Camels in Romania

Adrian BĂLĂŞESCU
National History Museum of Romania, Calea Victoriei nr. 12, 030026,
sector 3, Bucharest (Romania)
abalasescu2005@yahoo.fr

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ABSTRACT
A large number of animal remains (186 pieces) were accidentally discovered in 2008, during construction works on a private property in Agighiol village (Tulcea County), in an area previously unknown to have archaeological relevance. This material led to the identification of camel remains (155 bones), an exceptional result because camel material had been previously reported from only two other localities in Romania, both of them in Romano-Byzantine archaeological sites from Dobruja (9-12th centuries). Two 14C dates obtained on the camel remains from Agighiol place the animals in the Middle Ages, 17-18th centuries, thus relating the presence of camels to Ottoman Turk influences. We review the archaeological record of camels from Roman until Ottoman times, in Romania and surrounding countries. Camels were encountered in Dobruja up to the end of the 19th century and the beginning of the 20th century, as proven by old photographs.

KEY WORDS
Archaeozoology,
camels,
Middle Age,
Zoogeography,
Romania.

RÉSUMÉ
Chameaux en Roumanie.
Un nombre important de restes (186 spécimens) ont été accidentellement trouvés en 2008, pendant la construction d'une propriété privée dans le village d'Agighiol (Comté de Tulcea) dans une région qui n'avaient pas été répertorié pour son importance archéologique. Ce matériel a conduit à l'identification de restes de chameaux (155 os). Ce résultat est exceptionnel car les restes osseux de chameaux ont été seulement documenté dans deux autres localités en Roumanie, toutes deux des sites Romano-Byzantin de Dobroudja (9-12e siècles). Deux datations 14C obtenu sur les restes de chameau d'Agighiol situent l'animal durant le Moyen-Age, 17-18e siècles, reliant ainsi la présence du chameau à l'époque Ottomane en Roumanie et dans les pays adjacents. Les chameaux étaient présents en Dobroudja jusqu'au 19e siècle et le début du 20e siècle comme témoignent les photographie anciennes.

MOTS CLÉS
Archéozoologie,
chameaux,
Moyen Age,
Zoogéographie,
Roumanie.

