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FAUNAL REMAINS FROM THE KALAMAKIA CAVE (PELOPONNESE, GREECE)

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PRESENTATION

The cave of Kalamakia is situated at Areopolis, western coast of the province of Mani (Peloponnese). Localized on littoral, it opens at 2.30 meters above the sea level at the base of a rocky cliff 40 meters in height. Part of a karstic system, caves and galleries have been explored, especially in Areopolis area; a survey program has shown that these caves were inhabited in the upper Pleistocene (Darlas 1996). The surrounding landscape is harsh and rugged, with beach pebbles, and also with extensive pasture areas for bovids and horses. Adjacent to the cave is the Oitylon's bay which was probably a valley in the Quaternary period, when the sea level was lower (Van Andel, Tjeerd and Shackleton 1982; Wilkinson and Duhan 1990).

The quaternary filling has been divided into seven stratigraphic ensembles. A large part of the archaeological remains, lithic implements and faunal remains, come from different levels of ensemble IV. The most recent of these levels have been dated at $36\ 000 \pm 1000$ years via the Uranium imbalance method (Lumley and Darlas, 1994).

FAUNAL ASSEMBLAGE

26669 faunal specimens have been examined and 486 have been identified to species and anatomical part. The rate of identification is very weak (2%), even in middle palaeolithic assemblages, and reflects the importance of geochemical alteration and fragmentation phenomena.

Bone fragments, representing most of the material, are divided into coordinate elements (NR= 757) and non coordinate (NR= 25350) according to the three dimensional digging methods. These splinters (NR= 26107) include 10165 burnt specimens and fragmented teeth (NR= 143). The small size of fragments in relation to their length (90% are less than 2 centimeters) stresses the degree of fragmentation the archaeological record encountered. The majority of the faunal assemblage is constituted by the cephalic skeleton, with isolated teeth being most prevalent due to high resistance to fragmentation and erosion. Most of the specimen represent adult individuals, mainly Fallow deer and Ibex. Due to difficulties of species identification, a group called "artiodactyls" has been created which includes undifferentiated cervid or caprid remains. These remains were almost all in

concretions. Mechanical removal of concretion often resulted in fractures or destruction of the specimens (bone or tooth). A second technique of removal consists of acid processing: unfortunately, it also dissolves the bone surface. For these reasons it was often difficult to undertake a systematic analysis of bone surfaces. Evidence of carnivore gnawing and cut marks are rare. Impact fractures of anthropogenic origin are slightly more numerous but still rare. Despite the very low percentages of bones examined from a taphonomic point of view, some preliminary results can be presented.

Faunal list

1-recent surface assemblage

Capra hircus, *Lepus* or *Oryctolagus*, *Vulpes vulpes*, *Mustela putorius*, *Felis domesticus*, *Aves sp.* (*Alectoris graeca*, *Columba livia*, *Gallus sp.* and *Turdidae*), as well as some fish remains.

2- surface level (mixed)

Capra ibex, *Cervus elaphus*, *Dama dama*, *Elephas sp.*, *Lepus europaeus*, *Felis sylvestris*, some reptiles and insectivores. These remains are in part from the palaeolithic assemblages and suggest introduction of bones or alterations attributable to lagomorphes, mustelids, small canids and felids.

3- Pleistocene levels

Capra ibex, *Dama dama*, *Bos/ Bison*, *Elephas sp.*, *Rhinoceros sp.*, *Lepus europaeus*, *Canis lupus*, *Vulpes vulpes*, *Felis sylvestris*.

Fallow deer and Red deer are both present in the Peloponnese during the Pleistocene. Fallow deer is well represented in the late Pleistocene levels (Würm III) from the basin of Megalopolis (Melentis 1966), in the Aurignacien levels of Kleisoura rock-shelter, in the Argolid (Koumouzelis and Kozłowski 1996), on Kythera island (Manolessos 1955) but is absent from the late palaeolithic deposits of Franchthi cave in the Argolid (Payne 1975) and generally from the Holocene fauna of this region, except in Tyrins Bronze strata. Fallow deer probably emigrated or disappeared at the end of the Pleistocene (Bököyni 1971, Melentis 1980, Halstead 1987). Nevertheless, we believe that *Dama dama* survived in some favourable niches in Greece, e.g. mesolithic Beoetia, Thessaly (Trantalidou 1997; Masseti and Rustioni 1988).

Alteration, fragmentation and concretions have often hindered specific identification: many elements have therefore been identified to the genus or even family level. Even with some dental measurements of *Dama* and *Capra* available (table 3), biometrics could not help resolve the morphologic diagnosis deficiency.

In the same way, a doubt persists for bovids (aurochs or bison) and carnivores whose identification could only be made to gender (*Canis sp.*). Subspecies attribution within *Capra* is still not possible, as well as for the Fallow or Red deer (*cf. Dama dama* or *Cervus elaphus*).

This study of Kalamakia's assemblage brings to light methodological problems of bone retrieval, conservation and sampling but the solution resides in the pursuit of additional excavations to enrich collections and develop new techniques of concretion removal.

