

## ***Interactive comment on “Mechanisms of methane transport through *Populus trichocarpa*” by Ellyne Kutschera et al.***

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Thank you for your review of our manuscript. A reply to each point is made below.

It should be mentioned that our measurements of CH<sub>4</sub> flux from the canopies of *Populus trichocarpa* saplings are quantified to the end of finding any significant variation with temperature and isotopic fractionation. We do not intend the canopy measurements to be quantitatively comparable to measurements made under more precise conditions where the absolute value of the flux is sought.

As for vapor pressure deficits, these may have differed between the Tedlar bag and ambient. However, if CH<sub>4</sub> flux were mitigated in any way by a difference in vapor pressure deficit, it did not prevent the measurement of a significant relationship between flux, temperature and isotopic fractionation. This was the main goal of the investigation

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and future work could include the study of other effects such as vapor pressure deficit on these variables.

(i) We did not measure the quantity of lenticels as we were not attempting to find any relationship between lenticel density and fractionation, only net flux, temperature and isotopic fractionation.

(ii) The saplings were grown under hydroponic conditions and were never in a soil environment. Water levels were regularly checked within the hydroponic system, and air was continuously bubbled through the growing containers.

(iii) We did not directly speculate on the implications of our results to the movement of gas through woody vegetation in landfills or in general, other than to say in the Discussion section that if  $\text{CH}_4$  is present in the root zone our experiments demonstrate that it will be transported by the tree to the atmosphere. Our conclusions to this end are qualitative at this time.

(iv) We would be happy to provide the details of the modified Hoagland's solution, adding it to the manuscript.

(v) We did not measure the Tedlar bags for airtightness. There may have been a small amount of leaking from the bottom of the bag where it was secured to the tree. However, should any  $\text{CH}_4$  have escaped from the bag, it did not impair our ability to establish the relationships between flux, temperature and fractionation.

(vi) The Tedlar bags did not include a mixing apparatus, although the stem chambers did contain a small fan. If mixing had been significantly poor in the Tedlar bag, we should not have measured a generally linear increase of  $\text{CH}_4$  concentration in the bag over time.

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