



Supplement of

Towards quantitative reconstruction of past monsoon precipitation based on tetraether membrane lipids in Chinese loess

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Supplementary figures

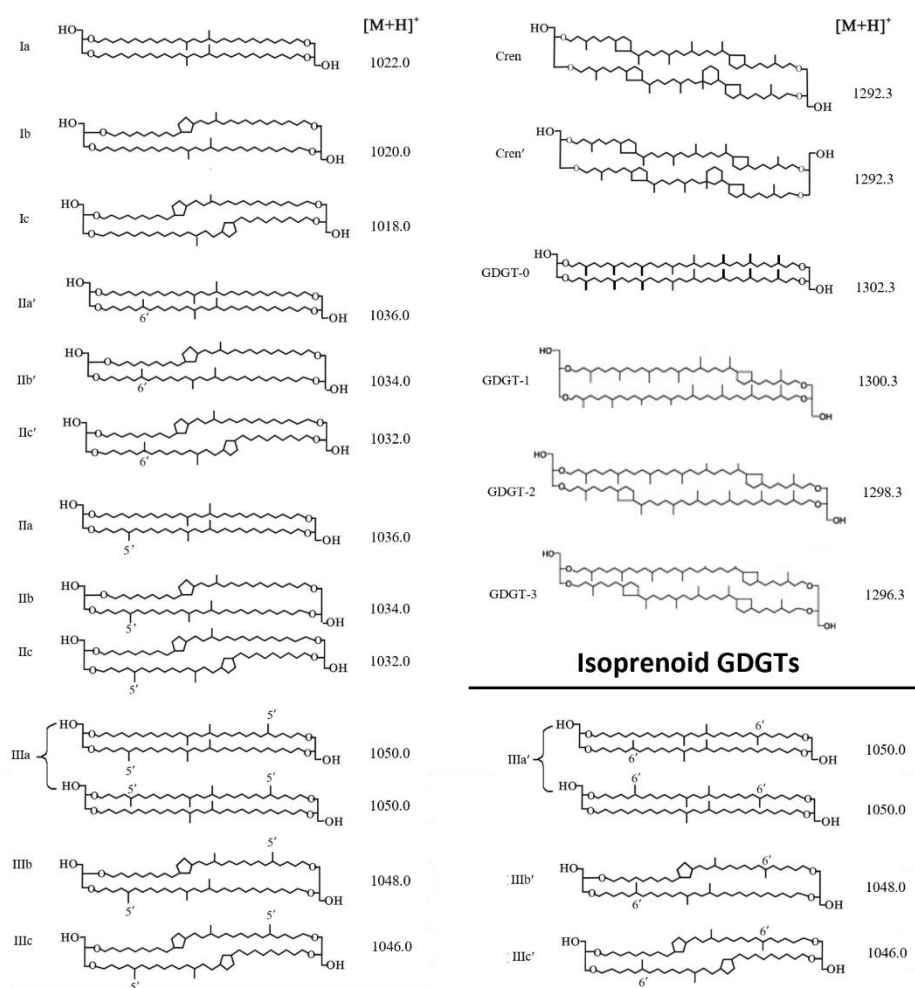


Figure S1. Structures of branched (left and bottom right) and isoprenoid (top right) GDGTs. The 6-methyl brGDGTs are represented by prime ('). The structures of penta- and hexamethylated brGDGTs with cyclopentane moiety(ies) IIb', IIc', IIIb', IIIc' are tentative.

