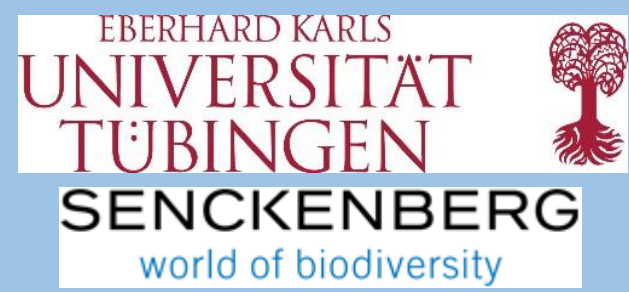


The *Elephas (Palaeoloxodon) antiquus* skeleton and other large mammals from the Lower Palaeolithic locality Marathousa-1 (Megalopolis Basin, Greece): preliminary results

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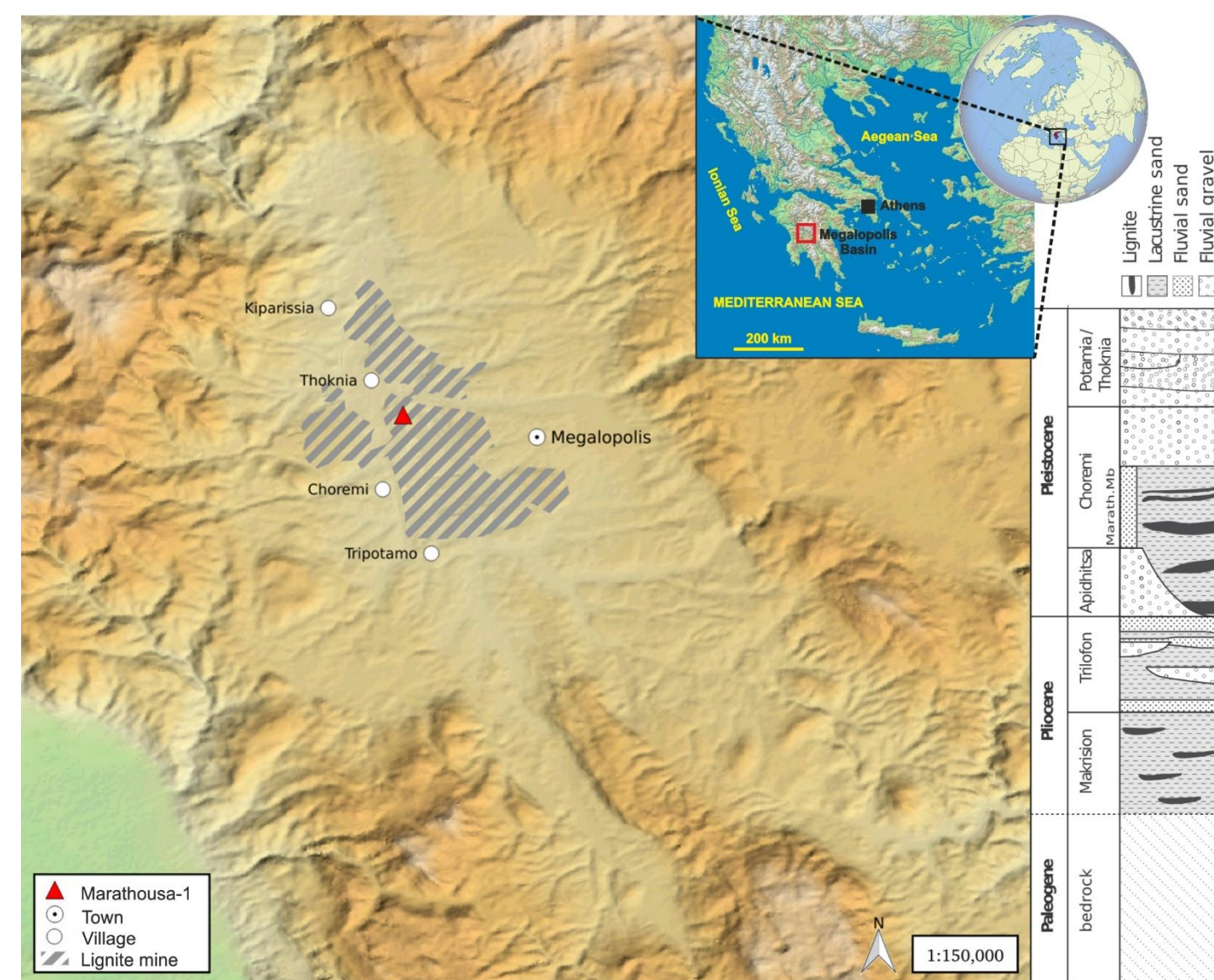
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1. INTRODUCTION

