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Supplement of

Isotopic evidence for alteration of nitrous oxide emissions and producing pathways' contribution under nitrifying conditions

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Supplementary material description

Six pages of supplementary material containing two tables and three figures.

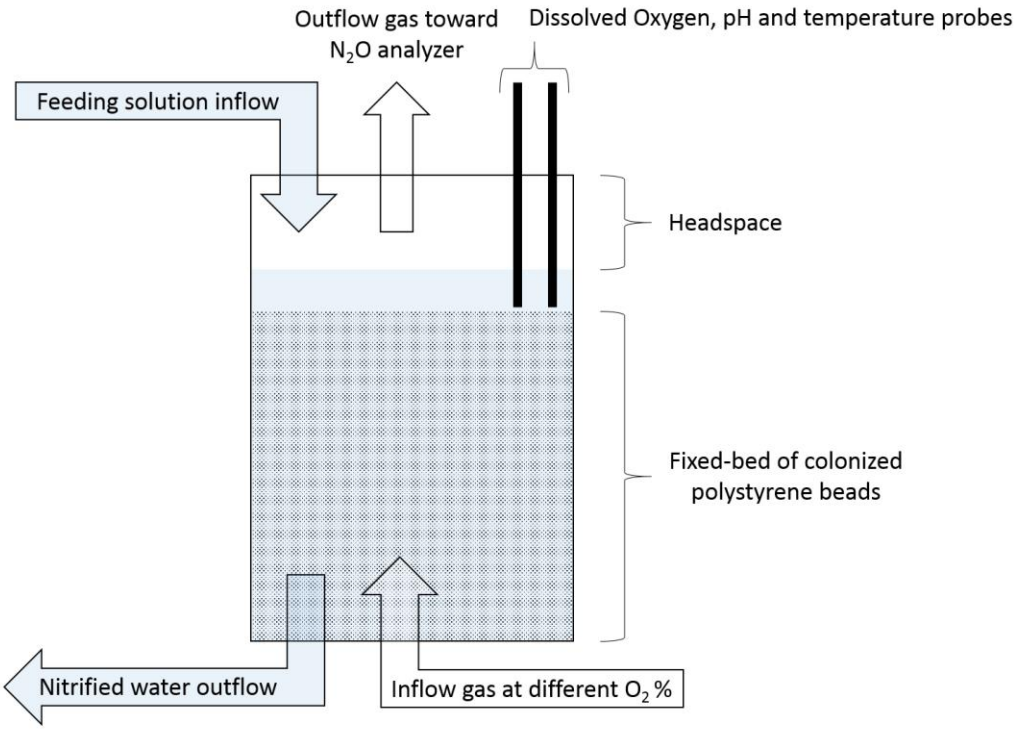

Figure S1. Schematic overview of the nitrifying reactor used in this study. Note that solution was down-flowing, while air was up-flowing.