Despite differences in faunal sample composition within each archaeological level, the artiodactyls dominance (Fallow deer and Ibex) is prominent and permanent. The presence of Boar is sporadic in the stratigraphy: maximal representation is seven elements, essentially isolated teeth. Rarer are the molar fragments of Proboscidian (cf. *Elephas sp.*); their presence might be attributed to a *manuport* phenomenon, already observed in Mousterian contexts in the Pyrenees, France (Gardeisen, 1997).

Carnivores are few and represent small sized species so their potential role in the accumulation of animals carcasses in the cave was limited or non-existent. In parallel, tooth marks are rare on artiodactyl bones : only two bones with such marks have been observed.

First model of subsistence

The "artiodactyles" (*Capra*, *Dama* and undifferentiated artiodactyla) represent 63 to 93% of the faunal assemblage. The suids (*Sus scrofa*) give only a brief idea of their potential role in human subsistence and indicate, in association with artiodactyles, a temperate climate and a wooded surrounding landscape.

A model of *in situ* animal exploitation can be inferred from the following findings. Bodypart representation reflects introduction of entire carcasses into the cave by humans. A few cut marks, impact fractures, impact notches on limb bones, phalanx or calcaneum and burnt splinters indicate complete animal exploitation (butchery, meat consumption, marrow extraction, bone breakage). Most of the "Artiodactyla" are adult animals and suggest what we may call a preliminary model of hunting strategy.

The Kalamakia faunal assemblage is well integrated in the Greek quaternary paleontological record and presents an original exclusive caprid and cervid association in the western Europe data (Bökönyi 1971; Trantalidou 1996).

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Figure 1 : mortality profiles of the main game (indeterminate artiodactyles included)

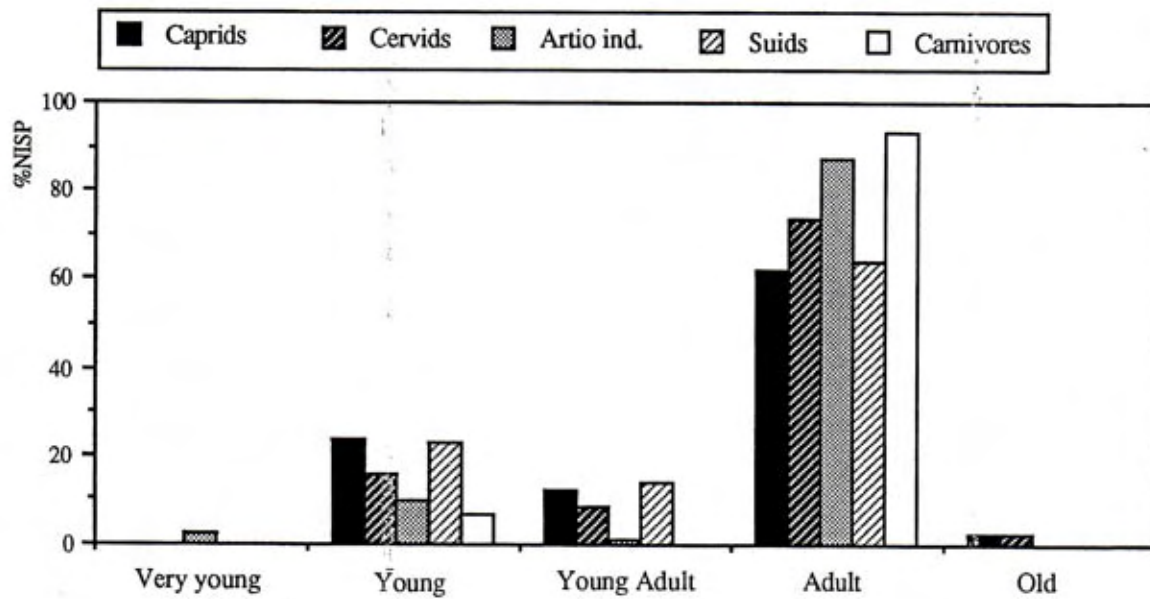
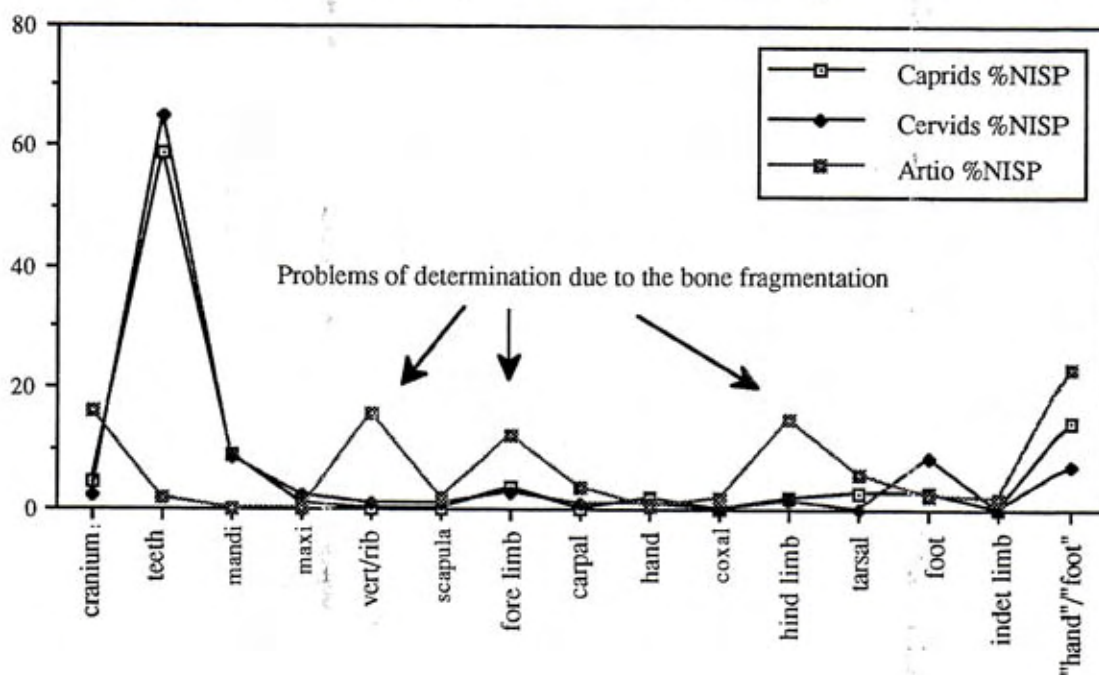


