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**TABLE OF THE STRATIGRAPHIC DISTRIBUTION OF TERRESTRIAL
MAMMALIAN FAUNAS IN ITALY
FROM THE PLIOCENE TO THE EARLY MIDDLE PLEISTOCENE**

ABSTRACT: AZZAROLI A., DE GIULI C., FICCARELLI G. & TORRE D., *Table of the stratigraphic distribution of terrestrial mammalian faunas in Italy from the Pliocene to the early middle Pleistocene* (IT ISSN 0084-8948, 1982).

The present paper shows the stratigraphic distribution of the Pliocene and lower and middle Pleistocene mammals of Italy. The faunal units are those usually accepted for the Mediterranean region, with the exception of the Galerian, as its knowledge is not yet sufficient for an acceptable formalization.

RIASSUNTO: AZZAROLI A., DE GIULI C., FICCARELLI G. & TORRE D., *Tabella della distribuzione stratigrafica delle faune a mammiferi continentali in Italia dal Pliocene alla parte inferiore del Pleistocene medio* (IT ISSN 0084-8948, 1982).

In questo lavoro viene presentata la distribuzione stratigrafica dei mammiferi del Pliocene e del Pleistocene inferiore e medio dell'Italia. Le unità faunistiche sono quelle ormai accettate comunemente per l'area mediterranea ad eccezione di quelle del Galeriano, le cui conoscenze necessitano di un maggiore approfondimento prima di una accettabile formalizzazione.

TERMINI-CHIAVE: biostratigrafia; Plio-Pleistocene continentale; Mammalia; Italia.

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LIST OF MAMMALS AND THEIR DISTRIBUTION

Ruscinian and Villafranchian faunal units: M = Montpellier; R = Roussillon; T = Triversa; \hat{M} = Montopoli; O = Olivola; \hat{T} = Tasso; F = Farneta; V/G = Villafranchian/Galerian units; U_i = Galerian, lower part; U_s = Galerian, upper part; * Faunas of the Saint Vallier unit are not represented in Italy.

	Ruscinian		Villafranchian						V/G	Galerian	
	M	R	T	\hat{M}	*	O	\hat{T}	F		U _i	U _s
<i>Mammut borsoni</i> (HAYS)			×								
<i>Anancus arvernensis</i> (CROIZET & JOBERT)			×	×		×					
<i>Archidiskodon gromovi</i> ALEXEEVA & GARUTT				×							
<i>Archidiskodon meridionalis meridionalis</i> (NESTI)						×	×				
<i>Archidiskodon meridionalis vestinus</i> AZZAROLI								×			
<i>Mammuthus armeniacus</i> (FALCONER)										×	
<i>Elephas antiquus</i> FALCONER										×	×
<i>Felsinotherium gervaisi</i> CAPELLINI		×									
<i>Tapirus arvernensis</i> CROIZET & JOBERT	×		×								
<i>Dicerorhinus jeanvireti</i> GUÉRIN		×	×	×							
<i>Dicerorhinus etruscus</i> (FALCONER)						×	×	×			
<i>Dicerorhinus hemitoechus</i> (FALCONER)										×	×
<i>Hipparion</i> sp.	×										
<i>Equus</i> cf. <i>livenzovens</i> BAJGUSHEVA				×							
<i>Equus stenonis</i> COCCHI						×	×	×			
<i>Equus stehlini</i> AZZAROLI							×	×			
<i>Equus süssenbornensis</i> WÜST										×	
<i>Equus altidens</i> REICHENAU										×	
<i>Equus marxi</i> REICHENAU										×	
<i>Equus caballus</i> L.										?	?
<i>Hexaprotodon</i> sp.	×										
<i>Hippopotamus antiquus</i> DESMAREST							×	×	×	×	
<i>Sus minor</i> DÉPÉRET	×	×	×								
<i>Sus strozzii</i> MAJOR						×	×				
<i>Sus scrofa</i> L.											×
<i>Cervus elsanus</i> PANTANELLI	×										
<i>Cervus pardinensis</i> CROIZET & JOBERT			×	×							
<i>Croizetoceros ramosus</i> (Croizet & Jobert)				×							
<i>Dama nestii</i> (MAJOR)						×	×	×			
<i>Eucladoceros</i> (?) sp.				×							
<i>Eucladoceros tetraceros</i> (DAWKINS)									×		
<i>Eucladoceros dicranios</i> (NESTI)						×	×				
<i>Cervus elaphus acoronatus</i> BENINDE										×	×
<i>Megaceros verticornis</i> (NEWTON)										×	×
<i>Megaceros solilhacus</i> (ROBERT)											×
<i>Megaceros savini</i> (DAWKINS)										×	
<i>Libralces gallicus</i> AZZAROLI								×			
<i>Libralces latifrons</i> (JOHNSON)										?	?
<i>Capreolus capreolus</i> L.											×
<i>Gazella borbonica</i> DÉPÉRET				×							
<i>Gallogoral meneghinii</i> (RÜTIMEYER)						×					
<i>Gazellospira torticornis</i> PILGRIM						×					
<i>Alephis lyrix</i> GROMOLARD		×									
<i>Leptobos stenometopon</i> (SISMONDA)			×	×							
<i>Leptobos etruscus</i> (FALCONER)						×	×	×			
<i>Leptobos vallisarni</i> MERLA							×	×			
<i>Leptobos</i> sp.								×			
<i>Bison schoetensacki</i> FLEROW										×	
<i>Bos primigenius</i> BOJ.										×	×
<i>Macaca</i> sp.			×								
<i>Macaca florentina</i> (COCCHI)							×	×			

