
The timing of the early hominin occupation of Central Europe: New TCN dating of Korolevo complex (western Ukraine)

Roman Garba^{*†1,2}, Jan Kameník¹, Vitalii Usyk², and František Veselovský³

¹Nuclear Physics Institute of the AS CR – Czech Republic

²Institute of Archaeology of the Czech Academy of Sciences – Czech Republic

³Czech Geological Survey [Praha] – Czech Republic

Abstract

The Paleolithic site of Korolevo is in eastern-central Europe, where the Tysa River leaves the Carpathian Mountains and flows onto the Pannonian Plain. Situated in a quarry, the open-air site is located on a river terrace where alluvium and loess have accumulated between the volcanic hills of Gostry Verkh and Beyvar. Since its discovery in 1974, numerous archaeological, palaeoecological and chronometric studies have established Korolevo as a key site of early hominin occupation in Central Europe. The unique stratigraphic sequence of eighteen cultural layers across three sites spans from the Lower to the Early Upper Palaeolithic. Our project aims to revise complete chronostratigraphic profile of Korolevo using TCN and other dating methods. The initial results yielded a burial age of 1.42 ± 0.10 Ma ($\pm 1\sigma$) for the lowest cultural layer (VII) at Gostry Verkh, establishing it as one of the earliest human settlements in Europe. Here, we present the preliminary results and archaeological interpretations of the new TCN burial dating of a younger Layer VI at the Gostry Verkh site, as well as the first dating of the lowest cultural layer at the Beyvar site. The sandstone pebbles and quartz artefacts were physically and chemically processed and ^{10}Be and ^{26}Al nuclide concentrations were calculated from isotope ratios measured using the the 300-kV AMS system MILEA. These results provide a new insight into the dispersal of hominins in one of the Europe's most complete Pleistocene cultural sequences.

Keywords: cosmogenic nuclides, lower Palaeolithic, Ukraine, geochronology, human evolution

*Speaker

†Corresponding author: garba@ujf.cas.cz