

# **Sorption of potentially toxic metals in alluvial soil profile in Podravina Region, Croatia**

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The subject of this research is an alluvial soil profile at the location Hlebine-Dedanovice in the Podravina region, Croatia. The main goal of the research was to create sorption isotherms of potentially toxic metals (PTMs) such as copper, zinc and cadmium through the soil profile in order to determine the sorption capacity of the soil and the impact on groundwater in the study area. The accumulation of PTMs in the soil, and their transport through the soil into the groundwater, is a serious problem in the preservation of the soil and groundwater quality, which is used as drinking water. In order to gain insight into the behaviour of PTMs through the studied soil profile, the following laboratory analyses were conducted: organic matter, mineralogical composition, cation exchange capacity (CEC) and contents of iron and manganese oxides. Comparing the analysed soil parameters with sorption parameters, a high correlation was found, especially towards CEC, Fe-oxides and mineral composition, which affects the increase in sorption of PTMs in the soil. Copper has shown that it has the highest sorption in the soil, with sorption capacities (RSC) being very high in all soil depths (above 96.8%), so in case of pollution it will not be significantly transferred to groundwater. Zinc has lower sorption values than copper (the lowest RSC being 85.1%), but higher than cadmium, which showed the opposite behaviour in soil with the lowest sorption parameters (lowest RSC 79.8%). Based on the obtained results, it can be concluded that cadmium represents a potential risk to groundwater. Accordingly, regular monitoring of cadmium concentrations with depth in soils of the study area is needed in order to quantify leaching of cadmium through the soil to the groundwater.