FLAVOUR LARGE VARIETY OF WHITE WINES PRODUCED AT DEALU BUJORULUI VINEYARD

ASPECTE PRIVIND SPECTRUL AROMATIC AL VINURILOR ALBE ELABORATE ÎN PODGORIA DEALU BUJORULUI

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Abstract. *The flavour of wines results from a harmonious blend of several chemical substances of different origin and structure. We can distinguish the primary or varietal flavours that come from grapes, the secondary flavours or for fermentation and tertiary flavours that are acquired during the evolution of wine. Varietal flavours are typical for variety wines, because they originate from a particular variety grapes as free or combined flavours. These are mainly terpenoids substances which are capable that hydrolysis to release volatile smelling (terpenes), which are well represented in Muscat Ottonel aromatic variety. In case of semi-flavoured Sarbien variety the most abundant odorant substance was given by alcohol 3-methyl 2-butanol, also present at Muscat Ottonel variety. During fermentation process, occur esterification reactions of alcohol with acids, resulting esters with varied flavours.*

Key words: flavour, white wines, fermentation, vineyard

Rezumat. *Aroma vinurilor rezultă dintr-un amestec armonios de mai multe substanţe chimice de origine şi structură diferită. Se disting aromele primare sau varietale, care provin din struguri, aromele secundare sau de fermentare şi aromele terţiare care se dobândesc în timpul evoluţiei vinului. Aromele varietale sunt tipice pentru vinurile de soi pentru că ele provin din strugurii unui anumit soi, ca arome libere sau legate. Este vorba în principal de substanţele terpenoide care sunt capabile ca prin hidroliză să elibereze substanţe volatile mirositoare (terpenele), care sunt bine reprezentate la soiul aromat Muscat Ottonel. In cazul soiului semiaromat Sarba, cantitatea cea mai mare de substanţă odorantă a fost reprezentată de alcoolul superior 3-metil 2-butanol, prezent dealtfel si la soiul Muscat Ottonel. In timpull fermentaţiei au loc procese de esterificare; prin reactia alcoolului cu acizii rezultă esteri cu nuanţe aromatice diversificate.*

Cuvinte cheie: arome, vinuri albe, fermentaţie, podgorie

INTRODUCTION

The quality of wine is also influenced by its aromatic character that involves a number of odorant chemical compounds, known as generic name of flavours.

About aromatic spectrum of Romanian wines has held a series of Romanian researchers in different geographical areas: I. Buia (2001) in vineyard Târnave and Heroiu Elena in vineyard Ştefăneşti-Arge (1998).

On international plan, about the aromatic character of the grapes and wine are related a number of researches that predominantly pertaining of Guerin-Schneider R. (2001), Rapp A., Versini G. (1995). Were determined for the first time some compounds of flavours from wines of Dealu Bujorului wineyard.

MATERIAL AND METHOD

Samples investigated to determine the volatile compounds with GC-FID (Gas-Chromatography - Flame Ionization Detector) are from Bujoru vineyard and include varieties of white wines unflavored white Feteasc㠠and royal Feteasca and varieties of flavored wines Sauvignon, Sarba, Muscat Ottonel.

The method used to analyze volatile compounds in samples of wines is liquid-liquid extraction, followed by gas chromatography with flame ionization detection (LLE / GC-FID).

For extraction of samples was used dichloromethane as solvent, 10 mL for firstly extraction and then 5 mL for secondary, for 50 mL sample. The drying of the organic phase was carried out with anhydrous sodium sulfate and its evaporation took place into the rotary evaporator (Laborata 4010, Heidolph, Germany) connected to a vacuum pump to a volume of 2-3 mL, then under pure nitrogen flow until 1,0 mL.

The instrument used in the analyze of the investigated compounds - separation, identification, quantification - GC-FID, Agilent Technologies 7890 GC type.

The identification of analyzed compounds – on the base of retention times - was done with the assistance reference-standards Sigma-Aldrich or Merck.

The sensitivity of the method depends on the efficiency of extraction and the response of detector for each compound.

The quantification of identified compounds was done through the method of external calibration (regression curve) with the assistance of internal reference - standard (3-octanol, 422 μg/L. concentration), by interpolating the relative areas of compounds to internal reference-standard area.

RESULTS AND DISCUSSIONS

From primary and secondary free flavours detected in white wines, α terpineol is well represented, especially at the varieties with genetic potential aroma. The α-terpineol is the unsaturated monocyclic terpene alcohol with one double link. It is formed in grapes by cyclization of the nerol and linalol, giving to the wine the “lilac” floral flavour (fig.1).

