



Topography and hydro-geomorphic fluxes drive the assemblage of microbial communities

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Abiotic factors have long been recognised as important factors in structuring microbial diversity and species associations, among which topography and hydro-geomorphic flows have an impact from plot to large scale. These factors are deeply involved in the dynamics of climate change. However, the actual impact of topography on microbial communities in spatially defined habitats remains unclear and, needing further development, represents a promising branch to investigate microbiological assets in the environment. In this study, we analysed a parcel in continental France which revealed a combined action of hydro-geomorphic fluxes and topography in structuring microbial assemblages. Species-habitat occurrence seems to respond to the effective energy locally displayed by fluxes. Largest richness and microbial variety occurred where fluxes are small such as on limited slope or reduced runoff concentrations. Species dominance was higher in zones with higher fluxes suggesting: 1) an impoverishment of the more sensible species, or 2) a selective adaptation of the most resistant species. This differentiation was evidenced by analysing the potential impact of topography and cumulated fluxes for runoff and sediments (i.e., WTI, LS RUSLE indexes) on microbial richness, dominance, and abundance at Phylum and Class levels.