COMPARATIVE APPRECIATION OF VARIOUS SPECIES OF YEAST STRAINS AND THEIR INFLUENCE ON CHROMATIC INDICES OF ROSE SPARKLING WINES

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Abstract: The work was carried out to compare assessment of different species of yeast: *Saccharomyces cerevisiae* CNMN-Y-24 Spumant, *Saccharomyces vini* CNMN-Y-27 Bianca from the collection of microorganisms laboratory "Biotechnology and Microbiology of Wine" and active dry yeast (active dry yeasts): *Saccharomyces cerevisiae* IOC 18-2007, *Saccharomyces bayanus* SIHA Aktivhefe 4 and their influence on chromatic characteristics and parameters of foaming properties of rosé sparkling wines.

On the basis of conducted study was established the influence of used yeast species at secondary fermentation on the quality of rosé sparkling wines. Were determined chromatic indices wich characterize composition and quality of rosé sparkling wines.

Key words: yeast strain, foaming properties, chromatic indices, sparkling wine.

Introduction

At present, are made research regarding the enlargement of the assortment of pink sparkling wine, using varieties of red grapes. In this context, we consider appropriate to research different types of yeast used in the fermentation secondary process in order to obtain sparkling wines rosé.

In winemaking, glassfibre yeasts-cell elipsoidă, oval form of the species *Saccharomyces cerevisiae* and *Saccharomyces oviformis (Saccharomyces bayanus)* and their physiological strains or their closest species, due to their positive properties, including tolerance to alcohol and low production of volatile acids.

Yeast strains of the species: Saccharamyces cervisiae, are the subject to the selection of permanent bayanus, looking for strains with the best oenological characteristics such as fermentativă, vigor SO2 resistance, tolerance to alcohol, minor productions of acetic acid and others. [3].

Research conducted by the N. Sarişvili, L. Moustafa, N. Burian [6] have shown, for choosing the right species of yeasts is necessary to have information about the accumulation in the environment of vital activity increased, which will contribute to the formation of the final product of organoleptic peculiarities.

These authors also,have found that the concept of physiological adaptation to the environment and technological value of species do not always coincide. Therefore, in order to determine the objectives of the assessment criteria and the characters used in the selection of species of yeasts for production of wine is necessary to include physiological, biochemical indices and physico-chemical. [6].

Species of yeasts are used in the preparation of the classical sparkling wines, along with specific clues, it is necessary to form a precipitate to settle the fast granular structure, easy deplasabil to plugin and does not stick to the walls of the cylinder.

In the process of fermentation changes can occur in the secondary color of pink wines. Thus, the precipitate formed besides tartaric salts and coloring substances, consequently, decreases the intensity of color but hue changes, established the mark suffers from not having held chemical modifications.

The high quality of the sparkling wine is related to not only the quantitative composition of wine, but also on the degree of stability and interaction of various substances and their transformation products.

In this study were examined to determine the species of yeasts on the physical-chemical indices, stable chromatic indexes, the specific properties of foaming and sparkling wines for obtaining primary rosé.

Materials and Methods

The research was comparative research and technological evaluation of various species of yeasts from the collection of microorganisms of the laboratory of "Biotechnology and Microbiology of wines" and various manufacturing companies ROSE on the process of secondary fermentation; their influence on the physico-chemical indicators, specific stable chromatic indexes, and foaming properties and primary. In table 1 it is shown the list of studied species of yeasts.

Table 1. List of studied species of yeasts

The name of the species	The number of collection
Saccharomyces cerevisiae	CNMN-Y-24
Saccharomyces vini	CNMN-Y-27
Saccharomyces cerevisiae	active dry yeasts IOC 18-2007
Saccharomyces bayanus	active dry yeasts SIHA Aktivhefe 4

Researchers have undergone experimental rosé sparkling wine obtained from Merlot grape variety in the wine-making season of the year 2013. The research methods have been applied to physico-chemical analysis recommended by the International Organisation of Vine and Wine, and those developed and modified to National Institute of Vine and Wine.

