“Developing Identity ON Yield, SOil and Site”
“DIONYSOS”
MIS Code: 5016090

Deliverable: 3.5.2 “Selecting main local wine varieties and identifying their characteristics”

3.5.2 (b) Winemaking Procedures of the Rare Varieties from Soufli

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Grapes of seven varieties, all planted in Soufli region, were harvested at technological maturity and then the Vinification process is described below.

White varieties: White Patiki

The grapes from the white variety Patiki, was hand harvested during early hours and they were then transferred to the experimental winery of the Oenolysis Athens firstly in the fridge overnight. In addition, 200 berries were frozen at -20^{o} C for further analyses. Next morning, they were destemmed, crashed and pressed. Potassium metabisulfite (7g/hL) was added to the juice and two hours later pectolytic enzymes (3 g/hl) were added as well. The juice was then chilled down to 10^{o} C and 24 hours later it was racked to 5L capacity plastic bottles. At this stage, the sugar content (Brix) of the juice was determined and also classical analyses were performed (pH and total acidity) and YAN (OIV), results were shown at Deliverable 1. The must was then inoculated with yeast strain UCLM 325 and the alcoholic fermentation started. The next day the must was supplemented with 20g/hl springferm as a nitrogen supplement.. Brix measurements were performed daily.

When the alcoholic fermentation was successfully completed, the wine was racked, chilled to 4^{o} C and 8g/hL of Potassium Metabisulfite was added. The wines were bottled and kept to a constant temperature of 10^{o} C. Then the wine was stabilized for proteins and tartrates . The wines were analysed one month later (results in Deliverable 2).

Red Varieties: Karnachalas, Bougialamas, Voulgaridia, Ligaridia, Bogiatzides, Papadies

The grapes from each red variety were hand harvested during early hours and they were then transferred to the experimental winery Oenolysis Pallini, Athens and placed in the fridge overnight in separate bins. In addition, 200 berries were frozen at -20^{o} C for further analyses (Iland, *et al*., 2004), results presented in Deliverable 1. The following morning, they were destemmed, crashed and cold pre-fermentation maceration for 24hours was performed at 5^{o} C. An addition of Potassium metabisulfite (7g/hL) was done. At this stage, the sugar content (Brix) was determined and classical analyses were performed (pH and total acidity) as also chromatic characteristics and YAN analysis was

done (OIV). They were then inoculated with yeast strain UCLM 377 (20 g/hl) and the alcoholic fermentation was initiated a few hours later. Three times a day the cap was punched down in order to submerge the skins and extract anthocyanes and tannins. Additions of yeast nutrients (Springferm, 20 g/hl) was also made 24 hours after inoculation. Brix measurement was performed daily. Six days after the end of alcoholic fermentation and when the color intensity was stabilized, juice/wine was racked and the skins were separated from and then pressed. After the completion of the alcoholic fermentation, the malolactic fermentation occurred by inoculating with CH16 lactic bacteria strain and as soon as it was completed, the wines were racked and treated with 8 g/hL of Potassium Metabisulfite. The wines were kept at room temperature, then cold stabilized, filtered and then bottled.

Classical analyses (Brix, pH, Total Acidity, Volatile Acidity, % Alcoholic Content, Reducing Sugars), the determination of Malic acid Total YAN and the chromatic characteristics (according the OIV guidelines) were carried upon the completion of the alcoholic and malolactic fermentation.

Figure 1 : Baskets of Bougialamas grapevine berries

Figure 2: Destemming berries by hand

Figure 3: Crushing process of Bougialamas grape berries

Figure 4: Pressing process of the skins after separating the skins from the must by the end of alcoholic fermentation

Fermentation Kinetics

All the fermentations were achieved by the 10th day however for Voulgaridi, Ligaridia, Bougialamas the fermentation kinetics were slower and fermentations were completed by the 14th day. By the of fermentation the reducing sugars for all the other varieties it was less than 1 g/L. In any case all the fermentations were achieved and the wines produced are characterized as dry which is important for the sensory evaluation which will be the next step.

Table 1. Fermentation Kinetics of all the 7 musts of the study.

