

Research on Behavior of Some Mixed Grape Varieties and Biotypes of Buziaş-Silagiu Area

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Abstract. Buziaş-Silagiu area, situated in Timiș county, has a long tradition for the cultivation of vines in the western part of Romania. It is an area characterized by a very favorable climate and soil conditions, offering the possibility of successful cultivation of many varieties, from the earliest to more autumnal. In this area there were identified numerous local varieties and biotypes, characterized by valuable agrobiological and technological features for growers and consumers, but also for breeders: high production, high quality, drought resistance, frost resistance, tolerance to some diseases and pests. Some of this varieties and biotypes show ampelografical and technological characteristics being used both for fresh consumption and for producing wine with lower alcoholic strength. The research has been conducted in the private plantations from Buziaş-Silagiu area and concerned 6 local varieties and biotypes with mixed features: Alb aromat de Silagiu, Coadă oii, Gras aripat de Silagiu, Mărcoveață, Roz aromat, Roz bătut. We focused on qualitative and quantitative characteristics, wood maturation and buds viability in comparison with mixed characteristics variety Chasselas. The witness selected is a very valuable variety, known worldwide and which is found in the vine varieties of reference area. The methods of research were the usual ones: determinations, measurements, visual examinations. The best results concerning grapes' quality were obtained by Alb aromat de Silagiu variety which accumulated 184.67 g/l sugar and an alcoholic potential of 10.86 degrees alcohol volume. Gras aripat de Silagiu and Coadă oii stood out for productivity. Regarding the viability of buds, Alb aromat de Silagiu exceeded the witness.

Keywords: local varieties, biotypes, variability, productivity, viability, mixed features.

INTRODUCTION

Local biotypes constitute a valuable genetic patrimony. Unfortunately, many of these varieties are in danger of extinction due to negligence or growers' preference for foreign varieties. In recent years, global but also local research trends aim to restore local varieties' importance in order to obtain high quality, typical authentic products. Moreover, the local varieties and biotypes are an important source of biodiversity for breeding (Dobrei *et al.*, 2009, Dobrei and Moş, 2010).

Long tradition in the cultivation of vines and very favorable climatic conditions of the Buziaş-Silagiu area are reflected in the abundance of local varieties and biotypes.

Some of these varieties have valuable agrobiological and technological features both for growers and consumers, but also for breeders: high production, high quality, drought resistance, frost resistance, tolerance to some diseases and pests.

The climatic conditions, the genotype and the appropriate technology are very important for successful cultivation of vines in certain areas. All of this influenced the quality and the quantity's production, the degree of maturation of tissues and the viability of buds (Dobrei *et al.*, 2005).

The research conducted in this area concerned some local varieties and biotypes, which were grouped into three production lines, according to the main ampelographical and technological features: varieties for fresh consumption, mixed varieties and varieties for wine production. The examined varieties are located in the family groves of this area. Therefore, 15 varieties of grapes are destined for fresh consumption.

The category of wine varieties includes 5 varieties: 2 for white wines and 3 for red wines. The category of mixed features varieties includes 6 varieties. In this paper, we will be referring only to the mixed varieties and biotypes.

Local varieties and biotypes with mixed features are generally characterized by medium-sized grapes, with the berries placed tightly on the bunch. Berries are medium sized, with elastic or rigid skin, of various colors. The core of the berries was pulpous, crispy or even juicy, with a pleasant taste. Some varieties are flavored. Most local varieties and biotypes with mixed features have a pleasant commercial aspect, close to that of table grapes.

The grapes of these varieties are suitable both for fresh consumption, and they can also be used for winemaking, resulting light, pleasant wines, but with a slightly reduced alcoholic degree. (Dobrei *et al.* 2010).

The purpose of the research was to reveal valuable qualities of local varieties and biotypes from Buziaş-Silagiu area, compared with the control.

MATERIALS AND METHODS

The research was conducted in a private plantation in the area of Buziaş-Silagiu and targeted six local varieties and biotypes with mixed ampelographic and technological features: Alb aromat de Silagiu, Coada oii, Gras aripat de Silagiu, Mărcoveaţă, Roz aromat, Roz bățut.

We pursued qualitative and quantitative aspects, as well as the degree of maturation of buds on the twig, compared with reference variety Chasselas Dore, which is suitable for both fresh consumption and for wine-making.

