Heavy metals body burden and evaluation of human health risks in African catfish (*Clarias gariepinus*) from Imo River, Nigeria

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The purposes of this paper is to describe the body burden of heavy metals in the African Catfish (*Clarias gariepinus*) obtained from the Imo River in Nigeria and assess the potential non-carcinogenic health risk that might be caused by consuming this seafood. A questionnaire-based survey on dietary consumption rates of protein sources among residents of the area showed that catfish - fresh or dried accounted for 58% of total protein consumed, and over 90% of catfish sold in the area were caught in the local region of the River. The non-carcinogenic health risk from individual heavy metal and combined heavy metals due to dietary intake were evaluated by calculating the target hazard quotients (THQs), and hazard index (HI). The concentrations (mean ± sem in μg/g on dry weight basis) of heavy metals determined using AANALYST 400 Perkin-Elmer AAS were: (Cd: 0.125 ± 0.29, Cu: 0.24 ± 0.13, Zn: 2.33 ± 0.14, Ni: 1.12 ± 0.003, Pb: 0.74 ± 0.05, Fe: 4.85 ± 0.54) for edible tissue, (Cd: 0.47 ± 0.13, Cu: 0.13 ± 0.004, Zn: 4.08 ± 0.25, Ni: 1.53 ± 0.12, Pb: 1.24 ± 0.20, Fe: 14.64 ± 0.52) for gills and (Cd: 0.03 ± 0.004, Cu: 0.21 ± 0.009, Zn: 2.65 ± 0.06, Ni: 0.84 ± 0.03, Pb: 0.47 ± 0.007, Fe: 6.89 ± 0.38) for internal organs. The order of heavy metal concentration was; gills > edible tissue > internal organ for Cd, Zn, Ni and Pb; edible tissue > internal organ > gills for Cu and gills > internal organ > edible tissue for Fe. The body burden of heavy metal seems to be highest in gills and lowest in internal organs. Target hazard quotients (THQ) for individual heavy metal and the hazard index (HI) values determined based on the levels of Cd, Cu, Zn, Ni, Pb, and Fe were all less than one, indicating that health risk associated with the intake of a single heavy metal or combined metal through consumption of this catfish for children and adult is relatively low at the moment. However, due to the potential health hazard of heavy metals, the Imo River system requires monitoring and awareness creation to avert possible health risk.

Biography

Michael Horsfall Jnr is a Professor of Analytical Environmental Chemistry and Director, Central Instrument laboratory of the University of Port Harcourt. He received his PhD (1992) from the University of Port Harcourt and had his post-doctoral training at the Loughborough University, UK. He was a UNESCO research fellow to National University of La Plata, Argentina as well as Royal Society of Chemistry research fellow at the University of Aberdeen, Scotland. He has published more than 70 papers in peer-reviewed journals which receive currently more than 100 citations annually. Horsfall is the Executive Editor of the Journal of Applied Sciences & Environmental Management. He has attended several international conferences and given plenary or invited lectures in USA, UK, Ethiopia, Scotland, Egypt, Kenya, and Benin Republic. He has research collaboration with groups in Argentina, Scotland and Ethiopia. His current research area is trace metals speciation; production and optimization of activated carbon from agro-wastes for remediation of industrial and domestic effluents. Professor Horsfall presented the 81st inaugural lecturer of the University of Port Harcourt.

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