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A fieldwork update on the new palaeontological excavations at the classical Turolian locality of Pikermi (Attica, Greece)

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The classical locality of Pikermi (Attica, Greece) is considered to be one of the most important fossiliferous localities in Europe. The fossils occur along the Megalo Rema ravine, locally known as Valanaris. The first fossils were discovered by the Scottish historian G. Finlay in 1836. Subsequently, excavations were carried out by many naturalists and palaeontologists, namely A. Lindermayer in 1843, J. Roth in 1852, H. Mitzopoulos in 1853 and 1860-1861, A. Gaudry during the winter of 1855-56 and summer of 1860, W. Dames in 1882, M. Neumayr and L. v. Tausch in 1885, A. S. Woodward and Th. Skouphos in 1901, O. Abel in 1912 and others, whereas N. Symeonidis, F. Bachmayer and H. Zapfe excavated in a nearby locality known as Kisdari or Chomateri from 1972 to 1980 (Roth & Wagner, 1854; Gaudry, 1862-67; Dames, 1883; Weithofer, 1888; Woodward, 1901; Abel, 1922; Symeonidis *et al.*, 1973; Bachmayer *et al.*, 1982). These excavations led to the acquisition of very important palaeontological collections of specimens from Pikermi by almost all major natural history museums of Europe (Paris, London, Athens, Munich, Berlin, Vienna etc.). The collected material has been used extensively as a reference for comparative studies in numerous publications up till now and resulted in numerous publications, including some very important ones for the early development of mammalian palaeontology (e.g. Wagner, 1839, 1840; Roth & Wagner, 1854; Gaudry, 1862-1867).

Since 2008, almost two centuries after the first excavations, the National and Kapodistrian University of Athens (NKUA) resumed fieldwork in Pikermi, with a series of new systematic excavations under the direction of Prof. George Theodorou (Theodorou *et al.*, 2010, 2013). Several new and prolific fossiliferous sites like PV1 (Fig. 1) and PV3 have been revealed. In particular, the site PV1, located about 0.5 km east of the classical site, has been thoroughly explored during the last decade. Systematic excavations have been carried out almost annually, each one lasting up to a period of three months. Until 2018, over fifty students from the Department of Geology and Geoenvironment of the NKUA, as well as other institutions, have received training or participated in the fieldwork campaigns, and more than 2000 fossil specimens have been collected.

The preliminary study of the collected material from PV1 shows a rich and diverse mammalian fauna with representatives of most macromammalian groups that inhabited Greece during the Turolian. The age of the locality has been recently refined to about 7.27 Mya (Böhme *et al.*, 2017). The most frequent mammalian representatives are hipparionine horses and bovids, but rhinocerotids and giraffids are also well represented. The faunal list includes two species of hipparionine horses, the slender *Cremohipparion mediterraneum* and the robust *Hippotherium brachypus*, the bovids *Tragoportax amalthea*, *Gazella capricornis*, *Protragelaphus skouzesi*, *Palaeoryx pallasi* and *Palaeoreas lindermayeri*, the cercopithecid *Mesopithecus pentelicus*, the felids *Amphimachairodus giganteus* and an unidentified felid in the size of *Metailurus major*, the hyaenid *Adcrocuta eximia*, the mustelid *Promeles palaeatticus*, the zygodont proboscidean *"Mammut"* sp., the two-horned rhinocerotids *"Diceros" neumayri* and *Dihoplus pikermiensis*, the giraffids *Bohlinia attica*, *Palaeotragus rouenii* and *Helladotherium duvernoyi*, the suid *Hippopotamodon erymanthius* and the rodent *Hystrix primigenia*. Complementing the list of mammalian taxa is a relatively smaller number of representatives of the class Aves, including *Pavo archiaci* (Phasianidae), as well as of the class Reptilia with *Testudo* cf. *marmorum* (Testudinae) and *Varanus* sp. (Squamata) (Theodorou *et al.*, 2010, 2013; Roussiakis *et al.*, 2014). Recent palaeoecological reconstructions place the aforementioned fauna in a wooded grassland-to woodland habitat of a savannah biome (Böhme *et al.*, 2017), supporting the initial environmental interpretations put forward by A. Gaudry (1862-1867).

