Lipid Contents, Classes, Fatty Acid Composition and the Levels of Heavy Metals in Some Selected Fish Species From Lake Victoria, Lake Turkana and River Tana in Kenya

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ABSTRACT

The consumption of marine natural products especially fish has many benefits such as Omega-3 fatty acids are important in growth, development and in preventing some diseases mentioned. Heavy metals are an important group of chemical contaminants and food is the major vehicle for entry into the system. In this research the levels of lipids, lipid classes, fatty acid composition and heavy metals in the fish species commonly found in selected Kenyan freshwaters were determined. Kenya has a long coastal strip, inland lakes and rivers, which provide the necessary sources of the various aquatic natural products. A total of twelve fish species were sampled from all regions as follows: two from Lake Turkana, six from Lake Victoria and four from river Tana. Folch method of lipid extraction was used for total extraction of lipids. Fatty acid compositions were determined using gas chromatography – flame ionization detector method in comparison with known standards. Concentration of heavy metals was evaluated using flame atomic absorption spectrophotometer. The mean total fish lipid contents ranged between 0.4 – 38.8 %. Triacylglycerol was the dominant lipid class ranging between 0.03% and 10.08 %. These were followed by the phosphatidylethanolamine ranging between 0.03% and 3.64 % while phosphatidylcholine ranged between 0.02 % and 0.73 %. The concentration ranges of Zn, Ni, Cu, Pb, and Cd in the fish were 0.170 – 0.667, 0.266 – 0.507, 0.010 – 0.419, 0.183 – 0.327 and 0.006 – 0.040 mg/kg, respectively. The present study showed that heavy metals were present in the samples at different levels but below the maximum residual levels prescribed by the EU and USFDA and that the fish and water from these areas, in general, were safe for human consumption.