Abstract

Background: Extracellular lipases are found in the culture broth when the fermentation is at the end of the exponential phase. Lipases can be induced easily since they are produced by the presence of oily sources or other materials as surfactants, fatty acids, some esters, glycerol and biliary salts. Objective: The aim of this work is to study the effect of carbon source concentration and the use of inductors on biomass production, and the lipolytic activity of a bacterium isolated from mature palm oil fruits.

Methods: The yield biomass/substrate was evaluated with glucose as carbon source at different concentrations (3, 5, 7, 10, 15 y 20 g/L) by dry weight and OD (600 nm). Lipolytic activity was evaluated by spectrophotometric assay using p-nitrofenilpalmitate at 37°C for 15 min. Results: Gram negative microorganisms with lipolytic activity isolated from palm fruit were identified as Pseudomonas aeruginosa. The growth of the bacteria was inhibited when glucose was used at concentrations greater than 5%. The production of lipase was induced by using three inducers (Palm oil, Tween 20 and palm oil:Tween 20 mixture), at three different induction times (0, 11 and 18 hours of fermentation). The highest activity (3,81 moles/ mL*min) was observed when the palm oil:Tween 20 mixture was added at 11 hours of fermentation. The kinetic of p-nitrophenylpalmitate hydrolysis using the supernatant of a culture induced with palmoil:Tween 20 mixture at 11 hours showed the production of p-nitrophenol beyond 300 minutes, with the greatest hydrolysis rate during the first 7 minutes. Conclusions: The growth of P. aeruginosa was not affected by using glucose as carbon source at concentrations of 3% and 5%. There was abasal level of lipase production without inducer, and greater lipolytic activity was achieved with the addition of inducers.

Keywords

Lipolytic activity, fatty acids, enzyme induction, hydrolysis.