



A short term response of the ecogeomorphological system under hydric stress situations along a mediterranean pluviometric gradient.

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Many studies have shown the variable response of the ecomorphological system along a pluviometric gradient, which from a functional point of view, may be summed up as an impoverishment of the relationship soil-water-plant. In the present study, taking such a spatial variability change as our starting point, have been analysed the adaptation of the different integral parameters of the ecogeomorphological system to a hydric stress situation.

The area under study is southern Spain, where have been established a pluviometric gradient on 3 experimental hillslopes, Colmenar (668 mm/y-1), Almogía (514 mm/y-1) y Berja (308 mm/y-1). On each of the hillslopes were established an experimental plot open from top to bottom 5 metres wide, which was monitored for four years (September 2002 to September 2006): the rainfall with a totalizator rain gauge, the water content of the soil in fixed sampling points situated every 10 m. from top to bottom by means of TDR probes, (Tektronix 1502C) both on the surface and at a depth of 15cm., the physico-chemical soil properties by analysing disturbed and undisturbed samples at the same measuring points for soil moisture, vegetation cover and the number of plants by photographing them at a height of 5 m. using a high resolution digital camera. By carrying out our observation during a period of drought 2004-2006 were able to analyse its effect on the parameters which make up the ecogeomorphological system of each of the hillslopes.

The objectives of the present study were: i) to determine the inter-annual variability of the soil water content and the available water for vegetation, and ii) to analyse the response, the adaptation and the degree of vulnerability of the remaining elements in the ecogeomorphological system, vegetation and soil, to a situation of hydric stress, as happened between 2004-2006 in southern Spain.

The results obtained showed that: i) as is characteristic of Mediterranean environments the soil moisture is very variable, as an immediate response to pluviometric events, and it is always greater deep down than on the surface, except in the most arid field site in which it is fractionally greater on the surface; ii) the soil water content was more uniform along each of the three hillslopes in the years of less rainfall, and more heterogeneous during the years of greater rainfall, due to the different percentage of clay, organic matter, better structure, that is, to the edaphological parameters; iii) vegetation cover and the number of plants reduces in accordance with the hydric availability of the soil, with the length of the dry season having a special effect and with a unequal effect on each of the field sites; iv) despite the increase in the moisture of the soil during the last year of the period being studied, the vegetation cover and the number of tussocks on each of the hillslopes continues to decrease, except on the hillslope in the most extreme arid area which adapted better to the hydric deficit due to the existence of xerophytic vegetation cover, the lower areas of each hillslope being those most affected by the stress situation; v) some physico-chemical properties were also seen to be affected by the drought.