Figure 2 : bodypart distribution of Caprids, Cervids and Artiodactyles indeterminate.



KALAMAKIA	Caprids	Cervids	Artio Indet	Suids	Proboscidian	Bovids	Carnivores	Total NISP
SURFACE	11	8	3		1		22	45
Bandes 4 à 9	25	45	29	7	1	2	1	110
level 93-1	9	3	2				1	15
level 94-1	20	29	44	2	2		16	113
level 95-1	8	12	12	1				33
level 95-2	38	34	79	7			12	-170
Total	111	131	169	17	4	2	52	486

Table 1: stratigraphic distribution of Kalamakia's faunal remains (NISP).

KALAMAKIA Bodyparts	Capra ibex		Dama dama		Artiodactyles indet		Total	
	NISP	%NISP	NISP	%NISP	NISP	%NISP	NISP	%NISP
Cranium	75	75	98	79,7	31	18,7	204	52,4
Vertebra/ribs					26	15,7	26	6,7
MA-scapula			1	0,8	3	1,8	4	1
MA-	4	4	3	2,4	18	10,8	25	6,4
MA-carpal			1	0,8	6	3,6	7	1,8
MA-extr	2	2	1	0,8	1	0,6	4	1
MP-coxal					3	1,8	3	0,8
MP-	2	2	2	1,6	24	14,5	28	7,2
MP-tarse	2	2			10	6	12	3,1
MP-extr	3	3	11	8,9	3	1,8	17	4,4
MI					3	1,8	3	0,8
MI-extr	12	12	6	4,9	38	22,9	56	14,4
Total	100		123		166		389	

Table 2 : bodypart distribution of Capra, Dama and Artiodactyles indetermined.
MA: fore limb/ MP: hind limb / MI: indeterminate limb / extr: "hand" or "foot"

table 3 -Kal

Biometry Kalamakia	cf. Dama				Capra			
	n	min	max	avera.	n	min	max	avera.
MD P2 inf	1			8,5	1			5,2
VL P2 inf	1			4,2	1			3,8
MD P3 inf	1			11,2	1			7,5
VL P3 inf	1			7,4	1			7,2
MD P4 inf	1			12,5	1			10,6
VL P4 inf	1			8	1			5,8
MD P3-P4 inf					1			7,2
VL P3-P4 inf					1			10,1
MD M1 inf	2	12,2	14,2	13,2	1			11,3
VL M1 inf	2	8,7	10,4	9,55	1			7,5
MD M2 inf	1			17,1				
VL M2 inf	1			11,9				
MD M1-M2 inf					1			13,3
VL M1-M2 inf					1			13,5
MD M3 inf	2	24,8	11,4	18,1	3	24,7	29,3	26,9
VL M3 inf	2	11,4	12	11,7	3	8	9,6	8,6
MD P2 sup	2	11,5	13,9	12,7	1			6,9
VL P2 sup	2	10,4	10,9	10,7	1			6,9
MD P3 sup								
VL P3 sup								
MD P4 sup					1			10
VL P4 sup					1			11,8
MD P3-P4 sup					4	7	8,7	7,8
VL P3-P4 sup					4	9	10,9	9,85
MD M1 sup	2	12,7	14,5	13,6				
VL M1 sup	2	15,2	17,2	16,2				
MD M2 sup								
VL M2 sup								
MD M1-M2 sup	2	14,6	16,7	15,7	3	11	13,4	12,1
VL M1-M2 sup	2	17,7	18,8	18,3	3	11,8	13	12,5
MD M3 sup	1			17,9				
VL M3 sup	1			19,3				

Table 3 : teeth measurements of Ibex and fallow deers.

MD : mesio-distal diameter.

VL : vestibulo-lingual diameter.