

The authors would like to thank the referees for their thoughtful comments and reviews. Responses to the referee comments are provided below.

## **Responses to Referee #2**

Pg 3651, lines 9-12: Haven't some of these compounds been shown to be emitted under stress-free conditions?

Response: On page 3651, "certain VBOCs are released when plants experience environmental stress" has been replaced with "increased emissions of certain VBOCs are associated with plants experiencing environmental stress" to clarify that it is the change in the levels of these VBOCs that indicate stress.

Pg 3651, lines 15-19 & 21-24: Clearly distinguish the compounds that are oxidation products vs. those that have functional groups due to the synthetic pathways within the plant (emitted with functional group already). For example, in the standard mixture used here, camphor and linalool are emitted as oxygenated monoterpenes, whereas nopinone is an oxidation product of b-pinene. The lack of distinction may cause confusion with readers who are not familiar with these compounds.

Response: On line 15, "terpenes that have been functionalized" has been changed to "terpenes that are functionalized" to broadly include compounds emitted with oxygen-containing functional groups and compounds oxidized in the atmosphere. It is beyond the scope of this manuscript to go into which compounds are formed by which pathways.

When discussing the different analytical methods in section 2, there is no mention of solvent extraction methods, like that in Oremeno et al. 2010 (ES&T) used with branch enclosure measurements. I think this Super Q and or Hayesep Q adsorbent cartridge method should be included in this extensive review of quantitative sample methods, or justify why it was excluded from the list.

Response: The authors thank the reviewer for pointing out this omission. The Super-Q and HayeSep-Q methods are now included in Section 2, with 3 new references including Ormeno et al., 2010.

Pg 3655, line 7: "With the latter": : : what was the former?

Response: "With the latter" has been replaced with "with the ATD".

When discussing the methods in Section 3, the authors should mention the type of column used, etc. At least reference the table with this information in this section of text.

Response: This information is provided on page 3661, line 11-12: "An initial and an improved set of GC columns/conditions were used (Table 3)"

What was the ozone level in the clean air vs. "lab air"? Could this affect the differing

results?

Response: While we do not have measurements on the ozone levels, we expect that most of the ozone was removed in the clean air stream. Oxidation is undoubtedly affecting the results; we thank the reviewer for pointing out this oversight. The following has been added on page 3663 as a reason for the differences in the number of compounds in the clean air vs lab air sample: “b) the greater oxidation potential (i.e., higher ozone level) in the ULA”

#### Section 4

The first paragraph discusses MDL values, but does not specify which sampling method was used to acquire those values.

Response: The following text has been added to the paper on page 3661: “No blank problems were experienced for any of the target compounds. As such, all MDL values were assessed by varying the on-cartridge mass amounts of the target analytes, and determining which values yielded an instrument signal to noise ratio of 10:1. MDL values were then calculated as equaling the mass amounts at 10:1 signal-to-noise divided by the sample volume of 5 l.”

In each new section, please redefine acronyms, like ATD.

Response: The authors do not believe that this is necessary.

When discussing the chromatograms in section 4.2, emphasize which plant sample and/or standard mixture was used to generate each figure. The information is there; it’s just buried with in the text and the differences between each sample are not immediately clear.

Response: In Section 4.2, a brief description of each sample (e.g., *Cedrus*, *ATD*, *laboratory*) is now provided at the start of each relevant paragraph.

Where the plants potted or cut? Was the aim of this study to simulate the potential emissions by inducing them or to simulate real emissions that would be measured in the field? Comment on how your results would differ, depending on each type of sample.

Response: The authors believe that this is outside the scope of the manuscript.

Pg 3663, line 18: “presumed higher level of biological activity” When were the samples taken; how long were they stored? Is the biological activity still relevant?

Response: We do not know for sure whether biological activity is still relevant, which is why we say “presumed”. It is one of three possible reasons for the differences observed between the *Cedrus* samples. The results and conclusions of the manuscript are not dependent on this point.

#### Conclusion

Please redefine OPM here. The only other definition was way back in the introduction.

Response: Done.

Pg 3666, lines 10-11: the repetition of “quantitative” makes this sentence confusing.

Response: “in quantitative measurements” has been deleted.

Overall, I am unclear from this conclusion what the “take home” message is. Much of this paper was a review of analytical methods.

Response: As outlined in the introduction, applications of GC×GC-TOFMS to VBOCs have been very limited. As we believe is clear, the purpose of this paper was to summarize best practices regarding sampling for VBOCs, and combine an optimized sampling method with optimized GC×GC-TOFMS

Table 4: the MDL should have units of ng m<sup>-3</sup> (the negative sign is missing)

Response: Looks okay in our version.