

Supplementary Materials

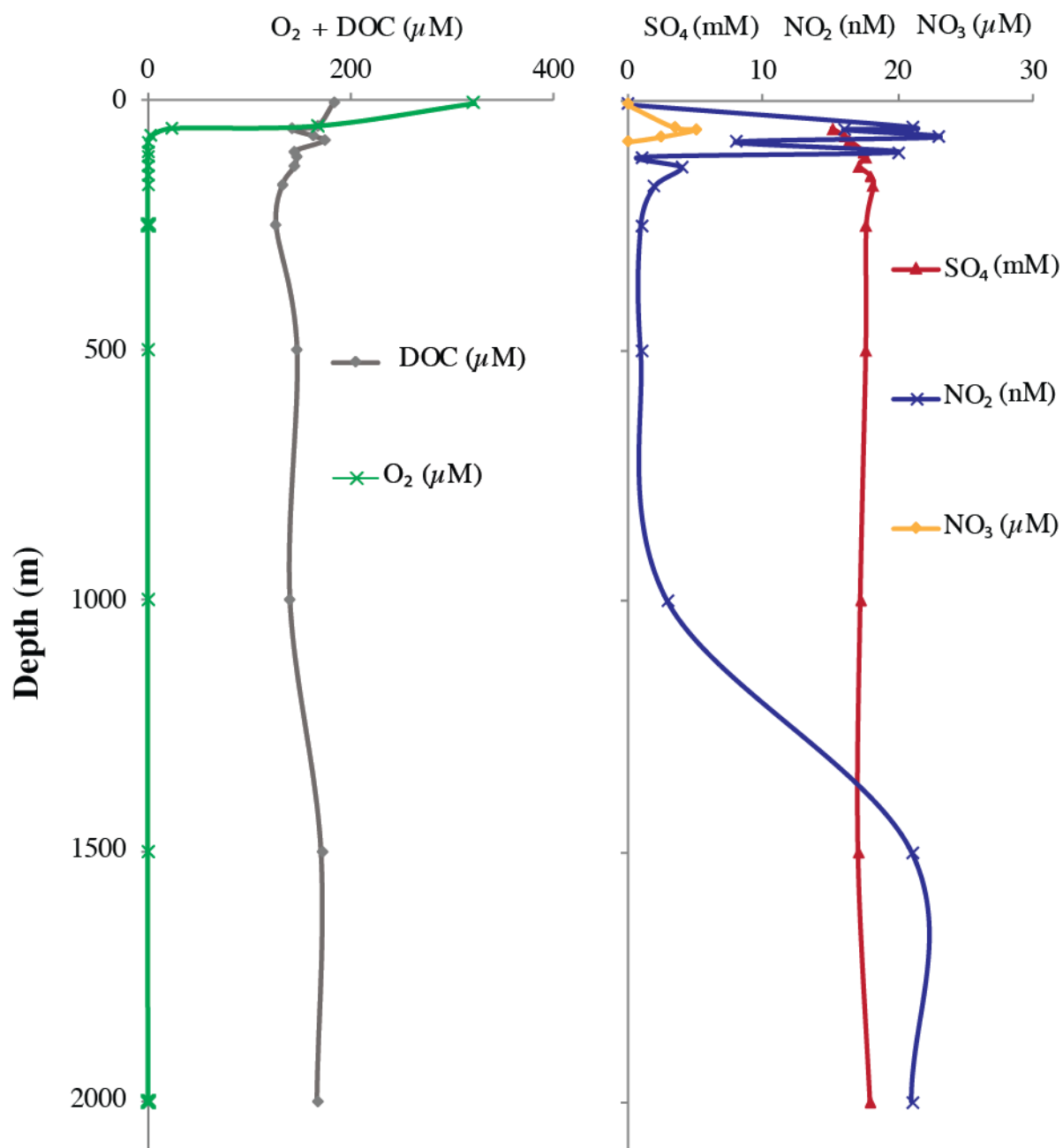


Figure S1. Environmental conditions in the Black Sea water column at the time of sampling.

