

Microbial dynamics in Mediterranean Moder humus

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Abstract

There is a growing interest in the links between humus forms and soil biota, and little is known about these links in Mediterranean ecosystems. Culture-independent techniques, such as DNA extraction followed by DGGE and enzyme activities, allowed us to compare microbial communities in two horizons of a forest soil in different seasonal conditions. Direct in situ lysis was applied for extraction of DNA from soil; intracellular DNA was separated from extracellular and used to represent the composition of microflora. The aims were to describe how biochemical and microbiological parameters correlate with topsoil properties in typical Mediterranean Moder humus. Changes in bacterial and fungal community composition were evident from DGGE profiles. Degrees of similarity and clustering correlation coefficients showed that the seasonal conditions may affect the composition and activity of bacterial and fungal communities in the OH horizon, while in the E horizon the two communities were hardly modified. In the same season, OH and E horizons showed a different composition of bacterial and fungal communities and different enzyme activities, suggesting similar behaviour of eubacteria and fungi relatively to all the variables analysed. Evidently, different organic carbon content in soil horizons influenced microflora composition and microbial activities involved in the P and N cycles. © 2011 Springer-Verlag.

Author keywords

Activities; DGGE; Enzyme; Humus; Mediterranean forest soils; Soil microbial communities