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 and other environmental compartments. 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 plant-soil interface through ecotoxicological test and a pot experiment with soil amendment application. It will also examine MP effect on soil health and soil microbiome, a key driver in many soil processes and potential to degrade MP in the soil. The aim is to gain a comprehensive understanding of the mechanisms on MP toxicology and its mitigation in the soil-plant interface, thereby advancing MP amelioration strategies to improve soil health and minimize environmental and human risks. This requires the interdisciplinarity of soil science, material science, and ecotoxicology. The project will encourage participation of stakeholders, particularly the gardeners in MP investigation, and include dissemination of the project's findings and workshops to promote societal participation and inclusivity. This will increase public awareness of MP contamination, mitigation and avoidance, along with soil health concern in Viennese urban soil context. Availability of the data generated in the project in open access database repository will support for meta- and relevant study as well as urban soil management.

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

Keywords:
Urban soilSoil amendmentMicroplastic contaminationEcotoxicologyMelioriation processesSoil microbiome

---

Principal Investigator:	Katharina Keiblinger
Institution:	BOKU - University of Natural Resources and Life Sciences
Co-Principal Investigator(s):	Harald Rennhofer (BOKU - University of Natural Resources and Life Sciences) Elisabeth Simbï¿½ck (Fachhochschule Technikum Wien)

Status: Vertrag in Vorbereitung

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