TITLE: SELECTION OF OLEAGINOUS YEAST STRAINS USING PURE GLYCEROL AS SUBSTRATE

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ABSTRACT:

Microbial lipids are alternative sources to vegetable oils, with applications in the food, cosmetic, pharmaceutical and biofuel industries. Yeast species are able of synthesizing and accumulating more than 20% of lipids from their biomass are considered oleaginous. The production of fatty acids by yeasts is attractive due to its ease of cultivation, ability to consume diverse low-cost raw materials, biomass production in bioreactors, efficiency for lipid accumulation and robustness in optimized processes. The objective of this work was to select new strains of oleaginous yeasts from the Culture Collection of Agricultural Microbiology (CCMA), at the Federal University of Lavras. Thirty yeast strains were evaluated from submerged cultivation in a medium containing 40g/L of pure glycerol. Cultures using inoculum of 10^8 cells/mL were incubated in an orbital shaker at 28ºC with stirring at 150 rpm, for 96 hours. At the end of cultivation, 100 mL samples were taken, the biomass was dried, weighed, and then lipid extraction was performed using the solvents chloroform and methanol. The lipid content was determined from the calculations: Lipid content (g/L) = weight of lipid in the bottle (g) - empty bottle weight (g) / grown sample volume (L), and lipid content (%) = lipid content (g/L) / cellular dry weight (g/L) x 100. The yeasts that showed the highest percentages of lipid accumulation were *Cryptococcus laurentii* (20%), *Cystofilobasidium ferigula* (41%), *Debaryomyces etchellsii* (28%), *Exophiala spinifera* (20%), *Rhodotorula dairenensis* (22%), *Rhodotorula mucilaginosa* (50%), *Torulaspora globosa* (31%), *Torulaspora maleeae* (70%), *Yarrowia lipolytica* (58%). The genera *Cryptococcus*, *Rhodotorula* and the species *Yarrowia lipolytica* are already described as oleaginous under cultivation in diversified substrates. The selected strains have a high potential for lipid accumulation, however, further studies must be carried out using different substrates and growing conditions to optimize lipid productivity and provide the construction of robust platforms for industries.

Keywords: fermentation processes, oleaginous yeasts, lipids, glycerol

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