

Dear Referee #2,

We really appreciate your effort and valuable although critical comments regarding to manuscript No. acp-2017-1005. We have prepared completely new version of manuscript that considered most of your comments. Please find enclosed supplement including our reply to principal problems as well as to your specific comments.

On behalf of all co-authors, yours faithfully, Svetlana Bičárová

Review of Referee #2 includes comments in separate paragraphs on pages C1-C4. In the following, problems or questions with answers for each paragraph are shortly described.

C2, paragraph 1

Problem: Purpose of risk assessment

Answer: Dwarf mountain pine creates the mountain forests timberline and it is considered as the most vulnerable tree species to the ground-level ozone.

Problem: Why comparison between AOT40 and POD

Answer: We have excluded AOT40 and left only POD as ozone metric.

Problem: Risk assessment without flux-response

Answer: In the new version of manuscript we added the POD_0 values to the ozone visible injury chart. Now after a new, the dose-response relationship is demonstrated in Fig. 7 showing both trend lines – of the ozone visible injury and POD_0 values as well. Conclusions resulted from this issue we included to the Results and Discussion chapters.

Problem: Visible injury vs. growth increment

Answer: Visible injury is parameter which is relatively easy to achieveable by visual assessment of symptoms (in line with ICP Forests Methodology and calibration courses), while growth increment is not so easy to obtain, it would be needed to measure it regularly or continuously, which is device- and time-demanding, especially on dwarf mountain pine. Measurements of radial increment was not the subject of our study.

C2, paragraph 2

Problem: Two tree species, two different regions

Answer: Due to many methodological weaknesses, in new revised manuscript we have completely excluded French study site as well as species *Pinus cembra*.

C2, paragraph 3

Problem: DO3SE parameterisation

Answer: We were recommended in previous study to leave it as supplement (due to its size, number abbreviations, parameters etc.).

Problem: Both *Pinus* species

Answer: In Slovak study sites they use to growth together (side by side), so they have similar site requirements (humidity, temperature, radiation etc.). F_{phen} is explained in chapter 3.1 Ozone metrics. There could be higher differences between regions, but we did not know them, because we did not have relevant measurements. It was one of the reasons we decided to exclude the French study site. We added the statistical analyse of G_{sto} in Fig. 2.

C3, paragraph 1

Problem: Flux-response

Answer: We added POD_0 and its trend line to the chart with visible ozone injury (Fig. 7).

Problem: The choice of threshold

Answer: Now it is explained in chapter 1 Introduction. The value of POD_0 19 mmol m⁻² PLA was adopted from study Sicard et al. 2016.

Problem: Missing reference

Answer: We also added the reference to DO3SE.

C3, Paragraph 2 and 3

Problem: The French site

Answer: It was resolved by exclusion of the French research site from study.

C3, paragraph 4

Problem: Figure 3b

Answer: The Figure was removed from Results section.

Problem: Flux-response

Answer: We added POD_0 and its trend line to the chart with visible ozone injury (Fig. 7).

C3, paragraph 5

Problem: Discussion

Answer: We have modified the title of the manuscript, excluded AOT40 and completely revised the discussion.

C3, paragraph 6

Problem: General spelling and language test

Answer: We accept this comment. English is not our native language. Upon completion of the professional discussion, the text will be sent to a professional linguistic correction.

Specific comments:

L 36–37 – we meant physiological response. However, this part is there not anymore.

L 41 – we added it, it is in chapter 1 Introduction in new version of manuscript.

L 45 – we added it, it is in chapter 1 Introduction in new version of manuscript.

L 55 – it means the most sensitive among conifers. We know that there are much more sensitive broadleaved tree species but prevailing trees are conifers in High Tatra Mts.

L 55-56 – we have modified the sentence, now it is in chapter 1 Introduction in new version of manuscript.

L 62 – The objective 1 was rephrased.

L 90 – Benham et al. 2010, however, this is not a part of the manuscript anymore.

Table 1 – we have included study site D to complete vertical transect. It is described in chapter 2 Study site in new version of manuscript.

L 103 – we added the reference, it is in chapter 3.1 Ozone metrics in new version of manuscript.

L 105 – we have excluded the French site and also we have used the Slovak sites with whole year data. Phenological function is explained in chapter 3.1 Ozone metrics.

L 108 – passage rate is explained in chapter 3.1 Ozone metrics.

L 117/120 – we already changed CL values, it is in chapters 3.1 Ozone metrics and 4.2 Response of stomatal conductance to environmental factors in new version of manuscript. We started to prepare this paper before CLs were updated.

L 117 – it is explained in chapter 1 Introduction, the value of POD_0 is mentioned in chapter 3.1 Ozone metrics and 4.3 Phytotoxic ozone dose and stomatal O_3 uptake.

L 247 – this part was moved to the chapter 5 Discussion.