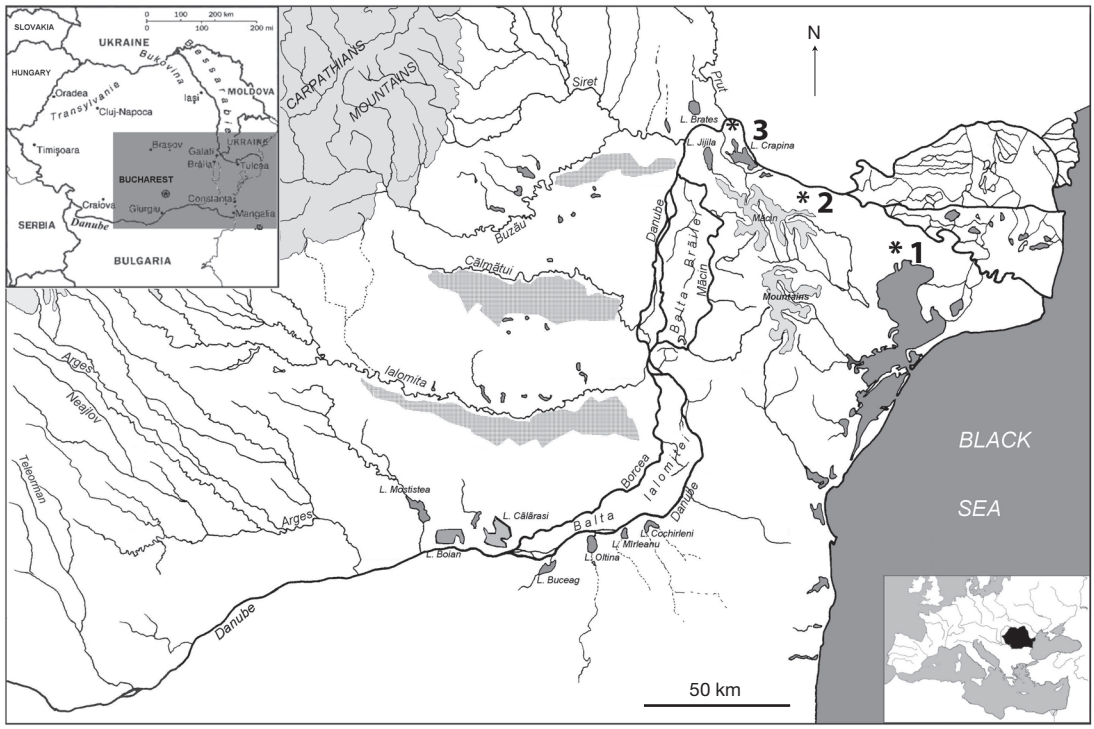

FIG. 1. — Geographic setting of archaeological sites with camel remains: **1**, Agighiol; **2**, Isaccea-Noviodunum; **3**, Garvăn-Dinogetia.

INTRODUCTION

The increase in the number of archaeozoological studies in Romania over the last twenty years (especially after the fall of communism), has led to numerous new discoveries which allow for a better understanding of the relationships between people and animals, as well as provide records of the distribution of animals regarded today as exotic, in some geographic areas (Bălășescu *et al.*, 2003; Horard-Herbin & Vigne 2005). Here we present evidence showing that camels lived in the present-day territory of Romania and in surrounding areas, in recent history – beginning with the Byzantine period and into modern times.

CONTEXT OF THE DISCOVERY

A relatively large number of animal remains (186 fragments) were accidentally discovered in 2008 during construction work on a private property, in the center of Agighiol village (Tulcea County), in an area with no previously recorded archaeological findings (Bălășescu *et al.* 2011). As this faunal material was collected in the absence of a specialist archaeologist and no stratigraphic context had been recorded for the finding (e.g., the presence of a habitation level or of other archaeological materials was not specified), it was almost impossible to determine its chronological position. Furthermore, for the same reason, it is likely that the osteological material of the potential archaeological complex was not collected in its entirety.

Aside from the camel remains, the osteological assemblage from Agighiol also contained remains of *Bos taurus* (cattle) and *Equus caballus* (horse). This assemblage is exceptional if we consider that, to the best of our knowledge, only two other examples of camel remains had been previously identified from archaeological settings in the territory of Romania.

Both of these came from sites in Dobrogea dated to the Byzantine period (9-12th centuries): Garvăn–Dinogetia (Gheorghiu and Haimovici 1965; Stefan *et al.*, 1967) and Isaccea–Noviodunum (Bejenaru 2007) (Fig. 1; Table 1).

This exceptional material was radiocarbon-dated for historical accuracy – at the Laboratoire de Mesure du Carbone 14, CEA Saclay-Gif sur Yvette, France. Samples were prepared at CNRS-UMR 7209 Paris "Archéozoologie, Archéobotanique. Sociétés, Pratiques et Environnements" by Antoine Zazzo. They came from camel tibia diaphyses and produced two 14C data (one on collagen and the other on apatite). These date the animal remains to the end period of the Romanian Middle Ages, most probably in the 17-18th centuries (Table 2).

DESCRIPTION OF THE FAUNISTIC MATERIAL

The conservation state of the archaeozoological material is very good. Some remains are fragmentary, others are complete, allowing the taxonomic identification of the entire analysed material. On the investigated camel remains there were no cut marks (defleshing and dismemberment), but only tooth marks from carnivores (on five bones – Fig. 2) and rodents (one fragment). The low number of biological marks (6/155, meaning 4%) suggests the bones remained for only a short period of time on the soil surface and available to the carnivores or rodents. Under these circumstances, we do not exclude the possibility of a rapid covering by the soil (sediment).

