

RELATIONSHIP OF CORAL FLUORESCENCE,
ZOOXANTHELLAE DENSITY AND CHLOROPHYLL *a*
CONTENT IN SCLERACTINIAN CORALS OF PULAU BIDONG

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2013

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**RELATIONSHIP OF CORAL FLUORESCENCE, ZOOXANTHELLAE
DENSITY AND CHLOROPHYLL *a* CONTENT IN SCLERACTINIAN
CORALS OF PULAU BIDONG**

**By
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**Research Report submitted in partial fulfillment of
the requirement for the degree of
Bachelor of Science (Marine Biology)**

**Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITY MALAYSIA TERENGGANU
2013**

This project should be cited as:

Cheong, C. J. (2013). Relationship of Coral Fluorescence, Zooxanthellae Density and Chlorophyll *a* Content in Scleractinian Corals of Pulau Bidong. Undergraduate Thesis, Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, University Malaysia Terengganu, Terengganu. P.

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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION REPORT
 FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: Relationship of Coral Fluorescence, Zooxanthellae Density and Chlorophyll *a* Content in Scleractinian Corals of Pulau Bidong by Cheong Chin Jou, Matric No. UK22911 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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ACKNOWLEDGEMENTS

First, I would like to thank my main supervisor, Assoc. Prof. Dr. Hii Yii Siang for his guidance and willingness to share his expertise towards making this project a success. I would also like to thank him for lending me his underwater camera and also other apparatus that were necessary for this project. He also gave me lots of precious advices while I am writing my thesis. His encouragement and attentiveness over this project further motivated me during the progress of this project. I would also like to thank my second supervisor, Assoc. Prof. Liew Hock Chark for his advices along the project. I would also like to thank Dr. Siti for giving us the experience on how to plan, carry out and present a scientific finding during the subject MMB3000 Fieldtrip. I would also like to thank our coordinator, Dr. Jennie and Dr. Saifullah who arranged lots of useful courses for us while preparing our thesis.

Besides that, I would also like to show my appreciation to Mr. Syed Shahrul Afzan Syed Bidin and my buddy, Lim Wei Chen, who helped me to conduct my sampling in the field. I would also like to thank all the staff that helped me throughout my lab work. They are: Mr. Che Mohd Zan Husin, Mr. Suliman Kasim, Mr. Abdul Manaf Ahmad, and Mr. Raja Razali Raja Ghani.

Lastly, I would like to thank all my friends and family members who had giving me moral support throughout the project.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vi
LIST OF FIGURE	viii
LIST OF SYMBOL, ABBREVIATION OR NOMENCLATURE	ix
LIST OF APPENDIX	xi
ABSTRACT (IN ENGLISH)	xii
ABSTRACT (IN BAHASA MALAYSIA)	xiii
CHAPTER 1 : INTRODUCTION	1
CHAPTER 2 : LITERATURE REVIEW	3
2.1 Coral reef	3
2.2 Causes of Bleaching	3
2.3 Units Used in Fluorescence Measurement	5
2.4 Changes in Fluorescence Values and Other Aspects during Stress	6
CHAPTER 3 : METHODOLOGY	9
3.1 Sampling Site	9
3.2 Sampling	10

3.3 Statistical analysis	13
CHAPTER 4 : RESULTS	14
CHAPTER 5 : DISCUSSION	23
CHAPTER 6 : CONCLUSION	28
REFERENCES	30
APPENDICES	34
CURRICULUM VITAE	53

LIST OF TABLES

4.1	The Result of CPCE during October, 2012	14
4.2	Zooxanthellae density and Chlorophyll a content of three coral species of Pulau Bidong	14
4.3	Fluorescence values of corals of Pulau Bidong (according to species)	15
4.4	Fluorescence values of corals of Pulau Bidong (according to depth)	15
4.5	Maximum quantum yield (Fv/Fm) of different corals of Pulau Bidong	16
4.6	Maximum quantum yield (Fv/Fm) of coral at different depth	16
4.7	The significant different of fluorescence values measured during morning and noon	17
4.8	The significant different of chlorophyll <i>a</i> concentration, zooxanthellae density and fluorescence yields among different species (One-way ANOVA Test).	17
4.9	The significant different of chlorophyll <i>a</i> concentration, zooxanthellae density and fluorescence yields among differen water depth (One-way ANOVA Test)	17
4.10	Correlation between chlorophyll <i>a</i> concentration, zooxanthellae density and fluorescence yields for Branching <i>Acropora</i> sp.	18

4.11	Correlation between chlorophyll <i>a</i> concentration, zooxanthellae density and fluorescence yields for Tabulate <i>Acropora</i> sp.	18
4.12	Correlation of chlorophyll <i>a</i> concentration, zooxanthellae density and fluorescence yields for <i>Stylophora</i> sp.	19
4.13	Linear equation for zooxanthellae density prediction	22
4.14	Correlation between fluorescence value (photographical analysis) and minimum fluorescence yield (PAM)	22
5.1	Zooxanthellae density and chlorophyll <i>a</i> concentration of Tabulate <i>Acropora</i> sp. during April, 2013	24

