

HIDRAM4000 project: landscape changes in Central Spain (Sierra de Pela, Guadalajara province) during the last 3,000 years, starting from pollen record of Somolinos lake record (1240 m a.s.l.)

S. Riera¹, A. Currás¹, R. Julià², L. Zamora³, F. Mezquita³, J. Armengol³, M.A. Marqués⁴, E. García-Soto⁵, S. Ferrero⁵, E. Pascua⁶, J. M. Reed⁷, E. Sánchez⁸

¹ Seminar of Prehistoric Studies and Research. Department of Prehistory. University of Barcelona. Barcelona, Spain.

² Institute of Earth Sciences, CSIC. Barcelona, Spain.

³ Department of Microbiology and Ecology. University of Valencia. Burjassot. Spain.

⁴ Department of Geodynamics and Geophysics. University of Barcelona. Barcelona, Spain.

⁵ Los Casares archaeological group. Sigüenza. Spain.

⁶ Dpt. of Mediaeval History & Institute for Environmental History. University of St. Andrews. Scotland.

⁷ Dpt. of Geography. University of Hull. Hull. UK.

⁸ Department of Ancient History, Medieval History, Palaeography and Diplomatic. Autonomous University of Madrid. Spain.

Since 2005, the project HIDRAM 4000 tries to determine the environmental changes and their impacts on the socio-economic development of ancient societies in central Spain during the Late Holocene. This project integrates archaeology, history and palaeoenvironmental data with the aim to determine the interactions between environmental and cultural changes and to elucidate the causes and repercussions of these changes. Palaeoenvironmental data were obtained from pollen, non-pollen palynomorphs, charcoal, ostracoda, diatoms, cladocera and sedimentological analyses carried out at high resolution in lacustrine sediments of the Somolinos karstic lakes.

Somolinos lake system is located in a mountain area in central Spain (Sierra de Pela, Guadalajara province, at 1240 m a.s.l.) characterised by a sub-continental Mediterranean climate. The sediment record obtained in a dried carbonated lake reached 380 cm depth and, on the basis of the 14C chronological model, it covers a lapse time between 900 cal BC and 700 cal AD. The high sedimentation rate (ca. 2mm/yr) allowed high resolution palaeoenvironmental analyses.

Pollen record shows a first environmental phase from 9th to the end of 1st century BC, characterised by a forested landscape dominated by pines and evergreen oaks. Early signals of human management are witnessed at the 8th century BC through a 40 years length clearance episode. From the 6th to the 1st century BC, successive oscillations of AP curve together with the increase of macrocharcoal and anthropogenic indicators suggest the existence of itinerant human activities inducing local deforested areas.

The forest clearance in the area started at the 1st century BC, when anthropogenic pollen indicators also suggest the expansion of farming and grazing activities. This process of deforestation resulted in an open landscape between the 2^d and the 5th century AD, when AP curve reaches the lowest values of the sequence. In addition, crop pollen and secondary human indicators record the highest percentages of the sequence, indicating extensive farming and grazing.

Even if this open landscape changed at the 5th century AD with the regeneration of evergreen oak forests, pine did not recover in the area, as documented in pre-clearing phases. This period is otherwise coincident with the decline of farming and grazing activities. Finally, the pollen diagram records the lake drying during the 8th century AD.