Results and Discussion

On the basis of studying the physiological properties of different yeast species in the collection of microorganisms of the laboratory "Biotechnology and Microbiology of Wines" ISPHFT for further research were highlighted earlier three species of yeasts.

For the scientific support of optimal wine spumate wines and rosé produced with the use of various species of yeasts, the analyses were performed on foamy properties and physico-chemical indicators, specific and chromatic.

In table 2 are presented physical and chemical indexes of rosé sparkling wine.

Table 2. Physical and chemical indexes of rosé sparkling wine obtained from Merlot grape variety with the use of different yeast species after 3 months of ripening

Species of yeasts	Alcohol, vol. %	Mass concentration		pH	OR, mV	Organoleptic note, points
		Titrable acidity, g/dm3	Volatile acidity, g/dm3			
Winerew material	12,4	5,9	0,40	3,28	205,1	8,2
Saccharomyces cerevisiae CNMN-Y-24	13,7	5,7	0,33	3,26	211,9	9,1
Saccharomyces vini CNMN-Y-27	13,8	5,8	0,33	3,28	211,1	9,15
*Saccharomyces cerevisiae*LAU IOC 18-2007	13,6	5,6	0,33	3,27	211,5	9,1
*Saccharomyces bayanus*LAU SIHA Aktivhefe 4	13,5	5,6	0,33	3,28	211,0	9,1

Analyzing the results of physico-chemical analysis, we note that rosé sparkling wine obtained from Merlot do not differ after mass concentration of acidity titratable acidity, volatile acidity, pH and potential OR is in the acceptable limits for all sparkling wines studied. Secondary fermentation process took place under the same conditions and the same blended each sample.

Pink sparkling wines fermented with use species yeasts *Saccharomyces vini* CNMN-Y-27 is characterized by a high concentration of ethyl alcohol - 13,8% vol., and the species of yeasts *Saccharomyces cerevisiae* CNMN-Y-24 characterized by a concentration of ethyl alcohol-13,7% vol. followed by getting some pink sparkling wines with lower alcohol using yeast species *Saccharomyces cerevisiae* active dry yeasts IOC 18-2007 where the concentration of ethyl alcohol is 13,6% vol. and *Saccharomyces bayanus* active dry yeasts SIHA Aktivhefe 4 13,5% vol. question.

The results of organoleptic assessment of rosé sparkling wine obtained from Merlot presented in tab. 2, indicates that all sparkling wines have achieved high organoleptic notes, which are in conformity with organoleptic analysis. Pink sparkling wines from Merlot use species of yeasts *Saccharomyces vini* CNMN-Y-27 has garnered the highest organoleptic note of 9,15 points, species of yeasts Saccharomyces cerevisiae CNMN-Y-7, active dry yeasts IOC 18-2007 and *Saccharomyces bayanus* SIHA Aktivhefe 4 each accumulated by 9,1 points, it is characterized by pink clean fruit aroma, taste balanced, slightly soft, fresh.

The reduction of phenolic compounds in pink sparkling wines is conditional on both physical and chemical processes, as well as species of yeasts. Catehinele and they are

oxided by a-difenoloxidaza and peroxidase. In their turn catehine and anthocyanin molecules are oxidized barriers becoming more labile and as a result depositing in sediment. Colouring and the phenolic participates in exchange reactions or directly join together with some compounds of the wine ferments (proteins, amino acids, aldehydes), and depending on the character of the compounds were formed, some of them are still coming in, while others have been based.

In figures 1 and 2 are represantated chromatic indexes and specify in pink sparkling wines with the use of various species of yeasts in fermentation in vats with secondary ripening period 3 months.

