

POTENTIAL OF PHENOLIC COMPOUNDS IN RED WINES FROM LOCAL VARIETIES

POTENȚIALUL COMPUȘILOR FENOLICI AL VINURILOR ROȘII DIN SOIURI AUTOHTONE

**OBADĂ Leonora¹, CIBUC Mariana¹,
GOLENCO Lidia¹, GROSU Olga¹, NEMȚEANU Silvia¹**
e-mail: oenologie_vdo@mail.ru

Abstract. For widening assortment of red wines, on study the possibility of using local red varieties. Significant for red wines is content in phenolic compounds - antocyanins and phenolic substances. In this context to the study were subjected wines made of 11 local varieties (Fetească Neagră, Rară Neagră, Codrinschi etc.) and cosmopolitan Merlot varieties under classic technology. The wines subject to investigations determined content of phenolic substances and antocyanins initially and over 6 and 11 months of storage. Research has shown that the initial content of phenolic substances depending on the variety ranges from 936 up to 3159 mg / l, and antocyanins - from 90 up to 793 mg / l. In all samples investigated, including the wine - Merlot witness, loss of phenolic substances predominate in the first 6 months of storage and then decreased intensity of this essential process. Unlike phenolic substances, decrease of anthocyanins in investigated wines, and in wine witness - Merlot has a higher intensity during storage at 6-11 months.

Key words: local varieties, phenolic compounds, antocyanins, phenolic substances.

Rezumat. Pentru lărgirea sortimentului de vinuri roșii se studiază posibilitatea utilizării soiurilor negre autohtone. Important pentru vinurile roșii este conținutul în compuși fenolici – substanțe fenolice și antociani. În acest context au fost supuse studiului vinurile obținute din 11 soiuri autohtone (Fetească Neagră, Rară Neagră, Codrinschi ș.a.) și soiul cosmopolit Merlot conform tehnologiei clasice. În vinurile supuse investigărilor a fost determinat conținutul în substanțe fenolice și antociani inițial și pe parcursul a 6 și 11 luni de păstrare. Cercetările au demonstrat că conținutul inițial în substanțe fenolice în funcție de soi variază de la 936 până la 3159 mg/L, iar în antociani – de la 90 până la 793 mg/L. În toate mostrele investigate, inclusiv și în vinul – martor Merlot, pierderile de substanțe fenolice predomină în primele 6 luni de păstrare, iar ulterior intensitatea acestui proces scade esențial. Spre deosebire de substanțele fenolice, diminuarea antocianilor în vinurile investigate, cât și în vinul – martor Merlot, este mai intensă în perioada de păstrare de la 6 la 11 luni.

Cuvinte cheie: soiuri autohtone, compuși fenolici, antociani, substanțe fenolice.

¹ Scientifico-Practical Institute of Horticulture and Food Technologies, Chișinău, R. Moldova

INTRODUCTION

Currently research is to broaden the assortment of red wines using indigenous varieties (Rusu E. et al., 2011). At the moment in Moldova assortment of varieties with black bean for wine is dominated by classic French varieties - Cabernet Sauvignon, Merlot, Pinot noir. However, our country has some local varieties, which in vision of researchers should present a strong interest for wine consumers (Apruda and Bereznicev, 2002). Their widespread use in wine-making would contribute to expanding the assortment of red wines and create identity of Moldovan red wines. From local black varieties can be useful for this purpose next varieties: Fetească neagră, Rară neagră and Codrinschi (Țuțuc et al., 1998).

Important for red wines is the color, which participates in the formation of grape phenolic compounds extracted by maceration-fermentation process. Quality of red wines, along with habitat and technological factors, depends largely on the used variety. Also highlights the black varieties each with a different content of phenolic compounds and are divided into varieties with potential biological and phenolic advanced coloring, with an average and poorly colored varieties (Rusu, 2006).

