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Research article

Citric Acid Fermentation by *Aspergillus niger*

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Abstract

From twenty soil samples collected, ninety six isolates were identified as *Aspergillus niger*. All *A. niger* isolates understudying were varied in their capability to produce citric acid on Czapek-Dox broth medium. Based on the productivity of citric acid in shake flask cultures after 3 days, the highest local *A. niger* MH368137, was selected for further experiments with the reference strain, *A. niger* EMCC132. The optimal time incubation for the maximum citric acid production reached statistically 5 days of fermentation. Through series of experiments were designed on various physicochemical fermentation parameters to establish the optimal conditions for citric acid overproduction, it could be summarized as: optimum temperature, 28˚C; initial pH 6.5; inoculums size 3.0×10^6 spores/ml; shaking culture (100rpm); maltose as a carbon source 40 g/L; peptone as a nitrogen source 3 g/L; Sodium phosphate as phosphorus source; 2% of methanol as enhancer. Through these environmental and nutritional parameters, citric acid production was clearly improved and gave 14 times higher that reached to 13.33 mg/1ml comparing to the original yields 0.907 mg/ ml by *Aspergillus niger* MH368137 (FQW). When local agricultural wastes and byproducts (pineapple peel, sugarcane bagasse, potato peels; sugarcane molasses and dates molasses) utilized for citric acid production, local strain *A. niger* MH368137 (FQW) produced highest amount of citric acid, reached up to 256.94 mg/ ml when grew on sugarcane molasses as a sole carbon source.