

Ammonium-nitrogen ($\text{NH}_4^+\text{-N}$) removal from groundwater by a dropping nitrification reactor: characterization of $\text{NH}_4^+\text{-N}$ transformation and bacterial community in the reactor

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Supplementary Materials:

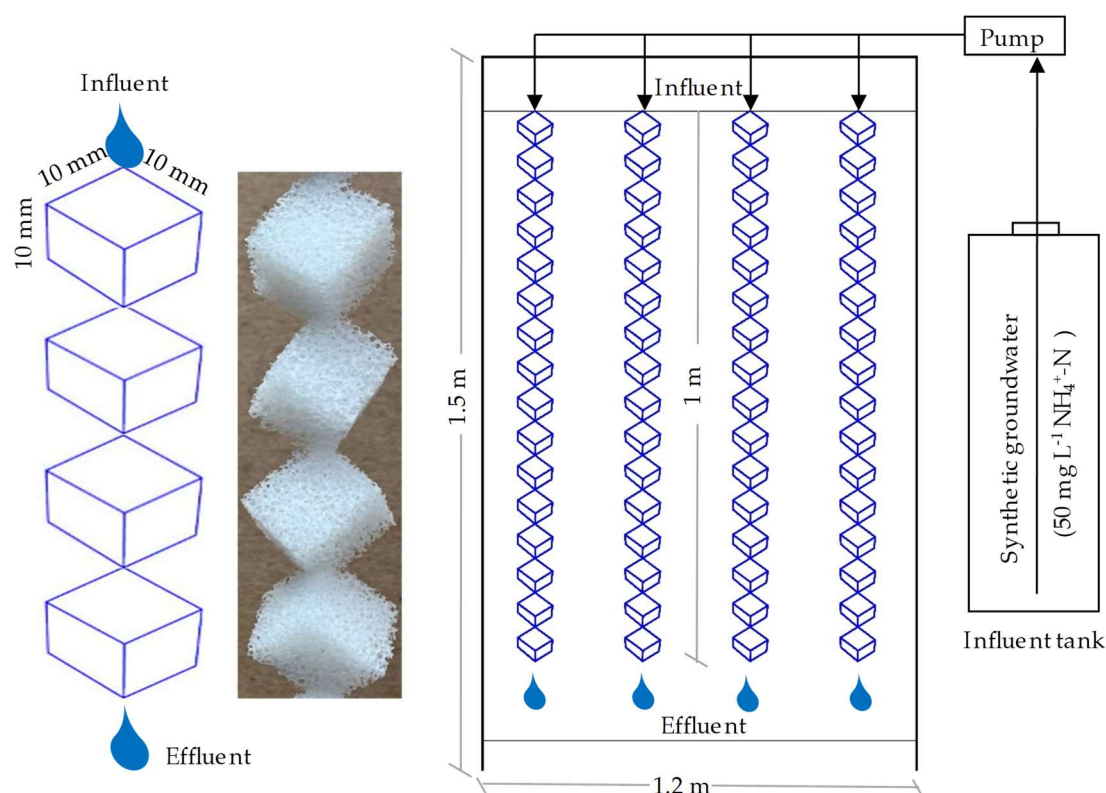
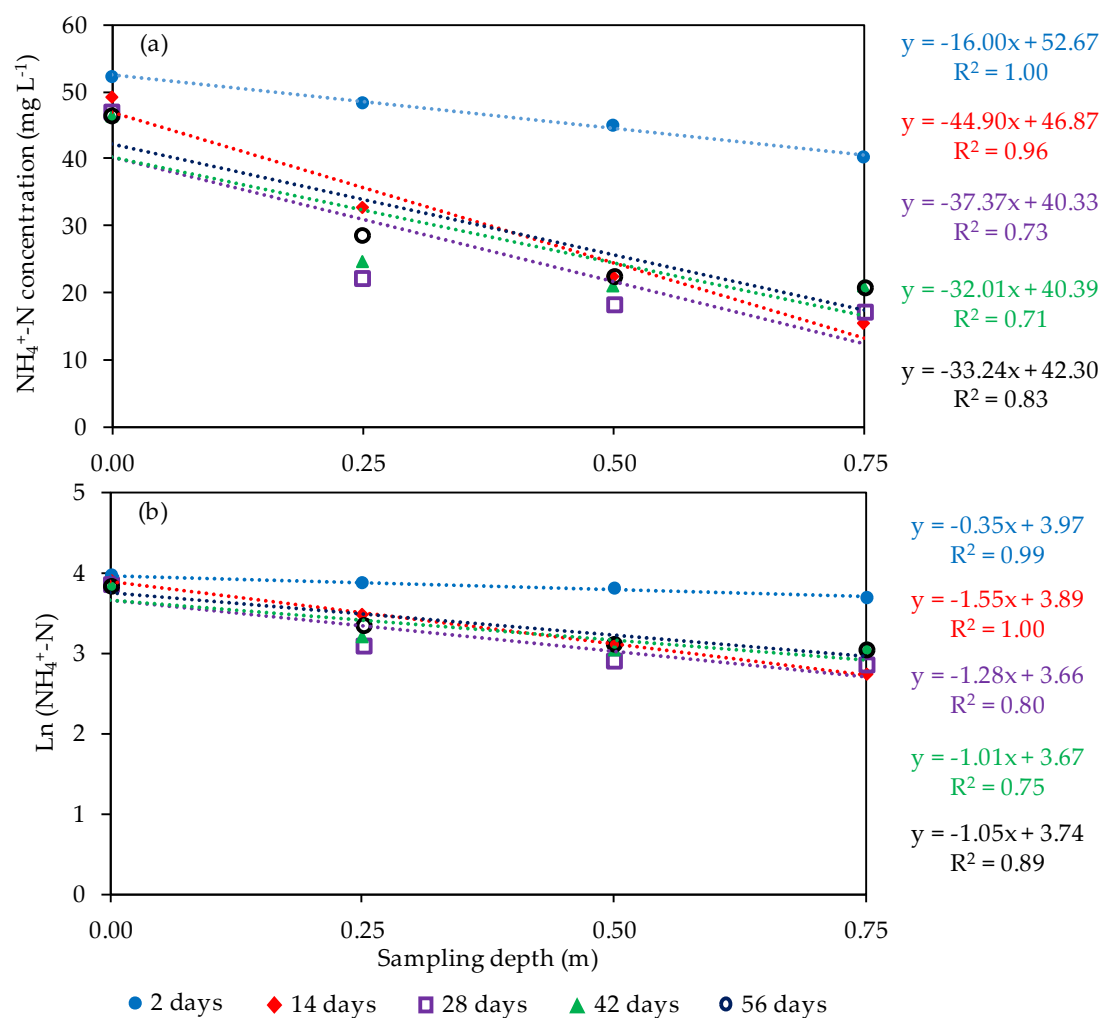


