

Impacts of meadows restoration on telluric microbial diversity.

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Restoration of the meadows in crop rotation seems to improve agronomic criteria such as biological soil quality as defined in terms of natural ecosystem (sustainability, biodiversity, functions). Considering the role of microbial communities in soil processes and the relatively high rate of turn-over of microbial biomass, analysis of these communities constitutes a key approach in the comprehension of soil functioning.

The experimental site, located in North West of France, consists in a set of 6 meadows established on silty soils according to a temporal succession (6 months, 2, 4, 7, 8, and 34 years) in reference to a cultivated field plot allowing a diachronic study. The total microbial biomass was estimated by fumigation-extraction method and total DNA assay. The bacteria content has been approached using the traditional plate count analysis tool. Microbial diversity was evaluated by metabolic profiles (BIOLOG) analysis and genetic fingerprints (RISA). Considering the 0-10cm layer, the microbial biomass evaluated by fumigation-extraction method increases with the age of the meadow and discriminates the 34 years old meadow. The microbial biomass evaluated by total DNA assay presents a similar pattern, which is not observed with the cultivable bacteria. Moreover, genetic fingerprints complexity is related to the age of the meadow suggesting an evolution of the community structure which is supported by the evolution of potential functional diversity observed. Those results confirm the impact of meadows restoration not only on the organic carbon statute but also on telluric communities.