

SERDUST general public abstract

The Quaternary loess deposits in the Carpathian Basin are different from those in western and central Europe because of the unique geography and complex layering of the area. The Carpathian Mountains and the Alps ice cap affect the way air moves, including how moisture behaves, and how particles are carried in this region. In the Middle Danube Basin, most of the wind-blown material comes from nearby areas, with the prevailing winds blowing from the North and Southeast.

There is a detailed paleoenvironmental record of the last 130,000 years in Surduk site along the Danube River in Serbia. In the middle of this record, a soil layer known as "Surduk Soil" occurs, which is similar to the Lohne soil in the Nussloch loess sequence, Germany. It is linked to a period about 38,000 years ago called 'Greenland Interstadial 8' corresponding to an important warming during the last glaciation in Northern Hemisphere. Unlike some other regions, Surduk does not have certain types of soils, which makes it challenging to compare with areas farther north. However, by studying the size of the particles in the soil, one can identify Loess Events (LE) that correspond to times of strong winds carrying coarser material. Also, the analysis of stable carbon isotopes in organic matter preserved in the sediment suggests the presence of certain types of plants during specific periods.

Researchers have looked at the Surduk area to study mollusks, the size of soil particles, and stable carbon isotopes. Recently, they have made progress in using earthworm calcite granules in the sediment to get very accurate dates using radiocarbon dating and to understand temperature and precipitation conditions. Precise dating is crucial for figuring out the history of loess and the presence of C4 plants in the Carpathian Basin. This research aims to apply these new methods to answer questions like how loess events are connected to climate events in the North Atlantic Ocean, why the Surduk record differs from others, and if C4 plant events tell us about the broader or more local climate conditions in the Carpathian Basin. By isotope analyses and precise dating of the earthworm calcite granules, scientists hope to reconstruct temperature and precipitation history and better understand the Surduk loess sequence's place in the last climatic cycle.