Analyzing the wines in terms of content in this aromatic ingredient, is found a higher percentage at less flavours varieties, compared with the neutral aroma, but the variety Muscat Ottonel was recorded with the highest content in flavours (0.2919 mg/L).

The secondary flavours, formed during alcoholic fermentation by yeast and lactic bacteria metabolism, are very large, being distinguished the superior alcohols, neutral fermentation esters, lactones etc.

Among superior alcohols, 1-hexanol has a vegetal flavour which is less desired, but is quantitatively underrepresented; likewise 1 - decanol and 1-phenyl ethanol are underrepresented. Are well represented among superior alcohols, 3-methyl 3 – butanol, in all varieties studied, especially to the Muscat Ottonel, with

the highest amount, 16.5 mg/L. 2-phenyl ethanol with floral aromas of rose shows the largest amount of superior alcohols in wines from Fetească regală, Fetească albă and Muscat Ottonel grape variety (fig. 2).

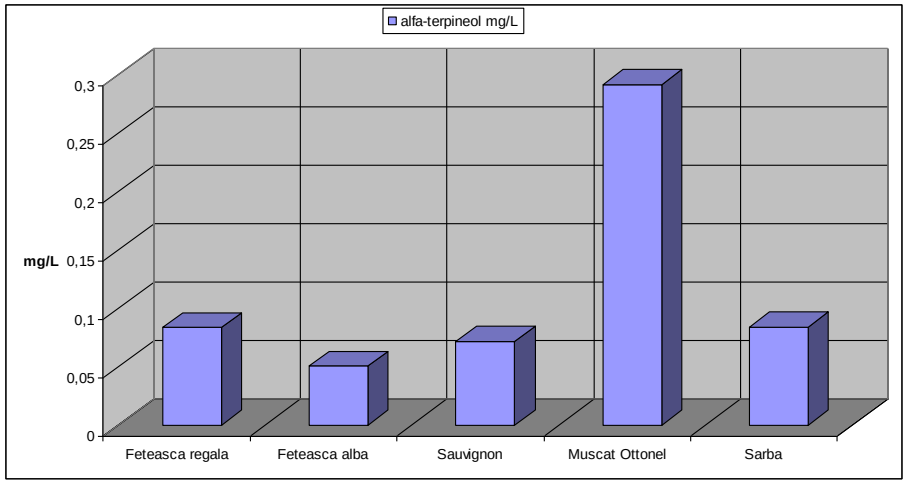

Fig. 1. α terpineolul in wines

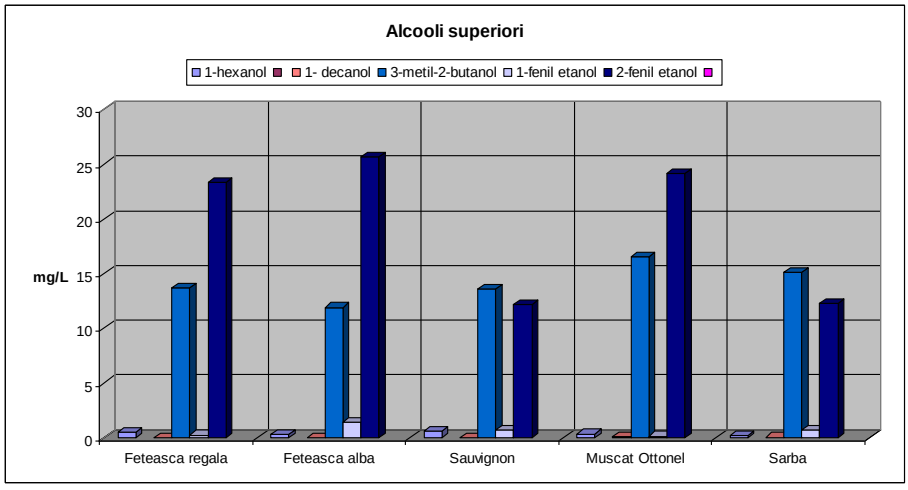

Fig. 2. Superior alcohols in wines

During fermentation there are formed inferiors short-chain and medium-chain fatty acids and their esters with ethylic alcohol. Ethyl esters of fatty acids with ethylic alcohol are promoters of fermentation aroma that give character of "*winy*".

Leading alcoholic fermentation of white wines from the Dealu Bujorului vineyard is: isobutyl acetate (pear flavor) isoamyl acetate (banana flavor).

