



The functional influence of soil fauna on chemistry and physics of urban soils

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In terrestrial ecosystems, soil fauna plays a major role in the processes of organic matter turnover, cycling of nutrients and the development of soil physical characteristics. Within the multidisciplinary research group INTERURBAN (DFG 409), the project FAUNA aims at identifying and characterizing the functional impact of soil faunal activity on turnover processes in urban soils. We postulate that since different species of soil animals differ in their functional traits, the dynamics of water and organic matter at urban locations is influenced by the specific composition of the involved faunal community.

In experiments with microcosms of different complexity, we assessed the impact of short food chains with varying combinations of soil faunal species on organic matter transformation, the release of nutrients and the mobilization of heavy metals.

Since the outcome of field studies of the INTERURBAN research group stressed the importance of heterogeneous hydrophobic soil areas on transport processes through preferential flow, we upgraded from a laboratory investigation scale to field surveys through the set up of field mesocosms. Here we studied how the burrowing activity of earthworms and the mixing of soil particles with excretion products may modify the structure of the soil horizons, the water distribution dynamics and the patterns of nutrient release.

The soil fauna of urban habitats greatly contributes to the processes of nutrient turnover, chemical mobilization and storage and the formation of spatially heteroge-

neous soil properties at urban locations. Furthermore, our results illustrate the limits of functionality of the soil faunal community in urban systems in respect to additional anthropogenic pressure, like soil desiccation or compaction.