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## CHARACTERIZATION AND OENOLOGICAL APPLICATION OF AN HIGH-PREFORMING STRAIN OF *OENOCOCCUS OENI* TO DRIVE MALOLACTIC FERMENTATION. A REVIEW ABOUT 15 YEARS OF RESEARCH AND WINEMAKING

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Malolactic fermentation (MLF) is a biological process fundamental to determine wine quality, however is frequently affected by troubles due to the difficult acclimation of lactic bacteria to wine conditions. In this work, we review 15 years of collaboration between oenologists and researchers to propose efficient solutions for the management of MLF.

The work started with the evaluation of the resistance of 10 *Oenococcus oeni* strains to wine limiting factors, in order to select a suitable strain for a reliable MLF in wines presenting difficult conditions. Resistance to low fermentation temperature, high SO<sub>2</sub> and/or ethanol concentration, and low pH were assayed in laboratory tests. A pool of the most resistant strains was tested in laboratory MLFs. At the end of fermentation, the dominant strains were identified by RAPD-PCR. One strain was found to be dominant in the majority of MLFs, under the most detrimental wine conditions. Therefore, it was chosen as selected strain for the inoculum of MLF trials in industrial wineries.

The effectiveness of the selected strain of *O. oeni* strain was confirmed in different vintages, through more than 50 MLFs carried out in different oenological realities. It accomplished MLF in wines having about 16% ethanol, pH low as 3.00 or more than 50 mg/L of SO<sub>2</sub>, and in fermentation temperatures below 17 °C.

Following the recent trends of wine technology, selected strains of *O. oeni* were involved in malolactic fermentation conducted by different approaches, focusing the attention on the simultaneous alcoholic and malolactic fermentations in grape must. Experimental winemaking takes place in different Italian wineries. A careful monitoring of evolution of MLFs and an extensive characterization of obtained wines ensures a comprehensive overview about the potentiality of different MLF's protocols to contribute to organoleptic profile of wines.