

Bioaccumulation of non-essential trace metals in tissues and organs of *Clarias gariepinus* (sharp-tooth catfish) from the Vaal River system – strontium, aluminium, lead and nickel

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Abstract

This is the first paper reporting on results obtained in a metal bioaccumulation study in the Vaal River system. It discusses concentrations of four non-essential elements (strontium, aluminium, lead and nickel) in water, sediment and various fish tissues. A second paper will report on concentration levels of the remaining five essential trace metals (chrome, copper, iron, manganese and zinc) studied. While heavy metals did accumulate in *C. gariepinus* tissues, no clear trends emerged with regard to differences between localities (Vaal Dam and Vaal River Barrage) or surveys. The highest non-essential element metal concentrations were generally recorded in gill (filaments and arches), followed by muscle, liver and lastly skin. This general trend appears to be in agreement with trends observed by other workers and reported in the literature. Variability in tissue metal concentrations in *C. gariepinus* within locality and seasons observed in this study is also reflected in results from available literature. This accentuates the importance of factors that influence the concentrations and bioavailability of trace metals.

Keywords: Heavy metal pollution, bioaccumulation, *Clarias gariepinus*, Vaal River Barrage, Vaal Dam, strontium, aluminium, lead, nickel