THE ORIGIN AND TREND OF ORANGE WINES

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Abstract: The present paper examines the genesis and trend of orange wines, as well as the potential of the local market to integrate this type of wine and the role of sustainability and durability in strengthening the creation of biodynamic wines. The research focused on the investigation of the local white grape variety Viorica from the Purcari area, examining the grapes, the procedures used to get the raw material wine intended for the production of Orange wine, and wines from the 2020 and 2022 harvests. After getting the wine raw material, the organoleptic properties were analyzed and the key parameters were evaluated, which revealed that they correspond to the documents in force.

Keywords: grapes, maceration - fermentation, diagram, orange wine, Qvevri, amber wine, local market, sales

1. INTRODUCTION

The term "orange wine" was coined by the British wine importer David Narvey in 2004. This is not an official name, which is why some winemakers call such products "amber wine", others even question the need to separate this wine in a distinct category. There is also the term "red wine" (Ramato, Italian), but it mainly refers to the Italian orange wine of the Pinot Grigio variety.

The first orange wines were obtained 6000 years ago in the Caucasus, the area of today's Georgia, in Asia Minor and in the Balkan area. The revival of this ancient process of orange wine production has taken place in the last 20 years [1, 2].

In the wine industry, wines are classified according to 3 colors: white, red, rosé. Sommeliers address orange wine as "The fourth wine" (Figure 1) that got its name because of the color.

It is a mistake to think that orange wines are a trend of recent years, as for the true connoisseurs, a glass of orange wine has been popular for a long time, although the trend of this type of wine has only appeared in recent years. Amber wines are a tradition in Slovenia, Croatia, the Istria Peninsula and Italy, and are a trend in Austria, Germany, the Czech Republic, France, Australia, the United States of America and New Zealand [3].

Winemakers are constantly experimenting with local grape varieties and new ways to serve them to consumers. Maceration is a handy tool for extracting flavors, and a short maceration of 12-24 hours can significantly enrich the flavor of the must, and in the case of some varieties, even without affecting the color of the wine [1, 2].

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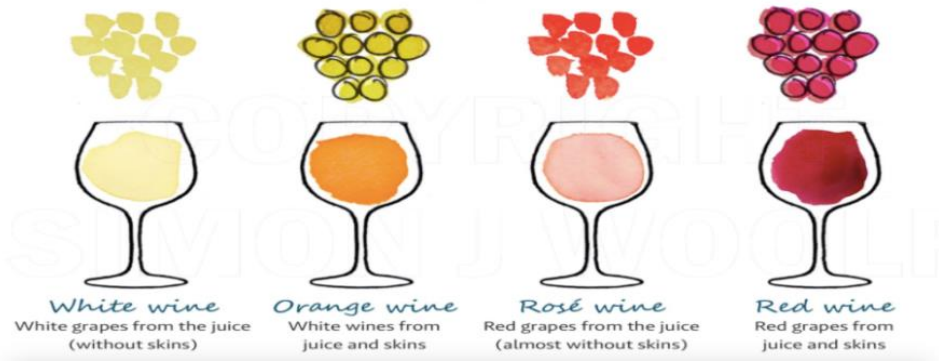

Fig. 1. The fourth wine [2].

Through this fermentation in the presence of the skin, a more intense color of the wine is obtained, with shades of orange, gold and amber and much more complex and intense aromas. The wines obtained through this technology have a more complex texture and characteristics, specific to red wines, but at the same time remain refreshing like white wines. Prolonged extraction also ensures the presence of high amounts of antioxidant polyphenols, which allows for a longer maturation of these wines and, at the same time, prolonged extraction ensures the possibility to decrease the amount of sulfites [3, 4].

The "Orange" Wine movement goes back to the ancient method of making wine in huge clay amphorae buried in the ground, known as Qvevris or Kvevri/Amphora (Figure 2). It can be traced back to early times in Georgia and has remained there to this day. In the late 1990s, it was rediscovered outside Georgia's borders, in Western Europe, and it is now widely used in the wine industry.

