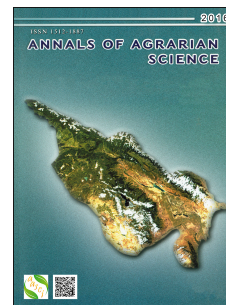


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## Radioactivity of soils in Mtskheta-Mtianeti region (Georgia)

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### ABSTRACT

One of the main problems in the sphere of ecological researches is natural and technogenic environmental radioactivity. The purpose of the given work was radioactivity determination in various types of soil within the territory of Mtskheta-Mtianeti region (Georgia). Samples in 17 control points have been selected within this territory (soil types - mountain forest meadow, brown forest acid, and others). Up to 22 radionuclides were identified in these samples. Concentration of radionuclides of Th-232 family (in total 6 identified radionuclides) was in limits from 17.6 to 54.9 Bq/kg with average value of 26.9 Bq/kg, U-238 family (in total 7 radionuclides) – from 14.9 to 59.1 Bq/kg with average value of 25.4 Bq/kg, U-235 family (in total 6 radionuclides) - from 0.65 to 2.7 Bq/kg with average value of 1.2 Bq/kg. Also individual radionuclides have been identified – Be-7 (activity concentration from less than minimal detectable activity to 23.1 Bq/kg with average value of 10.5 Bq/kg), K-40 (from 243 to 784 Bq/kg with average value of 464 Bq/kg) and Cs-137 (from 0.3 to 53.3 Bq/kg with average value of 21.7 Bq/kg). Radium equivalent activity varied from 59.4 to 168 Bq/kg with average value of 94.9 Bq/kg, thus the greatest values were observed for mountain forest meadow and cinnamonic light soils, and the least value - for brown forest acid, alluvial carbonate and cinnamonic soils. Annual effective dose varied from 0.036 to 0.104 mSv/y with average value of 0.058 mSv/y. There were marked some features of radionuclides distribution, in particular, depending on the type of soil and sampling point's location. Several activity ratios of radionuclides were considered, in particular,  $U-238/U-235$ ,  $U-238/Th-232$ ,  $Ra-226/U-238$  and  $Pb-210/Ra-226$  (in the last case there were observed appreciable deviations in the greater way from equilibrium value – up to 8.73 with average value of 4.15, at the same time appreciable qualitative correlation with features of geotectonic structure was marked). Comparison with reference data was carried out.

**Keywords:** Radionuclides, Soils, Activity concentration, Activity ratio, Radiation dose; Radioactivity.

### 1. Introduction

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