

STUDY OF VOLATILE AROMA COMPOUNDS OF SOME ROSÉ WINES FROM IAȘI COPOU VINEYARD

STUDII PRIVIND COMPUȘII VOLATILI DE AROMĂ DIN UNELE VINURI ROZE OBȚINUTE ÎN PODGORIA IAȘI COPOU

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Abstract. *The main objective of the present study is to identify volatile aroma compounds of some rosé wines obtained from black grapes, in Iași Copou vineyard. Fetească Neagră, Băbească Neagră and Merlot grapes were manually harvested in 2016 and vinified in rose wine. After 14 days fermentation at 15°C, the wine samples were filtered, bottled and subjected to analyses. The wine aroma compounds were analysed by a Shimadzu GC-2010, coupled with a QP2010 Plus mass spectrometer. Many terpenic compounds, alcohols and esters were identified in the studied samples. The wine obtained from the Fetească neagră variety was found to have the highest content in terpenic compounds from all the studied samples.*

Key words: vinified in rose, aroma compounds

Rezumat. *Scopul acestei lucrări este de a identifica compușii volatili de aromă din vinurile roze obținute din soiuri de struguri negri, în podgoria Iași Copou. Struguri din soiurile Fetească Neagră, Băbească Neagră și Merlot din recolta anului 2016 au fost recoltați manual și vinificați în rose. După 14 zile de fermentare la 15°C vinul a fost filtrat, îmbuteliat și supus analizelor. Compușii de aromă au fost identificați utilizând ansamblul format din gaz cromatograf Shimadzu GC-2010 cuplat cu spectrometru de masă QP2010 Plus. Au fost identificați compuși terpenici, alcoolii și esterii în cantități diferite. În urma acestui studiu s-a evidențiat cu un conținut mai ridicat în compuși terpenici vinul obținut din soiul Fetească neagră.*

Cuvinte cheie: vinificați în rose, compuși de aromă

INTRODUCTION

The name of the rose wine be attributed to the product obtained from the black grapes which are poorly pigmented due to their biological nature or which do not achieve sufficient pigmentation to produce red wines due to unfavorable conditions of maturation. There are also rosé wines that can be obtained from the rosé grape varieties (Cotea, 1985).

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In the process of obtaining rosé wines it is possible to lack maceration or to be short-lived. Flavor is one of the most important factors related to the quality of a wine and to characterize the flavor, volatile compounds play an important role. The volatile fraction of wine determines to a great extent the flavor, which is one of the most important characteristics that influence wine quality and consumer preferences. Volatile compounds are able to stimulate the sensory organs responsible for olfaction.

These compounds correspond to small molecules of medium hydrophobicity and molecular weight generally between 30 g / mol and 300 g / mol (Morrot and Brochet, 2000).

Depending on the origin and considering the technological stage of winemaking, the wine flavor can be classified into four different groups (Bayonove *et al.*, 1998): *varietal flavor*, typical of the grape variety; *pre-fermentative flavor*, from grape processing and subsequent operations; *fermentative aroma* produced by yeast during alcoholic fermentation and lactic acid producing bacteria during malolactic fermentation; *post-fermentative aroma* resulting from the transformations that occurred during wine preservation and aging of wine (Vilanova and Oliveira 2012).

These flavors are mostly attributed to classes of compounds such as higher alcohols, aldehydes, ethyl esters of fatty acids, fatty acids, ketones, monoterpenes and volatile phenols (Andujar-Ortiz *et al.*, 2009).

The organoleptic characteristics of rosé wines are intermediate between the macerated red wines and the white wines ones without maceration.

MATERIAL AND METHOD

The purpose of this study was to obtain data on volatile flavor compounds composition from some rosé wines obtained from black grapes in the Iasi Copou vineyard to verify that the wines obtained retained their typical variety.

The raw material was Fetească Neagră, Băbească Neagră, Merlot, harvested at the technological maturity of the Copou vineyard in 2016.

The grapes were harvested manually, after that, the complete transport of the raw material to the wine-making center was ensured. Once they get there, the grapes are subjected to qualitative and quantitative reception. After the destemming and crushing of the grapes, the short-term maceration-fermentation takes place. The must has been pressed with a hydraulic press. The must obtained without pressing the grapes, and the resulting press must, was placed in 50L glass containers where it was left for fermentation process.

