

**Endah Prayekti, 2012, Bioaugmentation Effectiveness in Bioremediation of Oil Sludge Waste, THESIS, It was under guidance of Dr. Ni'matuzahroh and Dr. Ir. Tini Surtiningsih, DEA., Biology Departement, Science and Technology Faculty, Airlangga University, Surabaya.**

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## ABSTRACT

*The purposes of this research are to determine heavy metal resistency of the exogenous bacteria, the effectiveness of consortium using for degradation, and the effectiveness of bioaugmentation with reinoculation to oil sludge degradation. Research were conducted by comparing degraation efectivity between indigenou and exogenous concortia. Indigenous bacteria were isolated from tested oil sludge. Exogenous bacteria's are collection of Microbiology Labororatory of Sains and Technology Faculty, Airlangga University. The exogenous bacteria's were being tested for their resistency to heavy metals in which oil sludge posses as co-contaminan. Resistency test to heavy metals were performed using liquid culture (10%v/v,  $OD_{610} = 0,1$ ) using MHB added with heavy metal, which is Hg (0,5 ppm, 1ppm and 5 ppm), Pb (10 ppm, 50 ppm, and 100 ppm), and Zn (50 ppm, 100 ppm, and 150 ppm), incubated in shaker with agitation speed of 100 rpm for 7 day in room temperature. Consortia effectivness test were performed using liquid culture (10%v/v,  $OD_{610} = 0,5$ ) using AMS containing oil sludge (1% w/v) with incubation condition in shaker at agitaion speed of 150 rpm in room temperature for 7 day. Bioaugmentation test were conducted as same as concortia effectivness test. Incubation were performed in shaker at agitation speed of 150 rpm in room temperature for 10 days. Results of this research were bacteria cell count from heavy metals resistency test analyzed using statistic, and bacteria cell count, Total Petroleum Hydrocarbon (TPH), and GC-MS profil from oil residu from degradation test analyzed descriptively. The exogenous bacteria's show resistency to a heavy metal and it's consortia gives a better degradation to oil sludge (42,2%) camparing to indigenous consortia (36,7%). GC-MS result shows that exogenous consortia with reinocultion treatment gives 70 % degradation of oil sludge. Aliphatic and aromatic component that been degrade was 65,06 % for aliphatic and 83,27% aromatic.*

*Key Words : Bioaugmentation, oil sludge, heavy metal, degradation*