ABSTRACT

The radioactivity levels of rocks sampled from the quarries of Kyasioni, Mavoloni and Kathaana located in the lower Eastern County of Machakos in Kenya were determined. Forty-two samples were collected using stratified random sampling and analysed using NaI(TI) detector with a specially designed lead shield. The parametric values of activity concentration, absorbed dose, annual dose rate and hazard indices were estimated using activity-dose relations suggested in UNSCEAR and ICRP reports. The mean activity concentration for the entire work for 238U (226Ra), 232Th and 40K were 68.33 ± 3.11, 101.10 ± 1.83 and 1084.02 ± 30.28 Bq/kg, respectively. Kyasioni quarry presented the highest activity concentration of 74.75 ± 3.15, 118.48 ± 1.91 and 1120.35 ± 30.07 Bq/kg for 226Ra, 232Th and 40K, respectively. The average annual effective dose was estimated as 0.58 ± 0.01, 0.47 ± 0.01 and 0.52 ± 0.01 mSv/y for Kyasioni, Kathaana and Mavoloni quarries, respectively. Other radiological parameters estimated from the corresponding activities were within the recommended limits hence guaranteeing safety to the users.