

# Effect of Selected Polyols And Salts on Stability of Xylanase Produced By *Bacillus pumilus*

Subajini Mahilrajan, Sandrasegarampillai Balakumar and Vasanthy Arasaratnam

Department of Biochemistry, Faculty of Medicine, University of Jaffna, Sri Lanka

jsubajini@gmail.com

## ABSTRACT

The objective of this study is to improve the stability of an alkaline xylanase with selected polyols and salts, which was produced by a locally isolated alkalo-thermophilic *Bacillus pumilus*. Xylanases with higher stability are used for the application in paper and pulp industry for bio bleaching. In the absences of additives at 55°C, the xylanase retained 38(±1.0)% of its initial activity at 30min and retained 45.6 (±0.76) and 20.6(±0.84)% of its initial activity at pH 8.0 and 9.0 respectively. Xylanase which contained polyols such as 10mM Poly Ethylene Glycol (PEG)-8000, 1M glycerol and 2M sorbitol the enzyme retained 24.0(±0.34), 19.0(±0.84) and 53.8(±0.57)% of its initial activity respectively at 60min. Addition of 10mM NaCl lost all of its activity while the enzyme retained

88.4(±0.18)% of its initial activity in the presence of 10mM CaCl<sub>2</sub>. Sorbitol and CaCl<sub>2</sub> were the best additives among the polyols and salts respectively. CaCl<sub>2</sub> and sorbitol of different concentrations were studied and the halflives of the xylanase in presences of 10mM CaCl<sub>2</sub> and 2M sorbitol were 302 and 63min respectively. When both 10mM CaCl<sub>2</sub> and 2M sorbitol were used together, the enzyme retained more (95%) of its initial activity at 60min than that in presence of 10mM CaCl<sub>2</sub> (88%) and 2M sorbitol (53%) individually. At 55°C half-life of the xylanase in presence of CaCl<sub>2</sub>, sorbitol and CaCl<sub>2</sub> & sorbitol were 18, 47 and 552min respectively. The enzyme contained both CaCl<sub>2</sub> & sorbitol helped to retain 95, 88 and 18% of the initial activity at 55, 60 and 65°C respectively; while at 70°C it lost all of its activity at 120min. Xylanase from *B.pumilus* was stable at 60°C for 2h with both CaCl<sub>2</sub> & sorbitol.

**Key words:** Half-life, Polyols, Stability, Salts, Xylanase