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# GENETIC DIVERSITY THE VITICULTURAL GERMPLASM FUND OF ROMANIA – NEWS ACCESSIONS

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***Abstract***

*In contemporary society, the viticultural germplasm fund, vine (varieties) and wine - are elements of universal and national heritage, and it must be known, evaluated, capitalized and last but not least, preserved - according to unitary, equidistant and unanimously recognized concepts by specialists. The accentuated variability of the varieties belonging to the species Vitis vinifera spp sativa, their number and the vast geographical space on which they are fund, provide genetic improvement ameliorators with a background of germplasm and an equally vast genetic resource. In the current practice of genetic improvement vines, it has always been taken into account the manifestation of exceptional heredity in offspring, for one or more characters, either from the spectrum of biological characters or from the spectrum of characters related to behaviour and production quality, as well as resistance to diseases and pests, drought resistance, frost resistance, extreme phenomena, etc. In general, the new grape varieties for table and wine, obtained in Romania are obtained by intraspecific hybridization, by self-pollination, by free pollination, by natural selection, as well as by fixing valuable mutations. In most of them, however, there are new characters, clearly superior to those found in the parent varieties. As the study shows, the particularities of new creations register a higher predictable genetic gain, incorporating a high genetic value, often even having a different production direction compared to the parents.*

***Key words****: diversity, germplasm fund, grape, varieties, yield.*

## INTRODUCTION

The improvement of grape vine assortment (table grapes, white, red, rose wine grapes, varieties with biological resistance, stock varieties) was realized gradually over the years, starting in 1946 (Constantinescu et al., 1959; 1960; 1962; 1965; 1966; Constantinescu and Negreanu, 1960; Dvornic, 1960; 1974), continuing with a prolific period between years 1970 and 2000 (Constantinescu et al., 1975, Gorodea et al., 1976; Lepadatu, 1979; Gorodea, 1983; Ioniță et al., 1981; Toma and Ispas, 1991), followed by a period more constant in results after 2000 (Toma and Ispas, 2008; Antoce et al., 2004; Glăman et al., 2018). The programme and the objectives of the activity of genetic amelioration of grape vine in our country were coordinated by the Research-Development Institute for Viticulture and Wine Making Valea Călugărească, by the combined activity of the 12 viticulture and wine making research stations and concerned mostly the creation of high quality varieties, with high productivity, with different maturation periods (table grapes), with resistance to diseases and pests and to weather conditions and extreme phenomena, as well seedless grape varieties (Brânduşe and Ionescu, 1992; Indreaș and Vișan, 2000; Ţârdea and Rotaru, 2003; Stroe, 2013; Glăman et al., 2018). This institutions possess ampelographic collections and contest plantations and carry out research activity, identification, acquisition, inventorying, registration and maintenance, activity that requires a complex and interdisciplinary approach. This collections contain old varieties, local varieties, varieties removed from the cultivated assortment, traditional varieties (agroecotypes) that are cultivated in a restrained area, wild varieties and species related to the cultivated ones, selected elite genotypes, natural mutations selected for their valuable features or obtained from genetic transformation (loss of genetic information), local ancestral varieties that are a national wealth that must be protected and used in breeding, as well as the grape varieties cultivated nowadays and the new varieties obtained using different breeding techniques.

Generally, these are considered true "gene banks", being a source of germplasm that helps the study and the knowledge of the agrobiological and technological aspects of the varieties used in the breeding and selection of the grape wine, at the same time maintaining the genetical diversity of the species. The biological material may be available at any time, for scientific and economical purposes. Practically, in contemporary society, the viticultural germplasm resource, the varieties and the wine, are elements of universal and national heritage, and this genetic heritage must be recognised, known, evaluated, utilized, and lastly, conserved. In this context, using different breeding techniques (interspecific hybridization, fixation of valuable mutations), 70 varieties of *Vitis vinifera* were obtained in Romania, creations for different production directions, mostly table grapes - 31 and white wine grape varieties - 21, followed by red wine grape varieties -15, seedless grape varieties - 4 and rootstock varieties - 3.To this numbers, 14 varieties with increased resistance to pests and diseases and to natural stress factors can be added.