TABLE 1. — Distribution of the fauna by species and anatomical elements.

Anatomical elements	*Camelus* sp.	*Camelus bactrianus*	*Camelus dromedarius*	*C. bactrianus* x *C. dromedarius*	*Bos taurus*	*Equus caballus*
Neurocranium	31					
Viscerocranium	11					2
Mandibula	3				1	
Dentes	2					
Atlas		3				
et Vert. cv.		12			2	
Vert. thor.		30			1	
Vert. lumb.		10			6	
Sacrum		4			2	
Vertebrae	7					
Costae	10					
Scapula	1					
Humerus	1				1	
Radius		1				
Metacarpus		1				
Pelvis	9				1	
Femur	4	1			5	2
Tibia		8			3	1
Talus		1				
Calcaneus		1				
Metatarsus		1	1	1	3	1
Phalanx 1	1					
Total	**80**	**73**	**1**	**1**	**25**	**6**

In the following, we will focus on a short description of the osteological material belonging to the camels. The repartition of the anatomical elements (Table 1 ; Fig. 3) points to a predominance of the

TABLE 2. — The 14C age determination measurements obtained for the camel remains from Agighiol. The values were calibrated with the Calib Rev 5.0.1 programme.

ID sample	Dated fraction	ID laboratory	Date BP	Date cal. BC (1 sigma)	Date cal. BC (2 sigma)
AGI - 1	collagen	sacA 21303	235 ± 20	[1649 AD:1665 AD] 0.711831 [1785 AD:1793 AD] 0.288169	[1643 AD:1669 AD] 0.635112 [1780 AD:1798 AD] 0.335406 [1945 AD:1951* AD] 0.029482
AGI -2	apatite	sacA21306	270 ± 25	[1528 AD:1544 AD] 0.248935 [1548 AD:1550 AD] 0.038158 [1634 AD:1661 AD] 0.712907	[1521 AD:1576 AD] 0.366902 [1582 AD:1591 AD] 0.016406 [1622 AD:1666 AD] 0.574615 [1783 AD:1796 AD] 0.042077

Fig. 2. — Camel bone fragments bearing carnivore teeth marks: femur (left), calcaneum (bottom right) and the first phalange (upper right). Scale bars, 10 cm.

remains belonging to the axial zone (vertebrae and ribs), representing 49% of all elements; the head remains follow - with 30.3% - and the hind limbs (coxal, femur and tibia) with 14.2%. The extremities of the limbs (carpal, tarsal, metacarpal, metatarsal bones and phalanges) - with 4.5% - and the front limbs (scapula, humerus, radius and ulna) - with 1.9% - have low percentages.

An evaluation of the minimum number of camel individuals shows these remains as belonging to at least six adult individuals, identified on the basis of six more or less complete maxillaries (Fig. 4). Their age is over five years if we take into consideration that, in general, the definitive dentition has already erupted completely and M^3 is present on all these maxillaries (Silver 1969, 301, table J). Three individuals seem to be older if we take into consideration the advanced wear of M^1 (Fig. 4).

The good conservation state of the camel material allowed a morphological and biometric study (Smuts Malie and Bezuidenhout 1987; Steiger 1990) leading to the separation of the two camel species: *Camelus bactrianus* (two-humped camel) and *Camelus dromedarius* (one-humped camel).

The majority of the material belongs to *C. bactrianus* (73 remains against 1 of *C. dromedarius*; the remainder of 80 could not be precisely identified).

Also, we made a series of diagrams, beginning from the complete bones, which in our case are represented by the metapodials (metacarpal and metatarsal bones) and the tibia (Figs 5-7). The biometric data from Agighiol (see the biometry appendix) were compared with those gathered by Steiger (1990). Thus, one of the diagrams points to the intermediary position (between the two species) of a metatarsal bone, a fact indicating a hybrid individual resulting from cross-breeding between the two species (Fig. 7).

