

Middle Pleistocene speleothem record from the Baradla Cave, Northeast Hungary

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A ~7 m long and ~3 m wide stalagmite called Zeppelin (ZEP) was studied in the Baradla Cave, northeastern Hungary. The stalagmite is fallen and placed horizontally on large rock boulders. The base was drilled at three locations, covering the oldest 80 cm. The textures of the drill cores could be correlated and revealed that the stalagmite built on a ~40 cm thick flowstone layer. The flowstone is severely contaminated by detrital material that although made fine lamination visible, precluded precise U-Th age determinations. The laminae that are least contaminated provided useful ages from $\sim 300 \pm 30$ ka to 170 ± 13 ka. Stable isotope analyses was conducted with a spatial resolution of 0.7 mm. Using the available ages and comparing the isotope record with ice core $\delta^{18}\text{O}$ data showed that the flowstone was formed even during glacial periods, while the significant interglacial corresponding to MIS9 is represented by a hiatus and clay deposition. On the other hand, the milder interglacial of MIS7 is represented in the ZEP record. It is a general observation that cold periods are too arid in the region to allow stalagmite formation, hence the flowstone formation during glacial periods provide precious data. The formation periods indicate that colder periods are characterized by more arid conditions that still supplied enough water for the flowstone-feeding fracture system while caused ceasing in stalagmite carbonate precipitation, whereas during a strong interglacial like MIS9 the water flow flooded the location and deposited detrital material. Further analyses to improve the age model and the paleoclimatic interpretation will be conducted.

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