SENSORY CHARACTERISTICS OF LOCAL WINES OF VRTOGOS WINE REGION (REPUBLIC OF SERBIA) AS A POTENTIAL FOR TOURIST DEVELOPMENT

Tamara Stošić[A], Stefan Šmugović[A], Velibor Ivanović[A], Tijana Stošić[B]*

ABSTRACT

Serbia has significant potential for the development of wine tourism. Wine tours, which are increasingly common forms of tourist attractions, both for domestic and foreign tourists, occupy a significant role on the tourist map of the country. The development of local vineyards, through the promotion of the best wines, represents the next significant step that will raise wine tourism in Serbia to an even higher level. Precisely for this reason, the main subject of this paper is the sensory evaluation of four local wines from the Vrtogos wine region of the Stari Dani winery, which is located in city Bujanovac in the very south of Serbia. Sensory evaluation of quality was carried out by trained tasters, who had the task of evaluating the potential they have for the development of wine tourism. Four types of wine were selected for the experiment, produced from commonly known grape varieties, but with an authentic and recognizable identity. The main goal is to show the sensory characteristics of the selected wines and compare their ratings, which can show whether the given wines have the potential to be drawn on the tourist map of Serbia and become an integral part of the hospitality and tourism offer.

Keywords: *wine, wine tourism, sensory evaluation, Vrtogos wine region, Stari Dani winery*

INTRODUCTION

One of the most powerful industries in almost all corners of the world is the wine industry. The participation of a large number of countries dedicated to the cultivation of vines and wine production makes this activity one of the main agricultural activities of mankind (Rockenbach et al, 2011), which significantly influenced the development of wine tourism in recent years.

The characteristic of wine tourism is that it provides a complete sensory experience. Every tourist, regardless of his knowledge of wine, can appreciate the different tastes, smells, appearance of the winery and the sound of opening a bottle of fine wine (López-Guzmán, 2011).

[A]   Department of Geography, Tourism and Hotel Management, Faculty of Science, University of Novi Sad, Novi Sad, Serbia
[B]   Universidad Autónoma de Barcelona, Gestió de la Seguretat i la Qualitat Alimentàriao8193 Bellaterra, Barcelona, Spain
[*]   Corresponding author: stefan.smugovic@dgt.uns.ac.rs

Wineries are mostly located outside the city centers, which contributes to the fact that wine tourism has a significant impact on the development of rural areas and rural tourism (Sekulić et al., 2016; Montella, 2017).

Wine tourism is one of the most dominant forms of tourism in France, Italy, Germany, Australia and New Zealand. Even most of the surrounding countries have developed various strategies for the development of wine routes. The authors point out that Serbia also has significant potential for the development of this type of tourism, but that development requires the detailed development of strategies and plans for the support and promotion of wine tourism (Pivac, 2009), which are being worked on in detail. Wine tourism in Serbia is still at the very beginning of development, but it has significant potential for further development (Sekulić et al., 2017).

Serbia has very favorable natural and other resources that are suitable for achieving much better, more stable and better quality wines (Petrović et al., 2015). Sensory characteristics of wine, such as color, aroma and taste, are closely related to wine quality, which is difficult to define due to its complexity and multi-dimensional aspects (Hopfer et al., 2014).

Scientists agree that the best way to understand the complexity of wine and its acceptance by consumers is to supplement information obtained from consumers, the best use of a specially trained panel to quantify the sensory attributes of one or more wines (Francis, Williamson, 2015).

The subject of the paper is the evaluation of the sensory characteristics of four wines from the "Stari Dani" winery that belong to the Vrtogos wine region and their potential for the development of wine tourism in the given region. The task of this work is to show the sensory characteristics of the selected wines, to look at the attractiveness of the wines of the winery "Stari Dani" and to determine their potential in the development of tourism in the area. The aim of the work is to obtain data on the sensory quality of the selected wines of the characteristic offer of the Stari Dani winery, and in this way to present the wines of the Vrtogos wine region for the potential tourist development of this area.

