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Research concerning the composition and organoleptic features of some wines from Buziaş-Silagiu (Timiş county, Romania)

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Abstract Research was carried out in 2009 and 2010 on some wines from some red and white grape cultivars from a private vineyard located on the Silagiului Hills. The grape cultivars we studied were Mustoasă de Măderat, Fetească regală, Riesling italian, Sauvignon, Pinot gris, Muscat Ottonel, Pinot noir, and Cabernet Sauvignon.

The quality of the wines depends first on the quality of the raw material and then on the preparation and conditioning technology. To established correlations between production and wine quality and with climate conditions, we made measurements concerning the grapes' degree of health, sugar content, and acidity upon harvesting. We also measured the main components of the wines and their organoleptic features. Measuring alcohol content allowed the ranging of the studied wines in a certain category: superior or current consumption.

As a result of our research on wine composition and organoleptic features, we recommend the use of some red and white grape cultivars with superior yields in the conditions of the studied area.

Key words

organoleptic features, quality, white and red wines

The taste quality of the wines besides their analytic components, are the unique way of assessing their qualities and flaws, the balance of components, and substances and features little identified in a laboratory [3, 7].

Producing high quality wines natural and typical of their areas of production requires both the knowledge of agro-biological and technological features inherited materialised in the degree of valorisation in different conditions and the cultivation technology, and technological processes specific to the valorisation of the raw material – grapes [5,6].

Due to the very high diversity of the viticultural assortment in the vineyards we need to study in detail the grape cultivars' behaviour of the existing assortment and the measure in which each grape cultivar corresponds from the point of view of quantity, quality, specificity, and efficiency [1,2].

Depending on the weather conditions, state of maturation of the grapes varies from year to year and from one variety to another, so that in rainy years, the cool autumn, the grapes are not mature enough to harvest the sugar content is lower and higher acidity [4].

Material and Method

Research was carried out in the years 2009 and 2010 on a private vineyard and winery from Buziaş-Silagiu (Timiş County, Romania) and focused on the following white and red grape cultivars: Mustoasă de Măderat, Fetească regală, Riesling italian, Sauvignon, Pinot gris, Muscat Ottonel, Pinot noir, and Cabernet Sauvignon. We analysed and made measurements on these grape cultivars from the point of view of sugar content, of acidity, components features, and organoleptic features aiming at establishing the quality potential of white and red grape cultivars from the reference area and at identifying the grape assortment for wine classification.

The grape harvesting period was established through the analysis of the sugar content and acidity of the must through the refractometric and titrimetric methods.

After the wine cleared, we made chemical and organoleptic analyses to assess wine colour, clarity, flavour, and taste in accordance with the international assessment method with 20 possible points.

Results obtained

Table 1 shows the full maturity period, sugar content, and acidity of the studied grape cultivars for the two research years. In the year 2009, grape full maturity ranged between September 15 and October 10, with the earliest maturity in the grape cultivars Fetească regală, Pinot gris, and Muscat Ottonel, and with the latest maturity in the grape cultivar Mustoasă de Măderat. Sugar content of the grape must was high in the grape cultivars Pinot gris and Pinot noir. All the grape cultivars we studied, except for the grape cultivar Mustoasă de Măderat, meet the conditions for producing superior wines.

Must acidity ranged within normal limits, except for the grape cultivar Mustoasă de Măderat that had a higher acidity, i.e. 6.4 g/l H_2SO_4.

In the year 2010, full maturity was achieved between August 8 in the grape cultivar Muscat Ottonel and September 30 in the grape cultivar Mustoasă de Măderat. Sugar content ranged between 154 g/l in the grape cultivar Mustoasă de Măderat and 227 g/l in the grape cultivar Cabernet Sauvignon. The grape cultivars accumulated enough amounts of sugar to obtain superior wines, except for the grape cultivar Mustoasă de Măderat whose sugar content allowed the manufacturing of a current table wine.

Table 1

Feature elements of the grapes upon harvesting

Grape cultivar	Full maturity date	Harvesting date	Sugar content (g/l)	Acidity (g/l H_2SO_4)
2009				
Mustoasă de Măderat	10.10	05.10	162	6,4
Fetească regală	15.09	25.09	180	4,5
Riesling italian	30.09	10.10	175	4,8
Sauvignon	30.09	05.10	180	3,6
Pinot gris	15.09	25.09	200	3,4
Muscat Ottonel	15.09	20.09	190	4,3
Pinot noir	25.09	30.09	200	3,8
Cabernet Sauvignon	30.09	15.10	180	4,4
2010				
Mustoasă de Măderat	30.09	10.10	154	5,6
Fetească regală	15.09	20.09	184	4,2
Riesling italian	25.09	25.09	217	3,9
Sauvignon	05.10	10.10	186	3,8
Pinot gris	20.09	25.09	190	3,5
Muscat Ottonel	30.08	25.09	220	3,2
Pinot noir	05.09	20.09	218	4,1
Cabernet Sauvignon	20.09	05.10	227	4,2

Tables 2 and 3 show the main components of the wines obtained during the research years. In both years, wine alcohol content ranged them among superior wines, except for the grape cultivar Mustoasă de Măderat that can range among current consumption wines. Acidity ranged within normal limits in all grape cultivars, except for the grape cultivar Mustoasă de Măderat whose value is above optimum, i.e. 4-5 g/l H_2SO_4.

