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(*Clusia grandifolia*)

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Toxicity of formaldehyde on african catfish (*Clarias gariepinus*) /
Nurhidayah Katimon.

PERPUSTAKAAN SULTANAH NUR ZAHIRAH
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

1100054367

1100054367		

Lihat sebelah

HAK MILIK
PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

TOXICITY OF FORMALDEHYDE ON AFRICAN CATFISH
(*Clarias gariepinus*)

By

NURHIDAYAH BINTI KATIMON

**Research report submitted in partial fulfillment of
the requirements for the degree of
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**Department of Marine Science
Faculty of Maritime Study and Marine Science
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FAKULTI PENGAJIAN MARITIM
DAN SAINS MARIN**

**PENGAKUAN DAN PENGESAHAN LAPORAN
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: Toxicity Test of Formaldehyde on African Catfish (*Clarias gariepinus*) oleh Nurhidayah Binti Katimon, No. Matrik: UK 9768 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Sains Samudera), Fakulti Pengajian Maritim Dan Sains Marin, Universiti Malaysia Terengganu.

Disahkan oleh :

Penyelia Utama

Nama : 
: PROF. DR. NOOR AZHAR BIN MOHAMED SHAZILI
Pegawai
Cop Rasmi : Institut Oseanografi
Universiti Malaysia Terengganu (UMT)
21030 Kuala Terengganu, Terengganu.

Tarikh: 6/5/07

Ketua Jabatan Sains Samudera

Nama : 
: DR. RAZAK ZAKARIYA
Ketua Jabatan Sains Marin
Cop Rasmi : Fakulti Pengajian Maritim dan Sains Marin
Universiti Malaysia Terengganu
(UMT)

Tarikh: 6/1/08

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CONTENTS

TITLE	PAGE
LIST of CONTENTS	ii-v
LIST of TABLES	vi
LIST of FIGURES	vii
LIST of ABBREVIATIONS	viii
LIST of APPENDICES	ix
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1: INTRODUCTION	1-3
CHAPTER 2: OBJECTIVES	4
CHAPTER 3: LITERATURE REVIEW	5-17
3.1 African catfish, <i>Clarias gariepinus</i>	
3.1.1 Taxonomy	5
3.1.2 Morphology and anatomy of <i>Clarias gariepinus</i>	6
3.1.3 Life cycle of <i>Clarias gariepinus</i>	8
3.1.4 Distribution of <i>Clarias gariepinus</i>	8
3.2 Formaldehyde	9
3.2.1 Physical properties	10
3.2.2 Chemical properties	10
3.2.3 Source of formaldehyde	11
3.2.4 Environmental transport, distribution and transformation of formaldehyde	12
3.2.5 Usage of formaldehyde	12
3.2.6 Safety level of formaldehyde	13
3.2.7 Toxicity and effect of formaldehyde	14

3.3	Toxicity test	16
CHAPTER 4: METHODOLOGY		18-26
4.1	Cleaning of apparatus	18
4.2	Preparation of freshwater	18
4.3	Acclimatization of <i>Clarias gariepinus</i> juveniles	19
4.4	Preparation of formaldehyde solution	20
4.5	Range finding test and 96 hours LC50 toxicity test	21
4.6	Episodic test	21
4.7	Sample preparation for Scanning Electron Microscope (SEM) analysis	22
4.8	Water parameter analysis	
4.8.1	Ammonium	23
4.8.2	Formaldehyde analysis	25
4.8.3	Other parameters (DO, pH and temperature)	25
4.9	Data analysis	26
CHAPTER 5: RESULT		27-38
5.1	Physical observation	27
5.2	Toxicity test	
5.2.1	Screening test	28
5.2.2	96 hours LC50 test	28
5.3	Water Parameter	
5.3.1	Dissolved Oxygen	30
5.3.2	Formaldehyde	31

5.3.3 pH	32
5.3.4 Ammonium	33
5.3.5 Temperature	34
5.4 Gills observation	34
CHAPTER 6: DISCUSSION	39-45
6.1 Toxicity test	39
6.2 Water parameter	
6.2.1 Dissolved oxygen	41
6.2.2 Formaldehyde	42
6.2.3 pH	42
6.2.4 Ammonium	43
6.2.5 Temperature	44
6.3 Gills observation (effect on organism tissue)	45
CHAPTER 7: CONCLUSION	46
BIBLIOGRAPHY	47-49
APPENDIXES	50-59
CURICULUM VITAE	60

LIST of TABLES

Table		Page
1.1	Results of formaldehyde contain in fish and food product.	2
5.1	Mortality of <i>Clarias gariepinus</i> in screening/range finding test	28
5.2	Accumulative mortality data of <i>Clarias gariepinus</i> for every replicate	29
5.3	Comparison of LC50 result based on different method of calculation	29
5.4	Average evaporation rate of formaldehyde during 96 hours toxicity test	31

