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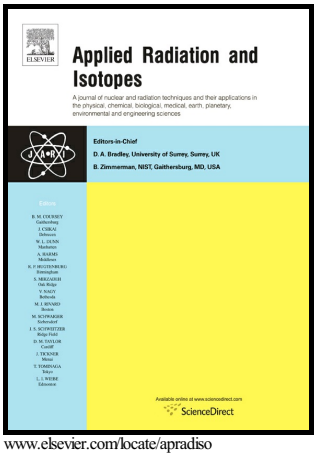

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The hematological and biochemical changes in rats exposed to britholite mineral

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Abstract

The present study was to investigate the alteration of biochemical and hematological parameters on the rats exposed to natural radiation caused by britholite mineral (REE, Ca, $Na)_5$ $[(Si,P)O_4]_3(OH,F)$ within 15 days. Britholite was collected from Kuluncak mining area, Malatya, bearing radioactive ^{232}Th isotope (average 2.68% ThO_2), which is nadir earth elements found high amounts. Britholite is toxic for the living animal and human and emits the radiation to natural surroundings about 0.8 R/h due to its radioactive ^{232}Th properties. In this study, animals were divided to two groups, one groups exposed to ^{232}Th, the other group was served as control group. All animals were fed with same food and water during the experimental study (15 days). After 15 days, the hematologic and biochemical parameters (Na, K, Ca, P, Cl, Mg, glucose, cholesterol, HDL, LDL, albumin, Uric acid, AST, ALT, total protein, Fe, urea and creatine level and hormonal parameters (TSH, T3 and T4) were analyzed The levels of serum triglyceride in the ionizing radiation group generated by 232Th isotope ($p<0.05$) statistically significantly increased compared with control group value. Lymphocytes, TSH, T3 and T4 decreased in the ionizing radiation group generated by 232Th isotope while neutrophils increased in the ionizing radiation group generated by 232Th isotope. The rats exposed to ionizing radiation generated by ^{232}Th isotope caused significant changes in the hematological and biochemical parameters and the most significantly alteration was observed in the thyroid hormonal levels, which might be due to high radiation doses within short time. These results should be kept in mind to maintain healthy life in people who lives in britholite mineral vicinity.

Keywords: Britholite, ^{232}Th, biochemical, hematologic analysis, radiation