



Fig S1: top: inflow of Lake Karakuli (visible in the background). Photo taken at alluvial fan south of the lake (see Fig. 1). Mt. Kongur Shan in the background. (Photo credit: Jian Ni; 20th September 2008).

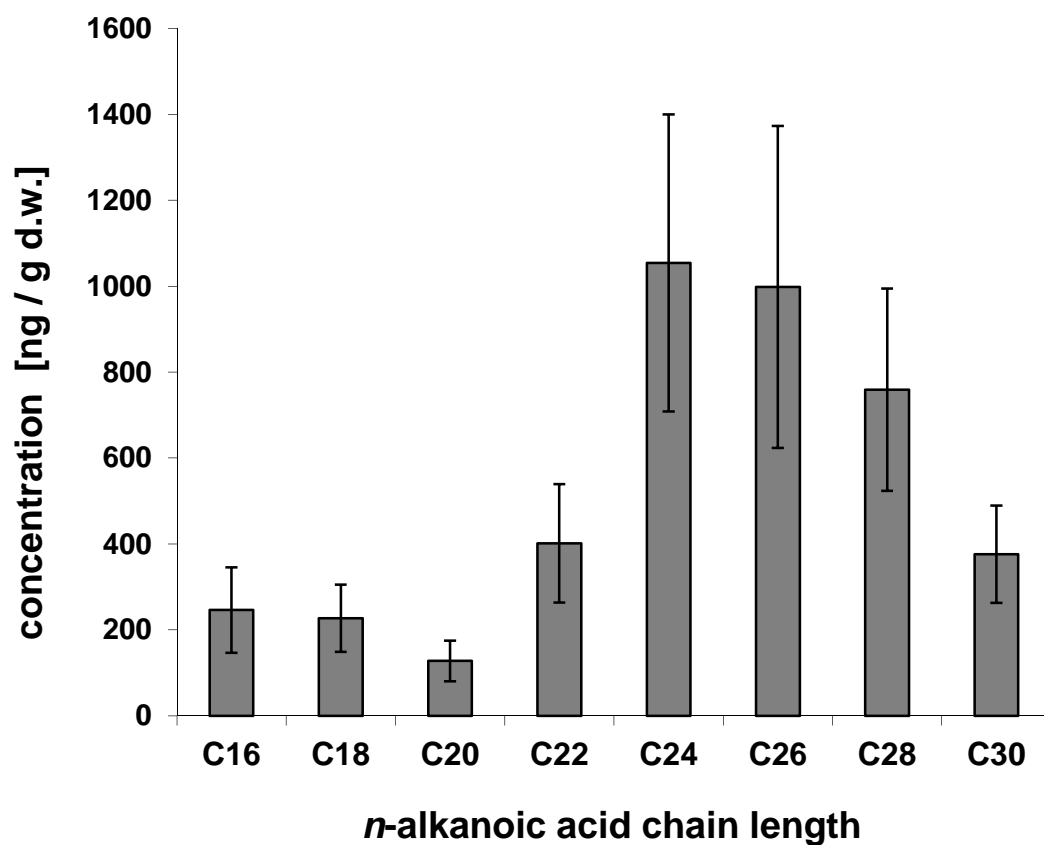


Fig. S2: Molecular abundance distribution of *n*-alkanoic acids showing mean and standard deviation (error bars) for all downcore samples ($n = 125$)