Production quality in the investigated varieties was estimated by measurements of two indicators: the sugar content and total acidity of must. Based on these, the glucose-acid index was calculated. The alcoholic potential of grapes was calculated according to the sugar content. Determination of sugars in the must (in g/l) was performed by refractometry analysis of must, using a manual Zeiss refractometer.

Quantitatively, the determination of production was achieved by counting and weighing bunches on each vine and each variety separately. Average yield of grapes per vine was done by multiplying the average weight of a bunch of average number of bunches per vine. Average yield of grapes per hectare was performed by multiplying the average production per vine with the average number of vines per hectare.

Measurements were made at full maturity of grapes for each variety considering the climatic conditions. Bud viability determination was performed on samples made up of twigs of average thickness for each variety individually. The method used was that of and visual inspection of the longitudinal sections of buds, which is simple and accurate enough. It was determined the percentage of live and dead eyes, and their position on the twig. Bud viability determination was made in late February, early March, after the great frosts.

Annual total length growth was determined by measuring the length of shoots on each block of each analyzed variety. Subtracting the length of unripened wood from this total growth, we have found the mature growth. The determination was made after leaf fall and after the first frost.

RESULTS AND DISCUSSION

In this paper are presented qualitative and quantitative production characteristics, the mature annual growths and the viability of buds for mixed local varieties and biotype in climatic conditions of Buziaş-Silagiu area, during 2008-2010. In some aspects, local varieties and biotypes were found to be higher compared to the control.

The quality and quantity of production, the mature annual growths and the resistance to cold of buds are strongly influenced by culture technology, by the genotype of varieties, soil fertility and also the climatic conditions of the current year: temperature, precipitation, sunshine.

Tab. 1 shows the results of research concerning the qualitative characteristics of local varieties and biotypes with mixed traits compared with Chasselas doré.

Tab 1

Qualitative characteristics of mixed varieties

Nr. crt.	Variety/Biotype	Sugar (g/l)	Acidity (g/l H ₂ SO ₄)	Sugar-acidity index	Alcoholic potential (% vol. alc.)	Diff. to the witness (Sugar g/l)	Significatio n
1	Alb aromat de Silagiu	184.67	3.83	48.25	10.86	17.67	**
2	Coadă oii	182.67	4.1	44.55	10.75	15.67	**
3	Gras aripat de Silagiu	164.33	4.2	39.13	9.67	-2.67	-
4	Mărcovață	181	3.76	48.14	10.65	14	**
5	Roz aromat	174.33	3.7	47.12	10.25	7.33	*
6	Roz bătut	162.67	4	40.67	9.57	-4.33	0
	Chasselas doré (martor)	167	3.93	42.49	9.82	-	-
		DL 5% 3.25 g/l		DL1% 5.89 g/l		DL 0.1% 11.78 g/l	

Production's quality of the studied mixed varieties was expressed by sugar content, total acidity and the report of these two parameters, respectively sugar-acidity index. The alcoholic potential was calculated based on the sugars content.

Regarding the accumulation of sugars for researched varieties and biotypes with mixed features, this was between 162.67 g/l from Roz bătut variety and 184.67 g/l from Alb aromat de Silagiu. Except Roz bătut and Gras aripat de Silagiu cultivars, which recorded negative differences, all varieties exceeded the witness on the accumulation of sugars. Sugar content of these varieties allows high quality wines with an alcoholic strength of approximately 10 degrees. Alb aromat de Silagiu variety excelled in this category, by having an alcoholic potential of 10.86 degrees vol. alc. The acidity was between 3.7 H₂SO₄ g/l at Roz aromat and 4.2 g/l H₂SO₄ at Gras aripat de Silagiu. Many varieties presented a balanced ratio between sugar and acidity as shown by the sugar-acidity index. The varieties Alb aromat de Silagiu and Roz aromat presented a “scented” or “muscat” flavour.