A special position, contribution in Romanian viticulture is attributed to the clonal selection – a tool utilized to avoid the genetic erosion of the varieties and a way to ensure the conservation of the clonal and local varieties and the ones of different origins (104 clonal selections). Our institution, as a part of this national breeding program of *Vitis vinifera*, possess an ampelographic collection composed of over 130 varieties, local varieties, ancestral, as well as varieties from the international assortment, new varieties obtained from Romania, with different directions of production. Practically, from the 84 newly obtained varieties, the U.A.S.V.M. Bucharest collection possess 55.95 % of the national new varieties, and if adding the biological resistant ones, 67.14% can be found. Among the main achievements that were obtained here, is the creation and (homologation) of two early ripening table grape varieties: 'Muscat Timpuriu de București' and 'Augusta', two table grape varieties with middle ripening - 'Chasselas de Baneasa' and 'Triumf' and two late ripening varieties - 'Select' and 'Coarnă neagră selecționată' (Stroe, 2016). Contextually, referring only to this point of view, they represent 19.35 % of the total number of table grapes created in Romania. The present study aims to highlight the elements that define the quality of these new varieties - visual quality (hedonic approach) and that are found in these collection, in the southern part of Romania, to popularize them, because, expect for a few varieties - 'Victoria', 'Crâmpoșie selecționată', 'Șarba', 'Novac', 'Negru de Drăgașani', 'Columna' (Antoce et al., 2004; Stroe and Cojanu, 2018; Antoce et al., 2017; Cichi et al., 2019), few are known and cultivated at national and international level, which indicates the lack and the inefficient utilization of the genetic resources of Romania. As a result, the marketing activity and the more coherent and aggressive promovation of this varieties would be a win for both grapevine growers and consumers. But, unfortunately, these newly obtained varieties, although very valuable, both productively and qualitatively, will be destined to anonymity, failing to transcend the boundaries of the area where they were created, even in the context of the over-publicized globalization. Furthermore, recent data shows that in the last 30 years, the total area of table grapes in Romania has decreased dramatically, representing only 6.9% of the total cultivated area (wine varieties representing 93.1%).

## MATERIALS AND METHODS

The present study was approached starting from the need to know the performances of these varieties from a visual and organoleptic perspective, in order to promote them, at least at national level. In order to achieve the objective presented above, research took place in the ampelographic collection in the experimental field of U.A.S.V.M. Bucharest, with institute code ROM06 in www.vivc.de. The data about this varieties and the paternal varieties can be found in Vitis International Variety Catalogue (www.vivc.de), as a result of the scientific papers confirming the origin and genetic paternity of those (Maul et al., 2012; Lacombe, 2013; Rustioni et al., 2013; Rustioni et al., 2014a, 2014b; Popescu, 2017; Popescu and Crespan, 2018). Although established in 1984, and renewed in proportion of 65%

between 2006 and 2018, from many points of view, the ampelographic collection of this institution corresponds to the standards of VITI-GENET 14-539. "OIV guidelines for recognising grapevine collections", of which we can mention: it holds a large number of varieties (the minimum number of varieties in an ampelographic collection must not be less than 20); each variety must be maintained in a minimum number of (4) plants, grafted on the same rootstock; must not contain quarantine microorganisms; must contain the varieties of reference ('Bicane', 'Cabernet Sauvignon', 'Chardonnay', 'Chasselas blanc', 'Merlot', 'Pinoit Noir', 'Riesling Weiss', 'Rkatiteli', 'Sauvignon'); adequate pruning system: Guyot simple/double, a planting distance chosen to promote the vegetative development of each plant (1m, 1.2 m/2 m, 2.2 m); the varieties must be grouped, according to their use. The varieties in the collection are pruned using the Guyot technique, with a load of 42 buds/vine, planted at a distance of 1.2/2.2 m, and the control plants for each category were chosen according to the VITI-GENET 14-539- "OIV guidelines for recognising grapevine collections" standard, Rustioni et al., 2013, which takes in account the maturation epoque and the direction of production.