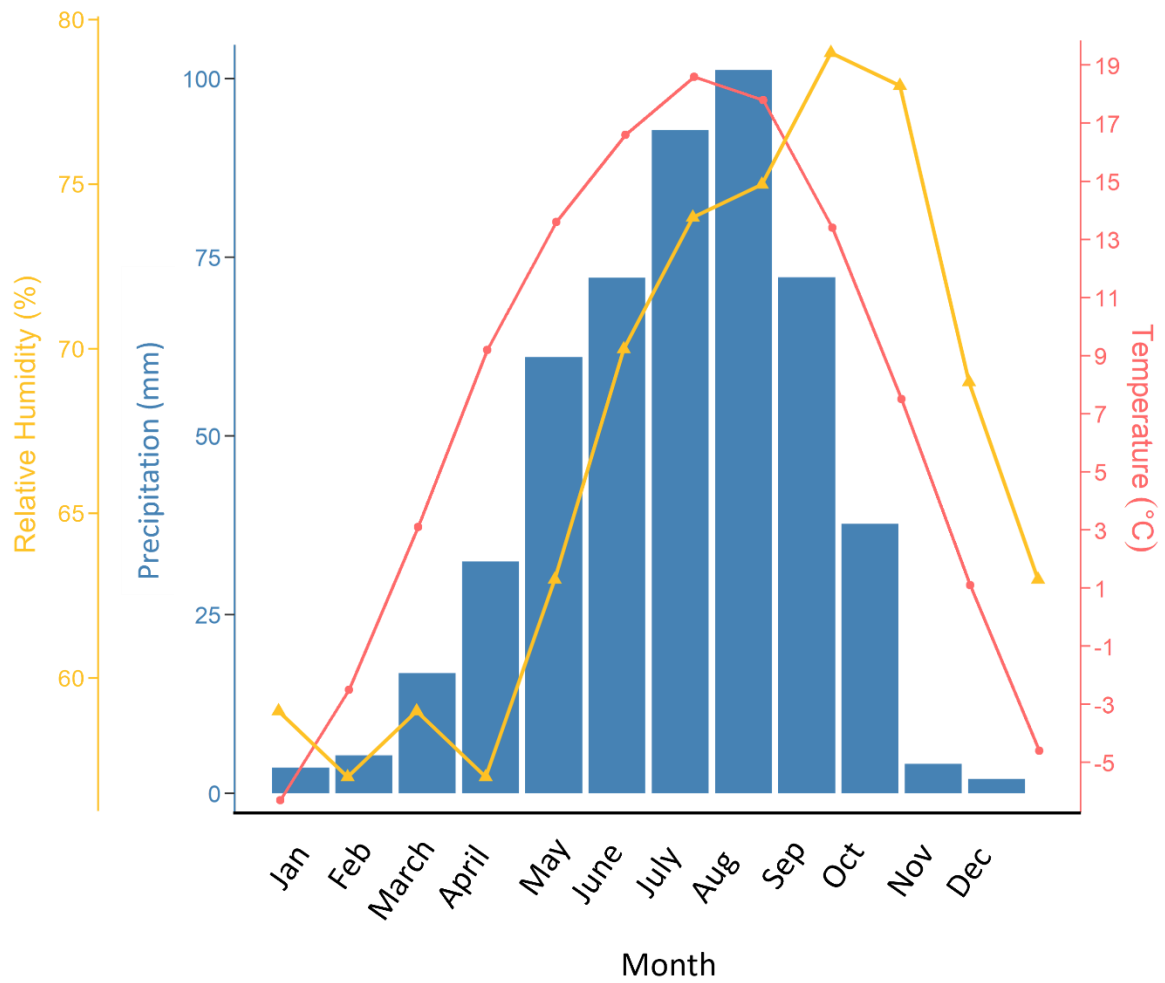


Figure S2. Monthly air temperature, precipitation, and relative humidity (RH) at Linxia city between 1999–2017, close to the Yuanbao section on the CLP. Data obtained from the China Meteorological Data Service Center, <http://data.cma.cn/en>.

