Kalamata Olives Fermentation with Multifunctional Yeast Starters

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Background

With rising demand for functional foods, controlled fermentation of table olives using selected microbial cultures is gaining importance. This study assessed the fermentation of Kalamata olives using yeast strains—four *Candida boidinii* and one *Saccharomyces cerevisiae*—isolated from spontaneous fermentations and selected for their multifunctional properties.

Methods

Kalamata olives were fermented in 7.0% NaCl brine acidified with 0.5% vinegar and inoculated with yeast strains to 3 × 10^6 CFU/mL. Microbial populations and physicochemical parameters (pH, acidity, salt) were monitored. Yeast survival was evaluated by rep-PCR at days 0, 75, and 150. HCA and PCA revealed correlations among fermentation variables.

Results

- Yeasts coexisted with LAB which dominated in most fermentations. Elimination of Enterobacteriaceae was observed within 14–16 days compared to 20 days in the spontaneous process.
- Inoculation with *C. boidinii* Y27 and *C. boidinii* Y31 resulted in the lowest pH.
- Only *C. boidinii* Y27 maintained high recovery at the end of fermentation (day 150)
- Multivariate analyses grouped fermentations in two clusters: one linked to higher acidification and another with less favorable outcomes.

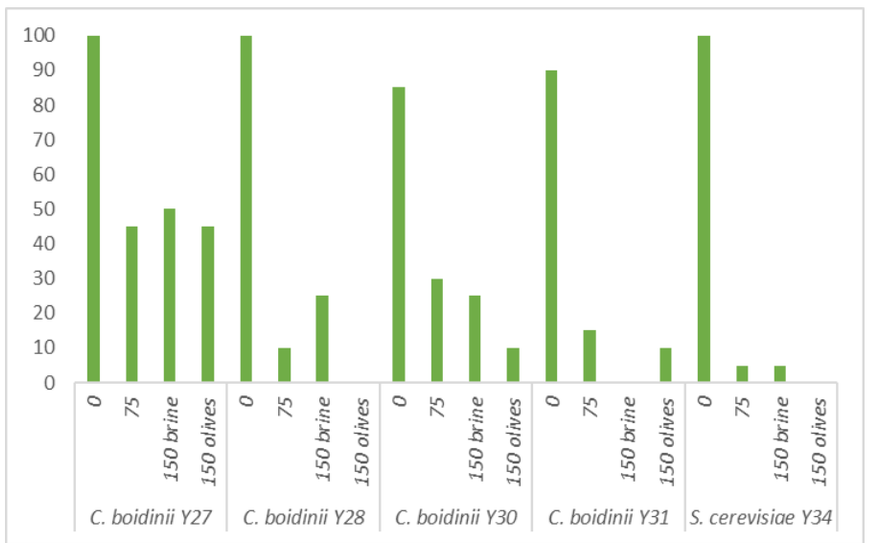

Fig 1. Starter culture survival rates (%) during different time points of fermentation.

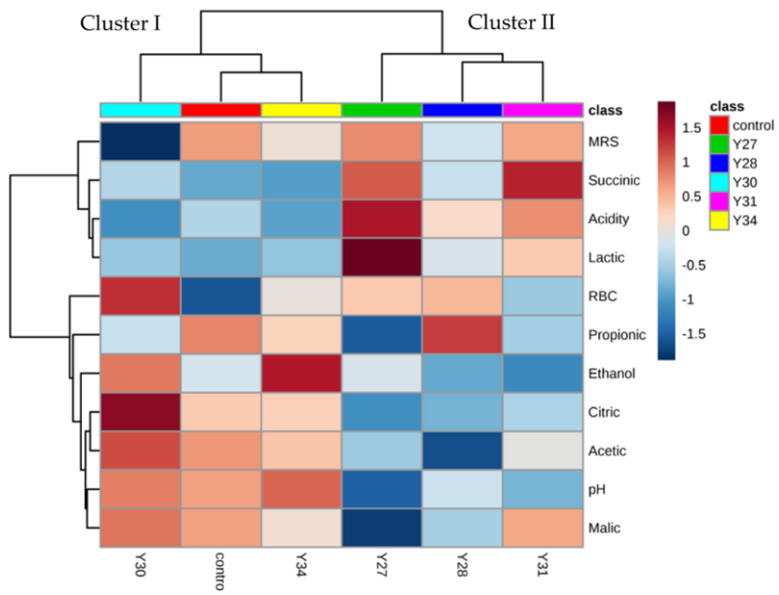

Fig 2. Hierarchically clustered heatmap of variables

Conclusions

C. boidinii Y27 stood out for promoting rapid Enterobacteriaceae decline, stable acidification, and long-term survival, suggesting its suitability as a starter culture.

References

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