As such, our study shows that on the territory in Romania, in the medieval period, the two species were found in Dobrogea and that *C. bactrianus* predominated in comparison with *C. dromedarius*. This would also result from the assessment of the combination NMI which would suggest at least three *C. bactrianus* individuals, one of *C. dromedarius*, one hybrid (*C. bactrianus x C. dromedarius*) and an individual unidentifiable down to the species level.

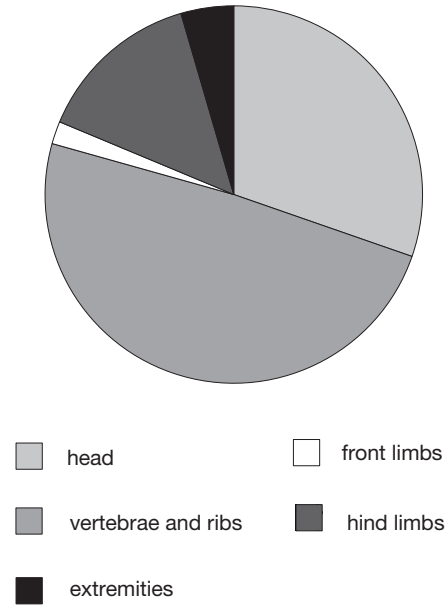

FIG. 3. — Repartition by body segments of the camel bone fragments.

PATHOLOGY

One of the camels presents a pathology at the intra-articular exostosis at the level of the cotyloid cavity of the right coxa between the ischion and the pubis (Fig. 8), between the femoral head and the articular cavity of the coxa. The exostosis has the following dimensions: 76.5 mm in length; 20.6 mm wide; a thickness between 3 and 5 mm.

In fact, this type of pathology might have been a "handicap" for the animal which, probably, had a slight limp. The origin of this exostosis is, probably of accidental or traumatic nature. Thus, a blow, a fall, etc., might break a part of the articular cartilage at the level of the femoral head. We cannot exclude, of course, the use of this animal in heavy work at an early age. In a subsequent phase, this cartilage might have become ossified, leading to the exostosis.

Unfortunately, the absence of the femur corresponding to this pathologic coxa does not allow us to reach a definitive conclusion. On the other hand, the lack of pathologies on the skeleton leads us to believe that this problem at the level of the coxa was strictly localized and only slightly incapacitating and the animal did not live long with this pathology and did not develop secondary conditions at the level of the appendicular skeleton.

DISCUSSIONS AND CONCLUSIONS

Up to the present, following our data, the sole camel discoveries in the territory of Romania are from Dobruja, Tulcea County, in archaeological levels related to the Byzantine period: a phalange 1 of *Camelus bactrianus* (two-humped camel) was found at Dinogeția (Garvăn, Jijila village), in a context assigned to the 9-12th centuries (Gheorghiu & Haimovici 1965), while a fragment of metapodium of *Camelus* sp. (Bejenaru 2007) was found at Noviodunum (Isaccea) at a level belonging to the 11th century.

