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Isolation and Characterization of CMCase from *Klebsiella* sp. ScYong-Seok Lee<sup>1</sup>, In-Hye Park<sup>1</sup>, Jie Chang<sup>1</sup>, M. Subhosh Chandra<sup>1</sup>,  
Keun-Ki Kim<sup>2</sup> and Yong-Lark Choi<sup>1</sup><sup>1</sup>Department of Biotechnology, College of Natural Resources and Life Science, Dong-a University, Busan 604-714, Korea<sup>2</sup>Division of Applied Life Science, Pusan National University, Miryang 627-706, Korea.

A CMCase-producing bacterium, *Klebsiella* sp. Sc, was isolated from Busan area's soil sample. This strain was identified on the basis of phylogenetic analysis of the 16S rDNA and *rpoB* (RNA polymerase B subunit) sequences. The gene encoding CMCase was cloned by genome library. The CMCase gene consisted of an open reading frame of 1,002 nucleotides and encodes 333 amino acids with a deduced molecular weight of 37,666 Da. The deduced amino acid sequence of the CMCase from *Klebsiella* sp. exhibits 95% identities and 97% positives to those from *Cellulomonas uda* and 58% identities and 72% positives to those from *Erwinia chrysanthemi*. The CMCase contain a conserved motif with the consensus sequence, ASDGDTLI AWALLRAQKQW. This result shows CMCase protein from *Klebsiella* sp. Sc belongs to glycoside hydrolase family 8, A-[ST]-D-[AG]-D-X(2)-[IM]-A-[SA]-[LIVM]-[LIVMG]-A-X(3)-[FW].

**Key words:** *Klebsiella* sp., CMCase, Glycosyl hydrolase family 8, Endoglucanase.

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Calcium Absorption and Growth Characteristics of *Agrocybe cylindracea* Mycelia in Submerged Culture

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The present study examined the effects of different Ca sources and concentrations on the growth and Ca absorption of *Agrocybe cylindracea* mycelia grown in submerged cultures. The dry weights of the mycelia were not significantly different (significance level of 5%) according to the type of Ca added, and increased with increasing Ca concentration until 500 mg/L, and then decreased at concentrations of 1000 mg/L or greater. The Ca contents of groups were significantly different according to the kind and concentration of the Ca source, in which the Ca content of the control group cultured without added Ca was 198.3 mg/kg, and in the treatment groups, Ca content increased to a minimum of 273.7 mg/kg (1.4 times) and a maximum of 67246.0 mg/kg (339.1 times); the Ca contents of the groups generally increased with increasing Ca concentration. According to the number of culture days, growth rates were highest during days 8 through 12, and remained relatively high until day 16. In addition, Ca contents per unit dry weight were higher in young mycelia having a shorter culture period than in mature mycelia having a longer culture period. According to pH, the most active growth and highest Ca content occurred in MCM liquid medium at pH 7.0. In conclusion, in order to produce *Agrocybe cylindracea* mycelia with high Ca content, it is considered most efficient to culture them in MCM liquid medium without a pH adjustment and containing 1000 mg/L of Ca-lactate, which is commonly used as a Ca additive in food, as well as to use mycelia between days 12-16 of culture.

**Key words:** *Agrocybe cylindracea*, calcium, mineral