PRELIMINARY TAPHONOMIC STUDY OF THE CARNIVORAN-DOMINATED ASSEMBLAGE OF BATALLONES-3 (LATE MIOCENE, MADRID BASIN, SPAIN)

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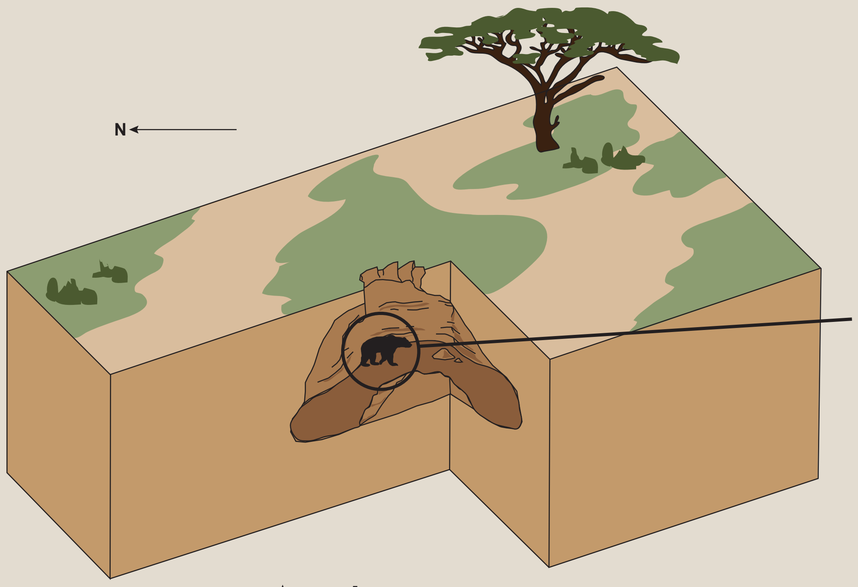
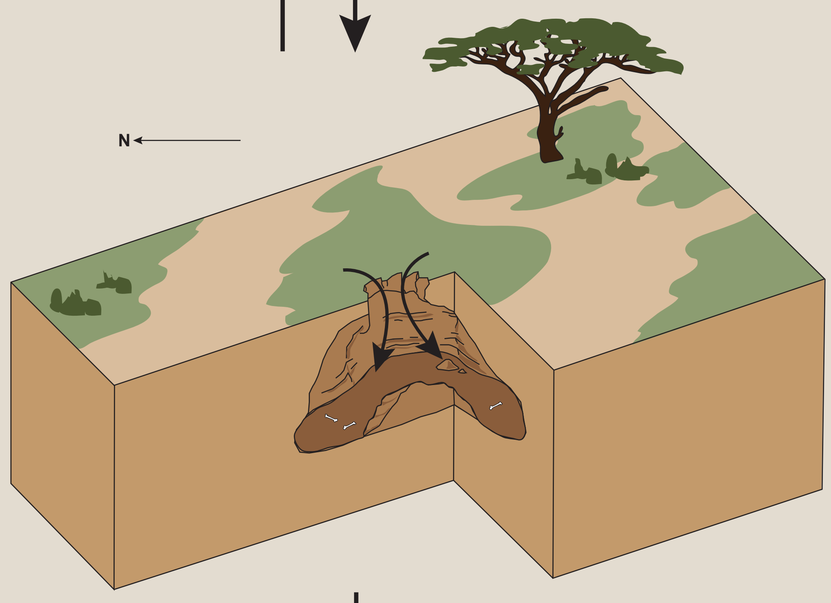
Introduction

