

PRODUCTION OF GLUCOSE ISOMERASE FROM SOIL BACTERIAL ISOLATES

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BACKGROUND/OBJECTIVES: The enzymatic isomerization of glucose into fructose by glucose isomerase (GI) is a crucial step in producing high fructose corn syrup, a precursor of valuable bio-based chemicals and materials synthesis. This study was performed with the objective of microbial strain selection and optimization of fermentation conditions for fructose production.

METHOD: *Bacillus* sp, *Hymenobacter* sp, *Paenathrobacter* sp, *Mycobacterium* sp, *Chryseobacterium* sp and *Stenotrophomonas* sp were isolated from soil samples in Kingfisher Lake and the University of Manitoba campus. These isolates were screened for their ability to produce GI. The GI production was optimized by varying some parameters such as pH, temperature, incubation period, nitrogen, and carbon sources.

RESULTS: All isolates exhibited maximum GI activity at 40°C. Optimum pH for the GI production by *Paenathrobacter* sp (Figure 1), *Chryseobacterium* sp, and *Bacillus* sp occurred at pH 8 while *Hymenobacter* sp, *Mycobacterium* sp, and *Stenotrophomonas* sp was at pH 6. Xylose and a mixture of peptone and yeast extract boosted enzyme activity.

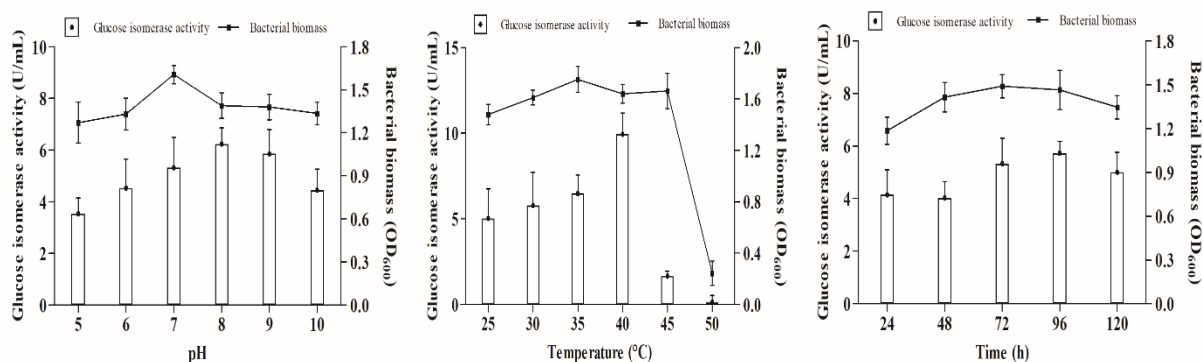


Figure 1. Effect of pH, temperature, and incubation time on the glucose isomerase production by *Paenathrobacter* sp.

CONCLUSION/IMPLICATION: These isolates could be promising bacteria for biomass conversion into useful compounds. The co-culturing of bacteria and enzyme immobilization for maceration, liquefaction, extraction and clarification processes are being studied.