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Radioactivity in Virgin Soils and Soils from Some Areas with Closed Uranium Mining Facilities in Bulgaria

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The soil radioecology is an important part of the environmental research in the country. Since the beginning of the 1970's regular monitoring of the content of different radionuclides in Bulgarian soils has been done. Objective of the studies were virgin soils from high mountain areas, hills and plains (the region of Kozloduy NPP and the Danube river valley). Natural and men-made radionuclides were observed. In the 25-year period after the the contamination with radionuclides due to the 1986 Chernobyl NPP accident a rich data base has been collected, recording the radiation status of the soils in Bulgaria. Special attention has been paid to the contamination with the long-lived technogenic radionuclides caesium-137 and strontium-90. This paper presents a summary of the obtained results.

Caesium-137 and strontium-90 were the main men-made radionuclides detected in the examined Bulgarian soils few years after the Chernobyl NPP accident. Their content in the soils from high mountain areas (Rodopa and Rila mountains) is several times higher than that in the soils from North Bulgaria and Sofia fields. High non-homogenity in the pollution within small areas (even as small as several square meters) has been observed.
Natural radioactivity was also studied. Averaged values for natural radionuclides like uranium-238, thorium-232, and radium-226 in virgin soils from different areas in the country are presented. A comparison of the dynamics of their behavior throughout the years is done. Bulgaria is a country with intensive uranium mining activities in the past years. That is why radiological monitoring of closed uranium mining facilities in different regions of the country are obligatory and of great interest. This work presents results from such investigations made in regions where remediation has been done. The results have been evaluated according to the Bulgarian radionuclide environment contamination legislation. The necessity of permanent environmental monitoring is assessed.