



The study of historical contamination of tin (Sn) in sediments at the Bang-Yai River estuary, Phuket Province

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Metal distribution and transportation in sediment is considered to be significant that can cause the adverse effects to human health and environment. Tin (Sn) and other metal contamination in the sediments at Bang-Yai River estuary, Phuket province, is a significant concern affected by the abandoned tin mining in the past. Percolation from the tailing ponds and the ground water discharges could result in contaminated ground water of the ponds to a nearby stream and receiving water. Tin is not very toxic to organism, however, the toxic form is the organic form. Organic tin can resist and not literally biodegradable in the environment for periods of time where it can spread through the water systems when adsorbed on sediment and are known to disturb growth, reproduction, enzymatic systems and feeding patterns of aquatic organisms. Tributyltins are the most toxic tin components to fish and fungi, whereas trifenylytin is much more toxic to phytoplankton. The exposure mainly takes place in the top layer of the water, as that is where organic tin compounds accumulate. Therefore, the objective of this study is to determine the pollution levels and the distribution of Sn in sediment cores in order to evaluate the pollution levels and the records of environmental changes of tin through the sediment profile. Two sediment cores were collected using a 30-cm long of Russian corer, sub-sampled into an interval of 1 cm thick using a stainless steel blade, digested using aqua regia digestion according to the Standard US EPA Method 3052 (1996), and analyzed by ICP-OES. The results showed that tin concentrations in all sediment samples are below detection limit (< 0.003 mg/kg). The geoaccumulation index (I_{geo}) and the enrichment factor (EF) values of Sn in the sediments cannot be found due to the very low tin concentration. This revealed that the study area was unpolluted and not enriched. However, the determination of other metals should be considered.

Keywords: Heavy metal; Phuket; Sediment; Tin mining