

Pompan Silarat 2015: Heavy Metal Contamination Under Different Area Utilization Pattern and Possibility to Use Mollusc as an Indicator. Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Assistant Professor Suchai Worachananant, Ph.D. 151 pages.

Studies on water quality, sediment contamination and concentrations of heavy metals in the sediments, surrounding water and some aquatic animals in Map Ta Phut Industrial Estate, Rayong province, Thailand, were carried out in May (Dry Season) and August (Wet Season) 2011, and May (Dry Season) 2012. Samples from 20 stations were collected. The results demonstrated that concentrations of cadmium, lead, copper, zinc, manganese and iron in water bodies ranged between ND-0.004, 0.005-0.027, ND-0.176, 0.010-0.283, 0.005-0.055 and 0.005-0.075 mg/l, respectively. The concentrations of cadmium, lead, copper, zinc, manganese and iron in sediment also ranged between 0.12-2.07 1.34-9.71 0.70-14.93 6.12-100.13 13.66-451.12 and 243.62-2,524.70 mg/kg, respectively. Also in the case of cadmium, lead, copper, zinc, manganese and iron concentrations in *Perna viridis* ranged between ND-0.47, 0.08-0.32, 0.02-3.60, 0.43-60.23, 0.01-18.90 and 0.33-36.42 mg/kg, respectively. Cadmium, lead, copper, zinc, manganese and iron concentrations in *Donax* sp. ranged between ND-0.49, 0.06-4.55, 0.03-2.97, 1.26-90.00, 1.27-35.69 and 0.44-56.41 mg/kg, respectively. Regarding to cadmium, lead, copper, zinc, manganese and iron concentrations in *Babylonia areolata*, the values ranged between 0.01-0.60, 0.05-6.01, 0.05-6.67, 2.56-72.49, 0.02-4.14 and 0.29-37.35 mg/kg, respectively. The results of correlation analysis revealed that heavy metal concentrations in sediment were significantly difference among seasons and sites ($p < 0.05$) as same as those in water. Results also showed that concentrations of heavy metal in sites closed to industrial areas were higher than those in urban areas and referenced sites. Statistical analysis had been used to determine the possibility of using mollusc as bioindicator and results revealed that concentrations of heavy metal in sediment was correlated to those in *Perna viridis* (filter feeding habits). In the case of *Donax* sp., which is also filter feeder but dwelled in sediment, there were correlation between heavy metals concentration in tissues and those in water and sediment. Regarding to scavenging habits of *Babylonia areolata*, correlation of heavy metal concentrations in tissues and in sediments was also shown.

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