

Production of Volatile Phenols by Wine Pediococci

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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 under wine conditions. In this work, it is shown that wine pediococci have the ability to produce volatile phenols from the corresponding phenolic acids. Cells, cultivated in liquid media supplemented with p-coumaric and ferulic acids, produced volatile phenols in the growth media, which were analysed by GC-FID. The results indicate the existence of strain variability and a much higher capacity to synthesize vinylphenols (4-vinylphenol and 4-vinylguaiacol, the intermediate compounds of the hydroxycinnamic acid metabolic pathway) than ethylphenols. Higher conversion yields were found for p-coumaric acid than for ferulic acid. The higher the p-coumaric acid concentration the higher the 4-vinylphenol concentration obtained. However, in terms of molar conversion yield, a maximum was reached at around 250 ppm of substrate, stabilising at higher values. The production of volatile phenols was found to be concomitant with the growth curves of the bacteria. This study shows that wine pediococci have hydroxycinnamic acid decarboxylase activity, thus being able to produce vinylphenols from phenolic acids in sensorially significant amounts.

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