
The MicroSof project: study of microplastic contamination in soil samples from 33 different sites in France

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Abstract

To date, the majority of the research on microplastics (MP) has focused on the marine environment. The pollution of continental ecosystems is comparatively little studied, even though the majority of all plastics is used and disposed on land. The main sources of plastic in soils include land application of contaminated sewage sludge and compost, plastic mulching, wastewater irrigation, atmospheric deposition, littering and surface runoff (1). However, estimates of MP concentrations and chemical natures are still limited and differ between studies. In France, only a few studies have tackled the issue of MP contamination in soils.

The MicroSof project aims to establish first national references on the contamination of French soils by microplastics. To do so, soil samples from 33 different sites under different land uses were analyzed (crop lands, forests, grasslands and vineyard/orchards). After pre-treatment and subsampling, the samples were digested with Fenton's reagent following the methodology outlined by Hurley *et al.* (2018) (2). MP were then extracted by density separation with a sodium iodide (NaI) solution. The study then allowed to quantify (number) and to qualify (chemical nature) the accumulated plastic fragments, as well as the size and the shape of these fragments.

(1) M. Bläsing et W. Amelung, "Plastics in soil: Analytical methods and possible sources", *Science of The Total Environment*, vol. 612, p. 422-435, janv. 2018, doi: 10.1016/j.scitotenv.2017.08.086.

(2) R. R. Hurley, A. L. Lusher, M. Olsen, et L. Nizzetto, "Validation of a Method for Extracting Microplastics from Complex, Organic-Rich, Environmental Matrices", *Environ. Sci. Technol.*, vol. 52, no 13, p. 7409-7417, juill. 2018, doi: 10.1021/acs.est.8b01517.

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