



The “*Mammuthus-Coelodonta* Faunal Complex”: An overview on Italian fossil record during the Last Glacial

Beniamino MECOZZI & Raffaele SARDELLA

Dipartimento di Scienze della Terra, Sapienza Università di Roma, P.le Aldo Moro, 5, 00185, Roma, Italia

The “*Mammuthus-Coelodonta* Faunal Complex”

During the last part of Pleistocene, a global climatic cooling trend, culminating in the last glacial maximum (LGM), produced drastic environmental changes, with profound effects on the origin of species, the development of their ecology and especially on the dispersal of faunal assemblages.

Several scientists suggested some mammals as indicators for northern hemispheric cold climatic conditions. In particular, for the Palearctic region two species, the woolly mammoth (*Mammuthus primigenius*) and the woolly rhinoceros (*Coelodonta antiquitatis*) have been used to indicate the Eurasian cold adapted mammal assemblages of Late Pleistocene, known as “*Mammuthus-Coelodonta* Fauna Complex”. The cold adapted faunal assemblage originated in Central Asian, from steppe or Artic tundra, as a result of intertaing tectonic, geographical, climatic, ecological and phylogenetic processes.

During the Last glacial, this mammal association was widely widespread in Palearctic region (Fig.1).

This researcher aims to present a new framework about the occurrence and diffusion of “*Mammuthus-Coelodonta* Faunal Complex” in Italian Peninsula.

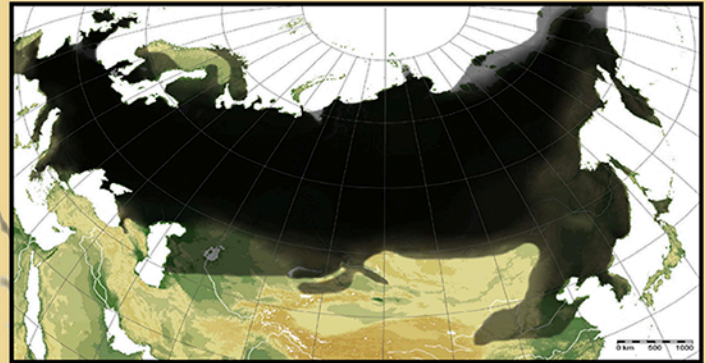


Fig.1 - Map of the maximum diffusion of “*Mammuthus-Coelodonta* Faunal Complex” during the Last Glacial in the Palearctic (Modified from Kahlke,2014).

	Riparo Fumane	Arene Candide	Grotta San Bernardino	Grotta del Broion	Riparo Tagliente	Settepolesini	Buca della Iena	Canale Mussolini	Cardamone	Ingarano
<i>Coelodonta antiquitatis</i>	X		X			X	?		X	X
<i>Mammuthus primigenius</i>		X			X	X	X	X	X	?
<i>Alces alces</i>		X	X	X	X	X				
<i>Bison priscus</i>	?	?	X	?		X				
<i>Megaloceros giganteus</i>	X	X	X			X	X			
<i>Marmota marmota</i>	X	X	X	X	X		X			
<i>Crocota crocata</i>	X	X					X	X	X	X
<i>Gulo gulo</i>	X						X			
<i>Panthera pardus</i>	X	X	X				X			X
<i>Panthera leo</i>	X			X						X
<i>Equus ferus</i>						X		X		
<i>Vulpes lagopus</i>	X		?	?						

Tab.1 - “*Mammuthus-Coelodonta* Faunal Complex” from Italian Peninsula sites.

Faunal assemblage from Italian Peninsula site

Other the woolly rhinoceros and woolly mammoth, the mammals association included some genera, such as *Saiga*, *Bison*, *Alces* and *Megaloceros*. Occasionally, also *Ovibos*, *Rangifer* and *Alopex* were reported. In addition, in Eurasian fossil record some genera were found into “*Mammuthus-Coelodonta* Faunal Complex” adapted to colder climatic conditions, such as *Crocota*, *Gulo*, *Panthera* and *Equus*.

This faunal assemblage was reported from some Italian Peninsula sites (Tab.1), even if it is slightly and incompletely represented and only in the north isolated components of it were found. In fact, in the Italian Peninsula fossil record *Saiga* and *Ovibos* genera have not been reported. *Rangifer tarandus* was recovered only from Northern Italy (Liguria and Friuli-Venezia-Giulia). *Alces alces* was largely represented from Northern-Eastern Italy, especially Friuli-Venezia-Giulia and Veneto. The woolly rhinoceros is poorly documented in Tyrrhenian side of the Peninsula, where the only verified occurrence is that from Circeo (Latina).

Italian Peninsula during the Last Glacial

The peculiar geographical position and the morphology of the Italian peninsula, and the presence of natural physical barriers, affected the distributions of vertebrates and local speciations. Especially, the Alpine chain was considered as a barrier to the dispersal of terrestrial mammals. During the Last Glacial, the sea level fall caused the emersion of most part of the Adriatic platform, giving rise to a wide-open plain which linked the isolated Italian Peninsula to the Balkan bioprovince (Fig.2). This landbridge made easier the dispersal route of “*Mammuthus-Coelodonta* Faunal Complex” during the Last Glacial in Italian Peninsula.

The presence and diffusion of the typical elements of “*Mammuthus-Coelodonta* Faunal Complex” enables to point out the paleoenvironmental and paleoecological reconstruction of the Italian Peninsula during the Last Glacial and provides key biochronological indications. The occurrence of “*Mammuthus-Coelodonta* Faunal Complex” in Italian fossil record, especially in central and southern part suggests that steppe and/or tundra biome were widely diffused during the Last Glacial (Fig.3). The cold adapted terrestrial fauna inhabited open habitats, that made with the forests a landscapes mosaic.



Fig.2 - Litho-Palaeoenvironmental map of Italy during Last Glacial Maximum (modified from Vai & Cantelli,2004).

Conclusion

The Italian Last Glacial vertebrate assemblages are characterized by the occurrence of the cold-adapted “*Mammuthus-Coelodonta* Faunal Complex”, with the exception of *Saiga* and *Ovibos*.

In addition, *Rangifer tarandus* and *Alces alces* were present only in the northern Italy. The “*Mammuthus-Coelodonta* Faunal Complex” was widespread throughout the Peninsula.

This mammal assemblage was reported only from plain land, suggesting that they probably inhabited vast cold open landscapes characterized by steppe and/or tundra biome.



Fig.3 - Map of “*Mammuthus-Coelodonta* Faunal Complex” Italian Peninsula sites; 1 Riparo Fumane; 2 Arene Candide; 3 Grotta San Bernardino, Grotta del Broion; 4, Riparo Tagliente; 5 Settepolesini; 6 Buca della Iena; 7 Canale Mussolini; 8 Cardamone; 9 Ingarano.



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