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Middle Pleistocene vertebrate fauna from Cretone (Sabina, Latium)[1]

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ABSTRACT – A fossil vertebrates assemblage has been discovered near the Cretone spa (Sabina, Latium). The fauna can be referred to the late Middle Pleistocene (Torre in Pietra F.U., Aurelian Mammal Age). Several taxa of small and large mammals and the avifauna testify temperate-cold climatic conditions and a woody environment with several open spaces.

RIASSUNTO – [Resti di vertebrati del Pleistocene medio di Cretone (Sabina, Lazio)] – Viene segnalata nei pressi delle Terme di Cretone (Sabina, Lazio) un'associazione di vertebrati fossili riconducibile al Pleistocene medio superiore (Unità Faunistica di Torre in Pietra, Età a Mammiferi Aureliano). I diversi taxa di micro e macromammiferi, oltre che l'avifauna, testimoniano la presenza di clima temperato-freddo e di un ambiente forestato con frequenti radure.

INTRODUCTION

The fossil vertebrate bones studied in this work come from a fluvio-lacustrine deposit located on the right side of the Tiber river, near the village and hot springs of Cretone, in Sabina (Latium). In particular the deposit outcrops on the northern side of the "Fosso della Fiora" (Fiora creek), west of the sulphureous spring of Cretone. The Fiora creek is along a fault that is oriented transversally to the Tiber (Girotti, pers. comm.).

As a result of tectonic activity, on the opposite side of the valley, Plio-Pleistocene marine sediments outcrop at the same altitude of the lowered continental sequence that includes the fossiliferous fluvio-lacustrine deposit (Girotti, pers. comm.).

The stratigraphical sequence of the deposit is from the top to the bottom:

1) travertine including "terre rosse", thickness: about 0.8 m;
2) calcareous silt with scarce argillaceous elements, yielding continental molluscs and ostracods, interbedded with levels containing carbonate pebbles and reddish sand pockets with volcanic elements and yielding the vertebrate fossils, thickness: about 1 m;
3) alternance of clays, silt and silty sands, of variable thickness: about 3 m;
4) fluvial conglomerates with scarcely classed heterometric clasts in a slightly cemented sandy matrix, yielding abundant volcanic elements, thickness: about 7m.

The faunal assemblage from Cretone includes species that are common in the Campagna Romana fossiliferous localities referable to the Aurelian Mammal Age (Gliozzi *et al.*, 1997). These vertebrate faunas, coming from the "Formazione tufaceo-diatomitica" which widely outcrops in Central Latium, have been referred to the "Rianino", a chronological interval located between the Nomentana and Ostiense erosional phases (Ambrosetti *et al.*, 1972). Malatesta (1978) later defined the "Formazione Aurelia" (type section Torre del Pagliaccetto, Torre in Pietra, Rome, Italy) as a transgressive cycle referable to the Rianin continental deposits. In the '80s the Aurelia Formation was related to the OIS 9 (Malatesta & Zarlenga, 1986, 1988) and dated between 370 and 270 ka (De Rita *et al.*, 1991). The mammal faunas of the Aurelia Formation have been chosen to define the Torre in Pietra F.U. (Caloi & Palombo, 1990), which includes the faunal assemblages referred to OIS 10, 9 and the beginning of OIS 8. This F.U. is characterized by the first occurrences of *Ursus spelaeus*, *Canis lupus* and *Megaloceros giganteus* (Gliozzi *et al.*, 1997). Moreover, the Aurelian Mammal Age is characterized, among small mammals, by the great diffusion of *Microtus* ex gr. *arvalis-agrestis* (Kotsakis *et al.*, in press) and the occurrence of advanced forms of *Arvicola cantianus* (in a very recent revision Maul *et al.*, 2000 suggest to use the name *Arvicola mosbachensis* for the Toringian forms and *Arvicola cantianus* for the specimens of the type locality Ingress Vale, Kent, England).

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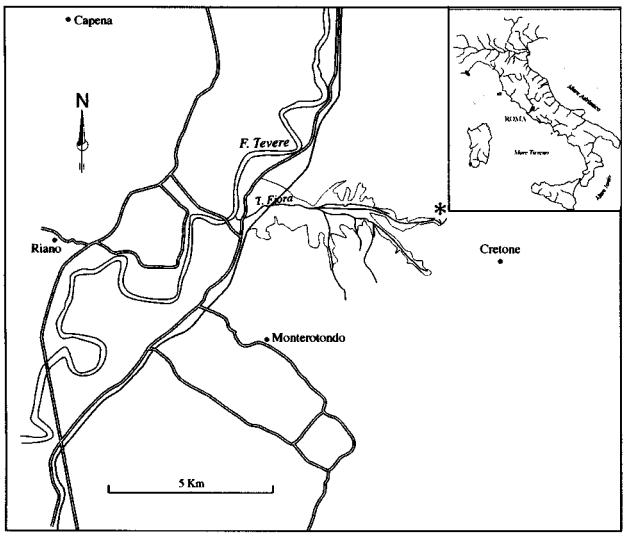


Text-fig. 1 - Location map of the fossiliferous site.

