EGU2020-18370
https://doi.org/10.5194/egusphere-egu2020-18370
EGU General Assembly 2020

Quantification of past temperature variability during the last 36 kyr using organic-derived proxies in the Padul wetland, southern Iberia

Marta Rodrigo-Gámiz[1], Antonio García-Alix[1], Gonzalo Jiménez-Moreno[1], Jon Camuera[2], María J. Ramos-Román[2], Jaime L. Torney[3], Dirk Sachse[4], and R. Scott Anderson[5]

[1]Department of Stratigraphy and Paleontology, University of Granada, Spain
[2]Department of Geosciences and Geography, Faculty of Science, University of Helsinki, Finland
[3]School of Geographical and Earth Sciences, University of Glasgow, UK
[4]Helmholtz Centre Potsdam, German Research Centre for Geosciences GFZ, Section 5.1 Geomorphology, Organic Surface Geochemistry Lab., Germany
[5]School of Earth and Sustainability, Northern Arizona University, USA

The study of climate variability in especially sensitive areas is crucial for a better understanding of the response of Earth's different components to abrupt changes and envisage future climate responses. In this regard, the southern Iberian and western Mediterranean regions have demonstrated hemispheric-scale teleconnections during the last glacial period. Long-records from continental sedimentary archives are scarce, and the Padul wetland represents one of the longest and most continuous continental record in this area, detecting climate variability at centennial to millennial-scale from the Pleistocene to the Holocene. The applicability of organic-based proxies in this organic rich continental archive is a promising tool because the variations in different biomarkers are closely related to biological sources and environmental factors such as temperature. Particularly interesting from a paleoclimatic point of view are glycerol dialkyl glycerol tetraethers (GDGTs), which are membrane lipids from Bacteria and Archaea, ubiquitous in a range of natural archives, including wetlands. Previous works have demonstrated their applicability as a significant past continental air temperature proxy, where the distribution of bacterial branched GDGTs (brGDGTs) is correlated with mean annual air temperature (MAAT) and soil pH. Here we present a first quantification of past temperatures using brGDGTs in the Padul sedimentary record. Preliminary results have evidenced substantial variations in derived-MAAT and distribution of the different brGDGTs during the last 36 kyr that are consistent with abrupt climate periods, such as Henrich Stadial 1 and the Holocene onset. Nevertheless, different absolute MAAT values using the peat-specific calibration and the mineral soil calibration have been obtained and they need to be evaluated.