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# Soil bacterial habitats on the scale of France

Battle Karimi (1), Samuel Dequiedt (1), Jean Villerd (1), Nicolas Chemidlin-Prévost Bouré (1,2), Sébastien Terrat (1), Antonio Bispo (3), Patrick Wincker (4), and Lionel Ranjard (1)

(1) INRA, Agroécologie, France (battle.karimi@inra.fr), (2) AgroSup Dijon, UMR Agroécologie, France, (3) INRA, Unité Infosol, Orléans, France, (4) CEA/Institut de Biologie François Jacob/Génoscope, Evry, France

Since the last years, the biogeography of microbial communities across the French territory was widely explored by applying the next generation sequencing method on the 2,200 soils sampled in the French Soil Quality Monitoring Network. Thus, the spatial distribution and environmental drivers of the bacterial richness and structure as well as the different taxonomic groups constituting the bacterial community have been disentangled. To improve and support sustainability of soil management, it is now important to define soil bacterial habitat on a wide scale to better predict biodiversity modifications due to environmental changes. In our work, a bacterial habitat is defined as the environmental context (abiotic factors), which shelter a specific biotic community. We identified 16 distinct bacterial habitats at the scale of France. The environmental parameters determining theses habitats are the soil pH, the C:N ratio, the land use, the soil organic carbon amount and the temperature. Some of these habitats are highly specific to a geographic region while others are largely spread across France. Each habitat presents a particular bacterial community structure with specific dominant and rare phyla in terms of relative abundance. In addition, we demonstrated that each habitat hosts a specific bacterial interaction network characterized by its own complexity and particular bacterial hub (the most connected phylum) underlying that the biotic interactions are also driven by the habitat.
This work is the first considering soil microbial habitat on a wide scale, which represents a cornerstone of soil microbial ecology to predict the impact of global changes on soil microbial diversity and soil functioning.