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QUALITATIVE CHARACTERISATION OF THE WHITE WINES OBTAINED IN THE COMPANY S.C. MURFATLAR ROMANIA S.A. IN THE PERIOD 2013-2015

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Abstract

SC Murfatlar SA, in a country with a long tradition in wine production, is proving to be one of the oldest, largest and innovative vineyards, with a location that gives a particular microclimate, favorable for the achievement of a wide variety of wines, of high quality. The purpose of the paper is to establish the dynamic quality of the white wines produced in S.C. Murfatlar Romania SA, by analyzing the main physical-chemical parameters responsible for the wine quality (alcoholic strength%, free sugar g/l, total acidity g/ l $C_4H_6O_6$, its no-reducing dry extract g/ l, total SO_2 mg/ l), for 12 samples analyzed. The main physical-chemical parameters, namely alcoholic strength, free sugar and total acidity recorded a significant increase in the analyzed period, for the two types of white wines from the four analyzed. All analyzed parameters were within the limits imposed by the International Organization of Vine and Wine (OIV) during the studied period.

Key words**:** *quality, physical-chemical parameters, white wines*

INTRODUCTION

Wine is an alcoholic beverage obtained exclusively by full or partial fermentation of fresh grapes crushed or subject to authorized processing or fresh grapes [9].

The wines that have controlled origin name and quality levels (D.O.C.) represent the highest category of quality [5]. Quality level award is motivated by several factors, such as the sugar content, the proportion of raisin berries, the attack of noble mold, which are determined primarily by the harvest time [2].

The total wine production recorded in 2015 in our country was of 3.6 million hectoliters, representing 65% of the total production of white wines, slightly in contradiction to the global trend, preferring red wine, this having only 30% of the production and rosé wine, 5% [12].

The title of the largest wine producer in Romania belongs to the company SC Murfatlar Romania SA, both based on the turnover recorded in 2015 (25.41 million euros), the vines area owned (over 3100 ha) and the production capacity (over 29 million liters annually of wine) and storage capacity (over 43 million liters of wine) [11].

The company owns the largest growing area in Romania, near the localities Basarabi, Valul lui Traian, Poarta Albă, Siminoc and Valea Dacilor. The company has the largest wine cellar in Romania, with a huge storage capacity of over 43 million liters of wine [10].

The wines produced by SC Murfatlar Romania S.A. participate annually in most international wine competitions and annually win medals (over 55 medals), contests like Chardonnay du Monde, Decanter World Wine Awards IWSC, Japan Wine Challenge etc. - all these medals strengthening the reputation of Murfatlar wine, an authentic product, with undoubted qualities [10].

The variety structure contains at present about 200 wines, in proportion of 65% white wines (Chardonnay, Sauvignon Blanc, Muscat Ottonel, Riesling Italian, etc.), 30% red varieties (Fetească Neagră, Cabernet Sauvignon, Merlot, Pinot Noir, etc) and 5% rosé varieties.

MATERIALS AND METHODS

The present study aims at analyzing the dynamics of qualitative parameters of white wines produced in the company Murfatlar Romania S.A. in the period 2013-2015. To this end, I conducted an analysis of the main physical-chemical characteristics, based on the data collected from the analysis report of the company S.C. Murfatlar Romania S.A. The analyzed physical - chemical characteristics for each wine were alcohol concentration (%), sugar free (g/l), total acidity $C_4H_6O_6$ (g/l), no-reducing dry extract (g/l), and total SO_2 (mg/l).
I analyzed also if the qualitative parameters of the four types of wines were within the limits imposed by the International Organization of Vine and Wine (OIV) during the studied period [9].

RESULTS AND DISCUSSIONS

The values of the main physical-chemical parameters responsible for white wine quality had in the period 2013-2015 the following values [8]:

Table 1. Physical-chemical parameters of white wines produced by S.C. Murfatlar Romania S.A. in the period 2013-2015

No	Year	Alcohol vol (%)	No-reducing dry extract (g/l)	Total acidity (g/l $C_4H_6O_6$)	Sugar free (g/l)	SO_2 total mg/l
White wine Sauvignon Blanc Collection Leat 6500 The Origin						
1	2013	12.00	18.70	5.70	9.70	169
2	2014	12.50	21.70	7.30	8.30	156
3	2015	12.70	19.60	6.02	8.30	184
White wine Chardonney -Collection Leat 6500 The Origin						
4	2013	12.80	20.80	7.10	2.50	143
5	2014	13.15	20.20	6.50	2.50	164
6	2015	13.20	20.40	6.09	2.80	164
White wine Muscat Ottonel - Collection Zestrea Murfatlar						
7	2013	11.70	20.80	5.91	35.8	164
8	2014	11.80	22.10	6.53	34.0	207
9	2015	12.10	22.70	5.82	38.4	207
White wine Riesling Italian - Collection Premiat						
10	2013	12.50	17.80	5.77	7.40	153
11	2014	12.80	18.20	6.57	7.40	189
12	2015	13.00	21.00	6.50	6.00	192

Regarding the sugar free, we see in figure 1 that for white wines Chardonney and Muscat Ottonel, its values had an increase in 2015 compared to the first year studied, up to 12% and 7.3%. Contrary to it, Sauvignon Blanc and Riesling Italian wines decreased by 14.4% respectively, 18%.

