Soil trophic interactions under radio contamination : an in-situ study in the Fukushima cedar forest.

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Résumé

The soil ecosystem provides important services such as carbon storage, which is studied through ecological functions including the recycling of organic matter. This ecological function is made possible by the fragile equilibrium of the soil food web and the interactions between the decomposer, detritivore, and predator organisms. However, this equilibrium and the functionality of soils are now seriously threatened by climate change, soil erosion and pollution. Radioactive pollution has been present in the Chernobyl and Fukushima regions for more than 35 years and 13 years respectively, but paradoxically the impact of this radioactive pollution on the relationship between biodiversity, ecosystem functions, and global change has hardly been studied. To address these challenges, in the summer 2024, we studied on 5 experimental plots within 6 cedar forests along a gradient of *in situ* radioactive contamination Fukushima Prefecture (Japan). Here, we investigated the effect of Cesium radio contamination on the abundance, biomass, and functional traits of each of the groups making up the soil food web (macrofauna, mesofauna, microfauna and microorganisms), as well as on the enzymatic activities involved in organic matter mineralization (fluorescein diacetate hydrolase, phosphatase, amylase ...) and C cycle. Relationships between radio contamination levels, soil organisms and ecosystem functioning were established using structural equation models. We expect that soil biodiversity (species richness, abundance) will be reduced in forest most contaminated, that the contamination will alter soils organisms' activities, reduce trophic networks- interaction and then C cycle.

Mots-Clés: Soil functions, Soil biodiversity, Nutrient cycling, Radioecology, Japan

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