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THE WINEMAKING TECHNOLOGY INFLUENCE ON CHEMICAL COMPOSITION OF BĂBEASCĂ NEAGRĂ RED WINES

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Abstract

In the present study it's evaluated the winemaking technology influence on chemical composition of Băbească neagră red wines obtained from grapes produced in Pietroasa and Odobeşti wine-growing centers. Wine samples were produced at USAMV Bucharest in six technological variants for each centre (V1 = control, V2 = selected yeast Lalvin BM 45 + chips, V3 = selected yeast Lalvin BM 45 + enzyme, V4 = selected yeast Lalvin BM 45 + enzyme Lallzyme OE + chips, V5 = selected yeast Lalvin BM 45+ enzyme Lallzyme OE + tannin Limousine, V6 = selected yeast Lalvin BM 45 + enzyme Lallzyme OE + tannin Tostato), with three repetition for each variant. The results were reported as means of all repetitions.
Acidity analysis of studied variants showed a maximum value (8,26 g/l tartaric acid) on V6 variant (selected yeast Lalvin BM 45 + enzyme Lallzyme OE + tannin Tostato) and a minimum (6,49 g/l tartaric acid) value on V1 (control). Regarding alcohol content, the maximum value (11,16 % vol/vol) is recorded at V2 variant (selected yeast Lalvin BM 45 + chips) and minimum value (9,91 % vol/vol) at V5 variant (selected yeast Lalvin BM 45+ enzyme Lallzyme OE + tannin Limousine). The physico-chemical analyses of the produced wines showed that the winemaking technology applied has a big influence on analyzed chemical parameters (acidity, alcohol, dry content, colour hue and intensity). We may also say that the wine-growing area has influence on chemical composition of studied wines.

Keywords: Băbească neagră, red wine, winemaking technology, chemical composition

1. INTRODUCTION

Băbească Neagră is an old autochtonous variety spreaded especially in Moldova vineyard (Odobeşti, Costeşti, Panciu, as well as other vineyard from the same region). The grapes are branchies, medium round beans, flattened, black – blue colour.

Băbească Neagră

They reach to fully maturity in the second half of september. Medium quantity of sugar content accumulated is 180-210 g/l; the acidity is moderate, 8.,1-8.4 g/l H_2SO4. The obtained wines are high quality, current consumption; they also may be used to obtain sparkling wine and wine-distillates. They have a lively red colour, with brilliant hue, they are easy and fruity with an equilibrate acidity. With controled origin are the Băbească neagră wines obtained from grapes cultivated at Nicoreşti vineyard, but the ones from Odobeşti, Coteşti and Panciu have also a good reputation. The present paper present a set of wines produced from grapes of two different winegrowing region (Pietroasa and Odobeşti), assessing the differences induced by winemaking technologies and geographic area.

2. MATERIAL AND METHOD

The analyzed wines were produced at USAMV Bucharest in six technological variants for each center, with three repetitions for each variant (Table 1). The physico-chemical parameter were determined using standard anlysis methods. Colour characteristics were tested using Specord 250 spectrophotometer. The results of physico-chemical analysis of the 18 variants of studied wines are reported as means of all repetions and presented in table 2.

Table 1. Technological variants for Băbească neagră wine samples

Winegrowing region	Variant	Type of oenological material used	Dosage and time of addition
Odobeşti	BNO1 (r1, r2,r3)	selected yeast Lalvin BM45	30 g/hl yeast (in the beginning of fermentation)

	BNO2 (r1, r2,r3)	selected yeast Lalvin BM45 + oak chips	30 g/hl yeast + 250 g/hl oak chips (after fermentation, contact 3-5 weeks)
	BNO3 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE	30 g/hl yeast + 2 g/hl enzyme (in the beginning of fermentation)
	BNO4 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + oak chips	30 g/hl yeast + 2 g/hl enzyme + 250 g/hl oak chips (after fermentation, contact 3-5 weeks)
	BNO5 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + tannin Limousine	30 g/hl yeast + 2 g/hl enzyme + 20 g/hl tannin Limousine (after fermentation)
	BNO6 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + tannin Tostato	30 g/hl yeast BM45 + 2 g/hl enzyme + 10 g/hl tannin Tostato (after fermentation)
Pietroasa	BNP1 (r1, r2,r3)	selected yeast Lalvin BM45	30 g/hl yeast (in the beginning of fermentation)
	BNP2 (r1, r2,r3)	selected yeast Lalvin BM45 + oak chips	30 g/hl yeast + 250 g/hl oak chips (after fermentation, contact 3-5 weeks)
	BNP3 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE	30 g/hl yeast + 2 g/hl enzyme (in the beginning of fermentation)
	BNP4 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + oak chips	30 g/hl yeast + 2 g/hl enzyme + 250 g/hl oak chips (after fermentation, contact 3-5 weeks)
	BNP5 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + tannin Limousine	30 g/hl yeast + 2 g/hl enzyme + 20 g/hl tannin Limousine (after fermentation)
	BNP6 (r1, r2,r3)	selected yeast Lalvin BM45 + enzyme Lallzyme OE + tannin Tostato	30 g/hl yeast BM45 + 2 g/hl enzyme + 10 g/hl tannin Tostato (after fermentation)

