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Salle Badiane, Agropolis International
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Disentangling the key drivers of mountain soil microbial taxonomic diversity, composition and activity along a temperate elevational gradient

presented by

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ABSTRACT

Soil microbial communities are sensitive to climate change in mountain ecosystems. Along an elevational gradient (1400-2400 masl) in the French Alps, we investigated microbial community structure, global catabolic activity and catabolic diversity beneath three plant species (*Vaccinium myrtillus*, *Juniperus communis* and *Picea abies*), in bulk and rhizosphere soils. Microbial taxonomic diversity in bulk soil was the same but in the rhizosphere of *V. myrtillus*, an increase occurred along the elevational gradient. On the other hand, microbial functional diversity did not present any change in either bulk or rhizosphere soils. The most abundant bacterial phyla detected for both bulk and rhizosphere soil were Proteobacteria, Actinobacteria, Acidobacteria and Verrucomicrobia. For fungi, dominant phyla were Ascomycota and Basidiomycota. Overall, microbial community structure depends intimately on elevation, whilst revealing a non-prominent role of plant species identity. Global catabolic activity at lower elevations, in the rhizosphere, was greater than in bulk soil, but converged in the nutrient-poor, colder soils found at higher elevations, although changes in catabolic diversity were negligible. Results showed that soil physicochemical properties were the main drivers of microbial activity, but that vegetation created distinctive microenvironments that refined these relationships, mainly through modifications in root chemical traits.

KEY WORDS

Microbial ecology; Elevational gradients; Root traits

Invited and animated by: Daniel Hernández-Cáceres (UMR AMAP)
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