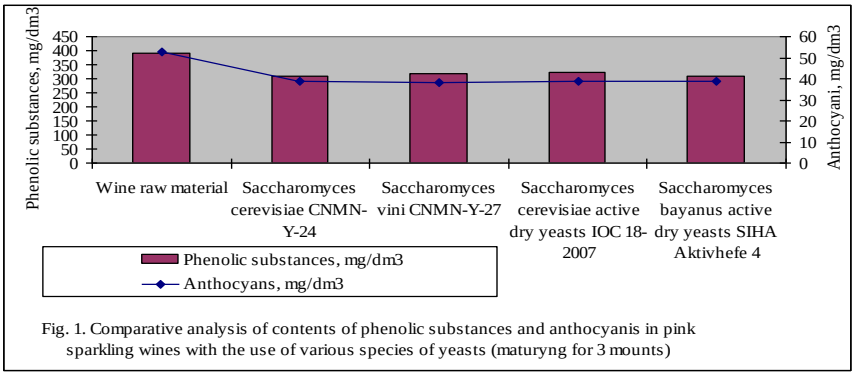

Fig. 1. Comparative analysis of contents of phenolic substances and anthocyanis in pink sparkling wines with the use of various species of yeasts (maturyng for 3 mounts)

During the data in figure 1 has been established, that as a result of secondary fermentation and maturing for 3 months is produced rosé sparkling wine phenolic substance decreases in average 80 mg/dm^3. Pink sparkling wines produced using the yeast species *Saccharomyces cerevisiae* active dry yeasts IOC 18-2007 substance phenolic decreases from 391 mg/dm3 to 323 mg/dm3, *Saccharomyces vini* CNMN-Y-27 contents of phenolic substances decreased by from 391 mg/dm^3 up to 320 mg/dm^3, *Saccharomyces cerevisiae* CNMN-Y-24 contents of phenolic substances decreases from 391 mg/dm^3 until 311 mg/dm^3, *Saccharomyces bayanus* SIHA Aktivhefe 4 phenolic substance decreases from 391 mg/dm^3 at 308 mg/dm^3. This decrease is related to the degree of adsorbtion of phenolic compounds by the yeast cells, the reactions of phenolic compounds interact with other parts of the sparkling wine, as well as the formation of polymeric compounds unstable, which settles. This decrease is due to the activity of yeast during fermentation by products, bentonite and phenols degradation during maturation.

According to the results shown in figure 1 the concentration of anthocyans in pink sparkling wine matured for 3 months obtained with the use of various species of yeasts contents of anthocyans lowers the average 14,5 mg/dm^3. The rosé sparkling wine which has used yeast species *Saccharomyces cerevisiae* CNMN-Y-24, active dry yeasts *Saccharomyces cerevisiae* IOC 18-2007, *Saccharomyces bayanus* SIHA Aktivhefe 4 contents of anthocyani lowers to 53 mg/dm^3 at 39 mg/dm^3, and for the use of yeasts species *Saccharomyces vini* CNMN-Y-27 to 53 mg/dm^3 to 38 mg/dm^3.

Species of yeasts *Saccharomyces cerevisiae* active dry yeasts IOC 18-2007 and *Saccharomyces vini* CNMN-Y-27 have a low adsorption of phenolic substances and

anthocyans.

Due to the data in Figure 1 has been established, that as a result of secondary fermentation and maturing for 3 months to produce rosé sparkling wine compared to coupage of phenolic substance decreases in average with 17 and 21% and anthocyan content with about 26 and 28% .

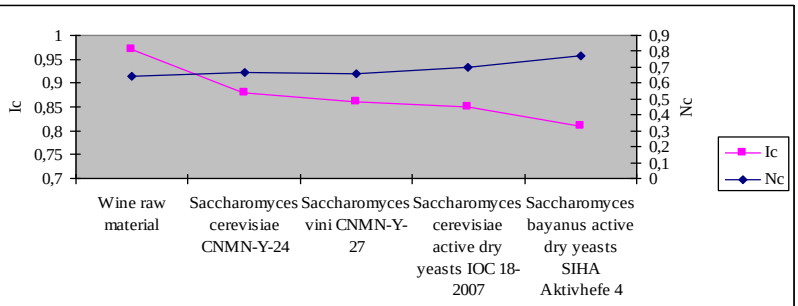

Fig. 2. Comparative analysis of the intensity and hue of color in pink sparkling wines with the use of various species of yeasts (maturing for 3 mounts).

