

***Ursus spelaeus* and Late Pleistocene associated faunal remains from Loutraki (Pella, Macedonia, Greece)-Excavations of 1999**

Ursus spelaeus del Pleistoceno Superior y fauna asociada de Loutraki (Pella, Macedonia, Grecia): excavaciones de 1999

TSOUKALA, E.¹; RABEDER, G.² & †VERGINIS, S.³

ABSTRACT

The large mammal assemblage from the bear-cave A in Loutraki, Pella, Macedonia, Greece, mostly very well preserved, is described and analysed. Among *Ursus spelaeus* remains, other large mammalian faunal remains, found up to 1999 (the excavation is still in progress) in association with the cave-bears belong to: *Crocota spelaea*, *Panthera pardus*, *Vulpes vulpes*, *Capra ibex*, *Dama* sp. One pyrite artefact, found also in association with the ursid remains, adds great interest to this site. The preliminary study showed the predominant presence of the cave-bear, while only very few specimens represent other animals. The presence of abundant deciduous bear teeth, in spite of their fragility, is remarkable. On some bones there are carnivore trace, either of other ursids or scavengers. The taphonomical approach would show interesting results.

Key words: Large mammals, Late Pleistocene, Loutraki bear-cave, Macedonia, Greece

(1) School of Geology, Aristotle University, 54006 Thessaloniki, Macedonia, GREECE

(2) Institute of Paleontology, University of Vienna, Althanstraße 14, A-1090, Vienna, AUSTRIA

(3) Institute of Physical Geography, University of Vienna, AUSTRIA

INTRODUCTION

About 10.000 ursid bones, bone fragments, and teeth from the Loutraki Late Pleistocene cave-site besides other samples representing large and small carnivores and herbivores, have resulted from five seasons of extensive excavations (1992-1999), which were carried out under the direction of Dr. Evangelia Tsoukala, in cooperation with Ministry of Culture (Ephory of Paleoanthropology and Speleology). The excavations of 1996 and 1999 were carried out also with the contribution of Vienna University (Profs G. Rabeder and S. Verginis).

LOCATION OF THE SITE

The cave-site of Loutraki (LAC: LOU-TRAKI ALMOPIA CAVES) is located in North Greece on the slopes of the Voras mountain (2.524 m), very close to the former Yugoslavian border, about 120 km north-west of Thessaloniki. The caves have been developed mainly in the north side of the V-shaped Rema Nicolaou gorge. It is a part of the "speleological park", with very rich vegetation, in the region of the Loutra spa.

GEOLOGY

The whole area is a fault ore-bearing zone of NW-SE direction. The Rema Nicolaou gorge consists of Maestrichtian limestone with intense karstik phenomena that have been caused due to the Tertiary faulting of the area. The results of these tectonic events are many fault surfaces. The erosion resulted a depth of about

150m of this gorge, to the bottom of which the Thermopotamus River is flowing. The intense erosion of the gorge may also show relatively recent (post-Pliocene) elevation of the north part of the great Loutraki fault. Extensional tectonic events such as slide planes, high angle normal faults and joints, as well as the erosion, are the reasons of the vertical development of the caves (MOUNTRAKIS, 1976). According to the speleological research of the area the speleological park complex consists of 6 caves, 4 rock shelters (ambries), 2 potholes, many holes and cave formations. The bear-cave A is at altitude of 540m. In the broader area there are findings dated to the Paleolithic or the Late Neolithic period and of the Bronze Age with many pottery-remains, while indications of Roman habitation in the Almoopia plain have been noted. A rock shelter, 50 m West of cave A, at the same altitude, presents on its base an old travertine layer, as well as a very cohesive conglomerate, remains of an old river bed, at the height of about 70m from the surface of the river. The thickness of this occurrence is 3-4m, and consists of various stones and sand deriving from the erosion of the surrounding rocks. These stones are permeated with CaCO_3 , giving a clast-supported conglomerate, the imbrication of which is not clearly shown. In some places it is shown a flow direction opposite to the today's river flow direction. Thus the paleogeographical structure was different in the period of the old riverbed deposition. There are 3 more old riverbed remains in various altitudes. In one of the two potholes, 50m of depth, a recent human skele-

ton was found and it belongs to a middle-aged man.

In the area extensive travertine occurrences are due to the old geothermal liquids or to the active thermal springs of this area.

