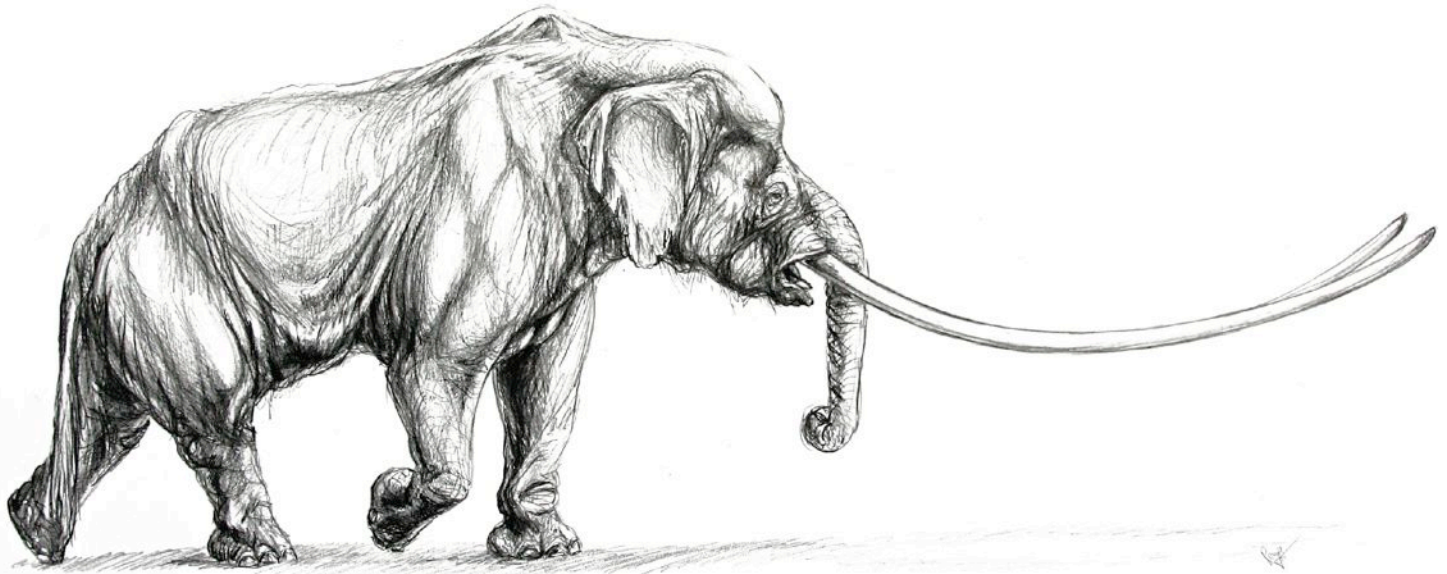




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ABSTRACT BOOK

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Carnivores of the Early Villafranchian site of Milia (Grevena, Macedonia, Greece)

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The Milia locality in Grevena, North Greece encompasses eleven excavation spots to date. It is well known as the source area of the two pairs of the longest fossil tusks yet found in the world: these measure 4.39 m and 5.02 m and belong to *Mammuth borsoni* (Hays, 1834) (Tsoukala, 2000; 2005; Mol and Tsoukala, 2010; Guérin and Tsoukala, 2013). The associated fauna includes: *Anancus arvernensis* (Croizet & Jobert, 1828), *Tapirus arvernensis arvernensis* Croizet & Jobert, 1828, *Dicerorhinus jeanvireti* Guérin, 1972, *Sus arvernensis arvernensis* Croizet & Jobert, 1828, *Hipparion* cf. *crassum*, bovids and cervids, *Hystrix* cf. *refossa* and three species of turtles.

Carnivores identified among the Milia fossils are represented by *Homotherium crenatidens* Fabrini, 1890, *Ursus etruscus* Cuvier, 1823, *Agriotherium* sp. and possibly two other small to medium-sized unidentified carnivores.

A well-preserved, almost 16 centimeter - long left upper canine of the scimitar-toothed machairodont *Homotherium crenatidens* was found at the Milia 1 site that exhibits typical coarsely crenulated edges. Moreover a distal portion of left humerus, an almost complete right tibia, and the navicular have been unearthed. A typical adult *Homotherium* reached 110 cm at the shoulder, comparable to the size of a male African lion and would have weighed about 250 kg. Packs of these hypercarnivore animals (diet with more than 70% meat) could easily have overwhelmed a proboscidean juvenile, other medium-sized pachyderms, or juveniles of the larger hoofed animals (van Logchem et al., 2010).

Ursus etruscus is identified at the Milia locality by the presence of a left lower canine with extreme gnawing marks of *Hystrix* (Fig. 1a), and a left humerus shaft with vestiges of the bar of bone enclosing the entepicondylar foramen in form of a rugosity at its proximal termination (Fig. 1b). This rugosity is more characteristic of *Agriotherium* humerus (Hendey, 1980). Additionally, a left caput femoris, two right proximal ulnae fragments, a right proximal portion of a radius and an eroded left metatarsal II of this species have been identified.