LITERATURE REVIEW

Wine as an aspect of the tourist experience

Wine is a very complex product whose offer varies in various varieties and styles of production, and consumers are ready to look for and try wines that will meet their expectations (Lattey et al., 2010).

Different techniques in the winemaking process aim to improve the color or increase other compositional parameters of the wine that can affect the sensory qualities of the wine (Gil-Munoz et al., 2009).

High-performance wine is produced in different vineyards around the world, and the cultivation of vines is adapted to environmental conditions, through different climatic conditions and soil (Van Leeuven, 2010).

The typicality of the wine makes it possible to distinguish, identify and recognize the wines that are produced in recognizable regions. As a concept, typicality can represent the individuality of wine and can bring a certain class of wine. For the wine sector, typicity is a term closely related to the term terroir and the influence this has on the characteristics of wines from a limited geographical area (Cadot et al., 2010; Cadot et al., 2012).

In Serbia, wine production depends on climatic conditions. Data from the Bureau of Statistics from 2015 show that wine production in Serbia was 198 million liters, while total consumption was 18.2 million liters. 369 market-oriented wine producers are registered, while around 80,000 producers are involved in grape production (Wine Atlas, 2015).

In addition to very favorable conditions for viticulture, wine production in Serbia is significantly lower than in countries with similar natural conditions. In a research conducted in Serbia, it was shown that 83% of respondents consume wine. Most respondents drink wine once or several times a week. The most important motive for buying wine is quality, followed by brand name, price and packaging (Vlahović et al., 2012).

The particularity that each wine has, related to the region of origin, can significantly influence its preference and recognition by consumers (Parr et al., 2010).

Wine tourism

There are numerous definitions that try to explain wine tourism, but most of them put the main focus on the motivation of tourists to visit a wine region and their experiences in these regions (Trsic et al., 2019). Hall and Macionis (Hall, Macionis, 1998) wine tourism is defined as "visits to vineyards, wineries, wine festivals and wine exhibitions for which tasting wine from grapes and/or experiencing the attributes of the wine-growing region are the main motivating factors for visitors".

This definition suggests that wine tourism is more than a superficial visit to wineries or vineyards to buy or drink wine. The possibilities it offers to consumers are significantly wider and include, in addition to wine products, enriched experiences (Byrd et al., 2016).

Due to its influence on the development of rural areas, the development of wine tourism brings with it numerous advantages, including an increase in wine sales at the destinations themselves, an improvement in the image of the destination and an increase in the number of tourists (Razovic, 2015).

Among the various characteristics of wine, many researchers consider "complexity" to be one of its most important aspects for understanding wine itself and consumer perception Complexity is therefore considered a positive aspect and a desirable characteristic of wine (Wang et al., 2018; Parr et al, 2011).

The development of wine technology and its availability on the market contributes to the fact that consumers are looking for superior and more diverse wines as well as having the appropriate knowledge to distinguish between grape varieties not only between countries of origin but also within regions within them (Tolley, 2005).

The research conducted by Famularo et al. (Famularo et al., 2010) showed that there is a significant influence of consumer interaction with aspects of wine tourism (visits to wineries, wine consumption, etc.) on their perception of the wine region as an important aspect when choosing and buying wine.

Many wineries recognize the importance of understanding consumer preferences, and have recently started harmonizing the data they receive through consumer surveys with the sensory analysis of wine by experts, thereby obtaining a starting point for better positioning on the market (Lesschaeve, 2007).

METHODOLOGY

Work methods

In order to carry out the research, experts who are qualified to evaluate the sensory characteristics of wine, from the gastronomy and food technology were engaged.

The Vrtogos wine region and four wines from the "Stari Dani" winery were taken as the basic region that was researched.

Two red and two white wines were used. Among the red wines, "Dert" blend of Cabernet Sauvignon and Merlot varieties and "Basma" of Pinot Noir variety were evaluated. From the white wines "Aber" from the Sauvignon blanc grape variety and "Alal" from the Chardonnay variety. For evaluation purposes, two bottles were served, a total of 1.5 liters of each wine. The glasses that were used were made of glass, colorless, transparent, without pictures or decorations with a foot that allows stability, and a handle (leg) that allows handling without heating the wine. The body of the glass was in the shape of a tulip, the upper part of which is narrowed because this shape allows the concentration of aromas and their nasal absorption. All wines were served in the same glasses. All evaluators received 2 deciliters of wine in each glass.

