



## **GEMAS results from the Pannonian Basin – geochemical signatures in a transnational geological structure**

Edith Haslinger (1), Gyoza Jordan (2), Igor Slaninka (3), Ajka Sorsa (4), Aleksandra Gulan (5), Mateja Gosar (6), Hazim Hratovic (7), and Volodymyr Klos (8)

(1) AIT Austrian Institute of Technology GmbH, Health & Environment Department, Environmental Resources & Technologies, Tulln, Austria (edith.haslinger@ait.ac.at), (2) Institute for Geological and Geochemical Research, Centre for Astronomy and Earth Sciences, Hungarian Academy of Science (MTA), Budaörsi ut 45, H-1112 Budapest, Hungary, (3) State Geological Institute of Dionyz Stur, Mlynská dolina 1, 817 04 Bratislava, Slovakia, (4) Croatian Geological Survey, Sachsova 2, P.O.Box 28, HR-10001 Zagreb, Croatia, (5) Geological Survey of Serbia, Rovinjska 12, 11000 Belgrade, Serbia, (6) Geological Survey of Slovenia, Dimičeva 14, SI-1000 Ljubljana, Slovenia, (7) Geological Survey of Federation of Bosnia and Herzegovina, 71210 Ilidza, Ustanicka 11, Sarajevo, Bosnia and Herzegovina, (8) State Geological and Subsurface Survey of Ukraine, 16, Ejen Pottier Str., 02680 Kyiv, Ukraine

The Pannonian Basin, also referred to as Carpathian Basin, has its geological origins in the Pannonian Sea which was part of the Parathetys Sea, from which it was separated around 10 Ma ago. It spreads over large part of the southeastern part of Central Europe. The centre of the Pannonian Basin is located in Hungary and extends to the adjoining countries Austria, Slovakia, Romania, Ukraine, Croatia, Serbia, Slovenia and Bosnia-Herzegovina. The basin is surrounded by the Carpathian Mountains, the Alps, the Dinarides and the Balkan mountains. The Pannonian Basin is filled by Molasse sediments, which were deposited during the Alpine orogenesis and originating from the rising Alpine and Carpathian Mountain chains. The orogenesis continued during the sedimentation into the Molasse basin. The tectonic movements resulted in several cycles of trans- and regressions of the Parathetys, the sedimentation of marine and freshwater sediments as well as a multitude of fractures and cleavages during the orogenesis and the subsidence of different parts of the basin. Even if the Pannonian Basin was formed during a complex orogenesis, it can be regarded as a geo- and hydrodynamic unit.

In accordance with the geological history, the soils in the Pannonian Basin developed on loose sediments – including significant loess deposits - and are dominated by soil types which also reflect the continental and steppe climate in this area – Planosols, Luvisols, Cambisols, Calcisols, Chernozems and Phaeozems. The basin is extensively used for agricultural purposes. The geochemical patterns Pannonian Basin are considerably different compared to its surroundings due to its geological development. The spatial distribution of some elements (REE (La, Ce), Y, Th, V, Cd, Pb) are clearly different inside and outside the basin area. For this transnational geological and geographical area, the GEMAS results are compiled and multivariate statistics are applied to find common geochemical signatures in relation to the geological history of the Basin.