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Long-term effect of irrigation with water from sewage treatment plant on AMF biodiversity and microbial activities.

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Shortage of water is one of the most important environmental problem in the Mediterranean areas that implicates the search for strategies for saving good quality water. The use of treated waste water for the irrigation of agricultural land can be a good solution for this problem because it reduces the utilization of fresh water and potentially could improve soil key parameters, but can modify physical-chemical and biological properties of the same. The aim of this work was to study the effect of long-term irrigation with treated waste water on microbial diversity, mainly arbuscular mycorrhizal fungi (AMF) of the soil and other properties related with the microbial community. The experiment was developed in an agricultural area with Citrus orchard, located in Alicante in the southeast Spain.

Here, we tested whether the communities of AMF as well as soil microbial properties were affected by irrigation with water coming from sewage treatment plant during 40 years in a soil. To carry out this study the soil properties (dehydrogenase, urease, protease-BAA, acid phosphatase, β-glucosidase, glomalin related soil protein, microbial biomass C and aggregate stability) and AMF diversity (the AM fungal small sub-unit (SSU) rRNA genes were subjected to PCR, cloning, sequencing and phylogenetic analyses) were analysed in the soil from two different plots with the same soil but with different type of irrigation (irrigated with fresh water and irrigated with treated water). The first results did not show significant differences in some soil properties between soil irrigated with water treated or not.