

NATURAL OCCURRING RADIONUCLIDES IN NOVEL SAND BEACHES FROM ESPÍRITO SANTO, STATE, BRAZIL.

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ABSTRACT

Novel locations in Espírito Santo State, southeast Brazil, from the mouth of Itapemirim River (south of the state) to the mouth of the river Cricaré (upstate) were collected and the natural radioactivity in the beach sand samples was determined by measuring the ²²⁶Ra, ²³²Th and ⁴⁰K concentration. In these sands, the minerals from the silica group (white up to yellow) represent the major concentration and the tonal variation is a strong indication of an anomalous radioactive region. Sand samples tightly sealed in standard 100 mL HDPE flasks were measured by high resolution gamma spectrometry after a resting time of approximately 4 weeks before counting, in order to ensure secular equilibrium of natural uranium and thorium series. The ²²⁶Ra concentration was determined as the weighted mean from the average concentrations of ²¹⁴Pb and ²¹⁴Bi, the ²³²Th concentration was determined as the weighted mean from the average concentrations of ²²⁸Ac, ²¹²Pb and ²¹²Bi and the ⁴⁰K concentration by its single radiation of 1460 keV. The results show the higher concentrations for the south region (Marataizes), namely 860±70 Bq·kg⁻¹ for ²²⁶Ra, 2300±260 Bq·kg⁻¹ for ²³²Th and 270±40 Bq·kg⁻¹ for ⁴⁰K. For Great Vitoria central metropolitan region, the higher values were 3870±290 Bq·kg⁻¹ for ²²⁶Ra 11070±1960 Bq·kg⁻¹ for ²³²Th and 270±40 Bq·kg⁻¹ for ⁴⁰K. For the upstate region (Guriri), the higher values were 60±5 Bq·kg⁻¹ for ²²⁶Ra, 80±10 Bq·kg⁻¹ for ²³²Th and 110±10 Bq·kg⁻¹ for ⁴⁰K.

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