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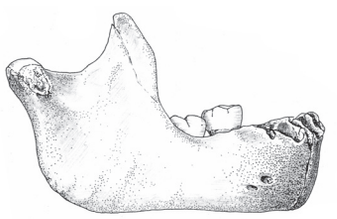

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Podium Presentation Session 11, Saturday 15:00

When diet became diverse: Isotopic tracking of subsistence strategies among Gravettian hunters in Europe

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Subsistence strategies are key paleoecological features of Paleolithic hunter-gatherers and their deeper understanding provides critical insights into essential aspects of human evolution. In this study, we discuss new collagen stable isotopic values (C, N, S) representing seven Gravettian individuals from the Troisième caverne of Goyet in Belgium. The dietary strategies of the Gravettian humans from Goyet are in line with the general trends observed among Western European Gravettian populations. These populations show both a low intake of mammoth and a high consumption of other terrestrial mammals as well as aquatic resources, such as at the sites Arene Candide and La Rochette. This is different for more eastern Gravettian hunter-gatherers, for example in Kostenki, Brno-Francouzska, Mal'ta, Předmostí, and Dolní Věstonice where the dietary contribution of mammoth meat was significantly higher. The stable isotopic data of the Gravettian humans from Goyet indicate that their dietary ecology was essentially based on terrestrial resources like reindeer, horse, and, to a lesser extent, mammoth. However, they yielded δ^{15}N values that are substantially lower than those of the earlier modern humans and Neandertals from the same site [1-2]. We hypothesize that the Gravettian humans had much less mammoth in their diet than all earlier humans from the same region. It was previously shown that in northwestern Europe a decline of mammoth, a key prey species, could already be detected at the onset of the Upper Paleolithic [2]. This trend appears to continue into the Gravettian, despite the persistence of the typical mammoth ecological niche, which is represented by a grassland with high δ^{15}N values. Interestingly, through isotopic analysis, we are able to track the spread of the horse from the local ecosystem (represented by specimens from Walou Cave, Belgium) into this niche now under-occupied by the mammoth. Radiocarbon dates obtained from several mammoth skeletal remains from the Troisième caverne of Goyet showed that this megaherbivore was indeed part of the ecosystem during pre-LGM periods. However, from the Gravettian in Goyet and the surrounding region we have only one mammoth specimen represented by a long bone, and interestingly, its sulphur isotopic signal indicates that this individual was not of local origin. We propose that the local mammoth population was under intensive hunting pressure or may even have been no longer present in the region. Instead, single individuals from other regions may have made it into the area and ended up as prey animals. While the δ^{15}N values of all Goyet Gravettian humans are relatively homogeneous, their δ^{13}C values are variable. This indicates significant dietary differences among the seven individuals, an observation that has not been described before for hunter-gatherers pre-dating the Gravettian. The human δ^{34}S values also support substantial differences in life mobility history between different individuals, which were not observed for the Goyet Neandertals. The result that different members of the same chrono-group had various individual mobility histories has implications for land use procurement strategies of those hunter-gatherer groups. In conclusion, our new isotopic results demonstrate a broad ecological flexibility among Gravettian humans, which can be seen in different human ecosystem interactions across Europe. The Goyet individuals contribute substantially to a more complete understanding of hunter-gatherer's ecology during this particular phase of the European Late Pleistocene. Our study shows that the Gravettian cannot be depicted as a uniform entity from an ecological perspective. It instead indicates that during this period, and not earlier, both inter- and intra-group diversity in subsistence strategies can be tracked through stable isotopic analysis.

References:[1] Wißing, C., Rougier, H., Crevecoeur, I., Germonpré, M., Naito, Y.I., Semal, P., Bocherens, H., 2016. Isotopic evidence for dietary ecology of late Neandertals in North-Western Europe. Quaternary International 411, 327-345.[2] Wißing, C., Rougier, H., Baumann, C., Comeyne, A., Crevecoeur, I., Drucker, D.G., Gaudzinski-Windheuser, S., Germonpré, M., Gómez-Olivencia, A., Krause, J., Matthies, T., Naito, Y.I., Posth, C., Semal, P., Street, M., Bocherens, H., 2019. Stable isotopes reveal patterns of diet and mobility in the last Neandertals and first modern humans in Europe. Scientific Reports 9, 4433.