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1100024355

Geochemistry of sediments in mangrove forest Setiu Wetlands
Terengganu / Le Horng Woei.

4p
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PERPUSTAKAAN KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA (KUSTEM)			
Pengarang		No. Panggilan	
Judul		Tanda tangan	
Tarikh	Waktu Pemulangan	Nombor Ahli	
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GEOCHEMISTRY OF SEDIMENTS IN MANGROVE...		LP 22 FST 1	
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GEOCHEMISTRY OF SEDIMENTS IN MANGROVE FOREST SETIU WETLANDS TERENGGANU

LEE HORNG WOEI

PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

**FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY PUTRA MALAYSIA
TERENGGANU**

2002

1100024355

GEOCHEMISTRY OF SEDIMENTS IN
MANGROVE FOREST SETIU WETLANDS
TERENGGANU

By

LEE HORNG WOEI

This project report is submitted in partial fulfillment of the requirements
for the degree of Bachelor of Science (Marine Science)

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY PUTRA MALAYSIA
TERENGGANU

2002

PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

This project report should be cited as:

Lee H.W. 2002. Geochemistry of sediments in mangrove forest Setiu wetlands Terengganu. Undergraduate thesis, Bachelor of Science in Marine Science, Faculty Science and Technology, College University Science and Technology Malaysia (University Putra Malaysia Terengganu), Terengganu. 120 p.

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ACKNOWLEDGMENTS

The author wishes to extend sincerest thanks and appreciation to Dr. Kamaruzzaman bin Hj. Yunus for his kindly supervision, guidance, assistance and support in every aspect of my study. Thank you for spending your precious time to hold meeting on each weeks to check the progress of the study. I especially thank Prof Madya Dr. Noor Azhar Mohamed Shazili, for the time he took to search for the useful journals and information for me. His critics and suggestions were deeply appreciated. Mr. Liew Hock Chark also deserves my special thanks for his helpful suggestions and statistical analyses. Not forgetting my friend, Phooi Cheng, for giving me relentless support, and encouragement for helping me in completing this final year project. Many thanks also to my project- mate (Chun Hau, Yin Teng, Patrick, Clarence and Anne) without their help this study would not have been possible to complete. I greatly appreciate the assistance from the lab assistants in UPMT. I also wish to thank my course mate, housemate, UPMT friends and also my seniors for their help in one-way or other. Thank you very much.

Most importantly, my beloved family for supporting me from the start tills the end in pursuing the Degree in Marine Science in UPMT. I really appreciate your consistent support, patience and encouragement that help to pull me through this final and tough year in Marine Science. Last but not least, my secondary best friends (from CLHS) that stood by me all the time. Thank you very much everybody and thank you God.

ABSTRAK

Kefahaman tentang perubahan yang berlaku dalam proses sedimentasi melalui kawasan hutan paya bakau adalah penting kerana hutan paya bakau ini berupaya mempengaruhi alam persekitaran dan proses-proses yang berkaitan dengannya. Kawasan hutan paya bakau ini merupakan tempat pemendapan ataupun 'sinki' bagi sedimen terampai. Sedimen yang termendap dalam dasar boleh memperuntukkan maklumat dan data yang berkaitan dengan paleoproduktiviti di kawasan kajian.

Kajian saintifik terhadap hutan paya bakau di Malaysia adalah terhad dalam bidang geokimia. Kajian yang dijalankan ini adalah di hutan paya bakau Setiu, Terengganu. Satu teras sedimen didapati daripada hutan tersebut dari permukaan hingga kedalaman 100 cm, yang menunjukkan ciri-ciri kandungan bahan organik yang tinggi serta bau sulfurik yang kuat. Kadar sedimentasi, usia sedimen, analisa geokimia terhadap elemen Th, Mn, Li, Pb, Al, Cu, Cr dan bahan organik karbon telah dijalankan untuk mengetahui paleoproduktiviti pada hutan paya bakau tersebut.

Kaedah $^{230}\text{Th}_{\text{excess}}$ dan $^{230}\text{Th}_{\text{excess}}/^{232}\text{Th}$ telah digunakan untuk menentukan kadar sedimentasi dan semua analisa elemen-elemen geokimia telah dijalankan dan ditentukan dengan menggunakan mesin ICP-MS. Kadar sedimentasi yang didapati adalah 0.62 sm/tahun dan 0.61 sm/tahun dengan usia sedimen pada kedalaman 100 cm adalah 161.3 tahun. Purata kepekatan bagi elemen geokimia yang dianalisa adalah Mn (147.16 ppm), Cu (11.77 ppm), Pb (31.90 ppm), Th (11.25 ppm), Cr (107.45 ppm), Li (97.46 ppm) and Al (4.19 %). Manakala untuk bahan karbon organik pada permukaan sedimen, ia adalah 4.24 %. Nilai untuk faktor pengkayaan (EF) bagi

elemen-elemen geokimia yang dikaji telah menunjukkan bahawa ia adalah datang dari sumber terigenus. Normalisasi dan korelasi elemen-elemen geokimia telah dijalankan untuk menentukan sumber elemen-elemen tersebut dan kaitannya dengan bahan karbon organik. Hasil daripada itu, didapati semua elemen geokimia adalah datang dari sumber semulajadi dan mempunyai hubungan korelasi yang lemah dengan karbon organik.

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ABSTRACT

The understanding of variation in sedimentary processes across mangrove areas is important because they influence the environmental and other related processes. They are believed to be an important sink for suspended sediment and those sinking sediments can supply information on both age and the paleoceanographic conditions of the study area. There are not many researches carried out in the mangrove forests of Malaysia especially in the field of geochemistry. This research was carried out in the mangrove forest of Setiu wetlands, Terengganu. One sediment core was obtained from the mangrove forest measuring from surface until 100 cm. The sediment core was obtained show some characteristic of high organic matter and high sulphuric odour. Sedimentation rate, sediment's age, geochemical proxy of Th, Mn, Li, Pb, Al, Cu, Cr and organic carbon were carried out to access the paleoproductivity of the mangrove forest.

The sedimentation rate is determined by using $^{230}\text{Th}_{\text{excess}}$ and $^{230}\text{Th}_{\text{excess}}/^{232}\text{Th}$ ratio and analyse with ICP-MS. The sedimentation rate for the mangrove forests are 0.62 cm/yr and 0.61 cm/yr with the sediment's age at the depth of 100 cm is 161.3 years. The total mean values for the geochemical elements are Mn (147.16 ppm), Cu (11.77 ppm), Pb (31.90 ppm), Th (11.25 ppm), Cr (107.45 ppm), Li (97.46 ppm) and Al (4.19 %). The total mean value of organic carbon content at the surface of mangrove forest is 4.24 %. The Enrichment Factor (EF), for all the geochemical elements were nearly close to unity, indicates that these elements were terrigenous in origin. Normalization and correlation of the elements were carried out to determine the source and the correlation with organic carbon in the mangrove forest. As a result

from that, all of the elements are found of from natural sources and have weak correlation with organic carbon.

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