Inayah Fitri, 2015, Pengaruh Jenis Sumber Nitrogen, Konsorsium Bakteri Dan Waktu Inkubasi Pada Bioremediasi Tanah Tercemar Limbah Lumpur Minyak Dengan Metode *Composting*, TESIS, dibawah bimibingan Dr. Ni'matuzahroh dan Prof. Dr. Ir. Tini Surtiningsih, DEA., Departemen Biologi Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui (1) pengaruh penambahan jenis sumber nitrogen, konsorsium bakteri, waktu inkubasi, dan interaksi antara jenis sumber nitrogen, konsorsium bakteri, waktu inkubasi terhadap jumlah total bakteri (CFU/g-tanah) dan kadar residu (g/g tanah) dalam bioremediasi tanah tercemar *oil sludge* (2) kadar rasio C/N dalam bioremediasi tanah tercemar *oil sludge* pada minggu ke-6 (3) komponen hidrokarbon yang terdegradasi pada perlakuan terbaik di minggu ke-6. Penelitian ini disusun dengan rancangan acak lengkap dengan dua kali ulangan. Perlakuan terdiri dari dua faktor. Faktor pertama adalah jenis sumber nitrogen yaitu tanpa penambahan (Kontrol/K), penambahan NPK (N), penambahan *Azotobacter* (A), penambahan NPK dan *Azotobacter* (NA). Faktor kedua adalah waktu inkubasi meliputi minggu ke 0, 2, 4, dan 6. Data hasil rasio C/N dan pengamatan komponen hidrokarbon yang hilang pada perlakuan terbaik setelah dilakukan GC-MS dianalisis secara deskriptif. Log TPC bakteri dan kadar residu dianalisis menggunakan uji *Kolmogorov – Smirnov Test* dan *Homogeneity of Variances Test* dilanjut dengan uji *Brown – Forsythe* dan uji *Games howell.* Hasil penelitian ini menunjukkan bahwa: (1) penambahan jenis sumber nitrogen, konsorsium bakteri, waktu inkubasi, dan interaksi antara jenis sumber nitrogen, konsorsium bakteri, waktu inkubasi berpengaruh terhadap jumlah total bakteri (CFU/g-tanah) dan kadar residu (g/g tanah) dalam bioremediasi tanah tercemar *oil sludge* (2) rasio C/N tertinggi pada perlakuan bernilai 107 sedangkan terendah bernilai 52 di minggu ke-6 dan (3) komponen hidrokarbon yang terdegradasi pada perlakuan terbaik di minggu ke-6 ialah *1,6-dimethyl-Naphthalene; 2,3,6-trimethyl-Naphthalene; 1,6,7-trimethyl-Naphthalene;* dan *Dioxide 4-hexylthiane.*

Kata kunci: jenis sumber nitrogen, konsorsium bakteri, rasio C/N, kadar residu.

Inayah Fitri, 2015, The Effect of Nitrogen Source Type, Consortium Bacteria and Incubation Time in Bioremediation of Contaminated Soil with Composting Methods, TESIS, This study was guided by Dr. Ni'matuzahroh and Prof. Dr. Ir. Tini Surtiningsih, DEA., Departement of Biology, Faculty of Science and Technology, Airlangga University, Surabaya.

ABSTRACT

The purpose of this research are to: (1) knowing the effect of addition a nitrogen source, a consortium of bacteria, incubation time and the interaction between the types of sources of nitrogen, bacteria consortium, the time of incubation of the total number of bacteria (CFU/g-soil) and residue levels (g/g soil) in bioremediation of soil contaminated with oil sludge (2) knowing about of C/N ratio in bioremediation soil contaminated with oil sludge at sixth week (3) determine of hydrocarbon component is missing on te best treatment at sixth week. This study was prepared by completely randomized design with two replications. The treatment consists of two factors. The first factor is the type that is without addition of a nitrogen source (Control/K), addition of NPK (N), addition of *Azotobacter* (A), addition of NPK and Azotobacter (NA). The second factor is incubation period includes weeks 0, 2, 4, and 6. C/N ratio and observations hydrocarbon component is missing on the best treatment after GC-MS were analyzed descriptively. Log TPC bacteria and residue levels were analyzed using Kolmogorov - Smirnov Test and Homogenity of Variance Test continued to Brown - Forsythe test and Games howell test. On the results of residue analysis is a 2-way ANOVA followed by Kolmogorov - Smirnov Test continued with the test Kruskall - Wallis and Mann-Whitney test. The results showed that: (1) addition of a nitrogen source, a consortium of bacteria, incubation time, and the interaction between the type of nitrogen source, a consortium of bacteria, incubation time affect the total number of bacteria (CFU/g-soil) and residue levels (g/g soil) in bioremediation of soil contaminated with oil sludge (2) C/N ratio the highest the treatment is 107 while the lowest is 52 in sixth week and (3) a hydrocarbon component is degradation on the best treatment at sixth week is *1,6-dimethyl-Naphthalene; 2,3,6-trimethyl-Naphthalene; 1,6,7-trimethyl-Naphthalene;* dan *Dioxide 4-hexylthiane*.

Key words: nitrogen source types, bacterial consortium, C/N ratio, residue levels.