	Ruscinian		Villafranchian						V/G	Galerian	
	M	R	T	Ĥ	*	O	Ĥ	F		U _i	U _s
<i>Semnopithecus monspessulanus</i> GERVAIS			×								
<i>Prolagus</i> sp.		×									
<i>Prolagus savagei</i> BERZI			×								
<i>Lepus valdarnensis</i> BOSCO							×				
<i>Lepus</i> sp.											×
<i>Hystrix etrusca</i> BOSCO						×					
<i>Castor</i> sp.			×								
<i>Castor plicidens</i> BOSCO							×	×			
<i>Castor</i> cf. <i>fiber</i> L.											×
<i>Mimomys stebliini</i> KORMOS		×									
<i>Mimomys polonicus</i> KOWALSKI			×								
<i>Mimomys gracilis</i> KRETZOI			×								
<i>Mimomys reidi</i> HINTON									×		
<i>Mimomys pliocaenicus</i> (MAJOR)							×				
<i>Mimomys blanci</i> VAN DER MEULEN									×		
<i>Mimomys savini</i> HINTON										×	
<i>Allophaiomys ruffoi</i> PASA								×	×		
<i>Allophaiomys</i> sp.									×		
<i>Pliomys episcopalis</i> MÉHELY									×		
<i>Pitymys hintoni</i> KRETZOI										×	
<i>Pitymys</i> sp.											×
<i>Microtus dentatus</i> MILLER										×	
<i>Arvicola cantiana</i> (MILLER)											×
<i>Glirulus pusillus</i> HELLER			×								
<i>Apodemus</i> cf. <i>elsomyoides</i> SCHAUB			×								
<i>Allocricetus bursae</i> SCHAUB										×	
<i>Beremendia fissidens</i> (PETÉNYI)									×		
<i>Sorex runtonensis</i> HINTON										×	
<i>Acinonyx pardinensis</i> (CROIZET & JOBERT)			×	×		×	×			×	
<i>Panthera toscana</i> (SCHAUB)						×	×			×	
<i>Felis lunensis</i> MARTELLI						×					
<i>Lynx issiodorensis</i> (CROIZET & JOBERT)			×			×	×				
<i>Homotherium crenatidens</i> (FABRINI)			×			×	×	×	×	×	
<i>Meganthereon cultridens</i> (CUVIER)						×	×				
<i>Pachycrocuta perrieri</i> (CROIZET & JOBERT)				×		×	×				
<i>Pachycrocuta brevirostris</i> (AYMARD)						×	×				×
<i>Crocota crocuta</i> (ERXLEBEN)									×		
<i>Euryboas lunensis</i> (DEL CAMPANA)			×			×					
<i>Ursus minimus</i> DEVÈZE & BOUILLET			×								
<i>Ursus etruscus</i> CUVIER						×	×	×			
<i>Ursus deningeri</i> REICHENAU									×	×	
<i>Ursus arctos</i> L.											×
<i>Canis etruscus</i> MAJOR						×	×				
<i>Canis arnensis</i> DEL CAMPANA							×				
<i>Canis falconeri</i> MAJOR							×				
<i>Canis lupus mosbachensis</i> SOERGEL										×	
<i>Cuon</i> cf. <i>alpinus</i> PALLAS											×
<i>Nyctereutes megamastoides</i> (POMEL)				×							
<i>Enhydriactis ardea</i> (BRAVARD)						×					
<i>Pannonictis nestii</i> (MARTELLI)							×				
<i>Martes</i> sp.							×				
<i>Blarinoides</i> sp.		×									
<i>Viverra</i> cf. <i>pepratxi</i> DÉPÉRET			×								

