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SUMALEE UNGCHAITHUM : XYLANASE AND *B*-XYLOSIDASE FROM THERMOPHILIC AND ALKALOPHILIC *Streptomyces* spp. THESIS ADVISOR : ASSOC. PROF. PAIROH PINPHANICHAKARN , Ph.D. 108 pp. ISBN 974-636-113-9

Among 375 strains of *Streptomyces* spp. isolated from Thai soil at pH 9 and 45^{0}C, *Streptomyces* sp. PC 22 and *Streptomyces* sp. CH 7 showed highest ability to produce xylanase and *B*-xylosidase, respectively. Maximum xylanase activity of 14.68 units/ml was obtained when *Streptomyces* sp. PC 22 was cultured for 2 days at pH 9, 45^{0}C in a medium containing 1% (w/v) xylan as a C-source and 0.5 % (w/v) each of polypeptone and cornsteep liquor as N-source:Maximum *B*-xylosidase activity of about 0.90 unit/mg of protein was obtained from *Streptomyces* sp. CH 7 when grown for 1 day at pH 7, 40^{0}C in a medium having similar compositions as that for *Streptomyces* sp. PC 22.

Replacements of xylan with low-cost xylan containing material and of polypeptone and cornsteep liquor with soybean hydrolysate (SBH) were investigated. Cultivation of *Streptomyces* sp. PC 22 under the above conditions in a medium containing 2.5 % (w/v) NaOH-treated cottonseed hulls, 0.2 % (w/v) xylan, 0.5 % (w/v) SBH with N-content of 0.45 % yielded maximum xylanase activity of 10.82 units/ml , while , *B*-xylosidase activity of 0.80 unit/mg of protein was produced from *Streptomyces* sp. CH 7 when cultivated for 3 days at pH 7, 40^{0}C in a medium containing 3.0 % (w/v) NaOH-treated cottonseed hulls, 0.3 % (w/v) xylan, 0.5 % (w/v) SBH with N-content of 0.45 % (w/w) , 0.1 % polypeptone and 0.2% (w/v) cornsteep liquor.

Preliminary study on properties of the xylanase and *B*-xylosidase revealed that optimum temperature for xylanase was around 50-70^{0}C and optimum pH was 5.5 to 7.0 while those of *B*-xylosidase were 55^{0}C and 6.5, respectively. Xylanase was stable to temperature up to 60^{0}C while that of *B*-xylosidase was up to 55^{0}C for 30 minutes. Both enzymes were stable to broad pH range of about 4.0-9.5. Xylanase and *B*-xylosidase were almost completely lost their activites when preincubated at 75^{0}C and 65^{0}C for 30 minutes, respectively.

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