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The mammoth from the archaeo-paleontological hominin site of Huéscar-1: A tile in the puzzling question of the replacement of *Mammuthus meridionalis* by *Mammuthus trogontherii* in the late Early Pleistocene of Europe

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ABSTRACT

The site of Huéscar-1 (Baza basin, Granada, Spain) yielded an interesting paleontological record close in age to the Early-Middle Pleistocene boundary. In 2003 two lithic artifacts were found, confirming the human presence at this site. The faunal assemblage preserves few marsh turtle remains, a number of avian species, and small and large mammals, including some elephant remains believed in the past to record the oldest appearance in Europe of *Palaeoloxodon antiquus.* They actually belong to the genus *Mammuthus,* although the identification (i.e., *Mammuthus meridionalis* or *Mammuthus trogontherii*) has been questioned. The aim of this research is two folded: (1) to provide a new description of Huéscar-1 remains, which can confidently be attributed to the southern mammoth, thus representing one among the last populations of *M. meridionalis* recorded in Europe; and (2) to briefly discuss open questions about time and mode of the replacement of *M. meridionalis* by *M. trogontherii* by the end of the Early Pleistocene.

1. Introduction

The site of Huéscar-1 is located close to the village of Huéscar, at the south of the Sierra de la Encantada and near the northern edge of the Baza basin (Granada, Spain). It is one among the most significant sites in the late Early Pleistocene of the Iberian Peninsula for its rich paleontological record (some herpetofauna, a diversified avifauna and several small and large mammalian species) (Mazo et al., 1985; Mazo, 1989a; Martínez-Navarro et al., 2006; Alberdi and Alonso, 2009; Ros-Montoya, 2010) (Fig. 1). The first investigations, dating back to the ⁻80s, provided extensive information on the geological context and paleontological record of the site (Mazo et al., 1985; Alberdi and Bonadonna, 1989). More recently, two flint flakes found during an archaeological field survey (Fig. 2) provided evidence of a human presence at the site (Martínez-Navarro et al., 2006).

According to a revision of the faunal lists published during the last decades (e.g., Mazo et al., 1985; Santafé-Llopis and Casanovas-Cladellas, 1987; Alberdi et al., 1989, 1998; 2001; Alberdi and Ruiz Bustos, 1989; Alcalá and Morales, 1989; Azanza and Morales, 1989; Cerdeño, 1989, 1993; Mazo, 1989a; b; Sánchez-Marco, 1989; Sesé, 1989; Ros-Montoya, 2010; Cuenca-Bescós et al., 2014; Agustí et al., 2015; Palombo, 2016), the Huéscar 1 vertebrate fauna includes: reptiles (Emydidae indet.), birds (cf. *Tachybaptus ruficollis*, *Anas crecca/A. querquedula*, *Anas platyrhynchos*, *Anas clypeata*, *Anas strepera*, *Anas* sp., *Netta rufina*, *Aythya ferina*, *Aythya nyroca*, *Aythya*

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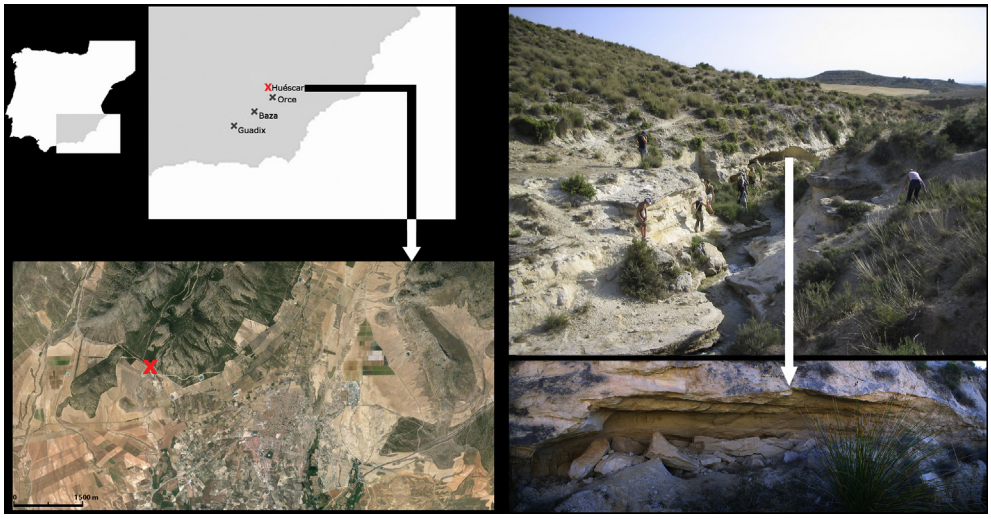

Fig. 1. Geographical location and panoramic view of the Huéscar-1 site.

Fig. 2. Two flakes found in situ at the Huéscar-1 levels during the survey of 2003 (modified from Martínez-Navarro et al., 2006). The scale bar represents 2 cm.

fuligula, *Aythya* sp., *Perdix perdix*, *Crex crex*, *Bubo bubo*), small mammals (Soricidae indet., *Eliomys quercinus*, *Apodemus* sp., *Castillomys crusafonti* ssp., *Mimomys savini*, *Iberomys huescarensis* (= cf. *Microtus (Pitymys) gregaloides* in Mazo et al. (1985), *Oryctolagus* sp., *Lepus* cf. *L. granatensis*, Leporidae indet.) and large mammals such as Carnivora (*Canis mosbachensis,* identified by some researchers as *Canis etruscus*, Hyaenidae indet., *Panthera gombaszoegensis, Homotherium* sp.I, Perissodactyla (*Equus altidens, Equus suessenbornensis, Stephanorhinus* sp., by some identified as *S. etruscus,* by others as *S.* ex gr. *S. hundsheimensis*), Cetartiodactyla (*Hipopotamus antiquus*, *Praemegaceros* cf. *P. solilhacus*, and a representative of the Caprini tribe identified as either *Capra* sp. or *Hemitragus*) and Proboscidea, the subject of this study.

Elephant remains were first identified as *Mammuthus meridionalis* by Mazo et al. (1985) and then referred to "*Elephas antiquus*" (recte *Palaeoloxodon antiquus)* by Mazo (1989a). In view of the chronology hypothesized for the site, according to the second identification the Huéscar-1 remains would have represented the earliest record of the straight-tusked elephant in Europe. The morphology and dimensions of these remains (in particular the molariform teeth), however, prompted various authors to ascribe them to the genus *Mammuthus* (e.g., Davies, 2002; Lister, 2004; Martínez-Navarro and Ros-Montoya, 2009; Ros-Montoya, 2010; Palombo and Alberdi, 2015; Palombo, 2014, 2016, 2017).

The aim of this research is two folded: i) to provide a new description and a firm identification of the elephant remains found at Huéscar-1, focusing on the morphological and biometrical features of the teeth and mandible; ii) to discuss the intriguing issues of the time and mode of the replacement of *M. meridionalis* by *M. trogontherii,* and the patchy persistence of *M. meridionalis* populations in Europe at the Early to Middle Pleistocene transition.