

Nitrite oxidizing bacteria suppression based on in-situ free nitrous acid production at mainstream conditions

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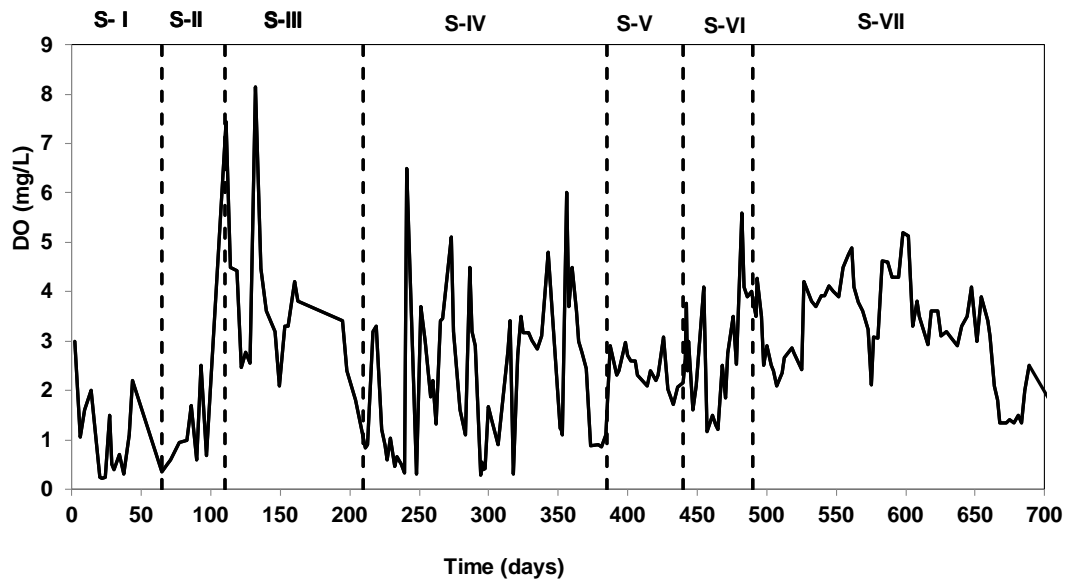


Figure S.1. Evolution of the dissolved oxygen (DO) concentration, in mg O₂/L, measured inside the reactor.

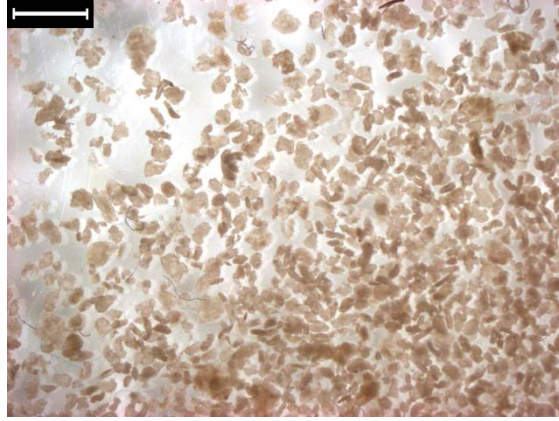


Figure S.2. Image of partial nitrification flocculent biomass on day 310 of operation. The size bar represents 2 mm.

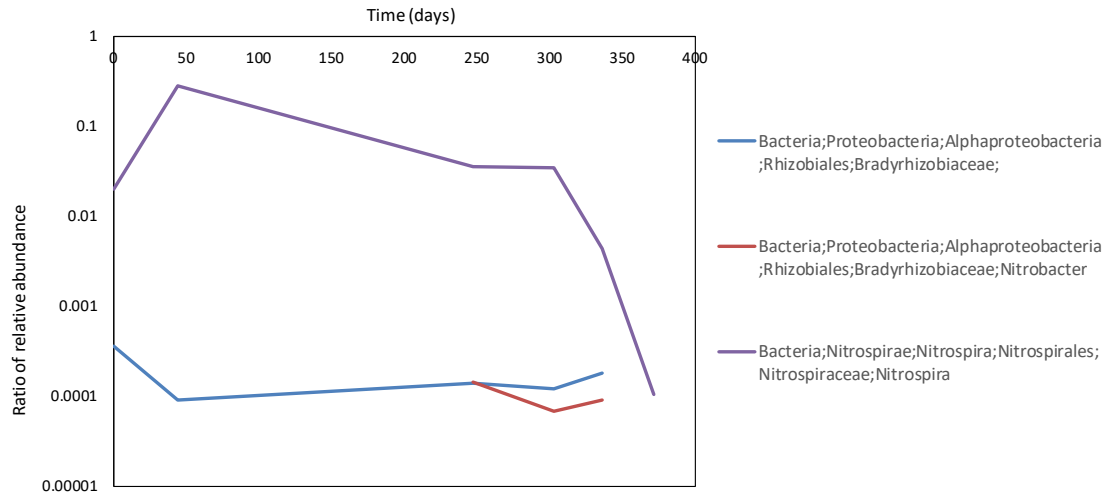


Figure S.3. Ratio of relative abundance for the bacterial populations (at genus level) present in sludge samples collected at different operational days of the SBR.

