MODERN PROCESSES RESEARCH OF ACCELERATED AGING INTO RED WINES PRODUCED IN „VALUL LUI TRAIAN" WINE REGION

CERCETĂRI PRIVIND PROCEDEELE MODERNE DE MATURARE ACCELERATĂ A VINURILOR ROŞII PRODUSE ÎN CENTRUL VITICOL „VALUL LUI TRAIAN"

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Abstract. *In present work there were studied two technological procedures of accelerated aging into red wines by maintaining of wine on oak chips from different geographical region and by adding of oenological tannin and their influence on polyphenolic complex of red wine, produced in „Valul lui Traian" wine region. It was noticed that Romanian and French chips using allow the best stabilization of color substances, but using the American chips increases the flavor. The adding of oenological tannin at aging period has the effect of color intensity and total polyphenolic index increasing and in consequence color stabilization by antocian-tannin complex forming, the aromatic profile has assessed insignificant.*
Key words: red wine, oak chips, oenological tannin, polyphenolic complex, color intensity.

Rezumat. *În lucrare sunt prezentate rezultatele studiului a două procedee tehnologice de maturare accelerată a vinurilor roşii prin menținerea vinului pe chips-uri de stejar de diferită proveniență geografică şi prin administrarea taninului oenologic, şi influența acestora asupra complexului polifenolic al vinului roşu, produs în centrul viticol „Valul lui Traian". Se constată că utilizarea chips-urilor româneşti şi a celor franceze permite cel mai bine stabilizarea substanțelor colorante, iar folosirea chips-urilor americane intensifică aroma. Administrarea în vin a taninului oenologic la etapa de maturare are ca efect creşterea intensității colorante, a indicelui IPT şi în consecință stabilizarea culorii prin formarea complecşilor antocian-tanin, profilul aromatic evoluând nesemnificativ.*
Cuvinte cheie: vin roşu, chips-uri de stejar, tanin oenologic, complex polifenolic, intensitate colorantă.

INTRODUCTION

The red wine with originality, flavor and delicate aroma can be obtained only by maturation and aging long enough properly.

Once formed, the wine enters in the maturation stage, where is continued a part of physico-chemical processes from the previous period of formation,

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supplemented by the complex chemical changes caused by the wood and oxygen's action on the wine.

As an alternative to traditional aging in oak barrels is considered the technology that provides maceration of oak materials as shavings, slides, chips and, more recently, the addition of liquid extracts from oak wood. These technologies allow the wine enrichment with substances from the oak wood. However, kinetics and extraction mechanism differ considerably from the classical method. (Cotea et al., 1988; Ribéreau-Gayon et al., 1998). Using the oak chips contribute to the wine enrichment with specific flavors derived from oak, to rounding and represents a simple technology that is easy to control at an attractive price.

Simultaneously with the oak using, another technology involves using of the purified oenological tannins for character conferring of "aging in oak barrels". The tannin intensifies the color and the phenolate flavor of red wines (Ţârdea et al, 2000).

To respond to the demand of red wines consumers from worldwide is imperative the research of modern accelerated aging methods, such as keeping the wine on oak chips or oak strips, micro-oxygenation of wine or oenological tannin adding.

MATERIAL AND METHOD

As an object of analysis was used Merlot, the quality wine raw material with Geographical Indication, produced in the wine region "Valul lui Traian", in which were added oak chips from France, USA, and Romania, as well as an ellagic tannin, sold local market.

In 4 Full Box recipients of 100 daL were added oak chips in 1,5 g/L doses.

In another batch of raw material wine was added ellagic tannin in the following doses: A -10 mg/L, B - 20 mg/L, C - 30 mg/L, D - 40 mg/L, E - 40 mg/L, F - 60 mg/L.

Then, every 10 days for 30 days of wine keeping on oak chips and after tannins adding were determined the basic physical-chemical indicators, the specific indicators by spectrophotometer method and organoleptic characteristics of wine.