For this analysis, we used 8 cultivars of 'Cardinal', 'Chasselas dore', 'Muscat Hamburg' 'Kişmiş alb', 'Crâmpoşie', 'Feteasca regală', 'Băbească neagră' and 'Cabernet Sauvignon', on which traits were measured repeatedly, using the same standard protocol mentioned across sites and years. The list of traits considered for this analysis were: berry colour (OIV descriptor); sugar content (Brix); berry weight (mg); colour of skin, flavour, conform OIV (2008a; 2008b; 2013).

The graphic representation of the frequency of utilisation of this very known varieties in the creation of new ones was realized with Word Cloud type graphics, generated using the add - on for Microsoft Word Pro Word Cloud. The graphics disclose the frequency of utilisation of some varieties for each category (if a variety was more utilised more frequently, it will be represented bigger in the generated image).

The phenological maturation of the berries - Brix was chosen according to the cultivar (= the optimum moment of harvesting or N stage on Baggiolini scale, stage 89 on BBCH scale, stage 38 on Eichiorn K. W. and Lorenz H. scale) (Baggiolini, 1952; Meier, 2001; Pierrot and Rochard, 2013). To assess the descriptive parameters of production quality, 10 primary climate parameters and bioclimatic indices for 2019 were calculated, in order to correctly appreciate the context of sugar content (Brix), which are visibly quite high, as it can be observed in Tables 1 - 7): annual average temperature - $12.92^0$C; average temperature in the growing season (IV-X) – $18.5^0$C; average temperature in summer (VI-VIII) - $23.05^0$C; average maximum temperature in July - $29.64^0$C; average minimum temperature in January - $(-4.55)^0$C; annual total precipitations – 528.6 mm; summer total precipitations -142.0 mm; Huglin Index; $\Sigma[(Tavg-10°C) + (Tmax-10°C)] / 2 \times k$ - 2458; Winkler Index; $\Sigma[(Tmax+Tmin)/2 - 10°C]$ - 1825; Cool Night Index; $Tmin_{sept}$-10.60 - (Climate records from the National Agency of Meteorology and Hydrology Bucharest).

## RESULTS AND DISCUSSIONS

The ampelographic collection in the experimental field of U.A.S.V.M. Bucharest holds in cultivation 48 mature varieties, out of the total number of 70 - (61.14 %): 22 table grapes out of a total of 31 - (70.96 %), 3 seedless varieties out of 4 - (75 %), 13 for white wine, out of 21- (61.90 %), 10 for red wine, out of 15 - (66.66 %). For a correct presentation, in order to popularize this varieties, we considered that it was necessary to determine the rate of use of the most know cultivars used as genitors for this new Romanian creations, this remarkable record of new varieties, practically foreshadowing their qualitative panel, because the descendants exceed the parents of in most cases.

According to Figure 1, in Romania, the following genitors stand out in the creation of new table grapes: 'Afuz Ali', 'Alphonse Lavallée', 'Coarnă albă', 'Coarnă neagră', 'Regina viilor', 'Cardinal', 'Muscat de Hamburg', 'Italia', 'Bicane' etc. Regarding the breeding of seedless grapes, the most valuable genitors are: 'Braghină', 'Perlette', 'Sultanină', 'Maria Pirovano', 'Tămâioasă românească'. Concerning the breeding of varieties for white

wine, as shown in Figure 2, the most utilised varieties come from the international and national assortment: 'Crâmpoșie', 'Fetească regală', 'Grasă de Cotnari', 'Tămâioasă românească', 'Iordană', 'Aligoté', 'Chardonnay', 'Riesling italian', 'Pinot gris', 'Traminer roz', 'Furmint', etc., and table grape cultivars, such as 'Hamburg Muscat', 'Muscat Perla de Csaba', 'Chasselas doré', 'Coarnă albă', 'Coarnă neagră', 'Bicane', 'Silvania' and varieties for red wine: 'Băbească neagră'.