Winemakers use qvevri of different sizes, from 20 to 5000 liters, while currently the most popular are those with a capacity of 1-2 thousand liters. Qvevris are made from sticky clay using only hands without a potter's wheel and fired to dry in a special pottery kiln. This is intense and hard work that requires precision, skill and patience. Good quality qvevri can be used to make wine for a hundred years and more without losing its aromas.

The quality of qvevri depends on many factors, including the right type of clay, clean the clay well of stones and mix the dough evenly, plastic clay [4].

Winemakers using Qvevri claim that their wine is naturally stable, rich in tannins, and requires no chemical preservatives to ensure long life and superior taste. The tannins found in qvevri wine limit the protein content and prevent turbidity.

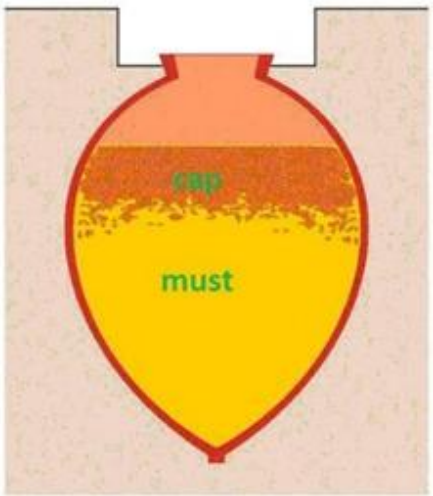

Fig. 2. Qvevri.

Following the analysis of competition on the domestic market, the following producers of "Orange" wines were identified in the Republic of Moldova (see Figure 3). Local producers are at the beginning of the road, the production of orange wines is an experiment for wine producers and thus a limited amount of wine is produced. Every year more and more producers launch this type of wine and even from local varieties such as Viorica, Fetească Albă, Fetească Regală, Alb de Onițcani [5].

Fig. 3. ,,Orange'' wine market.

2. EXPERIMENTAL SETUP

When carrying out the work, Viorica native white grapes from Purcari area were investigated, analyzing the grapes of the 2020 and 2022 harvests and determining the sugar content and titratable acidity.

In 2021, Viorica "Orange" wine was not produced from the Academia Collection and from any other variety because Academia, the most ambitious project so far of Purcari Winery, is a collection of Premium wines that explores in depth the identity and strong character of the local wines. Therefore, a period of research and identification of the evolution of the character of wine over time was necessary.

Orange wines are produced according to red wine technology, so the must obtained after destemming is conveyed to fermentation - maceration, which is carried out at a temperature of 20 ±26℃, in clay amphorae (Figure 4.). During fermentation and maceration, the dynamics of sugar content was examined. Organoleptic and physico-chemical parameters, corresponding to the permissible limits, were determined in the obtained wine raw material. Based on the sensory properties, the profile of these wines was made [6].

3. RESULTS AND DISCUSSION

In the production of Orange wines, the Viorica grape variety was investigated (Figure 5). Viorica is a wine grape variety with a semi-late ripening period. The variety is relatively resistant to frost and is moderately resistant to cryptogamic diseases. When ripening, it accumulates 190-200 g/dm^3 of sugars, the acidity being 9-9.8 g/dm^3. Grapes are used both for the production of Orange wine, dry, liqueur wines and for the production of juices with natural flavor. For the production of Orange wine, the grapes are de-stemmed without being crushed and if it is necessary the corrections are made to the composition of the must [7].

Then the fermentation-maceration of the grape must with active dry yeasts (10-15 g/hl) takes place at a temperature of 20 -26℃ until complete fermentation of sugars, malo-lactic fermentation of the wine raw material is allowed if necessary.

During fermentation – maceration, the temperature and the evolution of the sugar concentration decrease were examined every day. Diagrams of alcoholic fermentation of Viorica variety harvest of 2020 and 2022 are shown in Figures 6 and 7.

Fig. 4. Clay amphorae.

