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Hydrologic Evolution of a Carbonate Aquifer (Dinaric Karst, Croatia)

Ljubomir **BABIĆ**[1], Damir **LACKOVIĆ**[1] and Nada **HORVATINČIĆ**[2]

Dinaric Karst terrains contain specific, laminated speleothems, which line all surfaces of subterranean voids including Cretaceous bedrock limestone, and older vadose speleothems and clastic sediments. These speleothems may attain a thickness of one metre. Deposition of these speleothems took place during a long-term phreatic period in the Late Quaternary. This is in contrast to well-known, widespread speleothems, which were, and are deposited in vadose and uppermost phreatic settings. Furthermore, the origin of these phreatic speleothems departs from common experience by the dominant dissolutional widening of underground conduits when saturated. Phreatic speleothems can be important stratigraphic marker for the stratigraphy of cave sediments. This approach revealed a sequence of three hydrologic stages: (1) pre-phreatic stage with dominant vadose conditions and dissolution processes, (2) phreatic stage when the ground-water level was very high in the large karst area, and when the volume of the voids decreased, and (3) the last, dominantly vadose stage during which voids were enlarged for the second time, and phreatic speleothems may be covered by younger clastics and vadose speleothems.

[1] Department of Geology and Palaeontology, Faculty of Science, University of Zagreb, Ul. kralja Zvonimira 8, HR-10000 Zagreb, Croatia.

[2] Ruder Bošković Institute, Bijenička cesta 54, HR-10000 Zagreb, Croatia.

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