

Leaves contaminate soil with hydrocarbon

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In the autumn, leaves fall and contaminate soil, according to a study conducted by scientists at Ca' Foscari University of Venice and The Institute for the Dynamics of Environmental Processes (CNR) in collaboration with the Società estense servizi ambientali, a specialized company based in Padua. It happens in woods where clearing the land is required by law for heavy hydrocarbon concentration greater than 50 milligrams per kilo.

The researchers have identified natural hydrocarbons in woods and farmlands that had been fertilized with artificial fertilizer, compost or digestate in the past 10 years. Soil samples showed high levels of hydrocarbons, especially for samples taken in the woods with concentrations that reached up to four times the legal limit.

Foliage is to blame for this contamination. "The surface of the leaves is covered with waxes containing hydrocarbons, and when they fall, they contaminate the soil," explained Marco Vecchiato, post-doc fellow at the Department of Environmental Sciences, Informatics and Statistics at Ca' Foscari. "But even if this concentration appears to be higher than legal limits, it does not necessarily entail toxicity hazard."

The research was published in *Environmental Science and Technology Letters*, and represents a first step in analyzing a topic relevant to environmental protection, analytical chemistry methods and environmental legislation. "The levels and typology of analyzed hydrocarbons suggest a plant origin for farmland as well. But legislation considers the levels per se and makes no distinction between natural

occurrence and cases of contamination," says Vecchiato.

What would be the solution? In other countries the limits are set at higher levels, but the key seems to be the quality of the analytical method, which must be as detailed as possible without being too expensive or complicated. The research suggests alternatives to tell the difference between natural occurrence (led by leaves, fungi or bacteria) and contamination from hydrocarbons derived from petroleum. With a specially designed test, the researchers could distinguish a 'signal' left by foliage and one left by diesel or mineral oil leakage.

More information: Marco Vecchiato et al, Plant Residues as Direct and Indirect Sources of Hydrocarbons in Soils: Current Issues and Legal Implications, *Environmental Science & Technology Letters* (2017). [DOI: 10.1021/acs.estlett.7b00464](https://doi.org/10.1021/acs.estlett.7b00464)

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