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Project: ERA 91 (HRV & MNE ENDANGERED GRAPES)

Preservation and establishment of true-to-type and virus free material of endangered grapevine cultivars in Croatia and Montenegro

Reporting period: October 1, 2010 till November 30, 2012

RESULTS OF CHEMICAL AND SENSORY EVALUATION OF EXPERIMENTAL WINES

As one of the project tasks (WP1, aim 3) 10 wine grape varieties (6 from Croatia and 4 from Montenegro) have been subject of evaluation of its enological potential. Most of tested varieties are extremely underutilized and their quality parameters and enological potential is either unknown or poorly investigated. Besides, for these varieties up to this project there was no available virus-free planting material on the market.

The limited amount of grapes of these cultivars have been harvested during 2011 mostly in old farmers' vineyards and analyzed with standard ampelographic methods. In addition, following the standardized protocol at both partner institutions, grapes were processed through microwinification. Must quality was assessed by standard chemical analyses and wine quality was assessed through sensory evaluation by panel of 9 evaluators.

Here we present a summary of wine characteristics of these varieties. Detailed results will be published elsewhere.

Results of sensory evaluation of 5 white and 5 red wines originating from autochthonous varieties from Croatia and Montenegro

Evaluator > Variety	I	II	III	IV	V	VI	VII	VIII	IX	Average
Zlatica blatska (HR)	84	92	82	95	85	91	89	90	82	87.78
Jarbola (HR)	83	91	85	87	79	80	80	86	80	83.44
Sokol (HR)	88	86	80	91	74	88	76	83	78	82.67
Krstač (MNE)	80	76	83	86	87	87	78	81	79	81.89
Dišeća ranina (HR)	71	71	86	95	81	93	80	74	75	80.67
Vranac (MNE)	94	96	89	93	87	89	99	93	86	91.78
Kratošija (MNE)	83	96	93	96	84	94	83	77	83	87.67
Dobričić (HR)	94	97	86	72	77	87	94	82	81	85.56
Čubrica (MNE)	87	89	80	94	75	90	73	83	80	83.44
Sansigot (HR)	80	82	86	83	65	77	75	71	79	77.56



Sensory evaluation of experimental wines

Experiment station Jazbina of the Faculty of Agriculture University of Zagreb,
September 26, 2012

Evaluation summary of microwinification of six rare Croatian cultivars

Zlatarica blatska

Zlatarica blatska is very rare, almost disappeared Croatian grape variety. Very small population is found on island of Korčula, and it is became popular when it is discovered as one of parents of Pošip b., one of most important Dalmatian white cultivar. There were some tries of its revitalization, but because of some specific problems without success. Meanwhile, ZB has very high quality potential, especially in case of sugar content and aroma quality.

In wine tasting this wine has evaluated as the best white wine, with 87.78 points. It is characterised as full bodied wine, moderate in alcohol, but nice in aroma intensity and quality. Also, this wine is very balanced with basic sensory characteristics.

Table 1. Chemical analysis of grape must and wine and tasting value of wine of Zlatarica blatska variety

Zlatarica blatska			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Blato (Korcula)	18.09. 2011.	1,23	88	4,57	3,64	13,5	18,5	3,1	3,5	5,32	4,9	0,42	87,78

Jarbola

Jarbola is rare variety from city of Rijeka region. Recently revitalised, but still rare and locally important. It is quality variety with high potential in aroma and flavour characteristics. Its wines are usually light, fresh, fruity in flavour and emphasised with floral aroma. This wine showed such sensory characteristics, and it evaluated as one of the best white wines, with 83.44 points (of 100) in average.

Table 2. Chemical analysis of grape must and wine and tasting value of wine of Jarbola variety

Jarbola			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Risika (Island of Krk)	13.9. 2011.	3,24	85	6,16	3,58	12,2	20,3	5,3	3,33	6,52	6,21	0,31	83,44

Sokol

Sokol is recently rediscovered grape variety in Hrvatsko Zagorje (NW Croatia) region. But, it is old variety, spread in this region during centuries. If properly treated Sokol can provide very high quality. Some producers are very interested in planting of this variety and are interesting in establishment of new plantations.