In wine tasting, if different types of wine are evaluated, the lightest and driest wines are tasted first. For this reason, white wines "Alal" and "Aber" were served first, then red wines "Basma" and finally "Dert". The wines were numbered from 1 to 4 as follows – Alal number 1, Aber number 2, Basma number 3, Dert number 4.

All wines were served at a certain temperature. White wines are usually served at lower temperatures than red wines. Alal wine was served at a temperature of 12 ºC, while Aber wine was served at a temperature of 10 ºC. While both red wines were served at a temperature of 18 ºC.

As part of the research, ISO standards were used for quality assessment: SRPS ENIOS 8586 - 2, EN ISO 8588 and ISO 6658 (Popov-Raljić, 2013).

Table 1. Samples and basic characteristics

Samples	Characteristics
1 – In the analysis and discussion of *Chardonnay*	*Chardonnay* wine with 13% alcohol and no excess sugar, produced in 2018 in the village of Rakovac
2 – In the analysis and discussion of *Sauvignon blanc*	*Sauvignon blanc* wine with 14% alcohol, without excess sugar, produced in 2019 in the village of Rakovac
3 – In the analysis and discussion of *Pinot Noir*	*Pinot Noir* wine with 13.5% alcohol, without excess sugar, produced in 2015 in the village of Rakovac
4 – In the analysis and discussion of *Cabernet sauvignon* and *Merlot*	*Cabernet sauvignon* and *Merlot* blend with 13.5% alcohol, without excess sugar, produced in 2015 in the village of Rakovac

Research area

The sensory assessment of wine quality was carried out at the Faculty of Science and Mathematics, at the Department of Gastronomy, in Novi Sad. The tasting took place on July 9, 2022. Sensory evaluation was carried out in the morning hours. A room with white walls and tiles, natural lighting, adequate air circulation, good lighting, no noise, presence of foreign smells, ventilated, with a room temperature of 20 ºC was chosen as the place of assessment. Appropriately shaped glasses are provided for all wines. Before the tasting, a table with seven chairs was set up, on which a white tablecloth was placed. After that, white paper bases with wine codes were placed. In the middle of the table were plates with bread and apples. In addition to the bread and apples, each taster received a glass of water to clean the pallad and move on to the next sample.

Characteristics of evaluators

Seven professionally trained tasters participated in the research. According to the division related to the type of evaluator, the selected tasters belong to the group of experts. Tasters are fully competent to give their opinion and sensory evaluation of wine based on their expertise, knowledge and experience. Four men (70%) and three women (30%) aged 31 to 50 participated in the research.

Evaluation sheets

The rating sheets were modeled after the rating sheets created by Harrington (Harrington, 2007). The created rating sheet consists of three product properties and ten subcategories. The properties of the product were divided so that each evaluator had to evaluate the characteristics of the wine, the flavor and to recognize the specific bearer of the wine's flavor. As for the characteristics themselves, the color, clearness and intensity of

the smell are evaluated. The raters could rate the color on a scale of 1 to 5 in the following order: poor color, weak color, medium color, good color, and intense color. They could rate the clarity on a scale of 1 to 5: unclear, blurry, medium clear, semi clear and clear. In terms of the intensity of the smell, the scale was as follows: weak, weakly intense, medium intense, semi intense and intense.

The taste of the wine represented a special property of the product and six subcategories were evaluated - sweetness, acidity, bitterness, aroma intensity, aroma persistence and wine body. All subcategories could be rated on a scale of 1 to 5.

In the taste carrier, the evaluators were also able to recognize flavors on a scale of 1 to 5 where 1 is dried fruit, 2 is green fruit, 3 is herbal aromas, 4 is berries, 5 is citrus.

STATISTICAL DATA PROCESSING

The obtained results were systematized and statistically processed using descriptive statistics. To determine mutual differences with the application of the ANOVA test, the results of the Kruskal-Wallis and Mann-Whitney tests were also taken into account, where the results are converted into ranks and the mean ranks of each group are compared.

