

**4.5.P01****Soils in the Slanic Prahova salt massif area**

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In the Slanic salt massif area, where a long and intensive mining activity have been developed and its traces can be recognized everywhere, an evaluation of the soil state has been necessary.

Soils being the most superficial part of the earth crust, formed on basis of weathering of the surface rocks, its chemical and mineralogical content reflects this fact, so that the solid substrata of the Slanic soils, rich in NaCl, Ca, Mg, Na sulphates, imprint them the halomorphe character and properties specifically for solonchak and solonetz soils.

The chemical investigation has emphasized Mg, Ca, Na, K, Al, Mn, P as major chemical compounds and Co, Cu, Zn, Mo, Ni, Se, as minor ones, but only Na, Ca, Mg, have anomalous contents, especially in the limitroph area of salt springs, or near by the intensive water circulated zones (fissured or faulted zones).

Some differences could appear, in those places, where the substitutions between Na – Ca, Na – K or Ca – Mg could be possible.

An exception is contituted by the Baia Rosie captured salt spring, where the values are much diminished, pointing in this way, the capture of the salt springs as a solution for saline depollution.

The investigation of the soluble part of the soils represented by some cations ( $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ) and anions ( $\text{SO}_4^-$ ,  $\text{Cl}^-$ ) has emphasized the high possibility for their spreading in the limitroph zones, due to their carry on by surface and ground waters

This is very well emphasized by their areal distributions, which show large extentions of their spreading on NE – SW direction, the same one with the Slanic river flow (the main collector of the surface water), or NNW-SSE, the general orientation of geological structural elements.

**4.5.P02****Sr and U isotopic variations in the water-soil-plant system: Example of the Strengbach watershed**M.C. PIERRET<sup>1</sup>, F. CHABAUX<sup>1</sup>, F. HUYBRECHT<sup>1</sup>,  
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The role and impact of vegetation on alteration processes and on biogeochemical cycle remain an open question in Surface Earth Sciences, especially for understanding its real place on the recycling of chemical elements at the watershed scale. Here we propose to address this problem by a multi-geochemical approach including the analysis of Sr isotope ratios and  $^{238}\text{U}$ - $^{234}\text{U}$ - $^{230}\text{Th}$  disequilibria in the different reservoirs of the water-soil-plant system of a small catchment area: the Strengbach creek environmental hydro-geochemical observatory. This watershed, initiated 20 years ago (<http://talc.u-strasbg.fr/wwwoge/index.html>) is a forest catchment (80 ha) located in northeastern France, in a Vosges granitic massif between 883 and 1146 m altitude. We have collected rock samples from the main horizons of one weathering profile, water samples from the associated soil solutions and plant samples from the main tree species growing around. In addition, rain waters, and water samples from streams and springs of the watershed were also analysed (Riotte et Chabaux, 1999 [1], this study).

The soil solutions show lesser radiogenic Sr and lower  $^{234}\text{U}/^{238}\text{U}$  activity ratios than soil samples. Moreover, these solutions display similar characteristics in a plot of U activity ratios against Sr isotope ratios than the stream and spring waters. These results suggest that at the scale of weathering profile, as well as that of the watershed, the dissolved U and Sr of waters, are controlled by the same three end-members. Two of these end-members, have  $^{234}\text{U}/^{238}\text{U}$  AR <1 indicating mobilisation of U from already weathered mineral phases; the third end member characterized, by a  $^{234}\text{U}/^{238}\text{U}$  AR >1, would represent a U flux resulting from alteration of fresher material.

The first results obtained on plant samples show various isotopic signatures. Aerial part of plants show U-Sr isotopic ratios with atmospheric contribution. In contrary, the tree roots have U-Sr isotope ratios close to values of the soil samples and not those of soil solutions. Our results may confirm the major role of the root mycorrhizal systems as a mechanism of chemical tranfert in these forest ecosystems, in agreement with the recent works of Blum et al., 2002 [2]. This clearly questions the real importance of such a process at global scale.

**References**

[1] Riotte J and Chabaux F. (1999) *GCA* **63**, 1263-1275.

[2] Blum J.D., Klaue A., Nezat C.A., Driscoll C.T., Johnson C.E. (2002)