

Kinetic Properties of the α -Amylases Produced By the Locally Isolated Bacterial Strains

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α -Amylases have had many commercial applications for several decades. These enzymes are used in textile, paper industries, starch liquefaction, food, adhesives, and sugar production. Due to the industrial importance of α -amylases there is ongoing interest in the kinetic studies of new bacterial strains. The present study deals with the kinetic properties of α -amylases from locally isolated bacterial strains, named S₁, S₂ and S₃. α -Amylases from the strains S₁, S₂ and S₃ showed zero order kinetics for 5.0, 4.0 and 4.0 minutes respectively. When the activities of the enzymes were measured at pH 7.0 and different temperatures ranging from 30- 95°C, enzymes produced by the strain S₂ and S₃ gave highest activities at 80°C and that from the strain S₁ gave the highest activity at 90°C. When the activity of the α -amylases were measured at different pH values ranging from 6.0 – 10.0, the enzymes produced by the strains S₂ and S₃ gave the highest activity at pH 7.0 and 80°C and that from the strain S₁ gave the highest activity at pH 7.0 and 90°C. Michaelis constants (K_m) of the enzymes from the strains S₁, S₂ and S₃ to soluble starch were 2.8, 3.8 and 6.0 gL⁻¹ respectively at the respective optimum conditions of the enzymes. When thermal stability of the enzymes were studied without additives, the enzyme produced by the strains S₁, S₂ and S₃ showed 37.6, 33.5 and 35.5% of their initial activities respectively at 30 min and 90°C, and 68.75, 63.19 and 60.14% of their initial activities at 80°C and pH 7.0. Half lives of enzymes from the strain S₁ was 21 minutes at 90°C and pH 7.0 and those from the strains S₂ and S₃ were 51 and 42 minutes respectively at 80°C and pH 7.0.

Key words: α -Amylase, thermostable, pH optimum, temperature optimum and half life.