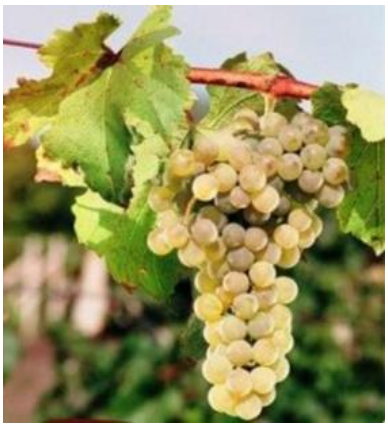

Fig. 5. Viorica variety.

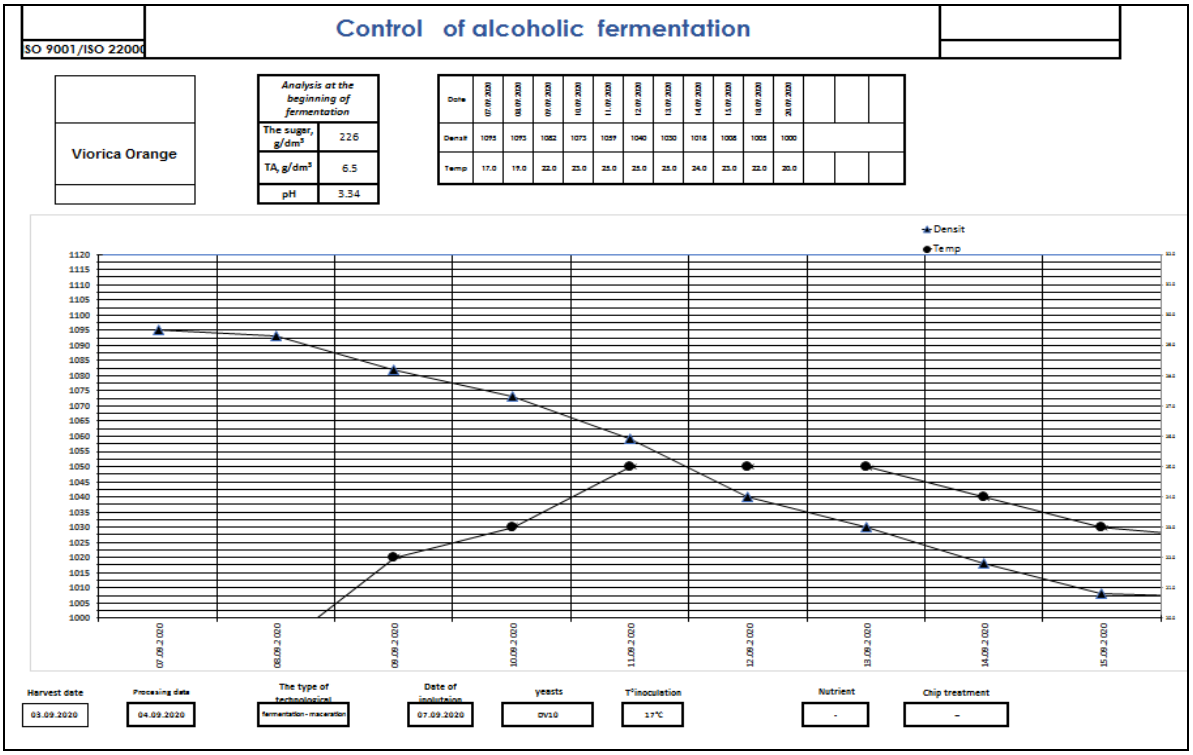

Fig. 6. Dynamics of the process of alcoholic fermentation of Viorica grape must (harvest year 2020).