The present study aims to investigate the potential of phenolic compounds of red wines made from local varieties Fetească neagră, Rară neagră, Codrinschi, Negru de Căușeni, Kopceak, Negru de Akkerman, Seină, Brează, Bătută neagră, Ciorcuță neagră, Busuioacă de Bohotin and variety Merlot – control.

MATERIAL AND METHOD

Were subjected to experimental researches dry red wines made from local grape varieties harvested in the central region of the country, and the wines from variety Codrinschi from South (Pleseni) wine season of 2011. Samples were prepared in the section micro vinification of Practical Scientific Institute for Horticulture and Food Technology. Merlot wine served as a witness (control). The experimental wine samples were obtained according to the classical technology pulp maceration-fermentation at a temperature of 25-28 ° C for 5-8 days.

Phenolic substances were determined according to OIV method - with the Folin-Ciocalteu and anthocyanins with method of color stabilization of wine with acidified alcohol and colorimetric determination of optical characteristics (Gherjicova, 2002).

RESULTS AND DISCUSSION

Research results showed that dry red wines made from local varieties are distinguished from each other by different contents of phenolic substances and anthocyanins. Figure 1 shows graphically the initially content of these compounds in dry red wines undergo investigations.

It should be noted that wine from Codrinschi variety harvested in the South is characterized by the highest potential of phenolic substances - 3159 mg / L, followed by varieties Kopceak (2340 mg / L), Codrinschi of the Center and Negru de Căușeni (2048mg / L). The highest content of anthocyanins in mentioned wine varieties are recorded in the variety Negru de Căușeni - 793 mg /

L. In wines from variety Codrinschi, South and Kopceak, this index is 634 mg / L, and the wine from Codrinschi variety Center - 507 mg / L.

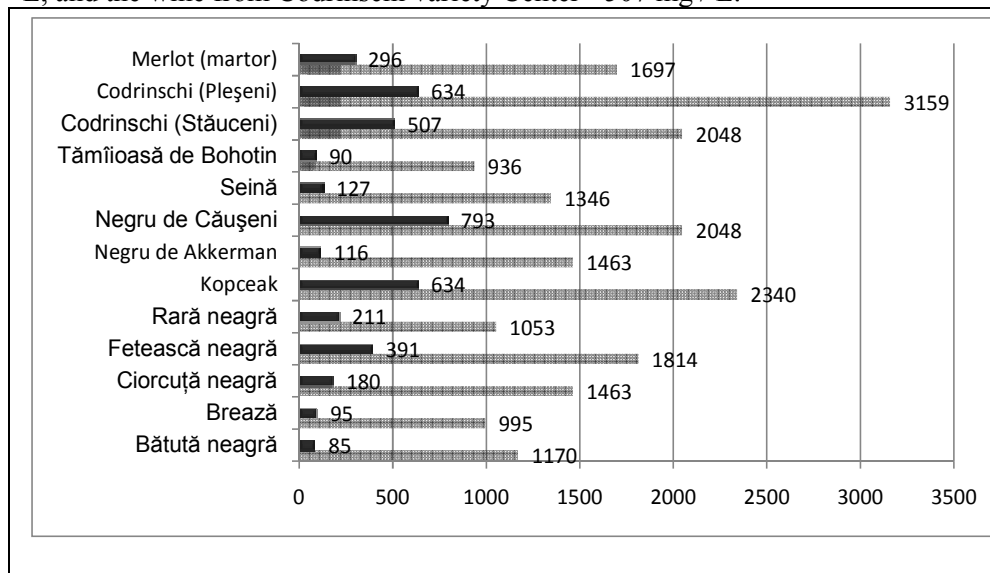


Fig. 1 - Phenolic substances and anthocyanin content of dry red wines from local varieties, harvest 2011

■ - anthocyanins, mg/L ▨ - phenolic substances, mg/L

Wine Fetească neagră has an average potential of phenolic compounds from 1814 mg / L- phenol substances and 391 mg / L anthocyanins, being placed closer to the control wine Merlot - 1697 and 296 mg / L - accordingly. Regarding wine from variety Rară neagră can be seen that it has a lower content of phenolic substances (1053 mg / L) and anthocyanins (211 mg / L) and is presented as a lighter red wine. And wine variety Busuioacă de Bohotin has poorest potential of phenolic compounds 936 mg / L- phenolic substances and 90 mg / L - anthocyanins. The lowest recorded potential of phenolic compounds in wines Bătută neagră, Brează, Seină and Negru de Akkerman.

