

STUDY REGARDING THE INFLUENCE OF SOME OENOLOGICAL PRODUCTS USAGE ON WINE'S CHROMATIC PARAMETERS

STUDIUL PRIVIND INFLUENȚA UNOR PREPARATE OENOLOGICE ASUPRA PARAMETRILOR CROMATICI LA VINURILE DE COTNARI

*GHERGHINĂ Nicoleta*¹, *COTEA V.V.*¹, *TUDOSE SANDU-VILLE ST.*¹,
*COLIBABA Cintia*¹, *NICULAU M.*²,

¹University of Agricultural Sciences and Veterinary Medicine Iași, Romania

²Research Centre for Oenology - Iași branch of Romanian Academy²

Abstract. *In the present study, the influence exerted by utilizing certain oenological products on white Frâncușă, Fetească albă, Grasă de Cotnari and Tămâioasă românească wines from The Cotnari vineyard during the 2009 harvest has been observed. The oenological products considered for this study were selected yeasts, nutrients, clearing enzymes and extraction enzymes. The obtained experimental variants were subjected to a spectrophotometric analysis method – Cie-lab 76 colour space in visible spectrum. The analysed chromatic parameters were: **L** (for luminosity or psychometric clarity), **a** and **b** for the color-opponent dimensions (red-green and yellow-blue) and **C** (chromaticity or colour saturation), based on non-linearly compressed CIE XYZ colour space coordinates. One noticed that the chromatic parameters varied with the different oenological product used.*

Key words: Cotnari, selected yeasts, enzymes, nutrients.

Rezumat. *În studiul de față s-a urmărit influența pe care o exercită utilizarea unor preparate oenologice asupra parametrilor de culoare la vinurile albe obținute din soiurile Frâncușă, Fetească albă, Grasă de Cotnari și Tămâioasă românească din podgoria Cotnari, recolta 2009. Preparatele oenologice luate în studiu au fost: levuri selecționate, nutrienți, enzime de limpezire și enzime de extracție. La variantele obținute s-au analizat spectrele de absorbantă în domeniul vizibil pe baza cărora s-au calculat componentele culorii prin metoda Cie-Lab 76. Parametrii cromatici analizați au fost: **L** (luminozitatea sau claritatea psihometrică), **a** (coordonata culorilor complementare roșu-verde); **b** (coordonata culorilor complementare galben-albastru); **C** (cromaticitatea sau saturația culorii). S-a constatat că parametrii cromatici s-au comportat în mod diferit în urma administrării produselor oenologice.*

Cuvinte cheie: Cotnari, levuri selecționate, enzime, nutrienți.

INTRODUCTION

Colour is a very important quality trait, being the first choice criteria in consumer wine choice. The main role in defining grape and wine colour is achieved by anthocyanins, tannins and flavonoids (Cotea V. D., Zănoagă C. V., Cotea V.V., 2009). When it comes to colour there are two types of wine: white and red, depending on the original grapes. There is also an intermediary category, rose wines, that have a lower phenolic content compared to red wines. The white wines colour is due to the presence of flavonoids (yellow pigments) and

hidroxicynamic phenolic acids that are being accumulated in the grapes. The colour hues differ: white, green-white, yellow-/white, yellow, green-yellow, golden yellow and correspond to the absorbed radiations from the visible light spectrum with wavelength between 400-480 nm (Țârdea C., 2007).

The present study follows the way that certain oenological products (selected yeasts. Enzymes or nutrients) influence the chromatic parameters for white wines obtained from Frâncușă, Fetească albă, Grasă de Cotnari and Tămâioasă românească grape varieties from Cotnari vineyard, 2009 harvest.

MATERIAL AND METHOD

Grape harvest took place in September 2009. The main grape compositional characteristics are presented in table 1.

Table 1

Main grape compositional characteristics

No.	Grape variety	Sugars g/L	Total acidity g/L C ₄ H ₆ O ₆
1	Frâncușă	195	9,15
2	Fetească albă	197	8,54
3	Grasă de Cotnari	208	8,20
4	Tămâioasă românească	202	8,75

The wines were obtained by using white dry wine processing technology (Cotea V., 1985), with the specification Grasă de Cotnari and Tămâioasă românească grape varieties were subjected to an 8-10 hours maceration process with the Vulcazym arome extraction enzyme (2 g/hL), with the exception of the control sample.

The studied variants for Frâncușă were the following:

M – spontaneous fermentation (control sample);

V₁ - selected yeasts were added to the must (IOC Expression) - 15 g/hL;

V₂ - selected yeasts were added to the must (IOC Expression) - 15 g/hL and nutrient (Fermoplus integrateur) - 35 g/hL;

V₃ - selected yeasts were added to the must (IOC Expression) - 15 g/hL, and nutrient (Fermoplus integrateur) - 35 g/hL. Also clearing enzymes (Pecvine V) were added to grapes 3 g/100 kg;

V₄ - selected yeasts were added to the must (Zymaflore X 5) - 20 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL. Also clearing enzymes (Pecvine V) were added to grapes 3 g/100 kg;

The studied variants for Fetească albă were the following:

M - spontaneous fermentation (control sample);

V₁ - selected yeasts were added to the must (Zymaflore X 16) - 20 g/hL;

V₂ - selected yeasts were added to the must (Zymaflore X 16) - 20 g/hL and nutrient (Fermoplus integrateur) - 35 g/hL;

V₃ - selected yeasts were added to the must (Zymaflore X 16) - 20 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL. Also clearing enzymes (Pecvine V) were added to grapes - 3 g/100 kg;

V₄ - selected yeasts were added to the must (IOC Expression) - 15 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL. Also clearing enzymes (Pecvine V) were added to grapes - 3 g/100 kg.