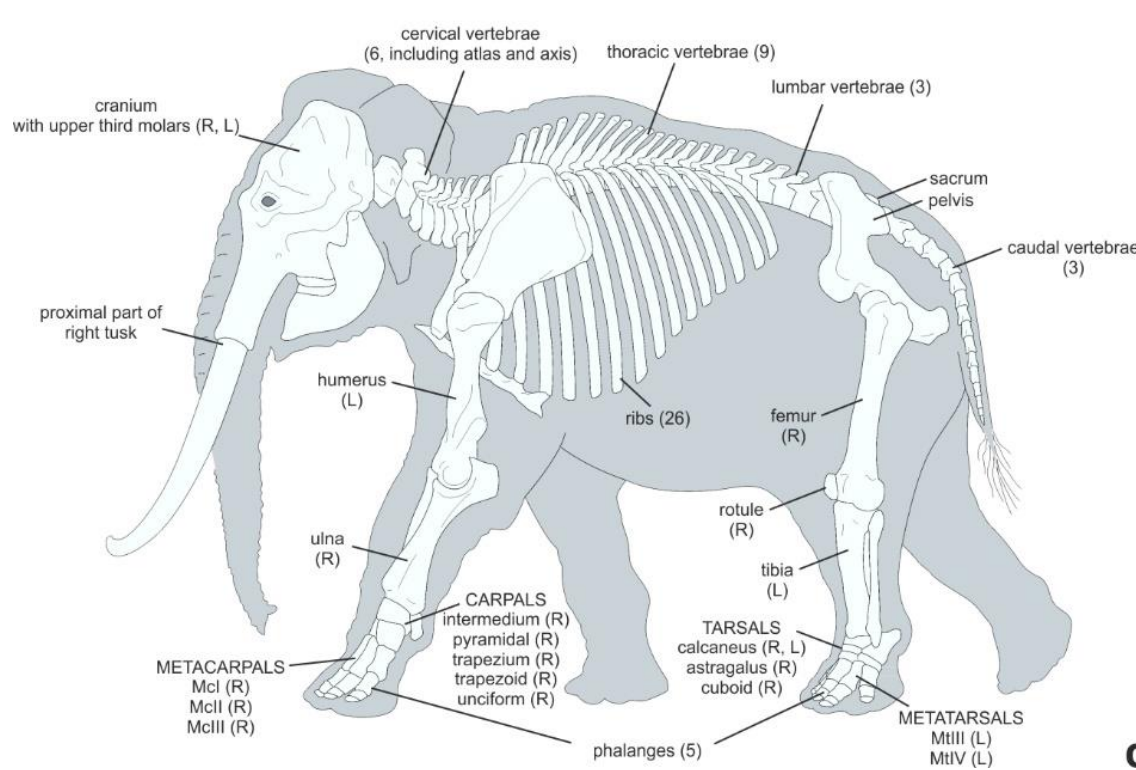
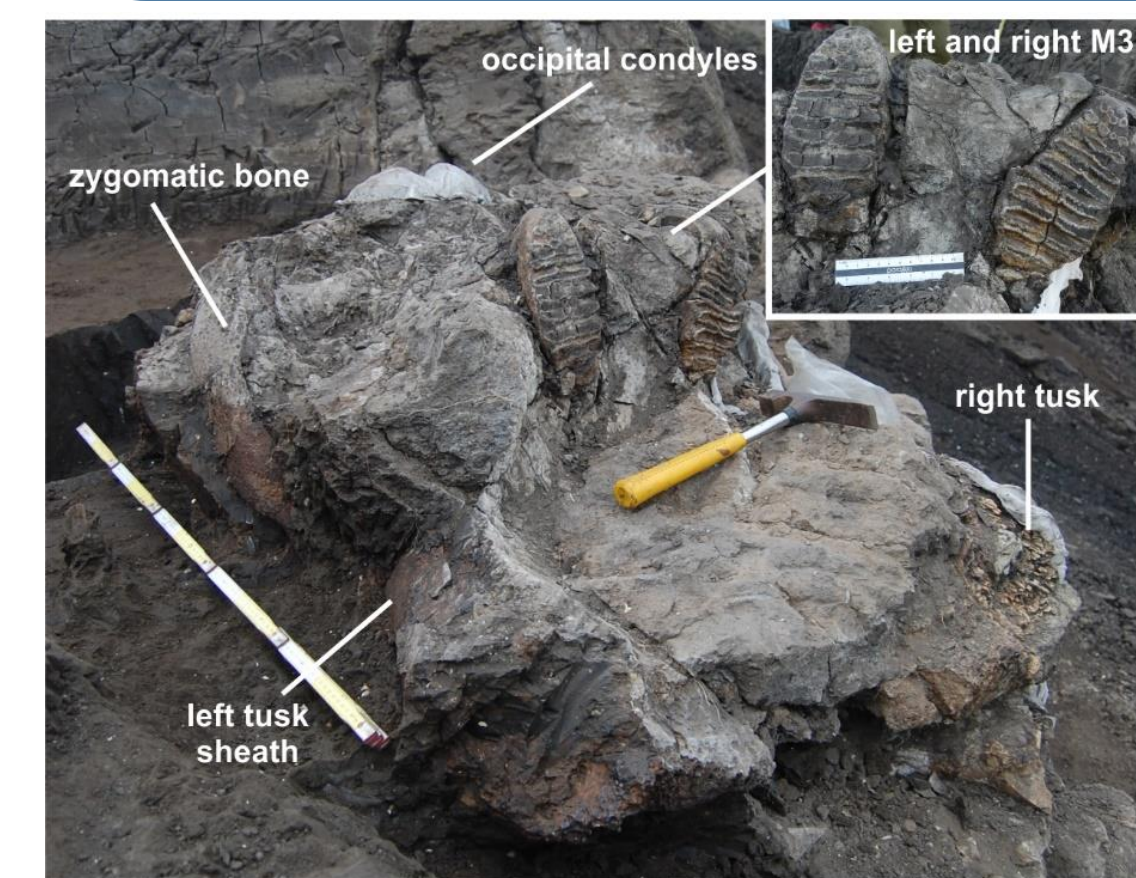
The Megalopolis Basin (Peloponnese, Greece) has long been known for its Middle Pleistocene mammal fossils (see [1] and references therein). In 2013 a palaeolithic/palaeoanthropological survey, conducted by a joint team from the Ephorate of Palaeoanthropology-Speleology of the Greek Ministry of Culture and the University of Tübingen, led to the discovery of a new open-air locality, Marathousa-1 (MAR-1), when stratified bones and lithic artefacts were identified in a section of the Marathousa Member, Choremi Formation [2]. The preliminary ESR analysis dates the locality at 0.5–0.4 Ma [3].



