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Assessment of Radioactivity Levels and Potential Radiation Health Hazards of Madsus Granites and Associated Dikes Nearby and Around Ruwisat Village, South Sinai, Egypt

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***Abstract*. Ruwisat village is located some 10 km northwest of Sharm El Sheikh town. This village is embracing basement rocks, mainly Madsus syenogranites and alkali Feldspar granites invaded by felsic dikes and surrounded by minor exposures of Miocene-Pliocene sedimentary rocks. New measurements data of this investigation aimed to study the assessment of potential internal and external radiation effects on human health around this village due to the irradiation from the granites and associated dikes. The field and laboratory measurements of sedimentary rocks ensured the absence of a considerable level of radioactivity (Sherif, 2011). For the Precambrian syenogranites and alkali feldspar granites, the potential health risk effects were investigated by calculating the different parameters, based on the activity concentration of ^{238}U, ^{232}Th, ^{226}Ra and ^{40}K in basement exposures determined by the gamma-ray spectrometry technique. The data analyzed for its statistical characteristics and the anomalies are evaluated in terms of depletion or enrichment processes. High-level calculated potential risk indices were observed at only very limited sites, along Ruwisat shear zones comprising felsic dikes of aplites that located far from touristic places of Sharm El Sheikh town, whereas at the locations of permanent population, the values were under the health hazard limits. In conclusion, in terms of long run possible radiation health hazard risk, the comparison of the health hazard indices calculation results by the limits showed that due to some of the local heterogeneities of the radionuclide distribution obtained from the study area. Reliable studies should be held for statistical information about cancers, average lifetime of people, typical health disease etc. An intensive coordination with the Ministry of Environmental Affairs of Egypt, the town planners and other responsible authorities' guarantees must take into consideration the recommendations of this study for regional land use planning.**

***Keywords*:** Ruwisat village, South Sinai, granites, dikes, radionuclide distribution, health hazard indices (Ra_{eq}, H_{ex}, H_{in}, AGED, Iγ, ELCR, ADRA, AEDE, Iα).

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1. Introduction

There are areas in the world where background radiation levels are abnormally high due to the high concentrations of radionuclides (eg.,Sunta, et al., 1982; Wei, et al., 1993; Sohrabi,1993; Bennett, 1997; Paul, et al.,1998; Paschoa, 2000; Sugahara , 2000; Ghiassi et al.,