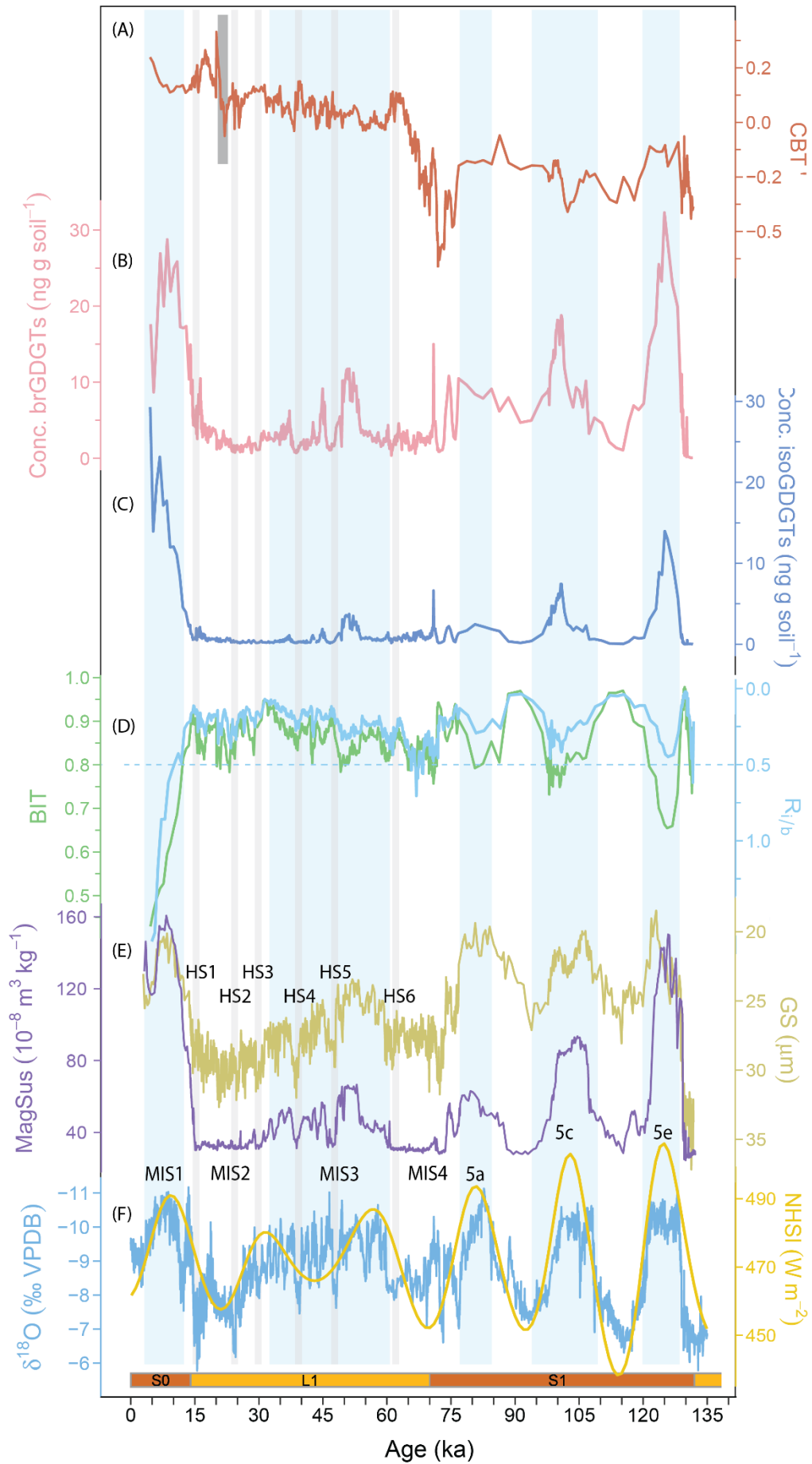


Figure S3. Overview of selected brGDGT- and isoGDGT-based proxy records for the past 130 kyr at Yuanbao. (A) Cyclization of Branched Tetraethers (CBT') of brGDGTs. (B) Concentration of brGDGTs. (C) Concentration of isoGDGTs. (D) Branched and Isoprenoid Tetraether (BIT) index and ratio of iso- and brGDGTs ($R_{i/b}$). (E) Grain size (GS) and magnetic susceptibility (MagSus). Grey intervals (~23–21 ka) in brGDGT-related records (CBT') indicate the transition from the outcrop to the pit and are not considered in the interpretation of the records. Light blue bars in the background indicate Marine Isotope Stages (MIS), and light grey bars indicate Heinrich stadials (HS). Brown and yellow rectangles above the x-axis represent paleosol (S) and loess (L) layers, respectively.

