

Water geochemistry in the Eastern Carpathians

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The easternmost area of the Carpatho-Pannonian Region (Hargita Mts, Slanic and Vrancea areas) is characterised by a large occurrence of mineralised springs with temperatures.

The main purpose of this investigation has been that to determine the hydrogeological pathways and the evolution of the studied waters with special regard to mixing processes at shallow depth. Thus, major, minor and trace components along with oxygen isotopes have been analysed on 72 thermal, mineral and stream waters in a NNW–SSE transect from the Transylvanian Basin (Corund) through the volcanic area of Hargita Mts to Slanic and Vrancea areas.

On the basis of the analytical results, the Eastern Carpat-

hians waters can be classified into three groups: 1) Ca–Mg–HCO₃ waters, mainly related to ground and stream waters circulating in flyschoid formation of the Carpathian chain; 2) Na–Cl waters as a result of their circulation in Miocene salt domes occurring in the Corund and Slanic areas; 3) Na–HCO₃ waters due to the interaction of shallow and/or high salinity waters, with a CO₂-rich gas phase which tends to lower the pH values of the interacting waters and modifies their original chemical composition. According to the Na/K, SiO₂ and K₂/Mg geothermometers, the temperature of the hypothetical reservoirs are always below 150–100°C. On the other hand, the oxygen isotopes prevalently indicate a meteoric origin, their values being between –2.4 and –11.7 per mil (SMOW) for all the studied waters, according to the altitude of the meteoric feeding systems. This may suggest a sort of decoupling with respect to the gas phase, the latter consisting of a significant deep source contribution. In conclusion, based on these considerations an evolutive modeling of the mineral and high salinity waters from the Eastern Carpathians is here presented.