Saoraya Sookkasem 2014: Isolation and Screening of Terephthalic Acid (TA)-Degrading Microorganisms from Textile Industry. Master of Science (Biotechnology), Major Field: Biotechnology, Department of Biotechnology. Thesis Advisor: Associate Professor Werasit Sanpamongkolchai, D.Agr. 138 pages.

Polyester is an durable synthetic fiber and most widely use in textile industry. Caustic treatment was used to improve the appearance and texture of polyester filament. During wastewater treatment process, Terephthalic Acid (TA) was precipitated and affected to environmental pollution . Basically TA treatment was carried out by incineration or landfill which caused air pollution and been costly. At present base on the ability of microorganisms, biodegradation could be applied for pollutant degradation. The isolation and screening of TA-degradation microorganism from soil and sludge waste water treatment, were carried out by using nondefined medium containing 0.1% TA as carbon source. The result showed that three isolates of TA degrading microorganisms , G5, P5 and S2 were isolated from landfill, sludge and textile industry's soil sample respectively. TA degrading activity and cell growth were investigated. The result showed that 3 isolates could use TA 1.0 (%w/v) as substrate for cell growth in the range of pH 6.0 to 9.0 and 30 °C to 45 °C. TA degradation activity was highest in the medium containing yeast extract 0.04 (%w/v). The activity was stimulated more by mixing 3 isolates together in 2 l minijar fermenter at 37 °C, 200 rpm agitation and aeration at 1.0 vvm. The result showed that mixed cultures could grow and degrade TA at concentration of 1.0% (w/v) during 60 hr at a level of 97.62% . Based on morphological study and 16sRNA sequence data, isolate G5 and S2 were classified as *Rhodococcus pyridinivorans* (99.8 and 99.2 % similarity, respectively) and isolate P5 as *Rhodococcus rhodochrous* (99.6 % similarity).

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