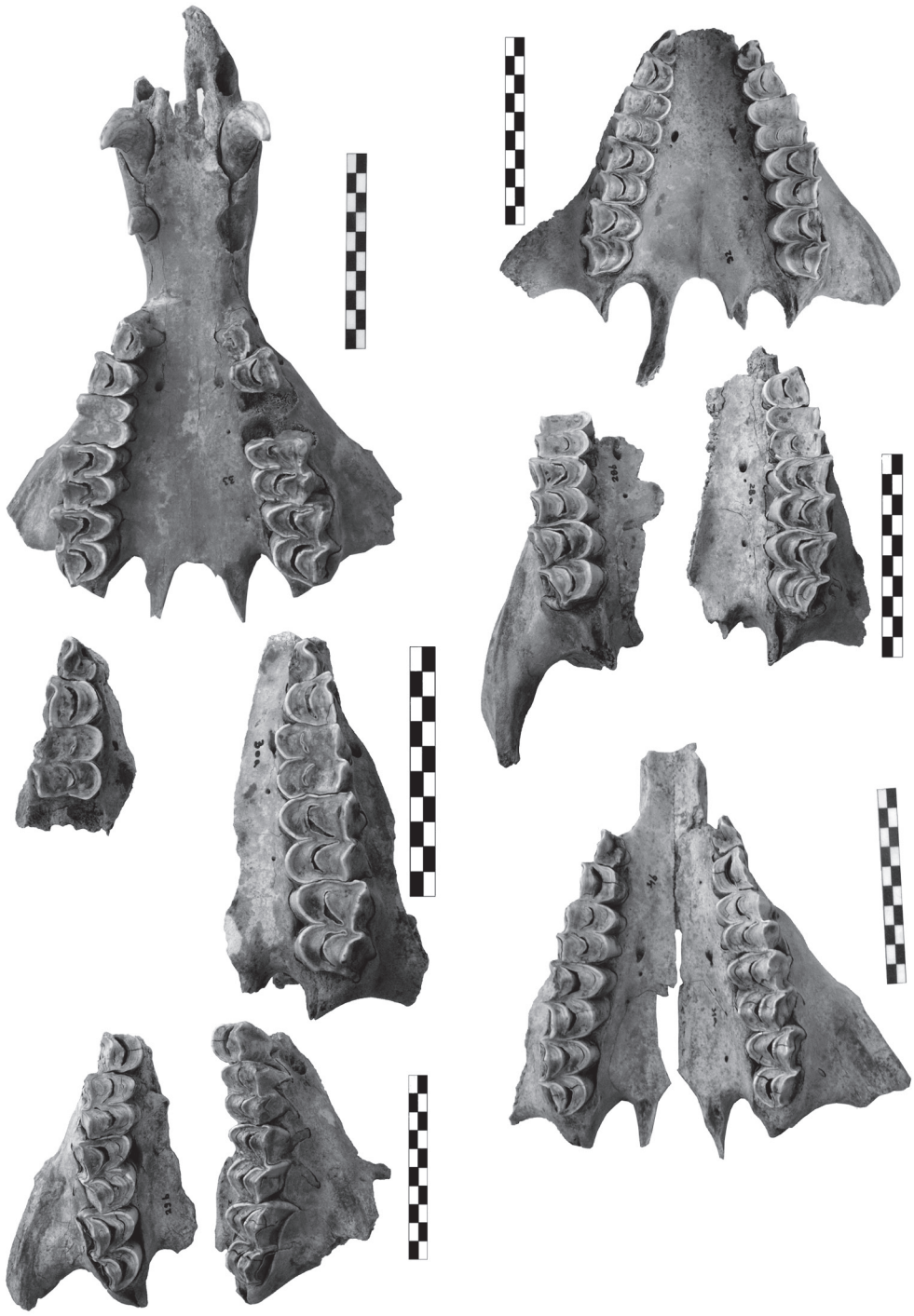

Fig. 4. — Remains of camel maxillaries allowing the determination of the minimum number of individuals.

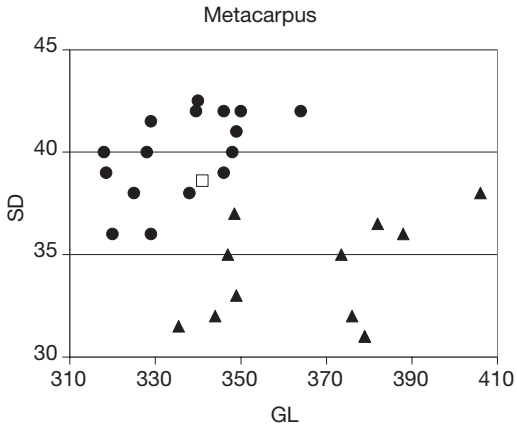

FIG. 5. — Comparisons between the biometric data of *C. bactrianus* (circle), *C. dromedarius* (triangle) and the Agighiol remains (square) for metacarpus. The measurements follow Angela von den Driesch (1976).

