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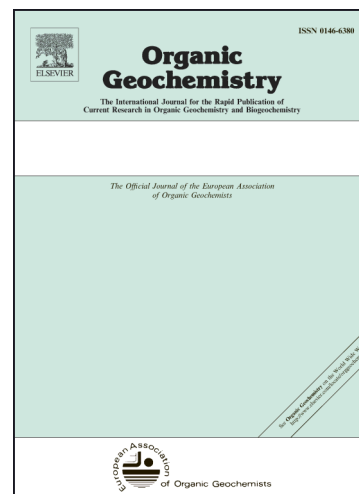
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A climatic chamber experiment to test the short term effect of increasing temperature on branched GDGT distribution in *Sphagnum* peat

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ABSTRACT

Branched glycerol dialkyl glycerol tetraethers (br GDGTs) are membrane lipids produced by unknown Bacteria and are being increasingly used as temperature proxies. Nevertheless, the direct effect of temperature on br GDGT distributions has been rarely evaluated. In this study, the impact of increasing temperature on brGDGT distributions and the speed of adaptation of br GDGT source microorganisms to temperature change were investigated by analysing br GDGTs in *Sphagnum* peat cores incubated under controlled conditions at two different temperatures – 12 and 15 °C – for 1 yr. Br GDGTs present as intact polar lipids (IPLs, presumably derived from recently active microorganisms) and core lipids (CLs, derived from dead biomass) were analysed. There were no significant differences in the relative abundances of the most abundant br GDGTs in the CL and IPL pools after 3 months' incubation. In contrast, the distribution of the br GDGT IPLs was significantly affected by temperature after 1 yr, whereas no change was observed in the CL fraction. This suggests that (i) the CL pool of br GDGTs has a turnover of at least 1 yr in peat and (ii) br GDGT source microorganisms rapidly adjust their membrane lipid composition (in > 3 months and < 1 yr, based on IPL analysis).

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