

The concentration of glucose and fructose influences the production of volatile phenols by wine Lactic Acid Bacteria

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Volatile phenols have characteristic aromas which, above a certain threshold, have a negative effect on the overall aroma of wine (1). *Dekkera/Brettanomyces* are recognized as the main producer organisms, although certain strains of Lactic Acid Bacteria (LAB) are also capable of producing volatile phenols (2, 3). In this work, we studied the influence of glucose on the ability of LAB to produce volatile phenols in culture medium supplemented with *p*-coumaric acid. The capacity of *Lactobacillus collinoides* ESB99 and *L. plantarum* NCFB1752 to produce 4-ethylphenol (4EP) was found to be higher at 3 and 5 gL⁻¹ of glucose than at 20 gL⁻¹. The results suggest that the vinylphenol reductase activity is enhanced in the presence of low concentrations of glucose, which may be associated with the cells necessity to regenerate NAD⁺, presumably the co-enzyme involved in the reduction of 4-vinylphenol (4VP) to 4EP. When fructose was added to the medium, the reduction step of 4VP was restrained, thus favouring the outcome of 4VP over 4EP. This effect might be related with the reduction of fructose into mannitol which is accompanied by the regeneration of NAD⁺. It was also found that aerobiose, in comparison to anaerobiose, notably favours the production of 4VP, suggesting that O₂ is used as electron acceptor allowing the regeneration of NAD⁺. This study shows that the ratio 4VP/4EP is considerably affected by certain wine factors which could be related to the intracellular NAD⁺/NADH balance.

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