

Coccolith fluxes in the North Atlantic: Assemblage composition and carbonate supply

Karl-Heinz Baumann, Claudia Sprengel, Harald Andrulleit

Coccolithophores, one of the main primary producers in the surface waters of the North Atlantic region, were investigated to quantify coccolith and coccolith-carbonate export fluxes and to determine possible seasonal trends in species composition. Coccolithophore flux variations in sediment traps at three mooring locations along an S-N transect at approx. 20°W from 33°N (L1) via 47°N (L2) to 55°N (L3) were recorded from July 1995 to July 1997. The 20-cup particle traps were deployed at 1000m, 2000m, and 3500m or 4000m below sea-surface; the material of the 2000m traps was studied. Sampling intervals ranged from 14 days to four weeks.

In general, total coccolith fluxes were characterized by a strong seasonality. Maximum coccolith flux values were reached in February-March (Station L1 at 33°N) or July-September (stations L2 and L3), respectively. Highest total coccolith fluxes and fluxes of different species at the three sites were rather comparable. Surprisingly, the coccolith fluxes at the relatively oligotrophic station L1 are up to 15×10^9 coccoliths $m^{-2} d^{-1}$ and slightly higher than those at L2 and L3, where up to 5×10^9 coccoliths $m^{-2} d^{-1}$ were observed. The examination of all trap samples revealed a highly diverse coccolithophore assemblage with in total 63 species. Nevertheless, sinking assemblages at all sites are dominated by *E. huxleyi* (generally >35%, >70% at L3), with only *F. profunda* (at L1), *Gephyrocapsa* spp. (mainly *G. muelleriae*) and *Syracosphaera* spp. (at L3) contributing considerably to the assemblages. All the other species exhibited maximum relative abundances of generally less than <10%.

In all trap samples, a conversion of coccolith fluxes into coccolith-carbonate fluxes based on mean species-specific carbonate masses was made. The mean contribution of coccolith-carbonate fluxes to the total carbonate fluxes in each trap was approx. 32%. The coccolith-carbonate fluxes are dominated on the one hand by small-sized coccoliths of the dominant species *E. huxleyi*, on the other hand by the larger, but less dominant, species *C. leptoporus* and *C. pelagicus*.