Basic characteristics of sample 1 - "Alal" wine

"Alal" is a white dry wine produced from the Chardonnay grape variety. Grape harvesting begins when the sugar level in the grapes reaches 21%, because then they reach optimal technological ripiness. After the grapes have cooled down, they are pressed and separated from grape juice. Then next are processes of sedimentation and sediment separation, and then the grape juice is transferred to fermentation tanks, where selected yeasts are added. The fermentation process lasts about 20 days at a temperature of about 13 °C. After fermentation, the young white wine is poured into stainless steel tanks and the sediment is separated. The wine is then stored in tanks for 6 months. Alal is a light-yellow wine, crystal clear, with a strong flavor of ripe fruit and a discreet aroma. It is very complex, which allows chefs to combine it with white meat, fish or cheeses (Internal documentation of the manufacturer).

Basic characteristics of sample 2 - „Aber" wine

"Aber" is a dry white wine produced from the Sauvignon Blanc grape variety. Grape harvesting begins when the level of sugar in the grapes reaches 21%, because then they reach optimal technological ripiness. After being delivered from the vineyard, the grapes are cooled and pressed. Then the next process of sedimentation and sediment separation, and then the grape juice is transferred to fermentation tanks, where selected yeasts are added. The fermentation process lasts about 20 days at a temperature of about 13 °C. After fermentation, the young white wine is poured into stainless steel tanks and the sediment is separated. The wine is then stored in tanks for 6 months. When the entire production process is finished, the wine is ready for bottling and marketing. Aber is a green-yellow wine with herbal flavors and pleasant acidity. Due to its complexity and unique taste, it combines well with fish, light meats and cheeses (Internal documentation of the manufacturer).

Basic characteristics of sample 3 - „Basma" wine

"Basma" wine is a dry, red wine obtained from the Pinot Noir grape variety. The grape harvest begins when the sugar level reaches 22–25%, as it is then considered to have reached technological ripiness. After the harvest, the grapes are transported to the cellar, where they are first pressed and the stems are separated from the berries. After pressing, the fermentation process begins with the addition of selected yeasts to the grape juice. The fermentation process lasts 12–14 days at a temperature of 24–28 ᵒC. Then the wine is separated from the juice and the silent fermentation process follows. The resulting wine is transferred to a stainless steel tank, and it needs to be decanted often in order to release as much of the phenolic substances as possible, which gives the wine its characteristic varietal smell. The wine is first stored for one year in stainless steel tanks, then it is poured into barrique barrels where it ages for 12-16 months. After that, it is ready for bottling and marketing. The wine is ruby in color, with flavors of dried fruit and oak, medium body. Due to its characteristic aromas, it is well combined with red meats, mature cheeses and creamy desserts (Internal documentation of the manufacturer).

Basic characteristics of sample 4 - „Basma" wine

"Dert" wine is a dry, red wine obtained from the blending of two grape varieties - Cabernet Sauvignon and Merlot. The grape harvest begins when the sugar level reaches 22–25%, as it is then considered to have reached technological ripiness. After the harvest, the grapes are transported to the cellar, where they are first pressed and the stems are separated from the berries. After pressing, the fermentation process begins with the addition of selected yeasts to the grapes. The fermentation process lasts 12–14 days at a temperature of 24–28 ᵒC. Then the wine is separated from the grape membranes and the silent fermentation process follows. The obtained wine is removed from the sediment and transferred to a stainless steel tank, and it needs to be decanted often in order to release as much of the phenolic substances as possible, which gives the wine its characteristic varietal smell. The wine is first stored for one year in stainless steel tanks, then it is poured into barrique barrels where it ages for 12-16 months. After that, it is ready for bottling and marketing. The wine has a characteristic dark red color, with recognizable aromas of the grapes from which it has been produced. The wine has a full berry flavor. Also, it belongs to the group of quality wines with geographical origin. It combines well with dark meat, blue fish and mature cheeses (Internal documentation of the manufacturer).