Table 2. Principal physico – chemical parameters (average)

Sample	Acidity g/l tartaric acid	Alcohol vol./vol %	Dry content g/l	Color intensity ICM = D420+D520+ D620	a	b
BNO1	6.4908	11.09	29.06	2.01	11.7377	0.7404
BNO2	6.9486	11.16	28.83	1.56	11.3834	0.5482
BNO3	7.9111	10.06	46.73	2.14	17.5125	-0.9757
BNO4	7.6998	9.95	47.76	2.15	17.1968	-1.0173
BNO5	7.9815	9.91	50.15	2.24	17.6486	-0.923
BNO6	8.2632	10.42	43.78	2.15	17.3558	-0.7208
BNP1	6.3383	13.53	22.90	2.11	17.112	-1.4474
BNP2	6.1739	13.57	22.55	1.9	15.0519	-0.9314
BNP3	6.9956	13.25	24.35	2.26	18.4438	-1.3355
BNP4	7.1599	13.31	24.15	2.6	21.2893	-1.5025
BNP5	7.2773	13.22	24.10	2.57	20.6862	-1.2676
BNP6	7.3712	13.21	25.08	2.58	21.0226	-1.4006

3. RESULTS AND DISCUSSIONS

A very obvious difference due to production region is the acidity of the samples, which is strictly correlated with the geographical area, more than with the winemaking technology.

Acidity analysis of tested samples relieve for Odobeşti center a maximum of 8,26 g/l tartaric acid on V6 variants (selected yeast + enzyme + tannin Tostato) and a minimum of 6,49 g/l tartaric acid on V1 variant (control).

For Pietroasa region the maximum is registered on V6 variant (selected yeast + enzyme + tannin Tostato) and the minimum of 6,17 g/l tartaric acid, on V2 variant (selected yeast + oak chips).

Figure 1 present an increase of acidity starting from V3 variant, when the enzyme was added.

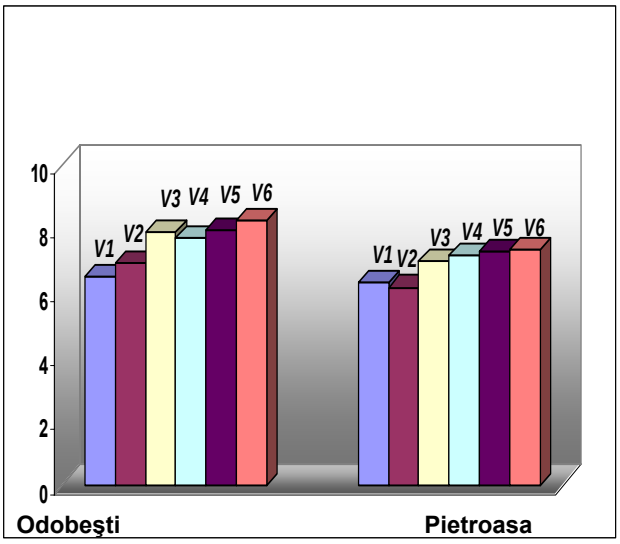

Figure 1. Winemaking technologies influence on tested samples acidity

Regarding alcohol content (Figure 2) in the grafic we can see a decrease of it starting V3 variant (selected yeast + enzyme), comparative with V1 variant (control). The highest values of alcohol content is recorded by wines obtained from grapes cultivated at Pietroasa center, with a mean value of 13.35%v/v and the lowest values are recorded by wines obtained from grapes cultivated at Odobeşti center, with a mean value of 10.43%v/v.

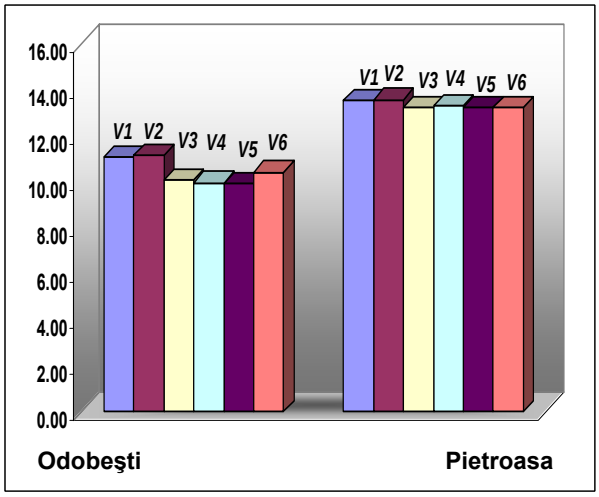

Figure 2. Winemaking technologies influence on tested samples alcohol content

Analyzing the obtained results we may see that the the highest values for dry content are recorded by wines obtained from grapes cultivated at Odobeşti center, with a mean value of 41.05 g/l and the lowest values are recorded by wines obtained from grapes cultivated at Pietroasa center, with a mean value of 23.86 g/l. Regarding the technological variants we may see increase of dry content value starting V3 variant (selected yeast + enzyme) comparative with control variant V1.

