Endosulfan, pentachlorobenzene and short-chain chlorinated paraffins in background soils from Western Europe.

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         Soil Pollutants - analysis

Abstract: Soils are major reservoirs for many persistent organic pollutants (POPs). In this study, "newly" regulated POPs i.e. Sendosulfans (a-endosulfan, ß-endosulfan, endosulfan sulfate), pentachlorobenzene (PeCB), and short-chain chlorinated paraffins (SCCPs) were determined in background samples from woodland (WL) and grassland (GL) surface soil, collected along an existing latitudinal UK-Norway transect. Statistical analysis, complemented with plots showing the predicted equilibrium distribution and mobility potential, was then explored to discuss factors controlling their spatial distribution. SCCPs were detected with the highest average concentrations (35 ± 100 ng/g soil organic matter (SOM)), followed by Sendosulfans (3 ± 3 ng/g SOM) and PeCB (1 ± 1 ng/g SOM). PeCB and Sendosulfans share many similarities in their distribution in these background soils as well as with several legacy POPs. A steep decline in concentrations of SCCPs with increasing latitude indicates that their occurrence is dictated by proximity to source regions, while concentrations of Sendosulfans peaked in regions experiencing elevated precipitation rates.

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Indigenous 14C-phenanthrene biodegradation in "pristine" woodland and grassland soils from Norway and the United Kingdom.

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Abstract: In this study, the indigenous microbial mineralisation of 14C-phenanthrene in seven background soils (four from Norwegian woodland and three from the UK (two grasslands and one woodland)) was investigated. 7PAHs ranged from 16.39 to 285.54 ng g-1 dw soil. Lag phases (time before 14C-phenanthrene mineralisation reached 5%) were longer in all of the Norwegian soils and correlated positively with TOC, but negatively with 7PAHs and phenanthrene degraders for all soils. 14C-phenanthrene mineralisation in the soils varied due to physicochemical properties. The results show that indigenous microorganisms can adapt to 14C-phenanthrene mineralisation following diffuse PAH contamination. Considering the potential of soil as a secondary PAH source, these findings highlight the important role of indigenous microflora in the processing of PAHs in the environment.

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