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BIOACCUMULATION OF TRACE ELEMENTS IN *Chrysichthys nigrodigitatus* (Lacépède, 1803) FROM THE LAKE TOGO-LAGOON OF ANÉHO COMPLEX, SOUTHERN TOGO

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Abstract

The phosphorite mining area is located in the Lake Togo watershed which contains the Lake Togo-Lagoon of Aného complex. These phosphorites are known to be highly concentrated in trace elements. This hydrosystem receives water inputs mainly from Haho, Zio and Mono Rivers. These rivers discharge their waters in the hydrosystem after leaching agricultural, urban and mining areas. This study aims to assess the contamination level of nine trace elements (Cd, Pb, Cr, Cu, Ni, Zn, Mn, Hg, and As) and their seasonal variability in *Chrysichthys nigrodigitatus*. Fish and water samples were collected from the lagoon complex during the rainy and dry seasons. These samples were analyzed for trace elements using an atomic absorption spectrometer method associated with a cold vapour and hydride generator. The average concentrations of trace elements in water (in µg/L) samples ranged from 0.38 for Hg to 141.63 for Pb. The average concentrations (in mg/kg) of Cd: 0.18, Pb: 1.93, Cr: 1.89, Ni: 0.88, Cu: 1.02, As: 0.39 and Mn: 5.06 in the muscles were significantly higher ($p < 0.0001$) than the permissible levels. The average concentrations of trace elements in the other organs (livers, gills and kidneys) were overall higher than the permissible levels ($p < 0.0001$). Seasonal variation of trace elements was observed in all the organs and was higher in the dry season ($0.001 > p < 0.05$). The highest contamination factors were as follow: muscle (Cd: 3.23), gills (Cd: 3.57), livers (Cr: 4.13) and kidneys (Cd: 3.69). Bioconcentration factors varied from 5.97 for Cd in the muscle to 8869.99 for Zn in the kidneys. These fishes are likely to cause toxicity effects to potential consumers. Therefore, it is necessary to protect this water ecosystem from further toxic element input.

Key words: Aného lagoon, bioaccumulation, *Chrysichthys nigrodigitatus*, lake Togo, trace elements

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