

Isolasi Identifikasi Bakteri Penghasil Xylanase serta Karakteristik Enzimnya

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Abstrak

Isolation and Identification of Xylanase Producing Bacteria and Characterization of Its Enzyme Properties. Nur Richana, Tun T. Irawadi, Anwar Nur, and Khaswar Syamsu. Xylanase is an extracellular enzyme produced by microorganisms. This enzyme is able to hydrolyse xylane (hemicellulose) to produce xylooligosaccharide and xylose. Thermoalkaliphilic xylanase is an agent that can be used as a substitute in the pulp whitening process instead of chlorine. A study was done to isolate, identify bacteria and characterize xylanase. The isolation of xylanase producing bacteria has been done from soil and waste of starch industry. Colonies which produced clearing zone were presumed as xylanolytic bacteria and chosen for further screening. Identification of potential isolate in xylanase production was done using 16S ribosomal RNA sequencing. Isolate *Bacillus pumilus* RXA-III5 originated from lime or alkaline soil was more potential isolate in xylanase production than other 24 isolates. Precipitation of xylanase, that was done using ammonium sulphate followed by dialysis produced xylanase of a higher specific activity (267.1 U.mg⁻¹) than that using acetone (131.1 U.mg⁻¹) and ethanol (186.65 U.mg⁻¹). Xylanase was done at purification produced three fractions of xylanase. Xylanase characteristics consist of pH and temperature (9 and 50°C), K_m and V_{max} value 6 mg.ml⁻¹ and 0.2 mol.minute⁻¹, respectively. The Fe²⁺ was the strongest activator and Mg²⁺ was the strongest inhibitor activity. This enzyme was detected as a cellulose-free xylanase. Xylanase is a prospective agent for bio-bleaching of paper.