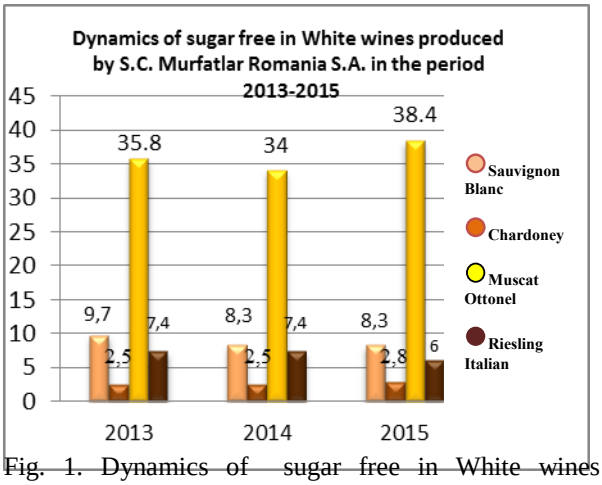

Fig. 1. Dynamics of sugar free in White wines produced by S.C. Murfatlar România S.A. in the period 2013-2015

These differences regarding the evolution of the 4 sugar free wines can be caused by the technology and features of grapes from which the wine was produced.
We see also that out of the 4 wines, Muscat Ottonel is the wine with the highest sugar free quantity accumulated, mainly due to the fact that the variety from which the wine was made had good weather conditions in 2015. The grapes were sweet, with intense honey flavors, with a crispy ad vegetal skin, some of them nearly dried, with some traces of noble mold, ideal conditions for the wine with a high concentration of sugar.
In contrast, Chardonney wine recorded the lowest values of free sugar, because a specific wine-making technology was chosen to obtain a dry wine. Must extracted carefully and clarified, an inoculation with selected yeasts was also made, following fermentation in new Romanian oak barrels. The wine left for maturation for 14 months, with periodic homogenization of fermentation yeast.
Depending on the content of sugars accumulated, the 4 studied wines are included in types of wine as follows: white wine Sauvignon Blanc - semi-dry wine, white wine Chardonney - dry wine, white wine Muscat Ottonel - semi-sweet wine and white wine Riesling Italian semi-dry wine.
Another parameter which plays an important role in the wine quality is represented by

alcoholic strength [1], influencing the flavor perception, taste, viscosity, sweetness, astringency and wine type. Also, it has an important role in wines preservation [3].

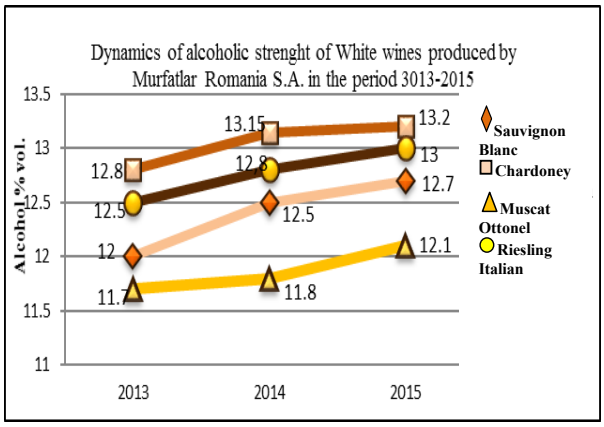

Fig. 2. Dynamics of alcoholic strength of White wines produced by S.C. Murfatlar Romania S.A. in the period 2013-2015

During the period 2013-2015, all 4 white wines studied had an increased trend in terms of alcoholic strength, recording on an average increases of over 4%. The highest values of the alcoholic strength were recorded in Chardonney white wines and Italian Riesling.
Alcoholic strength differences between the four types of wine can be explained by distinct duration of fermentation processes and the sugar content, these two factors largely influenced the alcoholic strength.
The total acidity gives wines the characteristic taste, lively, slightly sour [4].
In terms of dynamics of total acidity, we note the following variation in the analyzed period:

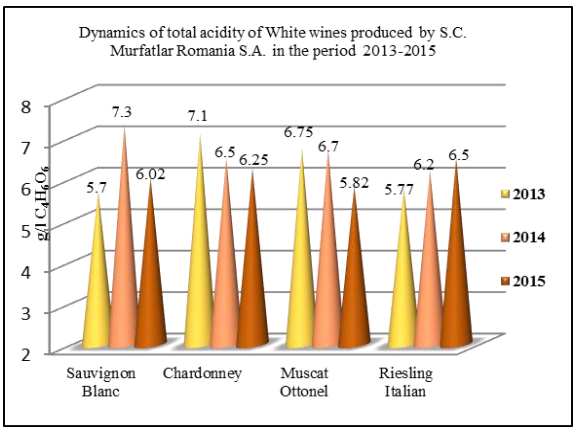

Fig. 3. Dynamics of total acidity of White wines produced by S.C. Murfatlar Romania S.A. in the period 2013-2015