REMARKS

RUSCINIAN.

Ruscinian faunas are poorly represented in Italy.

The fauna of the lignite mine called "Il Casino", in the Elsa Valley North of Siena, is fairly rich but very fragmentary and still needs a thorough revision. The attribution to the early Ruscinian is based on the tapir, much smaller than the Vallesian *Tapirus priscus* (there is no record of tapir from the Turolian) and on the suid, the dentition of which is undistinguishable from that of the Ruscinian and early Villafranchian *Sus minor*; the occurrence of *Hexaprotodon* (otherwise known in Italy from the Turolian fauna of Gravitelli, Sicily) and of *Hipparion* impart on the Casino fauna a rather archaic mark (MAJOR, 1877; PANTANELLI, 1879; DEL CAMPANA, 1918).

The fauna of Val di Pugna, in the outskirts of Siena, is referred to the late Ruscinian on the ground of the occurrence of *Alephis lyrix* (also called *Parabos boodon*) and of *Felsinotherium gervaisi*, a more advanced species than the early Ruscinian *Felsinotherium serresi* from Montpellier (CAPELLINI, 1872; CUSCANI POLITI, 1979).

The faunule of Arcille in the Maremma district belongs to the Pliocene but its exact chronologic position is uncertain (HÜRZELER & ENGESSER, 1976).

VILLAFRANCHIAN.

The succession of Villafranchian faunas was illustrated in detail by one of us (AZZAROLI, 1977). Recent findings (BORSELLI, DE GIULI, FICCARELLI & MAZZINI, 1980) led to minor additions to the faunal list: *Acinonyx pardinensis* and *Martes* sp. in the Tasso unit, *Equus stenorhis* and *Castor plicidens* in the Farneta unit (unpublished).

Allophaiomys ruffoi and *Mimomys reidi* were not found in association with large mammals; they come from bone breccias near Verona and their attribution to the Farneta unit is tentative (PASA, 1947; BARTOLOMEI, 1980).

VILLAFRANCHIAN-GALERIAN TRANSITION.

The associations of Domegliara (Selva Vecchia), Viatelle (PASA, 1947; BARTOLOMEI, 1980) and Monte Peglia (VAN DER MEULEN, 1973) come from fissure fillings and should be taken with reserve as far as their chronologic homogeneity is concerned. Faunas appear mixed, with elements surviving from the late Villafranchian (a large *Leptobos*, *Eucladoceros tetraceros*, *Homotherium crenatidens*) and decidedly post-Villafranchian elements (*Crocuta crocuta*, *Ursus deningeri*, *Cervus* cf. *elaphus*) (partly unpublished).

Because of these peculiarities we tentatively consider these faunas as transitional between Villafranchian and Galerian, although the possibility of an admixture of faunas of different ages cannot be ruled out.

GALERIAN.

The beginning of the Galerian is marked by the first appearance of *Microtus*, *Pitymys*, *Megaceros*, *Libralces*

latifrons, *Bos*, *Bison*, *Equus süssenbornensis*, etc. The subdivision of the Galerian into an older and a younger horizon has been based mainly on evidence derived from radiometric and palaeomagnetic data. Faunas are still too poorly known to afford a reliable basis of partition. It may be pointed out however that the younger horizon lacks archaic carnivores of Villafranchian affinity: *Panthera toscana*, *Homotherium*, *Pachycrocuta brevirostris*, while it is marked by the first appearance of *Arvicola*. Galerian faunas straddle the Matuyama-Brunhes boundary (AMBROSETTI, 1967; BERZI, 1972; AZZAROLI, 1977b; AZZAROLI, 1979; AMBROSETTI & alii, 1979; BIDDITTO & alii, 1979).