The aim of present work consists in comparing of two technological methods of red wine accelerated aging, as oak chips and oenological tannin using

RESULTS AND DISSCUTIONS

The wine material raw Merlot taken for research presented the basic physico-chemical indicators from the table 1.

Table 1

The phisico-chemical indicators of wine material raw Merlot

Indicator	Alcohol conc., % vol.	Sugars, g/L	Titratable acidity, g/L tartaric acid	Volatile acidity, g/L acetic acid	Dry unreductibile extract, g/L	SO_2, total/free mg/L	Fe, mg/L
Values	11,8	2	6,2	0,53	18,2	120/23	7

Table 2 reflects the specific indicators of control sample:

Table 2

Specific indicators of raw material wine Merlot

Indicators	Total polipheno lic index, TPI	Phenolic compoun ds, mg/L	Anthocya ns, mg/L	Colour intensity, CI, units	Colour nuance, CN, units	Relation anthocyan s /tannins A/T * 100
Values	25	1070	98	0,942	0,645	9,16

During wine maintaining on the chips take place a series of physico-chemical reactions that lead to changes of red wine specific indicators, conditioned largely by the presence of both of its tannins as well as those extracted from oak wood. First, of course, increases the concentration of total phenol substances. Therefore, if the TPI value of control sample remains practically unchanged, in all versions take place the tannins accumulation, which causes some increase of TPI values (fig. 1).

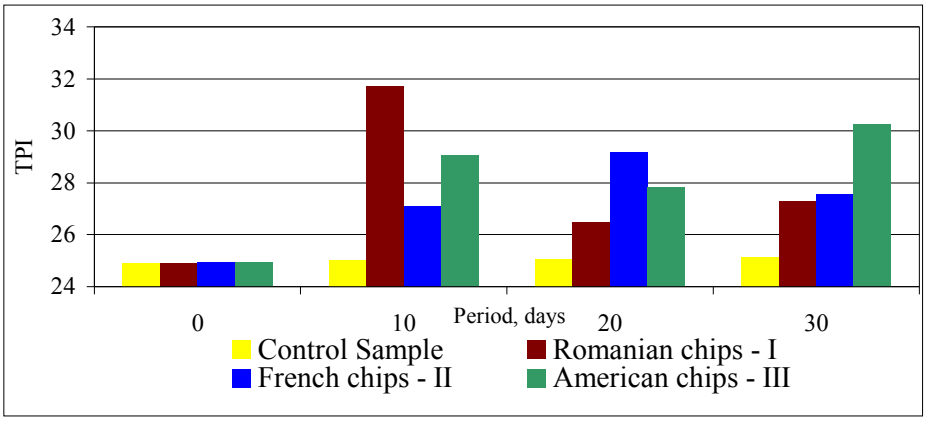

Fig. 1 - Evolution of total polyphenolic index on wine maintaning on oak chips

The concentration of phenol compounds increases after 10 days of keeping the wine on oak chips. The most intense extraction takes place from Romanian chips (I) and American (III), in which the TPI's values have increased by 27 and 12%, a slower extraction registering into sample II.

The highest values of TPI are recorded in samples III and II after a month of keeping the wine in contact with the oak chips. Therefore, it was observed that Romanian chips enrich wine with phenol compounds in higher proportions than those of French and American origin. These results confirm data previously obtained (Musteață et al., 2010).

At the same time, with phenol compounds accumulation and some complexes formation with other wine compounds it changes the color intensity of these. The value of color intensity increased by 0.2 units for all samples after 10

days. Color intensity remains virtually constant after 20 days, but on the 30th day it grows in all cases, the highest value recorded for the Romanian chips using.

Based on obtained results it was revealed that for maximum stabilization of color substances, as confirmed by the anthocyans / tannin relation (A / T), the optimal period of French and Romanian chips maintaining is reduced to 30 days, and for those American - 20 days (Musteață, 2010).

To compare two modern practices applied to red wine aging was added the oenological tannin extracted from oak wood in the same wine , in various doses recommended by the manufacturer and was followed the evolution of wine qualities in the same period. Evolution of the specific indicators is illustrated in figures 2-4.

