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EFFECT OF FREE OR IMMOBILIZED KEFIR CULTURE ON THE PROFILE OF VOLATILES IN LOW-ALCOHOL WINES

Yiannis Kourkoutas, Georgios Sgouros, Gregoria Mitropoulou, Valentini Santarmaki and Anastasios Nikolaou

Democritus University of Thrace, Greece

Nowadays, low alcohol wines (alcohol content <10 % vol) represent a new steadily rising trend in the global wine market driven by social, environmental and economic reasons. However, in order to achieve low alcohol concentrations, wines are being treated with harsh physicochemical methods that affect the wine quality negatively. To achieve high wine quality, malolactic (ML) fermentation is applied worldwide, resulting in reduction of beverage acidity, microbial stability, and organoleptic improvement. Nevertheless, it is a difficult and time-consuming process that may lead to delay or even failure. On the other hand, it is well documented that cell immobilization may offer numerous technological advantages, such as enhanced fermentation productivity, ability for cell recycling, application of continuous configurations, enhanced cell stability and viability, and improvement of quality. Hence, the aim of the present study was to evaluate the effect of kefir culture on the profile of volatiles in low-alcohol wines, since it was successfully used in simultaneous alcoholic and ML cider fermentations recently. Fermentation efficiency of free or immobilized cells on natural supports (apple pieces, delignified cellulosic material, and grape skins) was tested in repeated batch fermentations at a wide temperature range (5-30 C). Ethanol content ranged 4.5-10.5% (v/v) depending on fermentation temperature and malic acid conversion up to 59.3% was recorded. The main volatiles identified by HS-SPME GC/MS analysis were esters, organic acids, alcohols, carbonyl and miscellaneous compounds. Application of Principal Component Analysis clearly showed that the fermentation temperature had a significant effect instead of the nature of kefir culture. Noticeably, all products were accepted by the sensory panel during the preliminary organoleptic evaluation.

Biography

Associate Professor Yiannis Kourkoutas has completed his PhD at the age of 27 years from University of Patras, Greece, and postdoctoral studies from University of Ulster, N. Ireland, UK. He is the director of the Laboratory of Applied Microbiology & Biotechnology at the Department of Molecular Biology & Genetics, Democritus University of Thrace, Greece. He has published more than 80 papers in peer-reviewed journals, numerous abstracts in international conference proceedings including several invited talks, and has been serving as a Lead Guest Editor and an editorial board member in many special issues and reputed scientific journals.

ikourkou@mbg.duth.gr