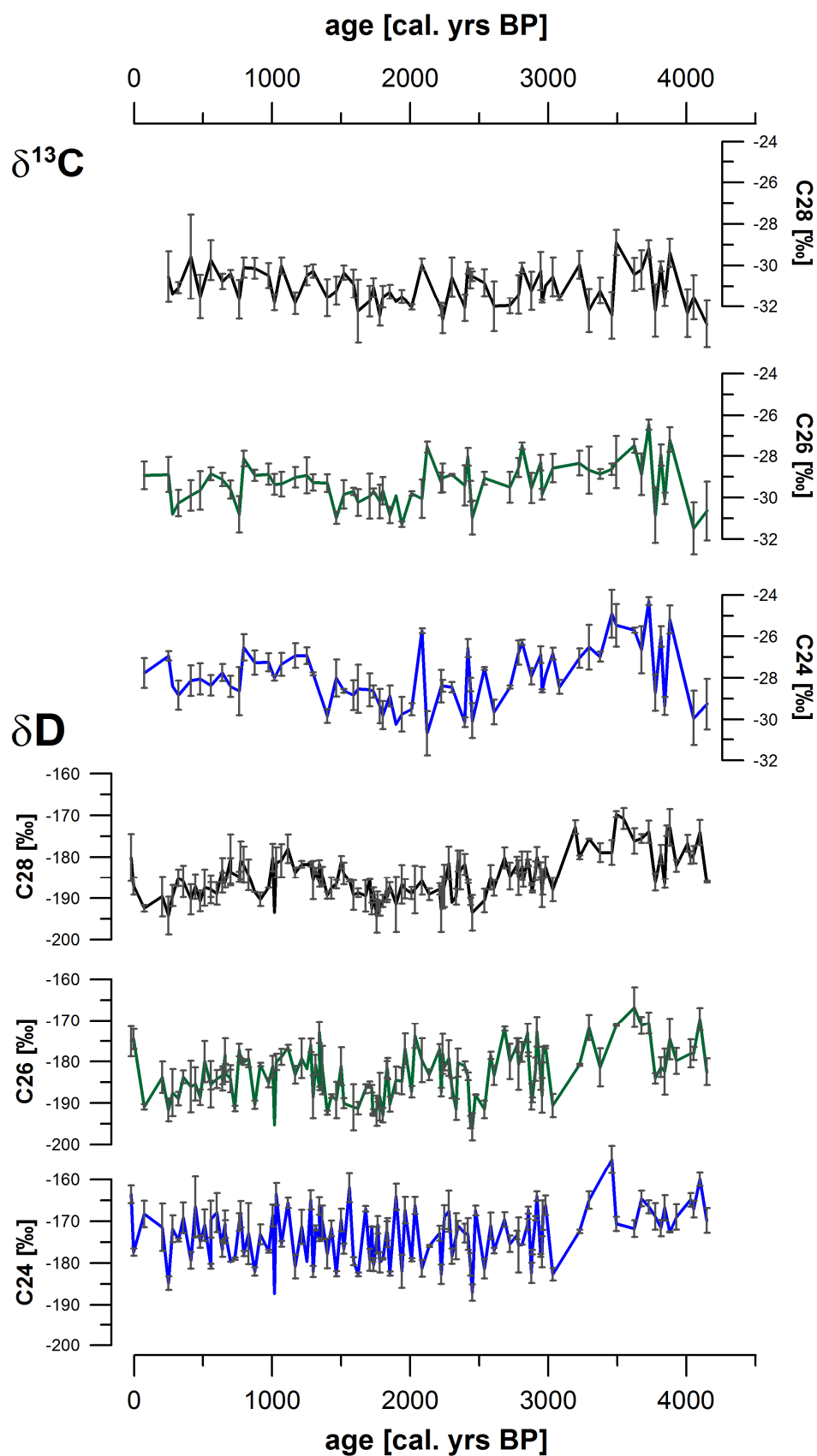


Fig S3: δD and $\delta^{13}\text{C}$ values of C_{24} , C_{26} and C_{28} n-alkanoic acids downcore. Error bars represent standard deviations of triplicate measurements.

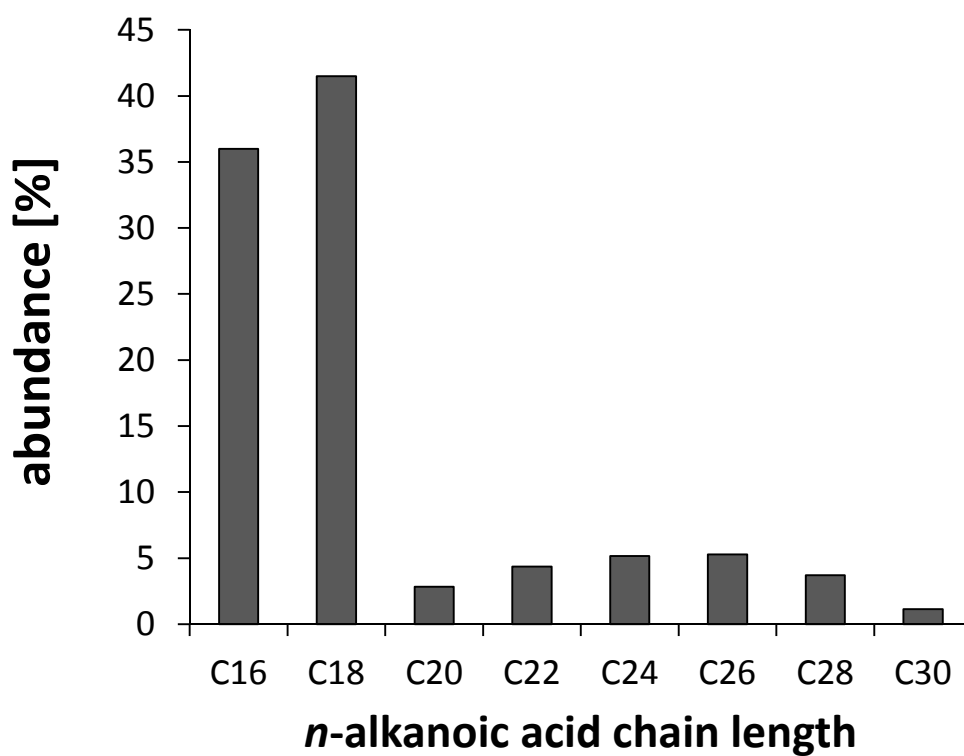


Fig S4: Top: relative abundance distribution of *n*-alkanoic acids in one submerged aquatic plant (*Potamogeton* sp.) collected close to the shore of Lake Karakuli from ca. 20cm water depth. Bottom: picture of the sampled macrophyte (Photo credit: Bernhard Aichner; 20th September 2008)

1 S5: Equation to calculate fractionation factors (ϵ) between source water and lipids:

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$$\epsilon_{\text{lipid/water}} (\text{‰}) = 1000[(\delta D_{\text{lipid}} + 1000)/(\delta D_{\text{water}} + 1000) - 1]$$

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5 S6: Tables with isotopic raw data; (a) δD -values and (b) $\delta^{13}C$ -values of measured *n*-alkanoic
6 acids

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8 S7: kml-file showing sampling sites of water samples, the coring location, and meteorological
9 stations at Taxkorgan and Bulun Kul.