LIST OF FIGURE

3.1	Location of the sampling site	9
3.2	Targeted sp. for present study: branching <i>Acropora</i> sp. (left), tabulate <i>Acropora</i> sp. (centre) and <i>Stylophora</i> sp. (right)	10
4.1	Graphs used to obtain linear regression equations	21
5.1	Some colonies experienced partial bleaching during April, 2013	25

LIST OF SYMBOL, ABBREVIATION OR NOMENCLATURE

SST	Sea Surface Temperature
PAM	Pulse Amplitude Modulation
FRR	fast repetition rate
°C	Degree Celsius
PSII	Photosystem two
UV	Ultra violet
O ₂	Oxygen gas
CO ₂	Carbon dioxide
µm	micrometer
F _o	Minimum fluorescence
F _v /F _m	Maximum Quantum Yield
F _v /F _o	The ratio of variable to minimal chlorophyll <i>a</i> fluorescence
ETR	Electron Transport Rate
F _m	Maximum Fluorescence
FA	The fraction of the incident light absorbed by the living cell
PPF	Photosynthetic Photon Flux

PAR	Photosynthetically available radiation
$\mu\text{mol m}^{-2}\text{s}^{-1}$	Micromole per meter square per second
ppt	Part Per Thousand
m	Meter
sec	second
cm	centimetre
ml	millilitre
%	percentage
rpm	Revolutions per minute
p.m.	<i>post meridiem</i>
a.m.	<i>ante meridiem</i>
cm^2	Centimetre square
FM	Minimum fluorescence in the morning
FN	Minimum fluorescence in the afternoon
FmM	Maximum fluorescence in the morning
FmN	Maximum fluorescence in the afternoon
cPCE	Coral Point Count with Excel extensions

LIST OF APPENDIX

Appendix A:	Steps For Photographical Analysis	34
Appendix B:	umt group codes (For CPCE)	36
Appendix C:	Results of CPCE Analysis (Summary)	38
Appendix D:	The Results of T-Test for the Significant Difference between the Fluorescence Yield in the Morning and Afternoon	42
Appendix E:	Results of One-Way ANOVA Test for the Significant Difference of Variables among Different Species	44
Appendix F:	The Results of One-Way ANOVA for the Significant Difference of Variables at Different Depth	48
Appendix G1:	Results for Correlation Test for Branching <i>Acropora</i> sp.	49
Appendix G2:	Results for Correlation Test for Tabulate <i>Acropora</i> sp.	50
Appendix G3:	Results for Correlation Test for <i>Stylophora</i> sp.	51
Appendix H:	Zooxanthellae Density Recorded in Previous Studies	52

ABSTRACT

The present study was conducted at Pantai Pasir Cina of Pulau Bidong, Terengganu. The fluorescence values were measured *in-situ* using Diving-PAM and underwater camera. Samples were collected for zooxanthellae count and to measure chlorophyll *a* concentration. According to the results, the chlorophyll *a* concentration was different from species to species. However, the zooxanthellae density was not significantly different from species to species. The results showed that the fluorescence yield in the morning was significantly different from fluorescence yield in the afternoon. The maximum and minimum fluorescence yields measured in the noon were significantly different from depth to depth. The minimum and maximum fluorescence yield in the noon can be used to predict the zooxanthellae density in *Stylophora* sp., whereas the Fv/Fm in the afternoon can be used to predict the zooxanthellae density in branching *Acropora* sp. The photographic method suggested that this method might only be suitable for corals with a flat and uniform surface. Baseline data should be formed in order to have a better understanding on the reef of Pulau Bidong.

ABSTRAK

Kajian ini telah dilakukan di Pantai Pasir Cina di Pulau Bidong, Terengganu. Nilai pendarfluor telah diukur dengan menggunakan Diving-PAM dan kamera selam. Sampel telah dikumpulkan untuk mengaji kepadatan zooxanthellae dan kepekatan klorofil *a*. Hasil menunjukkan bahawa klorofil *a* adalah berbeza daripada spesies kepada spesies. Walau bagaimanapun, kepadatan zooxanthellae adalah tidak berbeza daripada spesies kepada spesies. Keputusan kajian ini menunjukkan bahawa hasil pendarfluor pagi adalah berbeza daripada hasil pendarfluor petang. Maksimum dan minimum hasil pendarfluor diukur pada masa tengah hari adalah berbeza mengikut kedalaman. Hasil pendarfluor minimum dan maksimum pada tengah hari boleh digunakan untuk meramalkan kepadatan zooxanthellae dalam *Stylophora* sp. Manakala Fv/Fm pada waktu petang boleh digunakan untuk meramalkan kepadatan zooxanthellae dalam *Acropora* sp. bercabang. Kaedah fotografi hanya sesuai untuk batu karang dengan permukaan yang rata dan seragam. Data asas harus dikumpulkan untuk pengurusan batu karang di Pulau Bidong.