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Ancient Drought and Flooding Events Recorded by Microbial Lipids in China

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The Asian monsoon has received increasing attention in recent decades, but the monsoon-driven hydrological changes remain largely unknown in Earth history due to the limited proxy of monsoonal rainfall. In the past years, we proposed several microbial proxies to identify paleo-hydrological conditions including the ancient drought in Northwestern China and the flooding events in the middle Yangtze region. The relative abundance of the tetraethers of archaea and bacteria was used to identify the enhanced aridity in association with the uplift of the Tibetan Plateau in late Miocene (Xie et al., 2012). In central China, the lipid biomarkers (hopanoids) for aerobic microbes are used to trace the variation of the water table in the Dajiuhe peatland in central China. The hopanoid-based reconstruction is further supported by other records in the middle Yangtze region. A significant relation is observed between the proxy-inferred hydrological changes and the temporal transitions of the ancient cultures. The spatial migrations of the ancient settlements are also found to

correlate with the hydrological conditions in the middle Yangtze region (Xie et al., 2013). Our work demonstrates the sensitive response of microbial lipids to the hydrological conditions in ancient times.

Key words: Hydrological conditions, Asian monsoon, microbial lipids, peatland, archaeology

References

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