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Assessment of radiation and chemical risk in soils by radiometric and radioanalytical methods

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Chernobyl and other nuclear accidents have demonstrated that high levels of radiation can result in impacts on plants and animals, however little is known about the long-term effects of chronic exposure on biodiversity or other population and ecosystem level effects.

The overall aim of this study is to assess the impacts of chronic exposure to radioactivity and chemical pollutants. The study area on the Eastern Black Sea Region, Turkey has metal mining (Fe, Au, Ag, Mn, Mo, Cu, Pb and Zn) and industrial facilities, having elevated levels of both heavy metals, and affected the fallout of radionuclides after Chernobyl. Results for radiation and chemical pollution were obtained from the analysis of soil samples taken from 6 sites. All soil samples were measured for gamma, beta and alpha activities. Also, elemental concentrations of soil samples were determined by instrumental neutron activation analysis and X-ray fluorescence analysis.

In summary, to assess radiation and chemical pollution risk, the possible impact of long-term behaviour of the radionuclides and elements in soil should be taken into consideration. This type of study does however need to provide regional background levels for these important radioactive and chemical pollutants. Additional studies will be performed to estimate the exposure for the diversity and plants from radioactive and chemical pollutants.

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