

Radioactivity Measurements in Coastal Sediments along the Mediterranean Sea - Egypt

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Naturally occurring radioactive material (NORM) is responsible for most of the radiation exposure of the population. Activity concentrations of naturally occurring U-238, Th-232, K-40, and in 99 sediment samples collected from Egyptian Mediterranean coasts were determined by neutron activation analysis. The average activity concentrations of U-238, Th-232, K-40 and were 10.35 ± 1.85 , 16.29 ± 4.35 , and 196.81 ± 10.25 Bq/kg, respectively. These concentrations are lower than in the upper continental crust (UCC) and shale. The highest levels of U-238 and Th-232 were observed at the Nile branches input to the Mediterranean Sea. The activities in the mouth of the Damietta branch estuary were 157.86 and 349.35 Bq/kg and in the mouth of the Rashid branch were 34.18 and 42.33 Bq/kg for U-238 and Th-232, respectively, which is higher than in the UCC and shale. The various hazard indices such as the radium equivalent, the gamma index, the external hazard as well as the internal hazard show a low radiological exposure with the exception of the area on the Damietta branch that discharges into the sea. The annual effective indoor dose is slightly higher than the dose limit (1 mSv) in the Damietta branch region was 1.428 mSv. The obtained results can serve as a baseline data for potential changes in the future.

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