HISTORICAL OVERVIEW

The investigation of this area was started in 1990, when the speleologist K. Ataktidis showed to the first author fossil bones, that were brought to light by treasure seekers in the bear cave A. Then a group of scientists visited the new site and because of the great paleontological interest, and permission for excavation was asked from Ministry of Culture. The first excavation circle started in 1992 by School of Geology of Aristotle University, also sponsored by the former community of Loutraki, under the supervision of Ephoria of Paleoanthropology and Speleology (EPS) of Ministry of Culture, in cooperation with Prof. G. Chourmouziadis of Archaeology, with the contribution of Prof. Eitan Tchernov. The excavations were continued in 1993 and 1994 in cooperation with EPS (Dr. E. Kambouroglou, archaeogeomorphologist). In 1996 and 1999 the excavations were carried out by Aristotle University, EPS, with the contribution of the Vienna University (Profs G. Rabeder, S. Verginis and their team). The local authorities also gave financial support, first of the former Loutraki community and Physiographical Museum of Almopia, and then by the Aridea Municipality and the direction of the Loutra spas company.

TECHNIQUE OF THE EXCAVATIONS

The excavations in the bear-cave A followed strictly the archaeological rules. After the definition of 0 point, which is common for the ABCD, KLMN and VW block of squares, the orientated sondages in the chambers have dimensions: 4x4 m for the LAC II; 3x3 m for the LAC I; 1x1 m for LAC Ia; and 1x2 m for the LAC Ib. The excavation started in 1992 first, in the B10 square of chamber LAC II, with only two layers with many fossil-findings. In 1993 the excavations were continued in the B10 and B11 squares as well as to the trench-square D10 of the same chamber. Three coordinates were measured for the bones: the west east, the north south, the depth from the 0 point, and to the long bones the azimuth.

As it is shown, the brownish deposits are rather homogenous, of a thickness of about 70cm, mainly of silt sediments deposited under calm conditions of the paleoenvironment. All the material and the sediment have been washed to two double systems of sieves, one for micro-mammals of 0.3mm diameter and the other for large mammal remains of 0.5mm. During the last excavation, three-sieve system was used in order the material of the latter sieve to be more homogenous, the third one of 0.7mm. All this material will be exhibited to a local Museum among other archaeological and local folkloric samples.

Over than 10.000 large mammal samples were found, from the three block of squares (ABCD, LMN, VW in chambers

LAC II, I and Ib respectively). They mainly belong to very or to juveniles, many in situ (such as the whole metapodial range of very juvenile with no fusion of their epiphyses). On some bones there are carnivore traces. An artifact, found in association with the ursid remains, in the sieving of the third layer of B10 square adds great interest to the excavations. Seeds found during sieving were determined by the archaeologist †Maria Magafa as *Rumex crispus*, *Picris echioides*, *Matricaria chamomilla* (*Chamomila recutita*), Compositae, typical Mediterranean plants. The first one is the most common and loam, clay and nutrient indicator. The second is stony wasteland indicator and the third one indicates fresh or sandy loams, rich in nutrients, also saline soils.

THE CAVE A

Small fragments of recent stalagmite that covered cranial fragments and mandible of a child were found. The LAC Ib chamber, with the VW sondage gave interesting material, especially in 1999, especially of hyaenid bones, as well as large stones and large ursid specimens, such as skulls, complete pelvis, long bones etc. Therefore the presence of the "unknown" scavenger that was described in 1993 in the study of the Taphonomy is now confirmed. The Ia small chamber is very difficult of access, as it is more than 6m higher on the LAC I floor, on the top of a slippery rock. During the 1996 a quick excavation of this chamber resulted abundant material of macro- and micromammals of Holocene age. Obviously, the feeding source of these sediments differs

from that of the LAC I floor Pleistocene sediments. There are many disturbances in all chambers, made by the treasure-seekers. The excavations followed strictly the archaeological rules. The brownish rather homogenous deposits, are of a thickness of ~70cm, mainly of silty sediments deposited under calm conditions of the paleoenvironment.

