

DEVELOPMENT OF SEDIMENT COPPER TOXICITY  
TESTING FOR CHIRONOMID LARVAE

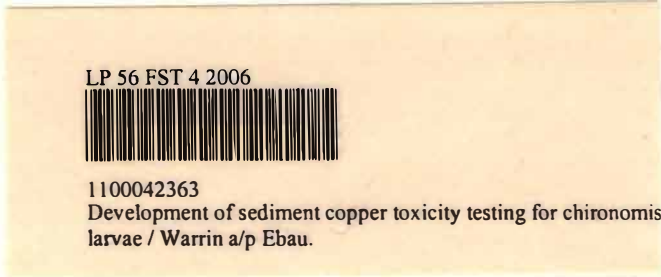
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Lihat sebelah

**DEVELOPMENT OF SEDIMENT COPPER TOXICITY TESTING FOR  
CHIRONOMID LARVAE**

**By**

**WARRIN A/P EBAU**

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

**Department of Marine Sciences  
Faculty of Science and Technology  
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**JABATAN SAINS SAMUDERA  
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**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK PENYELIDIKAN I DAN II**

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## TABLE OF CONTENT

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	<b>i</b>
<b>TABLE OF CONTENT</b>	<b>ii-iv</b>
<b>LIST OF TABLES</b>	<b>v</b>
<b>LIST OF FIGURES</b>	<b>vi</b>
<b>LIST OF ABBREVIATIONS/ SYMBOLS</b>	<b>vii-viii</b>
<b>LIST OF APPENDICES</b>	<b>ix</b>
<b>ABSTRAK</b>	<b>x</b>
<b>ABSTRACT</b>	<b>xi</b>
<b>CHAPTER</b>	
<b>1.0 INTRODUCTION</b>	<b>1</b>
1.1 Sediment Toxicology	1
1.2 Significance of study	4
1.3 Objectives	5
<b>2.0 LITERATURE REVIEW</b>	<b>6</b>
2.1 Introduction	6
2.2 Macroinvertebrates as toxicological tools	8
2.3 Sediment Pollution and bioaccumulation	10
2.4 The importance of pore-water in sediment toxicity studies	12
2.5 The test organisms with reference to the chironomids	13
2.6 Conclusion	18
<b>3.0 METHODOLOGY</b>	<b>19</b>
3.1 Reagents, apparatus and glassware	19
3.2 Preparation before sampling	19

3.3	Sediment Sampling, Handling and Storage	19
3.4	Sediment Characteristics	20
3.4.1	Hydrometer Method	21
3.4.2	Textural Triangular	23
3.5	Preparation of Stock Solution	23
3.5.1	Sediment Spiking	24
3.6	Copper Analysis	24
3.6.1	Pore Water	24
3.6.2	Sediments Digestion	25
3.7	Organism selection	25
3.7.1	Organism cultivation	26
3.8	Toxicity Experiments	26
3.8.1	Aquatic Toxicity Test	26
3.8.1.1	Primary Range Finding Test	27
3.8.1.2	Secondary range finding test	27
3.8.1.3	The 96 Hour LC50	27
3.8.2	Sediment Toxicity Test	28
3.9	Analysis of Data	28
3.9.1	Statistical analysis	29
3.10	Quality Assurance and Quality Control	29
3.10.1	Test Organism	29
3.10.2	Water	29
3.10.3	Replicate Samples	30
<b>4.0</b>	<b>RESULT</b>	<b>31</b>
4.1	Aquatic Copper Toxicity Test	31
4.2	Sedimentology	38
4.3	Sediment Toxicity	38
<b>5.0</b>	<b>DISCUSSION</b>	<b>45</b>



<b>6.0</b>	<b>CONCLUSION</b>	<b>52</b>
<b>7.0</b>	<b>REFERENCES</b>	<b>54</b>
	<b>APPENDICES</b>	<b>66</b>
	<b>CURRICULUM VITAE</b>	<b>72</b>

**LIST OF TABLES**

	<b>Page</b>
Table 2.5 : Taxonomy of <i>Chironomus tentans</i>	14
Table 4.1 : Summary of statistical data, showing the variability in LC50 values for 24 Hours, 48 Hours, 72 Hours and 96 Hours	36
Table 4.2 : Sediment composition	38
Table 4.3 : Cumulative mortality of clay loam experimental sediment after 96h	39
Table 4.4 : Cumulative mortality of sandy loam experimental sediment after 96h	39
Table 4.5 : The 96h LC50 values of the two type of experimental sediment	41
Table 4.6 : Nominal concentration in sediment and actual concentrations in overlying water, pore water and whole sediment for Clay loam	41
Table 4.7 : Nominal concentration in sediment and actual concentrations in overlying water, pore water and whole sediment for Sandy Loam	42
Table 4.8 : The summary of 96 Hours LC50 value	43