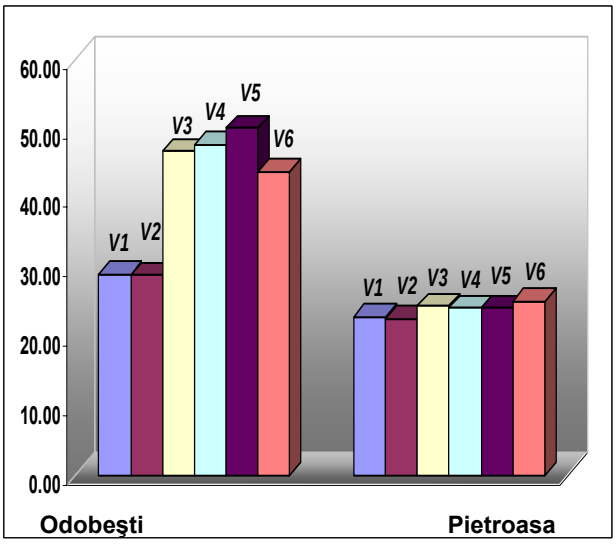

Figure 3. Winemaking technologies influence on tested samples dry content

In the case of colour intensity ICM the highes values are recorded on V5 variant (selected yeast + enzyme + tannin Limousine) by wines obtained from grapes cultivated at Odobeşti center and on V4 variant (selected yeast + enzyme + oak chips) by wines samples from Pietroasa center. The lowest values are recorded on V2 variant (selected yeast + oak chips) by wines obtained from grapes cultivated both at Odobeşti and Pietroasa center.

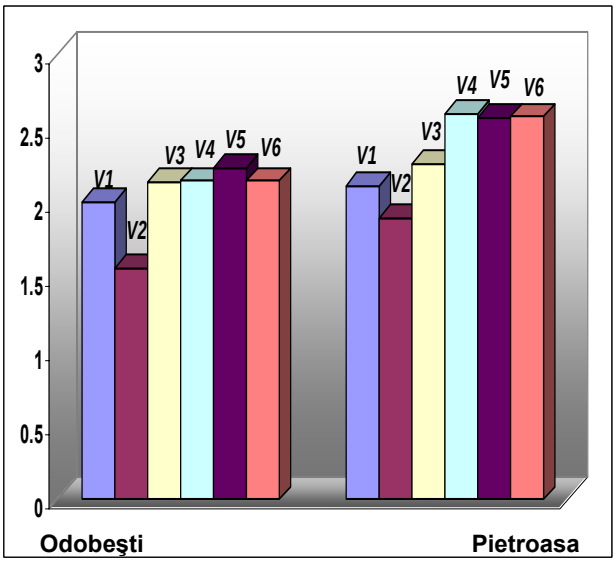

Figure 4. Colour intensity ICM of tested sample

The spectrophotometric analysis showed high values both for red component (a positive) of the colour and for the blue one (b negative) in both wine-growing region.
The ratio of the *a* and *b* colour parameters places the wines from Pietroasa center close to the ones from Odobeşti.

4. CONCLUSIONS

The analysis of Băbească neagră wines from the two wine-growing center shows that both winemaking technology and wine-growing region has a big influence on chemical composition and colour parameters of wines.
More obvious than winemaking technology is the influence of geographic area.
The obtained results shows that the enzyme added starting V3 variant has a big influence on physico-chemical caracteristics and colour parameters of analyzed wines.

5. REFERENCES

[1] A. Zalacain, J. Marín, G.L. Alonso and M.R. Salinas, Analysis of wine primary aroma compounds by stir bar sorptive extraction, Talanta, volume 71, issue 4, pag. 1610-1615, 2007.
[2] Bertrand A., Influence de la clarification de mout sur la production des aromes, Actualitees Oenologioues et Viticoles, 269-270, Dunod, Paris, 1981.
[3] Bertrand A., Beloqui M.A.A., Les enzimes a activite secondaire appliquees a l'expression aromatique des cepages, Bordeaux Cite mondiale, 1996.
[4] Bertrand, A., Mesure de la couleur, F.V. Nº 1014, O.I.V., Paris, 1996.
[5] Darriet P., Etat de nos connaissances sur l'arome et les precurseurs d'arome du Sauvignon, Lallemand vol. 4 – Les aromes du vin. Caracterisation et genese., Toulouse, 1996.
[6] J. Bakker and G. M. Arnold, Analysis of Sensory and Chemical Data for Color Evaluation of a Range of Red Port Wines, Am. J. Enol. Vitic. 44:1:27-34, 1993.
[7] James A. Kennedy, Jordan Ferrier, James F. Harbertson and Catherine Peyrot des Gachons, Analysis of Tannins in Red Wine Using Multiple Methods: Correlation with Perceived Astringency, Am. J. Enol. Vitic. 57:4:481-485, 2006.
[8] Soares, D., Spectrocolorimetry in wines, F.V. Nº 1017, O.I.V., Paris, 1996.
[9] Zambonelli C., Tini V., Castellari L., Guida all'uso dei Lieviti selezionati in oenologia, Calderini edagricole, Bologna, 2000.
*** Catalog produse oenologice Lallema