Dynamics of phenolic compounds was studied during 6 to 11 months of storage of the investigated wines. Figure 2 reflected the dynamics of phenolic substances. Research has shown that after 6 months of storage the reduction of the phenolic substances ranging from 32.5 up to 48.7% compared with the initial. This index decreased by over 45% in wines Negru de Akkerman, Seină and Bătută neagră and in the control wine Merlot reduction of phenolic substances is average and is 39.5%. Phenolic substances diminishes less during 6 months of storage in wines Codrinschi (Stăuceni), Kopceac -32.5% and Negru de Căușeni - 34.4%. In wines Fetească neagră and Rară neagră this index is about 40%, ranking the control wine.

The obtained results show that the 6-month to 11-month period, the reduction intensity of the content of phenolic substances is slower and does not exceed 9.6% of their initial amount. In Merlot variety this index is 7%.

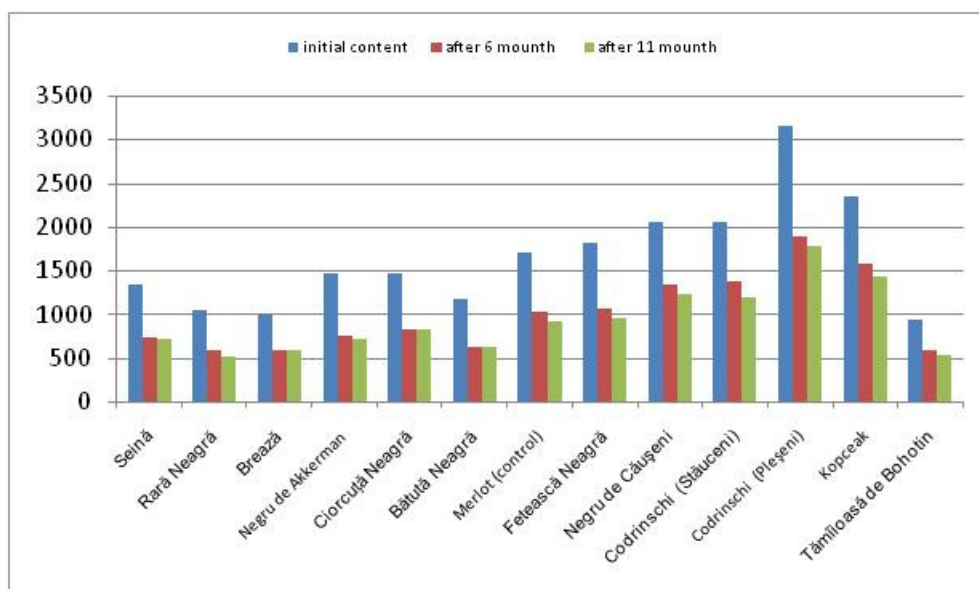


Fig. 2.- Dynamics of phenolic substances (mg / L) in red wines from local varieties over a 11 month period, the harvest of 2011.

In Figure 3 graphically are presented research results on the dynamics of anthocyanin content during a 11 month period.