RESEARCH RESULTS AND DISCUSSIONS

Analysis of the sensory characteristics of "Alal" wine (sample 1)

Based on the results obtained by the professional tasters, the wine "Alal" was rated by the tasters as a wine with a nice color, with a score of 4.00. The wine was rated as clear with a rating of 5.00. For the intensity of the smell, the tasters said it was semi intense (4.00), with a minimum and maximum score of 4. The sample was rated as a wine with a slight sweetness of 2.00. The acidity and sweetness of the wine are proportionally reversed. Since the wine is of low sweetness, it should have a higher acid content. This wine is rated as medium sour, with a grade of 3.00. Given that this wine has no excess sugar, and the percentage of alcohol is 13%, the slight sweetness comes from ethyl alcohol, which in itself has a sweet taste. Although the wine "Alal" has a higher percentage of alcohol (13%), the body of this wine is rated as medium, with a grade of 3.00. The wine was rated as a non-bitter wine with a score of 1.29. The intensity and persistence of the aroma were assessed as weak. Intensity was rated 2.29, and persistence was rated 2.00. The flavors that dominate this wine are those of green fruit, which was noticed by the tasters (table 2).

Table 2. Ratings of sensory characteristics of "Alal" wine (sample 1)

Wine 1	N	Minimun (Min)	Maximum (Max)	Mean value (M)	Standard variation (σ)	Variance (Var)
Color	5	4	4	4,00	0,00	0,00
Clearness	5	5	5	5,00	0,00	0,00
The intensity of the smell	5	4	4	4,00	0,00	0,00
Sweetness	5	2	2	2,00	0,00	0,00
Acidity	5	3	3	3,00	0,00	0,00
Bitterness	5	1	2	1,29	0,45	0,20
Aroma intensity	5	2	3	2,29	0,45	0,20
Persistence of aroma	5	2	2	2,00	0,00	0,00
Body	5	3	3	3,00	0,00	0,00
Flavor	5	2	2	2,00	0,00	0,00

Analysis of sensory characteristics of "Aber" wine (sample 2)

The wine was rated by the tasters as a wine with a nice color, a score of 4.00. The wine was rated as clear with a rating of 5.00. As for the intensity of the smell, the tasters said it was very intense (5.00). The wine was rated as a wine of low sweetness, 1.57. The acidity and sweetness of the wine are proportionally reversed. Since the wine is of low sweetness, it should have a higher acid content. This wine is rated as medium sour. With a rating of 3.00. Given that this wine has no excess sugar, and the percentage of alcohol is 14%, the slight sweetness comes from ethyl alcohol, which in itself has a sweet taste (Banjac et al., 2022). Although the wine "Aber" has a higher percentage of alcohol (14%), the body of this wine is rated as medium, with a grade of 3.00. In addition to alcohol, wine production technology also affects the fullness of wine. Since the wine was produced according to the technology of white wines, which means that the grape juice is separated from the stem immediately after pressing, this result is justified. A medium-bodied wine, accompanied by a medium intensity and persistent aroma. The intensity of the aroma was rated 3.00, as well as the persistence of the aroma. The tasters estimated that the wine was slightly bitter with an average score of 2.00. All tasters felt herbal flavors, which are also characteristic of "Aber" wine (table 3).

Table 3. Ratings of sensory characteristics of "Aber" wine

Wine 2	N	Minimum (Min)	Maximum (Max)	Mean value (M)	Standard variation (σ)	Variance (Var)
Color	7	4	4	4,00	0,00	0,00
Clearness	7	5	5	5,00	0,00	0,00
The intensity of the smell	7	5	5	5,00	0,00	0,00
Sweetness	7	1	2	1,57	0,49	0,24
Acidity	7	3	3	3,00	0,00	0,00
Bitterness	7	2	2	2,00	0,00	0,00
Aroma intensity	7	3	3	3,00	0,00	0,00
Persistence of aroma	7	3	3	3,00	0,00	0,00
Body	7	3	3	3,00	0,00	0,00
Flavor	7	3	3	3,00	0,00	0,00

Analysis of sensory characteristics of "Basma" wine (sample 3)

Like the previous two wines, this wine was rated as a wine with less sweetness. Unlike the previous wines, where the acidity was rated as medium, the acidity of this wine was rated as low. The mean value for sweetness is 2.12 and for acidity 2.00. The color of this wine is rated as beautiful with a medium average rating of 4.00. The wine is rated as clear with a rating of 5.00. The wine was rated by tasters as medium-bodied, intense and persistent in aroma. The body, intensity and persistence of the aroma have the same average rating, i.e. 3.00. As with the previous wines, this wine is dominated by varietal flavors of dried fruit and oak that the tasters recognized (table 4).