This wine was very rich in aroma, full in taste, and balanced with its sensory characteristics. It is evaluated in average with 82.67 points, in very wide range of 76 – 91 points.

Table 3. Chemical analysis of grape must and wine and tasting value of wine of Sokol variety

Sokol			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Klanjec	01.09. 2011.	0,95	96	5,25	3,64	14,2	20,1	3,3	3,58	5,6	4,93	0,67	82,67

Dišeća ranina

Dišeća ranina is old Croatian variety, spread in central part of Continental region. It is known as high quality variety, especially in case of aroma and flavour attributes. Despite of high potential, it is endangered cultivar, because of some problems in its production (female flowers – loose bunches and low yields, sensitivity to diseases).

Its wine showed expected characteristics (nice, discreet floral aroma), light body, freshness and balance. It is evaluated with 80.67 points in average.

Table 4. Chemical analysis of grape must and wine and tasting value of wine of Dišeća ranina variety

Dišeća ranina			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Voloder	16.09. 2011.	3,5	73	7,44	3,45	11,05	19,6	3,02	3,19	7,12	6,6	0,52	80,67

Dobričić

Dobričić used to be one of the most famous Croatian varieties before Phylloxera crisis in Dalmatia. The reason was deep colour and suitability for wine blending. Today it is rare, spread only in central Dalmatia, but in last few years some producers showed interest for planting this variety. Especially after discovery that Dobričić is one of parents of Plavac mali, the most important Croatian red cultivar.

Its wine was deep in colour, strong with alcohol, well-bodied and full in taste. Average evaluation was 85.56 points.

Table 5. Chemical analysis of grape must and wine and tasting value of wine of Dobričić variety

Dobričić			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Duilo - Split	14.09. 2011.	1.0 kg	89	4,3 g/L	3,57	15,6	30,5	2,8	4,01	4,6	3,84	0,76	85,56

Sansigot

Sansigot is very rare Croatian variety, limited only in island of Susak (formerly called Šušćan). It has some interesting production characteristics, showed during our investigation – high yield, satisfied quality potential, and high tolerance to Botrytis, despite of very dense bunch. Also, during research and vinification of this variety, it is noticed as one of most interesting red cultivar from this region. During tasting it is evaluated with 77.56 points in average.

Table 6. Chemical analysis of grape must and wine and tasting value of wine of Sansigot variety

Sansigot			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Risika, Island of Krk	22.09. 2011.	1,7	67	4,05	3,82	12,96	25,5	5,3	4,13	3,9	3,0	0,9	77,56

Evaluation summary of microwinification of four Montenegrin cultivars

KRSTAČ MNE 41

Krstac is Montenegrin autochthonous grapevine variety which has a very small areal of extent and breeding. It is mostly represented in Podgorica's sub region and it was leading variety for production of white wine in Montenegro.

Wine is of light golden yellow colour with greenish reflections. This wine has nicely expressed fruity aroma of peach and pear, balanced in taste and smell. Light body and freshness make this wine drinkable. During the evaluation, this wine has received 81.89 points out of 100 possible points.

Table 1. Chemical analysis of grape must and wine and tasting value of wine of Krstač variety

KRSTAČ MNE 41			CHEMICAL ANALYSIS										Tasting value of wine
			GRAPE MUST			WINE							
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	
Lješkopolje	30.08. 2011	4.2	21.5	5.37	3.47	12.74	17.0	1.15	3.22	5.20	1.78	0.35	81.89

VRANAC MNE 17

Vranac is Montenegrin autochthonous grapevine variety. It originated from Crmnica. Plamenac (1891) in "Grica" states that wine from Crmnica is the best in Montenegro and it can be compared with wines from Bordrdeaux. Jergovic (1892) in "Glas Crnogorca" asserts quality of Crmnica's wine, its colour and intensity. Author states that it is made of Vranac variety and somewhere by addition of Kratosija variety. In order to be very sure in quality of wine produced from Vranac variety, we did an evaluation of variety and wine from Godinje locality – one of the best localities in Crmnica and in Montenegro for breeding Vranac.

