Chutinun Sirisuntornsakul 2014: Screening and Optimization for Xylanase Production by Thermophilic Actinomycete from Paper Industry. Master of Science (Biotechnology), Major Field: Biotechnology, Department of Biotechnology. Thesis Advisor: Associate Professor Mangkorn Rodprapakorn, Ph.D. 91 pages.

Twenty six isolates of actinomycetes were screened from paper industry wastewater of Ratchaburi Province. Berg's medium was used in isolation contained 0.5% xylan as carbon source at pH 7.2 and 50°C for primary screening. The result showed positive clear zone of all 26 isolates after incubated for 3 days. Determination of morphological characteristics revealed that 26 isolates were assigned to 7 groups based on their color of spore mass, substrate mycelium and ability to produce soluble pigment on ISP2 and ISP3. Among them, isolate 901 showed the highest xylanase activity up to 18.46 unit/ml when cultivated in ISP2 with 0.5% xylan as carbon source (pH 7.2, 50°C) at 5 days of incubation. Molecular identification base on 16S rDNA gene sequence revealed that the isolate 901 shared 100% similarity with *Streptomyces mexicanus*. In cultivation also proved that the maximum of xylanase activity (24.56 unit/ml) was observed at the death phase. The effect of agricultural wastes as carbon source and nitrogen source on xylanase production were investigated. The result show corn cob gave high xylanase production (23.10 unit/ml) and found that 2.0% corn cob was verified to be suitable carbon source for xylanase production (28.14 unit/ml). The result also showed soy bean was the most effective nitrogen source which 1.6% soy bean meal provides highest xylanase activity at 28.48 unit/ml. The characterization of xylanase was determined. The result showed optimum pH and temperature for xylanase activity at pH 5.5 and 70°C, respectively. In addition, xylanase was stable in acid range at pH 3.0-5.0 and could tolerate in wide temperature range at 30-70°C.

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