

DISTRIBUTION OF FIVE EXCLUSIVE MANGROVE SPECIES
IN A TROPICAL ESTUARINE MANGROVE
TERENGGANU AND TOK BANG, MALAYSIA

BY
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2006

**DISCRIMINATION OF FIVE EXCLUSIVE MANGROVE SPECIES USING
SPECTRAL REFLECTANCE DATA AT SETIU, TERENGGANU
AND TOK BALI, KELANTAN**

By

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**Research Report submitted in partial fulfillment of
the requirement for the degree of
Bachelor of Applied Science (Biodiversity Conservation and Management)**

**Department of Biological Sciences
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2006**

This project should be cited as:

Nurhidayati, O. 2006. Discrimination of five exclusive mangrove species using spectral reflectance data at Setiu, Terengganu and Tok Bali, Kelantan. Undergraduate thesis, Bachelor of Applied Science in Biodiversity Conservation and Management, Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 63p.

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PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **DISCRIMINATION OF FIVE EXCLUSIVE MANGROVE SPECIES USING SPECTRAL REFLECTANCE DATA AT SETIU, TERENGGANU AND TOK BALI, KELANTAN** oleh Nurhidayati Ormil no. matrik: UK 7840 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Gunaan - Pemuliharaan dan Pengurusan Biodiversiti, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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ACKNOWLEDGEMENT

With the name of Allah s.w.t, I gratefully thanks for his bless and permission on me to finish this study successfully. Here with this opportunity, I would like to acknowledge to all those involved in this study, whether individually, directly or indirectly.

First of all, I would like to thank my parent and family for their financial and moral support on me throughout this study. Without their support, I really in lost and they are my spirits. I really appreciate their sacrifices on me and I pray they will always blessing by Allah s.w.t.

Now, I also like to thank a lots my supervisors, En. Kasawani Ibrahim and Prof. Madya Sulong Ibrahim for their guidance, advices and encouragement on me during the implementation of this project. I also thanks both of them for their patience in supervised me without any sigh although there were many problems occurs during doing this project.

My big thanks to En. Muhamad Razali Salam, En. Abdul Habir Alias, En. Nasir, En. Manaf and En. Kasim for their helps before and during the sampling. Thank a lots to En. Mohd Sufian and Dr. Chuah Tse Seng for their time and helps in the statistical analysis. Not forgettable thanks to Ruzalizam and Karthik for their helps in this study.

Lastly, thanks to all my friends, coursemates, KUSTEM and others who involved in this study directly and indirectly. Thanks a lot.

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LIST OF ABBREVIATIONS

ASD	-	Analytical Spectral Devices
nm	-	nanometer
NIR	-	near infrared
SPSS	-	Statistical Package for Social Science

LIST OF APPENDICES

Appendix 1: Equipment used

Appendix 2: Exclusive mangrove species

Appendix 3: Study sites

ABSTRACT

A study of spectral reflectance was conducted in Setiu, Terengganu and Tok Bali, Kelantan which were located in East Coast of Peninsular Malaysia. The objective of this study was to determine the spectral properties of mangrove species and the significant wavelength in discriminating mangrove species at both study locations. Five exclusive mangrove species have been selected in this study and they were *Acrostichum aureum*, *Ceriops decandra*, *Excocaria agallocha*, *Nypa fruticans* and *Sonneratia alba*. In Setiu, species with the highest spectral reflectance among other mangrove species was *Ceriops decandra* and the species with lowest reflectance was *Nypa fruticans*. Meanwhile in Tok Bali, species with the highest spectral reflectance was *Acrostichum aureum* and the species with lowest spectral reflectance was *Sonneratia alba*. There were 15 significant wavelengths which can be used to discriminate among five mangrove species in Setiu and 13 significant wavelengths at Tok Bali. Among these significant wavelengths, the 500 nm and 700 nm occurred at both study locations and this demonstrate that these two wavelengths were useful in discriminating mangrove species. In this study, there was no significant difference of spectral reflectance between Setiu and Tok Bali based on the P values which were bigger than $\alpha=0.05$ in all four pairs tested. Overall, this study showed that every species of mangrove have their own spectral properties based on some factors like pigment content, leaf structure, soil and cloud cover. It also showed that there were some significant wavelengths to discriminate among mangrove species and the spectral reflectance of mangrove species was similar between Setiu and Tok Bali.

PEMBEZAAN LIMA SPESIES EKSKLUSIF PAYA LAUT MENGGUNAKAN DATA PEMBALIKAN SPEKTRAL DI SETIU, TERENGGANU DAN TOK BALI, KELANTAN

ABSTRAK

Kajian mengenai pembalikan spektral telah dijalankan di Setiu, Terengganu dan Tok Bali, Kelantan yang terletak di pantai timur Semenanjung Malaysia. Objektif kajian ini adalah untuk menentukan ciri pembalikan spektral bagi spesies tumbuhan paya laut serta panjang gelombang yang signifikan bagi membezakan spesies tumbuhan paya laut di kedua-ke dua lokasi kajian. Lima spesies eksklusif paya laut telah dipilih iaitu *Acrostichum aureum*, *Ceriops decandra*, *Excocaria agallocha*, *Nypa fruticans* dan *Sonneratia alba*. Di Setiu, spesies dengan pembalikan spektral paling tinggi ialah *Ceriops decandra* dan yang paling rendah ialah *Nypa fruticans*. Manakala di Tok Bali, spesies dengan pembalikan spektral paling tinggi ialah *Acrostichum aureum* dan yang paling rendah ialah *Sonneratia alba*. Terdapat 15 panjang gelombang di Setiu dan 13 panjang gelombang di Tok Bali yang signifikan bagi membezakan spesies tumbuhan paya laut. Pada panjang gelombang 500 nm and 700 nm, kelima-lima spesies paya laut dapat dibezakan di kedua-dua tempat. Di dalam kajian ini, tiada perbezaan yang signifikan bagi pembalikan spektral di Setiu dan Tok Bali berdasarkan kepada nilai P yang lebih besar daripada $\alpha=0.05$ dalam keempat-empat ujian yang dilakukan. Keseluruhannya, kajian ini menunjukkan bahawa setiap spesies tumbuhan paya laut mempunyai ciri pembalikan spektral masing-masing bergantung kepada faktor pigmen, struktur daun, tanah dan litupan awan. Terdapat beberapa panjang gelombang yang nyata bagi membezakan spesies tumbuhan paya laut dan pembalikan spektral bagi spesies tumbuhan paya laut adalah sama di Setiu dan Tok Bali.