

THE EFFECT OF SUBSTRATE ON THE GROWTH OF *C. meningitis* sp.

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The effect of substrate on zinc toxicity towards Chironomus sp. /
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THE EFFECT OF SUBSTRATE ON ZINC TOXICITY TOWARDS
Chironomus sp.

Nurul Balkhis Binti Shaharim

Research report submitted in partial fulfillment of the requirement for the degree of
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FACULTY OF MARITIME AND MARINE SCIENCE
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**APPROVAL AND CERTIFICATION FORM
RESEARCH PROJECT REPORT I AND II**

I certify that the research report entitles: **The Effect of Substrate on Zinc toxicity towards *Chironomus sp.*** by **Nurul Balkhis binti Shaharim**, Matric No. **UK9732** have been read and all corrections recommended by the examiners have been done. This research report is submitted to the Department of Marine Science in partial fulfillment of the requirements for the degree of Bachelor of Science in Marine Science, Faculty of Maritime and Marine Science, Malaysian University of Terengganu.

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THIS THESIS DEDICATED TO
MY DEAREST PARENTS, BROTHER AND SISTERS, AND MY BELOVED
FOR THEIR ENDLESS LOVE, TRUST AND SUPPORT

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ABSTRACT

This study was carried out to determine the LC₅₀ value of zinc and to investigate how the substrate can affect the LC₅₀ value on the zinc toxicity towards *Chironomus sp.* The *Chironomus* larvae were exposed to 5 different concentration of zinc (20, 40, 60, 80, 100 ppm) and control for 96 hours in three different aquatic media – without substrate, with silica, with sediment. It was found that the median LC₅₀ of zinc was 30.7 mg/L in the aquatic medium without substrate, 52.2 mg/L in the aquatic medium with silica, and 34.7 mg/L in the aquatic medium with sediment. The experiments on the different substrate indicated that silica resulted in a significant reduction of zinc toxicity to the *Chironomus* larvae while the LC₅₀ value of zinc in the tests with sediment was similar to the tests in water only.

ABSTRAK

Kajian ini dijalankan untuk menentukan nilai LC_{50} untuk zink dan mengetahui dengan lebih lanjut bagaimana kehadiran substrat boleh mempengaruhi nilai LC_{50} bagi ketoksikan zink terhadap *Chironomus sp.* Larva-larva Chironomus didedahkan pada 5 jenis kepekatan zink klorida (20, 40, 60, 80, 100 ppm) dalam tiga jenis keadaan akuatik – tanpa substrat, dengan kehadiran silika, dengan kehadiran sedimen . Melalui kajian ini, didapati bahawa nilai median LC_{50} bagi zink ialah 30.7 mg/L (tanpa substrat), 52.2 mg/L (dengan kehadiran silika), dan 34.7 mg/L (dengan kehadiran sedimen). Eksperimen yang dijalankan terhadap dua jenis substrat ini telah menunjukkan bahawa kesan ketoksikan zink terhadap larva Chironomus semakin berkurangan dengan kehadiran silika berbanding sedimen kerana kadar ketoksikan zink dengan kehadiran sedimen adalah hampir sama dengan kadar ketoksikan zink tanpa kehadiran sebarang substrat.