Downcore variability in Sedimentation and Foraminifera assemblages of the abyssal SE - Atlantic

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During Meteor cruise 63/2 to the SE - Atlantic in March 2005, sixty-one sediment cores were sampled to study foraminifera. Repeated multicorer hauls between S 30° and the equator, at water depths between 5000 and 5600m, yielded samples for the reconstruction of oceanic parameters by use of planktic and benthic foraminifera and crucial sediment parameters. As samples were taken in horizontal slices changes in sedimentation and productivity can be reconstructed. Assuming expected sedimentation rates below 3 $cm*ka^{-1}$ (Ruddiman, 2001; Pierre et al., 2001), the time spanned may be at least 10 ka. Sample sites were chosen along a north-south transect to document interactions between faunal alteration and sedimentary and oceanic parameters. The investigated samples show clear differences in sedimentation and faunal composition for the three investigated deep-sea basins.

Sedimentation: Whereas samples from the Guinea Basin show constant sedimentation dominated by carbonate secreting organisms (mainly foraminifera and Coccolithophorida), Angola and Cape Basin samples show a different situation. In northern Angola as well as in northern Cape Basin, surface samples are composed of mainly biogenic opal in the sand fraction and various contents of terrigenous material in the sand, silt and clay fractions. At sediment depths of 7–8 cm in the Cape Basin and 10–11 cm in the Angola Basin, a complete change in sediment composition is obvious with a nearly equal silicate/carbonate ratio. At a sediment depth of 14 cm in the Angola Basin, sediments are similar to those of the Guinea Basin, with a high calcareous biogenic proportion. A similar situation is observed in the sediment record of the northern Cape Basin at S 30°. A change from siliceous to carbonate sedimentation with increasing sediment depth is visible. One core from the Cape Basin was processed for grain size analysis. In general grain size decreases with increasing sediment depth. Surface samples are composed of 15 % (dry weight) > 63 µm. In 5 cm sediment depth this proportion decreases to 10,5 %. The higher content of coarser grains in surface sediments could be caused by organic constituents on the sediment surface which are oxidized and thus absent in deeper sediment layers (Schulz et al., 2000). Another process leading to redistribution in grain sizes could be the loss of some agglutinating foraminifera, which are known to be delicate (Mackensen et al., 1993). A downcore change in the benthic foraminifera assemblage can be observed but no quantitative analysis addressing this question has been done yet. Foraminifera tests build up

about 50 % of the sediment fraction > 250 µm and still a substantial proportion in the sediment fraction 250–125µm.

Planktic Foraminifera: For a first, semiquantitative analysis, one core from each investigated abyssal basin was processed. Compared to the Guinea and Angola basins, a loss of warm-water species in the planktic foraminiferal assemblages in favour of transitional species was observed in the northern Cape Basin. At a sediment depth of 15 cm in the Cape Basin, mainly *Globorotalia scitula*, *Globorotalia inflata* and *Globorotalia truncatuli - noides*, and ancillary *Orbulina universa* and *Globigerinella siphonifera*, dominate in the sediment fraction > 250 µm. In Angola Basin sediments, *Globorotalia scitula* as well as *Globorotalia truncatulinoides* and *Globigerinella siphonifera* are absent, whereas *Globo - rotalia tumida*, *Globorotalia cultrata*, *Sphaeroidinella dehiscens*, *Neogloboquadrina dutertrei* and *Globorotalia crassaformis* appear. A minor change in planktic foraminifera assemblages is obvious between the northern Angola and the Guinea Basins. All species occuring in the Angola Basin are present in the Guinea Basin except *Globorotalia inflata*. *Pulleniatina obliquiloculata* and *Globigerinoides ruber*, and ancillary *Globigerinoides sacculifer*, appear in the Guinea Basin but neither in the Angola nor in the Cape Basin.

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