AMPELOGRAPHIC CHARACTERISATION AND SANITARY STATUS OF SOME ENDANGERED CROATIAN NATIVE GRAPEVINE CULTIVARS

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ABSTRACT
At the end of 19th century there were more than 400 grape cultivars grown in Croatia, most of them were considered autochthonous. Unfortunately, after beginning of 20th century drastic erosion of autochthonous cultivars has occurred. Today there are still more than 120 native cultivars with most of them being properly conserved and evaluated. As a part of the project ERA 91/01 "Preservation and establishment of true-to-type and virus free material of endangered grapevine cultivars in Croatia and Montenegro" detailed ampelographic and enological characterization of some underutilized native Croatian cultivars was performed. Ampelographic characterization was carried out using set of 45 OIV-descriptors on 28 cultivars. After microvinification, chemical and sensory analysis of wines of six cultivars medium or high qualitative potential was determined, giving good perspective for their revitalization. Sanitary status of five cultivars was assessed by ELISA test for presence/absence of four economically important viruses: GFLV (Grapevine Fanleaf Virus), ArMV (Arabis Mosaic Virus), GLRaV-1 and GLRaV-3 (Grapevine Leafroll Virus -1 and -3). Different level of virus infection was detected ranging from 7-90%, with GLRaV-1, and GLRaV-3 as the most common viruses. EU-vitis database (www.eu-vitis.de) format was followed and our results will be stored and available in this database.

INTRODUCTION
Grapevine has been grown in Croatia since ancient time, especially in the Dalmatian vine growing region where at the end of 19th century, it was possible to find several hundred cultivars, and most of them were considered to be autochthonous (Bulić, 1949; Zdunić, 2005). Today more than 80 native cultivars are registered in the official Croatian cultivar list, while an additional 50 rare genotypes remain underutilized, primarily due to the lack of good quality propagation material and the insufficient knowledge about their oenological potential. There are still many vines in old and abundant vineyards, representing old autochthonous cultivars that can not be positively determined by simple inspection. For this reason field expediton was performed as a part of a project ERA 91/01 "Preservation and establishment of true-to-type and virus free material of endangered grapevine cultivars in Croatia and Montenegro" with aim of identification and evaluation of some rare neglected autochtonous cultivars. Beside this sanitary evaluation of five cultivars was performed which will give the perspective for their posible revitalisation and production of healthy propagation material.

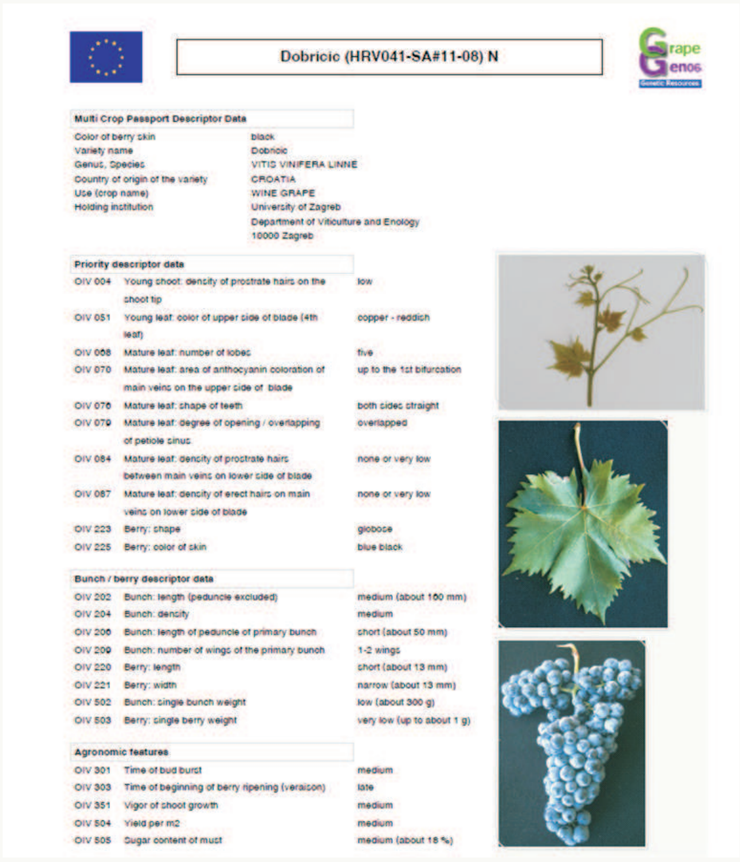


Figure 1 Variety description sheet for cv. Dobričić from European vitis database (eu-vitis.de)

Table 1 Sanitary status of six Croatian native grapevine cultivars assesed by ELISA test

Cultivar	Number of vines tested	Virus free vines	ArMV	GFLaV1	GLRaV3	GFV
Magrovina	15	2	0	0	10	2
Draganela	15	6	0	1	4	6
Dišeća ranina	15	8	2	6	1	0
Dobričić	16	5	0	3	7	4
Jarbola	15	14	1	0	0	0
Sokol	16	9	0	5	0	1

Table 2 Results of chemical analyses and sensory evaluation of wine samles of six Croatian native grapevine cultivars from year 2011

