

Article

Removal of High-Strength Ammonia Nitrogen in Biofilters: Nitrifying Bacterial Community Compositions and Their Effects on Nitrogen Transformation

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Table S1. Physicochemical properties of CFM and DAS material.

Item	CFM	DAS
pH	5.74	8.13
Density (g/cm ³)	2.83	2.57
Porosity	33%	52%
S _{BET} (m ² /g)	720	1500

Table S2. Chemical composition analysis of CFM and DAS material.

Content (%)	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	K ₂ O	Na ₂ O	TiO ₂	MnO	P ₂ O ₅
CFM	62.91	14.22	5.21	3.69	5.22	2.51	1.12	1.21	1.10	0
DAS	56.12	17.23	5.09	4.10	1.69	2.69	0.49	0.92	0	0.29

*All data represent average of triplicates.

Table S3. Specific primer sequence of HTR and PCR amplification cycle condition.

Target genes and regions	Specific primer sequence	Primary PCR condition ^a	Secondary condition ^a	References
AOA amoA	Arch amoA F 5'-STAATGGTCTGGCTTAGACG-3' Arch amoA R 5'-GCGGCCATCCATCTGTATGT-3'	33 cycles	94 °C 30s, 50 °C 30s,	[1]
AOB amoA	amoA-1F 5'-GGGGTTTCTACTGGTGGT-3' amoA-2R 5'-CCCCTCKGSAAAGCCTTCTTC-3'	35 cycles	72 °C 30s.	94 °C 30s, [2]
NOB 16S	nxrA F 5'-CAGACCGACGTGTGCGAAAG-3' nxrA R 5'-TCYACAAGGAACGGAAGGTC-3'	10 cycles of linear amplification; 35 cycles of exponential amplification. ^b	8 cycles 94 °C 30s, 55 °C 30s, 72 °C 30s.	56 °C 30s, 72 °C 30s. [3]

^a Before each run of cycles, the temperature was held at 94 °C for 2 min and after each run the temperature was held at 72 °C for 5 min.

^b 10 cycles of linear amplification were carried out after adding forward primers F, and then reverse primers R were added for 25 cycles exponential amplification.

Table S4. Environment indicators of different samples.

Index	Cu1	Cu2	Cu3	Cm1	Cm2	Cm3	Cd1	Cd2	Cd3
DO (mg/L)	2.2	2.2	2.0	1.9	1.7	1.6	1.2	1.2	1.0
pH	6.8	6.7	6.3	6.4	6.2	6.1	6.4	6.3	6.2
T (°C)	28.7	29.9	30.3	31.6	31.8	31.8	32.2	33.3	33.5
Index	Du1	Du2	Du3	Dm1	Dm2	Dm3	Dd1	Dd2	Dd3
DO (mg/L)	3.9	3.6	3.4	3.1	3.0	2.6	2.4	2.4	2.3
pH	7.9	7.5	7.4	7.7	7.5	7.3	7.6	7.4	7.2
T (°C)	28.5	29.6	30.6	31.4	31.6	31.7	32.0	33.1	33.3

References

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2. Wang, J.; Wang, J.; Rhodes, G.; He, J.; Ge, Y. Adaptive responses of comammox Nitrospira and canonical ammonia oxidizers to long-term fertilizations: Implications for the relative contributions of different ammonia oxidizers to soil nitrogen cycling. *Sci. Total Environ.* **2019**, *668*, 224–233. <https://doi.org/10.1016/j.scitotenv.2019.02.427>.
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