

June 20-21, 2018
Rome, Italy

Annamaria Bevivino, J Plant Physiol Pathol 2018, Volume 6
DOI: 10.4172/2329-955X-C1-014

WHY IS SOIL BIODIVERSITY SO IMPORTANT IN KEEPING SOIL HEALTHY: AN OVERVIEW FROM CULTURE-BASED TO METAGENOMIC INVESTIGATIONS

Annamaria Bevivino

Italian National Agency, Italy

Soil is a complex and dynamic ecosystem whose functionality is related to the equilibrium existing among chemical, physical and biological parameters and the resident microbial communities. Soil microorganisms play a central role in decomposing organic matter, in determining the release of mineral nutrients, and in nutrient cycling, and have direct and indirect effects on both crop growth and quality, as well as on the sustainability of soil productivity. In addition, soil microorganisms substantially contribute to the resistance and resilience of agro-ecosystems to biotic and abiotic disturbance and stress. Therefore, changes in microbial communities may directly affect soil ecosystem function since microbes can respond rapidly to environmental changes because of the vastness of microbial biomass and diversity. Given the role of soil microbes in soil safeness and function, there is the need to improve our knowledge about the ecology of microbial populations for proper agriculture management, at both levels of whole population structure and defined taxonomic/functional groups, such as those involved in inorganic nitrogen turnover and biogeochemical cycles. Different approaches can be followed for studying diversity and community structure and evaluating dynamics processes at a global level or at the level of distinct taxonomic groups, for identification and typing, and for functional characterization. Here, author summarise the methodological approaches to unravel the composition and function of belowground microbiota, ranging from classical and culture-based methods to molecular and high-throughput sequencing-based metagenomic analyses.

A holistic approach taking into consideration all of potential factors and drivers is necessary when examining the structure–function relationships of soil microbial communities for providing insight into the long-standing questions of which species of microorganisms are present?, what are they doing? who is active out there? and how do the activities of these microorganisms relate to ecosystem functions? An in-depth analysis of these interactions could be of crucial importance in designing new and effective microbial consortia for optimizing plant production and developing new strategies for disease control.

Biography

Annamaria Bevivino has her expertise in soil microbial diversity. She is Senior Scientist at ENEA, Italian National Agency for New Technologies, Energy and Sustainable Development, and Professor in Agro-Food Microbiology at University Campus Bio-Medico, Rome, Italy. Actually, she is a Management Committee Substitute for Italy of FPS COST Action FP1305: Linking below-ground biodiversity and ecosystem function in European forests (BioLink), actively participating in the activities of WG3: Belowground biodiversity in plantations and tree crops. She is Academic Editor for PlosOne and Frontiers in Microbiology and Member of Italian Society of General Microbiology and Microbial Biotechnology, Federation of European Microbiological societies, Italian Society of Agro-Food and Environmental Microbiology, International Union of Microbiological Societies. She is author of 43 peer-reviewed published papers in international journals, and more than 150 communications to national and international congresses.

annamaria.bevivino@enea.it