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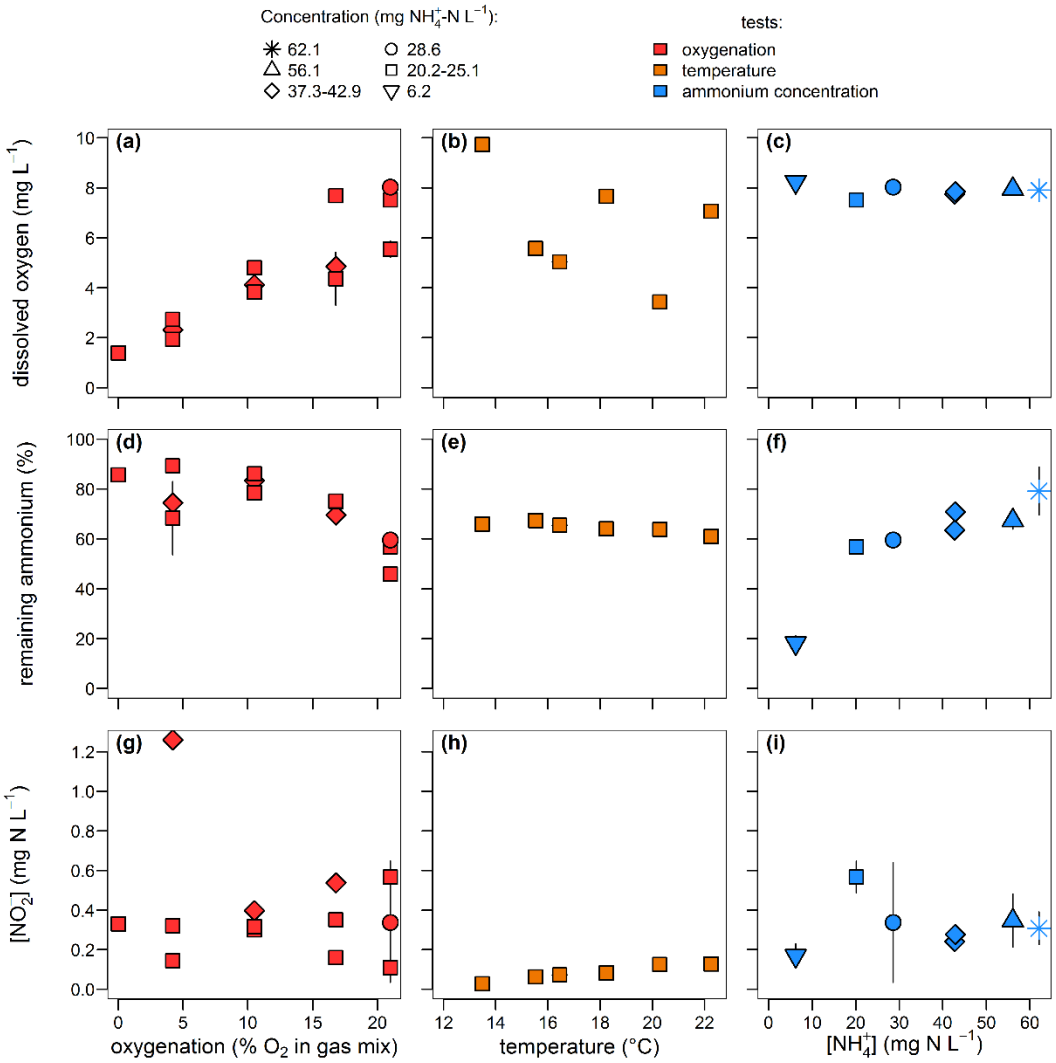

Figure S2. Effect of oxygenation, temperature and ammonium concentration on (a-c) dissolved oxygen concentration, (d-f) the remaining ammonium, and (g-i) the nitrite concentration.

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Table S1. Inflow and outflow ammonium, nitrite and nitrate concentrations measured during the ammonium concentration tests.

[NH_4^+] *(mg N L^{-1})*		**[NO_2^-]** *(mg N L^{-1})*		**[NO_3^-]** *(mg N L^{-1})*	
inflow	outflow	inflow	outflow	inflow	outflow
6.2 ±0.1	1.1 ±0.2	0	0.2 ±0.1	1.8	5.1 ±0.3
20.2 ±0.5	11.5 ±0.2	0.9 ±0.2	0.6 ±0.1	3.1 ±0.4	9.6 ±0.1
28.6 ±0.5	17 ±0.8	0	0.3 ±0.1	1.4	9.3 ±0.7
42.7 ±1.0	27.1 ±1.6	1.3	0.2 ±0.1	4.9 ±1.6	14 ±0
42.9	30.4	0.1	0.3	1.4	13.5
56.1 ±0.3	37.8 ±2	0.1 ±0.1	0.3 ±0	4.5 ±0.1	17.9 ±1.4
62.1 ±0.4	49.1 ±5.9	0	0.3 ±0.3	1.4	10 ±0.2

