



Monitoring drip water isotope and element variability: A new device for automatic drip water collection

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Understanding cave drip water elemental and stable isotope composition (δD and $\delta^{18}O$) are vital for interpreting climate proxy records derived from stalagmites as palaeoclimate archives. Delineating the temporal changes in drip water chemistry to climatic and environmental fluctuations (such as rainfall amount, degassing, bioactivity etc.) is even more important if calibration is attempted between climatic parameters and stalagmite proxy records. Monitoring of remote study sites has often been limited by the ability to regularly and manually collect drip water samples over an extended period of time. One important complication to be considered for stable isotope analysis is that sampling vials must be closed air-tight, in order to avoid post-sampling evaporation of the sampled water. To overcome these limitations we developed an automated and programmable sampling device that can collect 12 ml of drip water at pre-defined time intervals. A total of 49 samples can be collected in a turret over a period of up to one year. The device is powered by widely available C-cell batteries and works in cave environments with positive air temperature.

The autosampler has been installed and tested in Waldheim Cave, Switzerland, where we collected water at 24h intervals. We present preliminary data for the winter period December 2011 to March 2012.