Tab 2

Quantitative characteristics of mixed varieties

Nr. crt.	Variety/Biotype	Mass 100 berries (g)	Average weight of bunch (g)	Production per vine (kg)	Production (kg/ha)	Production Difference to witness (kg/ha)	Significatio n
1	Alb aromat de Silagiu	208	143.7	1.88	8703	-1481	0
2	Coadă oii	281	251.23	2.78	12869	2685	*
3	Gras aripat de Silagiu	305	304.8	2.81	13007	2823	**
4	Mărcoveață	218	173.97	2	9258	-926	0
5	Roz aromat	188	146.07	1.67	7730	-2454	00
6	Roz bătut	158	192.28	2.38	11017	833	-
	Chasselas doré (martor)	183	146.77	2.2	10184	-	

DL 5% 1125 kg/ha

DL1% 1752 kg/ha

DL 0.1% 2820 kg/ha

From the quantitative point of view, mixed local varieties and biotypes are generally characterized by medium-sized grapes with medium berries, placed densely on the bunch.

Regarding the quantitative characteristics of mixed varieties, mass 100 berries was between 158 g at the Roz bătut and 305 g to the Gras aripat de Silagiu cultivar. The following varieties have been distinguished by large and aesthetical berries: Gras aripat de Silagiu (304.8 g), Coadă oii (251.23 g) and Roz bătut (192.28 g). This fact is reflected in production per vine and production per hectare. These varieties have recorded positive differences to the witness. Specifically, the Gras aripat de Silagiu variety registered distinct significant differences. The production of Roz bătut was higher than of the witness, but the difference is not statistically assured. Alb aromat and Mărcoveață registered negative differences and Roz aromat registered significant negative differences.

Tab 3

Wood maturation and the buds viability of mixed local varieties and biotypes

No.	Variety/Biotype	Mature annual growths (m/plant)	Viable buds (%)	Nonviable buds (%)	Viable buds Difference to the witness (%)	Significati on
1	Alb aromat de Silagiu	9.68	87.41	12.59	3.29	*
2	Coadă oii	11.15	81.69	18.71	-2.45	-
3	Gras aripat de Silagiu	11.01	81.44	18.56	-2.68	-
4	Mărcoveață	9.38	74.66	25.34	-9.46	00
5	Roz aromat	7.16	73.13	26.87	-10.99	00
6	Roz bătut	11.4	85.56	14.44	1.44	-
	Chasselas doré (martor)	10.95	84.12	15.88	-	

DL5% 2.87%

DL1% 5.02%

DL0.1% 11.74%

The buds viability is influenced by many factors such as the culture technology, production levels, the climatic conditions of the current year, the genotype of varieties. etc.

Concerning the viability of buds, Roz aromat variety (73.13 % viable buds) and Mărcoveață (74.66% viable buds) have proved to be the most sensitive to cold compared with the control variety, registering distinctly significant differences, statistically covered. The varieties Roz bătut, Coadă oii and Gras aripat de Silagiu registered negative differences, but not statistically covered. The variety Alb aromat de Silagiu exceeded the witness on buds viability, with significant difference.

Mature annual growths expressed as m/plant had values corresponding to the grape cultivar vigor and genetic resistance, between 7.14 m at Roz aromat cultivar and 11.4 m at Roz bătut cultivar.

CONCLUSIONS

Some local varieties and biotypes with mixed features from Buziaș-Silagiu area have very valuable properties which recommend them to be retained or even expanded in culture

Regarding the accumulation of sugar for these varieties and biotypes, it was between 162.67 g/l from Roz bătut variety and 184.67 g/l from Alb aromat de Silagiu. Excepting Roz bătut cultivar and Gras aripat de Silagiu, all varieties exceeded the witness on the accumulation of sugars. Sugars content of these varieties allows wines with an alcoholic strength of approximately 9.57-10.75 degrees. Specifically, Alb aromat de Silagiu variety has a potential alcohol of 10.86 degrees alc vol.

Regarding the quantitative characteristics of mixed varieties, the following varieties have been distinguished by large and aesthetical berries: Gras aripat de Silagiu (304.08 g) and Coadă oii (251.23 g). This fact is reflected also in production. These varieties have recorded positive differences to the witness.

On the viability of buds, some local varieties registered significant negative differences to the control: Roz aromat variety (73.13% viable buds) and Mărcoveață (74.66% viable buds). They proved to be most sensitive to cold. However, there were certain varieties, like Alb aromat de Silagiu (87.41%) which exceeded the control.

Mature annual growths and the percent of viable buds ensured a normal fruiting pruning.

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