

CONCENTRATION OF ARSENIC AND MERCURY IN THE OYSTERS
(*Crassostrea iredalei*) FROM SETIU LAGOON, TERENGGANU

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FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
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iredalei) FROM SETIU LAGOON, TERENGGANU.**

By

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Istimewa Buat...

Ayahanda & Bonda Tercinta...

Bujang Saili Bin Sirat & Hadijah Binti Mohammed...

Adinda Tersayang...

Abisina, Bibi Afwah, Siti Yohana, Shaharniza,

Asrul Romdani, Shah Khawarizmi...



**JABATAN SAINS MARIN
FAKULTI PENGAJIAN MARITIM DAN SAINS MARIN
UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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ABSTRAK

Objektif kajian ini adalah untuk (1) menentukan kepekatan arsenik dan merkuri di dalam tiram dari Laguna Setiu, (2) menunjukkan korelasi di antara kepekatan arsenik dan merkuri di dalam tanah, tiram dan air, dan (3) membandingkan kepekatan arsenik dan merkuri dengan Akta Makanan Malaysia, 1983 untuk mengetahui sama ada tiram itu boleh dimakan atau tidak. Kepekatan arsenik di dalam tanah, tiram dan air dalam kajian ini adalah dalam lingkungan 9.00-36.10 $\mu\text{g/g}$, 8.20-43.90 $\mu\text{g/g}$ (berat kering) and 0.90-4.37 $\mu\text{g/L}$. Manakala kepekatan merkuri adalah dalam lingkungan 0.35-0.79 $\mu\text{g/g}$ dalam tanah, 0.60-0.90 $\mu\text{g/g}$ (berat kering) di dalam tiram dan 0.20-13.20 di dalam air. Terdapat korelasi di antara kandungan merkuri di dalam air dengan parameter kualiti air dan masa penyampelan. Manakala bagi arsenik, terdapat korelasi di antara tiram, tanah dan air. Berdasarkan statistik, terdapat korelasi yang rendah di antara tiram-tanah dan air-tanah. Manakala, bagi air-tiram, terdapat korelasi yang sederhana antara mereka ($P < 0.01$). BCF di dalam tiram/air adalah lebih tinggi berbanding tiram/tanah. Laguna Setiu telah didapati tercemar dengan arsenik dan merkuri. Ini kerana kualiti air telah melepasi had yang telah ditetapkan oleh WHO, 1993. Manakala bagi tanah pula, kandungan arsenic dan merkuri adalah lebih tinggi berbanding kandungan yang terdapat di dalam kerak bumi. Tiram di Stesyen 1, 3, 4 dan 5 tidak sesuai untuk di makan. Walaupun kandungan merkuri masih di bawah paras bahaya, namun, kepekatan arsenic telah melebihi had yang telah ditetapkan oleh Akta Makanan Malaysia 1983 iaitu $> 1.0 \mu\text{g/g}$ (berat basah).

ABSTRACT

The objectives of this study are (1) to determine the concentration of arsenic and mercury in the oysters from the Setiu Lagoon, (2) to show the relationship between the concentration of arsenic and mercury in the oysters, water and sediment and (3) to compare the concentration of the arsenic and mercury to the Malaysian Food Act 1983 safety level whether the oysters are safe for consumption. The arsenic concentration range in the sediment, oysters and water in this study were 9.00 to 36.10 $\mu\text{g/g}$, 8.20 to 43.90 $\mu\text{g/g}$ (dw) and 0.90 to 4.37 $\mu\text{g/L}$. While for the mercury concentration, there were in the range of 0.35 to 0.79 $\mu\text{g/g}$ in sediment, 0.60 to 0.90 $\mu\text{g/g}$ (dw) in oysters and 0.20 to 13.20 in water. As for the relationship, there were significant association of mercury in the water with the water quality parameter and the time of sampling. While for the arsenic concentration, the relationship between oysters, sediment and water were significantly correlated. There were low correlation between oyster-sediment and water-sediment. The oyster and the water show a moderate correlation ($P < 0.01$) between them. The BCF was higher in the oyster/water than oyster/sediment. Setiu Lagoon was contaminated by arsenic and mercury. The safety limits of the water were exceeding the limit that had been state by WHO, 1993. While for the sediment, the concentration of arsenic and mercury were too high than the earth crust. The oysters from Station 1, 3, 4 and 5 were not suitable for consumption. Even the mercury concentration were below the safety level, $< 0.5 \mu\text{g/g}$ (ww), however, the arsenic concentration was exceed the level regarded as harmful according to the Malaysian Food Act 1983 standards for metals in mollusks which was $> 1.0 \mu\text{g/g}$ (ww).