

STUDY REGARDING THE VALORIFICATION OF LOCAL BABEASCA NEAGRA GRAPES BY DIFFERENT TECHNOLOGICAL VARIANTS OF MACERATION FERMENTATION IN MOLDAVIA VINEYARDS

STUDIUL PRIVIND VALORIFICAREA STRUGURILOR DIN SOIUL AUTOHTON BĂBEASCĂ NEAGRĂ PRIN DIFERITE VARIANTE TEHNOLOGICE DE MACERARE-FERMENTARE ÎN PODGORIILE DIN MOLDOVA

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***Abstract.** The present paper aims at comparing the wines obtained by different maceration fermentation methods, from the local Băbească neagră grape sort. The study took place at the Oenology Laboratory of the University of Agricultural Sciences and Veterinary Medicine Iași. The study presents comparative data of wines obtained through different technologies permitting the identification of optimum wine making procedures that will improve the palette of Romanian red wine and underline at the same time the oenological potential of autochthonous grape sort Băbească neagră.*

Key words: Băbească neagră, maceration, anthocyanins, phenolic compounds

***Rezumat.** Studiul privind variantele tehnologice de producere a vinurilor roșii din soiul românesc Băbească neagră cultivat în podgoriile din Moldova s-a efectuat la Laboratorul de Oenologie al Facultății de Horticultură, din cadrul Universității de Științe Agricole și de Medicină Veterinară Iași în perioada 2008-2009. În studiul de față se prezintă date comparative privind vinurile obținute prin diferite variante de vinificație ce permit stabilirea variantelor tehnologice optime din punct de vedere calitativ în vederea îmbunătățirii sortimentului de vinuri roșii, precum și evidențierea potențialului oenologic al acestui soi autohton valoros, cu scopul promovării lui pe piața mondială a vinului.*

Cuvinte cheie: Băbească neagră, macerare, antociani, compuși fenolici

INTRODUCTION

The present paper aims at comparing the wines obtained by different maceration fermentation methods, from the local Băbească neagră grape sort. When taking into consideration that the 21st century is that of quality, different technological variants that can be used to obtain premium wines must be researched.

MATERIAL AND METHOD

Băbească neagră grapes have been used, harvest of 2008, Iași vineyard, Adamachi farm, Odobești, Panciu and Nicorești vineyards.

The grapes were manually harvested, in plastic buckets and transported to Iași Pilot Research Station where they were processed by different technologies.

Concerning the classical, thermo- and ROTO-tanks maceration, the grapes were first crushed and destemmed, the marc was homogenized. Marc processing was done differently:

In the case of classical maceration, selected yeasts of the *Saccharomyces cerevisiae* sort were added (30 g/100 kg) as well as pectolytic enzymes (1.5g/100 kg). Maceration-fermentation was performed in stainless steel tanks, for 120 hours, with pumping over twice a day. At the end of the maceration process, the marc was pressed by a pneumatic pump, the working pressure being no more than 2 atm. The obtained must has been kept in stainless steel tanks for finishing its alcoholic and malo-lactic fermentation. After finishing its malo-lactic fermentation, the wine was racked and conditioned as mentioned below at all variants obtained. Bottling was done after filtering.

When using thermo-maceration, the must was drawn separately from the rest of the marc and two thirds of it was heated up to 70°C and maintained at this temperature for 20 minutes, then mixed with the rest of the marc and after another 5 minutes, cooled back to medium temperature using the left third of the unheated must. Many studies have shown that heating the must at 70°C, for 15 – 30 minutes ends in a better anthocyanins extraction and also inactivates the oxidases (Cotea D.V., 1985).

When macerating in ROTO-tanks, the must was kept in stainless steel tanks for 72 hours, rotating them three times a day, 3 minutes/ rotation.

Carbonic maceration was applied to whole, healthy grapes, kept in a closed vessel, at its lower side with a grill that keeps them separated from must of the same grape sort with added yeasts, used for creating the necessary CO₂ atmosphere. The carbonic maceration process was considered finished when the grape skin was partially or totally discolored and the grape berries were easily crushed.

The selected yeast used was *Saccharomyces cerevisiae* BJ500, with the commercial name of Levoptime primeur, destined for young red wines that wish to enrich their expressivity and aroma.

The enzymatic treatment was done with Pectocor, while malo-lactic fermentation was obtained by adding *Oenococcus oeni* bacteria, commercial denomination Lactobacter SP 1.

RESULTS AND DISCUSSIONS

Physical-chemical analyses were done according to international standards.

It can be observed that the wines that were obtained by thermo-maceration qualify as quality wines with controlled origin denomination (in Iași, Panciu and Nicorești vineyards) with a maximum alcoholic concentration of 12.1% vol. for the Nicorești sample (tab.1).

When analyzing the wines obtained by ROTO-tanks maceration, the non-reducing extract has values of 20.5g/L - Odobești vineyard- and 22.5g/L - Nicorești vineyard- (tab.1).

The smallest values, meaning less extractive wines, were the ones obtained by carbonic maceration.

