

ASSESSMENT OF HEAVY METALS IN SMOKE-DRIED FISH EXPOSED TO HIGHWAY VEHICULAR POLLUTION

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ABSTRACT

This study assessed levels of heavy metals (Cd, Cu, Cr, Pb, Ni, and Zn) in unexposed fresh (control) and smoke-dried Catfish (*Clarias anguillaris*) and Snakehead fish (*Parachanna obscura*) exposed and sold along Warri-Port Harcourt Expressway during rainy (September 2014) and dry (January 2015) seasonal peaks. Heavy metals were also examined in Ofubu Lake water where fish species were harvested before smoke-drying. Fish was smoked-dried, marked, and displayed for three weeks along roadside markets in Koloware and Patani in Patani (Delta State) and in Adagbabiri, Sagbama (Bayelsa State). All fish samples were prepared by digesting using standard analytical methods and analysed for heavy metal concentrations using an Atomic Absorption Spectrophotometer. Results showed concentration of heavy metals in the order: smoke-dried fish (exposed to traffic) > fresh fish (not-exposed) > water at both peak periods. Heavy metals recorded in both fish species were significantly higher ($P < 0.05$) in dry than rainy season peak. In smoke-dried Catfish, mean concentration for dry and rainy season peaks respectively were 8.78 and 5.91 mg/kg for Cu, 20.29 and 13.83 mg/kg for Cr, 4.04 and 2.64 mg/kg for Ni, and 21.44 and 14.66 mg/kg for Zn. In smoke-dried Snakehead, mean concentration for dry and rainy season peaks respectively were 8.84 and 5.72 mg/kg for Cu, 21.38 and 13.43 mg/kg for Cr, 3.95 and 2.55 mg/kg for Ni, and 21.72 and 13.93 mg/kg for Zn. Metals in smoke-dried samples were significantly higher ($P < 0.01$) than fresh samples at both seasonal peaks except for zinc. All metals, except Cd in smoke-dried samples of both fish species were above WHO safe limits while Cr and Ni levels were lower than USFDA safe limits. All metals in dry fish were also above FAO recommended limits, except Cu and Zn. The study suggests that exposed smoke-dried fish sold along Warri-Port Harcourt Expressway might therefore not be fit for human consumption. It advocates for a call to stop indecent exposure of fish to road traffic and also a close monitoring of metal pollution in water and fish of Ofubu Lake.

Key words: *Clarias anguillaris*, *Parachanna obscura*, heavy metal, smoke-dried fish, vehicular pollution