After completion of the alcoholic fermentation, the wine is filtered through sterile plates. Following these operations, 22 L of wine were obtained and it was sulfated with a 1 mL / 0.75 L vial, 6% SO₂ solution and 220 mL of benonite was added (fig. 1).

The acquisition of these wine samples lasted 14 days, obtaining three variants of study.

For each sample taken after filtration and decarbonation of the sample, physicochemical analyzes (***) (2015), determination of flavor compounds and organoleptic analysis were performed.

The flavor compounds in these wines were identified using the Shimadzu GC-2010 equipment coupled with the QP2010 Plus spectrophotometer.

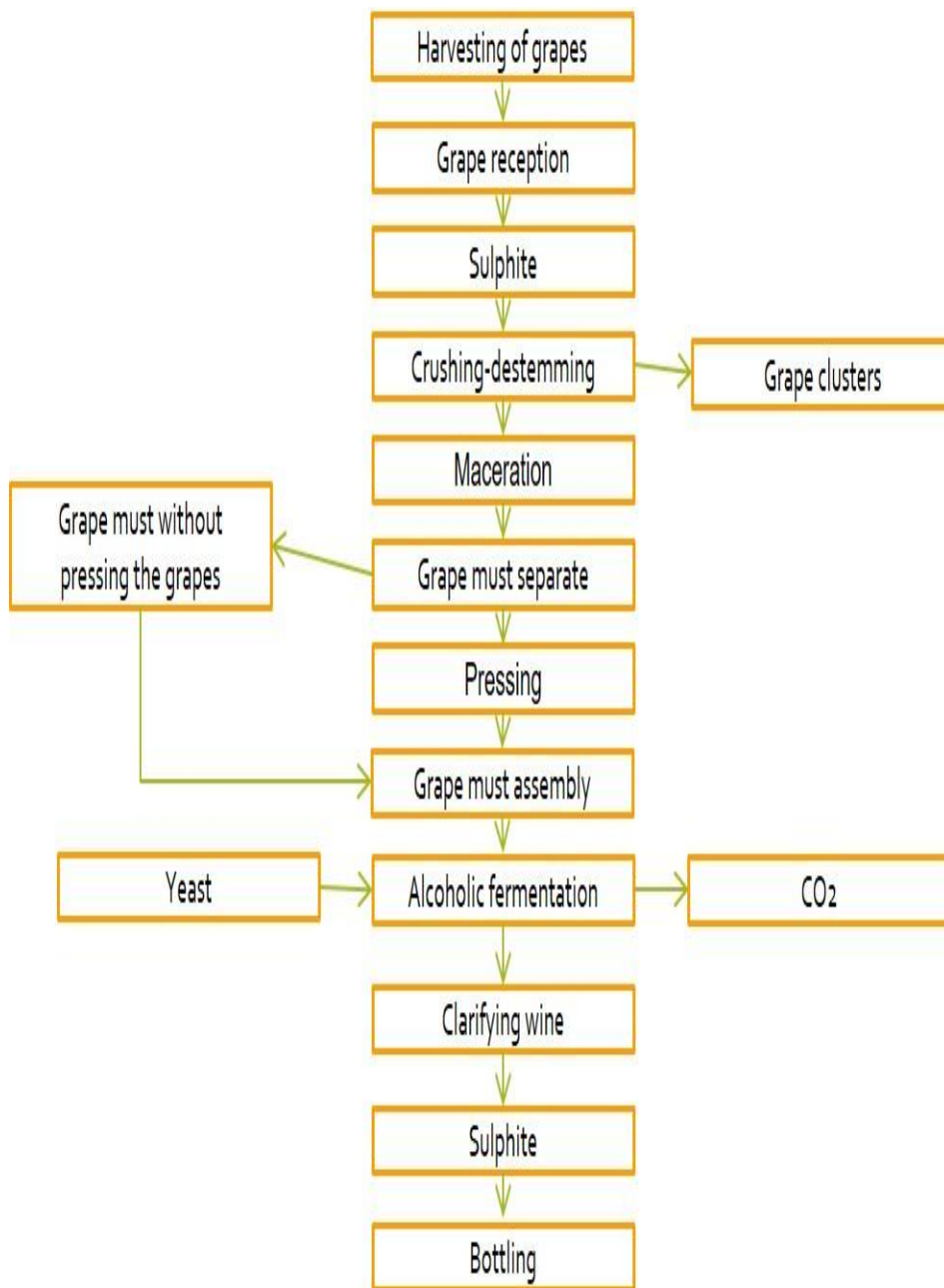


Fig.1 Flow diagram

RESULTS AND DISCUSSIONS

By analyzing the studies on the evolution of the chemical composition of the grapes, the winemakers have precisely established the time of harvesting the grapes, respectively the technological maturity.

