

## The Portuguese cave project: karstic caves of central Portugal as palaeoenvironmental archives

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### ABSTRACT

Karst systems record (as other records like marine sediments and ice sheets) changes in several parameters and preserve this valuable information over time. The isolation of these systems from the exterior environment transform the caves in a “living” archive of extreme importance to understand the environmental changes to which cave environments have been exposed. This fact allows the use these records to climate change scenarios. In Portugal, the work of local speleological teams consists mostly on the inventory and topographic analysis of caves. The resulting observations are rarely scientifically published. Most of the Portuguese karst systems are within protected areas due to their particular origin and evolution, as well as its national value and environmental fragility. Nevertheless, particular land use and management problems persist, threatening the integrity of karst resources for future generations. So, the scientific data resulting from the CAVE project will be directly applicable to the management and conservation of karstic environments at a regional scale. The CAVE project proposes an integrated approach based on an analysis of the various palaeoclimatic archives from caves and karst deposits. The most important tool is the stable isotope analyses and absolute dating in speleothems and the fluvial, lacustrine and other cave sediments analysis. These cave formations contain information relevant to the palaeoclimate reconstruction at a regional scale and sometimes show evidence of archaeological materials correlated with human occupation. The combination of data from various proxies within the same karstic environment (speleothems, clastic cave sediments, cave animals remains and archaeological evidence) allow for the ability to overcome the limitations of some absolute dating methods, to combine different climate records into a composite record, to carry on time-series analyses taking into account regional or global climate records and to identify the regional constraints of climate oscillations. The proposed research will focus on the some main karstic massifs of Central Portugal (Outil/Cantanhede Massif, Sicó Massif and Estremadura Massif) and has the following aims: i) the creation of an evolutionary model of caves based on structural, morphologic, sedimentologic and geoarchaeologic analyses, that will be further integrated with known geologic and geomorphologic regional evolutionary models; ii) the understanding of contemporary cave activity and groundwater dynamics and their vulnerability to human activities; iii) to transfer the project results and conclusions to public and private institutions with territorial planning and conservation responsibilities in karstic areas. Here we will present the preliminary results obtained for some caves in the Central Portugal area.

**Key words:** Cave sediments; geoarchaeology; isotopic analysis; climate global change.

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