Chemosphere

Organochlorine pesticide levels in Clarias gariepinus from polluted freshwater impoundments in South Africa and associated human health risks

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ABSTRACT

There are increasing concerns regarding the safe human consumption of fish from polluted, freshwater impoundments. The aim of this study was to analyse the muscle tissue of the sharptooth catfish Clarias gariepinus for selected organo-chlorine pesticides (OCPs) and to perform a human health risk assessment using a standard protocol described by the United States Environmental Protection Agency (US EPA). Fish were collected from the polluted Roodeplaat-(RDPD), Rietvlei-(RVD) and Hartbeespoort (HBPD) Dam impoundments located in the north-eastern regions of South Africa. GC–MS analyses showed levels of various OCPs in fish muscle samples from all three impoundments. For fish collected from the RDPD, p,p0 -DDE, endosulfan, lindane and b- and d-HCH were the most prevalent OCPs detected, while p,p0 - DDE and endosulfan were the most predominant in fish from the RVD. Lindane and b- and d-HCH were the main OCPs detected in fish from the HBPD. Dieldrin was the only OCP detected at concentrations for which a cancer risk and a hazard index above the acceptable risk levels were estimated. This was the case for fish from both the RDPD and RVD impoundments. No toxic risk was estimated should fish from the HBPD be consumed.