## LIST OF FIGURES

	<b>Page</b>
Figure 2.5 : Life Cycle of <i>Chironomus tentans</i>	16
Figure 4.1 : Summary of 96h LC50 values obtained for three different copper salts	31
Figure 4.2 : Mortality of <i>Chironomus tentans</i> in different concentration using Copper Chloride, Copper Sulphate, Copper Nitrate	33
Figure 4.3 : Mortality of <i>Chironomus tentans</i> in different concentration using Copper Sulphate	34
Figure 4.4 : Mortality of <i>Chironomus tentans</i> in different concentration using Copper Nitrate	35
Figure 4.5 : Summary of 96 Hours LC50 values obtained for all treatment	37
Figure 4.6 : Percent mortality of <i>Chironomus tentans</i> versus measured concentration of copper in dry sediments ( $\mu\text{g/g}$ ) clay loam and sandy loam of the 96-h sediment toxicity test.	40
Figure 4.7 : The summary of 96 Hours LC50 value	44

## LIST OF ABBREVIATIONS

### Abbreviation/symbol

AAS	Atomic Absorption System
ANOVA	Analysis of variance
LC50	Median Lethal Concentration
EC50	Median Effect Concentration
NOEC	No Observed Effect Concentration
IC50	Inhibition Concentration
LOEC	Lowest Observed Effect Concentration
BSAF	Biota-sediment Accumulation Factor
GPS	Global Positioning System
mg/L	Milligram per Liter
µg/L	Microgram per Liter
mg/kg	Milligram per Kilogram
e.g.	Examples
etc.	et cetera
Ø	Phi
mm	Milimeter
cm	Centimeter
m	Meter
s	Seconds
h	Hour
min	Minutes
mL	mililite

L	Liter
<sup>0</sup> C	Degree Celsius
g	Gram
ppm	Part per Million
rpm	Revolutions per Minute
USEPA	United States Environmental Protection Agency

## LIST OF APPENDICES

	<b>Page</b>
Appendix I Texture Triangle	66
Appendix II Hydrometer Method Worksheet	67
Appendix III T-test for 3 replicate of 96 h LC50 of Copper Chloride, Copper Sulphate, Copper Nitrate	69
Appendix IV One-way ANOVA analysis of 96 hours LC50 in three different salts	70
Appendix V One-way ANOVA analysis of 96 hours LC50 in clay loam sediment and sandy loam sediment	71

## ABSTRAK

Ujian ketoksikan terhadap 2 sampel sedimen jenis liat berloam dan pasir berloam yang mengandungi kuprum (Cu) dengan menggunakan biassay, *Chironomus tentans* dijalankan. Perbandingan dibuat antara ujian ketoksikan air, ujian ketoksikan sedimen dan ujian ketoksikan air dalam liang sedimen. Eksperimen juga dijalankan untuk menyiasat tentang “bioavailability” dan “bioaccumulation” logam kuprum oleh *Chironomus tentans* dan mengetahui lebih jelas lagi tentang faktor yang mempengaruhi “bioaccumulation” oleh organisma benthik. Ia juga bertujuan untuk menyediakan data-data awal ujian ketoksikan kuprum terhadap larva diptera daripada Malaysia ini. Dalam ujian ketoksikan air, penggunaan logam kuprum berlainan seperti Kuprum Klorida, Kuprum Sulfat dan Kuprum Nitrat menunjukkan tiada perbezaan dalam jumlah kematian. LC50 selepas 96 jam yang dicatatkan ialah 17.20 ppm, 18.55 ppm dan 18.21 ppm. Dalam ujian ketoksikan sedimen, hanya sedimen yang dicampurkan dengan Kuprum Sulfat digunakan dan ketoksikan LC50 96 jam yang diperolehi ialah 47.28 mg/kg untuk sedimen jenis liat berloam dan 46.40 mg/kg untuk sedimen jenis pasir berloam manakala merujuk kepada air liang sedimen, nilai ketoksikan adalah 17.34 ppm dan 18.97 ppm masing-masingnya.

## ABSTRACT

Toxicity of two copper spiked sediments, which is clay loam and sandy loam, were studied in bioassays using a midge, *Chironomus tentans*. Comparisons were made between aquatic test, sediment test and sediment pore water. Experiments were performed to investigate the bioavailability and bioaccumulation of copper by the freshwater bloodworm; *Chironomus tentans* to further understand the controls on bioaccumulation by benthic organisms. It is also to provide early copper toxicity database for this Malaysian Dipterian larvae. In aquatic test, the use of different copper salt, copper chloride, copper sulphate and copper nitrate showed no significant variation in mortality results. The 96h median lethal toxicity was 17.20 ppm, 18.55 ppm, and 18.21 ppm respectively. In sediment toxicity test, only copper sulphate spiked sediment was used and the median lethal concentration was found to be 47.28 mg/kg for clay loam sediment and 46.40 mg/kg for sandy loam sediment. With respect to pore water, the 96 h LC50 was 17.34 ppm and 18.97 ppm for clay loam sediment and sandy loam sediment respectively.