# Seasonal variability in concentration and fluxes of branched GDGTs in Huguangyan Maar Lake and the implications for the application of the MBT/CBT proxy in lacustrine settings

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Lake sediments provide an important archive for climate records that span the continental interior[1]. The novel organic proxy depended on branched GDGTs (Glycerol dialkyl glycerol tetraethers) was applied for estimation of past annual mean air temperature in lacustrine settings[2-4]. Here, we present the results of an integrated study of GDGTs in the water column of Huguangyan Maar Lake (HML), tropical Southern China. The vertical distribution of branched GDGTs was examined through *in situ* filtration of suspended particulate matter (SPM), and seasonal variability through a one-year time-series sediment trap deployment with one month resolution, which provides insight into the vertical and seasonal distribution of branched GDGTs production in HML, thereby placing constraints on the applicability of the MBT/CBT-paleotemperature proxy in this and other similar systems.

The results show that the branched GDGT-producing bacteria tend to live in the bottom of HML.The concentration and flux of branched GDGTs collected in winter were higher than those samples collected in other seasons, suggesting that bacteria producing branched GDGTs are thriving in winter in HML. These results led us to conclude that the environmental conditions in winter are favorable for the growth of bacteria producing branched GDGTs and MBT/CBT-drived temperature might record winter temperature in HML.

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