Belowground – aboveground interactions

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Abstract
Soils harbor a unique diversity of biota on small spatial scales. Due to the close spatial coupling species are interacting in complex ways, but these interactions are little understood until today. Novel techniques including stable isotope, fatty acid and molecular gut content analyses allow insight into the structure of soil food webs in unprecedented detail. This is essential to understand the multitude of ways how detritivore invertebrates interact in soil but also with plants and the aboveground world. The talk will introduce these complex interactions and the methodologies which allow insight into the tight coupling between the below- and aboveground system. Soil invertebrates form an important component of the rhizosphere of plants thereby affecting plant growth and plant performance in a multitude of typically beneficial ways. Further, many detritivore invertebrates serve as prey for predators of both the below- and aboveground system thereby potentially fostering the control of herbivore pest species. Overall, soil invertebrates serve essential ecosystem functions including decomposition of organic matter, recycling of nutrients, plant growth, priming plants against insect herbivores and fostering plant protection against herbivores via strengthening their control by predators. The talk advocates for the appreciation of the fundamental importance of soil microarthropods for the structure and functioning of virtually any terrestrial ecosystem and proposes them as model organisms to investigate belowground – aboveground interrelationships.