



ASSESSMENT OF TERRESTRIAL GAMMA RADIATION DOSE IN GEOLOGICAL TOURIST ATTRACTIONS IN RATCHABURI PROVINCE, THAILAND

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Abstract:

Terrestrial gamma radiations are emitted from radionuclides found in rocks and soils in a natural. A gamma radiation dose depends on the geological features of the region. In regions where a geologic structure is composed of granites, exposures due to external radiation can be comparatively high. The present investigation aims to evaluate the natural background gamma dose rates and corresponding annual effective doses for geological tourist attractions comprising Granitic mountains (Som Maew Rapids and Boa Kleung Hotspring) and Permian limestones (Ratchaburi Grand Canyon, Khao Ngu Stone Park, Pong Krathing Hot Spring, Chompol Cave, and Khao Bin Cave) in Ratchaburi province, central Thailand. Outdoor gamma dose rates were measured 100 cm above the ground level using a Radiation Alert Ranger[®] Survey Meter. Two measurements at 60 minutes intervals were done at each location in August 2022. Results showed that the average gamma dose rate in Granitic mountains (0.46 ± 0.07 mSv/h) is higher than in the Permian limestones (0.19 ± 0.03 mSv/h). In addition, the annual effective dose would be considered in the study areas. The highest and lowest annual doses were 0.80 ± 0.12 mSv/y (Som Maew Rapids) and 0.23 ± 0.03 mSv/y (Ratchaburi Grand Canyon), respectively, which was lower than the dose from the public exposure limit recommended by the International Commission on Radiological Protection (1 mSv/y). The excess lifetime cancer risks (ELCR) were calculated to assess the radiological hazard, and it was found in the range of 0.95×10^{-3} to 3.34×10^{-3} . Suggest that the radiation level measured at these locations may not pose a health hazard.