

***Interactive comment on “Plants or bacteria? 130 years of mixed imprints in Lake Baldegg sediments (Switzerland), as revealed by compound-specific isotope analysis (CSIA) and biomarker analysis” by M. Lavrieux et al.***

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Thank you for this question! In the case of the humus layer of the Baldegger Lake forest soils we only find Oi and Oe horizons (e.g. partly degraded and intact plant material) but no fully fermented Oa horizon (humus material which might be eroded with the soil sediments). Lake sediments were carefully prepared and all recognizable plant residues were picked out prior to lipid extraction. Thus, we think that with this method we are able to minimize the influence of the forest humus layer (e.g., in this case non fermented plant input) on the lake sediments. Sorry for the confusion, we

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will describe this clearly in a revised manuscript. However, in a currently ongoing study we analysed the isotopic composition of the FAs in the different humus horizons at a forest of Baldegger lake and can show that they are no option of being a major reason for the deviation of the lake sediments from the mixing polygon. Fresh leaves, litter and partially fermented material are actually heavier than the top soil (Ah) (0.1 - 1.1 permil for a spruce site and up to 1.7 permil for a maple tree site) and can thus not explain the deviation from the mixing polygon in the isotopically lighter direction. Thus, regarding the deviation of the lake sediments from the mixing polygon during the older time intervals covered by the lake sediment core, we don't think that the humus layer of the forest could be the crucial factor as a "missed source". Especially since we could then assume that the humus layer would also have had an affect on the recent lake sediments, but they plot within the mixing polygon. Kind regards, Axel Birkholz  
Christine Alewell

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