Figure 3 shows that Sauvignon Blanc and Italian Riesling wines have recorded increases in acidity, with 12.65% respectively 5.61%. Contrary to them, Muscat Ottonel and Chardonney wines suffered a decline in total acidity values up to 14.23% respectively 1.52%, decrease which correlates with simultaneous increase of the sugar free content and alcoholic strength, previously analyzed, because the alcohol and sugar content moderate the wine acidity, giving them a balance [6].

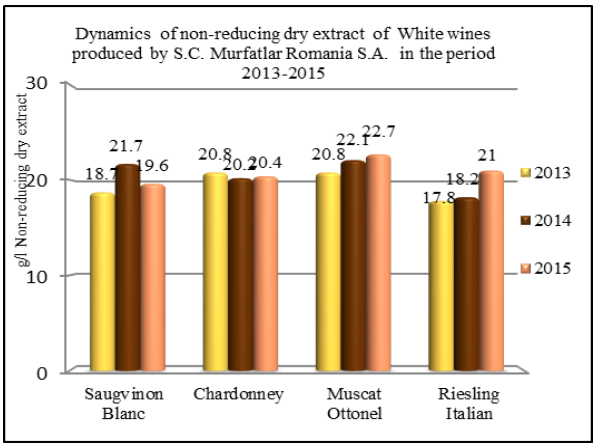

Fig. 4. – Dynamics of non-reducing dry extract of White wines produced by S.C. Murfatlar Romania S.A. in the period 2013-2015

No-reducing dry extract is a criterion for assessing the authenticity and naturalness of wines and from the 4 studied white wines, we note that the most extractive wines throughout the period Muscat Ottonel wines, with values over 20 g/l. The different level of no-reducing dry extract of the 4 wines is due to various processing technologies used, practices and treatments performed on wines and the features of used grapes.
In the case of Muscat Ottonel wine, in order to obtain a bigger extract, it was decided that the grapes Muscat Ottonel variety to be harvested when full ripening and immediately subject to a maceration in cold for 10 hours, following the fermentation in tanks of small dimensions.
The total sulphur dioxide plays an important role in determining the wine quality, helping preserving the flavor and freshness of color, participating in the bouquet formation, preventing illness of wine [7].

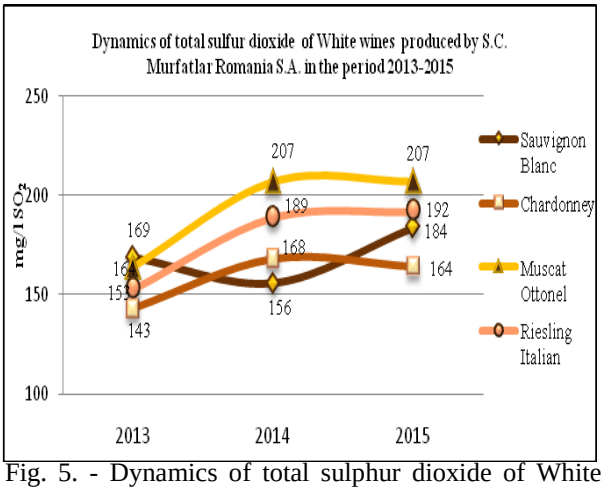

Fig. 5. - Dynamics of total sulphur dioxide of White wines produced by S.C. Murfatlar Romania S.A. in the period 2013-2015

In 2015, compared to the first year studied, we see that all white wines analyzed recorded increases of total sulfur dioxide content, the highest growth having Italian Riesling wine, with over 25.49%.

CONCLUSIONS

Based on the analyses made, I concluded the following:

From the point of view of the physical-chemical composition, the analyzed wines belonged to the following quality categories and types of wines depending on sugar:

♦ Saugvinon Blanc corresponded to the quality category DOC CMD and semi-dry wine type;

♦ Chardonney – quality category DOC CMD and dry wine type;

♦ Muscat Ottonel – quality category DOC CT and demi-sweet wine type;

♦ Riesling Italian – quality category DOC CMD and demi-dry wine type;

In the case of Chardonney and Muscat Ottonel wines, it was also noted an important increase trend of the main physical-chemical parameters responsible for the wine quality, respectively the alcoholic strength, sugar free and total acidity.

The qualitative parameters of four wine were within the limits imposed by the International Organization of Vine and Wine [9].

For the future, I propose the achievement of winemaking of the white wine varieties in cement amphorae instead of the current steel tanks (method applied to red wines at present) to obtain a superior type of these wines.

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