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Taphonomic approach to the faunal assemblages of the Middle Pleistocene sites of Oxígeno and Santa Elena (Manzanares Valley, Spain)

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The valleys of the Manzanares and Jarama rivers preserve one of the largest concentrations of Pleistocene sites in Europe, and feature plenty of discoveries of lithic industry and faunal remains that have taken place since 1862 [1]. The sites Oxígeno and Santa Elena are located in what is known as the Complex Terrace of Butarque (CTB) downstream from Madrid, to the last stretch of the Manzanares river, where it flows into the river Jarama. In this area the stepped terraces system disappears and gives way to the CTB, thanks to the dissolution of an underlying karst subject to a synsedimentary subsidence process, which gives rise to the thickening of the alluvial deposits, which can reach several tens of meters [2]. Different numerical dates obtained in several spots of the CTB visible base suggest that the bottom of the CTB was deposited during MIS 6 or even MIS 7 [1].

The lithic series of Oxígeno (9,440 pieces) and Santa Elena (2,556 pieces), although fairly unpublished [3], have been described as Large Flake Acheulean on flint, and possible Middle Palaeolithic industries [4]. The presence of handaxes with broad bilateral and bifacial configuration, which occasionally show retouch and edges conformed with soft hammer, and among which amygdaloidal silhouettes predominate, is outstanding both in Oxígeno (4%) and in Santa Elena (6%). Trihedrals and cleavers are also present in both series. Retouched elements are more common in Oxígeno (13%) than in Santa Elena (8%), with scrapers the best represented (37% of the retouched pieces of Oxígeno and 24% of Santa Elena).

This taphonomic study, the first complete one for both collections [5], brings to light a complex taphonomic history when trying to understand these faunal accumulations. 445 fossil elements have been recorded at Oxígeno, consisting of remains of *Bison priscus*, *Bos cf. primigenius*, *Bos/Bison sp.*, *Cervus elaphus*, *Equus caballus*, *Equus hydruntinus*, *Elephas antiquus*, *Elephas sp.*, *Mammuthus sp.*, *Megaloceros matritensis* and *Stephanorhinus sp.* The most commonly represented element are cranial fragments of *Elephas sp.* (24,71%); as well as teeth and mandibular fragments of *Bos cf. primigenius* (12,58%). With regard to Santa Elena, 130 fossil elements have been recorded, which have been identified as those of *Bos cf. primigenius*, *Bos/Bison sp.*, *Cervus sp.*, *Equus caballus*, *Equus sp.*, *Elephas antiquus*, *Mammuthus sp.*, *Megaloceros sp.*, *Stephanorhinus hemitoechus* and *Stephanorhinus sp.* Here, the best represented elements are fragments of *Bos/Bison sp.* (25,38%) horns and of *Elephas sp.* (23,84%) tusks, although taking into consideration the number of molars and premolars, the most abundant taxon (NISP) is *Equus caballus*. Taphonomic processes of weathering, abrasion, rounding, concretion and trampling, among others, have been identified in both assemblages. The incidence of processes related to fluvial transport is higher in Oxígeno than in Santa Elena, where abrasion and rounding are virtually absent. In both sites post-cranial bones are better represented than cranial bones, and their preservation is better. Dismemberment cut marks have been identified on a humerus of *Bos cf. primigenius* in Santa Elena. No cut marks have been preserved in Oxígeno. However, the preservation of the bone surfaces is not good, and therefore the lack of human action cannot just be assumed. Additionally, despite carnivore remains not being identified among the fossil elements, several tooth marks of that type of animals have been recorded: small pits and scores at Oxígeno; as well as pits and furrowing on *Bos cf. primigenius* and *Megaloceros sp.* bones at Santa Elena. The presence of human and carnivore activity makes it even more complicated to interpret the origin of the accumulation of these faunal assemblages associated with Acheulean industries.

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