Geophysical Research Abstracts, Vol. 7, 07728, 2005
SRef-ID: 1607-7962/gra/EGU05-A-07728


# Linking Biocalcification to the Global Carbon Cycle: Carbonate Systems during the Paleogene

**M. Mutti** (1), H. Weissert (2), M. Rasser (1,3), C. Scheibner (1, 4)

(1) Institute of Geosciences, University of Potsdam, P.O. Box 601553, D-14415 Potsdam, Germany (mmutti@geo.uni-potsdam.de), (2) ETH, Earth Sciences Department, Sonneggstrasse 5, CH-8092 Zürich, Switzerland, (3) now at Naturkunde Museum, Stuttgart, Germany, (4) now at Fachbereich Geowissenschaften, Universität Bremen, Germany

A fundamental step to understand the link between the carbon cycle and changes in biocalcification rates requires constraining the controls on the expansion/restrictions of biocalcifiers in carbonate environments at times of major carbon isotope excursions. We tackle this problem by investigating Paleogene carbonate systems in southern France and Spain, where the qualities of outcrops and the number of previous studies in the area provide excellent preconditions for the project. The Paleogene is an ideal time because it contains large magnitude events affecting both biocalcification (rapid diversification, maximum diversity and sudden extinction of larger benthic foraminifera) and the carbon cycle (a 3L' shift in carbon isotopes, the largest in the Cenozoic).

To constrain the main contributors to biocalcification in shallow-water domains, we focused on three main locations along the transition from the terrestrial to an outer platform setting: Serraduy and Campo (Spain) and Minerve (France). The distribution of carbonate facies provides a first basis to constrain the abundance and temporal variability main organisms groups contributing to biocalcification. The patterns emerging with these first results is that the rise of alveolinids as carbonate producers is paralleled by a marked variations in the carbon isotope record. A positive carbon isotope excursion of up to 2 L' culminates in the late Paleocene and is followed by a long-term decrease of up to 3 L', terminating in the early Eocene, and later stabilized throughout the Eocene. This patterns provides a first indication for linking biocalcification patterns to variations in carbon partitioning and ultimately to climatic changes.