Endoglucanase from the thermophilic fungus *Scytalidium thermophilum*: purification and some biochemical properties

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Cellulose is the most abundant renewable carbon source in nature, and its hydrolysis is catalyzed by celulases. These enzymes are classified as endoglucanases, exoglucanases or ß-glicosidades and act synergistically on cellulose by different modes. They are applied in textile, paper and food industries. Currently, there is a great interest in the application of cellulases to the production of ethanol from lignocellulosic biomass. In this work, we report the purification and some biochemical properties of an endoglucanase produced by *Scytalidium thermophilum*. The purification involved precipitation with $(NH_4)_2SO_4$ followed by chromatography on a CM-Fractogel column, resulting in three separated peaks. One of them was considered pure after analyses in PAGE and SDS-PAGE. This purified enzyme exhibited apparent molecular masses of 47 kDa and 44 kDa, estimated by SDS-PAGE and gel filtration, respectively. Optima of temperature and pH were 60°C and 4.5, respectively. Ions Hg^{2+}, Fe^{2+} and Cu^{2+} exerted strong inhibitory effect on enzyme activity. The enzyme presented half-lives of 23 min at 60°C and 46 min at 70 °C, in the absence and presence of 1% CMC, respectively. The highest specificity of the purified cellulase was for CMC, confirming its endo- hydrolytic character, and the values of K_M and V_{Max} for CMC were 0.473% (w/v) and 96.34 U/mg protein, respectively. Crude filtrate from *Scytalidium* grown in avicel showed a high level of endoglucanase activity, hydrolyzing 85% of CMC after incubation at 55ºC for 96 hours. Interestingly, endoglucanase activity was only slightly affected by the presence of glucose or cellobiose in the reaction medium. These findings suggest that this *Scytalidium* endoglucanase has a potential for biotechnological applications in cellulose saccharification processes.

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