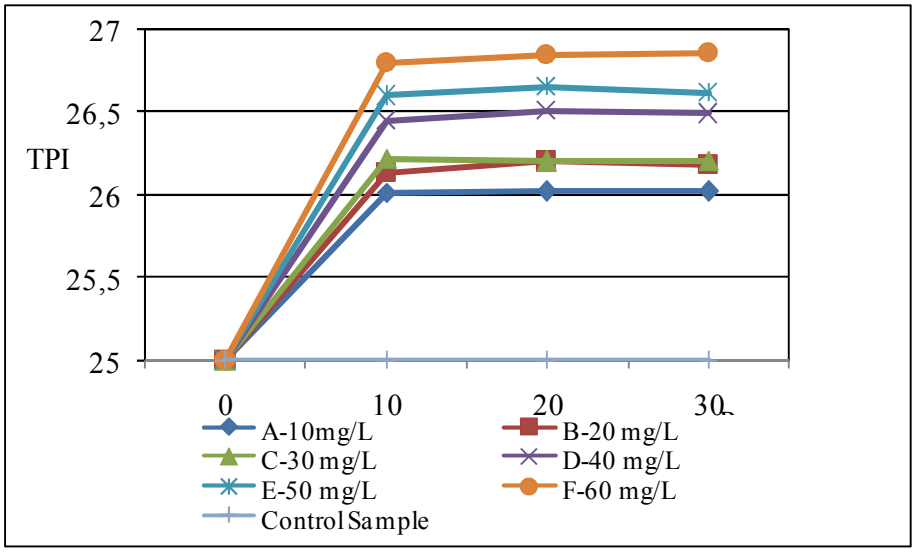

Fig. 2 - Evolution of the total poliphenolic index (TPI) on tannin adding in wine

Figure 2 shows the total polyphenolic index of the control sample remained virtually constant during 30 days. It is evident the TPI's growth in all variants of tannin adding after 10 days. Mostly has increased the value of the F variant (60 mg/ L dosage) with 7.2% (from 6,4% at 50 mg/L, and 6,0 or 4% at 40 and respectively 10 mg/L, dosages) compared to baseline values in the control sample. On 20 and 30 days, the TPI index continued to rise in all samples, depending on the added dosage. Obviously, the bigger tannin dosage was introduced in wine, so increased the index value TPI.

It is known that the color stability of wine and other indices depend not only on the content of phenol compounds, but also their shapes, the interaction method with other wine compounds (Ribéreau-Gayon et al., 1998).

The color intensity changing in wines is based on polyphenolic complex enrichment with phenol compounds of oak wood and combining them with colored pigments.