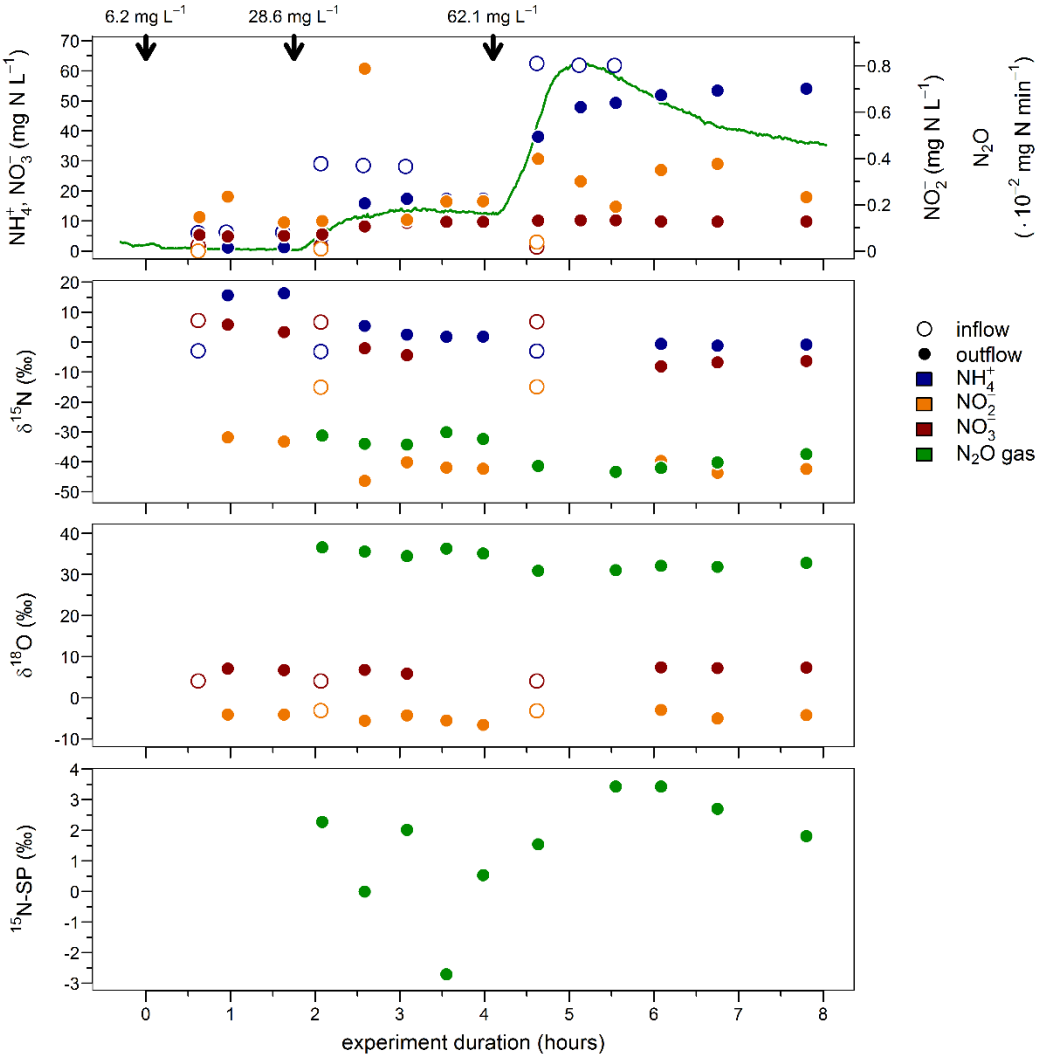

Figure S3. Concentrations, and nitrogen and oxygen isotope ratios of ammonium (NH_4^+), nitrite (NO_2^-), nitrate (NO_3^-) and nitrous oxide (N_2O) measured during the increasing ammonium concentration experiment. Nitrogen isotopomer site-preference (^{15}N-SP) was also calculated.

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Table S2. Inflow and outflow ammonium, nitrite and nitrate concentrations and nitrogen isotope ratios measured during the ammonium concentration tests presented in Fig. S3. Average concentration and nitrogen isotope ratio were calculated for the NO_x^- pool (i.e. NO_2^- and NO_3^-). Note that the nitrogen isotope ratio of inflow samples was measured only once in each experiment.

$[NH_4^+]$	$[NO_2^-]$	$[NO_3^-]$	$[NO_x^-]$	$\delta^{15}N\text{-}NH_4^+$	$\delta^{15}N\text{-}NO_2^-$	$\delta^{15}N\text{-}NO_3^-$	$d^{15}N\text{-}NO_x^-$
mg N l^{-1}				*‰*			
inflow				inflow			
6.08	0	1.76	1.76	-2.9	n.a.	7.2	7.2
29.09	0.01	1.38	1.39	-3.1	-15.1	6.7	6.5
62.51	0.04	1.35	1.39	-3	-14.9	6.8	6.2
outflow				outflow			
1.22 ±0.05	0.18 ±0.06	4.95 ±0.14	5.13	16 ±0.4	-32.5 ±1	4.6 ±1.4	3.3
17.02 ±0.72	0.31 ±0.08	9.26 ±0.66	9.60	2.9 ±1.6	-42.7 ±2.6	-3.2 ±1.4	-4.6
49.14 ±5.63	0.34 ±0.28	10.01 ±0.19	10.32	-0.9 ±0.3	-41.9 ±2	-7.1 ±0.8	-8.1