Figure 1. The patterns of the varieties for table grapes


Figure 2. The patterns of the varieties for white wines


Figure 3. The patterns of the varieties for red wines

Analysing the data from Figure 3, we can observe that in regard to the breeding of new varieties for red wines, regardless of their destination, the most used genitors are the local varieties 'Băbească neagră' and 'Negru vârtos', but also international varieties: 'Alicante Bouschet', 'Roșioară', 'Pinot noir', 'Cabernet Sauvignon', 'Merlot', 'Saperavi'. Table grapes varieties have also been evidenced - 'Hamburg Muscat', international varieties for white wines - 'Chardonnay' and international varieties for aromatic white wines - 'Muscat Ottonel'. The cultivars studied in the conditions of the experimental filed of U.A.S.V.M. Bucharest - situated in the south eatern part of Romania, presents promising perspectives, due to the rather high degree of adaptation. The success of their integration and extension in culture at national level, depends on finding adaptation to zonal climate change and lasting solutions of culture technologies, oenological practices, etc. From the analysis of sugar accumulation, it was found that the 25 varieties for table grapes, out of which 3 are seedless and 2 have mixed characteristics, recorded a fairly high sugar concentration for the year 2019, with values above those specified in the literature for some of them (Ţârdea and Rotaru, 2003; Stroe, 2012; Glăman et al., 2018; Stroe, 2020). Concerning the early ripening table grape varieties, the limits of this values are between 16.7 and 19°Brix: 'Augusta, 'Victoria', 'Timpuriu de Cluj' (mixed characteristics), and 'Muscat Timpuriu de București' recorded a maxim absolute 20.2°Brix. The same trend was observed for the accumulation of sugars in the case of the varieties with middle and late ripening (16.5-19.4°Brix) and 'Milcov', 'Silvania', 'Istrița', followed by 'Splendid' and 'Transilvania' from the same group (Table 2) and 'Xenia', 'Tamina' and 'Coarnă neagră selecționată' from the late ripening group. It can be appreciated that from this point of view, the cultivars from the three groups differentiated according to the maturation period, exceed the reference values for each group ('Cardinal', 'Afuz Ali', except the values accumulated in the control 'Muscat de Hamburg'). Practically, it does not equal the control regarding the soluble sugars, but it compensates by size, shape, uniformity of the berries and discrete aroma – qualities that overcome overcome the organoleptic barrier at the first contact of the consumer.

Table 1.Varieties grape table early ripening - qualitative parameters

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Muscat Timpuriu de București, 8256 | Coarnă albă x (Regina viilor x Muscat Perlă de Csaba) | 20.2 | Table grape early ripening 6 | 4.8 | ovoid | B | muscat |
| *Timpuriu de Cluj, 12451 | Crâmpoșie x Frumoasă de Ghioroc | 19 | | 4.3 | globose | B | muscat |
| Augusta, 14781 | Italia x Regina viilor | 16.7 | | 6.28 | ovoid | B | none |
| Victoria, 13031 | Cardinal x Afuz Ali | 16.8 | | 7.8 | ovoid | B | none |
| Timpuriu de Pietroasa, 21603 | Alphonse Lavallée x Regina viilor | 16.3 | | 4.3 | ellipsoid | N | foxy |
| *Bujoru, 26664 | Băbească gris x Muscat Perlă de Csaba | 19.9 | | 2.18 | ovoid | Rs | other flavour - frank |
| Cardinal Control, 2091 | Ahmeur bou Ahmeur x Alphonse Lavallée | 15.3 | | 5.3 | globose | Rg | other flavour - frank |

Color of skin, N black, Rg red, Rs rose, B white, Use: table/wine/seedless; Early ripening - about 2 weeks before Chasselas doré; Middle - ripening at the same time as Chasselas doré or 1-2 weeks after; tardive ripening (Late) - 3-4 weeks after Chasselas doré; Very tardive ripening (Very late) -5-6 weeks after Chasselas doré.
*varieties with mixed propertie

According to OIV, 2008 standards, table grape varieties can be harvested at concentrations of sugar smaller compared to the varieties for wine, but not less than 16°Brix, except for few derogations depending on the climate of each country. The data that refers to the carpometrical parameters, also indicates values that prove that most of the varieties have qualities that achieve and sometimes exceed the parental phenotype (specified in Figure 1).

