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## **ABSTRACT BOOK**

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## The Proboscidea of the Early Villafranchian site of Milia (Grevena, Macedonia, Greece)

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Two different species of Early Villafranchian proboscideans were contemporaneous in Milia (Grevena, Western Macedonia, Greece): the large zygodont, Borson's mastodon, *Mammuth borsoni* (Hays, 1834), and the smaller gomphotheriine, the mastodon of Auvergne, *Anancus arvernensis* (Croizet and Jobert, 1828), the former being predominant.

Since 1996 partial skeletons and a large number of isolated skeletal elements of the zygodonts have been excavated from Aliakmon River sand deposits in Milia (Tsoukala, 2000; 2005; Tsoukala et al. 2010). The skeletons include substantial portions of the cranium with left and right molars (M2, M3); two pairs of the longest upper tusks ever recorded in the world (4.39 m and 5.02 m) and the most complete mandible in Europe, with the two entire lower tusks in anatomical position, as well as three almost-complete mandibles with dentition (m2 + m3); and post-cranials. These partial skeletons represent very robust male individuals in the prime of their life at time of death (Mol and Tsoukala, 2010; Mol and van Logchem, 2009). In addition to the partial skeletons of Milia 5 (among the eleven MIL localities, Fig. 1) we present for the first time a deciduous tusk of *Mammuth borsoni*. We



Fig. 1. *Mammuth borsoni* Milia locality: view of the Milia 5 excavated area in 2007. Note the recovery position of the mandibles below the tusks. Upper right: map of Greece indicating the Milia (MIL) locality.



Fig. 2. *Mammuth borsoni*: Right second lower deciduous incisor, di2 MIL1885, a) labial view, b) lingual view. Scale bar equals 10 mm.

also discuss the evolutionary position of the specimens among mammutids and the stratigraphy. The enriched Milia zygodont material is compared with other European specimens in order to get a better understanding of its extinction (Mol and Lacombat, 2010).

Many discussions on the nature and development of the proboscidean tusks mainly on the Late Miocene elephantoid species have been presented by various researchers (Tassy, 1987; Göhlich, 2010 etc). On the other hand literature on the tusks of Pliocene elephantoid species is poor.

The new find presented here is a tiny delicate right second lower deciduous tusk (MIL 1885) and gives evidence to the study on the development of the growth and life of the earliest Villafranchian mastodonts (Fig. 2). It is the first time that such a young mammutid individual is reported in the literature and there is no comparative material available. The animal died within the first year of its life, probably shortly after it was born.

Seven specimens are attributed to the Milia straight-tusked Auvergne mastodon. The preserved mandible consists of left and right medium worn second molars, of typical tetralophodont structure (Fig. 3). The main cone is characterizing the pretrites and posterior the posttrites are followed by a conule, with a small talonid bearing two combs. The left first and second lophids and the right first, second and third lophids of the teeth are worn on the pretrites, all the pretrite semilophids being confluent.

Conclusions regarding the relationship between the two proboscideans can be derived from the site of Dorkovo (4.5 Ma) where *Anancus* is fully predominant over *Mammuth borsoni*, indicating a prevalence of open woodland environment about c. 4.5 Ma ago (Metz-Muller, 1995; Markov, 2004; Delson et al., 2005). Reverse analogies of Milia show that the favourable environmental conditions for *Mammuth borsoni* continued in northern Greece up





Fig. 3. *Anancus arvernensis*: The occlusal views of mandible fragments of the same individual, a) left, MIL 410b with m2 and b) right, MIL 410a with m2 and m3 fragment. Scale bar equals 100 mm.

to the end of the Late Pliocene. The morphology of the Milia specimen (mainly large size) may be a response to favourable environments for browsing-adapted species.

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