



Coupled denitrification - sulfide oxidation stimulated by the inflow of oxic Mediterranean waters into the anoxic layers of the Black Sea

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In stratified aquatic systems with frequent or permanent anoxia, such as the Baltic Sea, the Black Sea or enclosed fjords, strong mixing of anoxic and oxic waters occur predominantly where the oxycline intersects with the sediment or during inflow events that inject oxic water into anoxic layers. The impact of these mixing events on the biogeochemical cycling and on the microbial community is not well studied. Here, we present data from two cruises to the south western Black Sea, where saline, oxygenated Mediterranean water is transported through the Bosphorus Strait and mixed into the anoxic waters of the Black Sea. Oxygen is normally absent below 150m water depth in the Black Sea, but oxygen ($>2\mu\text{M}$) was detected in warm saline water intrusions as deep as 230m near the Bosphorus during our cruises. Moreover, strong temperature/salinity anomalies were detected down to 370m water depth. High resolution nutrient profiles cutting these Bosphorus plumes exhibit significant alteration of the fixed nitrogen (Nitrate, Nitrite, Ammonium) and sulfide inventory. Incubation with added 15NO_3^- , led to a significantly increased production of 30N_2 indicating high capacity of denitrification in the Bosphorus Plume water in contrast to the rest of the sulfidic water column. In the same waters we found high numbers of bacteria previously related to sulfidic events in the open ocean which are neither common in the Mediterranean waters nor in the deeper anoxic waters of the Black Sea.