

DISTRIBUTION AND CONCENTRATION OF ORGANOCHLORINE  
PESTICIDE IN THE AQUACULTURE CAGE-CULTURE AREA OF SETIU  
LAGOON, TERENGGANU

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2008



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LAGOON, TERENGGANU.**

**By**

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk **Distribution and Concentration of Organochlorine Pesticide in Aquaculture Cage-culture Area of Setiu Lagoon, Terengganu** oleh **Sulini binti Mamat**, No.Matrik **UK12443** telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperolehi **Ijazah Sarjana Muda Sains (Sains Samudera)**, Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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## LIST OF ABBREVIATIONS

SYMBOL	MEANING
OCPs	Organochlorine Pesticides
U.S	United State
EPA	Environmental Protection Agency
OCs	Organochlorines
DDT	Dichloro-Diphenyl-Trichloroethane
OPs	Organophosphate
HCH	Hexachlorocyclohexane
Na <sup>+</sup>	Ion Natrium
GABA	German American Business Association
LRT	Long-range Transport
BHC	Benzane hexaachloride
α	alpha
β	beta
δ	delta
γ	gamma
ε	epsilon
C <sub>12</sub> H <sub>8</sub> Cl <sub>6</sub> O	Endrin
N	North
E	East
GERG	Geochemical and Environmental Research Group
IS	Internal Standard
PCB	Polychlorinated biphenyl
TCMX	Tetrachloro-m-xylene
TEL	Total Extraction Lipid
GC	Gas chromatography
DCM	Dichloromethane
ECD	Electron Capture detection
GCIS	Gas Chromatography Internal Standard
C <sub>5</sub> H <sub>12</sub>	Petroleum ether
CH <sub>2</sub> Cl <sub>2</sub>	n-Hexane
TOC	Total Organic Carbon
K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	Pottasium Dichromate
V1	The Total of Dichromate used
V2	The Total of Ferum (II) sulphate used
ml	Milliliter
ng	Nanogram
g	gram
%	percentage
PSA	Particle Size Analysis
μm	Micrometer
°C	Degree Celsius
ppt	Part per thousand
H <sub>2</sub> O <sub>2</sub>	Hydrocarbon



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## ABSTRACT

The concentrations of sixteen compound of organochlorine pesticide (OCPs) were measured in the surface sediment and *Crassostrea sp.* collected from the aquaculture cage-culture area of the Setiu lagoon. The sampling was done two times in August 2007 during dry-season (Pre-monsoon) and beginning of the rainy season (monsoon) at November 2007. Sediment and oyster, samples were extracted using solid-liquid technique and pesticides determination using gas chromatography with electron capture detector (GC-ECD). The concentration of OCPs in the sediment during first sampling and second sampling were ranged 0.003-39.71 ng g<sup>-1</sup> and 0.27-192.74 ng g<sup>-1</sup> respectively. Meanwhile, for the *Crassostrea sp.* the total range concentration during first sampling was 0.03-434.33 ng g<sup>-1</sup> and for the second sampling was 0.001-28.80 ng g<sup>-1</sup> respectively. The OCPs compound fall into three major group mainly BHC, Cyclodiene and DDT. Each group had a different concentration for every station. The concentration of Cyclodiene group was higher compare to other groups. The concentration of OCPs was significant in the sediment between the dry-season and beginning at the rainy season (Anova (p<0.05)). As a conclusion, the concentration of OCPs in sediments and *Crassostrea sp.* for the both sampling was in the lowest concentration and not polluted.

# TABURAN DAN KEPEKATAN ORGANOKLORIN PESTICIDE DI DALAM KAWASAN AQUACULTURE SANGKAR TERAPUNG DI SETIU LAGOON, SETIU TERENGGANU

## ABSTRAK

Kepekatan enam belas jenis organoklorin pesticide (OCPs) ditentukan di dalam sedimen dan oyster yang diambil daripada kawasan akuakultur sangkar terapung di Setiu Wetland lagon. Persampelan telah dilakukan sebanyak dua kali iaitu pada Ogos 2007 ketika musim kering dan pada November 2007 ketika permulaan musim hujan. Sampel sedimen dan *Crassostrea sp.* diekstrak menggunakan teknik solid-liquid dan kepekatan pesticide ditentukan dengan menggunakan gas chromatography bersama pengesan electron (GC-ECD). Kepekatan OCPs di dalam sedimen semasa persampelan pertama dan kedua adalah masing-masing diantara  $0.003-39.71 \mu\text{g g}^{-1}$  dan  $0.27-125.63 \mu\text{g g}^{-1}$ . Manakala, untuk *Crassostrea sp.* jumlah kadar kepekatan OCPs semasa persampelan pertama adalah  $0.02-434.33 \mu\text{g g}^{-1}$  dan untuk persampelan kedua adalah  $0.001-22.71 \mu\text{g g}^{-1}$ . Kompoun OCPs boleh dibahagikan kepada tiga kumpulan besar iaitu BHC, Cyclodiene dan DDT. Setiap kumpulan mempunyai kepekatan yang berbeza bagi setiap station di dalam kawasan kajian. Kandungan kepekatan kumpulan Cyclodiene merupakan paling tinggi berbanding kumpulan lain. Kepekatan OCPs ada terdapat perbezaan di dalam sediment diantara musim kering dan permulaan musin hujan (Anova: ( $p < 0.05$ )). Sebagai kesimpulan, kepekatan OCPs di dalam sedimen dan *Crassostrea sp.* berada dalam kepekatan yang rendah dan tidak tercemar.