

## Middle Pleistocene fauna and lithic implements from Pagliare di Sassa (L'Aquila, Central Italy)

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**SUMMARY:** Faunal remains consisting of disarticulated skeletal elements showing little or no evidence of transport were found in a sandy alluvial fan outcrop at Pagliare di Sassa (L'Aquila, Central Italy). The fauna (Aves, an undetermined carnivore - possibly *Crocuta* - whose presence is attested to by a coprolite, ? *Elephas (Palaeoloxodon) antiquus*, *Stephanorhinus hundsheimensis*, *Hippopotamus* ex gr. *H. antiquus*, *Megaloceros savini*, *Megaceroides verticornis*, *Dama* sp (?*Dama clactoniana*), *Lepus* sp. and an Arvicolid rodent) imply a middle Galerian date. Two lithic implements, and a bone fragment, broken when fresh, with a complex fracture pattern and impact scars, provide evidence for a limited human presence on this site.

### 1. INTRODUCTION

In 1977 fragmented fossil remains of a large elephant were discovered in a sand quarry at Pagliare di Sassa (L'Aquila, Central Italy). Preliminary excavation tests carried out in 1998-1999 by the Soprintenza Archeologica dell'Abruzzo, with the collaboration of the Università degli Studi de L'Aquila and of the Museo di Paleontologia (Università degli Studi di Roma "La Sapienza"), led to the discovery of slightly fossiliferous horizons which are, nevertheless, of considerable taxonomic and taphonomic interest (Agostini *et al.* 1999).

More recently, systematic excavation has unearthed a large number of vertebrate fossil

remains, enabling a better chronological placing for this small fauna.

### 2. THE GEOLOGICAL SETTING

The fossil-bearing sequence takes the shape of an alluvial fan deposit composed of grey basal clays partially pedogenised at the top where they were cut into by a channel. The latter is filled with a sequence of sandy lenses with fine gravel intercalations that at times fit into each other and pass laterally to form regular plane-parallel beds. The fossil remains were discovered in two "horizons". The first is located at the clay/sand transition. The bones here have undergone limited transport by a low

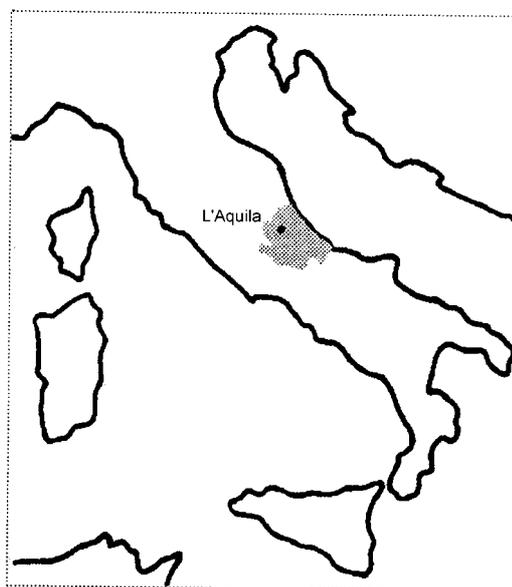


Fig.1 - Localisation of the site.

energy agent. There is evidence of localised reworking and re-deposition: the unsealed distal epiphysis of a juvenile rhino metapodium, for instance, was presumably detached and caught up in a whirlpool before being re-deposited in a sand bed overlaying that containing the diaphysis. The second horizon contained a smaller number of bones; the latter were recovered from the lenses and beds marking the transition to the upper parts of the lenses. From a purely morphostratigraphic viewpoint, the alluvial fan which is now cut by two streams distinct from the watercourse which had originally created it, is suspended over the alluvial plain of the river Laio, a right tributary of the river Aterno. It can be placed in the middle to lower part of the Middle Pleistocene. Paleomagnetic surveys have consistently registered normal magnetic polarity in the basal clays (Speranza, unpublished data).

### 3. FAUNA

The faunal remains from the first horizon consist of disarticulated skeletal elements showing limited or no evidence of transport. The best represented taxon from this horizon is a juvenile rhino, followed by an abundance of remains of a

large elephant, as well as a hippo and two cervids, though the latter two taxa are scantily documented. Specimens from the second horizon are even less abundant and show a more varied degree of preservation, ranging from abraded splinters to unaltered complete elements. There are at least two Aves, an undetermined carnivore, possibly *Crocuta*, whose presence is attested to by a coprolite, ? *Elephas (Palaeoloxodon) antiquus*, *Stephanorhinus hundsheimensis*, *Hippopotamus* ex gr. *H. antiquus*, *Megaloceros savini*, *Megaceroides verticornis*, *Dama* sp (?*Dama clactoniana*), *Lepus* sp. and an Arvicolid rodent. The best represented are the large cervids and the rhinoceros.

