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Monsoon-driven vegetation dynamics on the NE Tibetan Plateau during the Mid-Pleistocene Transition as evidenced in Qaidam Basin lake sediments

Andreas Koutsodendris (1), Jörg Pross (1), Dirk Sachse (2), Christian Herb (3), Erwin Appel (3), and Xiaomin Fang (4)

(1) Institute of Geosciences, Goethe University Frankfurt, Germany (koutsodendris@em.uni-frankfurt.de), (2) Institute of Earth and Environmental Science, University of Potsdam, Germany, (3) Department of Geosciences, University of Tübingen, Germany, (4) Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China

The Mid-Pleistocene Transition (MPT; $\sim$1.2-0.7 Ma BP) marks the shift from the 41-ka to the 100-ka ice-volume cycles during the Quaternary. Information on the character and expression of the MPT in Central Asia is as of yet very limited, with its influence on the Asian monsoon dynamics remaining largely unexplored. To better understand the development of the Asian monsoon system across the MPT, we here investigate the vegetation signature (at centennial to millennial timescales) using a continuous palaeolake sediment core from the western Qaidam Basin (NE Tibetan Plateau). In light of the strategic position of the Qaidam Basin between the monsoon-westerlies-Siberian High climate systems and the sensitive response of desert plants to moisture shifts, this study provides a unique, continuous record of short-term climate change during the MPT in Central Asia. Vegetation is dominated by steppe and desert plants, with *Artemisia* and Chenopodiaceae accounting for $\sim$60 % of total pollen grains in each sample. The *Artemisia*/Chenopodiaceae (A/C) ratio was used as a measure of relative moisture availability in arid regions, allowing identification of distinct dry/wet phases that correlate with glacial/interglacial cycles during the MPT. These phases show coeval shifts in sedimentological parameters and biomarker distributions (including n-alkane average chain length, $CaCO_3$, C/N ratio, and magnetic susceptibility), suggesting that moisture availability was the primary driver of processes in the aquatic and surrounding terrestrial environments. The A/C ratio provides evidence for increasing moisture availability during the younger intervals of the MPT in the Qaidam Basin (i.e. MIS 17-21). We interpret this trend to be related to orbital forcing, which is marked by relatively low eccentricity, obliquity and precession during that time. This orbital configuration implies a weak seasonality and low ice accumulation in high latitudes, which enhanced the summer monsoon and suppressed influence of the winter monsoon over the Tibetan Plateau. To test this scenario, ongoing analysis of leaf wax n-alkane δD values aim to provide information on the sources of moisture influencing the Qaidam Basin and their potential shifts during the MPT.