

SEDIMENTATION AND BIOLOGICAL CHARACTERISTICS  
OF TROPICAL MARINE SEDIMENTS

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Sedimentological and geohemical characteristic of Tok Bali  
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SEDIMENTOLOGICAL AND GEOCHEMICAL CHARACTERISTICS OF  
TOK BALI MANGROVE SEDIMENTS

BY

ZAINURULAZURA BINTI MOHD YASIN

Research Report submitted in partial fulfillment of the requirement for the degree of  
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**JABATAN SAINS SAMUDERA  
FAKULTI SAINS DAN TEKNOLOGI  
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**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Sedimentological and Geochemical Characteristics of Tok Bali Mangrove Sediments  
oleh Zainurulazura Binti Mohd Yasin, No. Matrik: UK 8305 telah diperiksa dan semua  
pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan  
Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah  
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*Zainurulazura Mohd Yasin*

## ABSTRAK

Kajian ini telah dijalankan untuk menentukan ciri-ciri sedimentologi, tekstur sedimen, kandungan karbon organik dan logam berat (Pb, Cr, Mn, Fe, Li, Al, Cu, Zn dan Cd) yang terdapat di dalam sedimen paya bakau di kawasan Tok Bali, Kelantan.

Keputusan hasil daripada analisis yang dijalankan menunjukkan nilai purata bagi saiz min, pengasingan (sisihan piawai), skewness dan kurtosis adalah 1.8914 $\phi$ , 0.9708 $\phi$ , -0.8859 $\phi$  and 3.7687 $\phi$ , menunjukkan bahawa sedimen di kawasan tersebut terdiri daripada butiran kasar (pasir sederhana), pengasingan secara sederhana, skewness yang negatif dan leptokurtic yang melampau. Ciri-ciri sedimentologi yang diperolehi ini adalah bersesuaian dengan tekstur sedimen yang mendominasi kawasan kajian iaitu lom liat berpasir. Peratusan karbon organik yang diperolehi adalah di antara  $2.00 \pm 0.07$  % hingga  $5.18 \pm 0.15$  %. Bagi logam berat, hasil analisis menunjukkan nilai purata bagi kepekatan Pb adalah 55.68 ppm, 462.02 ppm bagi Cr, 694.04 ppm bagi Mn, 4.17 % bagi Fe, 99.46 ppm bagi Li, 7.58 % bagi Al, 140.32 ppm bagi Cu, 841.65 ppm bagi Zn dan 19.36 ppm bagi Cd. Analisis korelasi bagi karbon organik dan peratusan liat menunjukkan korelasi yang kuat untuk semua logam berat kecuali bagi Cu. Normalisasi dan faktor pengkayaan menunjukkan bahawa logam berat yang terdapat di dalam sedimen adalah berpunca dari sumber daratan.

## ABSTRACT

This study was carried out to determine the sedimentological characteristics, sediment texture, organic carbon content and heavy metals (Pb, Cr, Mn, Fe, Li, Al, Cu, Zn and Cd) in the mangrove sediments of Tok Bali, Kelantan.

Results from analysis that have been done showed that the average mean size, sorting, skewness and kurtosis are 1.8914 $\phi$ , 0.9708 $\phi$ , -0.8859 $\phi$  and 3.7687 $\phi$  respectively, which means that the sediments are coarse-grained (medium sand), moderately sorted, very negatively skewed and extremely leptokurtic. This is supported with the dominant texture of the sediments which is sandy clay loam. The percentage of organic carbon obtained ranged from  $2.00 \pm 0.07$  % to  $5.18 \pm 0.15$  %. For the heavy metals, results revealed that the mean value for Pb is 55.68 ppm, 462.02 ppm for Cr, 694.04 ppm for Mn, 4.17 % for Fe, 99.46 ppm for Li, 7.58 % for Al, 140.32 ppm for Cu, 841.65 ppm for Zn and 19.36 ppm for Cd. Correlation analysis for organic carbon and clay shows strong correlation for all heavy metals except for Cu. Normalization and enrichment factor showed that the heavy metals in sediments are derived from terrigenous origin.