

Interactive comment on “Chemical characterization of fog and rain water collected at the eastern Andes cordillera” by E. Beiderwieden et al.

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The authors would like to thank the referees for their helpful and positive comments. The questions and suggestions were very constructive and are discussed now. The technical corrections were implemented. Due to the similar conclusions of the referee comments, the answer is cumulatively.

p. 864, Abstract: The referees criticised the following mention “the concentration of all analysed ions were relatively low compared to other mountainous sites”. We agree with the comment of the referees and modified the abstract accordingly. The last paragraph of the abstract is worked over and the citations are removed. The content of the present paper is a comparison of the chemical composition of marine and continentally influenced fog and not a comparison with other studies. That would also be very interesting but is not the scope of this study.

p. 865, Introduction: We agree with the request of information about the expected differences concerning continentally and marine influenced fog. Continentally influenced fog is suggested to contain higher concentrations of anthropogenic emissions whereas marine affected fog is assumed to yield sea salt ions such as Cl^- , Ca^{2+} , and Mg^{2+} (Munger, 1989, Gundel, 1994).”

Additionally, more information about the position of the ITCZ during the sampling period was wanted. From November through February, the position of the ITC takes course within the Ecuadorian highlands. There are basically two advection regimes (Bendix and Lauer, 1992): north easterly trade winds travelling over the Amazonian basin and south easterly trade winds deviated from the Andes cordillera.

p. 866, section 2.2: Apparently, the roof of the fog collector caused some question. It is difficult to say up to which wind speed the rain can be considered not to hit the strings. The size of the raindrops varies a lot and the changeover from rain to fog is smooth. Therefore, a calculation of the effectiveness of the roof is imprecise. Due to the conditions of the sampling site, the roof was not effective in preventing rain from reaching the fog sampler.

p. 867, section 2.4: a table that gives the limits of determination is added that explains the accuracy and precision of the analyses. Quality control of the analytical results was obtained with the measured conductivities and the calculation of an ion budget. For the calculation, we took into account the specific conductivities of the major ions NH_4^+ , K^+ , Na^+ , Ca^{2+} , Mg^{2+} , Cl^- , NO_3^- , PO_4^{3-} , and SO_4^{2-} . The quantities of these ions were also determined in the lab and therefore, the different conductivities can be compared as a hint of the data quality. Large discrepancies between these values indicate the presence of to other ions that were not included in the calculation.

p. 868, Results: the fog situation at the sampling site was relatively uniform with the exception of three periods. These times were very dry, sunny, and without fog events. The fog that was collected after this period contained much higher ion concentrations

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which are likely to be associated with dry deposition of aerosol particles on the collector surface. Three fog samples, which were collected after these non-foggy conditions that lasted for more than one week, were excluded from further analysis. In “normal” foggy conditions, it is adequate to clean the fog collector only once a week to prevent strings from being polluted by dry aerosols. During dry periods, cleaning once a week is not enough.

p. 872, Discussion: due to limited instrumentation, we do not have any reliable information about the typical number of rain events that occur in a week. We just know the amount of rain water that was collected by the rain collector. Additionally, as I mentioned before, the separation between rain and fog events for this site is very difficult to take. For the present study it is important to know that the fog samples were collected on a daily basis and the rain samples once a week. Therefore, the rain samples represent mixed samples of one week.

p. 873, Conclusions: it seems to us that there is a misunderstanding: with “liquid water concentrations” we meant concentrations of ions per litre of water and not concentrations per litre of air.

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