Geographic position of the Megalopolis Basin and the Marathousa-1 site, and stratigraphic column of the basin (modified from [2] and [4]; maps taken from commons.wikimedia.org, www.shadedrelief.com and www.openstreetmap.org).

3. ELEPHANT SKELETON

An elephant cranium (with widely laterally divergent premaxillary tusk alveoli, and molars with relatively narrow crown, intensively folded enamel and pointed midline sinuses) and numerous postcranial elements were found in close anatomical association and are attributed to a single individual of the straight-tusked elephant *Elephas (Palaeoloxodon) antiquus*. The skeleton belonged to an old male in its sixties with live skeletal height ~3.7 m and body mass ~9.0 tonnes.



Elephas (P.) antiquus remains from the MAR-1 skeleton; a, cranium *in situ* (upside down position) and detail of the upper third molars; b, right ulna; c, right femur; d, schematic drawing of an *E. (P.) antiquus* skeleton (www.archeozoo.org) showing the identified anatomical parts (in parentheses the side or the number of specimens) of the MAR-1 skeleton (collection 2013–2016).

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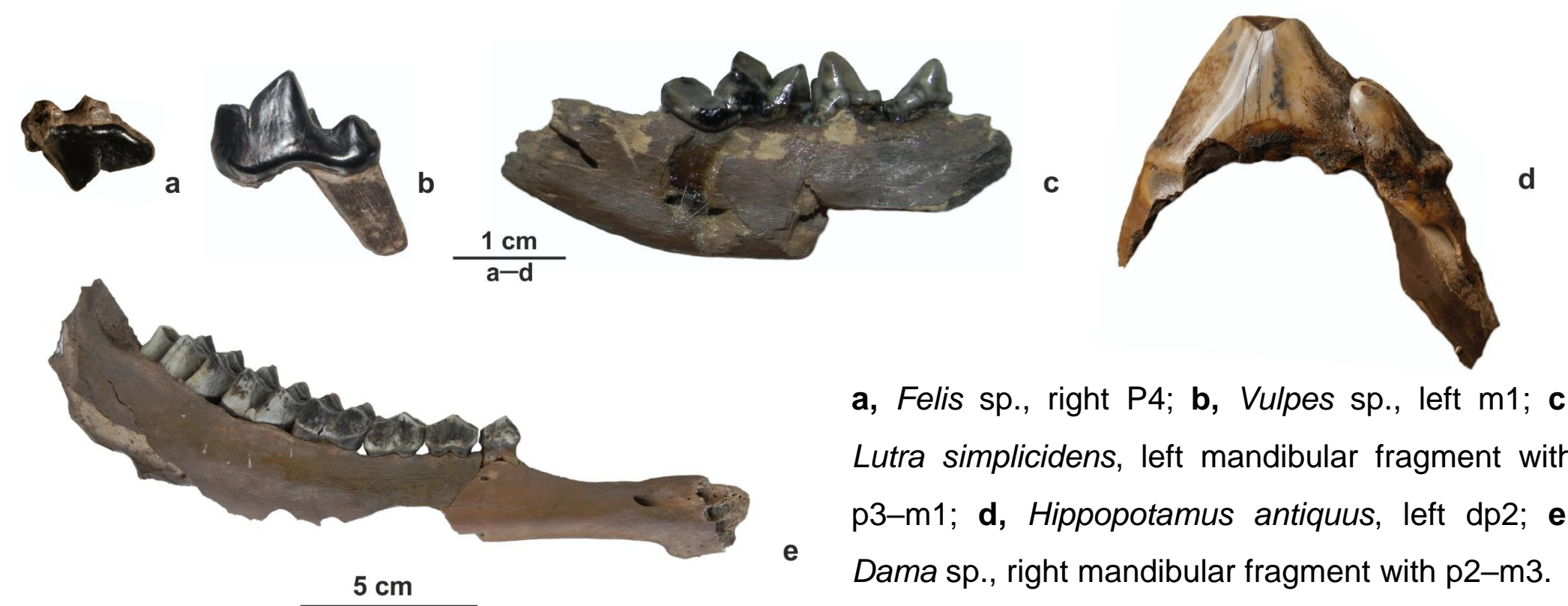
References:

- [1] Melentis, J.K., 1961. Die Dentition der pleistozänen Proboscider des Beckens von Megalopolis im Peloponnes (Griechenland). Ann. Geol. Pays Hell. 12, 153-262.
- [2] Panagopoulou, E., Tourloukis, V., Thompson, N., Athanassiou, A., Tsartsidou, G., Konidar, G.E., Giusti, D., Karkanis, P., Harvati, K., 2015. Marathousa 1: a new Middle Pleistocene archaeological site from Greece. Antiquity Project Gallery, 343.
- [3] Blackwell, B.A.B., Singh, I., GopalKrishna, K., Chen, K.K., Sakhrani, N., Tourloukis, V., Karkanis, P., Florentin, J.I.B., Panagopoulou, E., Harvati, K., Skinner, A., 2016. ESR dating the fossil-bearing layers at the Marathousa 1 site, Megalopolis, Greece, Paleoanthropological Society Meeting. PaleoAnthropology, Atlanta, pp. A4-A5.
- [4] van Vugt, N., 2000. Orbital forcing in late Neogene lacustrine basins from the Mediterranean. A magnetostratigraphic and cyclostratigraphic study. Utrecht University, Utrecht.

