

1829 THE EXOTIC INVASIVE PLANT, *Amaranthus viridis*, SUPPRESSES THE GROWTH OF NATIVE ACACIA BY ALTERING SOIL MICROBIAL COMMUNITIES STRUCTURE AND FUNCTIONALITIES IN A SAHELIAN ECOSYSTEM

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The functioning and stability of terrestrial ecosystems are mainly determined by plant specific richness and composition, which in turn, are closely interlinked with soil organisms development, in particular, soil microorganisms. One of the main success ways of invasive plants was these exogenous organisms-mediated modifications in soil microbial communities' composition and diversity as well as their functioning, thus compromising native plant survival. The aim of this experiment was to study the effect of the invasion of *Amaranthus viridis*, an exotic herbaceous plant, on soil microbial communities' structure and functioning in a Sahelian ecosystem, and on the survival of indigenous acacia species seedlings. At IRD field research station in Dakar (Senegal), soil samples have been collected on areas colonised by *A. viridis* plants and on areas colonised by others non invasive herbaceous species. Chemical characteristics, arbuscular mycorrhizal fungi spores and hyphal length, bacterial communities' structure (molecular fingerprints) and microbial enzymatic capabilities were determined on the soil samples. Moreover, we tested the effect of inoculation with mycorrhizal propagules on the growth of acacia seedlings. The results indicate significant higher soil content in C, N and P after the invasion by *A. viridis*. Moreover, these changes are accompanied by a higher overall microbial activity and a higher number of 16S gene copy in soil under the invasive plant. However, this exotic plant significantly decreases arbuscular mycorrhizal propagules present in soil and alters soil bacterial communities' structure and soil microbial functioning. Furthermore, an increase in soil mycorrhizal infectivity could make it possible to mitigate the depressive effect of this invasive plant on the development and nodulation of acacia species. These results clearly highlight profound shifts mediated by the exotic plant *A. viridis* during its invasive process, and, these modifications therefore alter the global functioning of plant communities. Moreover, mycorrhizal symbiosis can act as potential biological tool for invaded area restoration.

2396 MICROBIAL DIVERSITY OF A HIGH SALINITY OIL FIELD

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This work is a preliminary study to investigate the microbial diversity of an onshore oil field. It aims to compare results obtained from molecular methods, physicochemical analyses and cultivation. A core of 1150 m depth sediments (*in situ* T = 45 °C) was collected and immediately frozen with liquid nitrogen prior to further investigation. Macroscopic and Scanning Electron Microscopy analyses were performed. The sample corresponded to unconsolidated, porous sandstones with rich quartz/feldspar and lithic grains. Most of the grains were coated with clays. Salt crystals were abundant on the grain surfaces and within the clay coating. pH of the sediment was measured at 8.8, salinity corresponded to saturation. The sediment contained high amount of hydrocarbon. Major and minor metal concentrations were measured by ICP-AES. Carbon, nitrogen, sulfur and phosphorus concentrations were also measured. DNA extraction was performed with commercially available kits. To improve our DNA recovery, washing steps were performed prior to extraction according to Fortin *et al.*, 2004. PCR was effected with primers targeting 16S rRNA genes (archaeal and bacterial) and functional genes involved in sulfate reduction, nitrate and nitrite reduction, methanogenesis, alkane degradation and carbon assimilation. PCR products were cloned using the TOPO TA cloning kit according to the manufacturer's instructions. We didn't obtain amplification of *dsrAB*, *narG* and *mcrA* genes whereas *nirS* and *nirK* genes were amplified. According to the in-situ physico-chemical conditions and to the cloning-sequencing results, culture conditions were defined to isolate representative microorganisms. No sulfate-reducing, nitrate-reducing or methanogen have been isolated. In conclusion, geological investigation showed that the sediment was representative of an inland body of salt water, contemporary to the Atlantic ocean opening. Present microbial flora could have been then fossilized.



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