Production of citric acid from cocoa juice waste

ABSTRACT

A study was conducted for production of citric acid using cocoa juice as a substrate. Two-staged fermentation protocol was carried out employing ten different microorganisms in shaken flasks at 200 rpm and room temperature. Five percent methanol was added to the screened cultures on the third day of fermentation to stimulate citric acid production. Of the ten screened microorganisms only Candida lipolytica ATCC 8661 and Aspergillus niger ATCC 10581 showed a pronounced production of citric acid. The fermentation was optimized for the two selected microorganisms to maximize citric acid yield. Maximum yield of citric acid (38.45 mg/ml) was obtained on using C. lipolytica ATCC 8661 growing at room temperature in 25% cocoa juice, 0.5% peptone and pH 6.5 for 9 days. However, A. niger ATCC 10581 produced 45.00 mg/ml at 30°C in 50°/O cocoa juice media supplemented with 0.5% peptone and pH 6.5 for 15 days incubation. Samples were withdrawn at intervals and the citric acid contents were analyzed using HPLC. Optimization of citric acid production using C. lipolytica and A. niger produced 51.33 and 56.21 mg/ml, respectively.

Keyword: Aspergillus niger ATCC 10581; Candida lipolytica ATCC 8661; Fermentation