



REE profiles in continuous leach ICP-MS (CL-ICP-MS) experiments in soil linked to REE profiles in surface water in the Koiliaris River Critical Zone Observatory (CZO), Crete, Greece

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The Koiliaris River CZO watershed is situated 25 km east from the city of Chania, Crete, Greece. The total surface area of the watershed is 130 km² with a total length of 36 km and a maximum altitude difference of 2120 m. The outcropping rocks at higher altitudes are Plattenkalke nappe topped by the Trypali nappe, which are mainly bedded- and recrystallized brecciated un-bedded limestones and contain large karstic sinkholes. The Trypali nappe is topped by the Western Crete phyllites and is comprised of quartz and micaceous minerals. At lower elevation neogene marls and marly limestones and recent alluvial sand and conglomerate deposits are dominating.

The hydrology at the Koiliaris River watershed is dominated by spring outflow at the limestone- fluvial sediment boundaries at lower elevation (<200 m), (largely) dry rivers through the limestone nappes and one ephemeral river on the top of the phyllites. The springs at lower altitudes are fed by rain and the snow melt from the karstic aquifers. Stylos spring is the main water supply for the Koiliaris River while other tributaries are mainly in karstic areas and flow is limited. Throughout the watershed at 5 locations soil samples were taken at two different depths and water samples in various springs and rivers were collected and REE were analysed. Progressively reactive solvents (0.01M CaCl, 0.1M HNO₃, 1M HNO₃, 4M HNO₃) were pumped through the sample column, and then directly into the ICP-MS. All the major and the rare earth elements (REE) were continuously measured. The REE concentrations are normalized to NASC and are mineral specific. The mineral specific REE profiles can be linked to the REE profiles measured in the springs and rivers in the watershed.