

Elemental and isotopic characterization of sediments from Lake Brljan in karstic river Krka catchment (Croatia)

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Trace elements in surface waters (rivers and lakes) may originate from natural sources such as weathering of bedrock and soil, erosion, volcanic eruptions, and anthropogenic activities such as industrial effluents, agriculture runoff, domestic discharge, etc. Sources and time of exposure can be evaluated based on the distribution of elements in sediments by considering also the biogeochemical processes, background levels and changes over time (Cukrov et al., 2013). In sediment depth profiles valuable informations about historical events and changes in the environmental conditions are recorded.

The River Krka catchment has been investigated extensively in the past 30 years. It is still considered to be a pristine area, although some contamination was recorded over the years. The Lake Brljan is a 1.3 km long and 0.4 km wide waterbody located in the upper reach of the Krka River. The lake emerged, in part, from the growth of the travertine barriers at the Brljan barrier, but major impact on the morphology of the Lake Brljan had the construction of the concrete dam for the HPP "Miljacka" that was constructed in period 1904–1907 (Strmečki et al., 2018). At present, the geochemistry of the lake is scarcely documented. Therefore, the aim of our study was to characterise the sediments and pore waters by analysing mineral, elemental (major and trace elements, C_{org} and N) and isotopic ($\delta^{13}\text{C}_{\text{carb}}$, $\delta^{18}\text{O}_{\text{carb}}$, $\delta^{13}\text{C}_{\text{org}}$, $\delta^{15}\text{N}$, $^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{97/95}\text{Mo}$) composition of two depth profiles sampled at the entrance to and exit of the Lake Brljan. The results enabled the evaluation of the status of the sediments and elucidated the adsorption/desorption and redox reactions that occurred in the lake sediments, and indicated the main sources of trace elements.

References:

Cukrov, Cuculić, Barišić, Lojen, Lovrenčić Mikelić, Orešanin, Vdović, Fiket, Čermelj & Mlakar (2013), *Journal of Geochemical Exploration* 134, 51-60.

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