Figure S1. Schematic diagram of a dropping nitrification reactor.



Kinetic reactions	Coefficient of determination (R^2) Value				
	2 days	14 days	28 days	42 days	56 days
Zero-order	1.00	0.96	0.73	0.71	0.83
First-order	0.99	1.00	0.80	0.75	0.89

Figure S2. Zero-order (a) and first-order (b) kinetics for the decrease in $\text{NH}_4^+\text{-N}$ along the single axis of the dropping nitrification units. $\text{NH}_4^+\text{-N}$ concentrations represent the mean of four replicate reactors at different sampling depths. Comparison of the coefficients of determination (R^2) between the zero- and first-order kinetic reactions (c).

Table S1. Target genes for qPCR analysis, primers and sequences, annealing temperatures, and amplification sizes.

Target gene	Primer	Sequences (5'-3')	Annealing temp. (°C)	Amplification size (bp)	Reference
Bacterial 16S rRNA	341F	CCTACGGGAGGCAGCAG	60	193	[1]
	534R	TACCGCGGCTGCTGGCAC			
<i>amoA</i>	amo598f	GAATATGTTTCGCTGATTG	56	120	[2]
	amo718r	CAAAGTACCACCATACGCAG			
<i>nxrA</i>	F1norA	CAGACCGACGTGTGCGAAAG	58	322	[3]
	R1norA	TCYACAAGGAACGGAAGGTC			
<i>nirK</i>	nirK583F	TCATGGTGCTGCCGCGKGACGG	63	326	[4]
	nirK909R	GAACTTGCCGGTKGCCCAGAC			
<i>nirS</i>	nirScd3af	GT(C/G)AACGT(C/G)AAGGA(A/G)AC(C/G)GG	57	425	[5]
	nirSR3cd	GA(C/G)TTCGG(A/G)TG(C/G)GTCTTGA			

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