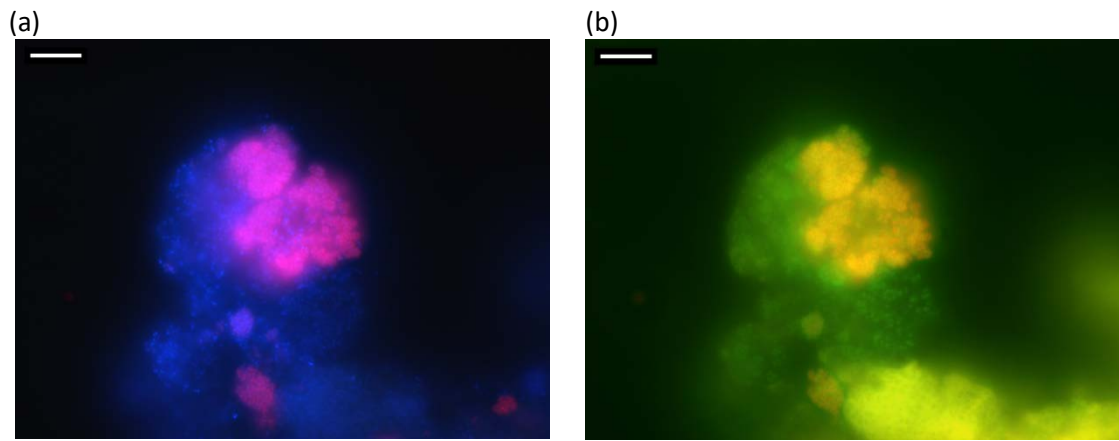


Figure S.4. FISH images of the biomass used as inoculum with the applied probes: (a) *Nitrospira* (NTSPA712, pink) and DAPI (blue); (b) *Nitrospira* (NTSPA712, orange) and Bacteria (EUBmix, green). Size bar: 10 μm .

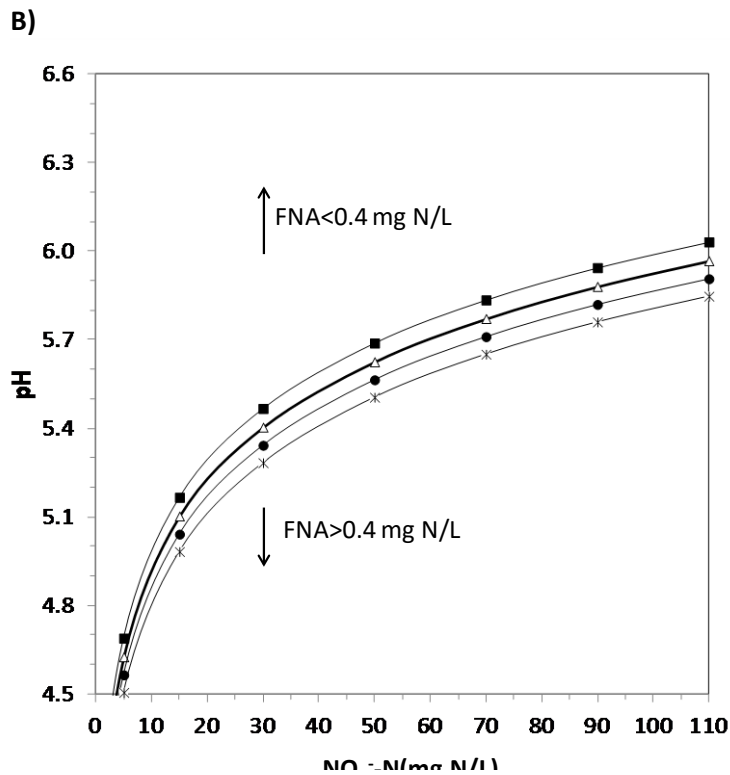
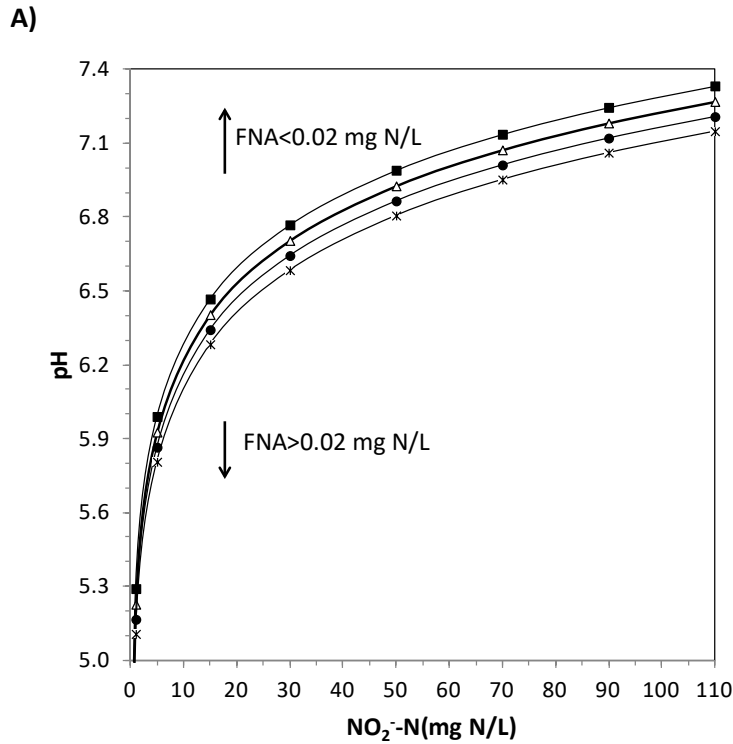


