

SELECTION OF AN ORGANIC *Saccharomyces cerevisiae* AND EFFECT ON TEMPRANILLO, CABERNET-SAUVIGNON AND BOBAL INDUSTRIAL VINIFICATIONS IN A CELLAR OF UTIEL-REQUENA D.O. (SPAIN).



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INTRODUCTION

The interest of consumers by organic food and drinks is increasing. Winemakers consider organic wines more authentic, singular and healthier [1]. There is a niche in the market for ecological yeast production which target are winemaker that desire to control alcoholic fermentation but maintaining wine singularity. The objective of this work was the selection of an organic yeast able to maintain or improve the characteristics of Tempranillo, Cabernet-Sauvignon and Bobal wines produced in O. D. Utiel-Requena (Spain). The main criteria established for selection were 1) yeasts must come from wines produced by organic management of vineyards and winemake also under organic practices and 2) yeasts should contribute to the characteristics of wines from Cabernet Sauvignon and Tempranillo Bobal grape variety in a positive way. After the selection procedure a *Saccharomyces cerevisiae* strain from Tempranillo vinification was retained as the best yeast to perform alcoholic fermentation of Bobal and Cabernet-Sauvignon and Tempranillo must. His behaviour in industrial conditions was established.

ISOLATION, IDENTIFICATION AND MOLECULAR CHARACTERIZATION

Yeast isolates were obtained in YDP medium from industrial organic fermentations. Isolates were identified by ITS length [2] and typed by *HinfI* mitochondrial DNA restriction profiles [3].

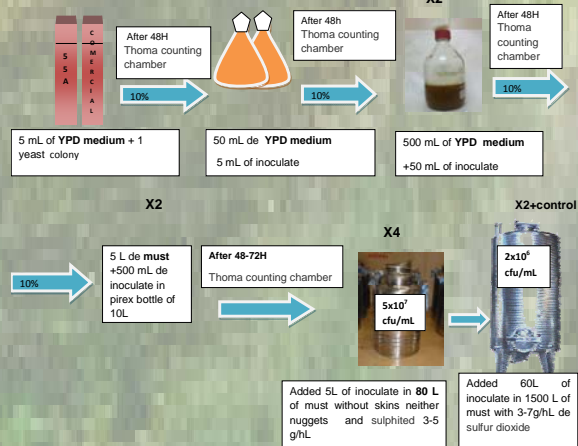


SELECTION OF YEASTS

The isolates were selected by their growth kinetics (under different physico-chemical conditions), sugars rate consumption, low ethanol and high glycerol production, agglomeration, β -glucosidase activity, ethanol and SO_2 resistance, and inability to produce H_2S and urea

INDUSTRIAL VINIFICATIONS WITH SELECTED YEAST

The selected strain 55A and strain Excellence SP - Lamothe - Abiet were inoculated into Bobal, Cabernet Sauvignon and Tempranillo must of three varieties to 2×10^6 cfu/mL. A lot of each grape must remained non inoculated.



FOLLOW UP OF INDUSTRIAL FERMENTATION

Evolution of sugars, ethanol, volatile and total acidity, and pH along alcoholic fermentation was monitored by a FOSS equipment.

The evolution of inoculated yeast and the degree of dominance along alcoholic fermentation was monitored by plating samples, selecting 10 colonies per plate and analyzing *HinfI* DNA mitochondrial restriction profiles.

SENSORIAL ANALYSIS

A four trained panel performed a sensorial analysis of the wines obtained from the experiment.

Results of yeast selection

From 132 isolates strain 55A was selected as the yeast that best fits with the criteria used for selection.