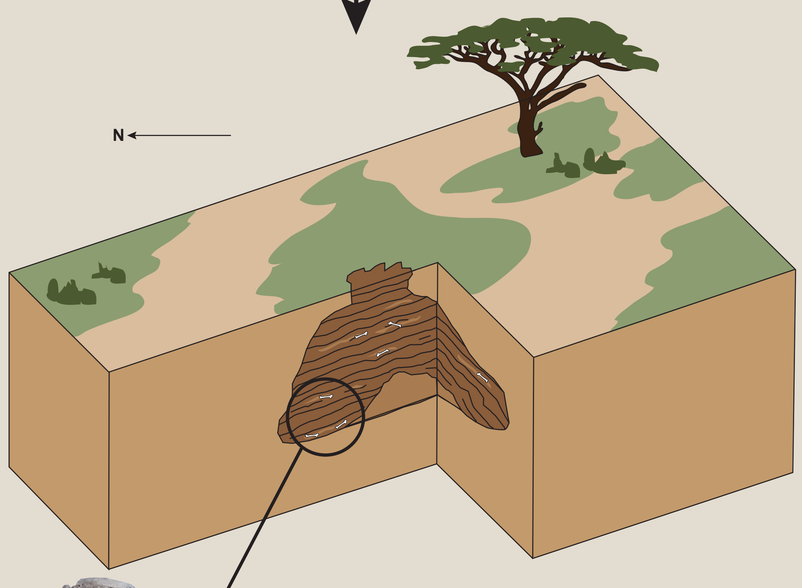
Batallones-3 is one of the nine late Miocene mammalian sites found in the Batallones butte (Madrid basin, central Spain, Calvo *et al*., 2013). Alongside Batallones-1, Batallones-3 contains an unusually large concentration of carnivoran remains: Batallones-1 hosting 98.39% of carnivoran remains whereas Batallones-3 99.58%. Carnivore-rich fossil sites are highly uncommon in the fossil record so their taphonomic study can provide valuable insights about the causes of formation of such concentrations and about the paleoecology of these species (Domingo *et al*., 2013). Remains are found in marl deposited inside a domically-shaped pseudokarstic cave, with an inferred upper opening in the center.



Repeated entrance of fauna



Sedimentation



Indarctos arctoides L5 vertebra.

During **diagenesis**, a high percentage of the remains were **fractured**, with fracture surfaces ranging from smooth to irregular.

MnO mineralization is very common on most of the bones.

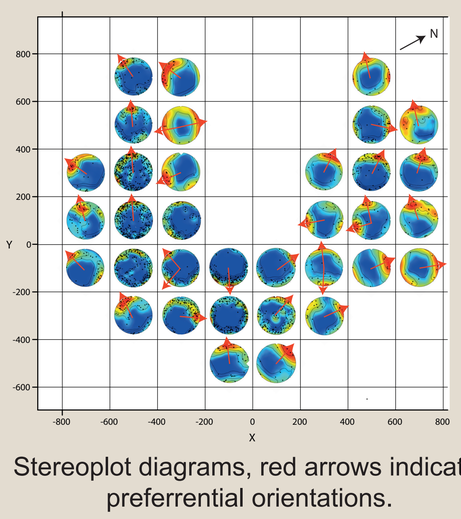
Assemblage Data

A total of **19,187 large-mammal remains** have been retrieved,belonging to at least **15 species**.

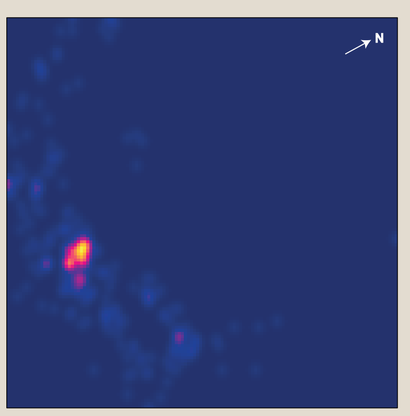
The most abundant taxa are the saber-toothed cats *Machairodus aphanistus* (35.92%) and *Promegantereon ogygia* (28.81%) and the ursid *Indarctos arctoides* (19.64%). Other taxa found at the site include the hyaenid *Protictitherium crassum*, the amphicyonids *Magericyon anceps* and *Thaumastocyon* sp., the mustelids *Eomellivora piveteaui*, aff. *Adroverictis ginsburgi* and aff. *Circamustela decheseauxi* and the mephitid *Promephitis* nov. sp..