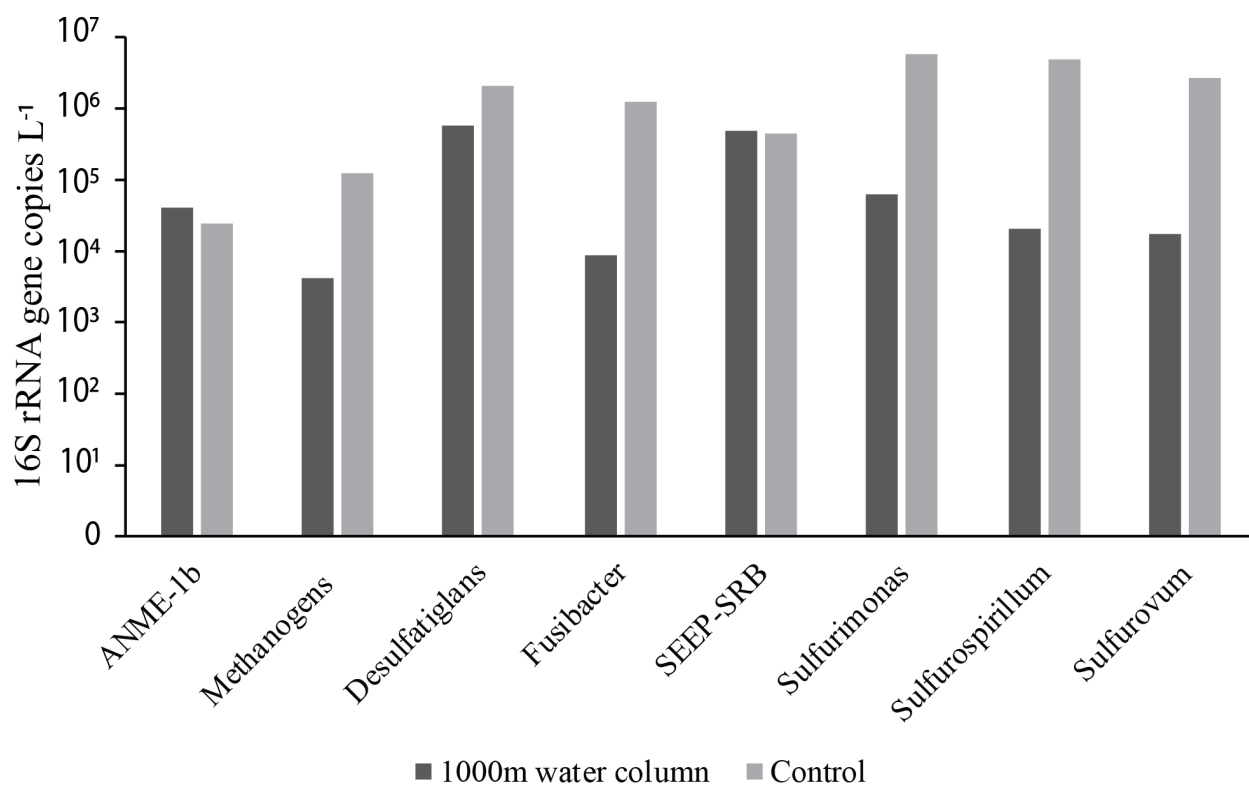


Figure S2. Abundance of major groups in the Black Sea water column (1000m depth) and the control incubation experiment, in 16S rRNA copies per L⁻¹. ANME – Anaerobic methane oxidizing archaea.

