

**“Looking for the missing time: palaeoenvironmental significance of hiatuses in speleothems” – popular science summary**

The paleoclimatic studies, which concern the changes of the Earth's past climate, are conducted also on the basis of speleothems. The interest in the reconstructions of environmental conditions using the speleothems has been constantly increasing. It results from the topical nature of climate change studies on the one hand, and usefulness of speleothems as a palaeoclimatic archive on the other hand.

The crystallization of calcium carbonate, which composes speleothems, depends on the various factors. The most important one is the amount and chemistry of feeding water. The switch of environmental conditions can be significant enough to stop the speleothem growth. This results in the occurrence of the gap of continuity in speleothem section, which is called a hiatus in geological terminology. Hiatuses are common in the speleothem profiles and result from the inhibitions of crystallization or/and destruction of previously formed speleothem. Although the numerous palaeoenvironmental studies based on speleothems have been conducted so far, the genetic significance of hiatuses has not been fully explained.

The main aim of the project proposed is to reveal the characteristic features of the hiatuses connected with the corrosion of speleothems and the processes responsible for their formation. The proposed studies will be conducted in the Polish and Slovak caves. The first part of the project will be focused on surfaces of speleothems which are actively corroded and on the conditions in which this corrosion occurs. The mineralogical, petrographic and geochemical methods will be applied. The studies on currently developed corrosion surfaces will be completed by monitoring of the cave environmental conditions, including the measurements of water chemistry. Additional data on the rate of speleothem corrosion caused by different factors will be collected due to the field experiments based on the determination of weight loss of the plates artificially installed in the caves. The second part of the project will be devoted to the genetic interpretations of hiatuses which occur in speleothem profiles. This will be achieved by the application of wide spectrum of methods including the microscopic and geochemical analyses. The time ranges of the hiatuses will be estimated by the isotopic dating of under- and overlying layers of speleothem. The results of the modern corrosion processes obtained in the frame of the first part of the project will be applied in genetic interpretation of the hiatuses.

The project effects will enable the precise interpretation of complex phenomena occurring in caves during the breaks in speleothem growth, which are recorded as hiatuses. Thus, the project will result in more precise palaeoclimatic reconstructions based on speleothems.