

Fossil pollen in cave ice as a proxy of climatic and palaeoenvironmental changes, on the example of Dobšinská Ice Cave

The scientific objective of the research work is reconstruction of the late Holocene palaeoenvironmental conditions based on the pollen analysis of the ice cave profile in Carpathians. The research will be carried out in Dobsina Ice Cave (Dobšinská ľadová jaskyňa), Slovakia. The analysis of pollen grains preserved in ice will allow for reconstruction of vegetation and thus the environmental conditions of this area during the last ca. 1200 years. The parallel aim is analysis of modern pollen grains based on the material deposited inside the cave and outside, near its entrance. Data obtained from the study of modern pollen grains will form the basis for a proper interpretation of the fossil record. The assumption of the project is that the pollen grains preserved in cave ice are an important indicator of palaeoclimate changes that may form the basis for the reconstruction of the palaeoenvironment, as they are a determinant of the vegetation of the area.

Climate changes is a very important scientific aspect, and the research of the ice massif in the cave is very valuable. The demand for this type of results comes from the fact that the understanding of the mechanisms controlling the climate changes in the past gives an opportunity to better understand the changes currently occurring and evaluation of risks associated with them. The ice mass melts slowly in the bottom part, due to the geothermal heat, while the increase in ice takes place from above. Thus, such a record is transient and unique, valuable at the same time. Additionally, by dating organic matter preserved in the ice profile at its different levels, it is possible to construct a precise time scale for the obtained pollen record. The collected data will be interpreted in terms of climate changes. Particular attention will be paid to the record of increasing human pressure on the environment, which can also be expected in the investigated pollen grain profile in the Dobšinská Ice Cave.