BIOTECHNOLOGY OF OYSTER MUSHROOMS FRUITING BODIES FERMENTATION WITH LACTOBACILLI

Basiul O., Yamborko G.

Department of Microbiology, Virology and Biotechnology, Odessa I. I. Mechnikov National University, Dvoryanska str. 2, 65082 Odesa, Ukraine
E-mail: hbasiul@onu.edu.ua

Lactic acid bacteria freeze-dried starter cultures use in edible mushrooms fruiting bodies fermentation is a promising innovation for microbiological and functional foods industry. So, the research was devoted to *Pleurotus ostreatus* fruiting bodies fermentation biotechnology development including its microbiota diversity study, lactobacilli effective strain selection and a freeze-dried starter culture creation.

Microbiological, biochemical and molecular-genetic investigation methods were applied.

It has been established that oyster mushroom fruiting bodies resident microbiota represented by following species: *Lactobacillus plantarum*, *Bacillus atrophaeus*, *Bacillus thuringiensis*, *Bacillus subtilis*, *Lysinibacillus sphaericus*, *Planococcus citreus*, *Sporosarcina ureae*, *Sporosarcina halophila*, according to physiological-biochemical properties, PCR-assay and fatty acid cells profile definition.

Lactobacillus plantarum ONU315 strain, isolated from *Pleurotus ostreatus* fruiting bodies, produced lactic acid in 1,4 ± 0,2% by 15 hours, with acid accumulation 170,0 ± 4,2 ^{0}T and limit acidity – 300,0 ± 9,1 ^{0}T per 24 day and characterized by a high level antagonistic ativity to oyster mushroom resident microbiota. *L. plantarum* ONU315 does not demonstrate antagonistic activity to other lactic acid bacteria species and was used in oyster mushroom fruiting bodies fermentation biotechnology development.

The effectiveness of *Lactobacillus plantarum* ONU315 strain was demonstrated respectively to end product microbiological, biochemical and organoleptic properties.

L. plantarum ONU315 starter culture lyophilization technology was worked out. Obtained protective media on the base of a skim milk, sucrose, sodium citrate, lactose, maltose and gelatin provided 95,0% viability (2,0 ± 0,2·10^{10} CFU/g) and biochemical activity of lyophilized strain retaining during 6 month storage. *Lactobacillus plantarum* ONU315 ferment use provides lactobacilli complete dominance among end-product microbiota and process passage possibility in a wide range temperature. Optimized fermentation temperature is 25-40°C in the first day and 4°C – the next fourteen.

Developed *Pleurotus ostreatus* fruiting bodies fermentation biotechnology provided fermented product save and stable characteristics without sterilization and canning necessity along with a high physiological value and taste quality.