



The climatic signal recorded in Scărișoara Ice Cave (Apuseni Mountains, Romania) during the last millennium

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The climatic signal recorded by proxy indicators in ice caves can provide valuable information on environmental changes during the Holocene. One of the best-known sites for climate and environmental reconstructions in Romania is Scărișoara Ice Cave (Apuseni Mountains), which hosts the largest and oldest cave ice accumulation in the world.

In this paper we present the variations of mid-autumn through mid-winter air temperature for the last 1000 years, as recorded by the isotopic composition of oxygen and hydrogen in the underground ice body in Scărișoara Ice Cave.

We have extracted a 10 m long, 10 cm diameter, ice core and measured the stable isotopes of oxygen and hydrogen along the length of the core. Six radiocarbon dates provide the chronological control of the profile.

The data set shows differences in $\delta^{18}\text{O}$ ($\delta^2\text{H}$ show similar variations and is not discussed) between the Medieval Warm Period (MWP) and Little Ice Age (LIA), with lower values between 1857-1805 and 1771-1592, and the minimum recorded in 1848 ($\delta^{18}\text{O} = -12.5\text{‰}$). This period was cold, with dry winters. In opposition, in the MWP, we have observed an increase in $\delta^{18}\text{O}$ values, with the maximum recorded in 1003 ($\delta^{18}\text{O} = -7.7\text{‰}$). At its height, the MWP extended from 1003 to 1131. D-excess values for the same period show both rapid changes in the source of precipitation, between Atlantic and Mediterranean ones, as well as a predominance of the positive NAO phase during the MWP and a somewhat erratic ANO behavior during the subsequent LIA.

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