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Modulation of Trace Metal Accumulation in the Liver and Intestine of Amphibian Host *Sclerophrys regularis* by the Enteric Parasite *Cosmocerca* spp. Sampled in Lagos Metropolis, Nigeria

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Abstract

Background

Recent studies have shown parasites as accumulation indicators that give critical information about the bioavailability of pollutants. To further buttress parasites in the assessment of metal sink potentials, the parasite *Cosmocerca* sp. was analyzed in a total of 168 host toads, *Sclerophrys regularis*, from three (3) study stations sampled around dumpsites and natural habitats in selected parts of Lagos Metropolis.

Method

Concentrations of Zn, Ni, Co, Cu, and Pb in the soil, parasite, intestine, and liver of toads at each location were analyzed using flame atomic absorption spectrometry.

Results

Comparison based on the concentrations of metals in *S. regularis* liver regardless of the collection site (dumpsite and natural habitat) showed that the most accumulated metal was zinc. Zinc significantly accumulated in the liver of the uninfected toad at the dumpsite, followed by the infected counterparts. There was also significant bioaccumulation of lead in the liver of the uninfected toads followed by the infected toads at the dumpsites. The accumulation of lead in the toads in their natural habitats was insignificant. The significant biota-sediment accumulation of copper in the liver was in the order of infected toad at dumpsite > infected toad at natural habitat > uninfected toad at habitat. Copper accumulation in the uninfected toad at the dumpsites was insignificant. As for cobalt, the significant biota-sediment accumulation in the liver was in the order of uninfected toad at dumpsite > infected toad at dumpsite > infected toad at habitat. Insignificant bioaccumulation occurred only in the uninfected toad at the natural habitat. A strong positive correlation (0.9546) between the concentrations of metals in the liver and the intestine indicated a common source of contamination and relatively proportional accumulation rates. Although there was a significant positive correlation between the concentrations of metals in the intestine and the parasites, a significantly negative correlation relationship, however, occurred between the concentrations of metals in the liver and the parasites.

Conclusions

This current study has demonstrated the possibility of employing *Cosmocerca* sp. as a bio-sink and bioindicator for zinc contamination. The parasites may therefore be promising in protecting *S. regularis* and safeguarding the health of the associated populace.

About this article

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