

TUNICIN TEST OF FORMALDEHYDE ON POSTLARVAE
Pemphigus monoclonus

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TOXICITY TEST OF FORMALDEHYDE ON POSTLARVAE
Penaeus monodon

By

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Toxicity test of Formaldehyde on postlarvae *Penaeus monodon*

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LIST OF ABBREVIATIONS

%	-	Percentage
‰ @ ppt	-	part per thousand
°C	-	degree centigrade
APHA	-	American Public Health Association
BOD	-	Biological oxygen demand
Conc.	-	Concentration
DOE	-	Department of Environment
EC ₅₀	-	Mean effect concentration
IPCS	-	International Programme on Chemical Safety
LC ₅₀	-	Mean lethal concentration
Log	-	Logarithm
mg.L ⁻¹ @ mg/L	-	milligram per litre
mg.g ⁻¹ @ mg/g	-	milligram per gram
µg.g ⁻¹ @ µg/g	-	microgram per gram
mL.L ⁻¹	-	microlitre per litre
mg/kg @ mg.kg ⁻¹	-	milligram per kilogram
nm	-	nanometer
pH	-	potential of hydrogen
PL	-	Postlarvae
ppb	-	part per billion
ppm	-	part per million

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Abstract

Formaldehyde in the environment had been increased due to the usage of formaldehyde as effective chemotherapeutant and disinfectant in aquaculture, food and wood industries. *Penaeus monodon* is a highly marketable crustacean in Asian region. Hence, toxicity study of formaldehyde on postlarvae *Penaeus monodon* is urgently required. Static and renewal toxicity test for 12 hours period was employed due to the rapid lost of formaldehyde during the experiment. The lost was 30 – 70% in test solution for all concentrations. The mortality of postlarvae reaches 76.6% after exposed to 40.0 ppm of formaldehyde for 24 hours and reaches 100% after 72 hours. In this study, the mean 96 hrs LC₅₀ value of formaldehyde to *Penaeus monodon* for the first test was 7.82 mg.L⁻¹ with ranges between 7.00 and 9.45 mg.L⁻¹, while the mean 96 hrs LC₅₀ value obtained in second test was 7.11 mg.L⁻¹ ranges between 5.46 and 8.88 mg.L⁻¹. According to this study, the recommended safety level of formaldehyde for postlarvae *Penaeus monodon* is < 0.7 mg.L⁻¹. As a result, the use of formaldehyde should be within the recommended safety level to prevent adverse effect on *Penaeus monodon*.

Ujian ketoksikan Formaldehyde terhadap postlarva *Penaeus monodon*

Abstrak

Formaldehyde merupakan suatu bahan toksik yang telah wujud secara semulajadi. Akan tetapi, keberkesanan formaldehyde yang tinggi sebagai agen disinfeksi dan kemoterapi telah pun meningkat kepekannya dalam alam sekitar. Kegunaan formaldehyde adalah tinggi bagi industri aquakultur, pemakanan, penghasilan papan dan sebagainya. *Penaeus monodon* merupakan krustasia yang mempunyai pasaran yang tinggi di rantau Asia. Maka, ujian bioassay bagi formaldehyde atas postlarva *Penaeus monodon* telah didirikan. Ujian bioassay secara statik dan pembaharui dalam setiap 12 jam telah dipilih disebabkan kepekatan formaldehyde didapati menurun dengan cepat. Kepekatan formaldehyde telah hilang sebanyak 30 – 70% bagi semua kepekatan formaldehyde. Mortaliti postlarva mencapai 76.6% selepas 24 jam bagi postlarva yang terdedah kepada kepekatan formaldehyde sebanyak 40.0 ppm dengan seterusnya mencapai mortaliti sebanyak 100% selepas 72 jam. Ujian bioassay kali pertama menunjukkan purata 96 jam LC_{50} bagi formaldehyde atas postlarva *Penaeus monodon* sebanyak 7.82 mg.L^{-1} dalam lingkungan $7.00 - 9.45 \text{ mg.L}^{-1}$, manakala ujian bioassay kedua mempunyai purata 96 jam LC_{50} sebanyak 7.11 mg.L^{-1} dalam lingkungan $5.46 - 8.88 \text{ mg.L}^{-1}$. Berdasarkan keputusan ujian tersebut, had selamat bagi formaldehyde atas postlarva *Penaeus monodon* adalah kurang daripada 0.7 mg.L^{-1} . Dengan itu, kegunaan formaldehyde mesti dalam had selamat supaya mengelakkan postlarva *Penaeus monodon* daripada kemautan yang tinggi.