

DISTRIBUTION OF Cd, Cu, Pb AND Zn IN THE ESTUARY OF  
SUNGAI TERENGGANU IN RELATION TO SALINITY DURING  
THE PRE-MONSOON SEASON

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PRE-MONSOON SEASON

BY

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## **ABSTRAK**

Kandungan logam surih di dalam muara Sungai Terengganu telah ditentukan. Dua siri penyampelan telah dijalankan, iaitu pada 21 September and the 1 Oktober 1997. Sampel-sampel air telah diambil dari kedalaman 1 meter, dan telah dianalisa untuk logam terlarut dan partikulat. Logam-logam yang dikaji diukur menggunakan anodic stripping voltammetry (ASV). Pada penyampelan pertama, paras saliniti adalah antara 0.9 ke 4.1 ppt, suhu antara  $27.46^{\circ}\text{C}$  ke  $27.89^{\circ}\text{C}$ , oksigen terlarut antara 4.24 mg/l ke 5.02 mg/l, and pH antara 5.65 ke 6.06. Untuk penyampelan ini, jumlah logam terlarut adalah seperti berikut :  $1.52 \mu\text{g/l}$  -  $35.90 \mu\text{g/l}$  untuk zink,  $0.09 \mu\text{g/l}$  -  $1.78 \mu\text{g/l}$  untuk kadmium,  $1.61 \mu\text{g/l}$  -  $11.46 \mu\text{g/l}$  untuk plumbum dan  $1.00 \mu\text{g/l}$  -  $3.10 \mu\text{g/l}$  untuk kuprum. Jumlah logam partikulat adalah seperti berikut : tiada bacaan untuk zink,  $0.03 \mu\text{g/l}$  -  $1.60 \mu\text{g/l}$  untuk kadmium,  $0.27 \mu\text{g/l}$  -  $34.77 \mu\text{g/l}$  untuk plumbum dan  $0.25 \mu\text{g/l}$  -  $1.51 \mu\text{g/l}$  untuk kuprum. Untuk penyampelan kedua, paras saliniti adalah antara 3.0 ke 30.2 ppt, suhu antara  $29.60^{\circ}\text{C}$  ke  $31.01^{\circ}\text{C}$ , oksigen terlarut antara 4.28 mg/l ke 6.05 mg/l, and pH antara 6.61 to 8.22. Untuk penyampelan ini, jumlah logam terlarut adalah seperti berikut :  $2.0 \mu\text{g/l}$  -  $45.1 \mu\text{g/l}$  untuk zink,  $0.05 \mu\text{g/l}$  -  $1.17 \mu\text{g/l}$  untuk kadmium,  $0.17 \mu\text{g/l}$  -  $5.90 \mu\text{g/l}$  untuk plumbum and  $0.11 \mu\text{g/l}$  -  $51.50 \mu\text{g/l}$  untuk kuprum. Jumlah logam pertikulat adalah seperti berikut :  $9.17 \mu\text{g/l}$  -  $41.80 \mu\text{g/l}$  untuk zink,  $0.012 \mu\text{g/l}$  -  $1.46 \mu\text{g/l}$  untuk kadmium,  $0.64 \mu\text{g/l}$  -  $11.76 \mu\text{g/l}$  untuk plumbum dan  $0.47 \mu\text{g/l}$  -  $8.94 \mu\text{g/l}$  untuk kuprum. Kajian ini mendapati terdapat pelbagai kaitan antara kepekatan logam surih dengan saliniti semasa

kedua-dua siri penyampelan yang dijalankan. Zink selalunya wujud dalam keadaan terlarut manakala logam-logam lain mempunyai kaitan yang pelbagai dalam kedua-dua bentuk itu.

## ABSTRACT

Trace metal content of the estuary of Sungai Terengganu has been determined. Two samplings were done, on the 23<sup>rd</sup> of September and the 1<sup>st</sup> of October. Samples were taken 1 metre below the water level. All four metals were analysed for the dissolved and particulate forms, using anodic stripping voltammetry. During the first sampling, the salinity ranged from 0.9 to 4.1 ppt, temperature from 27.46°C to 27.89°C, dissolved oxygen from 4.24 mg/l to 5.02 mg/l, and pH from 5.65 to 6.06. During this sampling, total dissolved metal concentration was : 1.52 µg/l - 35.90 µg/l for zinc, 0.09 µg/l - 1.78 µg/l for cadmium, 1.61 µg/l - 11.46 µg/l for lead and 1.00 µg/l - 3.10 µg/l for copper. Total particulate metal concentration was : non-readable for zinc, 0.03 µg/l - 1.60 µg/l for cadmium, 0.27 µg/l - 34.77 µg/l for lead and 0.25 µg/l - 1.51 µg/l for copper. For the second sampling, the salinity ranged from 3.0 to 30.2 ppt, temperature from 29.60°C to 31.01°C, dissolved oxygen from 4.28 mg/l to 6.05 mg/l, and pH from 6.61 to 8.22. During this sampling, total dissolved metal concentration was : 2.0 µg/l - 45.1 µg/l for zinc, 0.05 µg/l - 1.17 µg/l for cadmium, 0.17µg/l - 5.90 µg/l for lead and 0.11 µg/l - 51.50 µg/l for copper. Total particulate metal concentration was : 9.17 µg/l - 41.80 µg/l for zinc, 0.012 µg/l - 1.46 µg/l for cadmium, 0.64 µg/l - 11.76 µg/l for lead and 0.47 µg/l - 8.94 µg/l for copper. This study revealed that there were various relationship between metal concentration and salinity during the two sampling periods. Zinc was present mostly in the dissolved form, while the other metals varied among the two phases.