The non-reducing extract is well represented in all the cultivars: it is higher in red wines and lower in white wines, the most extractive ones being the grape cultivars Fetească regală among white grape cultivars and Cabernet Sauvignon among red grape cultivars.

As for reducing sugar content, all grape cultivars ranged within dry wines, fermentation being lead up to the exhaustion of the entire sugar content in the must.

Content of mineral substances is positively correlated with the dry extract content; wines in which we achieved maceration on pomace were richer in mineral substances, i.e. the red wines and the white wine Muscat Ottonel in which ashes are above 2 g/l. The grape cultivars Mustoasă de Măderat and Riesling italian proved to be poorer in mineral substances.

The amount of glycerol dosage was between 5.81 in the year 2009 in the grape cultivars Mustoasă de Măderat and 11.34 in the year 2010 in the grape cultivar Muscat Ottonel.

The content of polyphenols and antocyanins was high in the grape cultivars Pinot noir and Cabernet Sauvignon.

Table 2

Composition features of the wines in 2009

Grape cultivar	Alcohol (vol %)		Acidity g/l H_2SO_4	Nered. extract	Reduced sugar	Ashes g/l	Grey alkal.	Glycerol g/l	Polyphenols	Antocyanins
	Dosage	Total								
White wines										
Mustoasă de Măderat	8,9	8,9	6,4	19,8	0,4	1,65	0,48	5,81	0,50	-
Fetească regală	12,5	12,5	4,5	21,6	2,05	1,93	0,38	9,44	0,58	-
Riesling italian	12,5	12,5	4,8	20,1	1,23	1,88	0,49	9,36	0,46	-
Muscat Ottonel	12,4	12,4	3,5	20,5	1,16	2,10	0,65	9,68	1,02	-
Red wines										
Pinot noir	12,7	12,7	4,2	25,9	6,02	2,72	0,65	8,6	2,42	494
Cabernet Sauvignon	13,0	13,0	3,6	27,1	5,04	2,84	0,76	9,16	2,35	698

Table 3

Composition features of the wines in 2010

Grape cultivar	Alcohol (vol %)		Acidity g/l H_2SO_4	Nered. extract	Reduced sugar	Ashes g/l	Grey alkal.	Glycerol g/l	Polyphenols	Antocyanins
	Dosage	Total								
White wines										
Mustoasă de Măderat	8,9	9,0	5,4	18,9	1,08	1,75	0,36	7,40	0,81	-
Fetească regală	10,8	9,9	4,1	20,4	3,96	2,04	0,41	9,16	0,54	-
Riesling italian	12,1	12,7	3,8	20,1	4,28	1,98	0,56	9,90	0,51	-
Muscat Ottonel	12,3	12,5	4,2	20,4	6,40	2,16	0,60	11,34	0,55	-
Red wines										
Pinot noir	12,9	12,9	3,5	24,6	6,15	2,53	0,60	8,2	2,29	482
Cabernet Sauvignon	13,1	12,8	3,9	25,5	6,45	2,61	0,70	8,58	3,06	694

Table 4 shows the main features of the studied wines, assessed according to the international scale grading from 0 to 20.

Analysing the data in this table, we can see that the red grape cultivars Pinot noir and Cabernet Sauvignon and the white grape cultivars Fetească regală and Riesling Italian have superior taste features.

The grape cultivar Muscat Ottonel has no apparent quality features first because of the exploitation technology and second because of the biological potential of the grape cultivar and of the vineyard.

Table 4

Assessment and characterisation of the wines through organoleptic analysis (mean for the period 2009-2010)

Grape cultivar	Colour (0-2)	Clarity (0-2)	Aroma (0-4)	Taste (0-12)	Characterisation
Mustoasă de Măderat	2,0	2,0	3,4	8,0	Acidulated, refreshing, typical
Fetească regală	2,0	2,0	4,0	11,2	Typical, with personality, with specific aroma
Riesling italian	2,0	2,0	3,5	11,1	Balanced and typical
Muscat Ottonel	2,0	2,0	3,5	10,3	Slightly acidulated, with specific aroma
Pinot noir	1,5	2,0	3,5	9,8	Low harmonic, poorly coloured
Cabernet Sauvignon	2,0	2,0	3,5	11,3	Very extractive and coloured

Conclusions

As for the chemical composition of the studied wines, we can say that, due to the mean content of alcohol, wines range among "superior" wines except for the grape cultivar Mustoasă de Măderat that ranges among grape cultivars for current table wines.

Total mean acidity also ranges within maximum limits in most grape cultivars, except for the grape cultivar Muscat Ottonel whose acidity was too low in the year 2009 and the grape cultivar Mustoasă de Măderat whose acidity was higher in both years; this asks for balancing through addition of tartric acid or through blending.

The dry reducing extract has generally high values in all the grape cultivars, which denotes extractivity and corpulence. Red wines and the white wine Muscat Ottonel are more consistent, while Mustoasă de Măderat and Riesling Italian are less consistent.

Content of antocyanins and polyphenols records high values in the grape cultivars Cabernet Sauvignon and Pinot noir, which results in intensely coloured wines.

If, from the point of view of chemical composition and of organoleptic features the grape cultivars Riesling italian, Pinot gris, Cabernet Sauvignon, and Pinot noir are remarkable, we can say that the Buziaș-Silagiu area is an area with favourable conditions for both superior red wines and superior white wines.

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