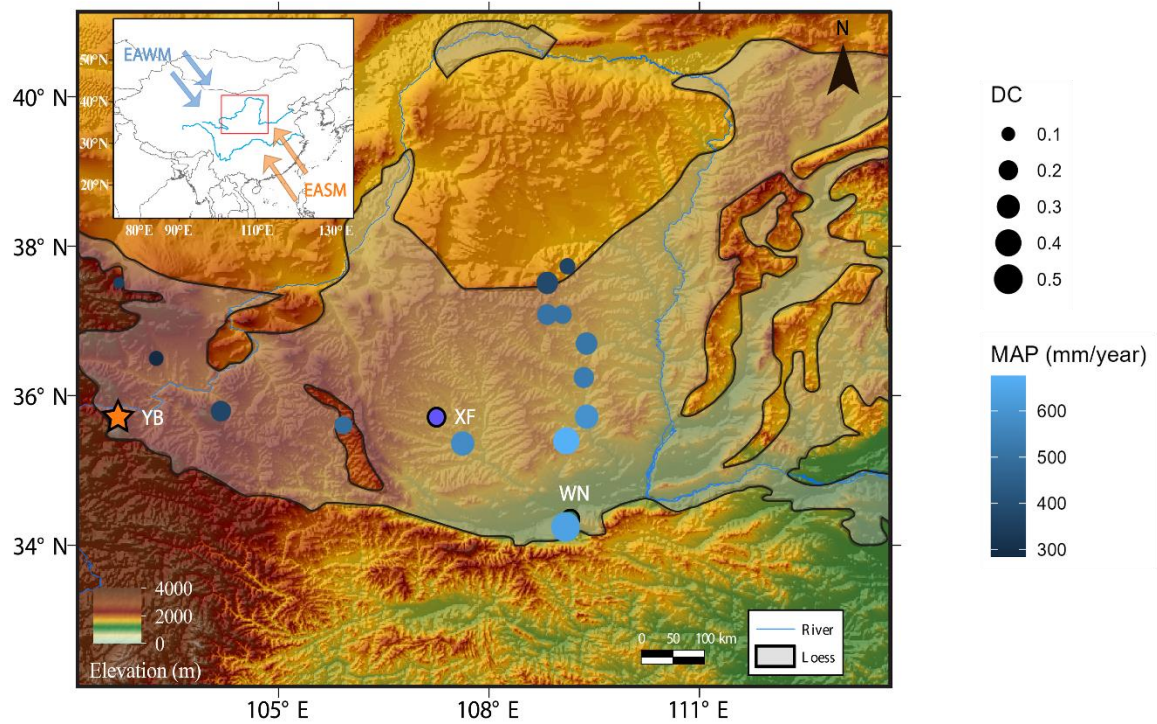


Figure S4. Locations of surface soils from the Chinese Loess Plateau used for Mean Annual Precipitation (MAP) calibration. The blue gradient and different sizes represent changes in MAP and DC, respectively. The orange star indicates the section for this study, Yuanbao (YB). Loess-paleosol sequences mentioned in the text are also indicated (Weinan, WN in green circle, and Xifeng, XF in purple circle).

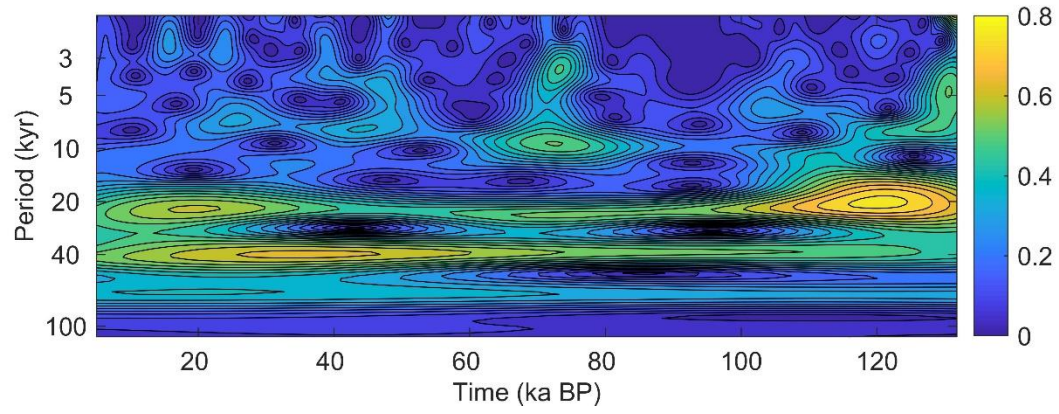


Figure S5. Wavelet power spectrum of degree of cyclization (DC) of brGDGTs from Yuanbao. Color shadings indicate the power of the correlation.