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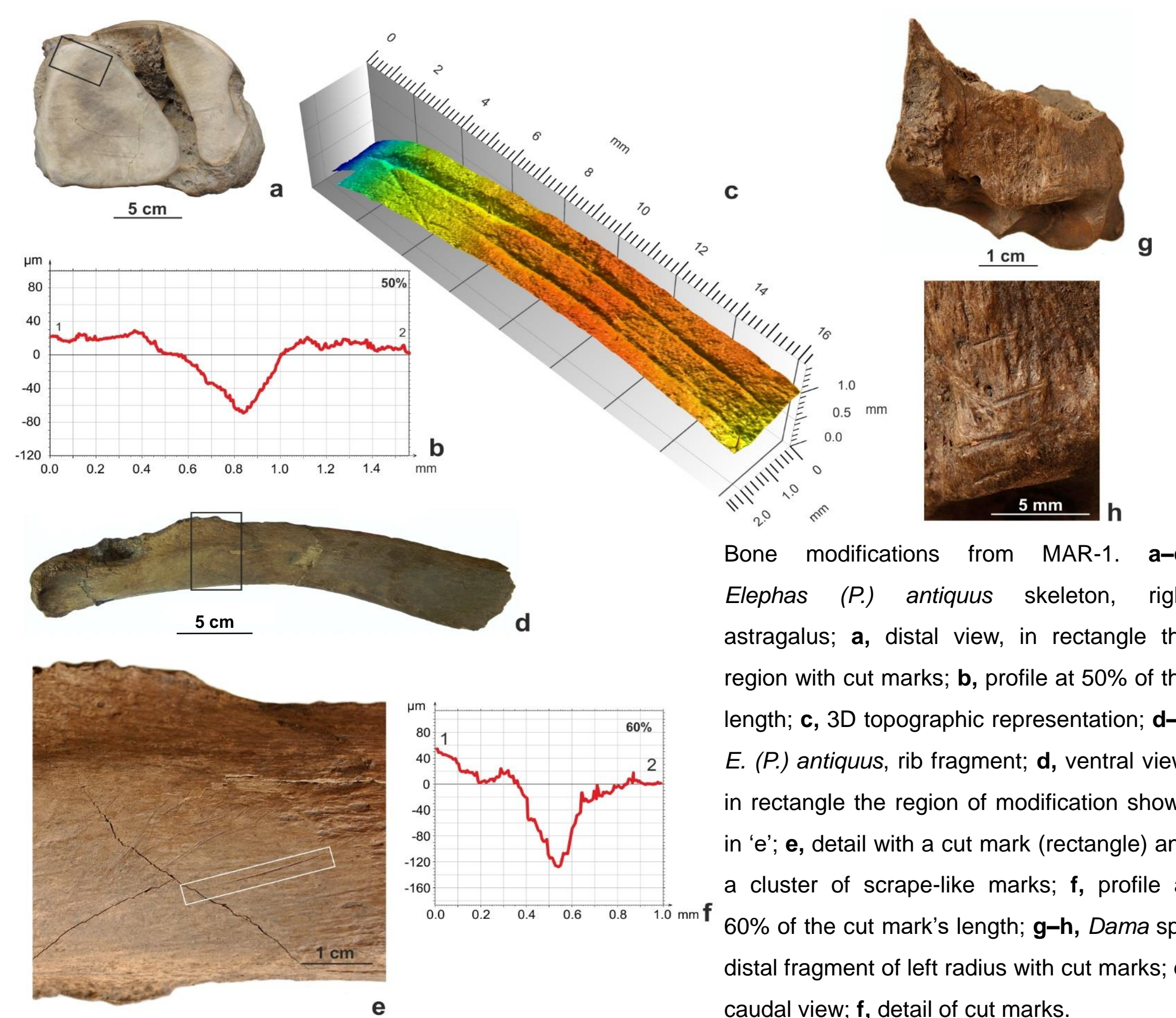
2. LARGE MAMMAL FAUNA

The material collected so far (2013–2016) includes the following taxa: *Castor fiber*, *Lutra simplicidens*, *Mustela* sp., *Felis* sp., *Vulpes* sp., *Canis* sp., *Elephas (P.) antiquus*, *Hippopotamus antiquus*, *Bison* sp., *Dama* sp. and *Cervus elaphus*. This faunal association is common in the Galerian mammal communities of Europe (ca. 0.9–0.4 Ma). Furthermore, it is consistent with a temperate climate, and is indicative of a landscape with substantial woodland components and more open areas, close to permanent and large freshwater bodies.



4. TAPHONOMY

The good state of preservation of the MAR-1 bones (with fresh or slightly weathered surfaces and no rounding) allows the identification of taphonomic modifications. Three-dimensional virtual reconstructions of marks with the use of a confocal microscope enabled the identification of cut marks and their micromorphological characteristics. Cut marks and percussion damage indicate hominin exploitation of the elephant carcass and other mammal bones by means of butchering activities, which is in accordance with the lithic assemblage and its spatial association with the bones. Carnivore gnawing is also evident on some specimens, suggesting a certain degree of carnivore competition with humans for early access to the animal carcasses.



Bone modifications from MAR-1. a–c, *Elephas (P.) antiquus* skeleton, right astragalus; a, distal view, in rectangle the region with cut marks; b, profile at 50% of the length; c, 3D topographic representation; d–f, *E. (P.) antiquus*, rib fragment; d, ventral view, in rectangle the region of modification shown in 'e'; e, detail with a cut mark (rectangle) and a cluster of scrape-like marks; f, profile at 60% of the cut mark's length; g–h, *Dama* sp., distal fragment of left radius with cut marks; e, caudal view; f, detail of cut marks.

5. CONCLUSIONS

MAR-1 is among the oldest elephant butchering sites in Europe and the only one known in Southeastern Europe. The recovery of additional faunal material will be essential for refining the biochronological, palaeoecological and taphonomic interpretation of the site, enhancing our understanding of the Lower Palaeolithic hominin food acquisition strategies and subsistence behavior, and about the *Homo-Proboscidea* interactions.