Geophysical Research Abstracts
Vol. 16, EGU2014-585-1, 2014
EGU General Assembly 2014

Effect of land management on soil microbial properties in agricultural terraces of Eastern Spain

Alicia Morugán-Coronado (1), Artemi Cerdà (1), and Fuensanta Garcia-Orenes (2)

(1) Universitat de València, Departament de Geografia, Elche, Spain (morugan@uv.es), (2) GEA (Environmental Soil Science Group). Agrochemistry and environmental, University Miguel Hernández, 03202-Elche, Alicante, Spain

Soil quality is important for the sustainable development of terrestrial ecosystems. Agricultural land management is one of most important anthropogenic activities that greatly alters soil characteristics, including physical, chemical, and microbiological properties. The unsuitable land management can lead to a soil fertility loss and to a reduction in the abundance and diversity of soil microorganisms. However, ecological practices and some organic amendments can promote the activities of soil microbial communities, and increase its biodiversity. The microbial soil communities are the most sensitive and rapid indicators of perturbations in land use and soil enzyme activities are sensitive biological indicators of the effects of soil management practices.

In this study, a field experiment was performed at clay-loam agricultural soil with an orchard of orange trees in Alcoleja (eastern Spain) to assess the long-term effects of inorganic fertilizers (F), intensive ploughing (P) and sustainable agriculture (S) on the soil microbial biomass carbon (Cmic), enzyme activities (Urease, ß-glucosidase and phosphatase), basal soil repiration (BSR) and the relationship between them, and soil fertility in agro-ecosystems of Spain. Nine soil samples were taken from each agricultural management plot. In all the samples were determined the basal soil respiration, soil microbial biomass carbon, water holding capacity, electrical conductivity, soil organic carbon, nitrogen, available phosphorus, aggregate stability, cation exchange capacity, phosphorous, pH, texture, carbonates, active limestone and as enzimatic activities: Urease, ß-glucosidase and phosphatase.

The results showed a substantial level of differentiation in the microbial properties, in terms of management practices, which was highly associated with soil organic matter content. The most marked variation in the different parameters studied appears to be related to sustainable agriculture terrace. The management practices including inorganic fertilizer and intensive ploughing had similar results on microbial soil properties. In conclusion, sustainable agriculture management could be more suitable in soil use and therefore protection of biodiversity.