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First national reference of microplastic contamination of french soils and the need for further monitoring

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4. Soil health in achieving the Sustainable Development Goals 4.27 133609 - How will we monitor soils in the coming century?

FIRST NATIONAL REFERENCE OF MICROPLASTIC CONTAMINATION OF FRENCH SOILS AND THE NEED FOR FURTHER MONITORING

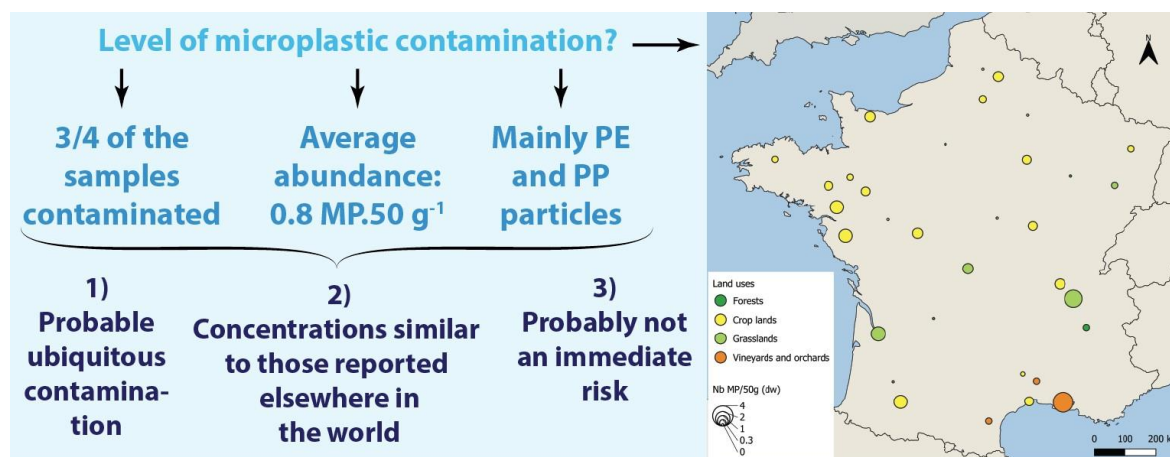
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The recent emergence of studies on plastic contamination of terrestrial environments has revealed the presence of microplastics (MP) in a variety of soil types, from the most densely populated areas to the most remote ones. However, the concentrations and chemical natures of MP in soils vary between studies, and only a few ones have focused on this issue in France.

The MICROSOF project aimed to establish the first national reference to French soil contamination by microplastics. Microplastics were analyzed in thirty-three soil samples selected from the French soil quality monitoring network, mostly among agricultural areas but not only. The study collected data on the abundance of microplastics in the [315 - 5000] μm range, their chemical nature and size, as well as mass abundance estimates and other relevant information. Results demonstrated that 76% of the soil samples contained microplastics, in concentrations ranging from < 6.7 to 80 MP.kg^{-1} (dry soil). Most samples from croplands, grasslands and vineyards and orchards were contaminated, whereas only one sample from forest contained MP, suggesting an increased risk of microplastic contamination in soils exposed to agricultural practices. The MP abundances were not statistically different from similar studies, indicating an intermediate level of contamination in French soils. Despite the information collected from farmers about their agricultural practices through intervention reports and surveys, the sources of microplastics in soils remained unclear questioning the transfer and behavior of those contaminants in the environment. Thanks to the support of ADEME, this study gave, for the first time, an overview of soil contamination by microplastics in France, as well as the potential risks. It also advocates for an integration of microplastics analysis on national soil monitoring programs to better apprehend the presence of those compounds in soil and their potential threats to ecosystems and humans.



Keywords: Microplastics, Soil contamination, Microplastic extraction, Soil monitoring, France