



Finding palaeowaters in a multi-layered aquifer system in the Lom depression of Danubian Plain in Bulgaria

Marianna Túri (1,3), László Palcsu (1), Mihály Molnár (1), István Futó (1), Tatiana Orehova (2), Aglaida Toteva (2), Vladimir Hristov (2), and Aleksey Benderev (2)

(1) MTA ATOMKI, Department of Environmental and Earth Sciences, Debrecen, Hungary (turi.marianna@atomki.mta.hu), (2) Department of Hydrogeology, Geological Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria, (3) Department of Mineralogy and Geology, University of Debrecen, Debrecen, Hungary

This work is an environmental isotope investigation of groundwater samples from a multi-layered aquifer system in the Lom depression of Danubian Plain in Bulgaria. Our previous studies in the Carpathian-Pannonian Region had been convinced through groundwater researches using noble gas temperatures that the recharge temperature difference between the Holocene and the late Pleistocene recharged waters is $9.13 \pm 0.89^\circ\text{C}$. The aim of this research in Bulgaria is to observe this phenomenon at the outside of the Carpathian-Pannonian Region. The purpose of the sampling campaign was to find out that one of the aquifers of the Lom depression could be a potential site for late Pleistocene, and Holocene paleoclimate reconstruction. There are water samples from the Dacian-Romanian complex, Upper-Pontian aquifer, Meotian–Lower Pontian aquitard and the Sarmatian aquifer as well. The collected water samples were examined for water chemistry, stable carbon, oxygen and hydrogen isotopes, and for noble gas concentrations, and besides them for radiocarbon and tritium.

The radiocarbon content of the water samples are in the range from 15.9 pMC to 98.6 pMC. Based on the obtained radiocarbon values it can be stated that tree aquifers of four could be contain such waters which recharged during the early Holocene late Pleistocene (Pontian, Dacian, Sarmatian). There are two wells in the Pontian aquifer (Dolni Tsibar, 20.8 pMC; Agroinvest, 23.8 pMC) with lower radiocarbon content. Based on the stable oxygen composition of the Agroinvest well, which is with -14.2‰ more negative than the others so it can be late Pleistocene recharged water. In the Dacian aquifer might be one well, the Valchedram which can be late Pleistocene recharged with 23.7 pMC. In the Sarmatian aquifer can be find the oldest water sample from all with 15.9 pMC of Smirnenski. The obtained noble gas temperatures and tritium values might be stated this hypothesis as well.

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