

Impact of nitrogen sources on the fermentative kinetic and aroma compounds production by non-Saccharomyces yeasts in alcoholic fermentation

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Over the past 50 years, the use of *S. cerevisiae* strains selected for technological traits as starter cultures allowed the control of wine fermentations. This practice is the safest way to ensure the completion of fermentation and to avoid the formation of undesirable off-compounds. The non-*Saccharomyces* yeasts, even if they are predominant in grape juice, are rapidly outcompeted by added *S. cerevisiae* during fermentation because of their poor adaptation to increasing concentrations of ethanol and to the lack of oxygen. The potential to improve the sensory quality of wines of these species, long regarded as spoilage microorganisms, is now recognized, these strains displaying a wide range of aromatic profiles that could provide complexity and typicality to wines. However, the contribution of the non-*Saccharomyces* to the quality of wines remains uncertain, because the expression of their potential to produce volatile molecules strongly depends on the environmental conditions. Consequently, a complete understanding of the metabolism responsible for the production of volatile compounds and its regulation is required for a better exploitation of the metabolic potentialities of non-*Saccharomyces* species during wine fermentation.

To fulfil this shortcoming, the fermentation dynamics and the production of volatile molecules of three yeast species growing in presence of a unique nitrogen source (27 N-molecules) were compared. This approach allowed to identify the metabolic specificities of these species, in particular their preferred amino acids to sustain yeast growth and their capacities to synthesize aroma.

These results are of significance for the comprehension of the metabolism of non-*Saccharomyces* yeasts and pave the way to a better management of these yeasts in sequential inoculation for winemaking.