Characteristics of wines inoculated with organic and commercial yeasts

TEMPRANILLO						
	ALCOHOL	SUGARS	TA	pH	VA	
CONTROL	13,095	2,375	6,195	3,91	0,42	
55A	13,055	1,855	7,205	3,815	0,41	
COMMERCIAL	13,35	1,24	6,65	3,965	0,275	

BOBAL						
	ALCOHOL	SUGARS	TA	pH	VA	
CONTROL	10,775	3,42	8,19	3,31	0,355	
55A	10,71	3,73	8,935	3,225	0,4	
COMMERCIAL	10,795	3,5	8,25	3,305	0,315	

CABERNET						
	ALCOHOL	SUGARS	TA	pH	VA	
CONTROL	16,005	2,46	6,16	3,535	0,395	
55A	15,73	2	7,455	3,45	0,37	
COMMERCIAL	15,74	1,845	6,955	3,47	0,135	

Wines obtained with organic 55A yeast showed lower concentration of ethanol, higher total acidity and the same residual sugars as those fermented with the commercial yeast strain or with autochthonous yeast.

Implantation monitoring in industrial vinifications

■ The selected strain 55A was unable to surpass the native yeasts in Tempranillo vinification.

■ In Bobal and Cabernet-Sauvignon fermentations, strain 55A dominated at the middle of alcoholic fermentation showing a relative frequency of 60% and 50%, respectively. However, at the end of fermentation is surpassed by other autochthonous strains

PERCENTAGES OF IMPLANTATION				
TEMPRANILLO	MOMENTS (%)		IMPLANTATION (%)	
	MIDDLE AF	FINAL FA	MIDDLE AF	FINAL FA
55A (profile T55)	50% profile F	40% profile F	0%	0%
	40% profile H	40% profile H		
		20% profile N		
CONTROL	20% profile A	20% profile A		
	10% profile B	10% profile C		
	40% profile C	20% profile F		
	10% profile D	30% profile G		
	10% profile E	20% profile H		
	10% profile F			
COMMERCIAL (profile I)	30% profile I	20% profile A		
	10% profile N	20% profile H		
	10% profile F	20% profile I	30%	20%
	20% profile A	30% profile F		
	10% profile O	10% profile L		
	10% profile P			

CABERNET SAUVIGNON				
	MOMENTS (%)		IMPLANTATION (%)	
	MIDDLE AF	FINAL AF	MIDDLE AF	FINAL AF
55A (profile T55)	50% profile T55	50% profile I		
	10% profile K	10% profile A		
	10% profile E	10% profile T55	50%	10%
	10% profile F	10% profile R		
	10% profile Q	10% profile T		
CONTROL	90% profile I	90% profile I		
		10% profile O		
COMMERCIAL (profile I)	60% profile I			
	10% profile F	60% profile I	60%	60%
	10% profile J	20% profile F		

BOBAL				
	MOMENTS (%)		IMPLANTATION (%)	
	MIDDLE AF	FINAL AF	MIDDLE AF	FINAL AF
55A (profile T55)	60% profile T55	20% profile T55		
	20% profile A	10% profile K		
	10% profile I	10% profile J		
	10% profile L	10% profile I	60%	20%
	10% profile M	10% profile A		
		30% profile E		
CONTROL	60% profile I	10% profile A		
	10% profile T	10% profile I		
	10% profile U	40% profile H		
	10% profile A	10% profile G		
	10% profile G	10% profile F		
		10% profile T55		
COMMERCIAL (profile I)	100% profile I	60% profile I	100%	60%
		30% profile T		
		10% profile G		

Sensorial evaluation

TEMPRANILLO	Visual	Nose	Flavor	Aftertaste	Persistence	Total
Commercial	6	6	7	6	6	31
Control	5	5	6	6	6	28
55A	6	7	7	7	7	34

CABERNET	Visual	Nose	Flavor	Aftertaste	Persistence	Total
Commercial	6	5	6	6	7	30
Control	5	6	6	6	6	29
55A	8	7	8	8	7	38

BOBAL	Visual	Nose	Flavor	Aftertaste	Persistence	Total
Commercial	6	5	6	6	5	28
Control	5	6	6	6	6	29
55A	7	7	6	6	6	32

Tempranillo, Cabernet-Sauvignon and Bobal wines fermented with the yeast 55A obtained the highest scores

ACKNOWLEDGEMENTS

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