

Responses to referee comments

“Dear authors,

The manuscript is almost ready for publication. Please address the minor points that have been raised by the 2nd round of review:”

AU: We thank the editor and two reviewers for their time and effort, and for bringing up points that further help improve the manuscript's robustness and readability. We answer to each point below (starting AU). The line numbers refer to line numbers in the manuscript version with track changes.

Reviewer 1:

"General Comments:

The authors have done an exceptional job of revising the manuscript. The paper is very close to being ready for publication. I recommend it be accepted after the following minor points are addressed to further enhance clarity and consistency.

Specific Comments :

1. While the use of fixed MIR and FAC values is acceptable for a comparative study, the discussion in Section 4.3 could be slightly strengthened. Please consider adding a single sentence acknowledging that for more accurate, site-specific air quality modeling, local atmospheric conditions (e.g., the NO_x regime) would need to be considered, as they can influence these reactivity coefficients. This adds a useful caveat for future modeling work based on these findings.

AU: Thank you for this suggestion. We agree on its usefulness to avoid the use of our results where they are not suitable. We added a corresponding phrase in section 4.3, see lines 583-585.

2. The discussion regarding the higher GLV emissions in Helsinki park trees correctly suggests that "mechanical damage or biotic effects may play a role". To add more depth, I suggest briefly elaborating on what these factors might be in a specific urban context. This could include, for example, park maintenance activities (e.g., mowing, pruning), higher recreational use leading to minor physical damage, or different patterns of herbivory in parks versus streets. A short expansion here would provide a more complete interpretation of this interesting result.

AU: As suggested, we added more potential explanations for the GLV emission potential differences between park and street trees in Helsinki, see lines 502-504.

3. The manuscript consistently uses emission potentials normalized to a standard temperature of 30°C for most analyses. However, the main figure for air quality potential (Figure 5) presents data calculated from emission potentials normalized to the median temperature of the sampling period. While the 30°C version is available in the supplement, this inconsistency in the main text may be confusing for readers trying to directly compare the emission potentials with the resulting OFP/SOAFP. For better consistency and clarity, I recommend using the 30°C normalized data for the main Figure 5, and moving the median-temperature version to the supplement if desired."

AU: Thank you for pointing out the potential confusion, we switched the figures between main text and supporting materials accordingly. See lines 438, 442-444.

Reviewer 2:

"I have reviewed the revised version of the manuscript entitled "Variability in BVOC emissions and air quality impacts among urban trees in Montreal and Helsinki". I appreciate the authors' thorough and thoughtful responses to all comments raised in the first round of review.

Integrating the statistical analysis from the supplement into the main text has significantly strengthened the results section. The revisions have also resolved ambiguities in the conclusions, and I believe that the manuscript now makes a coherent and well-supported contribution to current research on BVOCs and atmospheric chemistry in urban environments.

I have only two minor suggestions for further refinement:

- Line 240: In my opinion, the explanation of 'abnormally high values' lacks a formal definition. An outlier analysis would have been useful at this point.

AU: We added a Bonferroni outlier test to identify influential points in the linear regressions against light and temperature correction (Guenther, 1997), see lines 242-244.

- I recommend a final check for typographical errors, as there are quite a few in the current version (without track changes) of the manuscript, e.g.

L21: remove space after "database"

L26: remove the second period at the end of the sentence

L51: Check parenthesis

L100: Add space after emissions

L130: Is there a word missing before "city type"? Maybe an "a"?"

AU: Thank you for pointing out these typographical errors. We have now carefully checked the final version of the manuscript to clean any errors (including the ones highlighted here).