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The dentition from Montmaurin-La Niche cave (Haute-Garonne, France). New insights in the *Homo heidelbergensis* debate

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Due to an increasing Middle Pleistocene human fossil record in Europe, *Homo heidelbergensis* species has become one of the most debated species in the last two decades. While the Middle Pleistocene populations of Europe have been generally related to Neanderthal clade, the precise taxonomic and phylogenetic relationship with *H. neanderthalensis* remains unclear. Interestingly, recent studies confirm that teeth and mandibles are the first anatomical parts to show a clear Neanderthal signature. This fact has been interpreted as evidence of a less linear model for the origin of the Neanderthal lineage. The present study contributes to this question by considering human fossils from a restricted geographical area (i.e. the French and Spanish sides of the Pyrenees and surroundings) in order to at least control one possible evolutionary factor. We focus on the Montmaurin-La Niche (MLN) mandible which together with a tibia and a cervical vertebra was discovered in 1949 in a karst system in South-West of Toulouse (Haute-Garonne). An updated synthesis on the geomorphological context and the fauna from this site was published recently attributing the layer bearing human fossils (C3) to the MIS 7 (around 200 ka). We present the first detailed comparison of the dentition of the MLN specimen, with a particular focus on the similarities and differences to the Tautavel-Arago cave (mainly from MIS 12) in France and the Atapuerca-Sima de los Huesos (SH) site (MIS 11) in Spain. A metrical and morphological study was carried out on the teeth, including an analysis of the dental inner features by means of micro-computed tomography (microCT). We have particularly focused on the assessment of the trigonid crest pattern expression at both the enamel and the enamel dentine junction as it bears a significant taxonomic and phylogenetic value. Our study reveals that all the MLN teeth display a continuous middle trigonid crest that is also high at the level of the EDJ. In this feature, MLN would be similar to Arago, SH as well as to the Neanderthal lineage in presenting high prevalence of continuous middle trigonid crest at the EDJ (75%, 72% and 76% of the individuals, respectively). However, in both Montmaurin and Arago the distal trigonid crest is absent whereas this feature has been described as typical of the Neanderthal species and is present in a 23.2% and 14.7% of our SH and Neanderthal samples, respectively. To the light of our study we offer some insights about the relationship among hominins living in a restricted geographical area from MIS 7 to MIS 12 and that show a varied combination of primitive and derived traits. This study is part of an ongoing analysis that will include the mandible and a large comparative sample and expect to shed light on the Middle Pleistocene populations' variability and the different models suggested for Neanderthal's origin.

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