



ASSESSMENT OF SOIL MICROBIAL DIVERSITY WITH FUNCTIONAL MULTI-ENDPOINT METHODS

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Soil microbial diversity provides the cornerstone for support of soil ecosystem services by key roles in soil organic matter turnover, carbon sequestration and water infiltration. However, standardized methods to quantify the multitude of microbial functions in soils are lacking. Methods based on CO₂ development by the microbes such as substrate induced respiration (SIR) on specific substrates have lead to the development of MicroResp™ and Community Level Physiological Profile (CLPP) with Biolog™ plates, and soil enzymatic activity assayed by Extracellular Enzyme Activity (EEA) based on MUF-substrates. These methods have been proposed to fill the gap. The techniques vary in how close they are to in situ functions; dependency on growth during incubation; and whether it is only bacteria or also fungi and /or extracellular enzymes. Also they vary in the functions tested and the number of functions. In addition to the lack of principle methods, the data obtained from these substitute methods are currently not used in classification and assessment schemes, making quantification of natural capital and ecosystems services of the soil a difficult venture.

In this contribution, we compare and contrast the three techniques of assessing soil microbial functional diversity in a European transect consisting of 81 soil samples covering five Biogeographical Zones and three land-uses and compare with the vast





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amount of data delivered in other projects (BISQ, RMQS-bioindicateur). Based on experimental results with these methods, microbiological reasoning and ecological theory, we will perform a qualitative comparison between the multi endpoint methods of determining soil microbial communities functional diversity, and will suggest standardized classification and assessment options for practical application and data assessment.

