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Bio-Estimation of Selected Heavy Metals in Shellfish and Their Surrounding Environmental Media

Authors : Ebeed A. Saleh, Kadry M. Sadek, Safaa H. Ghorbal

Abstract : Due to the determination of the pollution status of fresh resources in the Egyptian territorial waters is very important for public health, this study was carried out to reveal the levels of heavy metals in the shellfish and their environment and its relation to the highly developed industrial activities in those areas. A total of 100 shellfish samples from the Rosetta, Edku, El-Maadiya, Abo-Kir and El-Max coasts [10 crustaceans (shrimp) and 10 mollusks (oysters)] were randomly collected from each coast. Additionally, 10 samples from both the water and the sediment were collected from each coast. Each collected sample was analyzed for cadmium, chromium, copper, lead and zinc residues using a Perkin Elmer atomic absorption spectrophotometer (AAS). The results showed that the levels of heavy metals were higher in the water and sediment from Abo-Kir. The heavy metal levels decreased successively for the Rosetta, Edku, El-Maadiya, and El-Max coasts, and the concentrations of heavy metals, except copper and zinc, in shellfish exhibited the same pattern. For the concentration of heavy metals in shellfish tissue, the highest was zinc and the concentrations decreased successively for copper, lead, chromium and cadmium for all coasts, except the Abo-Kir coast, where the chromium level was highest and the other metals decreased successively for zinc, copper, lead and cadmium. In Rosetta, chromium was higher only in the mollusks, while the level of this metal was lower in the crustaceans; this trend was observed at the Edku, El-Maadiya and El-Max coasts as well. Herein, we discuss the importance of such contamination for public health and the sources of shellfish contamination with heavy metals. We suggest measures to minimize and prevent these pollutants in the aquatic environment and, furthermore, how to protect humans from excessive intake.

Keywords : atomic absorption, heavy metals, sediment, shellfish, water
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