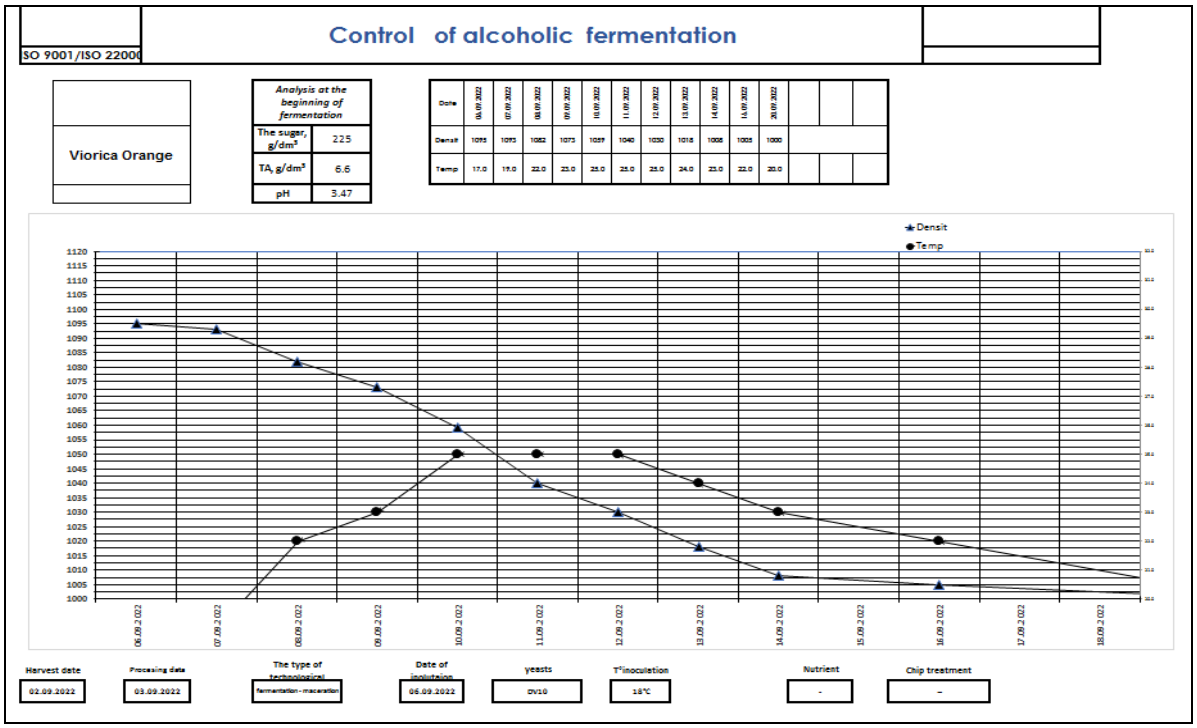

Fig. 7. Dynamics of the process of alcoholic fermentation of Viorica grape must (harvest year 2022).

Organoleptic and physico-chemical parameters were determined in the wine raw material obtained, which correspond to the admissible limits (Table 1).

Table 1. Physico - chemical indices of orange raw material wines, according [6].

Physico - chemical indices of wine raw material	The wine raw material orange Viorica 2020	The wine raw material orange Viorica 2022	Permissible limits after RT 356 și SM 117
Ethyl alcohol*, % vol, at 20 °C	13.35 ± 0.19	13.28. ± 0.18	Min 9.0
Mass concentration of sugars** expressed in reducing sugar, g/dm^3	3.4 ± 0.45	3.6 ± 0.19	Max 4.0
Mass concentration of titrable acids***, expressed in tartaric acid, g/dm^3	6.5 ± 0.42	6.8 ± 0.26	Min 4.0
Mass concentration of volatile acids****, expressed in acetic acid, g / dm^3	0.8 ±0.25	0.9 ± 0.19	Max 1.08
Mass concentration of total sulphur dioxide, mg / dm^3	8.7 ± 0.22	8.3 ± 0.19	Max 45
pH*****	3.34 ± 0.19	3.47 ± 0.25	3.0-3.5

* p < 0.05 According to OIV rules, OIV – MA – AS312-01A;
* p < 0.1 According to OIV rules, OIV – MA – AS311-01;
*** p < 0.05 According to OIV rules, OIV - MA – AS313-01;
**** p < 0.05 According to OIV rules, OIV - MA –MD-AS313-02ACIVOL.
***** p < 0.05 According to OIV rules, OIV – MA – AS313-15;

Based on the organoleptic characteristics (Table 2), the profile of these Viorica raw material wines was made (Figure 8).

