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Last glacial terrestrial vegetation record of leaf wax n-alcohols in the northern South China Sea: Contrast to scenarios from long chain n-alkanes

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Long chain n-alcohols and n-alkanes in core sediments from the northern South China Sea (SCS) were measured to make a comparison during terrestrial vegetation reconstruction from ~42 to ~7 ka. The results showed that terrestrial vegetation record from long chain n-alkanes matched well with previous studies in nearby cores, showing more C4 plants developed during the Last Glacial Maximum (LGM) and C3 plants dominated in the interglacial period. However, these scenarios did not occur during terrestrial vegetation reconstruction using long chain n-alcohols, i.e., showing C3 plant expansion during the LGM. The discrepancy during the interglacial period could be likely attributed to aerobic degradation of functionalized long chain n-alcohols due to the oxygen-rich SCS bottom water, resulting in the weak response of terrestrial vegetation signals. On the other hand, the difference between functionalized n-alcohols and non-functional n-alkanes to record local and distal vegetation signals, respectively might be a potential interpretation for the contradiction during the LGM when the SCS was characterized by low-oxygen deep water. Nevertheless, large variations on n-alkyl lipid compositions in C3/C4 plants could likely play a part in modulating sedimentary long chain n-alcohols and n-alkanes towards different vegetation signals, and caution must be taken in respect to the terrestrial vegetation reconstruction using long chain n-alkanes and long chain n-alcohols.