Wine produced from Vranac variety is of intensive dark red ruby colour with violet nuances. Its aroma resembles cherries and forest fruit (raspberry, cranberry, blackberry), as well as fig, plum and walnut. Harmonious wine, with high alcohol content, extracts and with rounded soft tannins that give it fullness and warmth. This wine has potential for aging in oak barrels, during which it gets caffee, vanilla, tosty and chocolate aromas. During the evaluation, this wine has received 91.78 points out of 100 possible points. Wine of Vranac variety was the best assessed wine on tasting and also in category of red wines on project.

Table 2. Chemical analysis of grape must and wine and tasting value of wine of Vranac variety

VRANAC MNE 17			CHEMICAL ANALYSIS													Tasting value of wine
			GRAPE MUST			WINE										
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	Total polyphen. (g/l)	Anthocyanins (mg/l)		
Godinje	31.08. 2011	3.7	23.1	5.41	3.62	13.66	28.1	2.11	3.51	5.80	2.59	0.60	2.49	387	91.78	

KRATOŠIJA (MNE 15-Beri)

Kratošija is an old Montenegrin autochthonous grapevine varieties. Kratošija has very heterogeneous population. Because of its heterogeneity, today in vineyards it is mostly represented in combination with Vranac variety. Kratošija is in close genetic relationship with Vranac variety (Callo *et al.* 2008). It was and still is represented in all viticulture areas (regions and sub regions) in Montenegro.

It is considered that in the past Kratošija was in the greatest extent (more than 80%) widespread in Beri and Doljani. Within the project, variety and wine evaluation of Kratošija from Beri locality was done.

Wine of Kratošija variety is of red colour with a purple outline. Aroma of this wine is fruity (cornelian cherry, blueberry and cherry) and floral, while it has light-medium body and high alcohol content. Because of its expressed acids, this wine is refreshing and it is excellent for blending with other varieties lacked with acids such Vranac is. During the evaluation, this wine has received 87.67 points out of 100 possible points. Wine of Kratošija variety took second place among tested red wines.

Table 3. Chemical analysis of grape must and wine and tasting value of wine of Kratošija variety

KRATOŠIJA MNE 15			CHEMICAL ANALYSIS												Tasting value of wine
			GRAPE MUST			WINE									
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	Total polyphen. (g/l)	Anthocyanins (mg/l)	
Beri	16.09.2011.	5.3	24.2	6.38	3.69	14.13	32.00	2.31	3.53	6.20	1.99	0.60	2.37	152	87.67

ČUBRICA MNE 07

Čubrica is mostly an accompanying of Kratošija variety on locality Doljani, where Kratošija dominates even today.

Wine is of red colour with a violet nuances. This wine has fruity and floral aroma. Light body, elegance and rounded. Balanced wine with good ratio of total acids and alcohol content. During the evaluation, this wine has received 83.44 points out of 100 possible points.

Table 5. Chemical analysis of grape must and wine and tasting value of wine of Čubrica variety

ČUBRICA MNE 07			CHEMICAL ANALYSIS												Tasting value of wine
			GRAPE MUST			WINE									
Locality	Harvest date	Yield (kg/vine)	Sugar (%)	Total acids (g/l)	pH	Alcohol (vol%)	Total extract (g/l)	Residual sugar (g/l)	pH	Total acids (g/l)	Tartaric acid (g/l)	Volatile acids (g/l)	Total polyphen. (g/l)	Anthocyanins (mg/l)	
Doljani	16.09.2011.	3.2	20.4	4.87	3.45	12.07	22.7	0.76	3.41	5.98	1.98	0.40	1.65	153	83.44