The superior fatty acid esters and floral aromas are represented by ethyl hexanoat, ethyl octanoat, ethyl decanoat, having a relatively low concentration in

white wines ranging from 0.01 mg/L isoamyl acetate in the case of neutral wines as Fetească Regală, and maximum 0.30 to 0.35 mg/L ethyl octanoat in flavoured wines as Sauvignon Blanc and Muscat Ottonel. These esters are better represented in Muscat Ottonel wine, which is essentially a flavoured variety (Ffg.3).

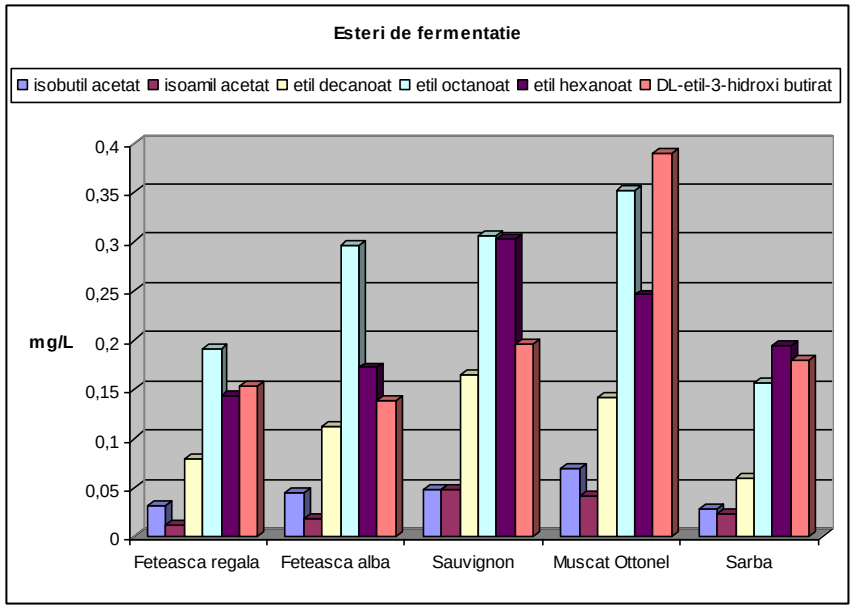

Fig. 3. Fermentation esters in wines

In small quantities also is formed superior fatty acids which presents pleasant floral aromas as the octanoic acid, showing high values in Sarba and Muscat Ottonel wines (36.5 mg/L) and values of 7-8 mg/L for wines with neutral character. (fig. 4).

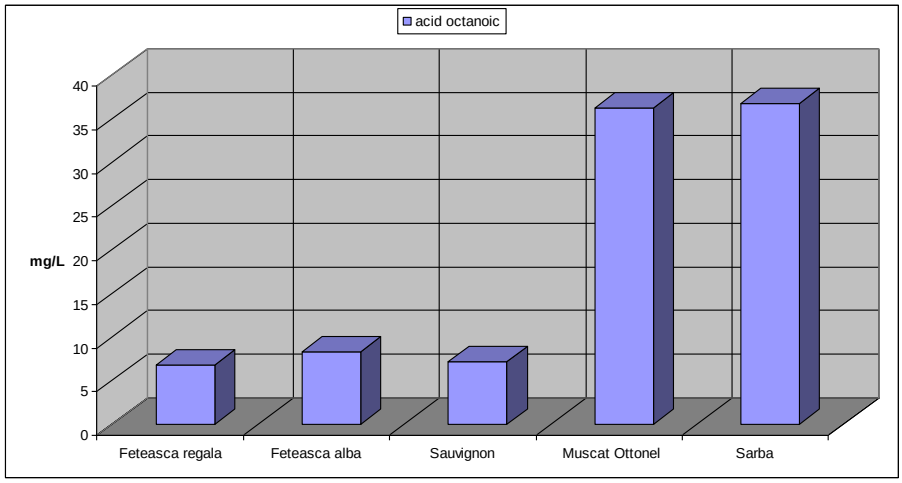

Fig. 4. Octanoic acid in wines

The lactones, represented by γ - octanoic lactone are present in the Feteasca white wine variety in higher proportion (18.6 mg/L) and insignificant in proportion to other varieties, without any significance on wine flavour (fig. 5).

