DETERMINATION OF HEAVY METALS IN SEDIMENTS, FISH AND AQUATIC PLANTS FROM LAKE VICTORIA

By

ORATA FRANCIS
B.Sc Hons. University of Nairobi

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DECLARATION

This is my original work and has not been presented for a degree in any other university

Orata Francis

Department of chemistry

University of Nairobi

This thesis has been submitted for examination with our approval as University supervisors

Dr. John Mmari Onyari

Department of Chemistry

University of Nairobi

Prof. S.O Wandiga

Department of Chemistry

University of Nairobi

Mr. D. M. Maina

Director, Institute of Nuclear Science

University of Nairobi
ABSTRACT

Flame atomic absorption spectrophotometer and X-ray fluorescence technique were used to analyze cadmium, chromium, zinc, copper and lead in sediments, fish and aquatic plants from Lake Victoria. The requirements for complete digestion using different acid methods followed the American Public Health Association (APHA, 1992). A total of 110 fish, 132 sediments and 64 Plant samples were collected from various sites of lake Victoria namely; Nzoia, Kasat and Kasagam rivers, Mbita, Winam gulf and within Kisumu City. Samples investigated included fish species (Oreochromis niloticus, Barbus altanialis, Labeo victorianus and clarius gariepinus), water hyacinth and sediments. Assessment of heavy metals in the Nyalenda waste treatment ponds situated at Kisumu municipality was also done. Overall the concentrations in sediments varied from site to site and were found to be as follows; dry weight basis, 11.87 - 749.2 mgkg⁻¹ for copper, 0.50 - 1.998 mgkg⁻¹ for cadmium, 13.74 - 98.17 mgkg⁻¹ chromium, 58.79 - 453.8 mgkg⁻¹ for zinc, and 6.99 - 424.2 mgkg⁻¹ for lead. Increased concentrations were noted at certain localities suggesting anthropogenic inputs. The mean concentration values (wet weight basis) obtained in fish muscle (and scales) respectively were: 0.10 - 0.84 (0.412 - 6.11) mgkg⁻¹ for copper, ≤ 0.002 - 0.03 (0.00 - 1.608) mgkg⁻¹ for cadmium, 0.079 - 0.917 (0.16 - 3.42) mgkg⁻¹ for chromium, 0.951-41.88 (50.32 - 314.62) mgkg⁻¹ for zinc, and ≤ 0.02 - 2.97 (4.324 - 18.32) mgkg⁻¹ for Lead. Lead levels in clarius gariepinus from some fish samples exceeded WHO limit of 2.0 mg/kg⁻¹. The trace metal concentrations obtained in this study for sediments are higher