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**Thermal stability of xylanase produced by *Bacillus pumilus***

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The aim of this study is to improve the stability of an alkaline xylanase produced by a locally isolated alkalo-thermophilic *Bacillus pumilus*. At 55°C, the xylanase retained 38(±1.0) % of its initial activity at 30 min without additives and it retained 45.6 and 20.6% of its initial activity at pH 8.0 and 9.0 respectively. In presence of 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 helped the enzyme to retain 35.0(±0.74) % of its initial activity at 30 min and the enzyme lost all of its activity at 60 min. The enzyme retained 85.3(±0.18) and 88.4(±0.18) % of its initial activity at 120 and 60 min respectively in presence of 10mM CaCl<sub>2</sub>. Half lives of the xylanase in presences of 10mM CaCl<sub>2</sub> and 2M sorbitol were 302 and 63 min respectively.

When both 10mM CaCl<sub>2</sub> and 2M sorbitol were used together, the enzyme retained more (95%) of its initial activity at 60 min than that in presence of 10mM CaCl<sub>2</sub> (88 %) and 2M sorbitol (53 %) individually. Half life of the xylanase at 55°C in presence of 10mM CaCl<sub>2</sub>, 2M sorbitol and 10mM CaCl<sub>2</sub> & 2M sorbitol were 18, 47 and 552 min respectively. Addition of 10mM CaCl<sub>2</sub> & 2M sorbitol to the enzyme, helped the enzyme to retain 95, 88, 18 and 0 % of the initial activity of the xylanase at 55, 60, 65 and 70°C respectively at 120min, while at 70°C it lost all of its activity at 120 min. Xylanase from *B.pumilus* was stable at 60°C for 2h with both 10mM CaCl<sub>2</sub> & 2M sorbitol. Xylanase retained 93, 64% of the initial activity at 10 days when stored at -4 and 30°C respectively.

**Key words:** Polyols, Stability, Salts, stability, Xylanase