

Study of Dinaric karst using isotope methods: project REQUENCRIM

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In the frame of the project Reconstruction of the Quaternary environment in Croatia using isotope methods (REQUENCRIM) the investigation of palaeoenvironment and palaeoclimate in the Dinaric karst in Croatia has been performed. Dinaric karst covers half of the Croatian territory having the wide range of karstic forms already proven as good palaeoenvironmental archives, such as terrestrial and submerged speleothems, tufa deposits, karst lake sediments, and marine algal rims. Within this research various carbonate sediments from different climate zones are studied: speleothems from 3 locations in littoral Croatia, mountainous Gorski Kotar region and central Croatia, lake sediments from Plitvice Lakes, tufa deposits from Zrmanja River, and marine algal rims from different locations along the eastern Adriatic coast. Research is based on isotope methods that include analysis of stable isotopes $^{13}\text{C}/^{12}\text{C}$ and $^{18}\text{O}/^{16}\text{O}$ in carbonate deposits, $^2\text{H}/^1\text{H}$ and $^{18}\text{O}/^{16}\text{O}$ in water, and radioactive isotopes ^{14}C and U-Th series for dating. Additionally, mineralogical composition and CHN analyses of lake sediments and physico-chemical analyses of water are performed. The expected outcome of the research is the following: climate and/or environment records in stable isotope composition of speleothems and tufa, differences in palaeoclimate/ palaeoenvironment conditions in various regions, how various carbonate deposits record conditions in time of deposition, comparison of tufa from Zrmanja River area with the tufa deposits from other areas of Dinaric karst, relative sea level changes during the late Holocene, how recent sea level change impact living algae (*Lithophyllum byssoides*), changes in the environment/climate during last ~200 years by studies of lake sediment depth profiles.

The project is financed by the Croatian Science Foundation for the period 2014 – 2018. In the first year of the project we started with: sampling of rainwater, dripwater and speleothems in 3 caves and monitoring of conditions inside and above the caves; sampling and some isotope measurements of the lake sediments from different locations in two lakes of the Plitvice Lakes system; sampling and some isotope measurements of tufa deposits from the Zrmanja River, as well as water chemistry analysis of the Zrmanja River; prospecting of marine algal rims along eastern Adriatic coast, collecting of samples and some isotope measurements. The Project team of the interdisciplinary research consists of chemists, geologists, geographers, a physicist and a biologist.

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