Expression, Enzymatic Characterization, and High-Level Production of Glucose Isomerase from *Actinoplanes missouriensis* CICIM B0118(A) in *Escherichia coli*

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High-level production of recombinant glucose isomerase (rGI) is desirable for lactulose synthesis. In this study, the *xylA* gene encoding glucose isomerase from *Actinoplanes missouriensis* CICIM B0118(A) was cloned and expressed in *E. coli* BL21(DE3), and high-level production was performed by optimization of the medium composition. rGI was purified from a recombinant *E. coli* BL21(DE3) and characterized. The optimum pH value of the purified enzyme was 8.0 and it was relatively stable within the pH range of 7.0–9.0. Its optimum temperature was around 85 °C, and it exhibited good thermostability when the temperature was lower than 90 °C. The maximum enzyme activity required the presence of both Co^{2+} and Mg^{2+}, at the concentrations of 200 μM and 8 mM, respectively. With high-level expression and the simple one-step chromatographic purification of the His-tagged recombinant enzyme, this GI could be used in industrial production of lactulose as a potential economic tool.

Key words: D-Glucose Isomerase, Medium Optimization, Enzymatic Characterization