

TITLE: GLYCEROL AS SUBSTRATE TO SINGLE CELL PROTEIN PRODUCTION BY YEASTS

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ABSTRACT:

Glycerol, a byproduct of biodiesel production, can be used as a carbon source in fermentation processes by yeasts for its bioconversion in several value-added products such as single cell protein (SCP). This work aimed to evaluate the SCP production by yeasts using glycerol as substrate. The yeasts *Aureobasidium pullulans* EBJ31, *Candida (Metschnikowia) pseudointermedia* CAC01, *Rhodotorula mucilaginosa* CCC31, *Wickerhamomyces anomalus* CCC32, *Trichosporon asahii*, isolated from different environmental samples, were cultured in 125 mL Erlenmeyer flasks containing 25 mL of modified YM medium (g/L): yeast extract 3.0, malt extract 3.0, peptone 5.0 and glycerol 20.0. The flasks were incubated in shaker at 150 rpm, pH 5.0, 30 °C during 96 h, being withdrawal samples each 24 h. Cellular growth was monitored by optic density (O.D.) at 600 nm. Crude protein concentration was determined by the phenol-hypochlorite method after digestion of the biomass in a mixture of 3.5 mL of concentrated H₂SO₄ and 3 mL of 30% H₂O₂ for 1.5 h in a digester block. The residual glycerol was determined by High Efficiency Liquid Chromatography (HPLC). The maximum O.D. was observed for *A. pulullans* EBJ31 (O.D. = 32.0), followed by the isolate *W. anomalus* CCC32 (O.D. = 31.5), *C. pseudointermedia* CAC01, *R. mucilaginosa* CCC31 and *T. asahii* EPB13 presented O.D. of 25.46, 21.11 and 9.8, respectively. *W. anomalus* CCC32 consumed all glycerol after 48 h of fermentation, *A. pulullans* EBJ31 consumed 17.7 g of glycerol/L (89%), *C. pseudointermedia* CAC01 consumed about 15.75 g of glycerol/L (79%) and *R. Mucilaginosa* CCC31 about 12 g of glycerol/L (60%) after 96 h. *T. asahii* EPB13 don't presented any glycerol consumption. *W. anomalus* CCC32 reached highest crude protein concentration in the dried biomass (55.0%), followed by *A. pulullans* EBJ31 (45.0%) and *R. mucilaginosa* CCC31 (41.7%). *T. asahii* EPB13 and *C. pseudointermedia* CAC01 presented 32.3% and 28.0% of crude protein in the biomass, respectively. Considering that *W. anomalus* CCC32 was the yeast with better substrate consumption and higher concentration of crude protein in the biomass, it is a promising microorganism for the single cellular protein (SCP) production using glycerol.

Key-words: Fungi, fermentation, microbial biomass

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