ISOLATION AND CHARACTERIZATION OF INSECTICIDE (CARBARYL) DEGRADING BACTERIA FROM SOIL

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FAKULTI SAINS DAN TEKNOLOGI
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PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:
Isolation and Characterization of Insecticide (Carbaryl) Degrading Bacteria From Soil.
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telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains (Sains Biologi), Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitled Isolation and Characterization of Insecticide (Carbaryl) Degrading Bacteria from Soil is the result of my own research except as cited in the references.

Signature : .....

Name : MOHD HASRI B. BAKRI

Matrix No. : UK 12347

Date : 12/05/2008

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ABSTRACT

Microbes in the soil can be used to detoxify and breakdown the pesticides in the environment. This study was carried out to isolate and characterize Carbaryl - degrading bacteria from soil sample. The sampling was conducted at the tobacco farm at Merang, Terengganu. In order to isolate the bacteria species, serial dilution technique and spread plate onto nutrient agar method were done. As a result, two bacterial isolates have been selected for further study due to its ability to degrade Carbaryl in Minimal Salt Medium containing Carbaryl as carbon and nitrogen sources. The degradation of Carbaryl by both isolates was determined using spectrophotometer (OD600nm) and bacterial colony count methods. These two isolated bacteria were named as Isolate 1 (Gram negative-rod species) and Isolate 2 (Gram negative-diplococci species). From the result, Isolate 1 more rapidly to degrade Carbaryl than Isolate 2 within 6 days.Based on biochemical tests and BBL Crystal Identification Kit test, Isolates 1 was identified as *Enterobacter sakazaki*. These isolates can be manipulated further to produce potential pesticide-degrader to meet the industrial needs.

ABSTRAK

Mikrob di dalam tanah boleh digunakan untuk menyahtoksik dan mengurai racun perosak di dalam persekitaran. Kajian ini dijalankan bertujuan memencil dan mencirikan bacteria yang menguraikan Carbaryl daripada sampel tanah yang diambil. Pensampelan ini dilakukan di ladang tembakau di Merang, Terengganu.Untuk memencil bakteria, kaedah pencairan bersiri dan plat sebaran dilakukan. Hasilnya, dua isolat bakteria berjaya diambil untuk kajian seterusnya kerana berupaya menguraikan Carbaryl di dalam Medium Garam Minima dengan Carbaryl sebagai sumber utama karbon dan nitrogen. Penguraian carbaryl diperhati menggunakan spectrophotometer (OD 600nm) dan kaedah pengiraan koloni bakteria. Kedua-dua isolat bakteria ini dinamakan Isolat 1 (gram negatif –berbentuk rod) dan Isolat 2 (gram negatif- diplococci).Hasil daripda kajian, didapati Isolat 1 lebih cepat mengurai carbaryl berbanding Isolat 2 dalam masa enam hari. Berdasarkan uji biokimia dan Kit Pengenalan Kristal BBL , Isolat 1 dikenal pasti sebagai *Enterobacter sakazaki*. Isolat-isolat ini boleh dimanipulasi seterusnya untuk menghasilkan pengurai racun perosak yang berpotensi untuk memenuhi keperluan industri.