Table 2. Table grape varieties with middle ripening - qualitative parameters

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Chasselas de Băneasa, 2480 | Chasselas doré | 17.6 | Table grape middle ripening -10 | 3.5 | globose-ovoid | B | none |
| Silvania, 11808 | Bicane x Chasselas doré | 19.3 | | 3.2 | globose | B | none |
| Napoca, 8348 | Alphonse Lavallée x (Regina viilor x Muscat Hamburg) | 16.5 | | 4.4 | ovoid | N | muscat discreet |
| Splendid, 11980 | Black rose x Regina viilor | 17.6 | | 5.47 | ovoid | Rs | muscat discreet |
| Transilvania, 12613 | Black rose x Cardinal | 17.3 | | 7.4 | ovoid | N | muscat discreet |
| Istrița, 21145 | Tămâioasă românească x Maria Priovano | 18.0 | | 3.6 | globose | B | muscat |
| Triumf, 12655 | Lignan x Afuz Ali | 16.8 | | 4.3 | ovoid | B | none |
| Azur, 833 | Coarnă neagră x Cardinal | 16.5 | | 2.9 | ovoid | N | muscat discreet |
| Milcov, 21363 | Coarnă neagră x Muscat de Hamburg | 19.4 | | 2.7 | ovoid | N | muscat discreet |
| Someșan | Muscat de Hamburg x Regina viilor | 17.4 | | 3.8 | ovoid | Rs | muscat discreet |
| Muscat Hamburg Control, 8226 | Muscat de Alexandria x Frankental | 23.1 | | 2.8 | globose | n | muscat intense |

Table 3. Table grape varieties with late ripening - qualitative parameters

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Select - 11471 | Bicane x Afuz Ali | 16.4 | Table grape tardive ripening 6 | 5.1 | ovoid | B | none |
| Greaca, 4959 | Bicane x Afuz Ali | 16.9 | | 5.8 | ovoid | B | none |
| Xenia, 13274 | Bicane x Muscat de Hamburg | 17.8 | | 5.2 | ovoid | B | muscat intense |
| Tamina, 12244 | Bicane x Muscat de Hamburg | 16.9 | | 5.8 | globose-ovoid | Rs | muscat discreet |
| Roz românesc, 10290 | Bicane x Afuz-Ali roz | 16.1 | | 3.4 | globose | Rs | none |
| Coarnă neagră selecționată, 2729 | Coarnă neagră | 18.1 | | 4.2 | ovoidal | N | none |
| Control Afuz Ali, 122 | - | 16.2 | | | cylindric | | none |

In regard to the average weight of the berry, it varied between 2.18 g in 'Bujore' and 7.8 g in 'Victoria' cultivar. Average berry weights higher than 5 g were recorded in 'Transilvania' - 7.4 g, 'Augusta' - 6.28 g, 'Splendid' - 5.47 g, 'Xenia' - 5.2 g, 'Select' - 5.1 g, etc. For the three seedless grape cultivars (Table 4) used for raw consumption and industrialization, the limits of sugar accumulation were between 20-23.5°Brix, in the following order: 'Centenar de Pietroasa', 'Otilia', 'Călina', which exceeds the 'Kişmis alb' control variety and the cultivar 'Otilia' also exceeded the control in terms of berry size and uniformity.

