



Stalagmites as climate archive

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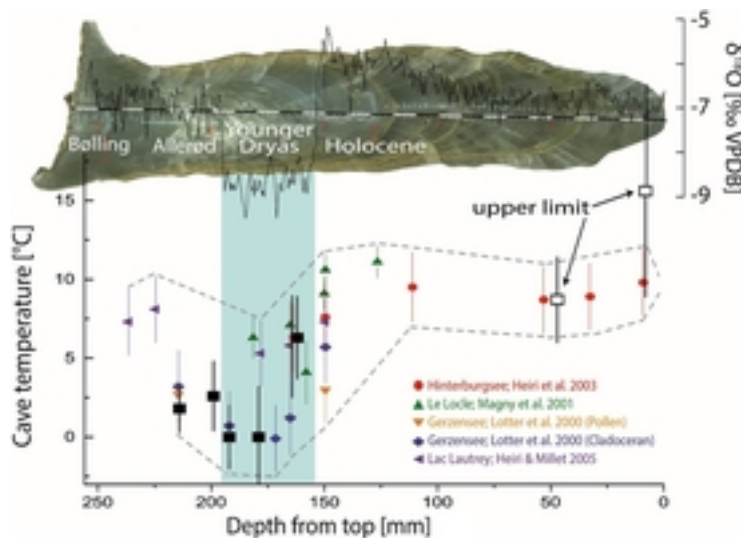
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Eawag, the ETH Zurich and the University of Bern have developed a new instrument: the “Combined Vacuum Crushing and Sieving System” (CVCS). This device makes possible the extraction of minute water and noble gas inclusions that are thousands of years old from the pores of minerals in caves, without distortion by the present atmosphere.

Up until now the CVCS has only been used with stone that was formed in warm epochs. But now a research group led by Eawag has demonstrated that the process is also suitable for stalagmites that formed during cold climate phases. The instrument can therefore be deployed to create a complete reconstruction of climate history extending back thousands of years. This is possible because the solubility of the noble gases argon, krypton and xenon is dependent on the water temperature at the time of inclusion, among other factors.



Stalagmites that grow from the ground towards the ceiling are better suited for climate research than the hanging stalactites for physical reasons. [pxhere/cc]



Graphic from the study: With the approximately 25 cm long dripstone from the Milandre Cave in the municipality of Boncourt (Canton Jura), the cave temperatures could be reconstructed up to 14,000 years before today.

Publication

Noble gas based temperature reconstruction on a Swiss stalagmite from the last glacial–interglacial transition and its comparison with other climate records. Ghadiriab E., Vogel N., Brennwald M. et al, Earth and Planetary Science Letters; Volume 495, 1. August 2018, Pages 192-201; <https://doi.org/10.1016/j.epsl.2018.05.019>

Related Files

[A climate record preserved in dripstone](#) Eawag Annual Report (2007) [pdf, 155 KB]

Related Links

A combined vacuum crushing and sieving (CVCS) system designed to determine noble gas paleotemperatures from stalagmite samples.

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