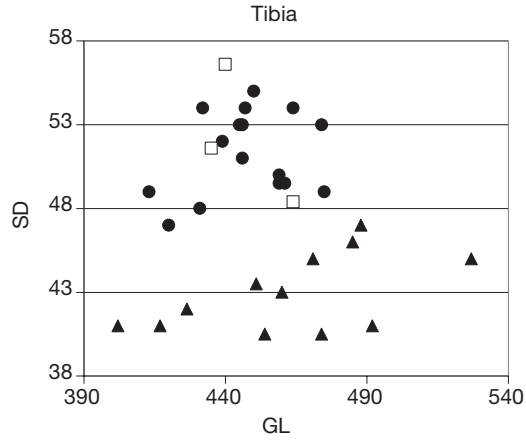

FIG. 6. — Comparisons between the biometric data of *C. bactrianus* (circle), *C. dromedarius* (triangle) and the Agighiol remains (square) for tibia. The measurements follow Angela von den Driesch (1976).

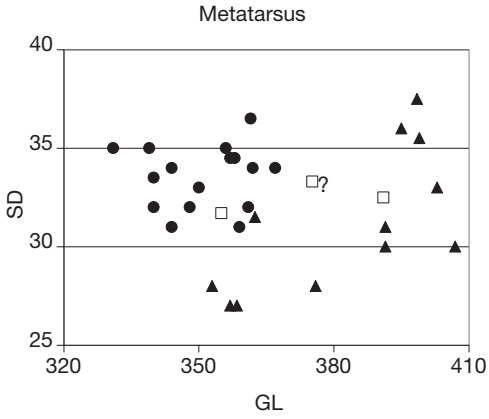

FIG. 7. — Comparisons between the biometric data of *C. bactrianus* (circle), *C. dromedarius* (triangle) and the Agighiol remains (square) for metatarsus. The measurements follow Angela von den Driesch (1976).

FIG. 8. — Camel pelvic bone with signs of pathology. Scale bar: 10 cm.

The low number of camel remains suggests the species had a reduced importance in the economy of the human communities from this period. The presence of the camel in the present-day territory of Romania could be the result of the movements of some populations from the North-East of the Black Sea or might be connected with the caravans linking the Orient with Europe.

It is apparent that, up to the present, the importance of the camel in various archaeozoological samples from Romania is very low (only two remains). For this reason, the discovery of 155 camel remains, belonging to at least six individuals, is all the more interesting and exceptional.

This discovery argues for the presence of this taxon within the spectrum of the domestic mammals belonging to the human communities of Dobruja, if we take into consideration the quantity of the faunal material, during the late medieval period (17-18th