Table 4. Seedless grape varieties - qualitative parameters

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Călina,1996 | Braghină x Sultanină | 23.5 | Seedless variety -3 | 1.6 | globose | Rs | none |
| Otilia, 15712 | Alphonse Lavalleé x Perlette | 20.9 | | 2.7 | globose | N | none |
| Centenar de Pietroasa, 21006 | Tămâioasă românească x Perlette | 20.0 | | 1.4 | globose | B | muscat discreet |
| Kişmiş alb-Control, 12051 | - | 19.4 | | 2.67 | ovoid | B | none |

Table 5. Qualitative parameters of grape varieties for white table wines

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g | Shape | Color of skin | Flavour |
| Astra, 20876 | Fetească regală x Pinot gris | 17,6 | white table wines 4 | 2,4 | globose | B | none |
| Băbească gris, 842 | Băbească neagră | 20.32 | | 2.4 | obloid | Rs | none |
| Miorița, 7845 | Coarnă albă | 18.9 | | 2.3 | ovoid | B | none |
| Roz de Miniș, 10289 | Selecție Bacator roz | 18.1 | | 2.7 | globose | Rs | none |
| Crâmpoșie Control, 3237 | - | 19.8 | | 2.7 | globose | B | none |

According to the data shown in Table 5, in the case of the varieties used for obtaining white table wines, the sugar accumulations are fairly high. The variety 'Băbească gris' exceeds the values recorded in the control variety, but generally higher than the values found in the specialised literature, as a result of the effects of climate change determined by the increased thermal resources.

Table 6. Qualitative parameters of grape varieties for quality white wines

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Alb aromat, 23101 | Tămâioasă românească | 22.1 | quality white wines 4 | 3.1 | gobose | B | muscat |
| *Aromat de Iaşi, 632 | Tămâioasă românească | 20.8 | | 2.2 | globose | B | |
| Blasius, 20959 | (Iordană x Traminer roz) x (R.Saint Pierre x Muscat Perlă de Csaba) | 20.4 | | 2.4 | globose | B | none |
| Columna, 2787 | Pinot gris x Grasă de Cotnari | 21.6 | | 2.3 | globose | B | none |
| Crâmpoşie selecţionată, 3238 | Crâmpoşie | 21.0 | | 2.6 | globose | B | none |
| *Donaris, 3642 | Bicane x Muscat de Hamburg | 20.7 | | 2.4 | globose | B | muscat discreet |
| Furmint de Miniş, 16940 | Furmint - mutaţie | 19.8 | | 1.9 | ovoid | B | none |
| Selena, 21558 | (Iordană x Traminer roz) x (Raisin de Saint Pierre x M. P. Csaba) | 20.6 | | 1.6 | globose | Rs | muscat discreet |
| Şarba, 10738 | Riesling Italian x Muscat de Hamburg | 22.0 | | 2.32 | globose | B | muscat |
| Fetească regală Control, 4121 | Frâncuşă x Fetească albă | 21.5 | | 2.05 | globose | B | none |

Table 7. Qualitative parameters of grape varieties for red wines

| Varieties Code VIVC | Parents | $^0$Brix (as Total Soluble solids, g/L) | Use | Carpometrical analysis berry | | | |
|---|---|---|---|---|---|---|---|
| | | | | Weight of berry (g) | Shape | Color of skin | Flavour |
| Arcaş, 566 | Cabernet Sauvignon x Băbească neagră | 18.5 | red table wines 6 | 1.35 | ovoid | N | none |
| Balada, 20920 | Băbească neagră x Pinot noir | 20.7 | | 1.7 | globose | N | none |
| Codană, 2740 | Băbească neagră x Cabernet Sauvignon | 19.0 | | 2.3 | obloid | N | none |
| Cristina, 21045 | Chardonnay x Băbească neagră | 18.9 | | 1.62 | narrow ellipsoid | N | none |
| Haiduc, 17687 | Roşioară x Cabernet Sauvignon | 19.8 | | 1.55 | obtuse-ovoid | N | none |
| Pandur, 17706 | Roşioară x Cabernet Sauvignon | 19.4 | | 1.9 | obloid | N | none |
| Băbească neagră Control, 843 | | 20.9 | | 2.3 | obloid | N | none |
| Mamaia, 21348 | Merlot x (Băbească neagră x Muscat Ottonel) | 20.6 | quality red wines 4 | 1.9 | globose | N | none |
| Negru Aromat, 15711 | Cabernet Sauvignon | 23.0 | | 1.65 | globose | N | none |
| Negru de Drăgăşani,23178 | Negru vârtos x Saperavi | 22.4 | | 2.4 | globose | N | none |
| Novac, 16933 | Negru vârtos x Saperavi | 21.5 | | 2.4 | ovoidal | N | none |
| Cabernet Sauvignon Control, 1929 | | 23.1 | | 2.0 | globose | N | none |

