

PS2-S11-PP04 Cryopreservation of microbial consortia isolated from Apulian table olives: Effects on vitality and functional potential

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Microorganisms are precious and irreplaceable biological resources for the green, sustainable transition of food systems. The characterization and preservation of microbial communities are key aspects for maintaining specific ecosystems of interest for food fermentation, promoting biotechnological innovation and supporting research purposes. Recently, microbiologists have focused their efforts on preserving whole microbiomes, but few studies have been conducted to optimize the storage conditions of microbial consortia by preserving their viability and functional potential. Here, we used microbiomes associated with fermented table olives as model matrices because of microbial complexity and for their importance in the Mediterranean area. This study aims to preserve the microbiota isolated from typical Apulian table olives cv *Leccino*, and to evaluate the effectiveness of a cryopreservation protocol by using glycerol and DMSO as cryoprotectants at -135 °C storing temperature. The microbial population was studied before and after a fixed period of storage using a culture-dependent approach and RNA-based metabarcoding analysis. Moreover, the metabolic profile was evaluated using Biolog Ecoplate. Preliminary results indicated that after one month of cryopreservation, the viability of the whole microbial consortium decreased by 1 logarithmic unit regardless of the cryoprotectant used. No significant changes in the metabolic profile before and after cryopreservation were observed, except for γ -Amino Butyric acid. Also, metabarcoding analysis showed no significant differences in relative abundances after a short period of storage. Results confirmed the proper preservation of the microbial consortium and its functionality after a short-term period of storage. Further monitoring of vitality, metabolic profile, and microbiota diversity is necessary to provide evidence of the effectiveness of the applied cryopreservation protocol in the long-term storage period.

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