

THE GEOCHEMICAL PROXY IN KEMUNJUNG MANGROVE FOREST
OF TERENGGANU, MALAYSIA

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2025

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TERENGGANU, MALAYSIA.

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Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Marine Sciences)

Department of Marine Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005

1100034590

ACKNOWLEDGEMENTS

Firstly, I thank God for enabling me to complete my thesis writing successfully. I wish to forward my deepest and sincere thanks to Assoc. Prof. Dr. Kamaruzzaman Hj. Yunus for his guidance and valuable suggestions throughout the completion of this project. And also a special thanks to Dr. Nor Antonina Abdullah for her advice and encouragement.

I'm also very much indebted to all research assistants Ong, Willy, Karthik and Wak for sharing their knowledge and helping me to improve my skills in thesis writing. Not to forget the contributions by all the Oceanography Laboratory staffs and sampling crew in providing me with all the necessary equipments needed for lab analysis and also for the smooth run of my sampling.

The completion of this thesis would have been impossible without the moral support and strength given by my beloved parents, brothers and sister-in-law. Last but not least, my deepest appreciation goes to all my coursemates, housemates and best friends who had stood by me and willingly helped me whenever I needed their support and help.

ABSTRACT

This research was carried out in the mangrove forests of Pulau Sekeping, Kemaman. This study is expected to help in monitoring and assessment processes of the mangrove area of Pulau Sekeping. Two sediment cores from Station A and Station B were obtained from the surface of the mangrove forests down to 100 cm deep. The sediment samples showed characteristics of high organic carbon content in the upper layers. The organic carbon concentration and geochemical proxy of Al, Mn, Co, Cu and Cr were analyzed to study geochemical environment of the mangrove forest.

The titration method was used to determine the organic carbon content in the sediment. The mean values of organic carbon concentration in Station A and Station B are 1.79 % and 1.66 % respectively. The heavy metal determination was done using ICP-OES. The total mean value for geochemical elements are Al (9.84 %), Mn (185.56 ppm), Co (51.28 ppm), Cu (34.08 ppm) and Cr (142.96 ppm) in Station A and Al (12.86 %), Mn (273.21 ppm), Co (54.15 ppm), Cu (40.81 ppm) and Cr (197.40 ppm) in Station B. Correlation between these elements with organic carbon were calculated and indicated quite weak relationships. Normalization was also done to the data to determine the degree of anthropogenic input of these elements in the mangrove system. As a result of this, the major sources of heavy metals examined in the sediments were of natural origin with very little impact from anthropogenic sources. Enrichment factors were also determined and revealed that the concentration of Mn, Cu and Cr falls in the category of deficiency to minimal enrichment. Only Co showed moderate enrichment in both stations.

ABSTRAK

Kajian ini telah dijalankan di kawasan paya bakau Pulau Sekeping, Kemaman. Kajian saintifik ini diharapkan dapat membantu dalam proses pengawasan ke atas hutan paya bakau Pulau Sekeping. Dua teras sedimen telah diperolehi dari Stesen A dan Stesen B dengan kedalaman 100 cm setiap satu. Sampel sedimen yang diperolehi menunjukkan kehadiran karbon organik yang lebih tinggi di lapisan permukaan berbanding lapisan dalam. Kepekatan karbon organik dan elemen geokimia seperti Al, Mn, Co, Cu and Cr ditentukan untuk menganalisa persekitaran geokimia kawasan paya bakau itu.

Teknik pentitratan telah digunakan untuk menentukan kandungan karbon organik dalam sedimen. Purata kandungan karbon organik yang didapati adalah 1.79 % and 1.66 % untuk stesen A dan Stesen B masing-masing. Penentuan kandungan logam berat dibuat menggunakan ICP-OES. Purata nilai kepekatan elemen geokimia adalah Al (9.84 %), Mn (185.56 ppm), Co (51.28 ppm), Cu (34.08 ppm) dan Cr (142.96 ppm) di Stesen A and Al (12.86 %), Mn (273.21 ppm), Co (54.15 ppm), Cu (40.81 ppm) dan Cr (197.40 ppm) di Stesen B. Korelasi antara elemen geokimia dengan karbon organik adalah agak lemah. Normalisasi dijalankan untuk mengenal pasti tahap kemasukan sumber antropogenik di kawasan itu menunjukkan kebanyakan logam berat yang terdapat di kawasan kajian berasal dari sumber semulajadi dengan hanya sedikit sumber luaran. Faktor pengkayaan yang dikira menunjukkan kandungan Mn, Cu and Cr jatuh dalam kategori kekurangan hingga pengkayaan minima. Didapati hanya Co yang menunjukkan pengkayaan pada tahap sederhana di kedua-dua stesen.