Analyzing the sensory profiles, it has been observed that the raw material wines processed at the winery of Viorica grape variety of 2022 are well balanced, full, unctuous, harmonious with a very good growth potential, subsequently matured in the barrel. In the matured white wines, the intensity of aroma, flavor, smoothness and balance are accentuated by floral and fruity nuances. If a comparative analysis is made between Viorica Orange wine obtained in 2020 and that of 2022, then it can be observed that the former are slightly more aromatic in

floral nuances and with a longer persistence of taste, with a well pronounced flavor and unctuousness, balanced and with a long-lasting mouthfeel.

Table 2. Organoleptic indeces of Viorica raw material wines 2020 and 2022, according [6].

Characteristic wine	*Clarity*	*Color*	*Flavor*	*Taste*
Wine Viorica 2020	Liquid Clear, without foreign inclusions	Intense gold with shades of amber	Romanian flowers, unripe mango, basil, candied fruit, apricot jam and jasmine	The taste is exuberantly juicy, a bit tannic, floral after taste
Wine Viorica 2022	Clear liquid, without sediment and suspended particles	Intense gold with shades of amber	Citrus tea, bergamot, candied fruit, apricot jam and jasmine	Floral, after taste notes of honeysuckle, a bit tannic

In the case of the 2022 wines, there is an obvious intensification of the fruit nuances, as well as some floral nuances, with a balanced acidity without bitterness, little astringency caused by aging in the barrel. Viorica orange wine has equal and homogeneous sensory profile data because the same technological production procedures were kept for both years and grapes picked from the same vineyard [8-11].

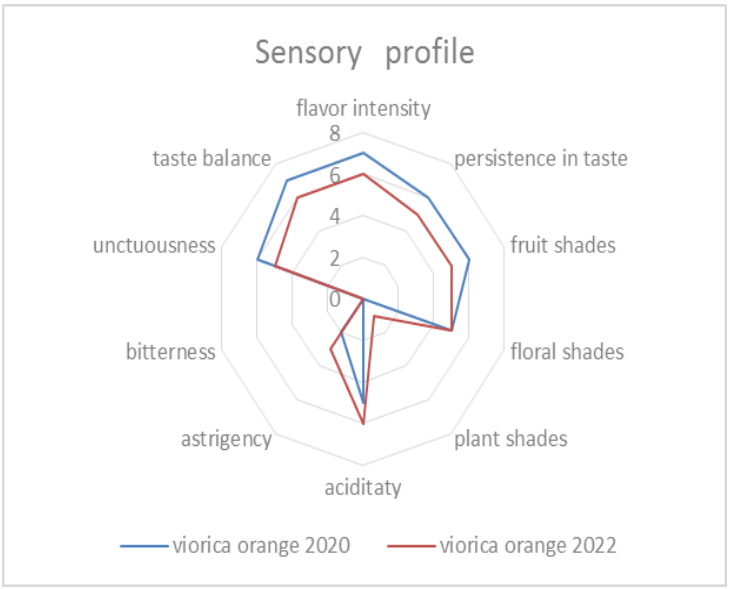

Fig. 8. Sensory profile of Viorica dry orange raw material wines 2020 and 2022 vintage.

Figure 9 represents the sales diagram of Viorica Orange for the year 2022 and it is noticed that Moldova is the segment with wines promoted for export, because the interest in collections of precious wines for their quality and history is sought, but also the segment of wines is in demand because they have a very good quality / price ratio. Academia caused interest in the domestic market so sales were 64.53% higher domestically than externally.

Figure 10 shows the diagram of domestic sales by market segment 2022 of Viorica de Purcari orange wine. The highest sales are represented by the large chain stores with 35%, on the 2nd place is VIP with 34%, on the 3rd place DUTY FREE with 15.5% and HORECA with 15.5%.

