

Assessment of Gamma Radiation Exposure of Soils Associated with Granitic Rocks in Kapıdağ Peninsula, Turkey

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Abstract : The external terrestrial radiation exposure is related to the types of rock from which the soils originate. Higher radiation levels are associated with igneous rocks, such as granite, and lower levels with sedimentary rocks. Therefore, this study aims to assess the gamma radiation exposure of soils associated with granitic rocks in Kapıdağ Peninsula, Turkey. In the ongoing study, a comprehensive survey carried out systematically as a part of the environmental monitoring program on radiologic impact of the granitoid areas in Western Anatolia. The activity measurements of the gamma emitters (^{238}U , ^{232}Th and ^{40}K) in the surface soil samples and the granitic rocks carried out by means of NaI(Tl) gamma-ray spectrometry system. To evaluate the radiological hazard of the natural radioactivity, the absorbed dose rate (D), the annual effective dose rate (AED), the radium equivalent activity (Raeq) and the external (Hex) hazard index were calculated according to the UNSCEAR 2000 report. The corresponding absorbed dose rates in air from all natural radionuclides were always much lower than 200 nGy h⁻¹ and did not exceed the typical range of worldwide average values noticed in the UNSCEAR (2000) report. Furthermore, the correlation between soil and granitic rock samples were utilized, and external gamma radiation exposure distribution was mapped in Kapıdağ Peninsula.

Keywords : external absorbed dose, granitic rocks, Kapıdağ Peninsula, soil

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