

## Use of *Lachancea thermotolerans* strains for modulation of acidity and aroma in Sicilian Syrah wines

Thursday, 12 March 2026 14:40 (10 minutes)

The compositional changes in grapes caused by global warming are compromising the quality of wines in Mediterranean regions. Recent studies have shown that hot vintages and severe water stress lead to an increase in pH and a decrease in the acidity of grapes. These phenomena are one of the main causes of changes in the acidity and sensory profiles of wines. To date, the production sector has already intervened by adding exogenous additives to mitigate these effects.

However, these practices are corrective measures associated with a significant environmental impact and possible negative effects on the sensory profile of wine. The aim of this work is to identify more sustainable solutions through the use of *Lachancea thermotolerans* strains.

In this context, *L. thermotolerans* represents a promising biotechnological strategy for adaptive fermentation management in warm and arid regions.

This study applied an integrated experimental approach to evaluate the acidifying and aromatic contribution of four *L. thermotolerans* strains (codes LT-A, LT-B, LT-C and LT-D), inoculated in microbial consortia with *Saccharomyces cerevisiae* and *Lactiplantibacillus plantarum*.

The influence of inoculation timing on technological, aromatic and sensory parameters of Sicilian Syrah wines was also assessed.

All strains showed bioacidification capacity, with LT-D achieving a maximum pH reduction of 0.68 units, exceeding chemical acidification and producing 5.96–12.10 g/L of L-lactic acid.

LT-B significantly improved the biosynthesis of fruity ethyl esters, including ethyl hexanoate, ethyl octanoate and ethyl decanoate.

The timing of inoculation had a greater impact on the aromatic composition than on technological parameters, as confirmed by sensory analysis.

Wines produced with the LT-A strain, with sequential inoculation at 48 hours (LT1 trial), achieved higher aromatic intensity and overall appreciation than those inoculated after 72 hours (LT5 trial).

Overall, these results demonstrate that strain selection combined with optimized inoculation timing enables precision modulation of acidity and aroma, supporting the use of non-*Saccharomyces* yeasts as sustainable climate-adaptive tools for Mediterranean winemaking.

**Primary author:** Dr NASELLI, Vincenzo (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy)

**Co-authors:** Prof. MAGGIO, Antonella Maria (Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo, Viale Delle Scienze, Building 17 Parco d'Orleans II, 90128, Palermo, Italy); Dr PIRRONE, Antonino (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Dr ALFONZO, Antonio (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Dr VELLA, Azzurra (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. FRACASSETTI, Daniela (Department of Food, Environmental and Nutritional Sciences (DeFENS), Università degli Studi di Milano, Via G. Celoria 2, 20133 Milan, Italy); Dr VIOLA, Enrico (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. MOSCHETTI, Giancarlo (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. BLAIOTTA, Giuseppe (Department of Agricultural Sciences, University of Naples Federico II, Portici, Italy); Dr DOLCE, Irene (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. SETTANNI, Luca; Dr CARUSI, Micaela (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze,

Building 5, Ent. C, 90128, Palermo, Italy); Prof. FRANCESCA, Nicola (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. GAGLIO, Raimondo (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. WEIDMANN, Stéphanie (Procédés Alimentaires et Microbiologiques (PAM), AgroSup Dijon, PAM UMR A 02.102, Laboratoire VALMiS-IUVV, Dijon, France); Dr CRAPARO, Valentina (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy); Prof. ENGLEZOS, Vasileios (Interdepartmental Centre for Grapevines and Wine Sciences, University of Turin, Corso Enotria 2/C, 12051 Alba, Italy)

**Presenter:** Dr NASELLI, Vincenzo (Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale Delle Scienze, Building 5, Ent. C, 90128, Palermo, Italy)

**Session Classification:** Sustainable Bioeconomy & Nature Based Solutions

**Track Classification:** General sessions: Sustainable Bioeconomy & Nature Based Solutions