

INTERNATIONAL STUDY OF HUMAN RIGHTS IN  
ASIA  
1978-1979  
VOLUME 1

1979

INSTITUTE OF SOCIAL AND TECHNOLOGY  
UNIVERSITY OF MALAYA, KUALA LUMPUR, MALAYSIA



MINERALOGICAL STUDY OF TANJONG BATU KULAT TO TANJONG TULANG,  
LANGKAWI MARINE SEDIMENT

By

ROSNANI NAZRI

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  
2006

1100042349

This project should be cited as:

ROSNANI, N., 2006. Mineralogical Study of Tanjong Batu Kulat to Tanjong Tulang Langkawi Marine Sediment Final Year Project Report, Bachelor of Science-Marine Sciences, Department of Marine Science, Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi. 79p

No part of this project may be produced by any mechanical, photographic, or electronic process, or in a form photographic, recording nor may be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without written permission form from the author and the supervisor of the project.

**SPECIALLY DEDICATED TO:**

*Haji Nazri Osman*

*Hajjah Zaruyah Mat Jidun*

*Rosmaili Nazri*

*Roszita Nazri*

*Roszizul Khairi Nazri*

*Rohayati Nazri*

*Ros Shimah Nazri*

*Roszizul Rahman Nazri*

*Muhammad Roslan Nazri*

**THANK YOU FOR ALL THE LOVE, SUPPORTS AND MOTIVATION!**

## ACKNOWLEDGEMENTS

First of all, I am very thankful to Allah SWT for giving me enough strength, enthusiasm and high determination to finish my research project. I wanted to pay infinite tribute gratefully to Dr. Vijayan V.V.Rajan of Marine Geology's Unit, Minerals and Geosciences Department Malaysia in Ipoh for giving me the opportunity and unlimited support in making this research project successful.

My principal gratitude is due to my supervisor Dr Nor Antonina Abdullah, whose guidance and dedication to make this research project a pleasure to produce. My gratitude also goes to all the community members of Minerals and Geoscience's Department Malaysia in Ipoh for their patience in helping and teaching me everything during conducting the project especially to Mr Abdullah, Mr Rais Ramli, Mr Hamid Ariffin, Mr Rizal, Mr Razak, Mr Mat Azami, Mr Sabadun, Mrs Rodziah, Mrs Che Kalsom, Mrs Siti Hajar, Mrs Nana, Mrs Hairani, Mr Wahab and last but not least to Assoc Prof Dr Siti Zauyah and Mr Roslan of Land Management Department, UPM for mineralogical analysis in grain mounting..

Also, thanks to all my colleagues and friends who have willingly and kindly assisted me in many ways especially Sis Dilla, Wani, Hainal, Zalina, Kim, Ai Ni, Sarah, Zai, Ely, Hada, Wawa, Nan, Rina, Konah, Nas, Mala, Benny and many more persons that is not stated which had directly and indirectly involved in fulfilling this research project.

Lastly, a million thanks to whom reviewing this research paper. If, by any chances of errors in any part of my research paper, I offer my sincere request for forgiveness in advance.

## ABSTRAK

Projek ini bertujuan untuk mengenalpasti kandungan dan jenis mineral serta taburan sedimen dasar laut di perairan Langkawi (Tanjung Batu Kulat hingga Tanjung Tulang). Kajian ini dijalankan di kawasan berukuran 15 km persegi terhadap 15 stesen dengan menggunakan pengcekau jenis Van Veen. Sedimen dianalisa melalui tiga kaedah utama: *X-Ray Diffractometer (XRD)*, *Grain mounting* dan *Quantitative Mineral Estimation (QME)* untuk fraksi kelodak dan liat, pasir dan mineral berat. Analisa tekstur sedimen ditentukan melalui pengkelasan Folk (1974). Analisis saiz butiran pasir, kandungan humus dan karbonat juga dijalankan. Keputusan dari analisis *XRD* menunjukkan kuartza sangat dominan di setiap stesen dan terdapat elemen surih seperti kaolinite, feldspar, illite dan montmorillonite di stesen tertentu. Analisa *grain mounting* turut menunjukkan mineral kuartza yang dominan di setiap stesen dengan kehadiran kalsit, oksida besi dan kandungan legap di beberapa stesen. Analisa *QME* menunjukkan kadungan hidroilmenite yang dominan di setiap stesen diikuti rutile, ilmenit dan zirkon. Zirkon hanya hadir di stesen 10, 14, 15, 16, 18, dan 22 manakala topaz hadir di stesen 13, 16 dan 19. Oksida besi, monazit, magnetit, siderit, turmalin dan topaz adalah mineral yang hadir surih. Pengkelasan tekstur menunjukkan liat ditemui jauh dari pantai (stesen 12, 19, 20, 21, 24, 25 dan 26) manakala pasir dan gravel didapati banyak hadir berdekatan dengan pantai (stesen 10, 11, 13, 14, 15, 16, 18 dan 22). Kandungan organik adalah kurang dari 7% bagi setiap stesen manakala kandungan karbonat adalah dalam lingkungan 12.5% (stesen 11) hingga 52.69% (stesen 24).

## ABSTRACT

The study was conducted to determine the mineral contents of the Langkawi Island marine sediments (Tanjung Batu Kulat to Tanjung Tulang). The sediments were collected from 15 stations which covered an area of 15 km<sup>2</sup> by using a Van Veen Grab. The sediments were analyzed for its mineralogy using three methods: *The X-Ray Diffractometer (XRD)*, *Grain mounting* using petrographic microscope with image analyzer and *Quantitative Mineral Estimation (QME)* for silt and clay fractions, sand fractions and heavy minerals, respectively. Textural analysis was determined using Folk's Classification and the grain size was also done along with its carbonate and organic contents. Results of the *XRD analysis* showed that quartz is the dominant mineral in every station while trace amounts of kaolinite and feldspar in stations 10, 12, 14, 15, 16, 18, 20, 21, 22, 25 and 26. Nevertheless, illite was present in trace amounts in station 11 and 19 while station 24 had trace amounts of montmorillonite. The result of *grain mounting* is a reflection to the results obtained from the *XRD Analysis* which showed that quartz is the dominant mineral in the study area with few existences of calcite, iron oxide and opaque materials. From the *QME analysis*, only 11 heavy minerals obtainable in the study area which are listed in order of their decreasing abundance: hydroilmenite, rutile, ilmenite, zircon, topaz, magnetite, leucoxene, iron oxide, tourmaline, monazite and siderite. Regarding the textural class mud was mostly found offshore while sand and gravel were mostly found nearshore. The organic contents is less than 6 % in all stations while the carbonate contents is moderately higher in most of the stations with the exception of station 24 (52.69%) and station 11 (12.5%).