

Oning Veschasit 2008: Study on Water Quality and Heavy Metals in Water, Sediment and some Aquatic Plants in the Tha Chin River. Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Associate Professor Saran Petpiroon, Ph.D. 296 pages.

Studies on water quality, sediment quality and concentrations of heavy metals in the water, sediments and some aquatic plants in the Tha Chin River, Samutsakhon, Thailand, were carried out in March and November, 2005. Water samples from 38 stations were collected. The results demonstrated that the concentrations of ammonium-nitrogen, orthophosphate-phosphorus and chlorophyll *a* ranged between 1.26-152.48, ND-16.93 μM and 1.67-535.34 $\mu\text{g/l}$, respectively. The high concentration of nutrients and chlorophyll *a* which were higher than critical criteria indicate that the aquatic environmental deterioration of the Tha Chin River has become more serious in near future. Acid volatile sulfides of sediment ranged between ND-9.70 mg/g-dry weight. These values were also higher than critical values.

The results of heavy metal contents showed that cadmium, lead, copper and zinc in the water ranged between ND-0.05, ND-1.04, 0.01-1.20 and 0.16-7.47 mg/l, respectively. However, most of these heavy metals were still within the range of standard values, except for some stations that lead and copper concentrations were higher than standard values. In the case of zinc, higher concentrations than standard values were observed during wet season. Meanwhile, heavy metals in the sediments ranged between 0.59-10.43, 12.66-49.79, 5.75-293.57 and 29.45-553.52 mg/kg, respectively. However, these concentrations were lower than standard values. In the case of water morning glory, these heavy metals ranged between ND-0.22, ND-2.42, 0.69-8.42 and 18.83-94.09 mg/kg-dry weight, respectively, whereas, in water mimosa they ranged between ND-0.30, ND-1.50, 2.00-13.13 and 16.33-78.70 mg/kg-dry weight, respectively. Consequently, heavy metals in water morning glory and water mimosa mainly ranged within standard values, except for some stations that lead concentrations were higher than standard values. In addition, heavy metals in water, lead and zinc in water morning glory were significantly different among seasons ($p < 0.05$).

The results of correlation analysis revealed that most of heavy metals (except cadmium) in sediments had significant correlation with total organic matter of sediments. In addition, copper in water morning glory had positive correlation with copper in water. Overall results indicated that high contamination of heavy metals occurred at the lower zone of the river. Moreover, water mimosa accumulated heavy metals higher than water morning glory.

Student's signature

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