

## Compound-specific radiocarbon analysis of lipid biomarkers in surface sediment from Lake Kawaguchi, central Japan

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Lake sediment in volcanic regions contains valuable information on past eruptive history, as well as environmental consequences that took place in the catchment along with volcanisms. In this study, we performed compound-specific radiocarbon analysis (CSRA) of lipid biomarkers in surface sediment from Lake Kawaguchi situated northern proximal to Mount Fuji, central Japan, including short-chain ( $C_{16}$ ) and long-chain ( $C_{24}$ ,  $C_{26}$  and  $C_{28}$ ) fatty acids. The results are compared with the  $^{14}C$  content of TOC, plant macrofossils (plant leaf and wood) and lake surface water in order to assess their potential for dating tool in the lake sediment. The  $^{14}C$  concentration of the long-chain ( $C_{24}$ ,  $C_{26}$  and  $C_{28}$ ) fatty acids ranged from  $-43$  to  $-183\text{‰}$ , corresponding to  $^{14}C$  ages between 288 to 1554 years BP. This indicates that these acids contain substantial pre-aged materials in addition to those emitted from contemporary plant leaf waxes. In contrast, the short-chain ( $C_{16}$ ) fatty acids showed a good agreement with the  $^{14}C$  concentration of lake surface water, suggesting that they are most likely derived from primary producers (diatom) in the present lake and have a potential to improve chronologies in the sedimentary sequence in which the occurrence of fossil leaves is rather limited.

Keywords: compound-specific radiocarbon analysis, lake sediment, fatty acid