

Paleo-climate and paleo-environment reconstruction based on a high-resolution, multi-proxy Holocene lake record from Lake Urmia (NW Iran)

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Lake Urmia, in northwest Iran, is the largest saline lake in the Middle East with a surface area of $\sim 5000\text{km}^2$. Historical documents indicate its existence since at least 2000 years BC, and palynological investigation of a 100 m-long core suggest it contains a sedimentary record spanning the last 200 ka. Despite this potential as an archive of paleo-climate and paleo-environmental information, to date there has been no molecular organic geochemical investigation or precise dating of these sediments.

We present lake sediment core data on both geochemical proxies and sediment lipid biomarkers on two cores from different part of the Lake. Each core has 10m length and covers Holocene time scale.

The age model based on calibrated radiocarbon dates shows variation of sedimentation rates between early and middle Holocene and a sudden increase in late Holocene. This is interpreted as a sudden event and mass movement.

Downcore results on bulk measurements (TOC, $\delta^{13}\text{C}$ and C/N) give evidence for a warmer and wetter climates between 0.5 and 3 kyr BP. Phytoplankton biomarkers were most abundant in this period, indicating high phytoplankton productivity. Further gradual shift to cooler and drier episodes occur between 3.5 and 7Kyr Bp, decrease in phytoplankton productivity indicating cooler climate and show terrestrial signal. The coolest and drier conditions occurred between 7-10.3 Kyr BP. This is in agreement with Carbon and Hydrogen isotopic composition of n-alkonic acids.