The elephants are documented by only very fragmentary remains (occipital condyles, a few tusk fragments, ribs and vertebral apophyses, a few parts of a scapula, a humerus and an ulna) probably belonging to a single, large individual. None of the specimens are diagnostic from a taxonomical viewpoint. Only the tusk fragments offer some clue in the absence of helicoidally arranged striae, which are instead typical of the mammothine lineage. The pattern of the Schreger lines cannot be detected with any certainty because of the diagenetic process. Nevertheless, the outer angles are more similar

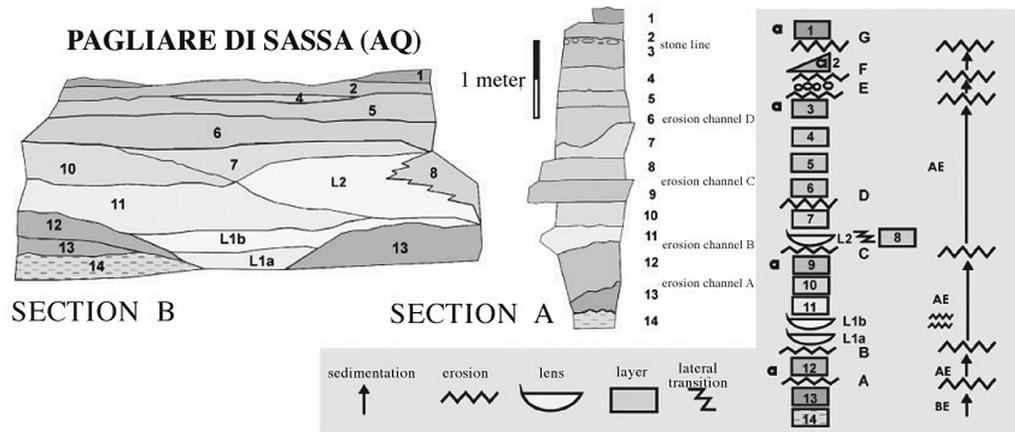


Fig.2 - Stratigraphic diagram.

to the modal values of *E. antiquus* than those of the *Mammuthus* representatives.

The rhino remains are not only more abundant, but also fairly indicative taxonomically, though belonging to a juvenile specimen. The overall morphological characters and the morphometry of the dentition, as well as of the stylopodial and autopodial bones are suggestive of *Stephanorhinus hundsheimensis* (Fortelius *et al.* 1993).

The hippo remains include both a fairly large adult, comparable to the Late Villafranchian

*H. antiquus* representatives from the Upper Valdarno basin, and a very juvenile individual, documented by a slightly worn, isolated D<sub>4</sub> and a tibia. Despite its large size, the adult hippo sample includes an almost complete and quite slender calcaneum. Given the ample morphological and dimensional range of these animals, the lack of truly diagnostic elements denies any sounder specific determination.

At least three cervid species are documented, i.e. *Megaceroides verticornis*, *Megaloceros savini* and *Dama* sp.



Fig.3 - *Stephanorhinus hundsheimensis*, left emimandible.

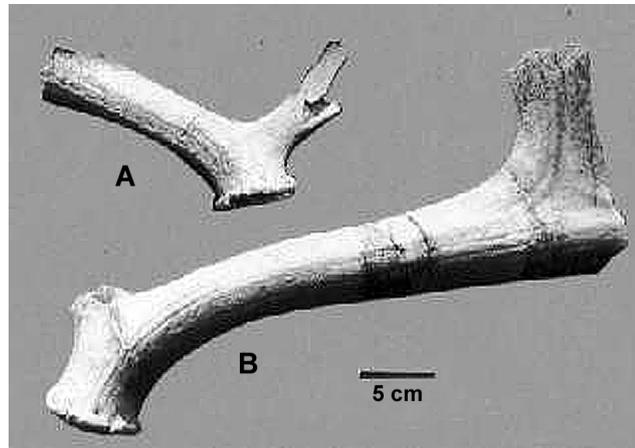


Fig.4 - A) *Megaloceros savini* left shed antler; B) *Megaceroides verticornis* right shed antler.

