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RADON AS A NATURAL TRACER OF ACTIVE CAVE FORMATION ZONES

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The Molnár János cave is one of the largest caves of the Buda Thermal Karst (Budapest, Hungary) and mainly characterized by water-filled passages. The major outflow point of the waters in the cave system is the Boltív-spring, which feeds the artificial Malom-lake. Previous radon measurements in the cave system and in the spring established the highest radon concentration (in average 44 Bq/L) in the springwater. The origin of radon was identified in the form of iron-hydroxide containing biofilms, which form by mixing of waters and adsorb efficiently radium from the thermal water component. Since mixing of waters is responsible for the formation of the cave as well, these iron-hydroxide containing biofilms and hence zones of high radon concentration mark the active cave forming zones. Based on previous radon measurements it is supposed that the active mixing and cave forming zone has to be close to the spring, since the highest radon concentration was measured there. Therefore, radon mapping was carried out with the help of divers in order to get a spatial distribution of radon in the cave passages close to the spring. Based on our measurements the highest radon concentration (83.68 Bq/L) ever was achieved in the springwater. Direct connection was established between the spring and the István-room of the cave, which was verified by artificial tracer as well. However, the distribution of radon in the cave passages shows lower concentrations (17.89-46.35 Bq/L) compared to the spring, therefore an addition deep inflow from a hitherto unknown cave passages is assumed, from which waters with high radon content arrive to the spring. These passages are supposed to be in the active cave formation zone.