Replies to reviews on Testing Ion Exchange Resin for quantifying bulk and throughfall deposition of macro and micro-elements on forests by Vos, Marleen A.E, et al.

Reply to anonymous referee #1

Overall, the authors have done their best to address the comments of all reviewers, but I still find sample sizes of 2 for the lab work to be problematic.

We acknowledge that the small sample size is a limitation and agree that further testing of the ion exchange method for deposition measurements is necessary. However, as mentioned in our response to major revisions, we remain confident in the reliability of our findings. We hope this paper encourages others to thoroughly test and refine the method before full-scale implementation, as not all studies using this method have tested the recovery and adsorption before implementing it.

Lines 52-53 – Please use subscripts for NH3 and NOx; and throughout, please show the charges for NH4 and NO3.

We checked the entire manuscript for the use of subscripts and used them consequently. We also added charges for NH_4^+ and $NO3^-$.

Lines 61-2 – Maybe I missed it, but I didn't see that Fenn and Poth 2004 claims that resins inhibits mineralization, nitrification and denitrification.

You are correct. In Fenn and Poth (2004), there is a discussion on whether differences in NH_4^+ concentrations can result from nitrification processes, which are primarily associated with common water collectors. Based on their discussion, we concluded that (1) nitrification does not occur in resin columns, unlike in the common water method, and (2) the higher NH4+ concentrations observed in resin columns could be due to the release of amino groups. These points are covered in the section "Possible Sources of Ammonium Discrepancy between Collector Types" in Fenn and Poth (2004).

Since Fenn and Poth (2004) discuss but do not definitively prove the inhibition of nitrification in resin compared to the water method, we revised lines 61-62 to: "Furthermore, the method is regarded as potentially more reliable for nitrogen, as the resin likely inhibits mineralization, nitrification, and denitrification, which can be affected by local weather conditions, as discussed by Fenn and Poth (2004) and Kohler et al. (2012).

Lines 65-67 – I'd suggest deleting the final sentence of this paragraph. It doesn't seem very relevant to the work at hand.

We deleted the final sentence of the paragraph.

Line 84 – The Qian and Schoenau (2002) reference is about using IERs to assess nutrient availability in soil; the Bayer et al. (2012) reference is about using IERs to remove Zn from wastewater. I'm not sure that these references are relevant to the work at hand.

We find these references valid as there are limited studies that specifically test the behavior of ion exchange resin (IER) under various field conditions. Although the resin is applied differently in these studies, the underlying principle remains consistent—the resin adsorbs elements passing through it. Given the lack of a broad spectrum of literature on the resin's behavior in environmental contexts, and considering the comparable function of the resin across different methods, we prefer to retain these references in the manuscript.

Lines 175-176 – "…since a higher recovery of the base cations was found with a 1M HCl extraction compared to an 0.5M HCl extraction (Fenn et al., 2018)" suggests that Fenn et al. experimentally compared the two HCl strengths, which is not the case. What the Fenn et al. (2018) paper says is: "Yamashita et al. (2014) used 0.5 N HCl as an extractant for SO42- and base cations, but we found better recovery of base cations using 1 n HCl. I'd suggest rephrasing or deleting this.

We rephrased the sentence to 'since a higher recovery of the base cations was found with a 1M HCl extraction

(Fenn et al., 2018) compared to a 0.5 M HCl extraction (Yamashita et al., 2014)'.

Line 180 – Suggest deleting "respectively".

We deleted the word "respectively" in this sentence.

Line 192-193 - Change content to concentrations.

Changed.

Literature

Fenn, M.E., Bytnerowicz, A., Schilling, S.L., 2018. Passive monitoring techniques for evaluating atmospheric ozone and nitrogen exposure and deposition to California ecosystems. Gen. Tech. Rep. PSW-GTR-257. Albany, CA: US Department of Agriculture, Forest Service, Pacific Southwest Research Station 257.
Yamashita, N., Sase, H., Kobayashi, R., Leong, K.-P., Hanapi, J.M., Uchiyama, S., Urban, S., Toh, Y.Y., Muhamad, M., Gidiman, J., 2014. Atmospheric deposition versus rock weathering in the control of streamwater chemistry in a tropical rain-forest catchment in Malaysian Borneo. Journal of tropical ecology 30, 481-492.