



## **Analysis of Cs-137 spatial distribution in forest soils of mountainous regions in Bulgaria**

M Zhiyanski,(1) **J. Bech (2)**, M Sokolovska (3), E Lucot (4), A. Lansac (5)

1Forest Research institute- BAS, 132, "Kl. Ohridski" Blvd., 1756 Sofia, BULGARIA

mariagrozeva@hotmail.com

2 Soil Science Chair. Fac of Biology Univ. Barcelona, Av. Diagonal 645, 08028 Barcelona  
SPAIN jbech@ub.edu

3 Laboratory of Environmental Biology, University of Franche-Comte, 2 Pl. Leclerc, 25030  
Besancon, FRANCE

The functional characteristics of forest soils in the mountainous regions of Bulgaria were analyzed in order to obtain a better understanding of radio cesium existence in soil. The aim of this paper is to describe the spatial variability of Cs-137 contamination in forest soils in relation to regional and local characteristics. The mountainous regions of Bulgaria are very extents and due to the Tschernobyl accident in 1986 are polluted non-homogeneously with radio nuclides. The present study shows that the radio cesium is located in the upper 0-5 cm of forest soils and in a few cases the maximum activity was determined at a depth of 5-10 cm in deep soil layers. The density of Cs-137 contamination in the Rila Mountain varies from 0,92 to 7,1 kBq/m<sup>2</sup>, while in the central Balkan regions the registered density varies from 1,3 to 21,2 kBq/m<sup>2</sup>. The obtained data shows that the spatial distribution of radioactivity is strongly related to altitude. Areas made up of different types of vegetation were compared and on the basis of the estimated factor of accumulation (FA) it was determined that coniferous vegetation was extremely efficient in taking up and retaining radio cesium for long periods of time, in comparison with broadleaves and meadow (herbaceous) vegetation. The FA for conifers in the Rila Mountain is 0, 39-0, 62 and in the Central Balkans the FA was between 0, 24 and 0, 92. Due to their low clay content and the high content of organic matter, these mountain forest soils can be considered an excellent eco system in which to study the mobility and behavior of Cs-137 and its transfer into

the soil-plant system. Due to the high levels of radio cesium contamination within the mountainous regions of the Central Balkans and the characteristics of these forest soils, the high mountain pastures located in this region, in the authors opinion, could be considered as risk zones.