

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

**Anonymous Referee #3**

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On the whole I don't have any issues with this papers approach, but I think that better referencing could have been used as there exist a number of studies in the literature that deal with the subjects discussed here which have importance. I am not trying to toot my own horn, or increase my citation index, but a lot of work has been done on this subject and I suspect the authors would want to know about it. Many of these articles are not available on instant PDF but they shouldn't be lost. For example, does the flux come from the leaves, or from the petioles? see Harden, H. and Chanton, J.P. 1994. Locus of methane release and mass dependent gas transport from wetland aquatic plants, Limnology and Oceanography, 39, 148-154. and also Whiting, G.J. and Chanton, J.P. 1996. Control of diurnal pattern of methane emission from aquatic macrophytes by gas transport mechanisms. Aquatic Botany, 54, 237-253.

fractionation can occur by a number of processes, mass flow and molecutlar diffusion.

These vary with the amount of sunlight and possibly temperature. see Chanton, J.P., Whiting, G., Happell, J., and Gerard, G. 1993. Contrasting rates and diurnal patterns of methane emission from different types of vegetation. *Aquatic Botany*, 46, 111-128.

and Chanton, J.P., and G.J. Whiting. 1996. Methane Stable Isotopic distributions as indicators of gas transport mechanisms in emergent aquatic plants. *Aquatic Botany*, 54, 227-236.

The authors may be interested in Popp, T.J., J. P. Chanton, G.J. Whiting, N. Grant, 1999. The Methane Stable Isotope Distribution at a Carex Dominated Fen In North Central Alberta, *Global Biogeochemical Cycles*, 13, 1063-1077.

All of these papers discuss methane isotopic fractionation during gas transport. while not dealing with trees, the authors discuss many of the issues these authors are grappling with.

Finally the authors should look at this book. *Trace Gas emissions by plants*.

<http://www.sciencedirect.com/science/book/9780126390100>

On page 9, line 4, the authors state that gas transport through aerenchyma is usually diffusive... I would take issue with that. the authors suggest that diffusion is not the primary transport mechanism they have observed. They are not the first to think about this, and they might want to read the work of others who have thought about this too.

In conclusions they state that the methane is not associated with transpiration. That's right, I agree. We went to a lot of trouble to examine stomatal control of methane emission back in the 1990's. We couldn't find it either. Discuss.

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