,210	24,19	0,992
'Cabernet sauvignon'	13,26	6,60	4,336	29,30	0,992
'Negru de Drăgăşani'	13,43	6,20	2,416	23,03	0,992
'Novac'	12,76	5,26	1,203	25,08	0,992
Average	**13,05**	**5,78**	**2,271**	**23,89**	**0,991**

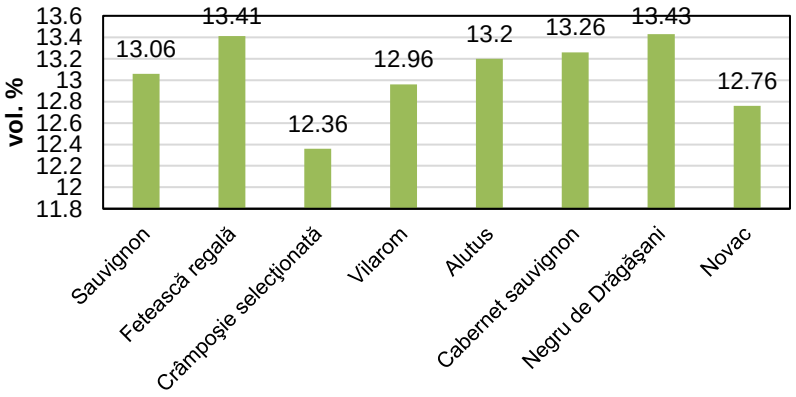

Figure 1 Alcoholic concentration - the average of the wines analyzed in the years 2021-2023

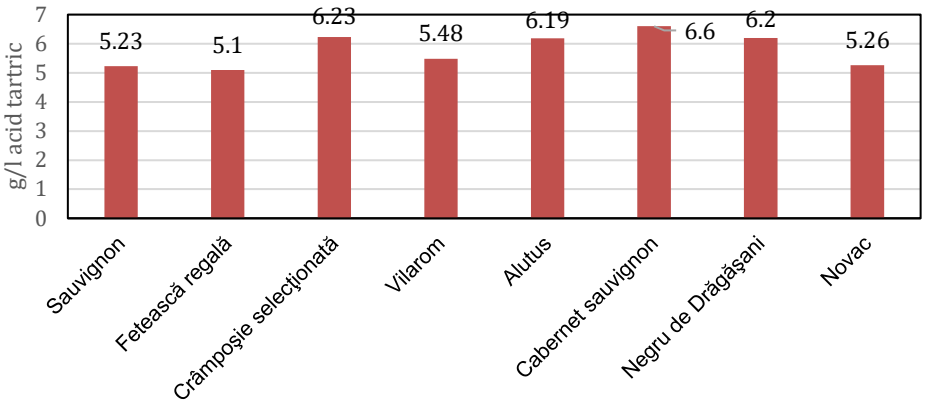

Figure 2. Total acidity - the average of the wines analyzed in the years 2021-2023

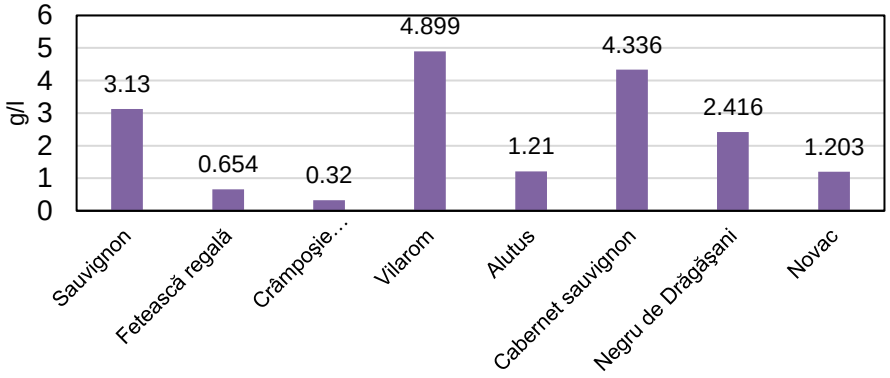

Figure 3. Sugar -the average of the wines analyzed in the years 2021-2023

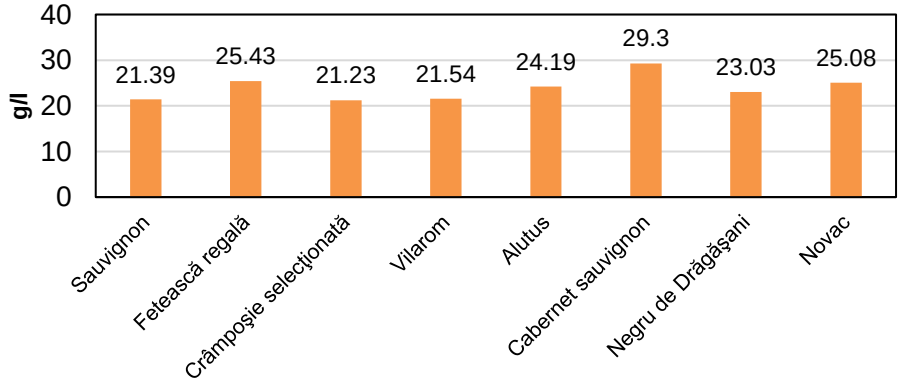

Figure 4. Total dry extract-the average of the wines analyzed in the years 2021-2023

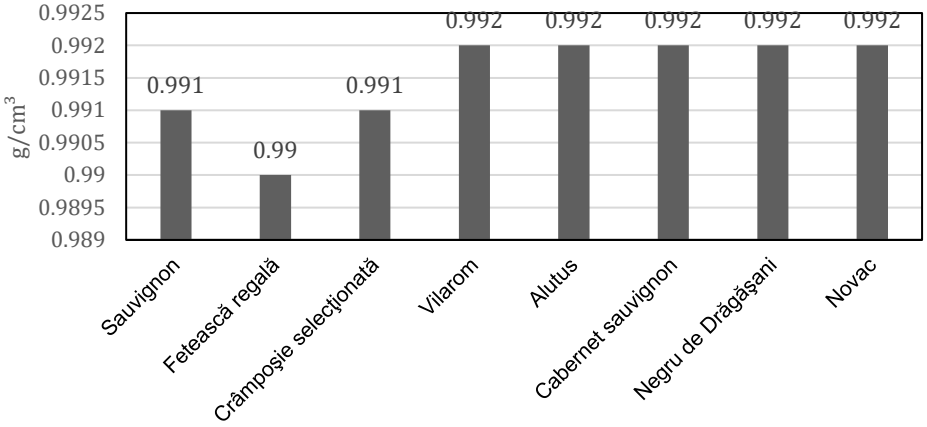

Figure 5. Density -the average of the wines analyzed in the years 2021-2023

CONCLUSIONS

The compositional analyses of the wines from the studied grape cultivars highlighted a good alcoholic concentration, non-reducing dry extract, reducing sugar, relative density at +20°C, in obtaining quality white and red wines.

The studied wines meet all the conditions to be classified as DOC and IG wines, due to the oenological qualities they possess.

The wines obtained can offer alternatives in disseminating the results in various national and international projects as well as in presenting at scientific events in the field.

ACKNOWLEDGEMENTS

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