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Comment on acp-2021-135

Anonymous Referee #3

Referee comment on "Measurement report: Biogenic volatile organic compound emission profiles of rapeseed leaf litter and its secondary organic aerosol formation potential" by Letizia Abis et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-135-RC3, 2021

This measurement report describes a study of BVOC emissions and SOA production from leaf litter of rapeseed, an important crop in some countries. The influence of uv light and ozone, both separately and together, was investigated. The topic fits well with the scope of ACP and there are few studies available on this topic. The manuscript is well organized but is difficult to read because it needs a thorough editing for English grammar.

The main issues that should be addressed before publication are:

- There are a lot of unknown compounds and tentatively identified compounds, as is expected with having only PTRMS measurements. The study would be improved by including a few measurements of rapeseed litter with complementary techniques, such as GCMS, to identify some of these compounds.
- Does the uv light or ozone change the BVOC emission? Measurements of the emission rates in the absence of uv light and ozone should be reported.
- How repeatable are these measurements? Biological systems tend to have a lot of variability. Either replicate experiments should be performed or some evidence should be provided to show that the it is expected that results would be similar if the experiment were repeated.
- The authors state that emissions from rapeseed leaf litter may have been underestimated (Line 327) but they don't say what the current estimates are. Current estimates should be presented and compared with these results. It is also suggested that SOA formation from leaf litter might be important (Line 332) but there is no indication of how the SOA formation they observed compares with other sources. There should be some comparison with the SOA formation that is currently known or at least predicted in models.
- One of the interesting findings is the relatively high contribution of various organic acids but this is not discussed in the text. The current limited discussion on organic acids should be expanded.
- The measurement technique appears reasonable but the description is lacking and

needs more details such as standards, accuracy and precision, etc.

Specific points:

Table 1: It would be useful to report the "per mass" emission in addition to the reported per area emission (or at least provide the specific leaf area so readers can do this calculation) to enable comparisons with literature values.

Line 25: The authors note that VOCs are either "anthropogenic, related to human activities, or biogenic" and then go on to label emissions from rapeseed as biogenic. But since rapeseed is a crop grown by humans, shouldn't this be considered anthropogenic?

Line 199: Define the Shannon index.

Line 292: The authors state that "mature leaves are known to emit less isoprene than young leaves". The referenced papers report the opposite (mature leaves emit more than young leaves) as do other studies. In any case, it should be noted that this isoprene emission from rapeseed leaf litter is not likely to be the same process as from living plants (whether they are mature or young) but is likely from bacteria or other non-enzymatic production of isoprene.

Line 309-310. This sentence is confusing and the meaning is not clear.