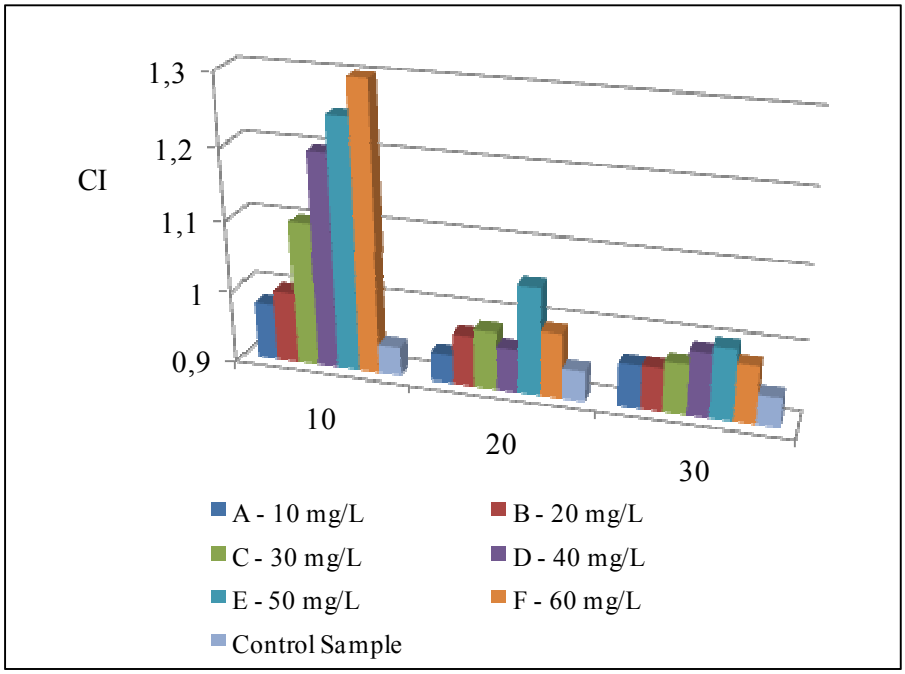

Fig. 3 - Evolution of colour intensity (CI) on tannin adding in wine

As a result of condensation reactions, both color intensity, as well as wine's color nuance is changing.

Fig. 3 shows that after 10 days of contact with oenological tannin color intensity sharply increased in all the cases, the values ranging between 0,98 and 1,3 units, which is by 4,14 and 38,15% more than baseline value.

At 20 days it was considerably reduced, so that at 30 days after tannins adding to increase slightly, stabilizing the values are between 0,96 -1,0. This is probably due to formation of complexes between anthocyans and tannins in wine, after condensation and polymerization reactions, at some point, leading to color stabilization.

Because anthocyans co-polymerization, color intensity increased. Anthocyans disappearance in the free state makes foreground appear the yellowish color (the leuco-anthocyans) and therefore the color nuance changes from ruby red to red-brick (Ribéreau-Gayon et al., 1998).

The evolution of this quite important index in organoleptic plan is shown in fig. 4.

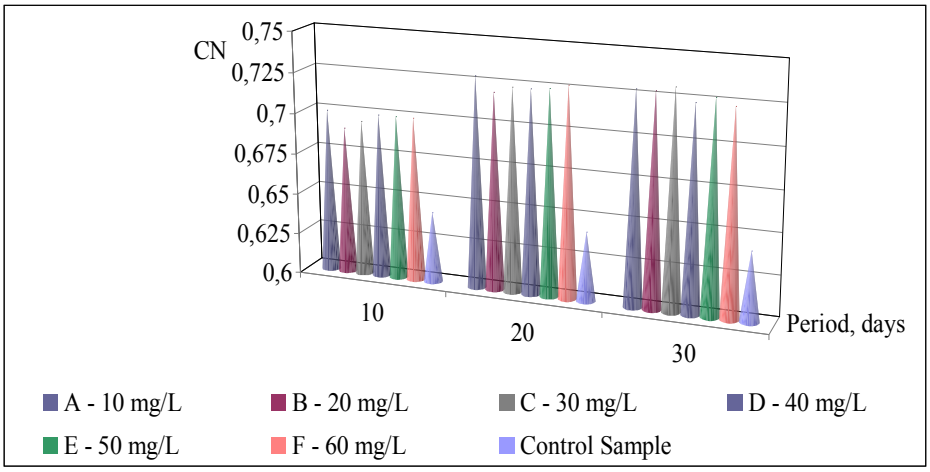

Fig. 4 - Variation of colour nuance (CN) on tannin adding in wine

CONCLUSIONS

Using the Romanian and the French chips allow to stabilize the best color substances by forming of more stable complexes of wine anthocyans and extracted tannins from oak chips. Worst evolved the polyphenolic complex for chips coming from the U.S.A.

To keep in the wine flavor the varietal nuances of wines, taste complexity and color stability of recommend the 40 mg/L dosage of oenological tannins, because it provides an increase of color intensity similar to 50 and 60 mg/L dosages, and the color nuance is changed the least.

Recommend for this wine the technological options of accelerated aging by keeping it on Romanian and French chips in 1,5 g/L dosage for 30 days or oenological tannins adding in a dose of 40 mg/L.

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