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Effect of Body Size and Food Quality on the Assimilation of ^{65}Zn and ^{110m}Ag in Bloody Cockles (*Anadara Senilis*) from Ghana

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In coastal ecosystems where bivalves are often exposed to metal contamination, dietary exposure has been recognised as a dominant uptake pathway of trace metals in bivalves. The present study employed radiotracers (^{65}Zn and ^{110m}Ag) to assess the assimilation efficiency (AE) of the two elements in Bloody cockles (*Anadara senilis*) from Narkwa Lagoon, Ghana. AE is an important parameter in determining bioavailability of trace elements from food. Zn and Ag bioavailability was assessed using single-feeding approach, followed by a 28-day depuration period, with two species of phytoplankton (*Isochrysis galbana* and *Skelotonema costatum*) used as food, and two different size groups of Bloody Cockles. Results indicate that AE of ^{65}Zn and ^{110m}Ag were influenced by the phytoplankton species used as food whereas, for both algal species, AE increased slightly with increasing cockle body size. Once taken up, ^{65}Zn was relatively strongly retained in cockle's flesh (biological half-life: ~40 days) whereas ^{110m}Ag was rapidly released (biological half-life: ~5 days). A complementary experiment -using subcellular partitioning and in vitro digestion method- was performed to provide additional information on the proportion of ^{65}Zn and ^{110m}Ag in the bloody cockle that is available for transfer to next trophic levels. Overall, this work highlighted that trace metal accumulation in marine filter feeders does depend on the metal bioavailability in food as well as on other biological factors, such as body size.

Country or International Organization

Ghana

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