Regarding the qualitative compositional panel of the varieties used for obtaining white wines, according to the data entered in Table 6, it is observed that the sugar accumulations are quite high, even exceed the control, as is the variety 'Şarba', 22.0°Brix and the variety 'Columna' with 21.6°Brix, exceeding the values of the control variety 'Fetească regală'. Some of these varieties exceed the values specified in literature: 'Alb aromat', 'Aromat de Iaşi' and 'Crâmpoşie selecţionată'. These accumulations that can be a result of the effects of the thermal resources during the vegetation period, especially during the period of full maturation of the varieties. Broadly, it can be observed that the sugar accumulations, in most of the varieties, exceed the value of 20°Brix, foreshadowing the obtaining of wines with an alcoholic potential of over 11.5% alcohol.

The data entered in Table 7 shows that the varieties used for obtaining red table wines accumulate high quantities of sugar, as a result

of the increased thermal resources of the year 2019, and their values exceed the ones found in literature (Haiduc, Pandur). The limits of sugar accumulation for the quality red wine varieties are between 20.6°Brix in 'Mamaia' variety and 23.0°Brix in 'Negru aromat' variety. Broadly, the sugar accumulations are predictable for obtaining wines with an alcoholic potential of over 11.5% alcohol and it is known that the modern consumer prefers wines with a moderate alcohol content (approximately 11-12% vol. alcohol), slightly extractive, obtained from varieties with moderate accumulations in sugars.

## CONCLUSIONS

As it results from the study, the particularities of the new varieties obtained in Romania, regardless of the method of obtaining, show that they are by far some valuable creations, and these are all the more obvious, especially when they qualitatively exceed the control of the maturation group they are part of, on the one hand, and parents on the other hand.

From the category of early ripening varieties, we recommend 'Victoria', 'Augusta', 'Timpuriu de Cluj' (mixed characteristics), defined by special qualities, given the size of the grapes, the colour and uniformity of the berries, but also the fact that they were distinguished by a great ecological plasticity. From the category of varieties with medium to late maturation, we recommend the varieties 'Napoca', 'Transilvania', 'Istrița', and from those with late maturation 'Select', 'Xenia', 'Tamina', 'Coarnă neagră selecționată'.

These varieties meet the requirements of the modern, cosmopolitan consumer, who wants table grapes with large berries 3.5-4-6 g, uniform, with a moderate sugar content (16-18°Brix) against a balanced glucoacidometric index and a discreet bite flavor. In other words, even if it does not equal the control of soluble sugars, it compensates with the visual qualities that overcome the organoleptic barrier.

Among the varieties used for white wines, the distinguished varieties are 'Șarba', 'Aromat de Iași', 'Alb aromat', 'Crâmpoșie selecționată', 'Băbească gri' and in case of the ones for red quality wines, 'Negru de Drăgășani', 'Negru Aromat', 'Novac' and 'Mamaia' are distingiuished.

Regarding the potential of wine varieties, the modern consumer prefers wines with a moderate alcohol content (approximately 11-12% vol. alcohol), slightly extractive, obtained from varieties with moderate sugar accumulations and late maturation, to avoid this process in periods with excessive temperatures, qualities that are fully found in some varieties from the list of this collection, from the list of new varieties obtained in Romania

Currently, these newly obtained varieties, although very valuable, both productively and qualitatively, are not known to the general public and will soon be destined for anonymity, if they are not publicized, because, for a new variety, it is difficult to cross the borders of the area where it was created, even in the context of over-mediated globalization.

It is imperative that the marketing and promotion activity be more consistent and more aggressive, as this would be a gain for both growers (producers) and consumers.

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