Spatial Data

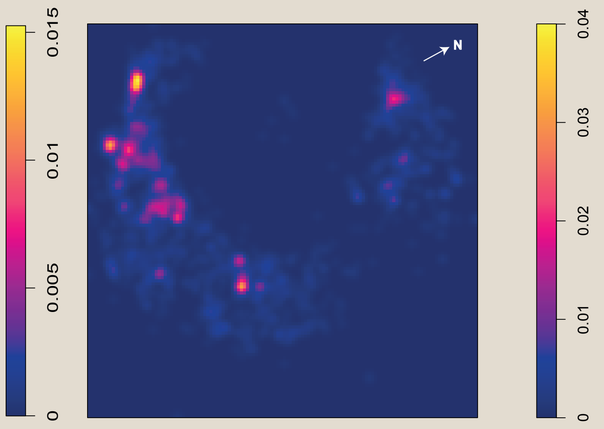
Two preferential orientations of the remains are observed: outwards from the center of the cave and with a northwestern trend. However, remains appear to have suffered little to no transport, since for each species the number of density clusters correlates to the MNI.



Stereoplot diagrams, red arrows indicate preferrential orientations.



Eomellivora piveteaui spatial density.

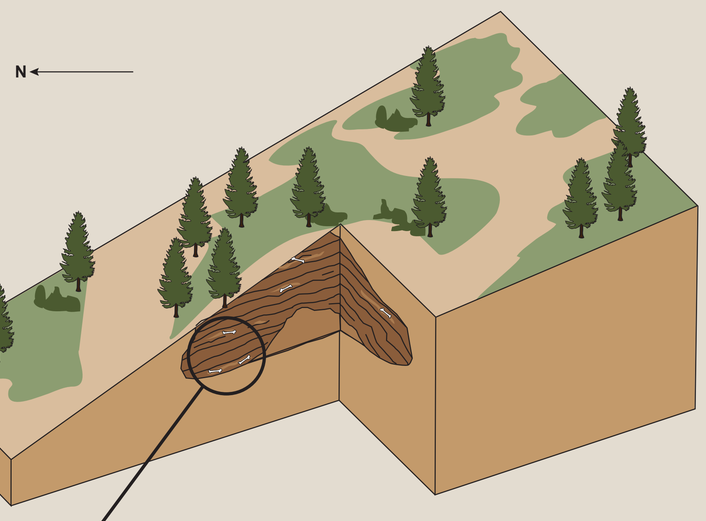


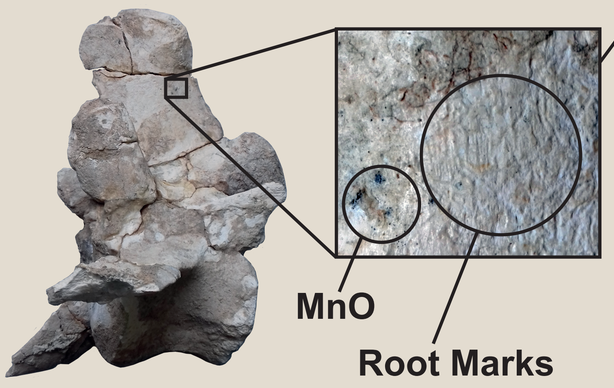
Indarctos arctoides spatial density.

Assemblage data	
NISP	19187
Number of large mammal species	15
Predominant ecological type	Carnivores
Predominant ecological groups	Felidae, Ursidae
Body sizes (kg)	1 - 250

Spatial data	
Assemblage area	115 m²
Fossil density	164.49 specimens/m²
Bone orientation	2 preferential directions

Slope erosion





Indarctos arctoides L5 vertebra.

Batallones Butte was reforested with pine trees, which caused abundant **root marks** in a large amount of the assemblage.

Batallones-3 was discovered after slope erosion unearthed some remains.

References

Domingo, M.S.; Alberdi, M.T.; Azanza, B.; Silva, P.G.; Morales, J. (**2013**) Origin of an Assemblage Massively Dominated by Carnivorans from the Miocene of Spain. PLoS One, 8, e63046.

Calvo, J.P.; Pozo, M.; Silva, P.G.; Morales, J. (**2013**) Pattern of sedimentary infilling of fossil mammal traps formed in pseudokarst at Cerro de los Batallones. Sedimentology, 60: 1681-1708.