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Carbon and hydrogen isotope analysis of n-alkanes in aquatic macrophytes and recent lake sediments from the Eastern and Central Tibetan Plateau

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Many lakes from the Eastern and Central Tibetan Plateau are densely populated with aquatic macrophytes. To interpret the variability of δ^{13}C- and δD-values of organic components in sediments with high input of aquatic macrophytes, there is a need to understand the possible variabilities in the contributing vegetation. Samples of the dominant submerged aquatic macrophyte species *Potamogeton pectinatus* and *Myriophyllum spicatum* as well as surface sediment samples from various lakes were analysed for n-alkane patterns, bulk δ^{13}C-values and δ^{13}C and δD of n-alkanes. The results were interpreted in the context of the environmental properties of the respective lakes.

Aquatic macrophytes showed characteristic n-alkane patterns maximising at C_{23} and C_{25}. Similar patterns were also found in the n-alkane composition of most of the sediments. Submerged macrophyte samples showed wide ranges of bulk δ^{13}C-values from -6.0 to -21.8 permil. Wide ranges of carbon isotopic signatures were also determined for the dominant n-alkanes C_{23} and C_{25} in plant samples (-16.6 to -29.5 permil) as well as in most of the corresponding sediment samples (-17.6 to -35.4 permil). The offset between δ^{13}C-values of the bulk plant material and the n-alkanes increased as the bulk material was getting less negative. δD-values of n-alkanes in plants ranged from -118 to -197 permil. Average δD-values of n-alkanes in sediments ranged from -147 to -214 permil. Contrary to δ^{13}C-values, δD-values of n-alkanes were relatively

constant within one sample.

Most of the examined lakes are rather alkaline. This consequently leads to the assimilation of HCO_3^-, resulting in less negative δ^{13}C-values of bulk plant material and mid-chain n-alkanes. There is a trend towards less negative values at higher pH. However, a correlation between pH/alkalinity and δ^{13}C is weak, possibly due to other influences e.g. limited CO_2 availability in the densely populated lakes. No obvious relationship between mean annual precipitation and δD of n-alkanes in sediments and plants has been found.