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Hydrochemical attitudes of karst springs of the system Kács and Sály (Hungary)

L. Kürti

Department of Climatology and Landscape Ecology, University of Szeged, Hungary
(livia.korti@ge.com / Fax: +3662 544 158)

The Bükk Mountain is situated in the northern part of Hungary. Its geological structure is very complex. The main body is built of Triassic and Jurassic limestone and it is very fragmented. Shale, clay and metabasalt can also be found in the area.

The Bükk Mountain is a huge reservoir of groundwater with several springs. Some of these have an important role in the drinking water supply system in the Borsod area, like the system of Kács and Sály. The catchment area of this system is bounded by shales in the north and by rhyolite in the south and southwest. The main body is Middle-Triassic limestone, which is not really well karstified.

In the Kács and Sály system I found springs with hot water, springs with mixed water and cold water springs. I have sampled these springs and some streams in order to know how the system works. I analysed the total hardness, the Ca^{2+} and Mg^{2+}content, the chloride, sodium, potassium, phosphate, nitrate and sulphate content of the water along with some pollutants' concentrations (PO_4, heavy metals). There are some differences between the springs in question. In the course of the hydrochemical measurements I used the methods of KRAWCZYK (1996).

For this analysis I used up-to-date mathematical methods e.g. cluster analysis and multidimensional scaling (KOVÁCS-VID-MAUCHA-BERÉNYI-IZÁPY 2005).

Based also on this analysis the springs of Kács and Sály can be categorised according to their chemical composition. Due to this method I can also find the relation betweeen the cold and hot springs. I suggest that one part of the precipitation descends into the phreatic zone, where the geothermal gradient is high and its water is warmed up. But due to the geological structure the water can reach the deeper zone via a fault

line, which is situated on the junction of the rhyolite and limestone (Oligocene). This situation makes the warm water rise and before the spring the descending and the ascending water is intermixed.