	Zlatarica blatska	Dišeća ranina	Sokol	Jarbola	Sansigot	Dobričić
Alcohol (vol %)	13,48	11,05	14,2	12,16	12,96	15,57
Sugar g/l	3,1	3	3,3	3	5,3	2,8
Extract without sugar g/l	16,4	17,6	17,8	18,3	21,2	28,7
Total acidity g/l	5,32	7,12	5,6	6,52	3,9	4,6
Volatile acidity g/l	0,42	0,52	0,67	0,31	0,9	0,76
pH	3,5	3,19	3,58	3,33	4,13	4,01
Result of sensory evaluation*	82	76	77	79	78	80

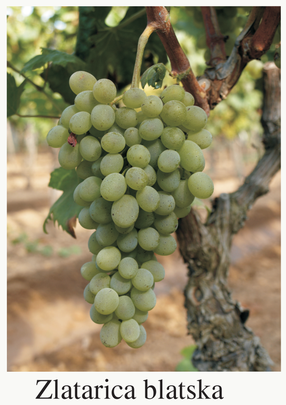
*official OIV 100-points scale method for wine sensory evaluation


Sansigot


Dišeća ranina


Dobričić


Sokol


Zlatarica blatska

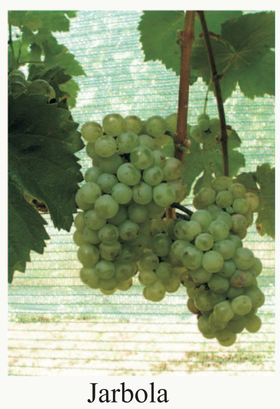

Jarbola

Figure 2 Photos of Croatian autochtonous cultivars included in oenological evaluation

MATERIALAND METHODS

Field identification and ampelographic description
Based upon existing ampelographic literature and previous experience of Croatian professional and scientific institutions dealing with viticulture, we began searching vine growing regions with the objective of finding, marking and sampling all remaining autochthonous cultivars. We described 28 cultivars in the field and obtained samples for ampelometric measurements, as well as for DNA analysis. Every genotype we described according to the OIV descriptor methods and according to the Primary, Secondary and Ampelometric Descriptor list. All gathered data together with photos of the characteristic phases (shoot tip, mature leaf and cluster) will be documented in the Eurpean vitis database (eu-vitis.de).

Sanitary evaluation
Samples of dormant canes were collected from the selected vines of six autochthonous cultivars: Magrovina, Draganela, Dišeća ranina, Dobričić, Jarbola and Sokol. The presence of four economically important viruses was evaluated using ELISA (enzyme linked immunosorbent assay): two nepoviruses, Grapevine fanleaf virus (GFLV) and Arabis mosaic virus (ArMV) and two closteroviruses Grapevine leafroll-associated virus 1 (GLRaV-1) and Grapevine leafroll-associated virus 3 (GLRaV-3).

Winemaking
Monovarietal wines were made from six autochthonous Croatian grapes of *V. vinifera* cv. Dobričić, Sansigot, Dišeća ranina, Sokol, Zlatarica blatska and Jarbola harvested in the year 2011. For the wine making a lot of 50-100 kg of grapes of each variety was de-stemmed, crushed and fermented in 100 l stainless-steel tanks. After the 12 weeks period of maturation wines were coarse filtrated and filled into commercial glass bottles, samples for chemical analyses were taken, while the rest was stored in cellar conditions for sensory analysis.

Chemical and sensory analysis
The basic chemical characteristics of wines were analyzed according to official OIV methods. Sensory analysis was used to describe and define the extent of any differences in sensory profile of the wines due to the *V. vinifera* grape used. Each sample of wine was judged by the experienced sensory panel (10 judges) for color, aroma and taste intensity and quality, body, aftertaste, harmony and general sensation using a official OIV 100-points scale.

RESULTS
Results of ampelographic description will be available through European vitis database. This database is a result of GrapeGen06 project and has different level of access (public, partner specific access, all partner access). Basic description of all the cultivars included is available through public access as Catalogue of varieties in the form of variety description sheets. Example of variety description sheet for Croatian native cultivar Dobričić is showed in figure 1.

Sanitary status of six native grapevine cultivars (Magrovina, Draganela, Dišeća ranina, Dobričić, Jarbola and Sokol) and number of vine tested is showed in table 1. Within all cultivars it was possible to find vines without presence of four tested viruses, and this vines will be used for propagation and production of virus free planting material for small mother blocks.

The results presented in table 2 show basic chemical composition and results of sensory evaluation of analyzed wines from six autochtonous grapevine cultivars. The presented results of wine samples from native grapevine cultivars are showing their good quality potential. Since the wines are produced from microvinifications (30-50 l) even better results can be expected in large scale vinifications.

Conclusion
Presented results of ampelographic evaluation and sanitary status of neglected Croatian autochthonous grapevine cultivars are giving a good perspective for their revitalization. They showed a good quality potential for wine production, and virus free vines detected in this research can be used for propagation of certified planting material. Results of this research will be available for public through the European vitis database and this way wine producer can access them in future.

Acknowledgement
This study is result of the project "Preservation and establishment of true-to-type and virus free material of endangered grapevine cultivars in Croatia and Montenegro" (ERA-91; SEE-ERA.NET Plus call).