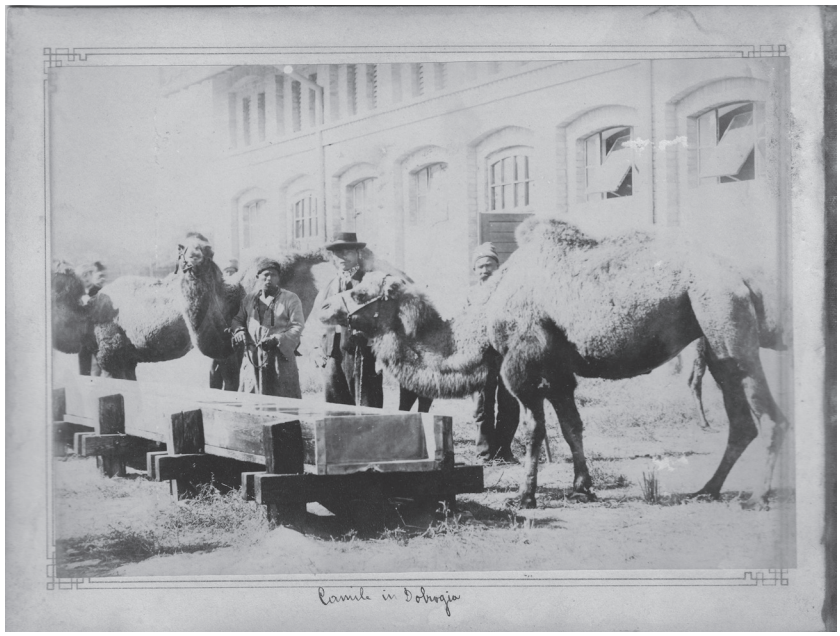

Fig. 9. — Camels in Dobruja - the end of the 19th century and the beginning of the 20th century (according to Arhire 2010).

centuries according to the radiocarbon dating). Its identification may be related to the presence and the influence of the Turks in this region.

In Central and South-Eastern Europe, the camel has been recorded since the Roman period. Its presence may be mainly the result of Roman occupation and the deployment of military units from Near Orient and African provinces, where the species is frequently found. Thus, osteological remains were found in Germany at Ravensburg (Benecke 1994), Abodiacum (Boessneck 1964), Breisach im Breisgau (Schmidt-Pauly 1980); in Switzerland at Vindonissa (Windish) (Hescheller & Kuhn 1949; Keller 1910); in Austria at Mauerbach (Riedel 1999) and Vindobona (Berger & Thenius 1951); in Hungary at Tac-Fovenypuszta (Bököny 1974) and Intercisa (Dunaujvaros) (Bököny 1989); in Serbia at Viminacium and Vranj (Vukovic & Blazic 2010); in Bulgaria at Novae (Schramm 1975) and at Nicopolis ad Istrum in the late Roman period (Beech 1997).

Evidence for the camel's presence after the Roman epoch is extremely rare and is found more in the Eastern Europe than in the central or the south-eastern area. They may be linked with the migration of various populations from Asia to Europe. Such kinds of discoveries were made mainly in Ukraine and Russia (Bököny 1974). In the Balkans, for the Byzantine period, we can mention the camel remains from Nicopolis ad Istrum (Beech 1997) from Bulgaria and from Dinogetia (Gheorghiu and Haimovici 1965) and Noviodunum (Bejenaru 2007) in Romania.

With the Turks' invasion of Europe, we note a return of the species which is documented in Hungary during the 15-17th centuries, beginning with the findings from Buda, Diosgyor and Szekszard-Palank (Bartosiewicz 1995; Bartosiewicz 1996). Within the context of Turkish (Ottoman) influence we can include the discovery of the Agighiol camel remains.

The Bactrian camel (*Camelus bactrianus*) is also found later in the territory of Dobruja in the modern epoch, as recorded by the photograph "*Camels in Dobrogia*" made between the last years of the 19 century and the first years of the 20th century (Arhire 2010, 106-107) (Fig. 9).

The role of these animals, originating from Central Asia (the two-humped camel) or from North Africa, the Arabian Peninsula and Western Asia (the one-humped camel or the dromedary), introduced and found in Europe from the Roman epoch, is connected with their use in public games, *ludi*-for the Romans (Toynbee 1973) - or as draught animals for military and civilian purposes. Probably, under conditions of food-shortage, they were also used as a meat source as pointed by the 19th century documents from Banat (Ardelean 2007, 393).

In general, Romania is characterized by a temperate continental climate. As the camel remains have been discovered only in Dobruja (a region situated between the Black Sea and the Danube) and recorded in historical documents from Banat (a region situated in South-Western Romania), this fact may be a consequence of the warmer climate of these zones, with milder winters which probably facilitated a better survival of these animals. Thus, in Dobruja, Pontic influences are felt which create a specific microclimate different from those in Romania, while sub-Mediterranean influences are felt in Banat.