Table 4. Ratings of sensory characteristics of "Basma" wine

Wine 2	N	Minimum (Min)	Maximum (Max)	Mean value (M)	Standard variation (σ)	Variance (Var)
Color	7	4	4	4,00	0,00	0,00
Clearness	7	5	5	5,00	0,00	0,00
The intensity of the smell	7	4	4	4,00	0,00	0,00
Sweetness	7	2	3	2,15	0,35	0,12
Acidity	7	2	2	2,00	0,00	0,00
Bitterness	7	2	2	2,00	0,00	0,00
Aroma intensity	7	3	3	3,00	0,00	0,00
Persistence of aroma	7	3	3	3,00	0,00	0,00
Body	7	3	3	3,00	0,00	0,00
Flavor	7	1	1	1,00	0,00	0,00

Analysis of sensory characteristics of "Dert" wine (sample 4)

The wine "Dert" was evaluated as a clear wine, with a beautiful color and a very intense aroma. All three characteristics were evaluated with an average score of 5.00. The wine was rated as a wine of low sweetness, grade 1.43, while the acidity was graded 2.43 (medium acidity). Given that it is a dry wine, the content of excess sugar is 0% and with a higher alcohol percentage of 13.5%, the sweetness, as with the previous wines, comes from ethyl alcohol. The wine was rated as a medium bitterness wine with a score of 3. As for the body, the wine was rated as a medium-full bodied wine with a score of 3.71. This was expected because it is a wine that represents a blend of two grape varieties, and the body of the wine is also influenced by the aging of the wine in oak barrels. The wine has a steady persistence of aroma (3.71), and a medium intensity of aroma (3.29). The wine is characterized by varietal aromas, which the tasters recognized. Everyone recognized the flavor of berries (table 5).

"Dert" is a wine that stands out for its color (25.00), intensity of smell (21.5) and aroma (23.00), bitterness and persistence of aroma, body (22.00) and taste (25.00)). The wine "Basma" received the highest score for sweetness. All wines are equally rated for clarity.

Table 5. Assessment of sensory characteristics of "Dert" wine

Wine 2	N	Minimum (Min)	Maximum (Max)	Mean value (M)	Standard variation (σ)	Variance (Var)
Color	7	5	5	5,00	0,00	0,00
Clearness	7	5	5	5,00	0,00	0,00
The intensity of the smell	7	5	5	5,00	0,00	0,00
Sweetness	7	1	2	1,43	0,49	0,24
Acidity	7	2	3	2,43	0,49	0,24
Bitterness	7	3	3	3,00	0,00	0,00
Aroma intensity	7	3	4	3,29	0,45	0,20
Persistence of aroma	7	3	4	3,71	0,45	0,20
Body	7	3	4	3,71	0,45	0,20
Flavor	7	4	4	4,00	0,00	0,00

Kruskal – Wallis analysis of wine

The results show that in the case of color, the wine Dert stands out, while the other wines are at the same level. The clearness of the wine is uniform in all samples, while the Aber and Dert wines stand out in terms of the intensity of the aroma. Although all the wines are without excess sugar, the Basma wine stands out with its sweetness rating. As far as bitterness is concerned, the Dert wine stands out, and it is expected that this wine is least sweet. Dert wine stands out in the categories of consistency and intensity of aroma, body and taste, which only speaks of how complex this wine is.

