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Title: Bioaccumulation of Heavy Metals in the Volta Clam, *Galatea Paradoxa* (Born, 1778) in Relation to Their Geoaccumulation in Benthic Sediments of the Volta Estuary, Ghana

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Abstract: Heavy metal accumulation in aquatic ecosystems is a common phenomenon among bivalve filter feeders. This study was carried out over an 18-month period at Ada and Aveglo in Ghana, where intense clam fishing represents a major livelihood. The study sought to investigate the concentrations of some heavy metals, zinc, manganese, iron and mercury, in whole soft tissues of three different size classes of the Volta estuary clam, *Galatea paradoxa*, in relation to geoaccumulation of the metals in benthic sediments. The study also sought to examine whether the levels of the metals in clam tissues were within acceptable limits for human consumption. Clam sizes were categorised as small (25–40 mm) medium (41–55 mm) and large (above 55 mm) based on shell lengths and predominant sizes captured in the Volta estuary. Mercury levels in clams and sediments were determined using a Mercury Analyser while Zn, Mn and Fe were determined using an Atomic Absorption Spectrophotometer. Heavy metal concentrations in clams were within permissible limits with reference to WHO safety standards. There were no significant spatial differences ($p > 0.05$) in the concentrations of Mn, Zn, Fe and Hg in clams at Ada and Aveglo. No relationship was observed between heavy metal concentrations in clams and geo-sediments indicating that metal accumulation in clams may not be directly or solely derived from sediments but from other sources such as dissolved metals in the water and seston. Highly significant differences ($p < 0.0001$) were observed between the clam size-classes and sediment samples for iron. Total mercury concentrations showed highly significant variations ($p < 0.0001$) between all the clam size-classes and the sediment samples.

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