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Selected Native Yeasts Improved Wine Aroma in Co-Fermentation Trials

Hanseniaspora occidentalis strains paired with Saccharomyces cerevisiae also increased anthocyanin retention and color stability during aging.

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Researchers reported that selected native strains of Hanseniaspora occidentalis, used alongside the standard winemaking yeast Saccharomyces cerevisiae, can improve both aroma and color in wine, pointing to a possible new tool for producers looking to strengthen varietal character without relying only on conventional fermentation.

The findings were published in the International Journal of Food Microbiology. According to the study, the work focused on non-Saccharomyces yeasts, a group that has drawn growing interest in winemaking because some strains can change how aroma compounds are released and how pigments are preserved during fermentation and aging.

The researchers evaluated 112 indigenous yeast strains collected in Huailai and selected H. occidentalis strains with strong β-glucosidase activity for co-fermentation trials. The enzyme matters because it can break down bound aroma precursors that are naturally present in grapes, helping release compounds that contribute to fruity and floral notes in finished wine. The study identified strains, including M23 and S19k, as strong candidates for this role.

In the fermentation tests, wines made with the selected H. occidentalis strains and S. cerevisiae showed what the authors described as a synergistic effect. Compared with control fermentations carried out with S. cerevisiae alone, the mixed fermentations produced wines with more pronounced fruity and floral aroma profiles. The study said the added enzymatic activity from the native H. occidentalis strains appeared to play a direct role in that shift by increasing the release of aroma-related compounds during fermentation.

The study also found an effect on color, another key measure for many red wines. According to the researchers, the presence of H. occidentalis helped promote higher extraction and retention of anthocyanins, the pigments that contribute to red and purple color in grapes and wine. Analytical results showed stronger color intensity and better color stability during aging in the co-fermented wines than in wines fermented only with S. cerevisiae.

That combination of aroma enhancement and color stabilization is significant because those two qualities often define how consumers and producers judge wine style and quality. For wineries, especially those trying to distinguish regional products, the use of native strains could offer a way to build more distinctive wines while reducing some of the sensory uniformity that can come from relying on the same commercial yeasts across many regions. The findings may also interest the broader beverage sector because they suggest a practical enzymatic route to improve flavor expression and appearance through fermentation management, though the commercial effect would depend on validation at larger production scale.

The research adds to a wider shift in fermentation science. For years, S. cerevisiae has remained the main workhorse of wine fermentation because it is reliable and well understood. But non-Saccharomyces yeasts have gained attention as winemakers and researchers look for ways to add complexity, preserve regional identity, and fine-tune sensory outcomes. Instead of replacing S. cerevisiae, these yeasts are often studied as partners in mixed fermentation, where timing and inoculation strategy can shape the final result.

In this case, the authors said the impact of H. occidentalis depended on co-fermentation design, indicating that how and when the yeast is introduced may be as important as the strain itself. That point could matter for commercial wineries, since fermentation protocols need to balance sensory gains with process control, consistency, and cost. A strain that performs well in the lab may behave differently in large tanks, with different grape varieties or under different cellar conditions.

The study’s focus on indigenous strains is also notable. Native yeasts from a specific wine region are often seen as part of the microbial environment that contributes to local wine character. By selecting strains already adapted to the local setting, producers may be able to improve aroma and color while preserving a closer link to place. That approach fits a broader push in wine research toward using local microbial resources rather than importing the same fermentation solutions everywhere.

The authors said more research is still needed to optimize fermentation parameters and better understand the metabolic interactions between H. occidentalis and S. cerevisiae during co-fermentation. Those interactions can be complex, involving

competition for nutrients, changes in enzyme activity, and differences in how yeast populations develop over time. Further work would help clarify how stable the effects are across vintages and grape types, and whether the gains seen in controlled trials can be reproduced consistently under commercial winemaking conditions.