Pikermi is one of most significant Late Miocene localities in Europe. The detailed study of the newly excavated material is essential for improving the understanding of the taphonomical, biogeographical and palaeoecological context of the locality, as well as for the evaluation of the systematic affinities and phylogenetic position of the Pikermian taxa. In particular, one of the key objectives based on this stratigraphically well-calibrated material is the assessment of the potential existence of multiple stratigraphic levels, as opposed to the commonly regarded biochronological and taxonomic homogeneity of the Pikermian fauna (Theodorou & Nicolaides, 1988).

Figure 1. A fossiliferous bone assemblage at the PV1 site (left), and the palaeontological exhibition in Pikermi (right).

Currently, a preliminary exhibition featuring specimens from the new excavations and selected reconstructions is housed in the Rafina-Pikermi Municipality's Urban Planning Building (Fig. 1). This exhibition has achieved to generate public interest and awareness on the scientific significance of the locality, through numerous visits by schools and non-profit organizations. Imminent plans of the project include the annual continuation of the excavations, with an expansion to other sites including PV3 and Chomateri, as well as the thorough preparation of the material and its scientific evaluation. The primary objectives encompass the establishment of a multidisciplinary and educational protected Geopark at Pikermi, as well as the founding of a local Palaeontological Museum, where the material of the excavations and a new permanent exhibition shall be housed.

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References

Abel, O., 1922. Lebensbilder aus der Tierwelt der Vorzeit. Jena, 644 p.

Bachmayer, F., Symeonidis, N., Zapfe, H., 1982. Die Ausgrabungen in Pikermi-Chomateri bei Athen. Eine Dokumentation. Annalen des Naturhistorischen Museums in Wien 84, 7-12.

Böhme, M., Spassov, N., Ebner, M., Geraads, D., Hristova, L., Kirscher, U., *et al.*, 2017. Messinian age and savannah environment of the possible hominin *Graecopithecus* from Europe. PLoS ONE 12 (5), e0177347.

Gaudry, A., 1862-1867. Animaux fossiles et géologie de l'Attique. F. Savy, Paris, 475 p.

Dames, W., 1883. Hirsche und Mäuse von Pikermi in Attica. Zeitschrift der Deutschen Geologischen Gesellschaft 35 (1), 92-100.

Roth, J., Wagner, A., 1854. Die fossilen Knochenüberreste von Pikermi in Griechenland. Abhandlungen der Bayerischen Akademie der Wissenschaften 7 (2), 371-464.

Roussiakis, S., Athanassiou, A., Michailidis, D., Mitsopoulou, V., Solomos, Ch., Theodorou, G., 2014. Remarks on new proboscidean remains from the classical Late Miocene locality of Pikermi and their associated fauna. Scientific Annals, School of Geology, Aristotle University of Thessaloniki, Greece, VIth International Conference on Mammoths and their Relatives, Grevena - Siatista 102, 171-172.

Symeonidis, N., Bachmayer, F., Zapfe, H., 1973. Ausgrabungen in Pikermi bei Athen, Griechenland. Annalen des Naturhistorischen Museums in Wien 77, 125-132.

Theodorou, G., Nicolaides, S., 1988. Stratigraphic horizons at the classic mammal locality of Pikermi, Attica, Greece. Modern Geology 13, 177-181.

Theodorou, G., Roussiakis S., Athanassiou, A., Filippidi A., 2010. Mammalian remains from a new site near the classical locality of Pikermi (Attica, Greece). Scientific Annals, School of Geology, Aristotle University of Thessaloniki 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.

Wagner, A., 1839. Fossile Ueberreste von einem Affenschädel und andern Saügthieren aus Griechenland. Gelehrte Anzeigen 8, 305-311.

Wagner, A., 1840. Fossile Ueberreste von einem Affen und einigen andern Säugthieren aus Griechenland. Abhandlungen der Bayerischen Akademie der Wissenschaften 2Kl. 3 (1), 155-170.

Weithofer, A., 1888. Beiträge zur Kenntniss der Fauna von Pikermi bei Athen. Beiträge zur Paläontologie Österreich-Ungarns und des Orients 6, 225-292.

Woodward, A. S., 1901. On the bone beds of Pikermi, Attica and on similar deposits in Northern Euboea. Geological Magazine 8, 481-486.