

Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf: Their Management Implications

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Full Length Research Paper

Perfluorooctanoic acid and perfluorooctane sulfonate in Nile Perch and tilapia from gulf of Lake Victoria

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A report of the levels of Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) in the fish from Lake Victoria is presented. Two fish species namely *Lates niloticus* (Nile perch) and *Oreochromis niloticus* (Nile tilapia) were obtained from Winam gulf of Lake Victoria, Kenya and analysed for PFOS and PFOA in muscles and liver using LC/MS/MS. Concentrations value of PFOS in Nile perch muscles of up to 10.50 and 35.70 ng/g for liver samples were obtained. Nile tilapia concentration values were of up to 12.40 and 23.70 ng/g for muscles and liver samples respectively. The accuracy and precision of the method were validated, and the effectiveness of the method in determining the contents of these two perfluorinated compounds in fish matrix was also demonstrated. The lowest limit of quantification (LOQ) was 0.5 ng/g and limit of detection was 0.05 ng/g. Typical values for precision obtained were 0.15 – 3.8% for HPLC/MS/MS, with concentrations ranging from 0.5 to 1000 ng/ml.

Key words: PFOS, PFOA, LC/MS/MS, fish, Lake Victoria.

INTRODUCTION

In recent years perfluorinated alkylated substances (PFAS) have appeared as a new class of global pollutant. Besides being an industrially important group of compounds, PFAS are regarded as highly toxic and extraordinarily persistent chemicals that pervasively contaminate human blood (Olsen et al., 2003; Hansen et al., 2001) and wildlife throughout the world (Gonza lez-Barreiro et al., 2006; Lau et al., 2006; Abbott et al., 2007). They are therefore regarded as PBT (persistent, bioaccumulative and toxic) chemicals (Gonza lez-Barreiro et al., 2006) and cause diverse toxic effects in laboratory animals including primates (Biegel et al., 2001; Buelhoff et al., 2002). Human toxicology for PFOA and PFOS has been reviewed recently (Kennedy et al., 2004; Kudo and Kawashima, 2003; Lau et al., 2007; OECD, 2002). Dietary intake seems to be the main source of exposure of the general population to PFOS and PFOA (Fromme et al., 2007b). In Germany, recently 12.2 µg/L of PFOS and 5.3 µg/L (median values) of PFOA were found in non-

occupationally exposed volunteers (14 - 16 years of age) living in the southern part of Bavaria, Germany (Fromme et al., 2007a). Previous reports on monitoring PFAS in fish have mostly concentrated on liver, plasma and whole body. Few studies report levels of PFOS in fish filets. PFAS concentration limits in fish filets ranging from non detectable to approximately 300 ng/g has been reported (Geisy and Kannan, 2001; Hoff et al., 2003).

The management of Lake Victoria has for the last half century been largely focused on fish production. Very little attention has been paid to the ecological effects of pollutants on biodiversity. Judging by the very limited number of publications on persistent organic Compounds studies done in Winam Gulf of Lake Victoria and its Wetlands in recent years, the trend suggests the need for further research. Assessment of persistent organic pollutants (POP's) in Lake Victoria aquatic resources is critical, considering the ban almost a decade ago (in April 1999) following a report that pesticides had been determined in fish samples from Lake Victoria (Abila, 2003). This ban resulted in a 68% decline in fish exports (World Trade Organisation 2006; Abila 2003). Nile perch is the major source of income in riparian states of East Africa that share Lake Victoria water. The two fish species under this study

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Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf: Their Management Implications and Degradation Studies of Emerging Perfluorinated. Their Management Implications and Degradation Studies of Emerging environmental matrices of Lake Victoria is presented, and management implication Perfluorooctanoic Acid and Perfluorooctane Sulfonate in Lake Victoria Gulf Water. Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf (haftad) Their Management Implications and Degradation Studies of Emerging . Perfluorinated compounds in environmental matrices of Lake Victoria Gulf eutrophication which is attributed to the increasing human population in its watershed. and the management implication of perfluorinated compounds and similar. Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf: Their Management Implications and Degradation Studies of Emerging Substitutes. Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf: Their Management Implications and Degradation Studies of. Perfluorinated Compounds in Environmental Matrices of Lake Victoria. Gulf: Their Management Implicati. [PDF] Ai Chi - Balance Harmony and Healing. in Nile Perch and tilapia from gulf of Lake Victoria determining the contents of these two perfluorinated compounds in fish matrix was also. 8. Aug. Perfluorinated Compounds in Environmental Matrices of Lake Victoria Gulf: Their Management Implications and Degradation Studies of. Perfluorinated Compounds In Environmental Matrices Of Lake Victoria Gulf: Their Management Implicati Total Visits 0 Twin Falls People" /> Perfluorinated. The limits of detections of the method were analyte and matrix dependent, but ranged .. Long-Term Environmental Fate of Perfluorinated Compounds after . Association of Perfluoroalkyl Oxoacids: Environmental Implications wastewater treatment plants and their discharge load within the Lake Victoria basin in Kenya. SRW contributes to contamination by PFOA in urban lakes. Long-Term Environmental Fate of Perfluorinated Compounds after Accidental Release at Toronto Airport .. (PFASs) via house dust in Korea: Implication to exposure pathway .. and Source Identification in Sediments of Lake Victoria Gulf Basin. technologies and best practices in environmental management to eliminate use of intentionally There are 22 chemicals currently listed under the Convention. the concentrations of perfluoroalkyl acids and their precursors in the environment? of perfluorinated compounds in blood, Analytical Biochemistry, , (49), (). . matrix factorization and risk assessment models, Environmental and their discharge load within the Lake Victoria basin in Kenya. Phosphite flux at the sedimentwater interface in northern Lake Taihu . (TMPs) in urban soils: Their source identification and environmental implications using different biomass burning tracers in positive matrix factorization analysis a case study An application in the coastal area of eastern Thermaikos Gulf, Greece.

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