

Responses to the comments of Referee#2

General comments:

This manuscript, which builds on a previous study by Cui et al. (2023), examines the origin and emission of secondary fatty alcohols (SFAs) in size-segregated atmospheric aerosols collected at a cool-temperate forest site in Hokkaido, Japan. The authors identified *n*-nonacosan-10-ol as the predominant SFA produced by coniferous trees and compared the concentrations in conifer leaves to levels in aerosol samples collected across seasons. The authors observed a seasonal variability, but due to extremely limited sampling in the summer and winter, it may be more accurate to consider their findings a comparison of spring and autumn *n*-nonacosan-10-ol levels. However, the methods are comprehensive, and overall, the study provides interesting new insights into a biogenic source of atmospheric aerosols, despite a somewhat small dataset. Therefore, I support the publication of this manuscript in BG, after addressing the following comments.

Reply: We sincerely thank the referee for the constructive comments on our work. We have carefully addressed all the comments and revised the manuscript accordingly.

Specific Comments

1. Fig 7/Table S4: The mass of *n*-nonacosan-10-ol shown for winter in Fig. 7 does not match the data presented in Table S4. According to Fig. 7, the mass of *n*-nonacosan-10-ol per leaf in winter is 2.32 ± 34 mg, but the average mass of the winter values shown in Table S4 can be calculated as 16.17 mg. In addition, the winter *n*-nonacosan-10-ol masses are exactly the same as those for summer (16.9, 14.3, and 17.3 mg), and two of the three leaf weights shown for summer and winter are identical (4.51 and 4.58 mg). Please double check the data shown in Table S4 and confirm that the values align with what is shown in Fig. 7.

Reply 1: We apologize for the wrong numbers shown in the original Table S4. The values in winter originally shown in Table S4 were mistakenly presented as the referee pointed out, while the data presented in Figure 7 is correct. We have now corrected the values in the revised Table S4.

2. Table S3: Does ‘deep yellow’ refer to the brown part of the leaf? I might have missed it, but it seems that this specific color is not defined in the text.

Reply 2: Yes, the "deep yellow" in Table S3 is identical to the "brown" part described in the main text, which we made a mistake to specify. We have corrected the term "deep yellow" to "brown" in Table S3 to be identical to the description in the text.

Technical Corrections

1. Line 104 is missing the word *the* (‘These species were selected because they dominate *the* study site in the forest’).

Reply 3: Corrected.

2. Table S1 should be referenced in the main text.

Reply 4: Table S1 has been referenced in Line 187 in the revised manuscript.

3. Table S2 should be referenced in the caption of Fig. 6 or in nearby text.

Reply 5: According to the comment, we have referred Table S2 in the caption of Figure 6.

4. A reference to Table S3 should be included in the main text.

Reply 6: Table S3 has been referred in the captions of Figures 8 and 9.

5. Line 457 and 457: The supplement is referred to as Supplementary Material and Supplementary Information, respectively. Please select one for consistency.

Reply 7: Because the original Fig. S2 has been moved to Figure 12, the terms “Supplementary ...” have been deleted in the main text.

6. Lines 476 – 479 need references.

Reply 8: We added the following references to the text.

Matas, A. J., Sanz, M., x, a, J., and Heredia, A.: Studies on the structure of the plant wax nonacosan-10-ol, the main component of epicuticular wax conifers, Int. J. Biol. Macromol., 33, 31-35, [https://doi.org/10.1016/S0141-8130\(03\)00061-8](https://doi.org/10.1016/S0141-8130(03)00061-8), 2003.

Kolattukudy, P., Espelie, K., and Rowe, J.: Natural Products of Woody Plants, *by JW Rowe, Springer-Verlag, Berlin*, 304, 1989.

Kolattukudy, P. E.: Chemistry and Biochemistry of Natural Waxes, Elsevier Scientific Publishing Company, 1976.