The raw material used in the study comes from the Iași-Copou vineyard and belongs to the varieties: Fetească Neagră, Băbească Neagră and Merlot.

Even if grapes intended for winemaking had homogeneous composition characteristics, the composition of the wines is different due to the different varieties used.

The main physical-chemical parameters of the analyzed wine samples are shown in table 1.

Following these analyzes, terpenic compounds, alcohols (1-propanol, 3-methyl-1-butanol, etc.) and esters (ethyl caprylate, ethyl laurate, etc.) were identified in different amounts (tab. 2).

Terpenic compounds, alcohols and esters have been identified in varying amounts. Following this study, the wine obtained from the Fetească Neagră variety was found to have a higher content in terpenic compounds

Organoleptic analyzes highlighted the following:

- citrus flavor has been identified in all samples
- raw berry notes are more impressive than exotic fruits
- the most predominant flavor of the olfactory sensation, on the rosé wines that have been tasted, is the mineral.

From a taste standpoint, rosé wines that have been analyzed from this point of view have been well structured, have a strong acidity and significant persistence.

Table 1

The physico-chemical characteristics of the rosé wines analyzed

Sample	Alcohol (% vol.)	T.A. (g/L acid tartic)	V.A. (g/L acid acetic)	Density (g/cm ³)	pH	Malic acid (g/L)	Lactic acid (g/L)	Fructose (g/L)	Glucose (g/L)	Sugar (g/L)
BN	12.7	6.8	0.47	0.9951	3.25	2.3	0	9.7	1.2	11.9
M	13.1	5.7	0.31	0.9937	3.39	1.6	0	8.4	0.2	9.2
FN	13.9	6.2	0.3	0.9908	3.52	2.3	0	1.4	0.5	3.3

VA - (volatile acidity); TA – (total acidity)

Table 2

Aroma compounds identified in rosé wines

Flavor	Aroma compound	BN	M	FN
smell of alcohol	1-Propanol, 2-methyl- (CAS) Isobutyl alcohol	X	X	/
	2-Pentanol, 4-methyl- (CAS) 4-Methyl-2-pentanol	X	X	X
	2-Pentanol, 4-methyl	X	X	X
	1-Butanol, 3-methyl	X	X	X
	4-Heptanol, 2,6-dimethyl	X	X	/
fruity, fresh	Octanoic acid, ethyl ester	X	X	X
	1-Hexanol	/	/	X
	Propanoic acid, 2-hydroxy-, ethyl ester	X	/	/
fruity	Ethyl butyrate	X	X	X
	Propanoic acid, 2-hydroxy-, ethyl ester	/	X	/
animal smell	ETHYL CAPRATE	X	X	/
swety, cheesy	HEXANOIC ACID	X	/	/
lemon	LINALOL	/	/	X
lime, roses	NEROL	/	X	X
citrus	GERANIOL	/	/	X
	Hexadecanoic acid, ethyl ester (CAS) Ethyl palmitate	X	X	X

BN-Băbească Neagră; M-Merlot; FN-Fetească Neagră

CONCLUSIONS

Experimental variants that have been studied have different physico-chemical properties because wine samples obtained from different varieties have been used.

From a chemical point of view, these wines come closer to white wines with a lower alcoholic strength, lower irreducible extract and adequate total acidity.

In the case of the Fetească de Neagră, there were identified aroma compounds from the terpene group (linalool, nerol, geraniol).

The aromatic profile of the wines was influenced by the vine variety, the maturity of grapes at harvest, the activity of yeasts, the preference and aging procedures. Through this study, it was observed that all analyzed wine samples showed a high degree of acidity, with a well-developed structure and a high level of persistence.

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