



Impact of seasonal variation on soil bacterial diversity and ecosystem functioning

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Soil biodiversity boosts the functioning of the ecosystem thereby contributing to the provision of various ecosystem services. Understanding the link between biodiversity and ecosystem functioning and their reaction to environmental heterogeneity can maximize the contribution of soil microbes to ecosystem services. The diversity, abundance and function of microorganisms can be altered by seasonal variation. There is a dearth of information on how soil biodiversity respond to environmental changes. The impact of seasonal variation on bacterial communities and its effects on soil functioning in four South African forests was investigated. The samples were analysed for pH, moisture content, total carbon and nitrogen, soil nitrate and extractable phosphate. High-throughput sequencing and quantitative PCR were used to determine the diversity and abundance of bacteria. Community level physiological profiles (CLPPs) were measured using the MicroRespTM method. Enzyme activities were additionally used as proxy for ecosystem functions. The functional genes for nitrification and phosphate solubilisation were also measured. Seasonal variation has strong effects on bacterial communities and consequently soil processes. A reduction in biodiversity has direct results on soil ecosystem functioning.