Investigating diagenetic patterns using $\delta^{18}O_p$ and $\delta^{18}O_c$ in bone and tooth apatite of modern, archaeological and fossil specimens

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In the study of archaeological and fossil bone assemblages, diagenesis is an important factor to consider as it will affect the elemental and isotope composition of bone and teeth. Indeed, the carbonates present in bone and tooth apatite are prone to exchange with the surrounding environment. Thankfully, oxygen in also present in the phosphate fraction of bioapatites which is much less prone to exchanges than carbonates. Furthermore, these are present in much larger quantities allowing the analyses of small samples, which is crucial when dealing with precious archaeological and fossil specimens.

Comparing the oxygen isotope ratios of the carbonates and phosphates provides insights into the degradation processes bioapatites underwent through time and allows for a better understanding of the exchanges that occurred between bioapatites and the burial environment. This paper presents preliminary results of δ18Op and δ18Oc analyses of a wide range of bioapatites from different contexts, highlights methodological difficulties, and discusses the interpretation of these results in the frame of diagenesis and palaeoenvironmental reconstructions.