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Radioactivity of sand in the coastal strip from Beruwala to Dondra, Sri Lanka

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All living beings on earth are continuously exposed to radiation from primordial radio nuclides ^{232}Th, ^{238}U and ^{40}K present in soils and sands. Due to their long half-lives these radionuclides remain in soils and sands for long periods of time contributing to the natural background radiation.

This study was carried out as a part of the island wide survey to measure the radioactivity levels in beaches around the country. The stretch covered in this study was from Beruwala to Dondra. A sand sample at each 1 km interval from Beruwala to Dondra was collected and activity concentrations of ^{232}Th, ^{238}U and ^{40}K were measured using gamma ray spectrometry. Based on the activity concentrations, the annual effective dose rates were calculated. At each sampling location the radiation dose rate at 1 m above ground was also measured using a portable survey meter.

The activity concentrations of sand ranged from 6 - 17058 Bq/kg for ^{232}Th, 3 - 3584 Bq/kg for ^{238}U and 3 - 1063 Bq/kg for ^{40}K. Measured gamma dose rates of the sampling locations varied from < 0.01 to 8.61 uSv/h. Annual effective gamma dose rates calculated ranged from 0.01 to 75.38 mSv/yr. The maximum activity concentration of all three radionuclide and the dose rate were measured at Dondra.

Keywords: Background Radiation, beach sand, gamma dose rate, activity concentration, gamma ray spectroscopy

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