Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

BPT24-P01 Room:Convention Hall Time:May 24 17:15-18:30

The Climatic effect on the distribution of Neanderhtal and Modern Humans

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The Neanderthals became extinct around 30 ka in the cooling setting, although our ancestor (modern humans) who evolved in Africa survived and adapted to cooler environment. To understand the reasons for their difference in reaction to the environmental changes, we combine different kinds of evidences from anthropology, archaeology, palaeoclimate, and palaeoenvironment. Here, we will report the progress of our joint research conducted by the Grant-in-Aid for Scientific Research on Innovative Areas ”The replacement of Neanderthal by Modern Humans: Testing Evolutionary Models of Learning” to share the information with potential coworkers from geoscience fields. Now, we are developing a database of radiometric dates of archaeological sites and human fossils, which will be shown on the palaeoclimate map produced by global circulation models. Furthermore, fluctuation of environments in the stage of their evolution, Europe for Neanderthal and Africa for modern humans, is also estimated by some geochemical proxies. By combining these information together, the difference between Neanderthal and modern human could be discussed in light of adaptation, hunting strategies, ecological niches and some aspects of their congition.

Keywords: MIS 3, Neanderthal, Homo sapiens, human evolution, palaeoclimate, palaeoenvironment

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WebGIS for mapping information derived from paleoenvironmental literature

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Web-based Geographical Information Systems (WebGIS) allow us to distribute interactive maps via the Internet. Users can handle the maps using a web browser to change the scale, contents and extent of a displayed map. WebGIS can also distribute text descriptions for particular locations. We use WebGIS to map information on paleoenvironmental literature published in academic journals. A preliminary system of WebGIS was constructed in the late 1990s and early 2000s, using ArcView IMS from ESRI as the main engine. It contained information from literature such as the location of areas studied, geomorphological and geological data used for paleoenvironmental reconstruction, target ages and eras, and references such as author names, article titles, journal names, and volume and page numbers. These data were taken from ca. 6,000 papers in international journals of earth and Quaternary sciences published between the mid-1990s and 2002. The data collection ceased in 2003 when a related research project was over. Recently another project ”Replacement of Neanderthals by Modern Humans” was launched in Japan by a group of archaeologists, anthropologists and geographers. For this project, we first transferred the data in the previous WebGIS to a new system with ArcGIS Server from ESRI. Then we added new data from articles published after 2002. We have been collecting data for the Middle East, South Europe and North Africa because they are relevant to the project. The new WebGIS will be useful for the project, because the spatial distribution of paleoenvironment and its temporal change are crucial. The system will also be used by researchers worldwide to collect basic information about existing paleoenvironmental literature.

Keywords: paleoenvironment, literature, GIS, Internet

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

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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 18O), dietary shifts (from 13C), and keystone herbivore migration and range reconstruction (from 87Sr/86Sr) during the dynamic palaeoecological trajectories of OIS 3 (60-40 kya).

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