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DALLA PRODUTTIVITÀ ALLA TUTELA
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Co-inoculation approach combining lactic acid bacteria and yeasts to enhance the production of Nocellara del Belice green split table olives

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Abstract

Table olives represent a very popular fermented food of the Mediterranean basin and are extensively produced in Greece, Italy, and Spain. In Sicily (south Italy) split green table olives hold particular significance. Traditionally these olives undergo spontaneous fermentation, but this method carries the risk of product spoilage due to undesirable microorganisms. To address this challenge, driven fermentation using selected starter strains offers a solution, ensuring a safer and more predictable production process.
Consequently, three distinct experimental productions of Nocellara del Belice split table olives were carried out. In the control trial, a commercial strain of *Lactiplantibacillus pentosus* OM13 was singly inoculated (referred to as OS3). Meanwhile, in the OS1 and OS2 trials, *L. pentosus* was co-inoculated with *Candida boidinii* and *Candida norvegica*, respectively. The strains *C. boidinii* LC1 and *C. norvegica* OC10 were previously selected for their bioprotective properties. Throughout the 90-day fermentation process, parameters such as pH, salinity, and microbiological populations were monitored. Subsequently, the olives underwent evaluation for color and pulp consistency, followed by sensory analysis.
The fermentation process was dominated by the inoculated microorganisms, mainly lactobacilli and yeasts (> 6 Log CFU/mL). In the co-inoculated trials, there was a marked reduction of undesirable populations. Brine acidification occurred rapidly, with pH values reaching 4.5 within 21 days. The co-inoculation technique resulted in a microbiologically safe product, maintaining colour integrity and achieving higher flesh hardness than the control trial. Sensory analysis revealed significant differences in taste, texture, saltiness and overall flavor, with no discernible odours or off-flavours. This strategic approach holds promise for enhancing the quality of split table olives.
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Keywords

table olives, fermentation, lactic acid bacteria, yeast, bioprotection