STUDY ON AROMA COMPLEX OF WINES OBTAINED FROM NEW MOLDAVIAN SELECTION VARIETY FLORICICA

STUDIU PRIVIND COMPLEXUL AROMATIC AL VINURILOR OBȚINUTE DIN SOIUL NOU DE SELECȚIE MOLDOVENEASCĂ FLORICICA

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Abstract: *The aroma complex of new variety of Moldavian selection Floricica was researched. The research demonstrated that the composition of wine aroma from variety Floricica is very complex and is constituted from compounds of different categories: aldehydes, ketones, higher alcohols, esters, terpenes, organic acids, lactones etc. The higher alcohols isoamyl and 2-feniletanol are the main aroma compounds, and their percentage share is 54.5%. This compounds form the basis (nucleus) of the wine aroma, which is completed by other aroma compounds like esters, terpens, acetals etc. We consider that the floral character of investigated wine aroma is determined more by the interaction of aroma compounds, which are present in a fairly significant number on the background of the main constituents - isoamyl and 2-feniletanol alcohols.*
Key words: aroma complex, Floricica - new variety of Moldavian selection, aldehydes, ketones, higher alcohols, esters, terpenes, organic acids.

Rezumat*: A fost supus cercetărilor complexul aromatic al vinului obținut din soiul nou de selecție moldovenească Floricica. Cercetrile au arătat că compoziția aromei vinului de soiul Floricica este foarte complexă şi constituită din compuşi de diferite categorii: aldehide, cetone, alcooli superiori, esteri, terpeni, acizi organici, lactone etc. Principalii compuei ai aromei sunt alcoolii superiori izoamilic şi 2-feniletanol, ponderea procentuală a cărora este de 54,5%. Aceşti compuşi alcătuiesc baza (nucleul) aromei vinului, care este completată de alți compuşi aromatici ca esterii, terpenii, acetalii etc. Considerăm că caracterul floral al aromei vinului investigat este determinat mai mult de interacțiunea compuşilor aromatici, ce se află într-un număr destul de mare pe fundalul principalilor constituienți – alcoolii izoamilic şi 2-feniletanolul.*
Cuvinte cheie: complex aromatic, soi nou de selecție moldovenească Floricica, aldehide, cetone, alcooli superiori, esteri,terpeni, acizi organici.

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INTRODUCTION

When creating quality wine greatly affects the chemical composition of the juice of berries, especially the aromatic complex, located on their husks. It is known that the general flavor of young wine from grapes is due to volatile compounds, which pass into the must during their processing and components that are formed during alcoholic fermentation. However, the character variety is determined mainly by certain volatile compounds belonging to the primary complex of grapes (Fregoni, 1998). In turn, complex aroma of wine is rich and consists of substances belong to different classes. Thus, Gamova et al. aromatic substances identified in the composition of the wine of new varieties of selection aldehydes, ketones, esters, complex, free terpenes, furans (Gamova et al.,1992).

On the other hand, research recently confirmed that the character variety is determined by a substance or a small group of substances. For example, Duboudien D. et al.,Malcolm I. et al. (quoted by Pomohaci N. et al.) believes that the quality of aromatic varieties such as Sauvignon etc., semiaromat, contributes nonterpene compounds such as 4-mercapto-4-methylpentane-2-one and metoxipirazinele (Pomohaci et al., 2000). Note that currently determine the natural aromatics of the wine, to it is through gas chromatography coupled with mass spectrometer, which allows detection of many compounds and their identification is based a library of aromatics mass spectrometer (Scorbanovet al., 2008, Sîrghi et al., 2009).

Since the present instrumental methods of analysis of volatile compounds in wine are much better, do consider relevant study of the complex aromatic wines from new varieties to optimize the technology for obtaining them.

MATERIAL AND METHOD

Subjected of researches was the dry wine made from variety selection in wine campaign in 2010.

For a depth research to complex aromatic wine obtained was passed through a cartridge type consisting of polystyrene extra reticulat DIAPAC hydrophobic nature activated after a specific treatment regimen. Elution of aromatic substances adsorbed on the surface of the cartridge was achieved with a mixture consisting of etylacetat and pentane in a 1:1 ratio. Eluent analysis was performed on gas chromatograph mass spectrometer Clarus600 T-WAX ETR column length of 50 m and diameter of 0.32 mm. Analysis conditions: helium carrier gas vapor room temperature - 220 ^{0}C the column - 75 ^{0}C between temperatures- 4 ^{0}C/min up to temperature of 225^{0}C. Identification of chromatographic peaks was performed according to general library NIST mass spectrometer.

The proportion of compounds that are part of the flavor composition was performed by determining the area of peak a particular compound which is directly proportional it percentage concentration of all aromatic substances amount of eluent.

Research has been conducted in laboratory Oenology and Wine with Designation of Origin of the Institute of Scientific and Practical Horticulture and Food Technology Research Institute Scientific Area and Fruit Viticulture North Caucasus of Russian Agricultural Academy.

