operated in the region from 1951 to 1999 and the remediation activities ended in 2004. The levels of As, Pb, Zn, Cu and Cd were determined in the river water (109 samples), floodplain ground water (3 samples), river channel (97 samples) and floodplain sediment (44 samples), haplic Luvisols, LVh, FAO, 1998 (16 samples), grass vegetation (25 samples), sheep's milk (6 composite samples from 800 animals) and goat's milk (1 composite sample from 19 animals). Seven sampling campaigns were carried out in the period 2005-2007. The studied trace elements were measured with the means of AAS-GF, ICP-AES/OES/MS and XRF in the laboratories of the University of Mining and Geology of Sofia, Humboldt University of Berlin, Acme Laboratories (Canada) and the Ministry of agriculture and food of Bulgaria. The results show As and Pb as the main contaminants in the local environment, associated mostly with the river channel and floodplain sediments along the Ogosta River and its initial tributary Chiprovska River. The mean As value (median) for the channel sediment is 1170 mg/kg (min 16 mg/kg; max 80390 mg/kg) and 1117 mg/kg for the floodplain sediment (min 43 mg/kg; max 26946 mg/kg). The mean Pb levels for the same media are 178 mg/kg (min 10 mg/kg; max 15205 mg/kg) and 282 mg/kg (min 43 mg/kg; max 2982 mg/kg), respectively. The mean As value exceeded the Dutch intervention value 21 times for channel sediment and 20 times for floodplain sediments. The same quantities for Pb were 0.3 and 0.5 times, respectively. Levels above the imperative values of the EU directive 75/440/EEC were detected in river water mostly for As, which ranged between 0.002 mg/l and 0.621 mg/l, with mean value of 0.053 mg/l. Two general patterns of vertical metal and arsenic distribution were revealed in the polluted floodplains. Type 1 is typical for the floodplain sections lower than 1m where the contaminants increase in depth and ground water pollution with As is established. Type 2 is the common one for the floodplain between 1-2.5 m above the usual river level. Trace element accumulation in the upper sediment layers is typical in these areas. Lead concentrations above the EU threshold of 0.02 mg/kg were established in 5 samples from sheep's milk (min 0.0036 mg/kg; max 0.077 mg/kg), as well as in the goat's milk (0.052 mg/kg), produced in the Chiprovtsi mining area. As the studied grass samples from the grazing areas were not rich in Pb, other paths of lead transfer to the milk should be suggested. Though some of the remediation measures were successful, it can be concluded that the negative environmental legacy from the mining is still present in the Ogosta River basin. Better results can be expected if all the contaminant accumulation zones and the path-ways of the pollutant dispersal in the mining affected area are taken in account when environmental recovery measures are designed.

Palaeoenvironment of the Eastern Mediterranean Miocene hominoids

Koufos G.

Aristotle University of Thessaloniki, Department of Geology, Laboratory of Geology and Palaeontology, GR 54124 Thessaloniki, Greece, koufos@geo.auth.gr

During Miocene several hominoids were living in Eastern Mediterranean (Balkans, Black Sea, Asia Minor). The known middle Miocene hominoids are *Griphopithecus alpani* and *Kenyapithecus kizili,* known the previous one from the localities of Çandir and Paşalar (Turkey) and the second from Paşalar; both localities are dated either to MN 5 or to MN 6. The late Miocene hominoids include the following taxa: a. *Ankarapithecus meteai* from the early Vallesian (MN 9) localities Sinap-12, 8A (Turkey); b. *Ouranopithecus macedoniensis* from the late Vallesian (MN 10) localities of Xirochori-1, Ravin de la Pluie and Nikiti-1 (Greece); c. *Ouranopithecus turkae,* found in the early Turolian (MN 11) locality of Çorakyerler (Turkey); d. *Udabnopithecus garedziensis* known from the latest Vallesian (MN 10) locality of Udabno I (Georgia); e. *Graecopithecus freybergi* discovered in the late Miocene locality of Pyrgos Vassilissis (Greece), and f. a single premolar is known from the middle Turolian (MN 12) locality of Chirpan (Bulgaria); the sole premolar has similarities with *O. macedoniensis*.

The faunal composition, diversity and similarity of the hominoid bearing mammal assemblages of Eastern Mediterranean are analyzed by various techniques. The faunal

composition of the middle Miocene hominoid bearing assemblages indicates closed environment with warm/humid conditions, while during late Miocene the environment was relatively open/dry. The analysis and comparison of the hominoid bearing mammal assemblages with other Eurasian middle and late Miocene ones, as well as with modern faunas from known environments indicate that all the European middle Miocene faunas and the Vallesian ones of Western Europe can be correlated to the modern closed assemblages (tropical/subtropical forests, seasonal forests) indicating similar palaeoenvironment. On the other hand, all the late Miocene with or without hominoids assemblages of Eastern Mediterranean (except Udabno I) are correlated with the modern open assemblages suggesting relatively open landscape with warm and dry conditions (wooded savannah, savannah with shrubs, savannah with grass). The habitat of *Griphopithecus alpani* and *Kenyapithecus kizili* was similar to that of a monsoon forest with meadows. The hominoids *Ankarapithecus meteai, Ouranopithecus macedoniensis, Ouranopithecus turkae* and the Chirpan hominoid were living in open landscape (savannah with trees, bushes, shrubs and grass) under warm/dry conditions. The palaeoenvironment of *Udabnopithecus garedziensis* seems to be more closed and humid than the other late Vallesian ones and closer to that of the middle Miocene assemblages.

Late Miocene Carnivores from the Greco-Iranian Province: comparisons, guild structure, palaeoecology

Koufos G.D. and Konidaris G.E.

Aristotle University of Thessaloniki. Department of Geology. Laboratory of Geology and Palaeontology. GR-54124 Thessaloniki, Greece, koufos@geo.auth.gr; georgeko@geo.auth.gr

The Greco-Iranian Province (Balkans, Turkey, Iran and Afghanistan) includes numerous mammal localities, which provided a significant number of carnivores. Although there are several taxonomic studies concerning them, their guild structure and relationships were never studied in details. The present study is a preliminary effort to give some data about their relationships, guild structure and their palaeoecology

The carnivores of the studied area are separated in groups, including the taxa of each MN zone of the Greco-Iranian Province. The faunal similarity of the defined groups is analyzed, indicating that Vallesian (MN-9 and MN-10) assemblages are well separated from the Turolian (MN-11 and MN-12) ones. Their faunal similarity is low, suggesting different taxa. The MN-13 assemblage is separated from the others due to its limited faunal data.

The guild structure (comparing body mass, locomotor pattern and diet class) of each MN assemblage is also studied and the diagrams indicate differences between the Vallesian and Turolian carnivoran assemblages. The absence of arboreal forms in all assemblages, as well as the relative abundance of the hyaenids and the cursorial forms suggest a possible open environment. The multivariate analysis of the studied carnivoran assemblages in comparison with the recent ones from known environments confirms their open character. These palaeoecological results fit quite well with the known palaeoenvironmental conditions of the Greco-Iranian Province.

Preliminary results of the palynological investigation of the Toarcian deposits of Ionian Zone (Western Greece)

Kouli K., Kafousia N. and Karakitsios V.

Department of Historical Geology and Palaeontology, Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens, 15784 Zografou, Greece akouli@geol.uoa.gr, nkafousia@geol.uoa.gr, vkarak@geol.uoa.gr.

In this study we present preliminary palynological data from Lower Toarcian deposits of the Ionian Zone (Western Greece). The Ionian Zone belongs to the external Hellenides and during the Mesozoic constituted part of the southern Tethyan margin. The initially shallow