

The Influence of Wine Phenolic Acids on the Production of Volatile Phenols by Lactic Acid Bacteria

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Keywords: volatile phenols, phenolic acids, wine, aroma

Some wine microorganisms can produce volatile phenols (vinylphenols and ethylphenols) from grape-derived hydroxycinnamic acids (*p*-coumaric and ferulic acids). Volatile phenols have characteristic aromas which, above a certain concentration threshold, have a negative effect on the overall aroma of a wine, but at low concentrations have been cited as contributing positively to aroma complexity. The contaminant yeasts *Dekkera/Brettanomyces* are recognized as the main volatile phenols producer organisms, although previous works have shown that some strains of Lactic Acid Bacteria (LAB) are also capable of producing volatile phenols. The objective of this work was to evaluate the effect of hydroxybenzoic acids and hydroxycinnamic acids on the production of volatile phenols from *p*-coumaric acid by some strains of LAB. Cultures in late exponential phase were grown in MRS medium with 50 mg l⁻¹ *p*-coumaric acid, supplemented with different phenolic acids at 0, 50 and 100 mg l⁻¹. It was found that the hydroxycinnamic acids tested (caffeic and ferulic) clearly stimulate the production of volatile phenols from the metabolism of *p*-coumaric acid, while not affecting bacterial growth. The hydroxybenzoic acids studied (gallic and vanillic) did not significantly affect the capacity of LAB to synthesize volatile phenols. Results suggest that hydroxycinnamic acids induce the biosynthesis of enzymes involved in the metabolic pathway: cinnamate decarboxylase which decarboxylates *p*-coumaric acid into 4-vinylphenol, and the vinylphenol reductase which reduces the latter into 4-ethylphenol.

Acknowledgements:

The authors would like to thank FCT (Fundação para a Ciência e a Tecnologia) for funding this research via project POCI/AGR/61331/2004. F.M. Campos would also like to thank FCT for the grant PRAXIS XXI/BD/19909/99.