The sporadic discovery of camel remains in Romania, especially in levels assigned to the medieval period, may be linked with the low interest of some Romanian archaeologists for the study of the fauna from archaeological sites. In our opinion, a better dialogue between archaeologists, historians and biologists will increase the knowledge concerning the spreading of some animal species in various less-known historical periods. In this way, the zoogeography of certain taxa and also the introduction or the extinction of different animal species could be followed.

As a conclusion, the presence of camels in Romania is known from the Byzantine period; they become more frequent in the medieval period, under the influence of the Turks, when we find both species, in Dobruja (archaeozoological evidence) and in Banat (documentary evidences), with a predominance of *C. bactrianus*. In Dobruja, the camel was recorded until the beginning of the 20th century. As in many settlements from the Roman epoch from Europe – and especially in countries surrounding Romania (Hungary, Serbia, Bulgaria) – camel remains have been identified, it is certainly expected to find them in our country. The sites from the Roman epoch should be more intensively studied from an inter- and pluri-disciplinary point of view with a greater emphasis on zooarchaeology.

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BIOMETRY APPENDIX

All measurements in milimeters, taken after von den Driesch (1976). Abreviations: **Cb**, *Camelus bactrianus*; **Cd**, *Camelus dromedarius*; **Cb x Cd**, *C. bactrianus x C. dromedarius*; **l**, left; **r**, right.

cranium	22	23	24	28 l	28 r	29 l	29 r	30 l	30b	31 l	31 r	32 l	32 r	33 l	33 r
13														195	197
13a								140.7		147.5	147.2	138.9	138.6	142	144.5
14				104.5	105	119.2	117.8	98		104	103.8	99.4	101		98.2
15														99.9	101.5
15a								43.5	42.2	41	40.3	40	38.7	49	50.5
19	82.8	84	84.1												
21	41.5	36.9	37.9												
22	39.8	40	39.5												
29										136.7		138.2		143	
30	126	114	118.5												

mandible	25	26	27
3	116.3	124.1	
6a	145.5	135	
7	123.8	114.5	
8	54.5	48	
10	162.5	176.2	167.2
11	151.5	167.5	121.2
12	231	230.3	
13	75.5	72	

humerus	19
SD	56.2
DD	54.02
CD	186
Bd	93
BT	80.9

scapula	9
SLC	79.9
GLP	118.9
LG	74
BG	67.34

radius	10
Bd	94.1
BFd	77.41
species	Cb

metacarpus	14
GL	341
Bp	68.8
Dp	45.4
SD	38.6
DD	24.62
CD	118
Bd	92.1
Dd	43.06
species	Cb

metatarsus	15	17	16
GL	391.0	375.0	355.0
Bp	64.5	63.6	65.9
Dp	49.4	50.7	51.4
SD	32.5	33.3	31.7
DD	23.5	25.1	23.0
CD	108.0	110.0	107.0
Bd	77.9	78.9	81.2
Dd	36.2	39.8	38.5
species	Cd	Cb	Cb x Cd

pelvis	13	
LA	64.7	

femur	20	21
DC	56.7	
SD	50.2	
CD	150	
Bd		105.8
species	Cb	

tibia	1	2	3	5	6	7	8
GL	464.0		422.2	427.0			
Bp	111.6	120.5					
SD	48.4		51.6	56.6		48.3	
CD	136.0		145.0	150.0		162.0	
Bd	80.2		89.5	97.3	86.6	87.1	87.3
Dd	48.0		51.4	58.0	54.9	53.6	53.4
species	Cb	Cb	Cb	Cb	Cb	Cb	Cb

astragalus	11
GLl	79.64
GLm	72.8
Dl	44.7
Dm	42
Bd	51.34
species	Cb

calcaneus	12
GL	143.9
BG	59
species	Cb

phalanx 1	18
GL	97.7
Bp	41.9
SD	22.6
Bd	33.9