

Identification of the Hypercellulytic *Trichoderma reesei* in Sheep's Rumen and Characterization of the Crude Carboxymethyl Cellulase

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Background & Objectives: Cellulose is one of the most common biopolymer in nature. Cellulolytic enzyme degrade cellulose by cleaving the glycosidic bonds. The cellulase enzyme complex consists of three types of enzymes that act synergistically in cellulose hydrolysis. Cellulases have diverse application in textile, paper, food and feed industry. These enzymes are increasingly used in the production of biofuel and single cell protein. Cellulases are relatively costly enzymes, and a significant reduction in cost will be important for their commercial use in different industry. Extensive research were done for economical production of cellulases. The simple way is to find the hypercellulytic microorganisms. Although, several microorganisms use cellulose as a carbon source, few of them have been screened for their cellulase production potential. Among these, microorganisms live in rumen of herbivorous animals are remarkable.

Methods: In this research cellulytic fungi isolated from sheep rumen, molecular identified and enzymatic activity of secreted endoglucanase of this isolate was done.

Results: Molecular identification revealed that, the isolate is belonged to *Trichoderma reesei*. Optimum temperature for growth of this fungus was 37 °C. Optimum protein content, substrate concentration, pH, temperature and incubation time was 700µg, 1.25% (w/v), 6, 500C and 60 minute, respectively. When carboxymethyl cellulose was used as substrate, Km and Vmax values of 3.32 (g/l) and 4.4 µmol glucose ml⁻¹ h⁻¹ for endoglucanase were obtained additionally specific activity was 1.1 µmol glucose ml⁻¹ h⁻¹.

Keywords: *Trichoderma Reesei*; Cellulase; CMC; Specific Activity; Km; Vmax