Microbial conversion of sugarcane juice to valuable biopolymers

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ABSTRACT

A high yield of levan production (22 g/L at 24 h; 22 g/L/d; 33.3 % by sucrose consumption) was obtained when the bacteria were cultured in medium containing sugarcane juice (containing 78 g/L of sucrose) at pH 6.5, temperature 37 ℃ and agitation speed 175 rpm. The fermentation broth was concentrated by ultrafiltration through a membrane of 5 kDa cutoff. The concentrate was harvested of levan by precipitation by addition of 4 vols. cold ethanol; the filtrate containing glucose was proven to be a suitable medium for ε-PL production by Streptomyces albulus when it was supplemented with yeast extract, (NH4)2SO4 and basal salts. 4.4 g/L of ε-PL accumulation was obtained in 72 h using two-stage fermentation with control of pH.

Keywords: sugarcane juice; levan; poly-ε-lysine; Bacillus subtilis natto; Streptomyces albulus; Biopol...