

Interactive comment on “High levels of primary biogenic organic aerosols in the atmosphere in summer are driven by only a few microbial taxa from the leaves of surrounding plants” by Abdoulaye Samaké et al.

Anonymous Referee #2

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The manuscript describes the contribution of primary biogenic organic aerosols (PBOAs) to PM₁₀, which were collected during the summer of 2017 (June–August) in a rural area of France. The quartz fiber filters (24-hour samples) were collected using high-volume sampling systems. The collected samples were analyzed for detailed chemical composition (inorganic ions, OCs and ECs, sugars and sugar alcohols) and for biological constituencies (DNA sequencing and analysis). Soil and vegetation samples were also collected and analyzed with the same techniques for comparison.

The goal of this study was to investigate the association between the chemical compo-

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sition of PM₁₀ (especially sugar compounds or SCs) and the identified PBOAs. This study is scientifically very important because very little is known about the contribution of bioaerosols to atmospheric particulate matter and what kinds of markers can be used for the quantitative analysis of bioaerosols in particular fungi and bacteria. The manuscript is well written and organized. I have several major comments.

Major Comments:

1. The title of the manuscript doesn't represent the research of this paper (it shows one of the results, but not the overall scope of this study).
2. The author performed a comparison between SC concentrations and collected bioaerosols, assuming that SCs in the atmospheric aerosols are mainly due to PBOAs. Other sources (e.g., biomass burning, the ocean) can also emit SCs (sugars and sugar alcohols). The author is missing the entire discussion of these possible sources. Therefore, without a proper comparison of SC emissions from different sources, the statement regarding "suitable markers" (line 77) should be carefully used. A discussion on other SC sources is needed.
3. Pollen can be a huge contributor to atmospheric PBOAs. Why were only bacteria and fungi collected and analyzed?
4. What standard deviations represented in this paper (e.g., lines 270–282)? It is unclear how they were calculated.
5. Figure 5 is not readable.
6. In lines 148–149, based on which factors (literature data etc.) was the OM/OC conversion factor of 1.8 used? This choice has to be well explained.

Some (not all) minor comments:

Line 16. It should be "on rural area of France"

Lines 37. References are missing.

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Line 119. Why PM10 cut was selected for sampling? Some PBOA have a larger size.

Line 122. How the collected filters were stored prior analyses? (It has to be added to the experimental section).

Lines 143, 170, 172. Company's city (state, country) is missing.

Line 207 (and everywhere in the text). Words "bacteria" and "fungi" should not be capitalized.

Figure 6. Explain what black diamonds represent in this figure.

Line 439. The space should be removed before "."

Line 445. Use OM instead of "organic matter".

Line 477. Use SC not "sugar compounds"

Line 518. Remove extra "."

Line 531. Use "strongly" instead of "highly".

I recommend this manuscript for publication after the author addresses the major questions.

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