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Distribution of radiocesium in soil and biomass of oak ecosystems in Bulgaria after the Chernobyl accident

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The radiocaesium is characterized by a long-term impact on forest ecosystems determined by the fact that the isotope could be found in all compartments of these ecosystems. The forest vegetation has great capacity to catch radioactive deposits and to retain these deposits for a very long time. This study focuses on radiocaesium contamination, expressed in active concentration of the element (Bq.kg-1), in different compartments of the aboveground biomass (leaves, branches, bark and timber), in forest floor and in soil of representative oak forest ecosystems from the region of South Bulgaria affected by the Chernobyl accident (1986).
The study shows that the radicaesium is mainly accumulated in bark of oak trees. The contamination of bark is 5 to 7 times higher than in other organs of studied trees. The highest contamination of bark is detected at distance of 1,3 m from the basis of the trunk (18-23 Bq.kg-1). In comparison with other organs of oaks the timber is low contaminated and the active concentration of caesium-137 varies from 0,8 to 1,5 Bq.kg-1. The presence of caesium in branches, leaves and timber, formed after 1986 shows that the main mechanism for contamination of trees is the root uptake. It is established that after Chernobyl accident 44% from Cs-137 in oak forest ecosystem is accumulated in forest floor layers and 30% in the superficial 0-5 cm of mineral soil. The peak in caesium-137 active concentration in forest floor has moved to the lower AoF layer. The major part of the Chernobyl radiocaesium accumulated in the topsoil is insoluble in water and its vertical migration in soil is very slow.