LITERATURE CITED

- AMBROSETTI P. (1967) - *Cromerian fauna of the Rome area*. Quaternaria, 9, 267-283.
- AMBROSETTI P., BARTOLOMEI G., DE GIULI C., FICCARELLI G. & TORRE D. (1979) - *La breccia ossifera di Slivia (Aurisina, Sistiiana) nel Carso di Trieste*. Boll. Soc. Pal. It., 18, 207-220.
- AZZAROLI A. (1977a) - *The Villafranchian stage in Italy and the Plio-Pleistocene boundary*. Giorn. Geol., ser. 2; 41, 61-79.
- AZZAROLI A. (1977b) - *A skull of the giant deer Megaceros verticornis from Eastern Tuscany*. Rend. Ac. Naz. Lincei, ser. 8; 41, 485-487.
- AZZAROLI A. (1979) - *On the occurrence of the cervid genus Libralces in the Pleistocene of Italy*. Pal. It., 71, 48-54.
- AZZAROLI A. & GUAZZONE G. (1979) - *Terrestrial mammals and land connections in the Mediterranean before and during the Messinian*. Palaeogeography, Palaeoclimatology, Palaeoecology, 29, 155-167.
- BARTOLOMEI G. (1980) - *Micromammiferi del Plio-Pleistocene*. I Vertebrati fossili italiani, 249-258, Tip. «La Grafica», Verona.
- BERZI A. (1972) - *An early middle Pleistocene fauna at Monte Oliveto (S. Gimignano, Siena, Italy)*. Pal. It., 68, 28-33.
- BIDDITTO I., CASSOLI P. F., RADICATI DI BROZZOLO F., SEGRE A. G., SEGRE NALDINI E. & VILLA I. (1979) - *Anagni, a K-Ar dated lower and middle Pleistocene site, Central Italy: preliminary report*. Quaternaria, 21, 53-71.
- BORSELLI V., DE GIULI C., FICCARELLI G. & MAZZINI M. (1980) - *Casa Frata: una località fossilifera del Villafranchiano superiore presso Terranuova Bracciolini (Arezzo) nel Valdarno superiore*. Boll. Soc. Pal. It., 19, 281-310.
- CAPELLINI G. (1872) - *Sul felsinoterio sirenoide balicoriforme dei littorali pliocenici dell'antico bacino del Mediterraneo e del Mar Nero*. Mem. Ac. Sc. Bologna, ser. 3; 1, 48 pp.
- CUSCANI POLITI P. (1979) - *Cranio di Parabos proveniente dalle formazioni plioceniche di Val di Pugna nei pressi di Siena (Toscana)*. Atti Ac. Fisiocritici Siena, ser. 14; 11, 16 pp.
- DEL CAMPANA D. (1918) - *Considerazioni sulle antilopi terziarie della Toscana*. Pal. It., 24, 147-233.
- HÜRZELER J. & ENGESSER B. (1976) - *Les faunes de mammifères néogènes du bassin de Baccinello (Grosseto, Italie)*. C.R. Acad. Sc. Paris, ser. D, 283, 333-336.
- MAJOR C. J. F. (1877) - *Considerazioni sulla fauna dei Mammiferi pliocenici e postpliocenici della Toscana*. Mem. Soc. Tosc. Sc. Nat., 1, 7-40, 223-245.
- PANTANELLI D. (1878-79) - *Gli strati miocenici del Casino (Siena) e considerazioni sul Miocene superiore*. Mem. R. Ac. Lincei, ser. 3; 3, 309-325.
- PASA A. (1947) - *I mammiferi di alcune antiche brecce veronesi*. Mem. Mus. Civico St. Nat. Verona, 1, 1-111.
- VAN DER MEULEN A. J. (1973) - *Middle Pleistocene smaller mammals from the Monte Peglia (Orvieto, Italy) with special reference to the phylogeny of Microtus (Arvicolidae, Rodentia)*. Quaternaria, 17, 1-144.