



Use of *Kluyveromyces marxianus* to Increase Free Monoterpene and Aliphatic Esters in White Wines

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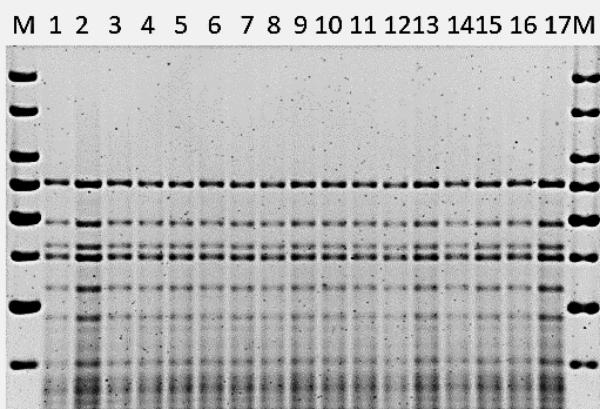
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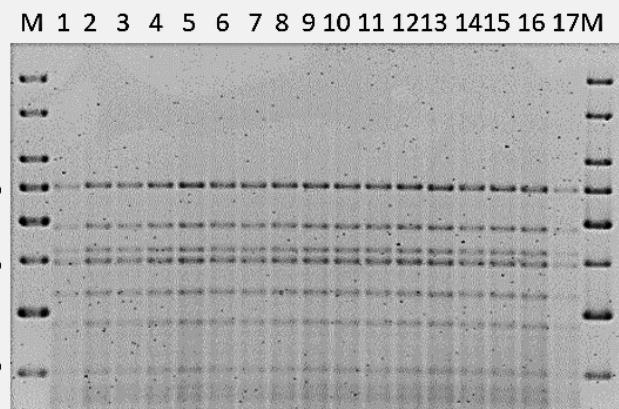
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MUSCAT OF ALEXANDRIA



(a)

GRILLO



(b)

Figure S1. mt-DNA RFLP of *K. marxianus* colonies isolated on the 5th day of fermentation from musts inoculated with Km L2009 strain. Strain *K. marxianus* Km L2009 (lane 1); yeast colonies isolated from Muscat of Alexandria (a) and Grillo (b) vinifications (lanes 2–17). Molecular weight marker (lanes M).

Table S1. Main chemical-physical parameters and statistical data analysis for the Muscat of Alexandria wines. Data are reported as average values \pm standard deviations of two different trials, each with measurements in triplicate.

	Spontaneous Fermentation			<i>S. cerevisiae</i> QA23		<i>K. marxianus</i> Km L2009		P-Values		
Alcohol (% v/v)	11.20 b	\pm	0.01	11.01 a	\pm	0.00	11.14 b	\pm	0.04	0.001
Total Dry Extract (g/L)	17.6 a	\pm	0.4	19.0 b	\pm	0.2	18.6 b	\pm	0.6	0.001
pH	3.32 a	\pm	0.02	3.32 a	\pm	0.03	3.40 b	\pm	0.00	0.001
Glycerol (g/L)	4.38 a	\pm	0.02	5.68 b	\pm	0.07	4.38 a	\pm	0.02	0.001
Tartaric Acid (g/L)	2.91 ab	\pm	0.05	2.87 a	\pm	0.12	3.01 b	\pm	0.01	0.05
Malic Acid (g/L)	0.93 ab	\pm	0.00	0.95 b	\pm	0.06	0.89 a	\pm	0.02	0.01
Lactic Acid (g/L)	0.13 c	\pm	0.02	0.08 b	\pm	0.01	0.04 a	\pm	0.01	0.001
Glucose + Fructose (g/L)	0.02 a	\pm	0.00	0.05 b	\pm	0.02	0.02 a	\pm	0.00	0.001
Acetic Acid (g/L)	0.23 b	\pm	0.01	0.30 c	\pm	0.02	0.19 a	\pm	0.00	0.001
Citric Acid (g/L)	0.27 b	\pm	0.00	0.28 b	\pm	0.01	0.23 a	\pm	0.01	0.01
Total Phenolics (mg/L)	97 b	\pm	1	92 a	\pm	4	94 ab	\pm	3	0.05
Total Catechins (mg/L)	10 b	\pm	1	10 b	\pm	1	9 a	\pm	0	0.05
Methanol (mg/L)	24	\pm	6	28	\pm	7	26	\pm	6	
Free SO ₂ (mg/L)	1	\pm	0	2	\pm	0	2	\pm	1	
Total SO ₂ (mg/L)	12 a	\pm	0	19 b	\pm	1	13 a	\pm	1	0.05

Different small letters (a, b, c) indicate significant differences between the same parameter in different types of fermentations. Tukey's HSD Test.

Table S2. Main chemical-physical parameters and statistical data analysis for the Grillo wines. Data are reported as average values \pm standard deviations of two different trials, each with measurements in triplicate.

	Spontaneous Fermentation			<i>S. cerevisiae</i> QA23		<i>K. marxianus</i> Km L2009		P-Values		
Alcohol (% v/v)	12.67 b	\pm	0.05	12.49 a	\pm	0.04	12.61 b	\pm	0.04	0.001
Total Dry Extract (g/L)	22.5 a	\pm	0.1	22.9 ab	\pm	0.2	23.1 b	\pm	0.4	0.001
pH	3.07 a	\pm	0.03	3.05 a	\pm	0.04	3.20 b	\pm	0.08	0.001
Glycerol (g/L)	6.53 a	\pm	0.14	7.87 b	\pm	0.05	6.62 a	\pm	0.07	0.001
Tartaric Acid (g/L)	4.17	\pm	0.03	4.13	\pm	0.05	4.14	\pm	0.19	
Malic Acid (g/L)	0.60 b	\pm	0.04	0.62 b	\pm	0.02	0.49 a	\pm	0.01	0.001
Lactic Acid (g/L)	0.12 b	\pm	0.01	0.08 ab	\pm	0.02	0.03 a	\pm	0.01	0.001
Glucose + Fructose (g/L)	0.01 a	\pm	0.00	0.02 b	\pm	0.00	0.01 a	\pm	0.00	0.05
Acetic Acid (g/L)	0.44 b	\pm	0.01	0.35 a	\pm	0.03	0.42 b	\pm	0.04	0.001
Citric Acid (g/L)	0.61 b	\pm	0.01	0.60 b	\pm	0.00	0.55 a	\pm	0.00	0.001
Total Phenolics (mg/L)	155 a	\pm	2	167 b	\pm	0	161 ab	\pm	2	0.001
Total Catechins (mg/L)	14	\pm	0	15	\pm	0	14	\pm	1	
Methanol (mg/L)	57	\pm	6	63	\pm	1	63	\pm	5	
Free SO ₂ (mg/L)	1	\pm	0	1	\pm	0	1	\pm	0	
Total SO ₂ (mg/L)	8 a	\pm	0	10 b	\pm	0	9 ab	\pm	1	0.001

Different small letters (a, b, c) indicate significant differences between the same parameter in different types of fermentations. Tukey's HSD Test.