P-068

Coccolithophore potential for transfer-function development: Reconstructing sea surface salinity in the Western Mediterranean

Blanca Ausin, *Biogeosciences, ETH Zurich, Switzerland*
(blanca.ausin@erdw.ethz.ch)
Iván Hernández-Almeida, MARUM, University of Bremen, Germany
Jose Abel Flores, University of Salamanca, Spain
Francisco Javier Sierro, University of Salamanca, Spain.
Martin Grosjean, University of Bern, Switzerland
Guillermo Francés, University of Vigo, Spain
Belén Alonso, Institute of Marine Sciences (ICM-CSIC), Barcelona, Spain

Coccolithophores are among the most abundant marine phytoplanktonic organisms. Calibration of the relationship between modern coccolithophore assemblages and environmental variables allows quantitative reconstruction of past surface ocean properties when applied to fossil coccolithophore records. The Western Mediterranean and the Atlantic Ocean is an ideal region for testing the potential of this method due to the presence of large environmental gradients promoted by water mass exchange through the Strait of Gibraltar. Multivariate statistical analyses revealed that distribution of coccolithophore species from 88 surface sediment samples from this region was primarily related to sea surface salinity (SSS). The modern analog technique (MAT) and the weighted-averaging partial least square regression (WA-PLS) were used to develop calibration models, leading to bootstrapped regression coefficients (R2_boot) of 0.85MAT and 0.80WA-PLS. These models were applied to a fossil coccolithophore record to reconstruct SSS for the last 25 kyr. Analog quality estimation and comparison of reconstructions with fossil ordination scores indicated the reliability of the SSS reconstruction for the last 15.5 kyr. Thus, the derived transfer function provides an independent paleoproxy for SSS estimation in the western Mediterranean Sea over the last 15.5 kyr. However, lack of modern analogs for fossil Emiliania huxleyi > 4 µm caution about record validity, and therefore transfer function reliability, from 25 to 15.5 ka. Short-term SSS changes for the last 15.5 kyr were associated with sea-level oscillations, regional and local climate conditions and variations in the Atlantic Water advected through the Strait.