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QUALITY OF RED WINES FROM VRANEC, MERLOT AND FRANKOVKA GRAPE VARIETIES ERMENTED BY TWO DIFFERENT YEAST STRAINS

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INTRODUCTION

The wine types of Vranec, Merlot and Frankovka are some of the most cultivated grape varieties in Macedonia and the Balkans. For the purposes of modern production, commercial yeasts are used, which in a way guarantees a good quality final product. The fast and controlled fermentation, the resistance to high temperatures, alcohol, sugar and sulphur dioxide are just some of the reasons for the use of commercial yeasts. However, the increased use of such yeasts leads to loss of the indigenous ones. The indigenous yeasts possess the best characteristics typical for each region which is confirmed with the production of quality wines. The main goal of the research is to compare the wines and their characteristics when fermented with indigenous (wild) yeasts and commercial yeasts.

The prospects of the wine production sector are limitless, every winemaker has their own affinities. One of the areas which we believe should be further developed is the isolation of yeasts in all the production regions to increase the quality of the products. Research is necessary for each wine region with proven quality and uniqueness. To that end, in-depth and wider research is necessary to further develop the regions. Within the master thesis, the results received will be presented and will be available to the wider public. Starting from the basic quality parameters such as the amounts of alcohol, sugar, pH. value, total acids etc. and then macro and micro wine elements, all have an influence on the sensory characteristics of the wine and are key in the development of excellent wines.

Fig.1. Must in fermentation

Fig.2. The wineyards

Material and methods

The varieties used in the research come from three different locations with unique characterisitcs. Vranec is found at the altitude of 400m, Frankovka at 520m and Merlot is at an altitude of 540m. They were all harvested during the period of their technological maturity. After the harvest the grapes were crushed by a special machine and treated with potassium metabisulphite at a 10g/100kg ratio and kept in plastic vessels of 70 liters. After three hours some of the samples were treated with commercial yeasts while others were left to continue with wild yeasts. The period of maceration was 5 days for all of the samples. During the fermentation the wines were stirred three times a day. After the fermentation the wines were transferred to stabilization vessels to rest.

For the purpose of the fermentation, commercial yeasts were used, a yeast of French origin specially developed for a broader (international) use of the brand OenoFrance La Deliciouse. All of the samples in the research were fermented at a sustainable temperature of 22-25°C to ensure uninterrupted quality fermentation. The rooms where the research was conducted were attended to hygiene throughout the entire process. The wines were controlled several times a day until the end of the process. The resulting samples were analysed at the State Phytosanitary Laboratory where the wine quality and the macro and micro wine elements were examined.

Wine	Yeast	Alcohol %	Sugar (g/l)	Total acids (g/l)	Ph	Free SO2 (mg/l)	Volatile Acidity (g/l)	Fe57 (ppb ug/l)	Cu65 (ppb ug/l
Vranec	SELECTYS® LA DÉLICIEUSE	12,154	2,112	5,914	3,2	9,24	0,34	3947,093	50,3118
Vranec	Baking yeast	12,738	4,542	5,803	3,4	8,238	1,233	10827,73	53,1375
Frankovka	SELECTYS® LA DÉLICIEUSE	12,358	4,421	6,58	3,3	8,203	1,581	4343,716	63,2453
Frankovka	Baking yeast	12,1011	4,314	5,512	3,2	7,8261	1,17135	3576,469	54,7527
Merlot	SELECTYS® LA DÉLICIEUSE	13,079	4,677	5,154	3,4	7,589	0,781	5037,64	163,0821
Merlot	Baking yeast	12,592	1,759	6	3,5	6,438	1,242	4040,567	163,1214

Fig.3. Table presentation

Results and discussion

Based on the given table we can analyze and discuss the final results. The highest level of alcohol during the fermentation was noted in the Merlot variety, which was fermented with a commercial yeast, while the lowest level of alcohol was noted in Vranec, also fermented with commercial yeast. The level of alcohol found in the final samples of Merlot and Frankovka fermented with commercial yeast is higher than the samples fermented with the baking yeast . The highest acid level was found in the Frankovka fermented with commercial yeast, while the lowest acid level was found in the Merlot fermented with baking yeast. The amounts of metals vary differently in all the samples, we can say that this variation is the result of the very areas of the grapes' origin and the uniqueness of the soil where they were cultivated. The highest pH level was noted in the Merlot sample fermented with baking yeast, while the lowest (identical) for all the Vranec samples (fermented with commercial yeast) and the Frankovka samples (fermented with baking yeast).

Conclusion

As a result of this research, where a total of 6 wine samples of 3 different varieties, fermented with 2 different yeasts during the process of production, we can conclude that the use of cultivated (commercial yeasts) enables a more certain and more effective fermentation. Although the differences in the values presented in the table and the graph are not considerable, they still play a significant role in the quality of the final product. The use of commercial yeasts positively influences wine production. Therefore, it is necessary to conduct more scientific research as well as more processes of yeast isolation in the region of the grapes' cultivation in order to contribute to a better wine quality and uniqueness.

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