Cold-Active Enzymes for Oenology: Application of Psychrotolerant Microorganisms for Polysaccharidases Production During Low-Temperature Red Winemaking to Improve Clarification and Quality of Wine

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ABSTRACT

Low-temperature fermentation is used to improve aroma production and retention in red wines, but colour and phenolic extraction is reduced under this condition. This effect can be compensated by the use of "cold-active" pectinolytic enzymes. Considering the key role of yeasts in fermentation, indigenous strains from wine-growing ecosystems that produce *in situ* pectinases active at low temperatures could be added to the winemaking process. The effects of applying psychrotolerant strains of *Aureobasidium pullulans* (*Ap*), a grape surface majority pectinolytic species, in pre-fermentative cold maceration (8°C) and low-temperature fermentation (17-20°C), were evaluated on the chromatic, phenolic, technological, and sensory properties of Malbec wines. *Ap* was shown to grow and remain viable in red grape juice and during the first days of fermentation, and significantly higher levels of pectinase activity were detected in *Ap*-vinifications compared to controls. *Ap*-wines showed higher total anthocyanins, total polyphenolic index, colour intensity and violet hue, with greater stability of wine colour and a reduction (25-30%) in filtration times. This study demonstrated the efficiency of the cold-active pectinases in improving the extraction and stability of red wine colour fermented at low temperature, approaching or reaching the levels of chromatic and phenolic parameters of the traditionally fermented Malbec wine.

Keywords: Anthocyanins, *Aureobasidium pullulans*, Cold-active pectinases, Low- temperature red fermentation, Pectinolytic yeasts, Malbec wine.

How to Cite

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