Table 1

Composition characteristics of wines obtained from Băbească neagră grape sort

No	Vineyard	Technological variant	Alc. conc. (% vol.)	T.A. (g/L C ₄ H ₆ O ₆)	Sugars g/L	N.R.E. (g/L)
1.	Iași	Classical maceration	11,3	7,6	4	21,4
2.		Thermo-maceration	11,61	8	2,2	21
3.		ROTO-tanks maceration	11,5	7,6	1,2	21,2
4.		Carbonic maceration	10,6	5,9	1,8	16
5.	Odobești	Classical maceration	10,5	7,6	3,8	20,6
6.		Thermo-maceration	10,6	7,8	2,6	21
7.		ROTO-tanks maceration	10,7	6,4	4,2	20,5
8.		Carbonic maceration	9,8	6,2	1,8	16
9.	Panciu	Classical maceration	11,63	7,6	2,6	22
10.		Thermo-maceration	11,7	7,8	1,8	22,4
11.		ROTO-tanks maceration	11,5	7,2	4,6	21,9
12.		Carbonic maceration	10,54	6,7	1,4	16,7
13.	Nicorești	Classical maceration	12	6,8	2,8	22,5
14.		Thermo-maceration	12,1	7,2	3,2	22,3
15.		ROTO-tanks maceration	11,9	6,4	1,8	22,5
16.		Carbonic maceration	10,6	5,8	1,6	16,4

Table 2

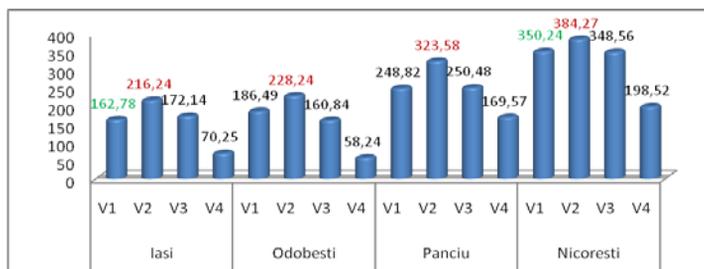
Phenolic compounds content in Băbească neagră wine

No.	Vineyard	Technological variant	Total phenolic compounds g/L	D ₂₈₀	I _{FC}
1.	Iași	Classical maceration	2,26	18,12	14,16
2.		Thermo-maceration	2,28	22,36	18,36
3.		ROTO-tanks maceration	2,24	19,84	16,26
4.		Carbonic maceration	1,14	12,21	9,26
5.	Odobești	Classical maceration	2,19	19,27	15,93
6.		Thermo-maceration	2,23	26,54	22,1
7.		ROTO-tanks maceration	2,16	23,1	18,26
8.		Carbonic maceration	1,27	12,53	9,64
9.	Panciu	Classical maceration	2,14	22,31	18,42
10.		Thermo-maceration	2,32	24,2	19,82
11.		ROTO-tanks maceration	2,19	21,96	17,43
12.		Carbonic maceration	1,18	11,34	8,93
13.	Nicorești	Classical maceration	1,92	29,85	24,72
14.		Thermo-maceration	2,31	31,25	23,96
15.		ROTO-tanks maceration	1,96	30,16	24,47
16.		Carbonic maceration	1,16	12,1	9,58

The anthocyanins content was between 162.78 mg/L (Iași) and 350.24 mg/L (Nicorești) in classical maceration wines. The maximum content of anthocyanins is 384.27 mg/L, found in wines obtained by thermo-maceration, from Nicorești vineyard (fig. 1).

Total phenolic compounds (tab. 2) are registered between 2.32 g/L in Panciu wines (thermo-maceration) and 1.14 g/L in Iași wines (carbonic maceration). The wines obtained by carbonic maceration are less astringent,

the values in table 1 reflecting the same aspect, presenting the smallest anthocyanins concentration (fig. 1).



V1 = classical maceration; V2 = thermo-maceration; V3 = ROTO-tanks maceration; V4 = carbonic maceration

Fig. 1. Anthocyanins content (mg/L) of Băbească neagră wine

CONCLUSIONS

Considering the harvesting climatic conditions of 2008, Băbească neagră produced quality wines in Nicorești and Iași vineyards, whereas in the other regions, it produced geographical indication wines.

The best quality results are given by thermomaceration, and then: roto-tanks maceration, classical maceration, carbonic maceration.

The optimal oenological potential of Băbească neagră is obvious in Iași, Panciu and Nicorești vineyards.

The wines obtained through carbonic maceration are less extractive with a lower anthocyanins content, this technique not being recommended in obtaining high quality wines from Băbească neagră grape variety.

REFERENCES

1. Cotea D.V., Barbu N., Grigorescu C., Cotea V.V., 2000 - *Podgoriile și vinurile României*. Editura Academiei Române, București.
2. Cotea D.V., 1985 - *Tratat de Oenologie*. vol. 1. Editura Ceres, București.
3. Cotea V.V., Cotea D.V., 2006 - *Tehnologii de producere a vinurilor*. Editura Academiei Române, București.
4. Macici M., 2008 - *Lumea vinurilor-Vinurile Lumii*. Editura Vreamea, București.
5. Pomohaci N., Stoian V., Gheorghită, M., Sîrghi C., Cotea, V.V., Nămoșanu I., 2000 - *Oenologie*, Vol. 1, *Prelucrarea strugurilor și producerea vinurilor*. Editura Ceres, București.
6. Pomohaci N., Cotea V.V., Popa A., Stoian V., Sîrghi C., Nămoșanu I., Antoce Arina, 2001 - *Oenologie*, Vol. 2, *Îngrijirea, stabilizarea și îmbutelierea vinurilor. Construcții și echipamente vinicole*. Editura Ceres, București.
7. Țârdea C., Sârbu G., Țârdea Angela, 2000 - *Tratat de vinificație*. Editura Ion Ionescu de la Brad, Iași.
8. Țârdea C., 2007 - *Chimia și analiza vinului*. Editura Ion Ionescu de la Brad, Iași.