



Hydrological and erosive response over different Mediterranean micro-environments by rainfall simulation (South of Spain).

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In the Mediterranean eco-geomorphologic system, the hydrological and erosive response has showed a very variable and complex behavior depending on several factors: topography, geology, vegetation pattern, soil properties, land use management, etc. The pluviometry is a key factor due to the great spatial and temporal variability. This research was carried out over different micro-environments representative from five hillslopes localized in the Littoral Betic Mountains in the south of Spain.

The results of several rainfall simulations on micro-plots (0.24 m²) and the differences of the incidence of the vegetation cover in the eco-geomorphologic system from semi-arid, dry-Mediterranean and sub-humid sites are exposed. Before, during and after the experiments runoff, soil moisture and sediment were measured. The results have shown rock fragments disposition on soil surface and vegetation seem to be the main factors that control the hydrological and erosive response at the micro-plot-scale of the experiments. Embedded rock fragments are the most important soil surface property because they reduce the infiltration. Whilst vegetation increases it what is more influential on the hydrological and erosive response of microenvironments at more arid sites. Have been observed that the micro-environment condition plays a more relevant role than the localization in the climatic gradient at micro-plot scale.

The final result shows: (i) The field sites analyzed were characterized by soil surface components with a significant number of rock fragments, frequently embedded and thus forming a soil crusting on the surface, which was in a severely degraded state. This, together with not very intensive grazing, is causing difficulties for vegetation recovery 60 years after farming activity was discontinued.

(ii) Comparing the extreme conditions along a climate gradient, no reduction in runoff or erosion was observed.

(iii) The rock fragments (abundance and distribution) are key factors in the hydrological and erosive response of the surface components, even more than the vegetation cover, so that hillslopes in Mediterranean sub-humid climatic conditions may respond similarly to others in more arid conditions.