

## Remarks on new proboscidean remains from the classical Late Miocene locality of Pikermi and their associated fauna

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The fossiliferous locality of Pikermi (Attica, Greece), discovered in 1836, constitutes a reference locality for the Eurasian continental Upper Miocene and specifically for the western part of the Greco-Iranian province. The Pikermi fauna is the product of several excavations carried out mainly during the 19th and early in the 20th century. The most important excavations were those conducted by Albert Gaudry (1855-56 and 1860), Arthur Smith Woodward and Theodor Skoufos (1901) and Othenio Abel (1912), and yielded an abundance of fossils dispersed in several museums all over the world. Following Abel's excavation and for almost 100 years there had been no research activity in the classical Pikermi site.

The fauna of Pikermi is generally correlated to the middle Turolian (MN12). However, as already noticed by early authors, the fossils in Pikermi occur along the ravine of Megalo Rema stream (locally known as Valanaris), on at least two stratigraphic levels. Gaudry (1855; 1862-1867) recorded the presence of two fossiliferous horizons: one at the water level and one slightly higher. Subsequently, Woodward (1901) referred to two or locally three fossiliferous horizons. This is well documented in a photograph by Th. Skoufos published by Abel (1922, fig. 132). However, the exact stratigraphic provenance of the Pikermi fossils is not specified in the relevant museum collections or publications. Consequently, the faunal content of each fossiliferous level is unknown and the famous Pikermi fauna may not represent a homogenous palaeocommunity (Theodorou et al., 2010; 2013).

In 2008 the National and Kapodistrian University of Athens started new research in Pikermi in order to locate new fossiliferous sites. Geological prospecting resulted in the discovery of the new site "Pikermi Valley-1" (PV1). Since 2008 three more fossiliferous sites have been discovered,

dubbed PV2–PV4, and systematic excavations are conducted on a yearly basis. The more recent excavation was carried out in September 2013. Until present, the most comprehensively excavated sites are PV1 and PV3 that have yielded a large number of specimens, including some proboscidean remains.

In PV1, where only one fossiliferous horizon has been detected, two isolated proboscidean teeth, a d3 and a d4 (Fig. 1A), have been unearthed. They exhibit zygodont characters and following Konidaris (2013) can be attributed to "*Mammuth*" sp. Other taxa preliminarily identified in PV1 are: *Mesopithecus pentelicus*, *Adcrocuta eximia*, *Amphimachairodus giganteus*, a medium-sized felid (size of *Metailurus major*), *Promeles palaeatticus*, *Cremohipparion mediterraneum*, *Hippotherium brachypus*, Rhinocerotidae indet., *Tragoportax amalthea*, *Palaeoreas lindermayeri*, *Protragelaphus skouzesi*, *Palaeoryx pallasii*, *Gazella capricornis*, *Bohlinia attica*, *Palaeotragus rouenii*, *Microstonyx major erymanthius*, *Hystrix primigenia*, *Testudo* sp. and *Phasianus archiaci*.

The site PV3 has not yet been excavated as extensively as PV1. All collected fossils come from the same fossiliferous horizon. Concerning the proboscideans, we note the presence of *Deinotherium* sp. as indicated by a large-sized second metacarpal with a triangular shaped cross-section at mid-length and a transversely concave distal articular surface. A large-sized scapula with maximal length of about 93 cm (parallel to the spine) could also be attributed to *Deinotherium* sp. as well (Fig. 1B). This specimen is still under preparation and it seems that the scapular spine lacks an acromion and a metacromion, as in *Deinotherium* (Harris, 1978). We also note the discovery of an almost complete still unidentified proboscidean femur. The preliminary faunal list of PV3 includes *Amphimachairodus*