Dates		Day 0	Day 1	Day 2	Day 3	Day 5 -	Day 6	Day 7 -	Day 8-	Day 9	Day 10	Day12	Day 14	
No.	Codes	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	P 20°c	G/F
1	KARNACHALAS	1.0923	1.0907	1.0849	1.0785	1.0404	1.0220	1.0155	1.0049	0.9956	0.9921	0.9921	0.9921	0.14
1'	KARNACHALAS B	1.0923	1.0907	1.0825	1.0729	1.0351	1.0198	1.0133	1.0035	0.9962	0.9927	0.9927	0.9927	0.51
2	MPOUGIALAMAS	1.0915	1.0874	1.0858	1.0793	1.0456	1.0337	1.0183	1.0063	0.9993	0.9965	0.9945	0.9945	0.25
2'	MPOUGIALAMAS B	1.0915	1.0874	1.0833	1.0729	1.0396	1.0292	1.0119	1.0028	0.9996	0.9968	0.9948	0.9948	0.14
3	VOULGARIDIA	1.0890	1.0874	1.0874	1.0866	1.0697	1.0610	1.0456	1.0322	1.0123	1.0053	0.9955	0.9923	0.05
3'	VOULGARIDIA B	1.0899	1.0874	1.0862	1.0841	1.0713	1.0602	1.0411	1.0292	1.0124	1.0044	0.9958	0.9924	0.08
4	LIGARIDIA	1.0990	1.0932	1.0866	1.0858	1.0761	1.0657	1.0479	1.0300	1.0154	1.0084	0.9975	0.9954	0,02
4'	LIGARIDIA B	1.0990	1.0932	1.0858	1.0817	1.0673	1.0587	1.0419	1.0270	1.0157	1.0077	0.9979	0.9957	0,03
5	BOJIATJIDES	1.0948	1.0957	1.0833	1.0744	1.0426	1.0205	1.0126	1.0028	0.9951	0.9921	0.9921	0.9921	0.11
5'	BOJIATJIDES B	1.0948	1.0907	1.0809	1.0673	1.0337	1.0176	1.0119	1.0021	0.9952	0.9922	0.9922	0.9922	0.15
6	PAPADIS	1.0990	1.0890	1.0874	1.0866	1.0689	1.0571	1.0411	1.0183	0.9921	0.9913	0.9913	0.9913	0.08
6'	PAPADIS B	1.0990	1.0899	1.0866	1.0866	1.0641	1.0525	1.0374	1.0162	0.9923	0.9915	0.9915	0.9915	0.09
7	White PATIKI	1.0907	1.0866	1.0793	1.0618	1.0278	1.0126	1.0042	1.0000	0.9919	0.9911	0.9911	0.9911	0.09
7'	White PATIKI B	1.0907	1.0874	1.0721	1.0571	1.0198	1.0070	1.0007	0.9987	0.9923	0.9915	0.9915	0.9915	0.17

Genetic Analysis

PCR results

Implantation control of the inoculated yeasts UCLM 325 and UCLM 377 was applied. It was found by using PCR analysis that the cells of these yeasts dominated in the fermentation, as we found around 90% of cells among the colonies tested at 2/3 of fermentation.

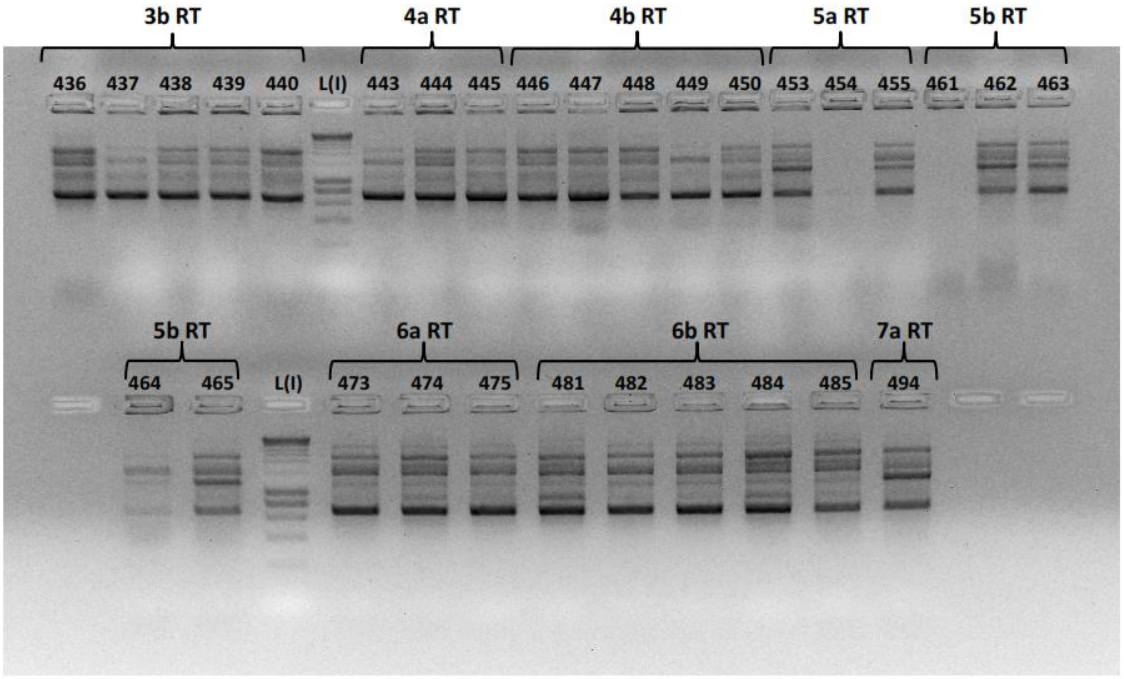

Figure1. Example of PCR analysis. 6a and 6b 473-485 represents fermentations that achieved by uclmS377.

Conclusion

Winemaking of rare indigenous varieties from Soufli was realized during this study. Classical winemaking steps were applied in order to produce white and red wines. Fermentation kinetics were normal while a slower fermentation rate was observed for Voulgaridi, Ligaridia and Bougialamas. Implantations control at 2/3 of the fermentation showed that all fermentations were achieved by the selected yeast. By the end, all the wines seemed to be of a good quality and the following step of the study will be the chemical and sensory evaluation of the wines.