Changes in microbial community structure associated with dynamics in oxygen supply at the Crimean shelf of the Black Sea

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Today's rapid global warming of oceans together with eutrophication appears to promote a deoxygenation of some of the world's water bodies [1, 2], which eventually leads to hypoxia and even anoxia in regions of low oxygen supplies. With less than 60 μM oxygen most animals are negatively impacted and microorganisms dominate benthic energy fluxes [3]. As a result, it can be expected that in zones with oxygen dynamics around this tipping point benthic and microbial community structure will vary considerably in space and time, with repercussions on the flux of energy and matter trough the ecosystem. Here we present effects of varying hypoxic conditions on benthic microbial communities. Sediments from a series of transects across oxic to hypoxic conditions at the Crimean shelf of the Black Sea were analysed by community fingerprinting using ARISA (Automated Ribosomal Intergenic Spacer Analysis), in order to asses the connections between oxygen supply and benthic microbial community structure.

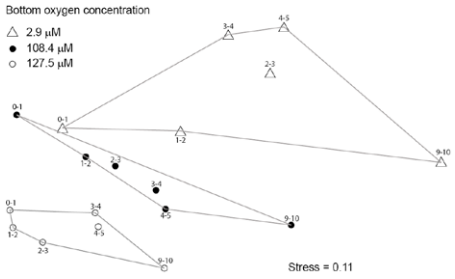

Figure 1: NMDS ordination plot (Bray-Curtis distance matrix) of ARISA profiles for the upper 10 cm layer sediment. Numbers represent each horizon sampled (cm).

Our data clearly exhibited a strong change in benthic bacterial community structure along a sampling transect including oxic, anoxic and highly dynamic hypoxic zones (Fig. 1), indicating an effect of temporal dynamics in oxygen supply at the microbial scale. This study is supported by the EU project HYPOX.

[1] Hoegh-Guldberg & Bruno (2010) *Nature* **328**, 1523–1528. [2] Zhang *et al*. (2010) *Biogeosciences* **7**, 1443–1467 [3] Díaz & Rosenberg (2008) *Science* **321**, 926–929.

Sulfur, carbon and nitrogen isotopic variation in the drinking water source of Beijing

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Samples of water, suspended particulate matter and sediments were collected in the drinking water source of northern Beijing and analyzed for sulphur, carbon and nitrogen isotopic compositions. The results showed that: (1) The ratios of sulphur isotope were between 4.9‰ and 10.7‰ in water samples; (2) The carbon and nitrogen isotopic ratios in suspended particulate matter were -29.34‰–-25.91‰ and -0.96‰–6.73‰ in summer, and -30.75‰–-25.75‰ and -0.83‰–9.67‰ in winter, respectively; (3) The sulphur, carbon and nitrogen isotopic ratios in surface sediments were -11.8‰–6.1‰, -27.25‰–-21.58‰ and 1.32 ‰–6.74‰, respectively. The differences of sulphur isotopic compositions in surface sediments from different sampling sites show the differences in the sources of sulphur. The suspended particulate organic matter was derived mainly from SOM-C_3 and macrophyte in summer, while it was derived from SOM-C_3 and plankton in winter. Surface sedimentary organic matters were mainly derived from SOM-C_3. Nitrogen isotopic ratios reflected the combined results of materials source and it can be used to trace some special biogeochemical processes. This study reveals that the source of organic matter has a close relationship with the situation of soil erosion in the areas.

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