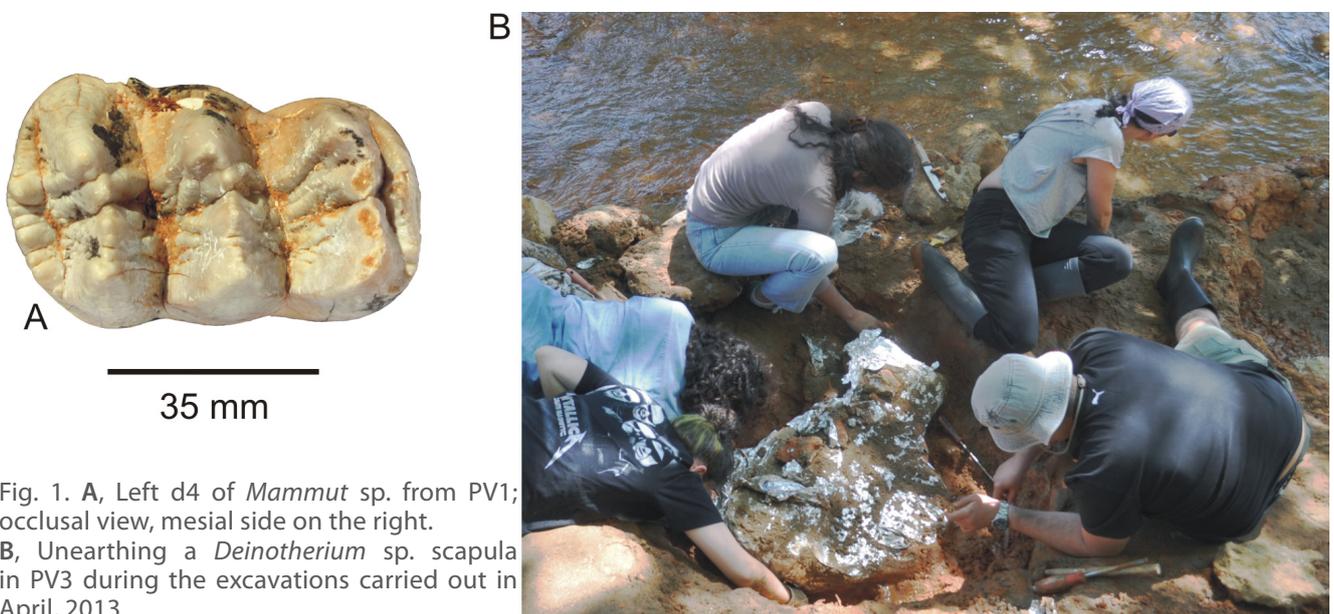


Fig. 1. A, Left d4 of *Mammuth* sp. from PV1; occlusal view, mesial side on the right. B, Unearthing a *Deinotherium* sp. scapula in PV3 during the excavations carried out in April, 2013.

*giganteus*, *Cremohipparion mediterraneum*, *Hippotherium brachypus*, *Dihoplus pikermiensis*, *Ancylotherium pentelicum*, *Tragoportax amalthea*, *Miotragocerus valenciennesi*, *Palaeoreas lindermayeri*, *Gazella capricornis*, *Helladotherium duvernoyi*, *Bohlinia attica*, *Microstonyx major erymanthius*, and ?*Gyps* sp.

The geographical position of PV3 matches the alleged location excavated by Albert Gaudry. The newly collected fossils come from a single fossiliferous horizon situated in the stream bed and/or the right bank of the Megalo Rema stream. This level corresponds to the lower fossiliferous horizon mentioned by Gaudry (1855; 1862-67). The presence of an upper horizon was confirmed during the excavation carried out in September 2013, when fossils were spotted about 2 m above the current water level of the stream. PV1 site is about 500 m east-southeast of PV3. The fossils collected also come from a single fossiliferous horizon, at or slightly above the water level, which quite probably corresponds to the lower level of PV1. However, a direct stratigraphic correlation with PV3 is not possible at the moment as the intervening sections along the Megalo Rema ravine are interrupted by agricultural activities.

The new research carried out in Pikermi has revealed a significant faunal assemblage. The collection of taphonomical data concerning the stratigraphic provenance of the specimens can provide new information that would help clarify the local stratigraphy and improve the correlation between Pikermi and other similar faunas (e.g. Kerassia, Samos, Axios Valley).

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## References

- Abel, O., 1922. Lebensbilder aus der Tierwelt der Vorzeit. Jena.
- Gaudry, A., 1855. Sur les premiers résultats de la mission qui lui a été confiée par l'Académie pour l'exploration du gîte fossilifère de Pikermi (Attique). (Extrait d'une lettre de M. A. Gaudry à M. le Secrétaire perpétuel). Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences 41, 894-897.
- Gaudry, A., 1862-1867. Animaux fossiles et géologie de l'Attique. F. Savy, Paris.
- Harris, J.M., 1978. Deinotherioidea and Barytherioidea. In: Maglio, V.S., Cooke, H.B.S. (Eds.), Evolution of African Mammals. Harvard University Press, Harvard, pp. 315-332.
- Konidaris, G.E., 2013. Palaeontological and biostratigraphical study of the Neogene Proboscidea from Greece. PhD thesis, Aristotle University of Thessaloniki, Thessaloniki.
- Theodorou, G.E., Roussiakis, S.J., Athanassiou, A., Filippidi, A., 2010. Mammalian remains from a new site near the classical locality of Pikermi (Attica, Greece). Proceedings of the 19th Carpathian-Balkan Geological Association Congress, Thessaloniki, Greece, Proceedings. Scientific Annals, School of Geology, Aristotle University of Thessaloniki, Sp. Vol. 99, 109-119.
- Theodorou, G., Roussiakis, S., Athanassiou, A., Mitsopoulou, V., Solomos, Ch., Lychounas, A., 2013. Pikermi; new excavations at a classical locality. 14th R.C.M.N.S. Congress "Neogene to Quaternary Geological Evolution of Mediterranean, Paratethys and Black Sea", Istanbul, Turkey, Abstracts, p. 128.
- Woodward, A.S., 1901. On the bone beds of Pikermi, Attica and on similar deposits in Northern Euboea. Geological Magazine 8, 481-486.

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