The effects of physical and chemical properties of marl derived soils on the erosion forms and rates

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Introduction

Considering to the distribution of marl derived soils in arid and semi-arid regions like west Azarbaijan province, Iran, located between 38° 58' to 39° 47' N and 44° 14' to 47° 16' E, this research was done in order to recognize the erodibility of such soils that almost made some difficulties in catchments due to their high sediment. So, the relation among the erosion forms and rates of marl derived soils with their physical and chemical properties were studied. For this purpose soil samples were prepared from these soils and considering to the forms and types of erosion, the soil erodibility indices of soils were determined.

Results

Results of t test showed there is a significant relation between K factor and silt, clay, pH and also between clay ratio and chloride, sand, silt and EC, that is show the effect of these factors on erosion rate with R^2 of 0.997. The stepwise linear regression showed the relation (1) to predict erosion rate:

$$erorate = 1.669 + 0.026 * slope \quad (1)$$

There is also the significant difference of sheet and rill erosion by slope, runoff volume, lime and chalk. Slope and soil water saturation percent are the Parameters affects the rill and gully forms. Sand, silt, slope and clay ratio are parameters affects on the three forms of erosion. The stepwise linear regression showed the relation (2) to predict erosion rate:

$$eroform = 9.59 - 0.12 * silt + 0.04 * sed - 0.05 * plastic\,\mathrm{lim}\,it - 0.11 * na \quad (2)$$

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Constraints from granitic plutonism on Paleozoic crustal evolution of the SW Iberian Massif

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Two main episodes of granitic magmatism occur at the boundary between the Central Iberian and Ossa-Morena Zones, a complex segment of crust that was subject to both Cadomian and Variscan tectonism. They intruded during two major Paleozoic events: i) associated with the Upper Cambrian - Lower Ordovician intra-continental rifting event (c. 493 Ma ± 3.5 Ma and 486-471 Ma, Portalegre and Carrascal plutons, respectively) and ii) related to the end of the Variscan orogeny- Upper Carboniferous (c. 309 ± 4.6 Ma to 306 ± 3 Ma, Nisa-Albuquerque batholith).

The present data indicate that the crustal recycling was strongly involved in granite magma genesis during the two major tectonic events, whereas the participation of mantle-derived magmas occurred only during the first event, in the Carrascal pluton.

In both tectonic events the magma-mixing was an important mechanism in granite petrogenesis. The inherited zircon cores indicate the involvement of Neoproterozoic basement (Cadomian) in granite magma sources during those two events.