*M. verticornis* is represented by two antler fragments and an incomplete mandible. The morphological traits of the antler fragments, in particular the evidence of branching in the terminal part of the beam, permit this megacerine's attribution to the subspecies *M. verticornis dendroceros* Ambrosetti, 1967.

*M. savini* is also documented by two proximal fragments of shed antlers. This species is easily identified because of the peculiar morphology of the basal portion of the antler in which the markedly flattened first tine is inserted very close to the burr.

Amongst the postcranial skeletal remains, two metatarsal bones are worthy of more detailed description and some discussion. In fact, the two specimens are longer and more slender than those usually characteristic of *M. verticornis*. These remains cannot even be ascribed to *M. savini*, as the literature only reports the description of antlers and incomplete skulls, as well as of very fragmentary remains of the postcranial skeleton.

The presence of a large cervid with very slender limbs has recently been reported in several late Early Pleistocene to early Mid-Pleistocene sites in Europe. Kahlke (1997) ascribed many of the remains from Untermafeld (late Early Pleistocene, Jaramillo subchron) to the new species *Eucladoceros giulii*. Specimens from Atapuerca (level TD6, early Middle Pleistocene), Venta Micena (latest Early

Pleistocene) and Akhalkalaki (Kahlke 1997; Made van der 1999) have also been referred to the same taxon.

After preliminary analysis, the metatarsals from Sassa show length and morphological indexes (i.e. robustness index) totally comparable to those of *E. giulii*. Nonetheless, reference to the genus *Eucladoceros* of the remains from the European localities mentioned above should be supported by a more detailed comparative analysis. It cannot be ruled out that these remains, as well as the metatarsals from Sassa, actually belong to one of the "giant deer" species (*Megaceroides* o *Megaloceros*) which were already present at the late Early Pleistocene-early Middle Pleistocene.

The cervid remains from Sassa also include palmated antler fragments and a fragment of  $P_2$  which document the presence of a medium sized deer. The palmated antler fragments rule out the possibility that the cervid belongs to one of the Early Pleistocene *Dama*-like species known as *Pseudodama*, and are rather suggestive of *Dama*.

#### 4. LITHIC IMPLEMENTS

Limited but sound evidence of a human presence was also discovered. Two slightly damaged flint flakes were retrieved from two different horizons. They had probably been carried over a short distance by natural agents as

the edges are fractured but still fairly fresh and only slightly abraded. The two implements are not diagnostic, except for the characteristically ringed bulbar surface of the larger one, which has the characteristics of a two-platformed flaking technique (see Cancellieri *et al.* 2001). A bone fragment, broken when fresh, also displays a complex pattern of fracture and impact scars suggestive of human intervention.

#### 5. FINAL REMARKS

The deer assemblage from Sassa is altogether indicative of a fairly broad time spell which spans the lower and middle part of the Middle Pleistocene (Galerian Mammal Age sensu Gliozzi *et al.* 1997). However, as yet the Pagliare di Sassa fauna lacks the elements that would allow for its precise biochronological positioning within the early Middle Galerian faunal units of Italy. However, the co-occurrence of *Megaloceros savini* and *Megaceroides verticornis* in Italy has only been reported in the Ponte Galeria local fauna (Ponte Galeria FU, sensu Petronio & Sardella 1999) at c. 750 ka bp (Milli 1998), whereas *Dama clactoniana*, of the more recent Isernia FU (c.600 ka bp, Coltorti *et al.* 2000) is not recorded at Sassa.

From a paleoecological perspective it is worth noting that the presence of hippo in an inland and relatively highland area is indicative of a fairly warm climatic phase. The presence of woodland or open woodland browsers such as megacerini together with mixed feeders such as the rhino, or even grazers like the hippo - all open landscape dwellers - suggests a mixed environment with open grasslands and sparse arboreal cover characterised by the presence of streams and bodies of water.

The human presence at Pagliare di Sassa is consistent with the so-called "revised short chronology" for the earliest peopling of Europe (Roebroeks & Van Kolfschoten 1996). According to Roebroeks and Van Kolfschoten's interpretation of the archaeological record, the southern fringes of the continent, including Italy, would have first been intermittently colonized as early as 1Ma, even if continuous settlement was to initiate only around 600ka.

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