



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

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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 wolly mammoth (*Mammuthus primigenius*) and the wolly rhinoceros (*Coelodonta antiquitatis*) have been used to indicate the Eurasian cold adapted mammal assemblages of Late Pleistocene, known as "Mammuthus-Coelodonta Faunal Complex". The cold adapted faunal assemblage originated in Central Asian, from steppe or Arctic tundra, as a result of interacting 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.

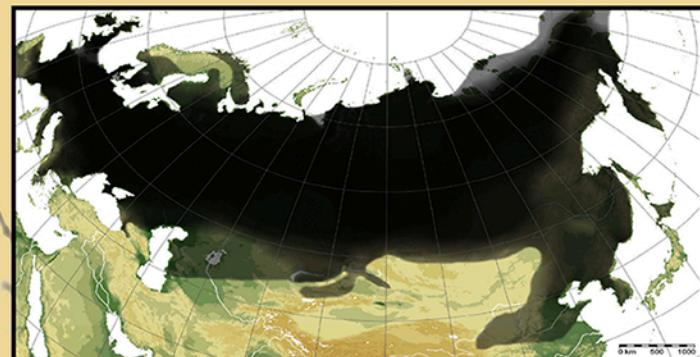


Fig.1 - Map of the maximum diffusion of "Mammuthus-Coelodonta Faunal Complex" during the Last Glacial in the Palearctic (Modified from Kahlike, 2014).

Faunal assemblage from Italian Peninsula site

Other the wolly rhinoceros and wolly 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 *Crocuta*, *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 wolly 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.

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; 4 Grotta del Broion; 5 Riparo Tagliente; 6 Settepolesini; 7 Buca della Iena; 8 Canale Mussolini; 9 Cardamone; 9 Ingarno.

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