

Geochemical and $\delta^{13}\text{C}$ characterization of Areia do Mastro and Papo-Seco formations (Lower Cretaceous, Barremian) for Paleo-environmental Reconstruction of the Boca do Chapim and Praia do Areia do Mastro Sequences (Cabo Espichel, South Portugal)

CHUN-HAN PANG¹, ANTONELLO AQUILANO¹,
CARMELA VACCARO¹, SILVÉRIO FIGUEIREDO² AND
ELENA MARROCCHINO¹

¹University of Ferrara

²Universidade de Coimbra-Pólo II

Presenting Author: vcr@unife.it

Geochemical analysis of sedimentary deposits is a fundamental tool for paleo-environmental reconstruction. Samples collected in Praia do Areia do Mastro (PAM) and Boca do Chapim (BC), north coast of the Espichel Cape, Portugal, were studied. Those samples are from the sequences of the Areia do Mastro (AMF) and Papo Seco (PSF) formations (Lower Cretaceous - Barremian). Macroscopic observations were carried out, associated with calcimetric determinations, EA-IRMS analysis for the determination of total C and $\delta^{13}\text{C}$ content, XRF and ICP-MS analysis for the definition of major, trace and ultra-trace elements concentrations to reconstruct the paleo-environmental conditions. As for PAM, the samples belong to the PSF and are mainly composed of sandstones, limestones and mudstones. The $\delta^{13}\text{C}$ values, in agreement with the other data obtained, suggest that these samples come from an estuarine paleo-environment with intertidal lagoon zones. With respect to all the analysis results of this work, three phases of probable paleoenvironmental development of the area are confirmed: 1. Open intertidal and lagoon region, from low to high and then low temperature; 2. Open lagoon-like region developed into an estuary; 3. Open estuary transformed into a closed lagoon.

The BC site's samples studied belong to both the AMF and PSF. Samples from the AMF of the BC site showed fairly similar characteristics among them, including an almost completely carbonate composition and a micritic texture, while those belonging to the PSF were found to be sandy limestones, mudstones, sandstones and lignite with gypsum.

The $\delta^{13}\text{C}$ values recorded in the samples from BC site and the lignite sediments with gypsum are also consistent with a lagoon and estuarine paleo-environment. As for the BC site samples, the data that emerged from this work allowed us to confirm a probable estuarine to closed lagoon paleo-environmental development with reducing anoxic conditions under climatic conditions varying from low temperature to high temperature.

Geochemical characterization of sediments from the AMF and PSF sequences has allowed us to conclude that the layers of