

BIOACCUMULATION OF ANTHRACENE IN  
*Pendaeus monodon* (Fabricius)  
THROUGH CONTAMINATED FEED

ONG PEI THING

MASTER OF SCIENCE  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI  
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THROUGH CONTAMINATED FEED**

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March 2005

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Faculty: Science and Technology

**ONG PEI THING**

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*Penaeus monodon* is able to accumulate anthracene through food ingestion. *Penaeus monodon* achieved steady state of anthracene accumulation within 5 to 15 days. Faster steady state of anthracene accumulation can be established when the shrimps were fed with higher anthracene content. Bioaccumulation factor (BAF) for anthracene in *Penaeus monodon* is  $7.71 \times 10^{-4} \pm 5.00 \times 10^{-4}$  which means *Penaeus monodon* only accumulated 0.1% of total anthracene content introduced. Uptake rate constant,  $k_1$  and depuration rate constant,  $k_2$  in this study are  $4.27 \times 10^{-4} \pm 2.55 \times 10^{-4} \text{ day}^{-1}$  and  $6.14 \times 10^{-1} \pm 1.16 \times 10^{-1} \text{ day}^{-1}$  respectively. *Penaeus monodon* started to have ruptured tissues on the shrimp after feeding with 100 mg/kg anthracene contaminated feed for 5 days. *Penaeus monodon* was able to eliminate anthracene within 10 days in a clean environment. This is most probably due to active cytochrome P450 mixed function oxygenase (MFO) system that speeds up excretion of accumulated anthracene in *Penaeus monodon*. In addition, *Penaeus monodon* also

have efficient detoxification ability through moulting. This could be observed from translocation trend of anthracene from head to shell in preparing for moulting process. *Penaeus monodon* is able to accumulate pyrene from 1000 mg/kg Tapis A crude oil. Pyrene is the highest concentration found compared to other PAH compounds detected in Tapis A crude oil. It contributed 25 mg/kg in the contaminated feed fed to the shrimps. Pyrene is the only compound accumulated in *Penaeus monodon*. Other PAHs were undetectable in the shrimps probably due to the low concentration in Tapis A crude oil. Similar trend of accumulation by pyrene as compared to anthracene on the whole shrimp was observed. *Penaeus monodon* samples from the culture ponds and South China Sea were low in hydrocarbons contamination and safe for human consumption.