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Incidence of the soil erodibility in the soil organic carbon sequestration along a pluviometric gradient. South of Spain.

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Climatic conditions, biomass and its vegetation cover, and the land use are the main factors which influence the generation processes of organic matter and the organic carbon sequestration by the soil, which, together with their different types of soil protection, become the key factors when determining the intensity of soil erosion and degradation.
Southern Spain is a mountainous area which was abandoned, as far as agriculture was concerned, in the mid-twentieth century. It has a different ecogeomorphological resilience depending on the impact of the aforementioned key factors. This has led to different levels of protection and soil degradation which fit into the pluviometric gradient have been established, the wettest areas being those where the recovery levels are highest, in contrast to the driest areas where the system shows evident signs of degradation.
Soil erodibility reduces the quantity of organic carbon retained, moving it towards the lower areas and so contributing directly to soil degradation. In this study was analyzed abandoned fields which may or may not have been affected by non-intensive grazing, along a pluviometric gradient: i) the degree of vulnerablility of the abandoned fields when faced with hydric erosion, and ii) the effects of erosion on the retention of organic carbon in the soil.
In total, 543 disturbed and undisturbed samples were taken from the soil surface (10 cm deep) spread over the field sites. Various soil properties implicated in the vulnerability because of erosion and in the carbon cycle were analysed: organic carbon, texture, aggregate stability, and permeability. Bio-diversity was established by drawing up an inventory of vegetable species, in each area under study to determine the degree of recovery of the ecogeomorphological system after the abandonment of agricultural activity. And the erosion of the soil was established by calculating the K factor of the USLE.
The results obtained show that: i) the soil properties analyzed are determinant when evaluating the vulnerability of the eco-geomorphological system along the pluviometric gradient under study, which is especially apparent in the biodiversity, the organic carbon content and the percentage of stable aggregates; ii) there exists a direct relationship between the soil erosion, the organic carbon content and the volume of precipitation; iii) it increases as the precipitation, the biodiversity and the vegetation cover decrease, and directly affects the organic carbon content captured, iv) so, can be state that a reduction in precipitation along the pluviometric gradient has a direct repercussion on a soil degradation gradient, evident in the erodibility of the same and in its organic carbon content.