Table 9. Kruskal-Wallis analysis of selected wines

CHARACTERISTICS	THE RESULT	TYPE OF WINE	MEAN RANK
Color	P 0.000000	Alal	11.00
		Aber	11.00
	X2 0.998748	Basma	11.00
		Dert	25.00
Clearness	P 0.000000	Alal	14.50
		Aber	14.50
	X2 1.000000	Basma	14.50
		Dert	14.50
The intensity of the smell	P 0.000000	Alal	7.50
		Aber	21.50
	X2 0.999942	Basma	7.50
		Dert	21.50
Sweetness	P 0.011796	Alal	17.50
		Aber	11.71
	X2 0.000003	Basma	19.00
		Dert	9.79

CHARACTERISTICS	THE RESULT	TYPE OF WINE	MEAN RANK
Acidity	P 0.000000	Alal	20.00
		Aber	20.00
	X2 0.012791	Basma	6.00
		Dert	12.00
Bitterness	P 0.000000	Alal	6.00
		Aber	13.50
	X2 0.000069	Basma	13.50
		Dert	25.00
Aroma intensity	P 0.000118	Alal	6.71
		Aber	16.00
	X2 0.080494	Basma	16.00
		Dert	19.29
Persistence of aroma	P 0.000000	Alal	4.00
		Aber	15.50
	X2 0.081076	Basma	15.50
		Dert	23.00
Body	P 0.000010	Alal	12.00
		Aber	12.00
	X2 0.311912	Basma	12.00
		Dert	22.00
Flavor	P 0.000000	Alal	11.00
		Aber	18.00
	X2 0.001398	Basma	4.00
		Dert	25.00

The results showed that the tasters noticed significant statistical differences for several sensory characteristics of the wine. Dert is a wine that stands out for its color, intensity of smell and aroma, bitterness and persistence of aroma, body and flavor. The marked astringency and bitterness of this wine is due to the tannins and phenolic compounds that black aged wines of the Cabernet Sauvignon and Merlot varieties have. These data agree with the data obtained in their research by Chira et al. (Chira et al., 2011) on a sample of wine from Bordeaux.

Basma wine received the highest score for sweetness. This result for a Pinot noir wine can be the result of certain chemical attributes of the wine which include skin tannin concentration, total fruit tannin concentration and wine monomer concentrations. (Cortell et al., 2008).

The high ratings of the sensory characteristics of the selected wines indicate that these are very high-quality wines that have the potential to occupy a good position on the market. Dert wine, which has a intense flavor, color, but also the intensity and persistence of the aroma, is a wine that can attract tourists, not only from the whole country, but also from the whole region.

The evaluation of the sensory characteristics of wine can serve as a catalyst for establishing better differentiation in the market because it offers customers, tourists a better understanding of the quality of wine (Santini, 2011).

CONCLUSION

The assessment of the sensory characteristics of the selected wines of the Vrtogos vineyards in order to obtain data on their sensory quality showed that the evaluated wines have quality and significant potential for the development of tourism in the given region.

Although the implementation of a sensory analysis program is usually the practice of wineries and academic institutions, adopting good sensory practices requires only good will, discipline and basic training. So today we can see more and more often that various catering facilities practice sensory evaluation of wine, both with employees and guests.

The sensory assessment conducted and the results obtained in the work show that the wines of the "Stari Dani" winery have the potential to be in the ranks of wines from other parts of our country.

The growth of wine tourism throughout the world shows that there is room for the development of this form of tourism in Serbia as well. This research shows that the wines from the Vrtogos vineyards, based on their quality, have the potential to be drawn on the map of wine tourism, both in our country and in the entire region.

Better development strategies and a different approach to the commercialization of wine, inclusion in wine routes, represent only some of the possible solutions for more efficient growth of smaller wineries and the development of wine tourism itself.

This research was based on only four wines from one winery in the Vrtogo region, so it does not represent a picture of the entire region, nor the entire country. The room for future research is in the sensory evaluation and evaluation of the potential of wines from some wineries of the same region in order to get a realistic picture of the potential of the entire region, which would represent a starting point for the formulation of certain development strategies. Similar research could be conducted in other regions within the state, which would map the area and encourage the development of wine tourism at the state level.

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ORCID Stefan Šmugović https://orcid.org/0000-0002-8489-101X