

## Comparison of geochemical and isotope signals in tufa barriers and fluvio-lacustrine carbonates in a tufa-precipitating karstic stream (Krka, Croatia)

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Krka is a typical karstic river, which receives a considerable amount of water through diffuse subsurface recharge. The hydrological situation is explained only for the upper part of the Krka watershed, whereas the situation in the middle and lower parts of the stream is yet to be properly described. Sedimentary processes of alternating barrage and lacustrine tufa formation in the river reflect the fluvio-lacustrine dynamics of the groundwater-fed river system; the continuous dispersed groundwater recharge of the river creates ideal conditions for tufa formation along the entire course of the river. At the present, the river is divided by several tufa barriers; upstream of many of them, lakes were formed, which are – because of continuous sedimentation – an ideal medium for historical review assessment of the sedimentation processes, through the elemental and isotope distribution.

In this abstract we present the results of the elemental and isotopic study of 3 tufa barriers and lacustrine sediment (surficial and sediment cores) in the two lakes formed between them in the central part of the river flow.

Surface sediments and sediment cores (up to 40 cm depth) in the lacustrine sequence were collected manually by SCUBA diving. Sediment cores were sectioned into 2 cm segments in a glove bag in N<sub>2</sub> atmosphere. Interstitial water was extracted by centrifugation (4000 rpm) and subsequent filtration through 0.45 μm membrane filters. In the pore water, the stable isotope composition of dissolved inorganic carbon and oxygen were analysed. The sediments were oven dried, crushed and analysed for the concentrations of carbon, sedimentary organic C and N, as well as their stable isotope composition. Main, minor and trace elements were also analysed.

Concentrations of sedimentary organic matter gradually decreased with depth with a significant shift to lower values in the depth segment corresponding to the time sequence 1990–2000. In upper 15 cm, relatively high C/N values were observed, indicating an increased amount of terrestrial organic debris and that originating from vascular plants compared to lower segments, where autochthonous microbial biomass prevails. Variations in carbonate C and O stable isotope composition integrated overall changes in abundance of particulate and dissolved C sources, as well as biogeochemical processes affecting them. In surface sediments, both δ<sup>13</sup>C and δ<sup>18</sup>O values resemble those of tufa barriers, whereas in the sediment columns, they increase with depth, concordantly with the dissolved inorganic C in the water, which points toward intensive interaction of inorganic (carbonate) and dissolved carbon pool in the sediment.

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