

## Multi-element isotopic analyses of Neanderthal prey from Dederiyeh Cave, Syria: palaeoecological implications

DIAB, Mark<sup>1\*</sup>, YONEDA, Minoru<sup>1</sup>

<sup>1</sup>Laboratory of Human Evolution, Department of Biosciences, University of Tokyo

The Neanderthals (*Homo neanderthalensis*) survived for several hundreds of thousands of years through changing climatic scenarios and complex ecological, biogeographic, and subsistence-settlement challenges. Archaeologists have written extensively about possible causes for extinction while little has been stated about the obvious ecological and social resilience they demonstrated over millennia of expansion throughout Europe and the near east. The results of initial stable isotope analysis on prey species hunted by Neanderthals at Dederiyeh cave, Syria provide proxy landmarks from which to discuss the palaeoclimatic and palaeoecological context of the northern Levant just prior to Neanderthal extirpation from the entire region approximately 40 kya. Stable carbon and oxygen isotope and strontium data suggest that Dederiyeh cave may have been an important location on an annual land use rotational schedule for Mousterian hunters. Carbon and oxygen isotopic data from wild goat and red deer reveal climatic and diet shifts suggesting niche partitioning. Strontium data indicate that both species were available in proximity to the cave all year-round; this has important implications for understanding Neanderthal land use and settlement behaviour. Age profiles of key prey species (wild goat, gazelle, and red deer) are similar to sites in the southern Levant. The significance of this research lies in the creation of stable isotope proxies for seasonal climatic reconstructions (from  $\delta^{18}O$ ), dietary shifts (from  $\delta^{13}C$ ), and keystone herbivore migration and range reconstruction (from  $^{87}Sr/^{86}Sr$ ) during the dynamic palaeoecological trajectories of OIS 3 (60-40 kya).

Keywords: Neanderthal, stable isotopes, Dederiyeh Cave, Syria, wild goat, red deer, prey exploitation