

DISTRIBUTION OF PETROLEUM HYDROCARBONS AND  
BACTERIA IN TERENGGANU RIVER ESTUARY,  
KUALA TERENGGANU

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**DISTRIBUTION OF PETROLEUM HYDROCARBONS AND BACTERIA IN  
TERENGGANU RIVER ESTUARY, KUALA TERENGGANU**

**BY  
YEOH BENG HOOI**

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## ABSTRAK

Kajian tentang taburan hidrokarbon petroleum dalam air dan sedimen di Muara Sungai Terengganu telah dikaji pada bulan Jun dan November 2002. Dua kali penyampelan (28/06/2002 dan 07/11/2002) telah dijalankan di 13 lokasi kajian yang terpilih.

Analisa statistik telah menunjukkan bahawa terdapat perbezaan yang ketara ( $p < 0.05$ ) dalam air dan sedimen di antara penyampelan pertama dan penyampelan kedua, tetapi tidak mempunyai perbezaan yang ketara ( $p > 0.05$ ) dikesan di antara station. Julat tahap hidrokarbon petroleum di perairan Muara Sungai Terengganu adalah di antara 28.619 – 439.588  $\mu\text{g.L}^{-1}$ . Min keseluruhan pada hidrokarbon pula ialah 203.032  $\mu\text{g.L}^{-1}$ . Walaubagaimanapun, julat kandungan hidrokarbon di dalam sedimennya adalah di antara 45.345 – 252.954  $\text{mg.kg}^{-1}$  sedimen kering dengan purata 136.073  $\text{mg.kg}^{-1}$  sedimen kering dalam sepanjang tempoh penyampelan. Keputusan daripada kajian ini menunjukkan bahawa air dan sedimen di Muara Sungai Terengganu telah dicemari hidrokarbon.

Perhubungan di antara tahap hidrokarbon petroleum, populasi bacteria pengurai hidrokarbon dan populasi bacteria heterotropik di Muara Sungai Terengganu telah dirumuskan. Satu kolerasi yang baik telah diperoleh di antara populasi bacteria pengurai hidrokarbon and populasi bacteria heterotropik melawan tahap hidrokarbon petroleum dalam air.

## ABSTRACT

The distribution of petroleum hydrocarbons in water and sediment of Terengganu River Estuary were studied during the months of June and November 2002. Two sampling trips (28/06/2002 and 07/11/2002) were conducted to all of the 13 sampling stations.

Statistical analysis revealed that there was a significant difference ( $p < 0.05$ ) of petroleum hydrocarbon levels in water and sediment between first samplings and second sampling, however no significant difference ( $p > 0.05$ ) was found between stations. The levels of petroleum hydrocarbon in the water of Terengganu River Estuary ranged between 28.62 – 439.59  $\mu\text{g.L}^{-1}$ . The overall mean of the hydrocarbons present was 203.03  $\mu\text{g.L}^{-1}$ . Whereas, the hydrocarbon contents in the sediment ranged between 45.35 – 252.95  $\text{mg.kg}^{-1}$  dry sediment, with an average of 136.07  $\text{mg.kg}^{-1}$  dry sediment throughout the samplings. Result from this study indicated that the water and sediment in Terengganu River Estuary was polluted with hydrocarbons.

The relationships among the petroleum hydrocarbon levels, the oil-degrading bacteria population and the heterotrophic bacteria population in Terengganu River Estuary were established. A good correlation was found between the oil-degrading bacteria population and heterotrophic bacteria population against petroleum hydrocarbon levels in water.