1. Record Nr. UNINA9910220042503321

Autore	Don Cowan
Titolo	Microbial Ecology of Arid Terrestrial Systems
Pubbl/distr/stampa	Frontiers Media SA, 2016
Descrizione fisica	1 online resource (127 p.)
Collana	Frontiers Research Topics
Soggetti	Microbiology (non-medical)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Sommario/riassunto

Water is usually referred to as the 'Molecule of Life'. It constitutes the most abundant molecule in living (micro)organisms and is also essential for critical biochemical reactions, both for the global functioning and maintenance of Ecosystems (e.g., Photosynthesis) and individual (microbial) cells (e.g., ATP hydrolysis). However, most of Earth's terrestrial environments present deficiencies in bioavailable water. Arid environments cover around a third of the land's surface, are found on the six continents and, with the anthropogenic desertification phenomenon, will increase. Commonly defined by having a ratio of precipitation to potential evapotranspiration (P/PET) below 1, arid environments, being either hot or cold, are characterized by scant and erratic plant growth and low densities in macro-fauna. Consequently, these ecosystems are microbially mediated with microbial communities particularly driving the essential Na and C biogeochemical cycles. Due to the relatively simple trophic structure of these biomes, arid terrestrial environments have subsequently been used as ideal ecosystems to capture and model interactions in edaphic microbial communities. To date, we have been able to demonstrate that edaphic microorganisms (i.e., Fungi, Bacteria, Archaea, and Viruses) in arid environments are abundant, highly diverse, different from those of other terrestrial systems (both in terms of diversity and function), and are important for the stability and productivity of these ecosystems. Moreover, arid terrestrial systems are generally considered Mars-like

environments. Thus, they have been the favored destination for astro (micro)biologists aiming to better understand life's potential distribution and adaptation strategies in the Universe and develop terraforming approaches. Altogether, these points demonstrate the importance of significantly improving our knowledge in the microbial community composition (particularly for Fungi, Archaea and Viruses), assembly processes and functional potentials of arid terrestrial systems, as well as their adaptation mechanisms to aridity (and generally to various other environmental stresses). This Research Topic was proposed to provide further insights on the microbial ecology of hot and cold arid edaphic systems. We provide a detailed review and nine research articles, spanning hot and cold deserts, edaphic, rhizospheric, BSC and endolithic environments as well as culture-dependent and -independant approaches.