Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2019-487-RC1, 2019

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Plant assemblages in atmospheric deposition" *by* Ke Dong et al.

Anonymous Referee #1

Received and published: 8 July 2019

General Comments:

The authors report a wide-ranging study on the two basic types of deposition for aerosol plant particles. They use high-throughput sequencing for identification and additionally qPCR for quantification of the different samples investigated in this study. The adaption of the clustering of OTUs with a similarity of 97% as known for bacteria might for plants be seen critical. References from literature, showing that this is a working method for clustering plant OTUs, are missing. The reached sequencing depth is sufficient as indicated via rarefaction curves and subsampling at 6,142 reads is comprehensible. The methods concerning the qPCR are in good agreement with the standard. Especially the deposition flux calculations give interesting results, but the authors name the weaknesses of the method like variation in the number of ITS gen regions and others (P7 L20). The scientific methods and assumptions are clearly outlined and not redundant. In general, the data of this manuscript are helpfull and this paper might fits to the

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scope of ACP, but my personal point of view is that it is more related to the main topic of BGS. The overall writing of the paper appears somehow tedious, mainly because of redundant parts within introduction and discussion, whereas the story could be very attractive with some more focus on the needs of the reader. I want to name two examples comparing the beginning of the introduction and discussion as both start in the same manure, to strengthen my point:

Specific comments:

The authors give the global atmospheric estimates of emitted particles in Tg per year. Noticeable here is that on P1L25 the amount of released plant particles is given with 47-84. In the Discussion P7L2 no range is given but the already mentioned amount of pollen from Hoose et al. 2010 is given with 47 Tg.

P1L25 An estimated 47–84 Tg of plant particles are released into the environment each year (Després et al., 2012;Hoose et al., 2010;Jacobson and Streets, 2009),. . .

P7L2 Large quantities of biological particles are emitted into the global atmosphere, with estimates of 0.75 Tg yr-1 for bacteria, 31 Tg yr-1 for fungi, and 47 Tg yr-1 for pollen (Hoose et al., 2010)

Another example:

P2 L1-5 . . .and/or by serving as ice nuclei (IN) and cloud condensation nuclei (CCN) (Pöschl et al., 2010;Pope, 2010). Finally, atmospheric pollen is involved in globalcycling of substances (Després et al., 2012) by long-range transport and subsequent settlement to the planetary surface (pedosphere) by dry or wet deposition, i.e.,sedimentation or precipitation, respectively.

P7 L2-6 The emitted particles are involved in global cycling of substances, including the bioprecipitation cycle in which organisms emit airborne particles (or are emitted as airborne particles) that serve as cloud nuclei and promote precipitation (Morris et al., 2014;Sands et al., 1982)..

Further question:

I wonder why the results of the Anderson sampler especially for the Pinidae (found within all chambers for all aerodynamic diameter) is not discussed by the authors as it might indicate pollen rapture or the co-emittance of non-pollen particles? Or is this an effect due to the mentioned air-filled sacci of for example Pinus?

Technical corrections:

In Table 1 : asterids and rosids are not capitalized in table 2 they are. Please unify.

Table 2: Please optimize the dimension of the table in a way that no single characters appear as for “Chenopodium“.

Figure 1: A method is missing, giving some information how data for the plots were generated. I guess 1A) qPCR and 1B) NGS? This should be added to the caption. Overall seems this figure caption somehow unfinished when compared to all others and scientific standards. One opening sentence would improve this.

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