IMPACT OF PHYTOPLANKTON BLOOM DEPOSITION ON MICROBIAL COMMUNITIES AND METAL FLUXES IN CONTAMINATED NORTH SEA SEDIMENTS: A MICROCOSM STUDY

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Metal contamination and eutrophication are two interrelated problems affecting many coastal zones, including the Belgian Continental Zone (BCZ) of the southern North Sea. High concentrations of heavy metals, such as Cd, Cu, Pb, Zn, Hg and Ni, have been reported, especially in muddy subtidal sediments. Furthermore, eutrophication due to the input of nutrients and organic matter from adjoining estuaries results in recurrent spring algal blooms. Sedimentation of these algae and algae-derived organic matter results in intense remineralization in the sediments. This can cause significant changes in the redox state of the benthic ecosystem, affecting benthic microbial community structure and metal behavior. This study investigated the benthic response of phytoplankton bloom deposition on microbial communities and metal fluxes in a muddy, heavily contaminated subtidal station (130) from the BCZ. We used microcosms to evaluate the deposition of high concentrations (3µgl^{-1} chl a) of *Skeletonema* sp. and *Phaeocystis globosa* on microbial community structure. Sediments were sampled after 0, 2 and 7 days. Changes in microbial eukaryote community composition and activity were analyzed using molecular methods (18S rDNA and rRNA based DGGE respectively). These data were complemented by monitoring of the benthic metal fluxes and other geochemical variables (a.o. O_2, pH, chlorophyll and DOC), and changes in composition and activity of benthic prokaryotes. The interaction between organic matter deposition, microbial community structure and activity, and metal dynamics will be discussed.