



16TH INTERNATIONAL
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CONGRESS ABSTRACTS

Influence of organic nitrogen supplementation on yeast gene expression and volatile thiol composition of wines

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Yeast derivatives (YDs) encompass various nitrogen sources, including amino acids, oligopeptides, and small peptides, contributing to yeast metabolism and variations in the aroma profiles of wines. Regarding varietal thiols, studies have demonstrated a nuanced connection between nitrogen metabolic pathways and thiol production. The present work explored the effect of grape must YDs supplementation on the expression of yeast genes involved in nitrogen uptake during fermentation, as well as on the release of polyfunctional thiol compounds from non-volatile precursors. The expression of genes encoding permeases involved in amino acids, peptide, and thiol precursor transportation (GAP1, OPT1, OPT2, FOT3, DAL5, PTR2) and genes associated with thiol release (IRC7 and STR3) were quantified by real-time RT-PCR, at four timepoints during the yeast growth phase in both control and YDs treated samples (n=3). Besides, at the end of the fermentation, volatile thiols and their precursors were quantified by UPLC/MS-MS. YDs upregulated GAP1, OPT1, PTR2, IRC7 and STR3 expression, and downregulated FOT3. Furthermore, nitrogen supplementation positively influenced the concentration of 4-mercapto-4-methylpentan-2-one and 3-mercaptohexan-1-ol in wines. Despite the varying effects of YDs on permeases, the concentration of both the volatile thiols was positively correlated with the expression of every gene analyzed at the end of the yeast growth phase.