The studied variants for Grasă de Cotnari were the following:

M - spontaneous fermentation, without using extraction enzymes, but with a 8-12 hours maceration process (control sample);

V₁ - selected yeasts were added to the must (Cross Evolution) - 20 g/hL;
V₂ - selected yeasts were added to the must (Cross Evolution) - 20 g/hL and nutrient (Fermoplus integrateur) în doză de 35 g/hL;

V₃ - selected yeasts were added to the must (Cross Evolution) - 20 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL and clearing enzymes (Zymoclaire CG) - 1,5 g/hL;

V₄ - selected yeasts were added to the must (Zymaflore X 16) - 20 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL and clearing enzymes (Zymoclaire CG) - 1,5 g/hL.

The studied variants for Tămâioasă românească were the following:

M - spontaneous fermentation, without using extraction enzymes, but with a 8-12 hours maceration process (control sample);

V₁ - selected yeasts were added to the must (Fermol aromatic) - 25 g/hL;

V - selected yeasts were added to the must (Fermol aromatic) - 25 g/hL and nutrient (Fermoplus integrateur) - g/hL;

V₃ - selected yeasts were added to the must (Fermol aromatic) - 25 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL and clearing enzymes (Zymoclaire CG) - 1,5 g/hL;

V₄ - selected yeasts were added to the must (Zymaflore X 5) - 20 g/hL, nutrient (Fermoplus integrateur) - 35 g/hL and clearing enzymes (Zymoclaire CG) - 1,5 g/hL.

After the alcoholic fermentation, the wines were separated from the lees deposited, filtrated, sulphitated and bottled.

The colour components were calculated based on the absorbency spectrum recorded in the visible domain (VIS) with an Analytik Jena S-200 spectrophotometer attached to a computer, by using a glass vat with 1 cm optical length; The retention time was 0,1 s, while $\Delta\lambda = 1$ nm. The absorbance spectrae were numbered and quantified using an "VINCOLOR" programme, upgraded by the research team in order to obtain L, a, b and C chromatic parameters according to CIE Lab 76 analysis method.

The chromatic parameters analysis was conducted in January-February 2010 in the Oenology Laboratory of the University of Agricultural Sciences and Veterinary Medicine „Ion Ionescu de la Brad“ Iași.

RESULTS AND DISCUSSIONS

From the data presented in table 2, one can extract the influence of certain oenological products on the chromatic parameters of the obtained wines.

It was noticed that the used oenological products (selected yeasts, enzymes and nutrients) lead to a decrease of the **L** (luminosity) parameter, in comparison to the control sample for all the studied variants. It was also noticed that the selected yeasts increased the **a** (red green complementary colour coordinate) parameter for the variants obtained from Fetească albă grape variety and lead to a decrease for the other varieties, fact due to the specificity of the grape sort. In the case of **b** (yellow blue complementary colour coordinate) and **C** (chromaticity or colour saturation) parameters, higher values were recorded compared to the control sample in all of the experimental variables.

Due to nutrient addition (Fermoplus integrateur) **a** parameter registered an increase in the studied samples, except the one obtained from Fetească albă; **b** and chromaticity (**C**) parameters increased in the variants of Fetească albă and Tămâioasă românească and decreased in the samples made from Frâncușă and Grasă de Cotnari grape varieties.

The clearing enzymes lead to a decrease of the **a** parameter for the Grasă de Cotnari grape variety, (for the other ones one noticed an increase) and an increase of **b** and **C** parameter values for all the values of the four grape sorts.

Table 2

Influence of certain oenological products on the chromatical parameters of Cotnari wines

No	Grape variety	Sample	Clarity L	Colour coordinates		Saturation C
				a red-green-	b yellow-blue-	
1	Frâncușă	M	99,4	-0,28	2,07	2,09
2		V ₁	99,2	-0,33	2,79	2,81
3		V ₂	99,1	-0,36	3,29	3,31
4		V ₃	99,1	-0,36	3,32	3,34
5		V ₄	99,2	-0,51	3,4	3,44
6	Fetească albă	M	100	-0,49	2,02	2,08
7		V ₁	99,7	-0,39	2,72	2,75
8		V ₂	99,7	-0,45	2,89	2,9
9		V ₃	99,4	-0,37	3,4	3,42
10		V ₄	99,3	-0,28	3,5	3,51
11	Grasă de Cotnari	M	99	-0,41	3,58	3,6
12		V ₁	98,7	-0,47	4,77	4,79
13		V ₂	98,7	-0,43	3,03	3,07
14		V ₃	98,9	-0,64	4,13	4,18
15		V ₄	98,8	-0,41	3,99	4,01
16	Tămâioasă românească	M	99,5	-0,5	3,39	3,43
17		V ₁	99,2	-0,62	4,22	4,26
18		V ₂	99,3	-0,55	3,76	3,8
19		V ₃	99	-0,46	4	4,03
20		V ₄	99,3	-0,55	3,61	3,65

CONCLUSIONS

1. The selected yeasts highlight the oenological potential for the processed grapes.

2. The nutrients add to the differentiation of the wines' sensory profiles in relation to the initial musts, technological conditions and olfactory-gustatory characteristics that must be found in the obtained wines.

3. Enzymes allow an enrichment of the colour of wines, extraction and superior varietal aromas.

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