The following taxa have been recorded at Cretone:

AMPHIBIA: *Bufo bufo* (Linnaeus, 1758); REPTILIA: *Emys orbicularis* (Linnaeus, 1758), *Testudo* sp., *Podarcis* sp., *Coronella* sp.; AVES: *Anser* cf. *A. anser*, *Corvus monedula* (Linnaeus, 1758), *Pica pica* (Linnaeus, 1758), Passeriformes indet.;

MAMMALIA: *Apodemus flavicollis* (Melchior, 1834), *Microtus* ex gr. *M. arvalis* (Pallas, 1778) – *M. agrestis* (Linnaeus, 1761), *Arvicola mosbachensis* (Schmidtgen, 1911), *Lepus* cf. *L. corsicanus* De Winton, 1898, *Mustela putorius* Linnaeus, 1758, *Felis silvestris* Schreber, 1775, *Canis* sp., *Ursus* cf. *U. spelaeus* Rosenmüller, 1794, *Elephas antiquus* Falconer and Cautley, 1847, *Stephanorhinus hemitoechus* (Falconer, 1868), *Dama* cf. *D. clactoniana* (Falconer, 1868), *Cervus elaphus* ssp., *Bison priscus* (Bojanus, 1827).

DISCUSSION

Twenty two vertebrate taxa have been recorded in the Cretone faunal assemblage. *Stephanorhinus hemitoechus* and *Cervus elaphus* are the best-documented species, with several teeth and limb bones. Among the mammals, *Arvicola cantianus* is the most significant taxon for the biochronology of the fauna. This rodent is represented by three specimens (two complete M_1) with such morphological features and biometrical values of the enamel thickness of the concave and convex sides of the triangles (Koenigswald & Heinrich, 1999) that we can refer this specimen to forms that are more advanced than those present in Italy in the Early Toringian (Isernia F.U.) (Kotsakis *et al.*, in press).

Among the large mammals, *Ursus* cf. *U. spelaeus* and *Canis* sp. of a size referable to the modern wolf are present. Unfortunately these mammals, important elements of the Aurelian faunas, are very poorly represented (a single I_3 for the cave bear, a fragmentary IV metatarsal for the wolf); their biochronological value must therefore be considered with caution. Also *Cervus elaphus* cannot be referred to a defined subspecies, but the fossils from Cretone show apomorphic features in the jugal teeth that are typical of post Galerian forms. Only a few antler, tooth and limb bone fragments represent *Dama* cf. *D. clactoniana*. This species was distributed from Middle Galerian to Middle Aurelian and later replaced by the first modern fallow deer *Dama dama tiberina* (Di Stefano & Petronio, 1997). The Aurelian faunas are also characterized by the occurrence of *Bison priscus*.

Among the birds, two species of Corvidae (*Corvus monedula* and *Pica pica*) testify the occurrence of the taxa in the Sabina area in the late Middle Pleistocene. The faunal assemblage's composition enables us to outline the environmental conditions. The Aurelian faunal renewal is generally related to the OIS 9 (Gliozzi *et al.*, 1997). In such context the extinction of *Ursus deningeri*, stenonian equids and the megacerine deer of the *Megaceroides verticornis* group and the diffusion of advanced forms of herbivores and carnivores can be recorded.

