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Atmospheric Chemistry and Physics
Discussions

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.

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This manuscript presents a study on the connection between organic tracers and microbial taxa and it also points to the important contribution of leaves from surrounding vegetations. The manuscript is well prepared and the results and findings are very interesting and of importance for the fellow researchers. It could be accepted for publication in the journal.

We thank the reviewer for his/her constructive comments that helped to improve the

quality of this work. We have reviewed the comments and made a point by point revision of the article. Detailed responses to the comments are given below, point by point, in blue, including changes made directly to the manuscript, in red (see the main text).

Specific comments:

(1) The title can be shortened or modified to make it concise and highlighted.

We agree with the referee and have changed the title as follows "High levels of primary biogenic organic aerosols are driven by only a few plant-associated microbial taxa" to concisely represent the findings of our research paper.

(2) L12-13: The specific taxa of bacterial and fungi as the major contributors of PBOA could be highlighted in the Abstract.

Thank you for suggestion, this information has been added in the Abstract (see lines 13-16).

(3) As mentioned in Section 2.1, the meteorological data were collected during the campaign. How about the influence of these environmental factors such as temperature, humidity and so on which were suggested to be essential for the release of primary biological aerosols?

We do agree with the referee that some specific environmental factors have been widely suggested as potentially influencing the initial release of primary biological aerosols and their subsequent dispersion in air (Jones and Harrison, 2004; Zhang et al., 2010). However, in our opinion the detailed analysis of these relationships was beyond the scope of this study for two main reasons:

First, we have recently conducted a large study on the spatial behavior of primary sugar compounds (SC) and the identification of their major effective environmental drivers. In this recent study, based on daily (24h) data series covering 16 national sites throughout France, it was clearly demonstrated that the main drivers of daily atmospheric concentrations of SC are ambient air temperature, relative humidity, wind speed, vegetation density or harvesting activities for sites influenced by agriculture (Samaké et al., 2019).

Second, it has already been shown that bioaerosol concentrations (most likely Bacteria and Fungi) in the near surface atmosphere increase during rainstorms, with some studies also showing that Ascomycota concentrations increase sharply during and immediately after rainstorms (Elbert et al., 2007; Womack et al., 2015). This implies that their initial release is closely linked to the short-term dynamics (i.e. within few hours) of specific environmental factors. Here, we would like to draw the attention of the reviewers to the fact that, in the present study, some consecutive quartz filter samples (maximum 2 days) with low OM concentrations have been pooled for high throughput DNA sequencing. The resultant composite data at a temporal resolution of 2-days are too coarse to allow a realistic study of the environmental factors that effectively drive the short-term dynamics of primary biological aerosol concentrations.

Thus, extending the correlation analysis between local meteorology (few hours) and the relative abundances of fungal sequences at the genus level (aggregated over 2 consecutive days) would not, in our opinion, provide valuable additional information.

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