ANTIBACTERIAL ACTIVITY OF ACTINOMYCETES ISOLATED FROM MARINE RESOURCES

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FAKULTI SAINS DAN TEKNOLOGI
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ANTIBACTERIAL ACTIVITY OF ACTINOMYCETES ISOLATED FROM MARINE RESOURCES

By
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PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **ANTIBACTERIAL ACTIVITY OF ACTINOMYCETES ISOLATED FROM MARINE RESOURCES** oleh **SITI NOORSHAHIDA BINTI JOHARI**, No. matrik: **UK12112** 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 Antibacterial activity of actinomycetes isolated from marine resources is the result of my own research except as cited in the references.

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ABSTRAK

Antibakteria adalah penting dalam rawatan penyakit dan bernilai di seluruh dunia. Kajian ini bertujuan untuk mencari antibiotik yang baru dari aktinomiset marin untuk industri perubatan. Matlamat kajian adalah untuk menyaring aktiviti antibakteria dari aktinomiset marin dan pengkelasan bakteria hingga ke peringkat genus berdasarkan morfologi koloni dan pembentukan spora. Teknik pembauran cakera agar modifikasi digunakan untuk penyaringan aktiviti antibakteria terhadap enam target bakteria dan yis. Sampel bakteria di kultur pada agar kentang (PDA) dan dieramkan selama 2-6 minggu. Daripada 30 aktinomiset, 12 daripadanya atau 40% memberikan keputusan positif bagi penyaringan antibakteria. Ini disebabkan penghasilan bahan antibiotik yang dirembeskan oleh bakteria. Sampel yang berlabel Laut Bidong 25°C W 6.1.2 memberikan diameter zon perencatan yang paling besar terhadap *Bacillus subtilis* (16mm), *Aeromonas hydrophilla* (12mm) and *Streptococcus agalactiae* (8mm). Tiga daripada tujuh target bakteria tidak menunjukkan sebarang aktiviti. Zon perencatan yang dihasilkan diukur dalam unit millimeter dan dibandingkan dengan antibiotik komersial gentamisin 10µg. Kaedah sisip kaca digunakan untuk pengkelasan bakteria hingga peringkat genus. Bakteria dikultur pada PDA selama 1-2 minggu dan sisip kaca yang steril diletakkan pada sudut 45°. Ini untuk membenarkan aerial miselium bakteria merebak pada sisip kaca. Sisip kaca ini diperhatikan dibawah mikroskop pada pembesaran 100×. Untuk kaedah sisip kaca sampel aktinomiset dikelaskan hingga peringkat genus dengan merujuk kepada 'Bergey's Manual Determinative Bacteriology' edisi ke-9. Daripada 25 sampel aktinomiset marin, 7 genus telah dikenalpasti dan 5 sampel masih tidak dapat dikenalpasti. Secara keseluruhan, 8 sampel telah dikenalpasti sebagai genus Streptomiset. Genus yang lain ialah *Actinopolyspora*, *Actinomadura*, *Actinoplanes*, *Tsukamurella*, *Nocardia* and *Streptoverticillium*.

ABSTRACT

Antibacterial is very important in disease treatment and valuable in worldwide. The importance of this study is to discover a novel antibiotic for pharmaceutical industry from marine isolated actinomycetes. The aims of this study are to determine the antibacterial activities compounds of marine isolated actinomycetes and genus identification of actinomycetes based on colony morphology and spore formation. The modification of agar disc diffusion method was used to screen antibacterial activities against six targeted bacteria and yeast. These samples were cultured in potato dextrose agar (PDA) and incubated for a period of 2-6 weeks. From a total of 30 actinomycetes isolates, 12 of them or 40% had shown positive result for antibacterial activities. This result was due to the effect of antibacterial compounds that is excreted by the bacteria. Sampel labeled with Laut Bidong 25°C W 6.1.2 showed largest diameter against *Bacillus subtilis* (16mm), *Aeromonas hydrophilla* (12mm) and *Streptococcus agalactiae* (8mm). From seven targeted bacteria, three of them do not show any antibacterial activities. The inhibition zones were measured in millimeter units and compared with standard antibiotic gentamicin 10µg. For genus identification cover-slip method was used. The bacteria were cultured in PDA for a period of 1-2 weeks, covered with sterile cover slip at an angle of 45°. This was to allow the aerial mycelia of bacteria to grow on the cover slip. The cover slip was observed under microscope at a magnification of 100×. For cover-slip method the samples were identified until genus by referring to Bergey's Manual Determinative Bacteriology 9th edition. Seven genuses were identified from 25 samples of actinomycetes isolates and 5 samples remain unidentified. On overall, eight samples were identified as members of genus *Streptomyces*. Other genuses were *Actinopolyspora*, *Actinomadura*, *Actinoplanes*, *Tsukamurella*, *Nocardia* and *Streptoverticillium*.