

TITLE: CHARACTERIZATION OF CONTAMINANTS BACTERIA STRAINS ISOLATED FROM INDUSTRIAL ALCOHOLIC FERMENTATION

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ABSTRACT:

Alcoholic fermentation in bioethanol industries is susceptible to contamination microorganisms. Among the contaminants, the group of lactic acid bacteria (LAB) is the most abundant. During the fermentation, the LAB is in constant interaction with the yeast strain of the *Saccharomyces cerevisiae* species, causing a decrease in fermentative yield. LAB is classified into three distinct groups as a result of their metabolism (obligatory homofermentative, obligatory heterofermentative and facultative heterofermentative) which interfere in a different way in the fermentation. In order to understand the mechanisms involved in this interaction, it is interesting to use isolated strains of the process. The present study aimed to characterize 2 strains (I3a and I4a) belonging to the strain bank of the Laboratory of Biochemistry and Technology of Yeasts (ESALQ / USP) isolated from the distillery of the State of São Paulo. The objective of the characterization was to identify the metabolism of the contaminants from the analysis of CO₂ and mannitol production and identification at the species level. The strains were inoculated in MBL liquid media containing basic nutrients for growth, as well as glucose and fructose as carbon sources. The experiment was conducted in glass tubes containing an inverted Durhan tube. The isolates were inoculated separately in triplicate and incubated for 24 hours at 32° C. After growth, the Durhan tubes were analyzed for the presence or absence of gas (CO₂). For the mannitol analyzes, 1 ml of the sample was collected and analyzed by liquid chromatography (Aminex HPX-87H BioRad ion exclusion column - Hercule, CA, USA). Species identification was performed from the amplification of the phenylalanyl tRNA region synthase alpha subunit via PCR and sequencing by the Sanger method from amplicons. The results of identification showed that I3a strain belonged to the species *Lactobacillus fermentum* and I4a strain belonged to the *Lactobacillus plantarum*. In addition, I3a produced CO₂ and mannitol while the I4a did not produce. It can be concluded that I3a strain present metabolism heterofermentative and the I4a strain present metabolism homofermentative.

Keywords: Fermentation, contamination, *Lactobacillus*, heterofermentative, homofermentative.

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