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What’s happening now in Atapuerca? Latest research at the Sierra de Atapuerca

Commission on First humans in Europe
(Organizers: Jordi Rosell, Alfonso Benito, Jesús Rodríguez)

Tuesday 2nd (9:00 to 13:30  15:00 to 19:30)
Salon de Actos (Facultad de Económicas)
Our results reveal that despite the wider variability of trigonid crests types at the EDJ compared to the OES, the correlation in the morphology of the inner and the outer surface of the lower molars is high. Furthermore and in accordance with previous works (e.g. Bermúdez de Castro et al., 2003; Martinón-Torres et al., 2013), we highlight a more primitive dental conformation in Gran Dolina TD6 hominins in comparison with more derived features in the European Middle Pleistocene hominins from Sima de los Huesos.

To the light of our microCT study, we present some evolutionary interpretations of the relationship among the Early and Middle Pleistocene hominins of Europe, where the divergence of the features -primitive or derived- is considered regarding to H. sapiens and H. neanderthalensis trigonid and talonid crest expression.

Crown formation times of Homo antecessor molars fit within the variability of other hominin species.

Molar crown formation times are relatively stable throughout hominin evolution at least from the last common ancestor with chimpanzees, regardless dental morphological differences. Thus, differences in the eruption times might be mostly based on differences in the root extension rates.

10. CROWN FORMATION TIMES IN HOMO ANTECESSOR MOLARS (GRAN DOLINA-TD6, SIERRA DE ATAPUERCA, SPAIN)

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Human remains from Atapuerca-Gran Dolina TD6 level represent at least 11 individuals that are dated to approximately 0.9 million years. These fossils were recovered in different seasons since 1994 and were the base to name a new human species, Homo antecessor. There are several publications regarding the morphological features of this hominin, including teeth. However, information available about Homo antecessor dental development is scarce, and those studies did not employed histological variables. Here, we studied the crown formation times of Homo antecessor lower molars. Our results are compared with molar crown formation times in other hominin species and great apes obtained from the literature. We studied seven Homo antecessor molars that are assigned to three individuals: two lower molars (one M1 and one M3) and five upper molars (three M1, one M2 and one M3). Environmental scanning electron microscope (ESEM) was used to estimate the imbricational enamel formation time and microtomography (microCT) was used to estimate the appositional enamel formation time.

Crown formation times of Homo antecessor molars fit within the variability of other hominin species.

11. THE UNGULATES FROM GRAN DOLINA LEVEL TD8 AT ATAPUERCA: EVOLUTION, BIOSTRATIGRAPHY, BIOGEOGRAPHY

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The locality of Gran Dolina at Atapuerca records the Early-Middle Pleistocene boundary, an extraordinary sequence of fossiliferous levels straddling this boundary, archaeological levels and the level TD6, which yielded over a hundred remains of Homo antecessor. These levels are dated by an array of dating techniques and palaeomagnetism situates the Brunhes-Matuyama boundary in the top of level TD7. Level TD8 is the first Middle Pleistocene fossiliferous level.

Ongoing research results in increased data on the ungulates that lived around the Early-Middle Pleistocene transition and new hypotheses on their evolution. Here we present the ungulate association of TD8 in this context and compare it to those of other localities of more or less similar age. The TD8 ungulates are similar to those of lower levels at Gran Dolina, but differ from those from many other European early Middle Pleistocene localities. TD8 is peculiar in retaining a species of the giant deer genus Eucladoceros and a small rhinoceros. Such a small rhinoceros is common in the late Early Pleistocene and some believe it to be related to Stephanorhinus etruscus,
while others believe it to be related to S. hundsheimensis. The persistence of these forms suggests that TD8 is older than the localities with which it is compared. If that is the case, it is the oldest Middle Pleistocene ungulate fauna. Alternatively, it is a geographic difference and relic forms persisted longer in Spain.

The Sierra de Atapuerca sites offer a series of chronologically sequences whose correlation allows the paleoenvironmental and cultural evolution during the Early and Middle Pleistocene to be reconstructed. Previous work in these sites showed the difficulties in identifying clear cut-off points separating entirely different environmental episodes along the sequence, which lacks evidences of extremely harsh conditions. Another difficulty was relating the paleo-environmental changes with the cultural ones.

Here we present a multiproxy analysis focused on the Middle Pleistocene unit TD10 of Gran Dolina site, which is the richest archaeological unit being excavated in Atapuerca. Our main goal is to describe in detail the 3m thick stratigraphic succession of TD10, and to situate the most significant geological, geochronological, paleoenvironmental, palaeontological and archaeological information recovered up to now in the most representative profiles.

The main purposes of such a multidisciplinary presentation are to identify specific micro-scale environmental variations through the TD10 sedimentary unit, and to assess how they are reflected in the archaeo-palaeontological record.

A total of twelve “sample units” (layers) have been individualised in the TD10 succession, from top to bottom: four in sub-unit TD10.1, four in TD10.2, two in TD10.3 and two in TD10.4. One extra control point was taken in level TD9, just to record the differences between these apparently so diverse units.

Each of these points has been specifically sampled, and data coming from different fields of study is taken into account separately. Data sources broadly include geology (sedimentology, stratigraphic features, soil micro-morphology observations and geochronology), environment (pollen, small and large fossil vertebrate remains) and archaeology (behavioural data coming from technological and zooarchaeological studies).

A first step in the study involves combination of these...