Agriotherium is an extinct genus of the Ursidae, represented by an almost complete calcaneus and a canine fragment. The canine preserves only the part of the base of the crown, where there is posteriorly a slight but well distinguished longitudinal crest. It also preserves a complete, robust and rather short root. The canine is large in size: according to Hendey's description (1980) the *Agriotherium* canines differ from the canines of Ursinae only in being less elongated anteroposteriorly, which fits well with the Milia specimen. The smaller dimensions may indicate that the Milia individual to be female. The calcaneus, which was discovered at the Milia 5 excavating site, is well preserved and almost complete, missing only a small part of the distal end (Fig. 2). Compared with that of

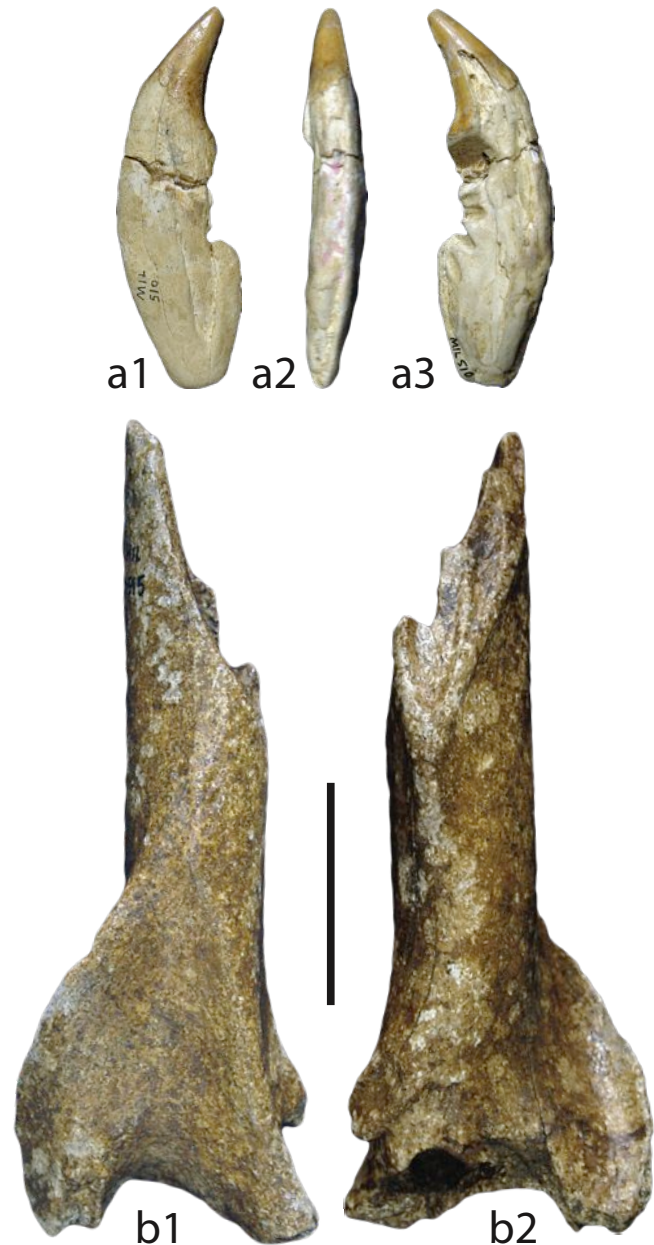


Fig. 1. *Ursus etruscus* Milia. a, Lower left canine MIL 510 with gnawing marks of *Hystrix*, a1, labial, a2, anterior; a3, lingual view; b, left humerus diaphysis MIL 1515, b1, posterior, b2, anterior view. Scale bar equals 50 mm.

the latest Miocene-Early Pliocene *Agriotherium africanum* Hendey, 1972, which is ursine-like, differing principally in having a relatively shorter, asymmetrical and much stouter tuber calcanei (Hendey, 1980).

The Milia carnivore remains represent almost 1.35% of the total specimens. Canids that dominated the Villafranchian have not been so far recovered in Milia. Early Villafranchian carnivores are poorly known in Greece due to absence of localities.



Fig. 2. *Agriotherium* sp. Milia, left calcaneus MIL 551. a, anterior, b, posterior, c, lateral, d, medial view. Scale bar equals 50 mm.

The Milia Pliocene assemblage of the two mastodonts *Mammuth borsoni* and *Anancus arvernensis*, the perissodactyls *Dicerorhinus jeanvireti* and *Tapirus arvernensis* along with the carnivore *Agriotherium* sp. allows us to date the site to the biozone MNQ 16 (Early Villafranchian).

The Milia carnivore association has been compared to those of European sites of equivalent biozones, specifically Viallette and Etouaires in France and Hajnáčka in Slovakia. Our identification of *Agriotherium* marks its initial discovery in Greece. The carnivore assemblage of Milia requires a forested landscape in a warm, relatively wet climate.

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