



## **Isotopic and morphological investigations of a *Bison bonasus* skull, Bihor Mountains, Romania: paleoenvironmental implications**

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In this study we investigated morphologically and geochemically a skull from an open pit situated on a karst plateau area in the Bihor Mountains. The study presents the first radiocarbon dating and stable isotope composition of bison skeletal remains from the Romanian Carpathians. Due to the wiggles in calibration curve, the result of radiocarbon determination yielded two relevant maxima of the probability distribution of calendar age. Even when analyzing the 95.4% range, two maxima can be distinguished, although both are quite narrow: one is around AD 1550 and the second around AD 1645. These ages indicate that the investigated bison died during the Little Ice Age (LIA), approximately 200 years before the last ones were hunted to extinction in the Carpathians. Stable isotope composition of carbon from bison tooth enamel suggests that the bison diet consisted exclusively of C3 grasses, compatible with a high altitude habitat and low mobility. Calculated mean annual temperature (MAT) temperature using carbon stable isotope composition of enamel is lower than the present one measured for the same area. Oxygen isotope composition of enamel indicates that the bison drank from stagnant water sources, such as lakes or puddles formed from rain water. This further suggests low mobility of the bison as well, as the presence of such small stagnant water sources is characteristic even today for the karst Plateau area. Calculated oxygen isotope compositions of rain and drinking water at the time the bison lived indicate a lower relative humidity, around 60-70% at the level of LIA, which is lower than today's humidity of 80%.