

Dear Editor,

We would like to thank you for the opportunity to resubmit another revised copy of our manuscript “*Measurement report: Atmospheric fluorescent bioaerosol concentrations measured during 18 months in a coniferous forest in the south of Sweden*”.

The comments and remarks have helped us to further strengthen our paper. Please see below for a point-by-point response to all the referee comments.

Thank you in advance for your consideration, we look forward to hearing from you soon.

Best wishes,

Madeleine Petersson Sjögren and Jakob Löndahl (on behalf of all authors)

*Answers to referee #1 comments and remarks:*

Referee #1:

l. 140: ,This is the first report on use of the BioTrak for measurement of bioaerosols.’ According to l. 129 and suggested by its name, measuring bioaerols is a main purpose of the BioTrak. Probably the authors mean first application of the BioTrak for ambient air as stated in l. 504.

**Answer: You are correct. We updated the sentence to: “This is the first application of the BioTrak for measurement of ambient air.”**

l. 141-142: The first sentence of this paragraph reads a bit out of context since both WIBS and UV-APS nor a comparison to measurements with these instruments were not mentioned in recent text passages.

**Answer: We agreed. We made the decision to introduce this paragraph in a slightly different way now. The following sentence was added: “For comparison of results between different studies of ambient air bioaerosol measurements (in particular with more used techniques such as UV-APS and WIBS), it should be noted that the BioTrak’s fluorescence excitation and fluorescence emission operates at partly different wavelengths compared to both the WIBS and the UV-APS. Therefore, data are not completely comparable.” See lines 141-144.**

l. 241-243: The sentence needs a grammatical revision. I don't understand what the authors wanted to express. Further, how could pollen from spring and summer survive until fall to increase the bioaerosol concentration in fall?

**Answer: We updated the two sentences to the following which is what we wanted to say: “At the beginning of fall spores from fungi are dispersed in the air, which increases the fall  $N_{\text{FBAP}}$  (Schumacher et al., 2013; Toprak and Schnaiter, 2013). This also explains the pattern here observed, where an increase of bioaerosols in the fall is plausibly due to a combination of pollen dispersed from the late summer, in combination with fungi and spores in late summer and early fall (Sept-Oct, primarily).”**

section l. 296 - 314: Can the difference in cut off size between UV-APS, WIBS and Biotrak also influence the  $N_{\text{FBAP}} / N_{\text{TAP}}$  ratios? If yes, this should be mentioned as well.

**Answer: Thank you for this comment. We added the following sentence: “It should also be noted that we only counted particles with diameters between 1 and 12  $\mu\text{m}$ , which means that results from studies with other particle diameter ranges might not be comparable.” on line 310-311.**

l. 302 and 308-309: It is mentioned two times ,that these differences also influence ratios between NFBAP and NTAP.‘ One occurrence is probably redundant.

**Answer: Thank you for noticing this. We removed the sentence on line 308.**

l. 513: ,underestimates the bioaerosol concentration and correctly classifies biological material‘ -> ,underestimates the bioaerosol concentration but correctly classifies biological material‘ ?

**Answer: Thank you we updated the “and” to a “but” on line 513.**

Fig. S5: There is probably a typo in the figure caption. It says: 'In addition to this, figure S6a seems to indicate that the increase in NFBAP scaled with the intensity of the rain event.'. I think it should be ,...figure S5a seems to...‘.

**Answer: Thank you, we updated it to say S5 instead of S6.**

Fig. S8 & S9, l. 507, l. 508: The figure numbers are probably S7 and S8, respectively.

**Answer: We had by mistake given the figures number S8 and S9 while it should correctly be S7 and S8. Thank you for pointing this out! We have updated the reference to these figures on lines 507 and 508.**

*Answers to referee #2 comments and remarks:*

Referee #2:

Line 70 of main manuscript -> Hund GmbH has in the meantime put a new model on the market. Please replace "BAA300 (BAA 500, Hund GmbH)" by "POMO-BAA500e (Helmut Hund GmbH, Germany)".

**Answer: Thank you for this. We have replaced the line accordingly see line 70.**

*Answers to editor remarks:*

Line 23: Please add "concentration" after "number".

**Answer: We have done this. See line 23.**

Line 90: Please delete (AT) as this is not consistently used along the text.

**Answer: We did this. See line 90.**

Line 120: Both terms were already defined in line 102.

**Answer: Thank you we removed this additional line on 120.**

Line 259: I suggest changing "This is due to that the" with "This is because the..." or with something equivalent.

**Answer: We updated the line to be “This is because the ...” see line**

Line 282: Please delete “(Lieberherr et al., 2021)” as this is mentioned two lines above.

**Answer: We updated the sentence, see line 279.**

Line 287:  $N_{TAP}$  was already defined in L128.

**Answer: We removed the extra definition, see line 286.**

Lines 296-297: I think something is missing here. Please improve the grammar.

**Answer: Thank you for noticing this. We updated the sentence to the following “The seasonal average  $N_{TAP}$  was between 3.42 and 4.96  $\text{cm}^{-3}$ , which is higher than in most other similar studies where both  $N_{FBAP}$  and  $N_{TAP}$  have been measured.” see line 296.**

Line 298: Please add a period after “UV-APS”.

**Answer: We added the period, see line 298.**

Line 306 and along the text: Figures from the supplementary material must be called consecutively in the main text.

**Answer: Thank you for noticing this, we have renamed the figures and are referring to the accordingly now. See line 305.**

Line 311: "NTAP" and "NFBAP" need to be fixed.

**Answer: Thank you for noticing this. We have updated it accordingly. See line 311.**

Lines 451-452: I suggest replacing "To test the robustness of the analysis where a rain event was defined by the threshold of 0.5 mm h-1, we also applied other thresholds (including 1 mm h-1 and 2 mm h-1) but none of the thresholds used..." with "To test the robustness of the analysis a rain event was defined by the threshold of 0.5 mm h-1. Although we also applied other thresholds (including 1 mm h-1 and 2 mm h-1) none of the thresholds used..."

**Answer: Thank you, we updated the manuscript accordingly. See lines 450-453**

Line 518: Please add a period after "BioTrak".

**Answer: We added the period, see line 517.**

Lines 528-529: I think the authors forgot to delete this sentence.

**Answer: We did, thank you. We have now removed the line.**

Line 544: I am not sure if "prohibited" is completely correct. How about "inhibited"?

**Answer: We agree and updated the word to inhibited. See line 541.**

Figure 5: I suggest deleting (AT) in the caption and to replace "AT" with “air temperature” in the y-axis of panel b.

**Answer: Thank you, we updated it to be air temperature instead of AT both in the caption and on the y-axis of Figure 5b.**

Figure S2 is not mentioned in the main text.

There is no Figure S7. Therefore, Figure S8 and S9 should be S7 and S8, respectively. Fix this in both files.

**Answer: We updated S8 and S9 to be S7 and S8, respectively. We also added a line with reference to figure S2, see lines 228-229.**