RESULTS AND DISCUSSION

Note that in terms of smell, characteristic Floricica wine is rich and intense floral aroma with notes of wild flowers delivered. In this context we tried to determine the compounds responsible for floral aroma extract obtained by chromatographic analysis of the wine. Table 1 presents the volatile compounds determined and the proportion in the composition of each extract. The analysis result 115 compounds were determined. These compounds belong to various groups: aldehydes, ketones alcohols, esters, terpenes saturated and unsaturated organic acids indoles furans oxides, lactones etc.

Table 1

Determined volatile compounds in wine aroma Floricica extract.

Compound name	Percentage %	Category
Acetldehyde	0,004	Aldehyde
Acetone	0,039	Ketone
1,1 dietoximetan	0,029	Acetals
2-butanone	2,642	Ketones
3-methyl-2-butanone	0,532	Ketones
2,4,5-trimethyl-1,3-dioxolane	0,043	Oxides odorant
Ethyl propanoate	0,871	Esters
Ethyl-2-methyl propanoate	0,004	Esters
Propyl acetate	0,010	Esters
Butyl acetate	0,018	Esters
2-pentanone	0,019	Ketones
2-methyl-3-pentanone	0,019	Ketones
2-butanol	0,127	Alcohols
2-methyl-3-buten-2ol	0,014	Alcohols
3-methyl-2-pentanone	0,009	Ketones
Propanol	0,189	Alcohols
1,1-diethoxy butane	0,004	Acetals
Ethyil butirate	0,044	Esters
Butilacetat	0,021	Esters
Isobutanol	1,571	Alcohols
3-ethoxy-2-butanone	0,012	Ketones
Izoamylacetate	0,740	Esters
Butanol	0,074	Alcohols
2,2-dimethyl-4-hydroxy-3-hexanone	0,003	Ketones
β-mircen	0,003	Terpenes
ethylcrotonate	0,003	Esters
2-heptanone	0,022	Ketones
Isoamylol	28,450	Alcohols
Limonene	0,003	Terpenes
Pentanol	0,015	Alcohols
3-methyl-3-buten -1ol	0,002	Alcohols
hexylacetate	0,009	Esters
Ethylpiruvate	0,011	Esters
2-heptanol	12,407	Standard solution
3-methyl pentanol	0,046	Alcohols
Hexanol	0,096	Alcohols

Ethyllactate	1,146	Esters
trans-3-hexanol	0,014	Alcohols
3-pentanol	0,003	Alcohols
3-etoxipropanol-1	0,014	Alcohols
cis-3-hexenol	0,014	Alcohols
1-methoxy-1-octen-4-one	0,019	Ketones
Nonanal	0,008	Aldehyde
Etiloctanoate	0,145	Esters
Heptanol	0,009	Alcohols
cis-Linalool-oxyde	0,003	Terpenols aciclic
acetic acid	8,885	Acids
Furfural	0,001	Aldehyde
Ethyl-3-hidroxybutanoate	0,029	Esters
Linalool	0,058	Terpenols
2,3-butandiol	0,108	Alcohols
Ethyl-3-hidroxybutanoate	0,005	Esters
1-octanol	0,002	Alcohols
Benzaldehyde	0,001	Aldehyde
2-methyltetrahydroxytiofen-3-ol	0,021	Sulfur compounds
Acetoin	0,019	Ketones
2-methyl-etoxy-1-etanol	0,009	Alcohols
Hotrienol	0,027	Terpenols
1-metoxy-2-butanol	0,007	Alcohols
trans-4-hydroxymethyl-2-methyl-1,3-dioxolane	0,005	Oxids odorant
Ethyldecanoate	0,079	Esters
Ethyl-2-furanoate	0,001	Furanic compounds
Ethylmethylsuccinate	0,001	Esters
n-butanoic acid	0,259	Acids
4-methylbenzaldehyde	0,001	Aldehyds aromatic
r-butyrolactone	0,063	Lactones
Diethylsuccinate	0,311	Esters
3-methyl-butanoic acid	0,353	Acids
cis-4-hydroxymethyl-2-methyl-1,3-dioxolane	0,002	Oxids odorant
Ethyl-9-decenoate	0,012	Esters
2,6-dimethyl-3,7-octadiene-2,6-diol	0,039	Alcohols
Terpineol	0,039	Alcohols
3-Methylthyo-1-propanol	0,013	Thyoether + alcohol
1,3-propandiol diacetate	0,140	Esters
2,7-dimethyl-4,5-octandiol	0,012	Alcohols
Diethylglutarate	0,001	Esters
i-butiric acid	0,029	Acids
Ethyl phenyacetate	0,002	Esters
Ethyl-4-hydroxybutanoate	0,758	Esters
Methyl-2-hydroxybenzoat	0,015	Esters
2-phenylethyl acetate	0,290	Esters
Geraniol	0,015	Terpenols
2,4-dimethylbenzaldehyde	0,03	Aldehyde
Hexenoic acid	1,580	Acids
N-3-methylbutyl acetamide	0,434	Amides
2,3-butandyoldiacetate	0,113	Esters

