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ACTIVITY OF EXTRACELLULAR ENZYMES OF SOILS AS A MONITORING TOOL

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ABSTRACT

Assessment and monitoring requirements of soil quality have been debated for many years at European and Global level. The loss of soil biodiversity is recognised as being of great importance as it is essential for ecosystem functioning and because it crucial for ecosystem function like primary productivity, decomposition of organic matter, nutrient cycling, water infiltration, creation of soil aggregates, stability of soil structures, dynamics of the soil food webs and suppression of pests. The microbial community is considered the main driver of most of these soil functions. To measure the activity and diversity of the microbial community a number of methods can be applied, including catabolic activity investigated by Biolog-plating, respiration of different substrates as investigated by MicroResp and activity of extracellular soil enzymes. Soil hydrolytic enzymes originate mainly from fungi and bacteria and are of importance for decomposition of many labile organic substrates, thus having pivotal importance for biogeochemical cycling. Their activity reflects the functional diversity and activity of the microorganisms involved in decomposition processes, which are essential processes for soil functioning and soil ecosystem services. We will present the potential activity of eight hydrolytic extracellular enzymes on 79 sites from five different climatic zones with three different land-uses of varying physicochemical characteristics from across Europe and at six sites where different soil treatments are contrasted. The results for hydrolytic extracellular enzyme activity will be related to climatic zones and land-use as well as soil properties and microbial activity to evaluate if this knowledge can be used in relation to monitoring soil quality.



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