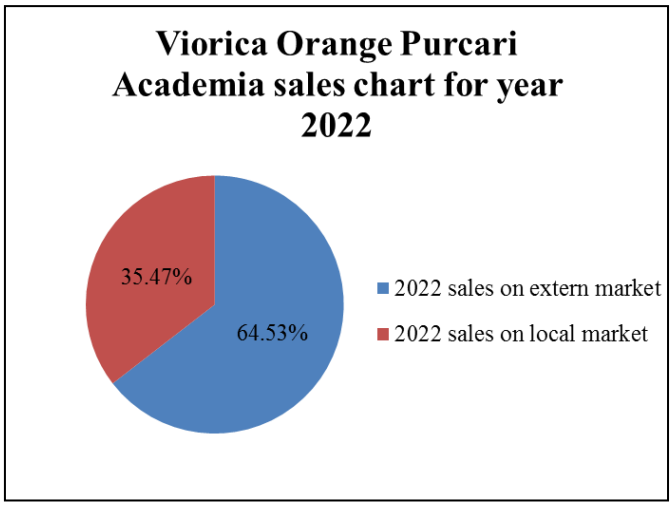

Fig. 9. Viorica Orange Purcari Academia sales chart for year 2022.

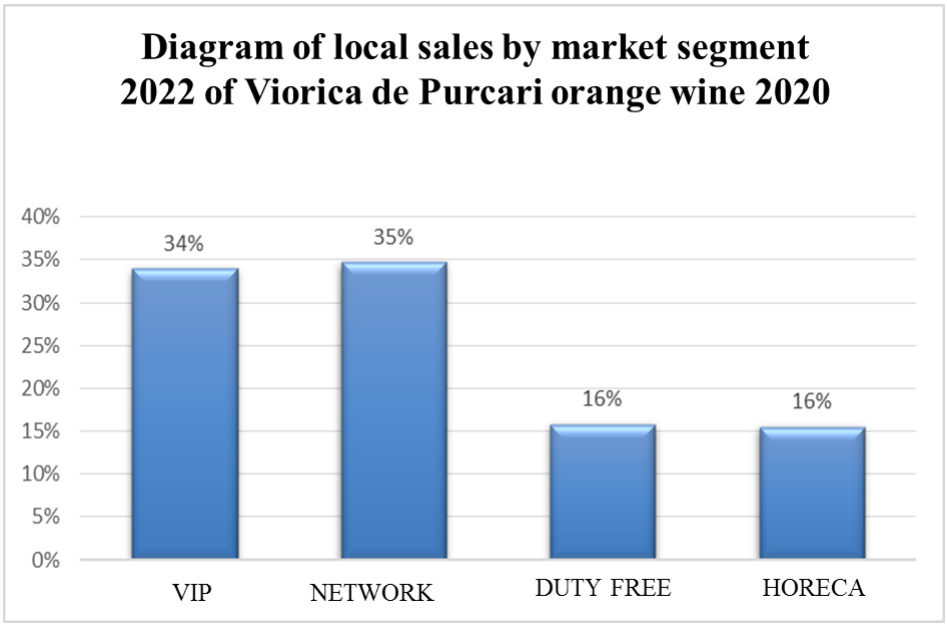

Fig. 10. Diagram of local sales by market segment 2022 of Viorica de Purcari orange wine 2020.

4. CONCLUSIONS

The pedoclimatic conditions of the Purcari vineyards, which are characterized by rich heliothermal resources, are very favorable for the cultivation of Viorica vine variety, which produces dry wines and at the same time produces "Orange" wines with the accumulation of large quantities of sugars, which favor high quality wines with intense coloring.

The right choice of vinification system, working parameters and treatments improves the quality of the "Orange" wines from the Purcari vineyard. The way of processing Viorica grapes after red vinification influenced the alcohol content, sugar, color intensity, hue, and quality of the wines that were obtained.

The physico-chemical parameters and organoleptic properties of the Orange wines examined correspond to the documents in force.

Current global trends include sustainability, green, organic and biodynamic production through the use of eco-friendly packaging, minimization of waste, wastewater and carbon footprint. Every manufacturer should keep up

with the times and the progress of civilization, now the population is interested in natural products without chemical adjustments and they have the same requirements for wines.

Recommendation: The Rcaţiteli grape is recommended for the production of the ”Orange” wine, because in Georgia the wines obtained in Qvevri are produced from the given variety.

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