Thesis Title	Localization and Induction of Xylanolytic Enzymes in *Bacillus* sp. K-1
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Abstract

Bacillus sp. K-1 produced xylanolytic enzymes in 3 parts when grown in xylan containing medium. Extracellular enzyme composed of xylanase, β-xylosidase, arabino-furanosidase and acetyl esterase. Xylanase is found in residual xylan. The enzyme activity of this 2 parts reached to maximum after 3 days incubation. Intracellular enzyme composed of β-xylosidase and arabinofuranosidase. The enzyme activity reached to maximum after 1 day incubation. Extracellular β-xylosidase was induced by xylose and xylan. While arabinofuranosidase was induced by arabinose and xylan. Acetyl esterase and xylanase produced when grown in all carbon sources tested and high xylanase activity was found when grown in xylan containing medium. When analyzed extracellular enzyme by SDS-PAGE and active-PAGE, the molecular weights of extracellular xylanase were estimated to be 23 and 45 kDa. In residual xylan, there were 2 types of protein which could be xylanase at least one type. The properties of extracellular enzyme without bound xylanase (low molecular weight xylanase) were studied. The optimum pH and temperature of high molecular weight xylanase were 6.0 and 70 ^{o}C, respectively. Its stability were pH 7-11 and temperature 25-37^{o}C, respectively. Other extracellular enzymes, the optimum pH and temperature of β-xylosidase were 8.0 and 60 ^{o}C, respectively. Its stability were pH 5-7 and temperature 25-37 ^{o}C, respectively. The optimum pH and temperature of arabinofuranosidase were 8.0 and 70 ^{o}C, respectively. Its stability were pH 6-10 and temperature 25-55 ^{o}C, respectively. Hg^{2+}, Co^{2+} and Mn^{2+} greatly inhibited high molecular weight xylanase

activities. Extracellular enzyme hydrolyzed rice straw, corn hull, bagasse with greater activity on birchwood xylan. The low molecular weight xylanase had an importance role in hydrolysis of insoluble xylan.

Keywords : Localization of xylanolytic enzymes/ Induction of xylanolytic enzymes/ *Bacillus* sp. K-1