In figure 2 it is observed in pink sparkling wines obtained by using various species of yeasts coupage in comparison with dye intensity coupage decreased within the following limits: from 0,9 up to 0,11 for species of yeasts *Saccharomyces cerevisiae* CNMN-Y-24 and *Saccharomyces vini* CNMN-Y-27, and the yeast species *Saccharomyces cerevisiae* active dry yeasts IOC 18-2007, *Saccharomyces bayanus* SIHA Aktivhefe and 4 from 0,12 up to 0,16. The hue is suffering from a slight modification.

Reduction the intensity of dyes would be explained by the fact that the part of the anthocyans are absorbed by the cells of yeast, which leads to the reduction of their concentrations, influencing directly the color of pink sparkling wine.

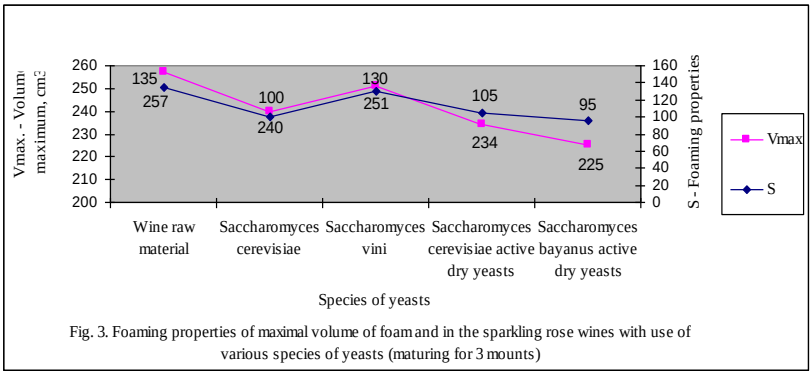

Fig. 3. Foaming properties of maximal volume of foam and in the sparkling rose wines with use of various species of yeasts (maturing for 3 mounts)

From the data presented in figure 3, note that the properties of foaming and maximum volume of rosé sparkling wine foam in the process secondary fermentation in comparison with the original indices fall. This can be explained by the fact that after the

secondary fermentation process, significant changes occur in the content of phenolic compounds: subtracting fractions flavonoids content reduction, polymeric simple phenols and flavonoids.

In such a way, the decrease in value and volume indices of the foaming of rosé sparkling wine foam compared to coupage depends on a greater extent to the species of yeasts used, than physico-chemical content of wine. As it is seen in figure 3, the use of yeasts for the secondary fermentation of *Saccharomyces vini* CNMN-Y-27 and *Saccharomyces cerevisiae* CNMN-Y-24 volume indices of foaming and sparkling rosé of maximum wine are more than increase the use of species of yeasts active dry yeasts *Saccharomyces cerevisiae* IOC 18-2007 and *Saccharomyces bayanus* SIHA Aktivhefe 4 where foaming properties and maximum volume of rosé sparkling wine foam indicates the lower values.

So, the correct choice of yeast species plays a significant role in the secondary fermentation process the essential influence on the formation of primary and foaming properties of pink sparkling wine.

Conclusions

The researches on the pink sparkling wines with ageing period of 3 months in vats obtained with the use of various species of yeasts showed that each species of yeasts acted in its own way.

On the basis of the obtained results it can be concluded that yeast species *Saccharomyces vini* CNMN-Y-27 and *Saccharomyces cerevisiae* CNMN-Y-24 used, for the secondary fermentation of rosé sparkling wine obtained from grapes of the variety Merlot allows getting pink sparkling wine with advanced foaming parameters, physical-chemical and stable chromatic indexes, also due to the organoleptic quality do not yield to the rosé sparkling wine where we used active dry yeasts species *Saccharomyces cerevisiae* IOC 18-2007 and *Saccharomyces bayanus* SIHA Aktivhefe 4.

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