PALEONTOLOGY

Loutraki *U. spelaeus* is a rather robust type, with complicated morphotype of the premolars, especially of the lower premolar P₄, which is at the stage of three or four cuspids, thus showing clearly a tendency for molarization and an advanced evolutionary stage. The bear remains represent animals of all ages (males or females) but the young ages dominant, as it commonly occurs in bear-caves. The presence of the most abundant milk teeth, in spite of their fragility, is remarkable and unique for the Greek bear-caves, as well as of teeth, which have just been substituted, shows clearly, that bears used the cave as a den. They are hundreds of teeth, representing all the milk tooth-row. The preliminary study, except the dominant presence of *U. spelaeus*, showed only few specimens to represent a small bovid, cervid and carnivores, such as a large felid, fox and crocuta. Prehistoric humans seem not to have used the cave, as the findings so far (except one lithic pyrite artefact) do not show this, but the excavation is still in progress (TSOUKALA 1994, 1996; TSOUKALA *et al.*, 1998).

The following faunal elements have

been determined in the bear-cave up to now:

| |
|---|
| CARNIVORA |
| Family: Ursidae- <i>Ursus spelaeus</i> |
| Family: Hyaenidae- <i>Crocatuspelaea</i> |
| Material: I¹, I², I³, Mc III, Mc IV, Mt III, 4 Ph I |
| Family: Felidae- <i>Pantherapardus</i> |
| Material: 2Ph I |
| Family: Canidae- <i>Vulpes</i> sp. |
| Material: M² sin |
| |
| ARTIODACTYLA |
| Family Bovidae- Sub-family Caprinae- <i>Copra ðer</i> |
| Material: Carpal LAC, Metacarpal 3 +4 LAC, 2Ph II |
| Family Cervidae- <i>Dama</i> sp. |
| Material: Scapula fr., Carpal IV |

Some of the conclusions are:

- The Loutraki bear-cave is very rich in paleontological material.
- Carnivores are represented in scarce diversity, but ursids are extremely abundant.
- The study of about half of the ~10.000 bones, bone fragments and teeth of the bears, the most representative, showed the presence of the *U. spelaeus*.
- The bones are mostly well preserved. Few long bones are complete and well preserved.
- The abundance of the material shows relatively long occupation of the cave by bears. The cave does not seem to be used by humans, as only one lithic (pyrite) artifact was found in B10 square.
- The absence of well preserved complete skulls of adults, among this rich material is remarkable, while there are few

almost complete skulls of sub-adults and juveniles.

- The majority of the tooth and bone remains belong to juveniles and sub-adults, while very few belong to very old individuals and few to adults, indicating thus an extremely high incidence of young and neonate mortality. There are many bear carcasses as a result of death during hibernation. The abundance of the milk teeth, in spite their fragility, is very remarkable.

- The presence of both sexes has been established due to the sexual dimorphism either of the teeth (mainly canines) or of the postcranial skeleton, with a slight predominance of females over males.

- Very few bones, such as a complete right anterior foot, have been found in situ, but the majority has been found scattered, and this is due either to the animals themselves or to the action of flowing water.

- The rounding and abrasion of some bones such as metapodials, phalanges and patellas also establish the action of flowing water. The not so good preservation of certain remains, as well as their position within the sediments, indicate a rather considerable, but not great (few were found in situ), flow over the deposit.

- Few bones, have traces of large carnivore teeth and this can be explained either by the presence of the other carnivores (felid, hyaenid, canid) or by cannibalism.

- Some bones have cutting marks, which are probably due to many rodents.

- The bears used the cave as a den. The abundance of the material, the juvenile remains, establish the inhabitation.

REFERENCES

- MOUNTRAKIS, D. (1976). *Geological study of the Pelagonien and Vardar Zone boundary in the Almopia area (North Macedonia)*. Thesis Dissert. Aristotle University, pp.: 1-164, Thessaloniki.
- TSOUKALA, E. (1994). Bärenreste aus Loutraki (Macedonien, Griechenland). "*Ursus spelaeus*", *2nd Höhlenbären Symposium*, 15-18 September, Corvara, Italy.
- TSOUKALA E. (1996). Comparative study of ursid remains from the Quaternary of Greece, Turkey and Israel. *Acta Zool. Craoviensa*, **39** (1): 571-576, Krakow, Poland.
- TSOUKALA, E.; RABEDER, G. & †VERGINIS, S. (1998). *Ursus spelaeus* and associated faunal remains from Loutraki (Pella, Macedonia, Greece) - Excavations of 1996. Geological and geomorphological approach". *4th International Höhlenbären-Symposium*, 17-19 September, Velenje, Slovenia.