

PROPERTIES AND CHARACTERISTICS OF TOK DALI
MANGROVE SEDIMENTS

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PROPERTIES AND CHARACTERISTICS OF TOK BALI MANGROVE SEDIMENTS

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**JABATAN SAINS BIOLOGI
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: PROPERTIES AND CHARACTERISTICS OF TOK BALI MANGROVE SEDIMENTS oleh Suzana binti Mohd Rashid, no. matrik: UK7963 telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah Sarjana Muda Sains Gunaan (Pengurusan dan Pemuliharaan Biodiversiti), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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LIST OF ABBREVIATIONS

Al	-	Aluminum
Cd	-	Cadmium
CHR	-	Corrected Hydrometer Reading
CF	-	Calcite fragments
Cl	-	Chlorine
Cu	-	Copper
Cr	-	Chromium
EDTA	-	Ethyhene Diamine Tetra acetic Acid
EDS	-	Energy dispersive X-ray spectroscopy
F	-	Feldspar
Fe	-	Iron
G	-	Gram
HCl	-	Hydrochloric acid
He	-	Hematite
HF	-	Hydrofluoric acid
HNO ₃	-	Nitric acid
H ₂ SO ₄	-	Sulfuric acid
ICP-MS	-	Inductive Couple Plasma- Mass Spectroscopy
K	-	Sodium
K ₂ Cr ₂ O ₇	-	Potassium dichromate
Kg	-	Kilogram

Li	-	Lithium
Mg	-	Magnesium
mL	-	Mililiter
mm	-	Milimeter
Mn	-	Manganese
N	-	Nitrogen
NaPO ₃	-	Natrium hexametaphosphate
Ni	-	Nickel
O	-	Opaque materials
Pb	-	Lead
pH	-	potential of Hydrogen
ppm	-	Parts Per Millon
Qz	-	Quartz
r	-	Correlation Constant
SEM	-	Scanning Electron Microscope
Si	-	Silica
Zn	-	Zinc
μm	-	Microgram
°C	-	degree centrigrade
%	-	Percentage

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ABSTRACT

This study was conducted to determine the physico-chemical properties and characteristics of sediments at Tok Bali mangrove forest. The sediments were collected on 28 August 2005 from three stations. The texture for study area is sandy loam (station 1), sandy clay loam (station 2) and clay loam (station 3). Results of the sand and silt fractions showed that quartz and calcite fragment is the dominant mineral found in the study area in station 1 and station 3. The SEM/EDS analysis to determine the composition of element shows that O, Al, and Si higher in Tok Bali mangrove, meanwhile SiO_2 and Al_2O_3 are high compound in sediment in Tok Bali mangrove. The range of soil pH in the study area is 6.97 to 7.30. The average calculated percentage of organic carbon shows $2.20 \pm 1.48\%$ in the study area. The highest of organic nitrogen in the study area is found in station 2 with the range 9.190–8.672%. The highest of trace metals concentration as detected via ICP-MS is Zn is $830.28 \pm 233.16\text{ppm}$, Ni is $264.68 \pm 348.75\text{ppm}$, Mn is $611.43 \pm 103.87\text{ppm}$ and Cr $548.08 \pm 300.50\text{ppm}$. Correlation between percentage of organic carbon and heavy metals shows negative based on r value correlation of Mn, Ni, Cu, Zn and Cd. Due to normalization, heavy metals found are mostly in moderate and significance enrichment in Tok Bali mangrove but not a serious problem, and this might have derive from the pollution and consider anthropogenic input. This result was proving by enrichment factor. Normalization and enrichment factor showed heavy metals in Tok Bali are from natural sources.

CIRI-CIRI DAN SIFAT-SIFAT SEDIMEN DI HUTAN PAYA BAKAU TOK BALI

ABSTRAK

Kajian yang dijalankan adalah untuk mengenalpasti ciri-ciri fizikal dan ciri-ciri kimia dalam sedimen di hutan paya bakau Tok Bali. Kandungan mineral di dalam pasir ditentukan dengan menggunakan mikroskop petrografik dengan menganalisis imej. Keputusan menunjukkan agihan pasir dan lumpur di kawasan kajian adalah di dominasi oleh quartz dan serpihan kalsite yang ditemui di stesen 1 dan stesen 3. Analisis SEM/EDS menunjukkan komposisi elemen O, Al, dan Si adalah tinggi di kawasan kajian, manakala SiO_2 dan Al_2O_3 adalah kompon yang di jumpai hadir dalam jumlah yang tinggi di hutan paya bakau Tok Bali. Bacaan pH tanah di kawasan kajian adalah 6.97 hingga 7.30. Nilai purata bagi kandungan organik karbon adalah $2.20 \pm 1.48\%$, manakala kandungan nitrogen yang tinggi dijumpai adalah di stesen 2 iaitu 9.190–8.672%. Berdasarkan kawasan kajian yang dijalankan sedimen di hutan paya bakau Tok Bali hadir dalam keadaan kelodak. Nilai tertinggi bagi kandungan logam berat yang dikesan dengan menggunakan ICP-MS adalah Zn iaitu $830.28 \pm 233.16\text{ppm}$, Ni $264.68 \pm 348.75\text{ppm}$, Mn $611.43 \pm 103.87\text{ppm}$ dan Cr $548.08 \pm 300.50\text{ppm}$. berdasarkan nilai korelasi, logam berat yang ditemui adalah dalam kadar yang sederhana dan dalam keadaan yang boleh dikatakan hampir kepada tahap yang kritikal tetapi masih boleh dikawal lagi. Daripada nilai korelasi dan faktor pengkayaan menunjukkan logam berat di hutan paya bakau Tok Bali adalah berasal dari sumber semulajadi.