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Distribution patterns of fungi and bacteria in saline soils

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Saline soils are environments characterized by uneven temporal and spatial water distribution and localized high concentrations of salts. Spatial distribution patterns of fungi and bacteria in saline soils, and the link between microbial community dynamics and salts accumulation are critical issues throughout the world (Ettema, Wardle 2002).

This study was focused on spatial distribution patterns of soil fungi and bacteria in a saline soil located in *Piana del Signore* (Gela, Italy) where some ecological variables acted as shaping factors in aboveground and belowground communities distribution. Bacterial, archaeal, and fungal communities diversity and distribution in ten soil sites (A horizons, 0-10cm), were characterized by 16S rDNA genes with T-RFLP method. Pyrosequencing-based analysis of the V2-V3 16S rRNA gene region was performed to characterize the sites on the basis of bacterial groups distribution, diversity and assemblage. To better investigate the ecological niches of some of the main culturable species of this environment, it was carried out the isolation and identification of the fungal flora from soil, using Warcup plating within two different salt concentrations (NaCl 5% and 15%), combined with a metabolic screening of some representative isolates (Di Lonardo et al., 2013).

A natural gradient of soil salinity shaped the distribution of microbial species in the environment. The different concentration of salt (NaCl), and calcium sulfate (Ca2SO4) in soil influenced the structure and distribution of the microbial communities even when comparing neighboring areas within a 50 m scale.

Some bacterial phyla, together with some fungal species, appeared spread in the whole area, independently of the salinity gradient, thus highlighting the presence of organisms with a very different survival strategy in such an extreme environment.

In conclusion, the organization and diversity of microbial taxa at a spatial scale reflected the scales of heterogeneity of physical and chemical properties of the habitat under investigation.

Metabolic profiling reveals a functional succession of active fungi during the decay of Mediterranean plant litter. Soil Biology & Biochemistry 60, 210-219.

References

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