Phenylmethanol	0,010	Alcohols
Ethyl-3-methylbutyl succinate	0,004	Esters
2-phenylethanol	26,069	Alcohols
3,7-dimetyl-7-octen-1,6-diol	0,019	Diols
(S)-N-(1-cyclohexanethyl)acetamid	0,004	Amides
Methyl-5-oxohexanoat	0,013	Esters
2,5-dimethyl-4-hydroxy-3(2H)-furanol	0,002	Furans
Diethyl malate	0,344	Esters
Octanoic acid	2,342	Acids
cis-terpin hydrate	0,003	Alcohols
3,7-dimethyl-2,7-octadien-1,6-diol	0,020	Alcohols
Ethylacetamino acetate	0,013	Amines
Diethyl-2-hydroxypentanedioate	0,110	Esters
2-methoxy-4-vinilphenol	0,094	Phenols volatile
5-Oxotetrahydrofuran-2-carboxylic ethyl acid	0,476	Acids
Decanoic acid	0,648	Acids
3-hydroxy-4-phenyl-2-butanone	0,007	Ketones
Ethyl-2-hydroxy-3-phenylpropanoate	0,068	Esters
Phenylethanal	0,024	Aldehydes benzoic
9-decenoic acid	0,228	Acids
Geranic acid	0,029	Acids
Ethyl hydrogen succinate	5,326	Esters
2,3-dihydrobenzofuran	0,271	Furans
3-indolyl acetic	0,005	Compounds indole
Benzoic acid	0,123	Acids aromatic
2-phenylacetic acid	0,034	Acids
N-(2-phenylethyl) –acetamide	0,057	Nitrogen compounds
Ethyl-5-oxo-2-pyrolidinecarboxylate	0,360	Esters

Aromatic substances examined contained the highest percentage share is the higher alcohols, namely isoamyl alcohol - 28.45% and 2 fenilethanol - 26.06%. But the olfactory characteristics of these two alcohols are not far from roses. Isoamyl alcohol is distinguished by its fruitiness and 2-fenilethanol has a nice overall flavor. According to Cotea et al. (2009) 2-fenilethanol presence in wine seems to be essential in the formation of wine flavor.

Of the total number of compounds identified 32 back esters those with greater weight being ethylpropanoate, isoamylacetate, ethyl lactate, 2-phenyiethylacete, diethylmalate. Of these esters the isoamylacete have banana flavor, pear, the ethyllactate - smell pleasant and fine, the ethyloctanoate - baked apple, pineapple, pear, the diethylsuccinate - bunch of maturity, the 2-fenylethylacetate – honey.

An essential contribution to the character of flavor has terpenes compounds although heir content is small. In the flavor of the investigated wine were identified the terpenes: β - mircen, limonene, cis-linalool oxide, linalool, hotryenol, 2,6-dimethyl-3,7-octadien-2,6-diol, α-terpineol, geraniol. Aromas of tissue compounds have pleasant Muscat, coriander, the smell of lilacs, rose and positively affects wine flavor.

Of ketones identified in investigated wine aroma are mentioned 1-methoxy-1-octen-4-one and acetoine, both has fragrant, 2-heptanone – fruity smell. The categories of aldehydes in addition to aldehyde were identified nonanal which has smell rose and mandarin, furfural - fragrant fresh bread, benzaldehyde - bitter almonds and 4-methylbenzaldehyde - pleasant aroma.

In extracts investigated have been an identified and organic acid which of them is the largest acetic acid percentage share. The presence of acetic acid in relatively high is good for wine flavor quantities because in his opinion Cotea et al. (2009) it is a good solvent for oils, amplified their olfactory sense. Others saturated and unsaturated acids monocarbonilic influences less composition of flavor. Although furan compounds are in the small amounts they influence the olfactory qualities of wine (Cotea, 2009).

CONCLUSIONS

The study showed that wine flavor composition is very complex Floricica varieties and consists of different categories of compounds: aldehydes, ketones alcohols, esters, terpenes, organic acids, lactones etc. The main flavor compounds are higher alcohols isoamyl and 2-fenilethanol whose weight percentage is 54.5%. Nominated compounds form the basis of (core) wine flavor which is complemented by other aromatic compounds. It was found that a class representative and quantitative numerical in the wine aroma is esters. Although weight of terpenes in aromatic composition is small their contribution to the flavor character is not negligible. We believe that floral character of wine flavor investigated is determined more by the interaction of aromatic compounds find in a large number in the background of the main constituents – isoamylol and 2-phenolethanol.

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