

RISK ASSESSMENT OF ORGANOCHLORINE INSECTICIDES AND POLYCHLORINATED BIPHENYLS (PCB_s) ASSOCIATED WITH FISH CONSUMPTION BY FISHERMEN'S FAMILIES IN EDKU REGION, EGYPT

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Abstract

Persistent organic pollutants such as organochlorine compounds (OCC_s) and polychlorinated biphenyls (PCB_s) were monitored in ventral muscles of Bolti fish *Tilapia sp* collected seasonally during 2006/2007 from Edku Lake. The potential health risks imposed on community residents consuming fish, were the main target of the current study. The mean values of OCC_s residues were 69.71, 19.03, and 15.23 ppb for lindane, endosulfan, and heptachlor, respectively. Chronic daily intake (CDI) of the detected pollutants was estimated associated with fish consumption for adults and children at both 50th and 90th percentiles of probability. The highest values of CDI were recorded 2.37E-03, 6.40E-04 and 3.30E-04 mg. kg⁻¹.day⁻¹ for lindane, endosulfan and Σ PCB_s, respectively, among adults at 90th percentile. Adults are expected to be exposed to higher burden of risk than children *via* fish consumption where, risk values of OCC_s recorded were 6.58E-04 and 2.67E-03, while they were 1.31E-05 and 1.32E-04 for PCB_s at 50th and 90th percentiles, respectively.

Residents (either adults or children) may be at risk under the current exposure estimations since the predicted risk values exceeded the EPA threshold value (1.0E-04- 1.0E-06) particularly at 90th percentile. Furthermore, Total Target Hazard Quotient (TTHQ) showed a higher trend than unity (1.13-11.23) for adults and (0.66-5.08) among children at 50th and 90th percentiles. Risk factors must be prevented from this region, where the estimated risks were greater than unity resulting in adverse health effects, which may be associated with high fish consumption.

Keywords: Fish, organochlorine, polychlorinated biphenyls, risk estimation, Edku habitants.

INTRODUCTION

Persistent organic pollutants (POP_s) are chemicals that may persist for a long period of time in the environment. These chemicals are prone to long -range transport through the upper levels of atmosphere and can be deposited 1000 miles away from the pollution source. They

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are characterized by being lipophilic (high octanol-water partition coeffic-