

Interactive comment on “Atmo-metabolomics: a new measurement approach for investigating aerosol composition and ecosystem functioning” by Albert Rivas-Ubach et al.

Anonymous Referee #1

Received and published: 7 October 2016

Referee report for "Atmo-metabolomics: a new measurement approach for investigating aerosol composition and ecosystem functioning" by Albert Rivas-Ubach et al., submitted to AMT

This manuscript describes the organic analysis of ambient aerosols with three techniques, GC-MS, LC-MS and direct infusion MS. The focus of this manuscript is not clear at all. The title seems to suggest that a new technique is described but all that is provided are analyses techniques that are used in the community since years. So, I cannot see what the new aspect of this paper is. Creating a new word for existing analysis strategies is not helpful.

It is not clear what the focus of the paper should be. The actual results seem to suggest

C1

that tracers of PBAP are the main focus but then the manuscript often mentions that the aim is to determine the overall particle composition, which is clearly dominated by many other sources and not only PBAP.

Figure 1-3 are to a large extent trivial and would be better suited in a review rather than in a research paper.

p. 4 looks to me more like a conclusion section rather than text for an introduction.

The results (e.g. in Figure 4-8) show some interesting findings but overall they are hardly discussed and compared to existing, up to date literature. For all the applied techniques (GC, LC, and direct infusion high resolution MS) there are many current publications, which need to be discussed.

Aerosol sampling (p. 8). It is not clear why the commercial filter holders were modified. This should be clearly motivated. Filter sampling is used in aerosol sciences since decades and it is a standard method. However, much of the sampling description seems to suggest that a new technique is presented, which is not the case. Aerosol was collected without any upper size cut as it is standard practice in aerosol science. This is a serious short-coming and brings the severe risk that large biological material is collected that would not be transported over significant distances due their large size. Collecting aerosol within a certain size range is absolutely essential for any aerosol sampling and analysis. Therefore, the results of this study cannot claim to represent atmospheric aerosols.

GC and LC results. LC results report 18 identified compounds. GC analysis mention 14 compounds. Most comprehensive aerosol analyses presented in the literature using these techniques identify many more compounds. It is not clear why in the study presented here only a small number of compounds was identified. There is no evidence given how these compounds were identified. Simply mentioning "Library identification" is not sufficient. More details would need to be given.

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Figure 7 and 8 show interesting results but more discussion would be needed.

Section 4.1 is mostly trivial discussion and can be shortened a lot. The same applies to much of section 4.3.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-209, 2016.