

Radiological Assessment of Fish Samples Due to Natural Radionuclides in River Yobe, North Eastern Nigeria

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Abstract : Assessment of natural radioactivity of some fish samples in river Yobe was conducted, using gamma spectroscopy method with NaI(Tl) detector. Radioactivity is phenomenon that leads to production of radiations, whereas radiation is known to trigger or induce cancer. The fish were analyzed to estimate the radioactivity (activity) concentrations due to natural radionuclides (Radium 222(226Ra), Thorium 232 (232Th) and Potassium 40 (40K)). The obtained result show that the activity concentration for (226Ra), in all the fish samples collected ranges from 15.23 ± 2.45 BqKg⁻¹ to 67.39 ± 2.13 BqKg⁻¹ with an average value of 34.13 ± 1.34 BqKg⁻¹. That of 232Th, ranges from 42.66 ± 0.81 BqKg⁻¹ to 201.18 ± 3.82 BqKg⁻¹, and the average value stands at 96.01 ± 3.82 BqKg⁻¹. The activity concentration for 40K, ranges between 243.3 ± 1.56 BqKg⁻¹ to 618.2 ± 2.81 BqKg⁻¹ and the average is 413.92 ± 1.7 BqKg⁻¹. This study indicated that average daily intake due to natural activity from the fish is valued at 0.913 Bq/day, 2.577Bq/day and 11.088 Bq/day for 226Ra, 232Th and 40K respectively. This shows that the activity concentration values for fish, shows a promising result with most of the fish activity concentrations been within the acceptable limits. However locations (F02, F07 and F12) fish, became outliers with significant values of 112.53 μ Svy⁻¹, 121.11 μ Svy⁻¹ and 114.32 μ Svy⁻¹ effective Dose. This could be attributed to variation in geological formations within the river as while as the feeding habits of these fish. The work shows that consumers of fish from River Yobe have no risk of radioactivity ingestion, even though no amount of radiation is assumed to be totally safe.

Keywords : radiation, radio-activity, dose, radionuclides, river Yobe

Conference Title : ICSR2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020