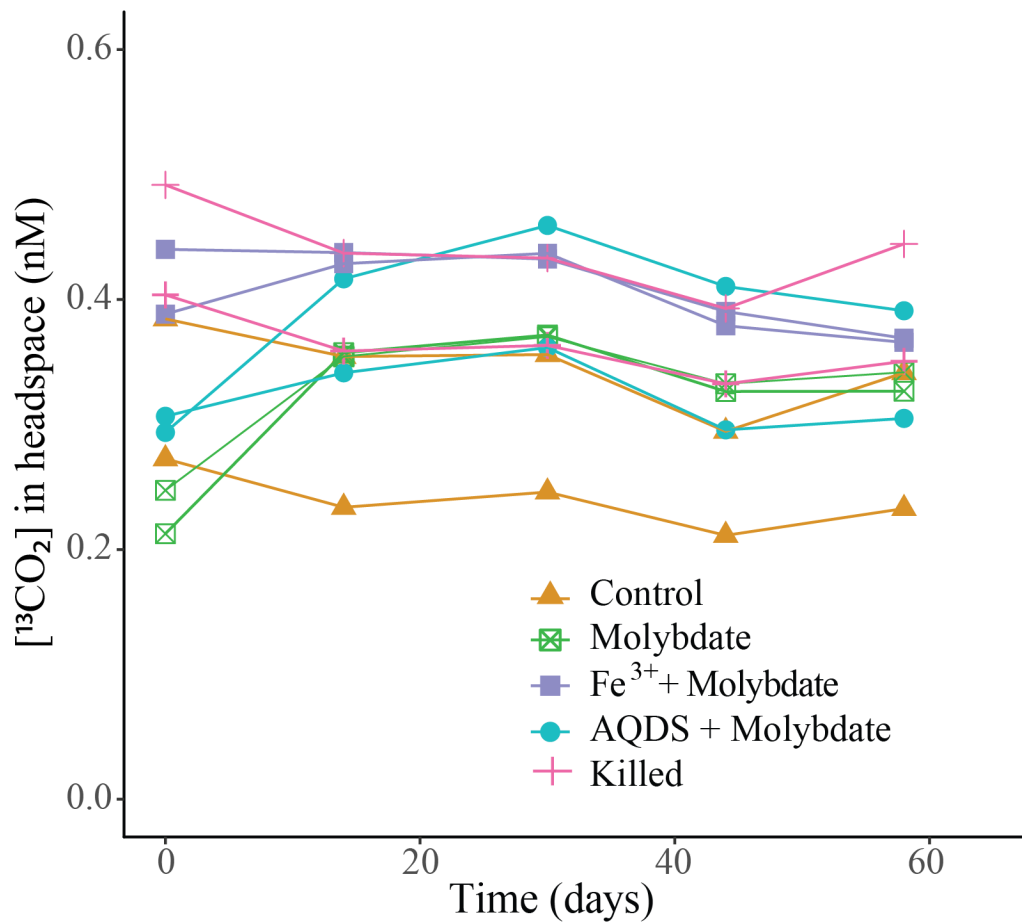


Figure S3. ¹³CO₂ concentration in the headspace of the incubations with different electron acceptors.

Table S1. Overview of the incubation experiments.

	Artificial seawater ¹	¹³ CH ₄	¹⁵ NH ₄	Sodium Molybdate	Fe ³⁺ citrate	AQDS
Abiotic control	x	x				
Control	x	x	x			
Molybdate	x	x	x	x		
Fe ³⁺ + molybdate	x	x	x	x	x	
AQDS + molybdate	x	x	x	x		x

1. Commercially available sea salts mixture (Sigma Aldrich).

Table S2. Total number of 16S rRNA reads per incubation, and the relative abundance (as % of the total 16S rRNA gene reads) of major species in the incubation experiments and the Black Sea water column. Values for duplicate bottles are averaged.

Treatment	Total 16S reads per experiment	Archaea			Bacteria				
		ANME- 1b	Methanogens ¹	<i>Desulfatiglans</i>	<i>Fusibacter</i>	SEEP-SRB	<i>Sulfurimonas</i>	<i>Sulfurospirillum</i>	<i>Sulfurovum</i>
1000m water column	2.3×10^5	0.3	0.03	4.7	0.07	3.8	0.50	0.17	0.14
Control	2.1×10^5	0.03	0.15	2.6	1.5	0.56	6.9	5.9	3.3
Molybdate	2.4×10^5	0.03	0.92	6.8	1.8	0.54	2.4	27	0.2
Iron-oxides	1.7×10^5	0.02	0.22	1.6	1.9	0.19	1.9	4.6	0.5
AQDS	9.8×10^4	0.04	1.8	13	6.9	1.8	3.4	0.6	0.4

1. Namely here Methanomicrobia, Methanococci, Methanobacteria, Methanomassiliicoccales, and Methanofastidiosales, but excluding all ANME groups.