



The Villarquemado Lacustrine Record (Iberian Range, Spain, Teruel): Climate and Tectonics for the last 100 kyr in NE Spain

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A 72 m long core recovered from the Laguna del Cañizar wetland, close to the town of Villarquemado (Teruel province, Iberian Range, NE Spain) provides the longest Quaternary lacustrine record for the Iberian Range and one of the longest of the Iberian Peninsula, comparable to Padul (Granada) and Fuentillejo (Ciudad Real) records. The wetland is located at about 1000 m. a.s.l. in the south central area of the Jiloca Depression, a 60 km long, 6 - 10 km wide, N-S half-graben bounded by NW-SE trending normal faults. The Depression belongs to a series of intramontane basins developed in the Iberian Range during the second extensional episode that started in the Upper Pliocene. Extensional neotectonics is still active with normal faults affecting Pleistocene and Holocene deposits and landforms and seismological activity in historical and modern times. Although the change from endorheic to exorheic conditions in these depressions occurred during the Neogene and Plio-Quaternary the south-central sector of this depression remained an endorheic basin till it was artificially drained in the 18th century when maximum flooded area was 11.3 km² and water depth up to 2.8 m.

The sedimentary sequence is mostly composed of shallow carbonate-rich lacustrine

facies: *Chara* sand and silt, banded to laminated grey silt, and variegated, mottled carbonate mud and silt. Bioturbation and edaphic textures are common. Alluvial fan facies as debris flows and fluvial deposits intercalate with lacustrine facies. Decimeter-thick peat layers and carbonate-rich sediments occur at the top of the core (Holocene) and in the lower half. Facies have been characterized using mineralogical (X Ray diffraction), elemental (TOC/TIC) and geochemical (XRF scanner) analyses. Carbonate-rich and peat sediments deposited during some intervals that could be related to interglacial/interstadial conditions. The chronological model for upper 30 m is based on AMS ^{14}C dates. OSL and U/Th dating are in progress for the lower part of the sequence. A basal age older than 100 ka is expected if sedimentation rates maintain within this range. The unexpected thickness of the sedimentary sequence (> 72 m) suggests a major role for subsidence in the genesis of the southern part of the basin. It also explains the location of the main seismotectonic activity in the southern sector of the depression, where the basin depocenter is located, and away from the most prominent topographic escarpments. This core will help to solve some of the controversies on the tectonic and climate evolution of the area, such as: i) the recurrence time for fault activity during the last 100 ka and the different history of the main faults; ii) the relative role of karstification versus subsidence as agents of basin formation; iii) the hydrological and climate history of the Iberian Range during Late Quaternary; iv) the occurrence of vegetation refugia for meso-thermophilous taxa during the cold phases in the continental areas of the northern Iberian Peninsula. The Villarquemado record provides an excellent opportunity to differentiate the roles of tectonics and climate in lacustrine basins and contributes to better resolve the climatic signal archived in lake sediments.