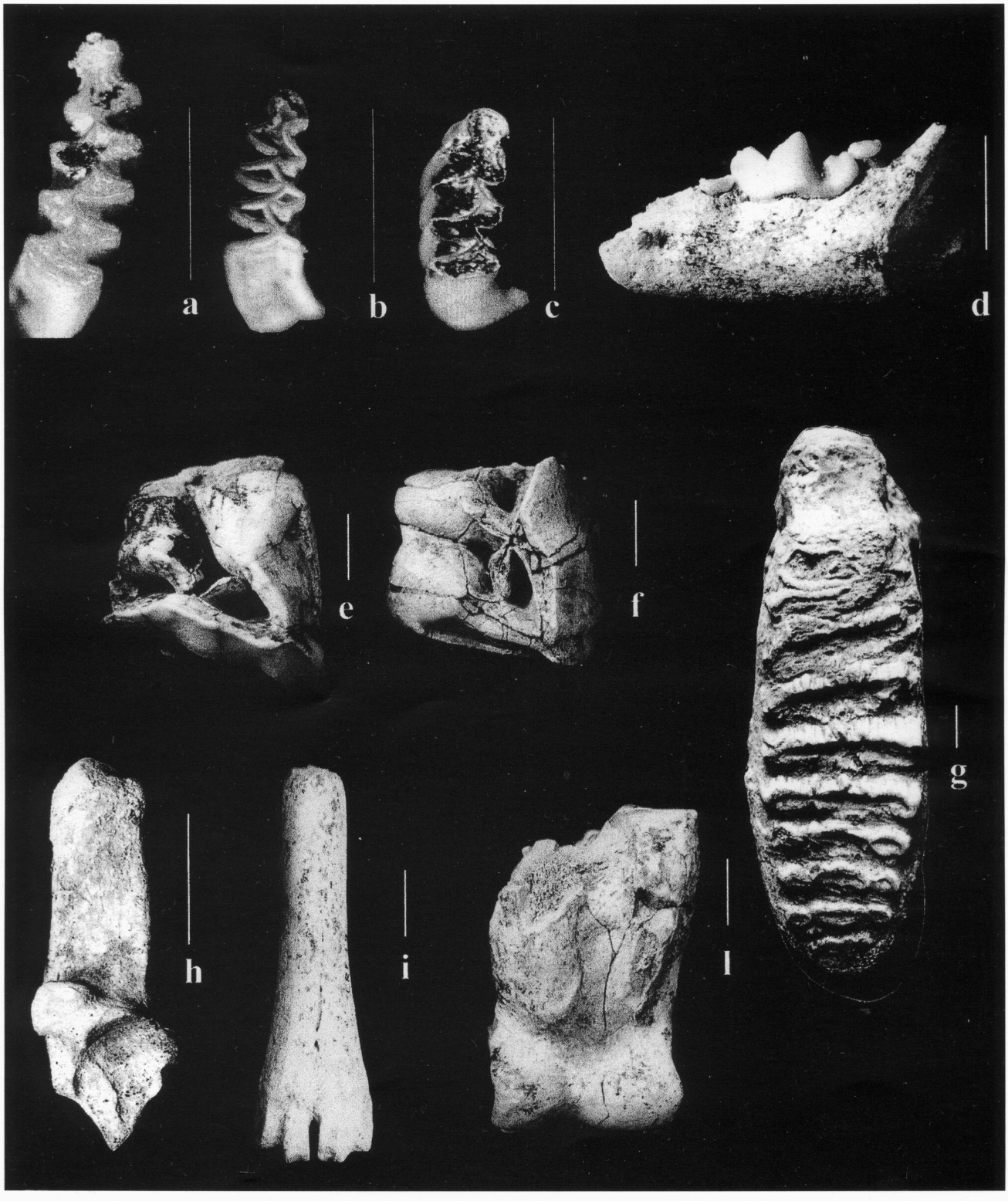
In the late Middle Pleistocene the area was characterized by open spaces with several wet areas with low energy running waters. Such considerations can be supported by the occurrence of *Bufo bufo*, *Emys orbicularis*, *Anser* cf. *A. anser* and *Arvicola cantianus*.

The presence of open spaces also in the surroundings is suggested by *Lepus corsicanus*, microtine rodents, rhinos and *Bison priscus*, even if *Apodemus flavicollis*, cervids and wild cats and the birds *Corvus monedula* and *Pica pica* testify a more varied landscape, with woods and rocks.

CONCLUSIONS

The occurrence at Cretone of an advanced form of *Arvicola cantianus*, the cave bear and the modern wolf enable us to refer the faunal assemblage to the early Aurelian (Torre in Pietra F.U.). In Northern Latium the best-known early Aurelian fauna is from the Riano Flaminio basin.

A rich vertebrate fauna has been collected from the tufaceous-diatomitic deposits of Riano since the end of the '50s. Among the taxa, we can point out the recording of some almost complete skeletons of *Elephas antiquus*, *Cervus elaphus rianensis* (three male specimens) and *Dama clactoniana* (Leonardi & Petronio, 1974, 1976; Petronio, 1980). The paleobotanical analysis of the tufaceous-diatomitic sequence at Riano (Follieri, 1962a, b) suggests cold-



Text-fig. 2 - Bone remains of some of the mammal taxa found in the late Middle Pleistocene Cretone deposit (Rome, Italy): a) molar of *Microtus* ex gr. *arvalis-agrestis*; b,c) *Arvicola cantianus* molars; d) *Mustela putorius* mandible; e, f) *Stephanorhinus hemitoechus* molars; g) *Elephas antiquus* molar; h) *Dama* cf. *clactoniana* heel; i) *Cervus elaphus* ssp.metacarpus; l) *Bison priscus* first phalanx. For a, b, c: the scale bar is equivalent to 2 mm; for d, e, f, g, h, i, l: the scale bar is equivalent to 2 cm.

temperate climatic conditions (occurrence of the diatom *Stephanodiscus astrea minutulus*), followed by a warmer stage related to the diffusion of the "colchic" forest and, finally, by a younger cold-temperate episode.
The fossil record from Cretone enables us to outline only general paleoenvironmental considerations and the hypothetical correlation with one of the two cold-temperate episodes recorded at Riano.

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