ESR24-012 - Targeting microplastic detoxification mechanisms for urban soil health

Zusammenfassung

Healthy soil supports human well-being by providing ecosystem services e.g., food production and water purification. The presence of microplastic (MP) contamination, a result of anthropogenic activities, threatens soil health and functionality. Despite the severity of these threats, the subject of MP contamination in soil is largely unexplored. To mitigate MP risks, soil amendment application has been proposed to potentially immobilize MP and reduce its toxicity in soil and thus food supply chain. However, its mechanisms remain unclear. Accordingly, the project will focus on urban soil, a significant reservoir of MP contamination. It will extensively characterize MP and its toxicity in a set of soils from community gardens in Vienna and surrounding forests. The project will undertake a comprehensive mechanistic study on MP toxicity in soil and plants through ecotoxicological test and a pot experiment with soil amendment application. It will also examine MP effect on soil health and potential degradation by native soil microbes. The aim is to gain a comprehensive understanding of the mechanisms on MP toxicology and its mitigation in soil and plants, thereby advancing MP amelioration strategies to restore soil health and minimize environmental and human risks. This requires the interdisciplinarity of soil science, material science, and toxicology. The project will include dissemination of its findings and workshops to promote societal participation and gender equality.

Wissenschaftliche Disziplinen:
Soil science (40%) | Material sciences (25%) | Ecotoxicology (35%)

Keywords:
Urban soilSoil amendmentMicroplastic contaminationEcotoxicologyMelioration processesSoil microbiome

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Status: Vertrag in Vorbereitung

Weiterführende Links zu den beteiligten Personen und zum Projekt finden Sie unter
https://wwtf.at/funding/programmes/esr/ESR24-012/