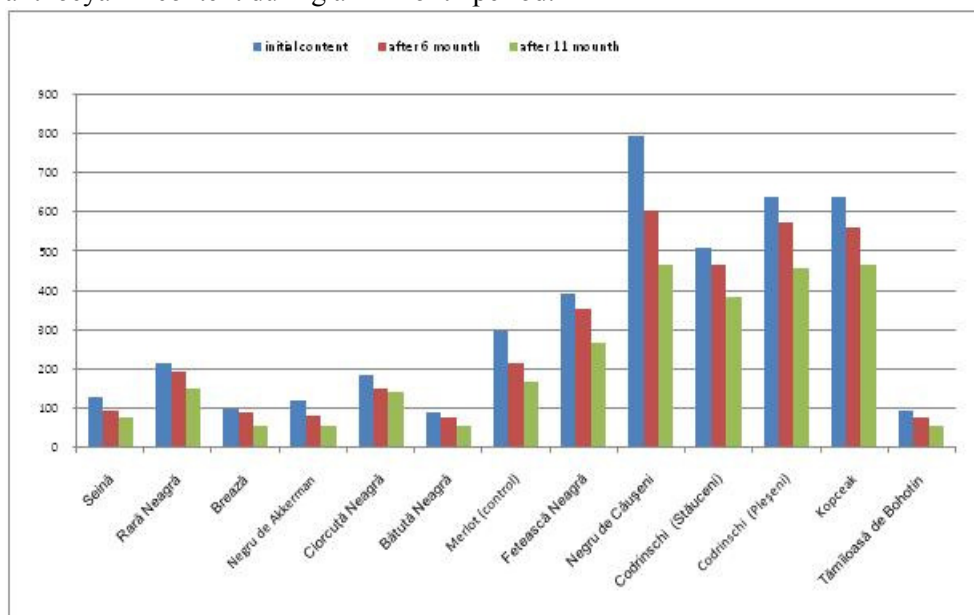


Fig. 3 - Dynamics of the colorants (mg / L) in red wines from local varieties over a 11 month period, the harvest of 2011

Data demonstrate that anthocyanin content decreases during the 6-11 month period, but the intensity decrease is different depending on the variety. After 6 months of storage the decrease of anthocyanins is distinguished by lower intensity and tends to reduce the maximum of the colorants in wines subject of research. The wines Codrinschi (Pleşeni) Kopceak, Fetească neagră, Rară neagră and Brează anthocyanins decreases by only 10.0 to 12.0% compared to the initial content. An important decrease of anthocyanins is recorded in wines Negru de Akkerman (31.9%), Seină (29.1%) and Negru de Căuşeni (24.1%).

The results obtained show that the retention period of 6-11 months in investigated wines anthocyanin content continues to decrease with a higher intensity than in the case of phenolic substances - from 6.1% to 33.7%. Thus in wine from variety Brează anthocyanins decreased rate of 33.7% in the second period to keep the wine Bătuță neagră - 24.7%, Fetească neagră - 21.8% and Busuioaca de Bohotin-23, 3%.

In variety Merlot in this period, the percentage decrease in anthocyanins was 15.9%. Research has shown that more instances are anthocyanins in wines wich had the lowest initial containing in these compounds - Brează, Bătuță neagră, Seină. Those wines are distinguished by a low content of phenolic substances.

Wines Fetească neagră, Codrinschi, Rară neagră and Kopceak characterized by greater stability of colorants, their total reducing being about 30.0% within 11 months of storage, while Merlot index is high and is 44.6%.

Based on research results it can be seen that the loss of phenolic substances and anthocyanins after 11 months of storage is an inevitable process that occurs both in red wines from local varieties, and in the control wine Merlot. The data correlate with the literature on loss of phenolic compounds in young red wines made from European varieties (Pomohaci et al., 2001; Valuico, 2011).

CONCLUSIONS

1. The investigated wine obtained from local varieties the phenolic compounds varies widely: phenolic substances - from 936 up to 3159 mg / L, and anthocyanins - from 90 up to 793 mg / L.

2. With a high content of phenolic substances and coloring are distinguished red wines from local varieties Codrinschi Pleşeni, Kopceak and Fetească neagră.

3. Variety Rară neagră is characterized by an average containing of phenolic compounds which can be obtained lighter red wines.

4. Bătuță neagră, Brează, Ciorcuță neagră, Seină and Negru de Akkerman have a low potential of phenolic compounds and can not be recommended for red wines.

5. Decrease over time of the content in phenolic compounds is an inevitable process that takes place both in wines from local varieties, and in the control wine Merlot.

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