

Review of Valiente et al. for Biogeosciences

The paper presents the relative contribution of several microbial processes related to nitrogen removal (denitrification, DNRA, and anammox) under different experimental conditions with/without light and with/without oxygen. The authors use ^{15}N -isotope pairing technique to obtain the corresponding contribution. I consider that this paper is interesting, taking into account the global problem of nitrogen inputs in aquatic ecosystems and their consequences for N_2O emissions. However, I found the paper wordy, hard to read, and the figures poorly illustrate the information about this work. I have several concerns that I detail below.

Major concerns:

-Quality of the figures

I think that the authors have to remake the figures to illustrate their results better. Figures 1, 2, and 4 include the acclimation phase that, in my opinion, masks the “real” results. I suggest showing in these figures only the exact experimental time (i.e., since the addition of the ^{15}N -nitrate, time 0). Most changes occur in the first 24h. I think these figures could be more illustrative showing only these 24h-36h that is the period until NO_3 disappears. The complete figures could go to supplementary material.

Figure 3 should be cut at the same time that Figures 1,2 and 4. In this figure, I am also wondering if the specific times with more than 100% of recovery are errors. Please, consider deleting these times. For instance, time 3 in the treatment OD that reach almost 120%. I think there is an error mostly because time 2.5 and time 4 are pretty similar.

-The precision of some chemical analysis.

The concentration of ammonium shows tremendous values of standard deviation (Figure 1). I have concerns to assume the low replicability of this analysis. The concentration of DOC and its changes is high. I have some concerns here too. I did not see the complete protocol for DOC. In saline, endorheic lakes DOC is usually high (around 1-10 mM), but the values around 40 mM are extremely high even for this type of systems. Water from saline lakes needs a protocol for DOC with longer purge time and acid additions to make sure all the DIC has been removed. I was unable to see these details in the methods of acid addition and purge time. Changes in 20 mM are so extreme that I have concerns. Usually, phytoplankton blooms can change almost nothing DOC concentration in water.

Minor concerns

- Lines 42-48, I think this paragraph is not necessary since the paper is about nitrates removing and confuse the reader.
- Lines 100-108, I found some incoherence here. Is Petrola lake submitted to nitrogen inputs or not?
- Line 158, What is dissolved bound nitrogen?

-Line 348, I think the reference of McCrackin and Elser is not about sediments