



Long-term effect of irrigation with waste water on soil microbial community in semi-arid conditions

Fuensanta García-Orenes (1), Alicia Morugan (1), M^a Mar Alguacil (2), and Antonio Roldan (2)

(1) University Miguel Hernández, Agrochemistry and Environment, Elche-Alicante, Spain (fuensanta.garcia@umh.es, +34966658532), (2) CSIC-Centro de Edafología y Biología Aplicada del Segura, Department of Soil and Water Conservation, P.O. Box 164, Campus de Espinardo 30100 Murcia, Spain

The water shortage is one of the most serious environmental problems in semi-arid areas around the world, which implicates the search for alternatives sources of water to satisfy the water demand in these regions. The use of wastewater for the irrigation of agricultural land is one of most suitable solutions to save better quality water when the natural resources are scarce. The reuse of wastewater in soil irrigation is not a new practise and is increasing in many places around the world; however the implications for the sustainability of agro-ecosystems must be studied in deep. The objective of this work was to study the effects of the long-term irrigation with treated wastewater in soil microbial community (evaluated as abundance of phospholipid fatty acids, PLFA). The experiment was conducted in an area located in Alicante (Southeast Spain) (Coordinates 38° 17'38" N, 0° 33'50" W). During 40 years an experimental Citrus aurantium L. (orange tree) orchard has been drip-irrigated with waste water, and control plots with the same characteristics subjected to drip irrigation with fresh water, were also stabilised during all the experimental period. Soil samples from individual trees were collected in a randomised design with three replicates for each irrigation treatment (irrigation with waste water and irrigation with fresh water), to analyse the abundance of PLFA at the end of the experiment. The results show a major content of total PLFA in soils irrigated with fresh water, also these soils showed higher variety of PLFAs, and so a higher variety of groups of microorganisms.