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Estimation of the radiation dose rate in the Natural Occurring Radioactivity Materials of the gulf of Tunis sand.

Humans are exposed to ionizing radiation usually from Natural Occurring Radioactivity Materials (NORM) in soil, phosphate fertilizers, building materials, food and even to the elements of their own bodies. In order to study the dispersal process and activity concentration of the U-238, Th-232 and K-40 radionuclides on the coast of the entire Gulf of Tunis: This sedimentary area at the mouth of the Medjerda river is a source of residual NORM accumulation from the agricultural activity and eroded soil. In order to quantify these impacts on the Gulf beach sand in Tunis, analyses have been carried out which are composed of sand samples from zero to 10 cm depth with a mesh of 9 points every 0.5 km throughout 18Km, for a period of 3 months. Variations in gamma dose rates have been studied to determine the local dose flow environment. The average activity concentration of primary radionuclides U-238, Ra-226, Th-232 and K-40 in the range was 48, 5, 70 and 72 Bq/kg of sand, respectively.

The median dose rate in the air, observed at 1m above the sand, was 13 η Sv/h with a range of 4 to 236 η Sv/h. The equivalent annual effective dose was 0.01 mSv/year with a maximum of 0.28 mSv/year.

These results showed that NORM impact is negligible compared to those of international sites in the Mediterranean region.

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