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POSTER – P002

Functional screening of non-*Saccharomyces* yeasts from grape must, manna, and honey for wine colour stability and aroma modulation

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ABSTRACT

Ensuring colour stability in red wines represents a major technological and commercial challenge for the wine industry. Wine colour stability is influenced by biochemical and physical interactions between yeasts and anthocyanins during fermentation [1]. In addition to conventional fermentative traits, non-*Saccharomyces* yeasts may contribute to colour preservation or depletion depending on strain-specific characteristics such as anthocyanin adsorption, β -glucosidase activity [2], and hydroxycinnamate decarboxylase (HCDC) activity [3]. In this study, 163 non-*Saccharomyces* strains obtained from spontaneously fermenting grape must, manna, and honey were screened for oenological potential. Following a preliminary selection process based on ethanol tolerance ($\geq 4\%$ v/v), potassium metabisulfite resistance (100–250 mg/L), and low H₂S and acetic acid production, 52 indigenous strains were retained and characterised together with five reference strains (57 strains in total). Anthocyanin adsorption was assessed on YEPD agar supplemented with grape-derived anthocyanins (pH 3.5). β -Glucosidase activity was evaluated using an esculin-glycerol agar assay (halo-based semi-quantitative classification). HCDC activity was determined on YEPD

agar supplemented with p-coumaric acid. Marked strain-dependent variability was observed for all colour-related traits. Anthocyanin adsorption ranged from absent to high, with *Metschnikowia pulcherrima* and *Hanseniaspora uvarum* predominantly showing high adsorption, whereas *Lachancea thermotolerans* displayed mainly medium adsorption. Of the 57 strains analysed, 11 showed no detectable β -glucosidase activity, whereas most isolates exhibited medium to strong activity. HCDC activity was highly prevalent in *H. uvarum*, *M. pulcherrima*, and *L. thermotolerans*, whereas it was absent in *Starmerella* spp. and *Citeromyces matritensis*. The combined evaluation of adsorption and enzymatic traits emphasises the relevance of strain-level selection to balance aroma enhancement and colour preservation. Several strains, particularly within *L. thermotolerans*, exhibited balanced combinations of adsorption and enzymatic activities, underscoring the importance of strain-level selection for targeted red winemaking strategies aimed at enhancing colour stability and sensory complexity. These findings support targeted strain-level selection as a biotechnological approach to optimise colour preservation and aroma potential, with relevance for industrial red wine product

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