Title: PRODUCTION OF MYCELIUM OF *AGARICUS BISPORUS* (J.E. LANGE) IMBACH USING SOLID RESIDUE OF ORANGE JUICE

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Abstract:

Polysaccharides from basidiomycetes with many interesting biological functions have been studied. The efficiency in obtaining biomass is related to intrinsic and extrinsic variables to the bioprocess. Liquid fermentation has shown better production rates of mycelia in terms of time if compared to fruiting bodies production. Raw materials needed to the preparation of culture media are among the factors that increase process costs. The search for agro-industrial waste for the cultivation of these microorganisms is currently a way to add value making the production process more sustainable. The aim of this study was to analyze orange residues as a substrate for the production of *Agaricus bisporus* mycelium in liquid fermentation. For the experiments was employed a strain of *A. bisporus* deposited in Industrial Microbiology Microorganisms Collection of the University of Santa Cruz do Sul, kept in agar potato with monthly subcultures. *Citrus* sp. residues (oranges) were obtained from a local market. A pre-inoculum was prepared from three discs of 5 mm from fungal mycelium, maintained in a shaker at 120 rpm/28 ℃ for 7 days in a medium containing (g L^{-1}) glucose (40), yeast extract (3), peptone (3), KH_2PO_4 (0.5) and $MgSO_4$ (0.3). The culture media for fermentations were prepared adding the residue instead of glucose in two different formulations: (1) residue of orange flour at a concentration of 1.5% (w/v) and (2) residue of orange in natural state at a concentration of 20% (v/v). Fermentations were conducted in 250 ml flasks for 240 h in a shaker at 120 rpm/28 ℃. The production of mycelium and growth curve were measured every 48 h in dry weight. So far, *A. bisporus* behavior was similar in the two formulations analyzed. The maximum growth for residue of orange flour was achieved in 192 hours, with a dry biomass of 1.85 g L^{-1}. In the residue of orange in natural state, 2.25 g L^{-1} was the maximum of dry biomass achieved at 240 h. Considering the applicability of the process to obtain biomass, the liquid fermentation using residue in natural state proved to be most suitable in terms of yield. As this residue has about 40% of fermentable sugars, the next important stage of process control is to analyze the consumption of sugar by the microorganism for different variables optimized by response surface analysis.

Key-words: biomass, bioprocess, liquid fermentation, orange residue

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