

Study shows soil pollution in urban green spaces and natural areas is similar

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Microplastic debris. Credit: Roberto Ruiz (UA)

An international study shows that soil in urban green spaces and natural areas share similar levels of multiple contaminants such as metals, pesticides, microplastics and antibiotic resistance genes around the

world. Soil contamination is one of the main threats to the health and sustainability of ecosystems.

The work, carried out by more than 40 authors from research centers and universities in Spain, China, Switzerland, Australia, Germany, Chile, South Africa, Nigeria, France, Portugal, Slovenia, Mexico, the United States, Brazil, India and Israel, was recently published in *Nature Communications*. The team has collaborated with ecologist Carlos Sanz Lázaro and Nuria Casado Coy, researchers at the Ramón Margalef Multidisciplinary Institute for Environmental Studies (IMEM), and experts in the study of plastic and bioplastic pollution.

The [environmental stress](#) associated with soil pollution, whether of natural origin or caused by humans, can directly affect biodiversity and further compromise the resistance and resilience of ecosystems in the face of climate change and [natural disasters](#), as explained by Carlos Sanz Lázaro.

As the article reports, soil pollution is currently associated with vehicle emissions, industrial processes, pesticide treatment and plant diseases, as well as poor waste management. It is therefore to be expected that [urban green spaces](#) are more influenced by pollutants than natural ecosystems, which are geographically distant from human activities. However, the study has shown that hazardous pollutants (metals, pesticides, microplastics and [antibiotic resistance genes](#)) can be dispersed by [air transport](#), uncontrolled waste disposal and even rainwater running off the surface of a piece of land and into natural ecosystems.

This work is relevant because it provides evidence of a quantitative comparison of soil pollutants in urban and natural areas on six continents, according to the University of Alicante (UA) ecologist.

The case of microplastics

Microplastics, typical pollutants of anthropogenic (human) origin, are also ubiquitous in soils of urban green spaces and [natural ecosystems](#) around the world. Surprisingly, as reported by Sanz Lázaro, they have found similar proportions of the form and polymer type of microplastics in natural areas and urban green spaces, which further supports the idea of a spread of anthropogenic pollutants through ecosystems. These microplastics, often originating from cities, affect distant areas by atmospheric transport, with fibers being the main form of plastic particles suspended in the atmosphere in cities such as Paris, London and Dongguan (China). The fibers generally consist of polyester and polypropylene from synthetic fabrics, ropes, and nets.

The advance of pollutants is such that, as detailed in the article, the soils of remote Antarctica also have microplastics. This could be related to the dispersal of microplastics from Antarctic research stations and other continents by sea and air, and by other activities such as tourism that can contribute to the accumulation of microplastics in the soils of Antarctic sites. As concluded by the UA researcher, the results of this international research show that the level and characteristics of microplastics in [natural areas](#) match those present in urban parks and gardens in terrestrial ecosystems around the world.

More information: Yu-Rong Liu et al, Soil contamination in nearby natural areas mirrors that in urban greenspaces worldwide, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-37428-6](https://doi.org/10.1038/s41467-023-37428-6)

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