



Changes in human occupation and soil erosion rates through historical time: evidence from an agricultural complex in Toledo (Spain).

Raul Ortega (1), Veerle Vanacker (1), Isabel Miralles (2), and Nicolas Bellin (1)

(1) Georges Lemaître Center for Earth and Climate Research (TECLIM), Earth and Life Institute. University of Louvain, Place Louis Pasteur, 3, B-1348. Louvain-La-Neuve, Belgium (raul.ortegaperez@uclouvain.be / Fax: +32 (0)10/47.28.37), (2) Estacion Experimental Zonas Aridas. CSIC. Ctra Sacramento s/n. 04120. La Cañada de San Urbano. Almeria, Spain.

1Georges Lemaître Center for Earth and Climate Research (TECLIM), Earth and Life Institute. University of Louvain, Place Louis Pasteur, 3, B-1348. Louvain-La-Neuve, Belgium. 2Estacion Experimental Zonas Aridas. CSIC. Ctra Sacramento s/n. 04120. La Cañada de San Urbano. Almeria, Spain.

In the Tajo Basin (Spain), there is evidence of human occupation since the Palaeolithic. It is well documented that human pressure largely altered the landscape during historical times. One well-documented example of intensive land use comes from the agricultural complex of Santa Maria de Melque (Toledo region, Spain). Despite of some evidence of some older remnant, the main settlement of Melque was dated in the visigothic era (c. 650-750 A.D). It consisted of a monastic building, four major dams with irrigation terraces and a perimeter fence. During the muslim era (IX A.D) the church was abandoned and a village came to form. In the Christian era (c. XI-XII A.D), the Islamic settlement was abandoned, the church was restored and a necropolis was created around it. The settlement was abandoned in the 17th century.

Sedimentological and palynological analyses of sediments from the Melque and Zorras streams have provided excellent materials for a palaeo-environmental reconstruction of historical human-induced vegetation change. The data indicate the existence of various agricultural phases with cultivation of crops of flax, barley, wheat, rye and olive and peach trees during the Islamic and Christian eras. Natural vegetation became the dominant after abandonment of the site.

The main objective of this research is to analyse the link between human occupation phases, weathering and soil erosion. Geo-archaeological data from the Melque complex provides us information on the different phases of human occupation, together with information on land use change during historical times. Past erosion rates are now inferred from geochemical analyses of dam deposits. We are using cosmogenic nuclides to get an index of erosion intensity for a sequence of old sedimentary deposits. In addition, the degree of weathering of eroded sediments and topsoil material is quantified using X-Ray mineralogical analysis. Preliminary results suggest high erosion rates during historical times. The mineralogical analyses indicate that the mineralogy of eroded sediments trapped in dam deposits is close to fresh soil material, which suggests fast erosion of topsoil material from poorly developed soils during the agricultural occupation phase.