



Sr isotope composition of low-Mg oyster shell calcite for stratigraphic assignment of Early Cretaceous near-shore deposits (Lusitanian Basin, Portugal)

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The late Early Cretaceous greenhouse climate has been studied intensively based on proxy data derived essentially from open marine archives. In contrast, information on the response of coastal settings is relatively scarce – most notably due to the stratigraphic uncertainties associated with many Early Cretaceous siliciclastic-rich near-shore marine deposits. Here, we present a revised stratigraphic assignment of Albian near-shore deposits of the Lusitanian Basin of W' Portugal, which have been independently dated using C- and Sr-isotope signals derived from bulk rock and low-Mg oyster shell calcite. Studied sections include the Guincho section (near Cascais) and the Praia do Sul and Praia Sao Julia sections (south of Ericeira). Carbon isotope trends based on bulk rock carbonate are difficult to correlate between the different sections, most probably due to the heterogeneous composition and diagenetic alteration of the carbonate fraction. In contrast, analysis of the low-Mg calcite shell of abundant oysters from these successions provides some promising results. Following a detailed screening of the shell material (incl. catholuminescence microscopy, trace element geochemistry) for diagenetic alteration, C- and Sr-isotope measurements have been carried out. Sr-isotope analysis of a first set of samples (Guincho section) was done using laser-ablation multi-collector ICPMS technique, which allows for sampling of small shell areas. $87\text{Sr}/86\text{Sr}$ ratios of low-Mg oyster shell calcite fluctuate between 0.707373 ± 0.000002 and 0.707456 ± 0.000003 ; absolute values and the overall stratigraphic trend match well with the global open-marine seawater signature during Albian times. Based on the new Sr-isotope data, existing biostratigraphic assignments of the Guincho section are corroborated and partly revised. In summary, the use of low-Mg oyster shell calcite represents a promising tool for the age assignment of Mesozoic siliciclastic-rich near-shore deposits and provides a stratigraphic resolution unmatched by conventional biostratigraphic approaches.