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Ber. Inst. Erdwiss. K.-F.-Univ. Graz	ISSN 1608-8166	Band 9	Graz 2004

SIGNIFICANCE OF COCCOLITH SEDIMENTATION DURING THE MIDDLE TO LATE MIOCENE IN THE SE-ATLANTIC: BUDGETS AND ISOTOPIC COMPOSITION (ODP-SITE 1085A)

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ODP Site 1085A, drilled during Leg 175, is located in the Cape Basin at the SW- African Continental Margin (29°22.47´S, 13°59.41´E, 1713m water depth) off the Oranje River, a perennial river discharging into the South Atlantic (Wefer, Berger, Richter et al., 1998). Today, Site 1085 is bathed primarily in the Upper Circumpolar Deep Water (UCDW) near the mixing zone with the North Atlantic Deep Water (NADW). Site 1085A penetrated the Middle Miocene and comprises a complete record of hemipelagic sediments down to 14My. Sediments are dominated by nannofossil ooze, diluted by various amounts of silt and clay. Sedimentation rates range from 3-5 cm/ky in the Middle to Late Miocene (Wefer, Berger, Richter et al., 1998).

The main purpose of this study is to investigate the productivity changes in this area during the Miocene, the main interest focussing on production, dissolution and dilution of carbonate. The studied interval covers the time span from 7.5 to 12.5 My including the Miocene ‘Carbonate Crash‘ (Lyle et al., 1995), which is characterised by a dramatic drop in carbonate content (from 60 - 85% down to 35% $CaCO_3$). Based on the fact that grain size analyses revealed a very low sand content across the entire interval, we conclude that the main carbonate production is dominated by coccoliths. Aim of this investigation is to analyse their role as carbonate producers. With a view to determine the relative contribution of various coccolith species to the total carbonate flux, estimates of coccolith volume are necessary. Based on Young & Ziveri (2000), coccolith volume is dependent on the shape and the length. In a first step absolute abundances of all coccolith species were determined and in a second step the coccolith volume was calculated. Additionally the bulk sediment was sieved using a 0.020mm sieve to detach the coccoliths (fraction < 20µm) from adult and juvenile foraminifera. Afterwards isotope measurements of the fraction < 20µm were performed on a Finnigan MAT 252 mass spectrometer to obtain stable isotopic signals of coccolith carbonate. Further studies will include a comparison of isotope signals of benthic and planktic foraminifera (Paulsen et al., in prep.) with our coccolith data in order to determine and discuss potential differences between carbonate built up by foraminifera and coccoliths.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: Berichte des Institutes für Geologie und Paläontologie der Karl-Franzens-Universität Graz

Jahr/Year: 2004

Band/Volume: 9

Autor(en)/Author(s): Krammer Regina, Baumann Karl-Heinz, Henrich Rüdiger

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