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*Supplement of*

## **Direct O<sub>2</sub> control on the partitioning between denitrification and dissimilatory nitrate reduction to ammonium in lake sediments**

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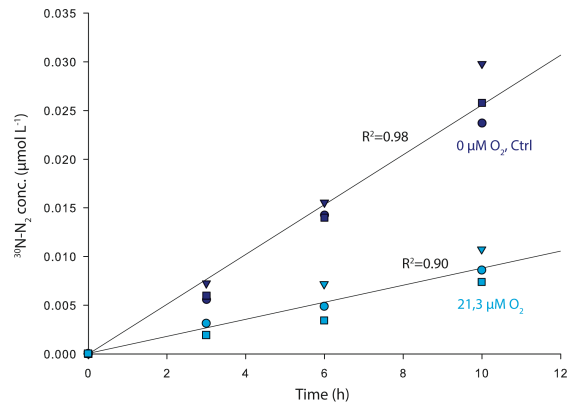
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**Table S1: Average O<sub>2</sub> concentrations in replicate slurries (see Table 1) at different time points during the incubation period (~ 10 h). The first time point (T1) was always at 30 minutes after the beginning of the incubation while the other time points (T2, T3, ..., T9) were different for each treatment (i.e. more frequent O<sub>2</sub> measurements at low O<sub>2</sub> levels).**

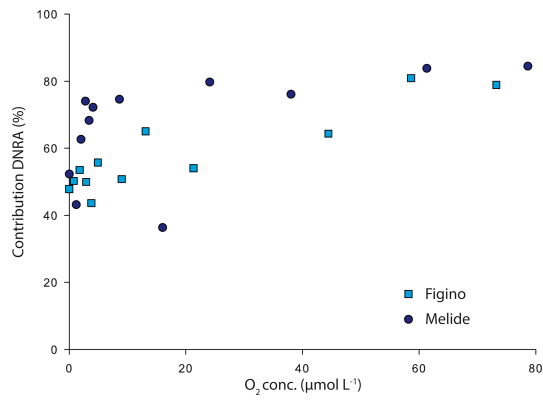
	Average O <sub>2</sub> concentration during incubation (μmol L <sup>-1</sup> )	O <sub>2</sub> concentration in slurry at different time points (μmol L <sup>-1</sup> )								
		T1	T2	T3	T4	T5	T6	T7	T8	T9
<b>Figino</b>	1.2	1.4	1.2	1.4	1.2	1.2	1.1	1.0	1.1	1.2
	2.0	1.7	2.2	2.0	2.2	1.9	2.0	1.7	2.0	2.1
	2.8	2.2	2.6	2.9	3.1	2.9	2.9	2.9	2.8	3.0
	3.4	3.0	3.2	3.9	3.2	3.6	3.7			
	4.1	3.5	3.5	3.9	4.3	4.1	4.2	4.9		
	8.6	7.5	7.8	8.8	9.1	8.1	8.9	10.1		
	16.0	17.6	17.1	15.0	16.7	16.5	13.6	15.5	15.8	
	24.1	26.3	25.8	22.9	24.5	21.0	24.2			
	38.0	39.3	35.2	39.5	36.8	38.3				
	61.3	66.8	62.1	57.2	56.9	63.4				
78.6	81.0	84.8	73.1	81.6	73.6	77.4				
<b>Melide</b>	0.8	0.8	0.8	0.6	0.8	0.8	0.7	1.0	1.1	
	1.8	1.2	2.0	1.7	2.0	1.8	1.7	1.9	2.1	
	2.9	2.7	3.0	2.9	3.1	2.8	3.0			
	3.8	3.2	3.5	3.3	3.8	3.7	4.1	3.5	4.3	4.4
	4.9	4.8	4.8	5.1	4.7	4.7	4.9	5.2		
	9.0	8.3	8.2	8.8	8.7	9.5	9.4	10.3	11.1	11.1
	13.1	11.3	11.3	13.3	12.7	13.8	13.8	15.1		
	21.3	20.6	19.0	21.4	21.4	24.2				
	44.4	40.3	36.4	47.8	46.7	50.6				
	58.6	44.6	53.3	56.3	52.0	57.8	66.6	68.9	69.0	
73.2	39.3	70.8	73.8	69.7	76.8	81.2	86.4	87.3		

**Table S2: Results of the t-test analysis of the difference between denitrification and DNRA rates in O<sub>2</sub> treatments and those in control experiments. *P* values with significant differences (*P* < 0.05) are highlighted in bold character.**

	O <sub>2</sub> concentration in slurry (μmol L <sup>-1</sup> )	Denitrification	DNRA
<b>Figino</b>	1.2	0.3529	<b>0.0023</b>
	2.0	<b>0.0011</b>	<b>0.0127</b>
	2.8	<b>0.0003</b>	0.2137
	3.4	<b>0.0004</b>	<b>0.0305</b>
	4.1	<b>0.0001</b>	<b>0.0182</b>
	8.6	< <b>0.0001</b>	<b>0.0003</b>
	16.0	<b>0.0056</b>	< <b>0.0001</b>
	24.1	< <b>0.0001</b>	<b>0.0093</b>
	38.0	< <b>0.0001</b>	< <b>0.0001</b>
	61.3	< <b>0.0001</b>	<b>0.0002</b>
78.6	< <b>0.0001</b>	< <b>0.0001</b>	
<b>Melide</b>	0.8	<b>0.0099</b>	<b>0.0256</b>
	1.8	<b>0.0002</b>	<b>0.0008</b>
	2.9	<b>0.0055</b>	<b>0.0019</b>
	3.8	<b>0.0001</b>	<b>0.0002</b>
	4.9	<b>0.0045</b>	<b>0.0002</b>
	9.0	< <b>0.0001</b>	< <b>0.0001</b>
	13.1	< <b>0.0001</b>	<b>0.0459</b>
	21.3	< <b>0.0001</b>	<b>0.0005</b>
	44.4	< <b>0.0001</b>	<b>0.0433</b>
	58.6	< <b>0.0001</b>	<b>0.0062</b>
73.2	< <b>0.0001</b>	< <b>0.0001</b>	



**Figure S1: Exemplary times-series of  $^{30}\text{N}_2$  concentration data during incubation experiments in two different  $\text{O}_2$  treatments (triplicate) at Melide.**



**Figure S2: Relative contribution of DNRA (%) to total  $\text{NO}_3^-$  reduction at variable  $\text{O}_2$  concentrations at Figino and Melide.**