Characterization of a Novel Membrane Bound Xylanase from Bacillus thermoamylovorans MG73

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ABSTRACT

In this thesis, a novel thermostable xylanase was isolated from a xylan-utilizing bacterial strain Bacillus thermoamylovorans MG73 and characterized. Unlike other bacillus strain that secrete the xylanase out to the living environment, the xylanase found in this thesis is a membrane-bound xylanase. In order to understand the approximate molecular weight of the xylanase, zymogram analysis was applied and the molecular weight of this novel xylanase was found to be around 60 Kda. To further characterize the novel xylanase, this thesis also tried to determine the influences of temperature, pH, thermostability and ions concentration on the enzyme activity. The optimal temperature of the enzyme is 100 ° C, where the optimal working pH is pH10. For enzyme stability, the enzyme activity can remain over 80% after two hours in 100 ° C. Ions are very important for the novel xylanase, especially Mn2+ and Ni2+, however, higher ion concentrations will reduce the xylanase activity. In conclusion, this thesis revealed a novel membrane bound thermostable xylanase, as the first Gram positive membrane bound xylanase ever reported.

Keywords : xylanase, Bacillus thermoamylovorans, membrane bound, zymogram

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