LIST of FIGURES

Figure		Page
3.1	A and B, Internal anatomy of African Catfish, <i>Clarias gariepinus</i>	7
3.2	Structure and functional group of formaldehyde	10
5.2	Comparison of pH readings between formaldehyde concentration at initial and final of test duration.	32
5.3	Comparison of ammonium readings between formaldehyde Concentrations	33
5.4	Normal gills	35
5.5	Gills exposed in formaldehyde for 20 minutes	35
5.6	Gills exposed in formaldehyde for 1 hour	36
5.7	Gills exposed in formaldehyde for 3 hours	36
5.8	Gills exposed in formaldehyde for 9 hours	37
5.9	Gills exposed in formaldehyde for 27 hours	37
5.10	Gills exposed in formaldehyde for 71 hours	38

LIST of ABBREVIATONS

%	-	Percentage
°C	-	Degree centigrade
APHA	-	American Public Health Association
DO	-	Dissolved oxygen
EC50	-	Median effect concentration
LC50	-	Median lethal concentration
Mg.L-1/mg/L	-	Milligram per liter
L	-	Liter
ppm	-	Part per million
pH	-	Potential of hydrogen

LIST of APPENDICES

APPENDIX	Page
APPENDIX 1	
Apparatus and chemical substances	50
APPENDIX II	
Spearman-Karber calculation	
a) Replicate 1	52
b) Replicate 2	54
c) Replicate 3	56
APPENDIX III	
Water Parameter Readings	
a) DO	58
b) pH	59
c) Ammonium	59

ABSTRACT

The aquaculture activity is widely use formaldehyde (37% in formalin) to control ectoparasitic diseases. The African catfish (*Clarias gariepinus*) is one of commercial freshwater fish that been rear widely. Thus, a toxicity test was carried out to determine the safety level and other effect of formaldehyde on organism tissues and organs such as gills. The semi renewal toxicity test was used as formaldehyde has high evaporation rate. From the test that has been conducted, the 96-hours LC_{50} value for formaldehyde on African catfish (*Clarias gariepinus*) is 16.433ppm. Formaldehyde also capable in reduce DO level, and based on the readings DO level was decrease rapidly towards the increase of formaldehyde concentration. Other water parameter however did not shows significant relation. For the gills observation, it supposed to use SEM. However, due to technical problems the method was changed and the observation was only made through Motil Light Compound Microscope. Even thought the sample fixation method and sample condition not suitable for the microscope observation, still some changes on the gills can be observed where some part of the gills become decay when exposed to formaldehyde longer. Based on this study, the estimated safe concentration of formaldehyde is 0.1 of the LC_{50} value which is 1.6433ppm. However, more studies are needed to confirm it.

ABSTRAK

Formaldehyde (37% dalam formalin) telah digunakan secara meluas dalam aktiviti akuakultur untuk mengawal ektoparasit. Ikan Keli Afrika (*Clarias gariepinus*) pula merupakan salah satu spesis ikan air tawar komersil yang ditanam secara meluas. Oleh itu, ujian ketoksikan telah dijalankan bagi mengetahui kepekatan formaldehyde yang selamat digunakan serta kesannya keatas tisu dan organ organisma seperti insang. Sistem yang digunakan adalah separa pembaharuan kerana tahap pemeluwapan formaldehyde yang tinggi. Daripada ujian yang telah dijalankan, nilai 96-jam LC₅₀ terhadap Ikan Keli Afrika (*Clarias gariepinus*) ialah 16.433ppm. Selain daripada itu, formaldehyde juga berkeupayaan mengurangkan kadar oksigen terlarut (DO) dan berdasarkan data yang diperolehi kadar DO telah menurun secara mendadak selari dengan peningkatan kepekatan formaldehyde yang digunakan. Parameter air yang lain pula tidak menunjukkan sebarang perhubungan yang jelas dengan kepekatan formaldehyde. Bagi pemerhatian insang, oleh kerana CPD tidak berfungsi maka kaedah analisa dengan SEM telah ditukar dengan pemerhatian menggunakan Motic Digital Compound Microscope. Walaupun kaedah pengawetan sampel tidak sesuai serta tahap pembesaran kanta yang terhad, sedikit perubahan insang masih dapat dilihat dimana ia menunjukkan tanda-tanda- mereput apabila semakin lama didedahkan dengan formaldehyde. Berdasarkan kajian ini, tahap formaldehyde yang selamat digunakan adalah 0.1 dari nilai 96-jam LC₅₀ iaitu 1.6433ppm. Walaubagaimanapun, kajian lanjut perlu dilakukan untuk kepastian yang lebih.