Isolation and Cellulase Characteristics for Bamboo Cellulolytic Microbes

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ABSTRACT

Results of the research showed that: (1) cellulolytic microbes strain ZQBC691 was isolated from bamboo shoots compost, can produce CMCase (endoglucanase) to hydrolyze carboxymethyl cellulose (CMC). Based on 16S rDNA sequence analysis, strain ZQBC691 was classified as Streptomyces griseoaurantiacus; (2) the optimal conditions in which the strain hydrolyzes CMC were initial pH of 5.3, the agitation rate is 150 rpm, culture temperature is 30 ℃ and CMC concentration is 15 g/L; (3) the strain showed higher hydrolytic ability for CMC and salicin, but lower degradation for avicel. Furthermore, it can hydrolyze bamboo fiber to produce glucose, lactic acid and acetic acid; (4) the optimal conditions for the strain ’ s CMCase activity are pH of 5 (37.38 IU/L) and 50 ℃ (34.13 IU/L); (5) the pretreatment conditions for dilute sulfuric acid of bamboo powder are as follows: the pretreatment temperature at 100℃ for 60 min with 0.2 M H2SO4; and (6) the conversion rate using commercial cellulase (from Trichoderma reesei) for bamboo fiber is higher than for bamboo powder.

Keywords : cellulolytic microbes ; CMCase ; carboxymethyl cellulose ; Streptomyces griseoaurantiacus ZQBC691 ; bamboo fiber

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