

Large mammal footprints from the Late Miocene of Western Crete

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Although terrestrial Miocene deposits as well as faunal and floral findings are numerous and widespread in Greek Neogene sedimentary rocks, trace fossils are sparse and are limited mainly to casts of roots and invertebrate ichnofossils. No footprints of terrestrial vertebrates and especially of mammals have been reported from the Greek Neogene to date. This is fairly strange considering that there are several important Miocene mammal localities such as Pikermi, Samos, the Axios valley localities and many others found all over Greece. Terrestrial mammal localities of Miocene age have also been reported from the island of Crete. Although not many, still their number is considered adequate and they are located all over the island. Until now nine localities have been traced; five in Lassithi prefecture, one in Heraklion prefecture, two in Rethymnon prefecture and one in Chania prefecture. Their age spans from the Middle to the Late Miocene. The oldest one is Melambes in Rethymno and the youngest one Vrysses in Chania.

Although the identified terrestrial deposits and findings are very sparse in Western Crete, a new locality has been discovered recently where footprints of terrestrial mammals were exposed. The actual locality is situated near the village Vouves, to the west of the city of Chania. The ichnofossils come from lacustrine deposits that belong to the Roka Formation. The identified footprints were exposed at a low section located in a cultivated area. Two ichnotaxa are represented in the findings so far. The first and more impressive finding is a very well defined footprint that can be related with an average sized felid (ichnofossil *Felipeda*). The second group of footprints are the traces of Ruminant hoofs. More specifically the “hoof” traces belong to a large sized ruminant. The felid footprint has a maximum anteroposterior diameter of 126 mm and a transverse diameter of 95 mm. It constitutes a cast where not only the imprint of the foot with the four fingers is well preserved, but also the full traces of the claws of all four fingers. They have also been cast and preserved, indicating that the claws had been drawn out of their sheaths at the time of the imprint’s formation. The size of the largest ruminant footprint has an anteroposterior diameter of 115 mm and a transverse diameter of 93 mm. These footprints were moulds of the original hoofs, clear but not so well defined as the felid one. The age of nearby marine deposits of the Roka Formation is considered as Tortonian. Therefore, an equivalent age can also be inferred for the fossiliferous layer with the footprints. This is the first recorded case of footprint trace fossil findings from Neogene sedimentary deposits of Crete and Greece in general. In addition these findings provide more evidence for the presence of well established terrestrial environments and faunas in the area of Crete during the Late Miocene.

Slovak gemstones

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In present-day Slovakia the survey in gemology has been oriented to searching for new gemstone deposits and to proving their quality. Suitable kinds of siliceous materials, which have not been examined for these purposes until now, have been discovered. *Obsidians* were found in eastern Slovakia, with their qualities predetermining them for use as chipped stone implements far in the past. In addition to sharp chipped edges that were used to function as various cutting implements, obsidians are attracting our attention by their black colour and

remarkable lustre. Also in the present obsidian lumps of different size can be found on clayey sediments in vineyards at the position of Viničky. Interesting remains of trunks of Tertiary trees, which were devastated by volcanic activities, are known as *wood opals*. One part of their wooden mass burned; the other was buried in volcanic ash and gradually impregnated with opal mass to give rise to attractive colourful remains with characteristic structure of original woods - chestnut trees, laurel trees and other thermophilous plants as well. Polished opals have impressive appearance and like obsidians, they can be used for jewellery. When set in jewels, their banded structure becomes apparent in play of colours. This quality is specific with embossed cuts. The site of Veľký Ďur-Rohožnica is a typical deposit. Wood opals from Povrazník are those with nice colours. They are of brown, orange, orange-red colours and have bright glassy lustre. Wood opals occur in positions of pyroclastic rocks of stratovolcanos. *Common opals* occur at several places in Slovakia as well, often accompanying wood opals and chloropals. They have glassy to dull lustre and different colour variations. Rather big accumulations were unearthed e.g. near Mochovce (Dobrica) in vein fillings of andesite rocks. Another type of opal is the one from the crust of a weathering ultrabasic body near Hodkovce, eastern Slovakia. It also occurs in a variety of colour variations, from light yellow to green (colouring due to Ni mixtures).

Attractive stuff for cabochon cuts and minute embossed cuts are *fuchsites* or fuchsitic quartzes (occurring at Rudňany). They make altered rims of ultrabasic bodies and at some places they are rather thick. Their negative feature is that they have been secondarily fractured to a high degree.

Fractions of exclusive high-quality *epidotites* are suitable for decorative purposes as well. They are vein fillings in granitoid rocks of the Trábeč hills. Epidote veinlets are solid and massive and they can be as thick as several centimetres. Interesting pebbles can be found in alluvia of brooks crossing the mountain range. Being cut and polished, initially modest boulders obtain attractive structure and lustre. The *Levice travertine*, known as “golden onyx” for its remarkable colouring and banded structure, has been used for decades traditionally. First it was used for interior facing of noble mansions and burial vaults. Later utility artefacts, such as bowls and writing sets were made of it. In present tiny gemstones and accessories are made of its waste.

The Vth century AD jewellery from Cluj-Napoca (Romania): a non-destructive investigation

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The 2007 archaeological excavations carried out at the Polus Centre 5 km west of Cluj-Napoca (Romania), exhumed among others a princely tomb containing gold jewellery. It belongs to the Gepids, an East Germanic tribe which settled down in the nowadays Transylvania, in the second half of the Vth century AD. Nine gold pendants inlaid with a total of 45 slices of red gemstone were subject of a non-invasive (nor sampling neither dismounting of the gems from the jewels) and non-destructive (no damage to the gem) study. Previously, the gemstones were macroscopically assigned to the ruby variety of corundum.

Each pendant has a total length around 3.85 cm and consists of two parts: a leaf-shaped lower one, with four tablet-cut gemstones and an upper part, half moon shaped, with one gemstone. The stones are mounted in the cabochon technique and backed by a *paillon* – a reflecting layer of thin golden foil, stamped with a very regular and small cross-hatched pattern. Tiny gold balls decorate the pendants.

The observation with a stereomicroscope under normal light shows that gemstones consist of a highly transparent, dark red material. Almost each piece has a number of tiny inclusions, such as crystallographically oriented rutile needles intersecting at 70°, rutile „dust”, negative crystals, and probably apatite. Black, sometimes hexagonal-shaped, platy crystals are most likely ilmenite and occur frequently. The VIS spectra revealed absorption