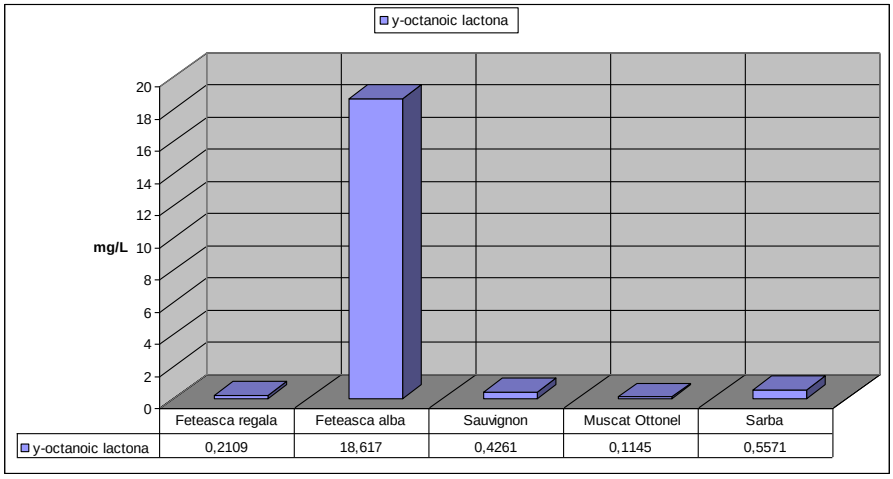

Fig. 5. γ – octanoic lactona in wines

During wine aging, evolutionary processes occurring, contribute to the formation of these flavour bouquet with the taste being perceived olfactory, constituting tertiary aromas. Part of this class are also the diethyl succinate and monoethyl succinate, which are neutral esters and ethyl lactate is formed during malolactic fermentation. Among the esters of aging, the best is in the case of monoethyl succinate in Muscat Ottonel variety wine (156.8 mg/L) and diethyl succinate of the same variety (45.8 mg/L) (fig. 6).

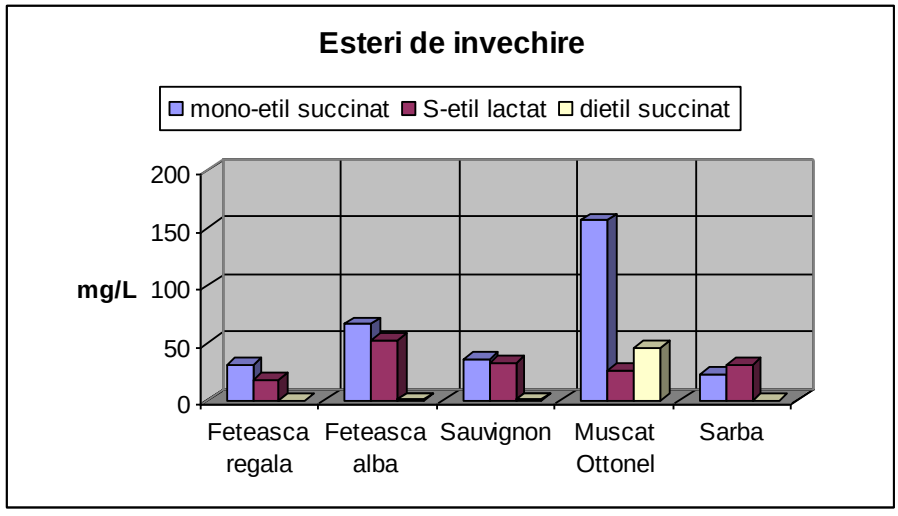

Fig. 6. Esters of aging in wines

CONCLUSIONS

1. The α terpineol is very well represented, especially in wines from Muscat Ottonel variety, variety with aromatic genetic potential.

2. Among superior alcohols well represented is 3-methyl 3 – butanol, in all varieties studied, with relevance to the Muscat Ottonel, which has the biggest amount, 16 5 mg/L; 2 phenyl ethanol, shows the largest amount of superior alcohols in wines from Fetească regală, Fetească albă and Muscat Ottonel varieties.

3. The alcoholic fermentation esters of white wines are isobutyl acetate (pear flavour), isoamyl acetate (banana flavour). The esters of superior fatty acids present floral flavours and are represented by ethyl hexanoat, ethyl octanoat, ethyl decanoat, that have a relatively low concentration in white wines, the isoamyl acetate in the case of neutral wines royal Fetească as the ethyl octanoat from flavored wines variety Sauvignon blanc and Muscat Ottonel. These esters are better represented in the Muscat Ottonel wine variety.

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