

Tracking hydroclimate trends throughout the last millennium in Eastern Carpathians (Romania)

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To improve the future climate predictions, we need to have a good understanding of past climate variability and the associated forces ideally at centennial to millennial scales. In this study, we used high resolution analyses of abiotic (C14 dating, $\delta^{13}\text{C}$ stable isotopes, organic matter content and bulk density) and biotic (testate amoebae, micro- and macrocharcoal remains, plant macrofossils and pollen) proxies with the aim to disentangle the effect of climate from the human influence in the evolution of an ombrotrophic peatbog ecosystem (Mohoș) in the Eastern Carpathians, Romania. Specifically, we seek to quantitatively reconstruct the hydroclimate effect on the bog hydrology and its evolution for the past 1000 years, period difficult to understand due to the growing presence of human communities.

Over the last 1000 years, we identified four distinct periods of hydroclimate and anthropogenic impact and their effect on the peatbog development: 1) Between AD 1050 and 1325, a relatively wet period although with slightly contrasting conditions between proxies, dominated forest ecosystems and more intense fire events, while the human presence in the area was limited. 2) Between AD 1325 and 1625, highly fluctuating peatland surface moisture conditions, densely forested canopy (92 %) and low fire activity. 3) Between AD 1625 and 1850 a drying trend with more intense fire events and disturbance in the peatbog evolution. 4) From AD 1850 and present, increasingly dry conditions, intense human activity and disturbances by fire events as well as peatland drainage. Our quantitative reconstruction of the hydroclimate and palaeoecological evolution of Mohoș peatbog, based on high resolution multi-proxy analyses, represent one of the few to investigate the last millennium environmental changes in the central-eastern Europe. The results show strong correlation with other studies from central and central-eastern Europe. However, we observed different conditions when correlated with other studies from north-western Europe.

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