Figure S.5. Graphical representation of the FNA concentration profile obtained using the equation proposed by Anthonisen et al. (1976)¹ applied at different temperatures: 5 °C (■), 10 °C (Δ), 15 °C (●) and 20 °C (*). **A)** For NOB: $\text{FNA} < 0.02 \text{ mg N/L}$ (above the lines, no inhibition zone) and $\text{FNA} > 0.02 \text{ mg N/L}$ (below the lines, inhibition zone); and **B)** For AOB: $\text{FNA} < 0.4 \text{ mg N/L}$ (above the lines, no inhibition zone) and $\text{FNA} > 0.4 \text{ mg N/L}$ (below the lines, inhibition zone).

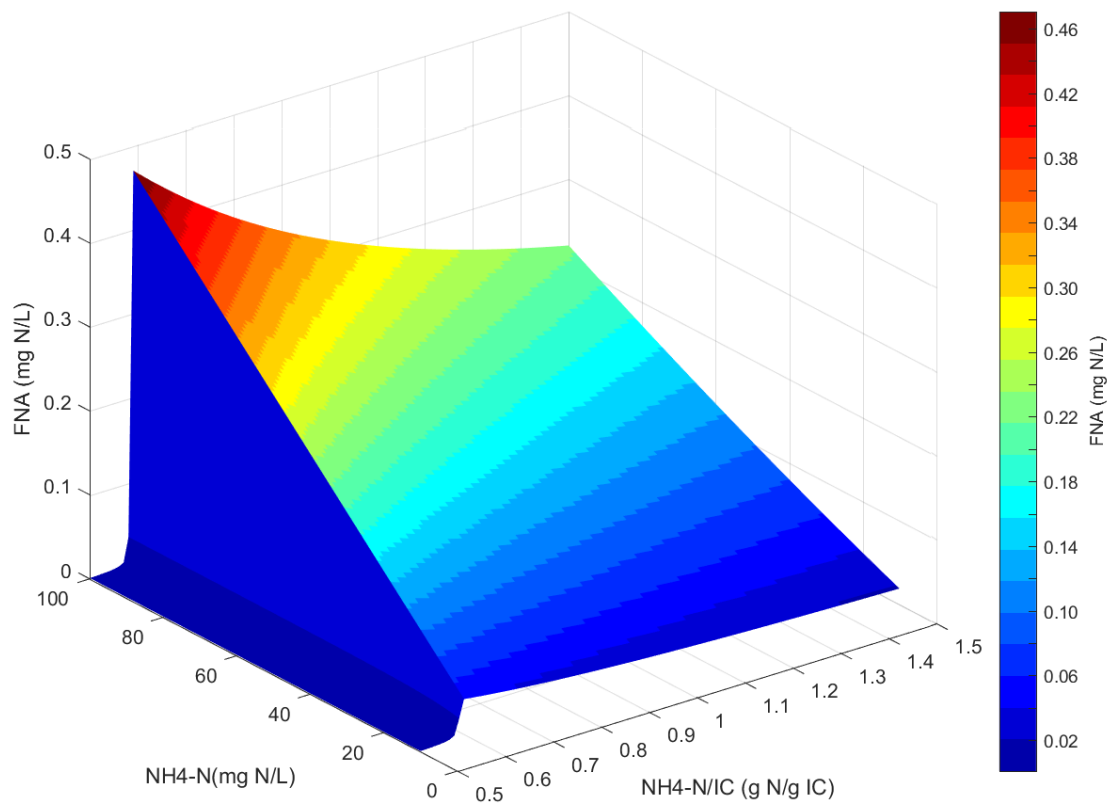


Figure S.6. Sensitivity analysis of the impact of the change of the NH4/IC (g N/g C) ratio and ammonium concentration (mg/L) on the FNA accumulation.

References:

1. Anthonisen AC, Loehr RC, Prakasam TBS, Srinath EG. Inhibition of nitrification by ammonia and nitrous-acid. *Journal Water Pollution Control Federation*. 1976 1976;48(5):835-852.